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LE INTELLIGENZE AZIENDALI PER LA COMPETITIVITÀ SOSTENIBILE E IL BENE COMUNE

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Lettera del presidente

Il XLI Convegno Nazionale di AIDEA è stato un'importante occasione di confronto sulle profonde trasformazioni che stanno interessando le imprese, le istituzioni, la società e naturalmente anche le università e le nostre discipline economico-aziendali.
La crescente diffusione dell'intelligenza artificiale sta imprimendo ai processi economici, organizzativi e sociali una velocità di cambiamento senza precedenti. Essa modifica le modalità attraverso cui si genera e si utilizza la conoscenza, si assumono le decisioni, si organizzano le attività e si costruiscono le relazioni con i diversi portatori di interesse: in sintesi, come si genera, si comunica e si distribuisce valore. La rapidità del progresso tecnologico non deve, tuttavia, farci dimenticare che la tecnologia non è mai del tutto neutrale: incorpora scelte, criteri, priorità e visioni della società. L'intelligenza artificiale deve rimanere uno strumento al servizio della responsabilità e della libertà umane, senza trasformarsi in un criterio autonomo e impersonale al quale delegare decisioni che incidono sulla vita delle persone e delle comunità.
Ciò richiede trasparenza, responsabilità e capacità di controllo, ma soprattutto la piena riconoscibilità della Governance aziendale cui compete la decisione finale. Le possibilità offerte dagli algoritmi non possono attenuare la responsabilità di chi progetta, governa e utilizza tali sistemi all'interno delle imprese e delle organizzazioni. In questa prospettiva, il bene comune non rappresenta un limite esterno all'innovazione, ma il suo criterio più alto di orientamento. Le imprese sono chiamate a concorrervi attraverso scelte che sappiano armonizzare competitività, sostenibilità, rispetto della persona e responsabilità verso le generazioni future. La loro capacità di perdurare non può essere separata dal contributo che offrono in termini di valore economico e di tutela del patrimonio umano, sociale e ambientale nel quale operano.
Gli studi raccolti in questi Atti testimoniano la vitalità della comunità italiana delle aziendaliste e degli aziendalisti, una comunità che ha sempre saputo confrontarsi con le trasformazioni del proprio tempo senza rinunciare alla solidità delle proprie centenarie radici scientifiche e alla responsabilità del proprio ruolo. È proprio dalla capacità di coniugare tradizione e innovazione, rigore metodologico e apertura interdisciplinare, che può nascere un contributo autorevole alla comprensione del presente e alla costruzione del futuro.
Nel corso di una storia più che bicentenaria, AIDEA e la tradizione scientifica che essa rappresenta hanno attraversato profonde trasformazioni ed anche diverse rivoluzioni industriali. Con il medesimo spirito, la nostra Accademia saprà continuare ad essere una comunità scientifica aperta, responsabile e capace di proiettarsi positivamente nel futuro, contribuendo a orientare anche la nuova rivoluzione che interessa le intelligenze aziendali.

Il Presidente

Gennaro Iasevoli

Il convegno

La celebrazione del XLI Convegno dell'Accademia Italiana di Economia Aziendale si è confermata un'eccellente opportunità per un ampio ed aperto confronto scientifico fra studiose e studiosi di discipline aziendali su temi che animano un dibattito accademico e culturale vivacissimo ed ormai giunto a un livello di maturazione e approfondimento tale da richiedere sintesi teoriche unitarie che si rivelino utili a integrare i paradigmi interpretativi utilizzati dai cultori delle discipline aziendali per condurre i loro studi e orientare l'agire manageriale.

L'amplissima partecipazione di socie e soci, la più alta mia registratasi da quando AIDEA ha adottato il nuovo modello di governance, è stata la dimostrazione più evidente dell'interesse per la tematica del Convegno e della crescente attenzione che le nostre comunità mostrano per le iniziative scientifiche di altro prestigio che AIDEA promuove con impegno e costanza.

Il successo del Convegno è il risultato di uno sforzo collettivo che ha richiesto l'impegno di numerosissime Colleghe e Colleghi e del numeroso ed efficiente staff dell'Università Cattolica del Sacro Cuore di Milano. Tutte le persone coinvolte, ciascuna nel proprio ruolo, hanno apportato un contributo importante nell'esclusivo interesse di AIDEA. Il consiglio direttivo, il comitato scientifico, il comitato organizzativo i coordinatori e i componenti delle track, le chair persons, i relatori e le relatrici, gli illustri ospiti della seduta plenaria e della track del Journal of Management and Governance, i dottorandi e le dottorande che hanno animato le attività precongressuali.

Il Convegno è stata un'occasione per riflettere sulle sinergie tra intelligenza artificiale e intelligenze aziendali. Se le intelligenze aziendali sono messe al servizio della generazione di valore, se la collaborazione e l'integrazione fra componente umana e artificiale genera maggiore valore, se le aziende restano al servizio "dell'uomo", è cruciale che questo maggior valore sia non solo generato, ma anche misurato, rendicontato ed equamente condiviso. Evidentemente non si tratta solo di valore in senso strettamente finanziario. In particolare, le nuove conoscenze generate dall'interazione delle intelligenze aziendali dovrebbero essere appannaggio di tutti per non rendere impari le relazioni economiche. La proposta di modelli teorico-interpretativi e di soluzioni operative per affrontare efficacemente anche le problematiche appena richiamate è un ulteriore impegno culturale che, grazie anche a questo Convegno, aziendaliste e aziendalisti hanno di mostrato di sapere assumere. Nell'esercizio del loro sforzo teorico, per accademiche e accademici, è utile tenere a mente l'ammonimento di Ursula Franklin: "La fattibilità della tecnologia, come la democrazia, dipende alla fin fine dalla pratica della giustizia e dall'imposizione di limiti al potere".

Riccardo Mussari

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Track 1: CREARE VALORE PUBBLICO SOSTENIBILE: SFIDE E OPPORTUNITÀ PER IL MANAGEMENT

Smart city project organizational design for public value: a configurational approach

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Smart city project organizational design for public value: a configurational approach

Emanuele Gabriel Margherita[1], Stefania Denise Escobar[2], Giovanni Esposito[3], Nathalie Crutzen[4]

1. Introduction

Public value is a key goal for public administration (PA) (Palumbo and Manesh 2023). Broadly, public value involves what is good for and positively valued by the public (Moore 1995). Specific forms of public value may include services characterized by higher efficiency, effectiveness, and other higher-order forms, such as accountability, fairness, justness (Moore 1995); as well as services that are more accessible to both citizens and tourists (Escobar and Hall 2025). In this work, we use the conceptualization of public value used by (Castelnovo et al. 2016) in terms of the intended outcomes (direct short-term effects) of the PA initiatives implemented. Digital transformation is considered a driver of public value in PAs because it can create less expensive and citizen-centric services (Chen et al. 2020). To this end, smart city projects play a pivotal role in the transition of PAs to digitalize their processes (Escobar and Margherita 2021; Margherita et al. 2023). Smart city projects can be understood as organizational subunits whose primary goal is to implement digital tools that enhance urban services, thereby creating public value while meeting timelines, staying within budget, and complying with predefined performance standards (Viitanen and Kingston 2014). For instance, Hong Kong's municipality developed 8 smart city projects to create public value through mobility enhancement, energy efficiency, smart recycling, and e-government portals (Lam and Yang 2020).

Although previous studies have mostly limited their analysis to the relationship between technological tools and the expected public value outcomes (Bibri and Krogstie 2017), they tend to overlook a more complex examination of the organizational design choices of smart city projects. Such an analysis is essential because each PA has different needs, and the diversity of digital tools requires distinct sets of activities to generate public value. In other words, the traditional "one-size-fits-all" approach to smart city projects must shift toward a "one-size-does-not-fit-all" perspective that takes into account the specific needs of each PA (Nam and Pardo 2011; Esposito et al. 2021).

Designing a smart city project involves a series of organizational choices that we conceptualize along three dimensions: (1) technological choices that enable digital transformation (e.g., first-generation digital technologies or AI systems); (2) implementation arrangements that structure the inter-organizational collaboration for innovation (e.g., public–private partnerships or tendering); and (3) training and capability-building initiatives aimed at preparing human resources of public servants to effectively engage with digital tools.

The first key organizational decision for PAs in smart city projects concerns the technological solutions chosen to sustain digital transformation. These can be broadly categorized

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into two types. The first category includes digital technologies that require active human input, which we term first-generation digital technologies. Public servants operate these systems by entering, managing, or processing data to deliver enhanced services to citizens (Kummitha 2019). A primary example is e-government, defined as the reorganization of public administration and management systems to maximize the use of ICTs in delivering administrative services to citizens (Aleisa 2024). These tools enable the transition from paper-based and in-person workflows to digital, networked procedures. However, they typically require ongoing updates and maintenance, particularly when administrative processes change (Chidama and Ononiwu 2023). Beyond e-government, digital scheduling and platform systems also fall within this category. These include systems that allow public servants to manage transport networks or cultural events, while enabling citizens to reserve tickets or access services online. These systems are typically designed so that PAs can modify or update them as needed (Esposito et al. 2025).

The second category encompasses AI, defined as "the ability of a machine to learn from experience, adjust to new inputs, and perform human-like tasks" (Duan et al. 2019). Unlike first-generation tools, AI systems act autonomously, assisting public servants in decision-making and providing real-time insights. Examples include city's platforms, which offer live analytics on urban mobility, and smart waste management systems, which employ AI to monitor and analyse air quality data (Margherita et al. 2023).

Beyond the selection of technological solutions, PAs also make organizational decisions about how to structure collaboration with external actors, often by creating an inter-organizational field that supports the deployment of smart city projects (Mora et al. 2023). Given that public administrations often lack the specialized technical skills required to manage complex smart city initiatives or to develop digital tools in-house, they commonly rely on external technology providers (Chu et al. 2021). These actors are typically engaged through Public–Private Partnerships (PPPs) and public tenders, which represent two distinct modes of inter-organizational coordination (Kummitha 2019; Esposito, Taffoni, et al. 2024).

Public–private partnerships (PPPs) are long-term collaborative arrangements in which PAs and private organizations co-design, co-invest in, and co-implement smart city projects (Quan and Solheim 2023). In PPPs, the inter-organizational collaborations are structured through joint governance mechanisms, shared responsibilities, and negotiated objectives, fostering a strategic and integrative relationship between public and private actors. In contrast, tendering is a form of regulatory coordination (Kummitha 2019), used to contract specific services or technological implementation through competitive public calls. Through tendering procedures, public administrations establish quasi-markets, where innovation is delegated to external providers selected via open bidding (Esposito, Terlizzi, et al. 2024). Here, the inter-organizational collaboration is organized through formal contracts, clear task specifications, and time-limited engagements, emphasizing transactional accountability rather than strategic co-development (Esposito, Terlizzi, et al. 2024).

Moreover, digital skills have increasingly been recognized as a critical prerequisite for the effective adoption and use of digital technologies (Ciarli et al. 2021). They have become central to both academic and practitioners' debates on the diffusion of digital technologies, particularly in public sector contexts (Helsper and van Deursen 2015). Therefore, human resource training aimed at developing digital competencies represents a third key organizational choice in the design of smart city projects (Gerli et al. 2022). This includes targeted training programs and continuous professional development initiatives, which are essential to enable public servants to operate digital tools effectively and to support the reconfiguration of administrative processes in line with digital transformation goals (Gerli et al. 2022).

So far, the literature has largely examined the organizational design choices of smart city projects for public value - technological tools, inter-organizational collaboration instruments, and training initiatives - in isolation. However, the smart city projects in PAs require the combined effect of multiple interdependent choices. As a result, there is a lack of comprehensive,

configurational studies that investigate how different design elements interact to support the successful development and implementation of smart city projects for public value. To address this gap, we pose the following research question: "What configurations (if any) of smart city project organizational design are associated with the realization of expected public value?"

To address these gaps, this study conducts a fuzzy-set qualitative comparative analysis (fsQCA). fsQCA accounts for the complexity of causal relationships and enables the identification of alternative smart city project organizational design choices through which public value may emerge. Our sample consists of 85 smart city projects initiated under the call for projects "Walloon Smart Territory – 2019". The empirical focus on this specific regional context allows us to account for real-world variation of smart city projects across municipal administrations.

This study contributes to the literature on the organizational design of innovation and smart city projects (De Vries et al. 2016; Kummitha 2019), as the first to empirically examine organizational choices oriented toward public value in an integrated manner. Moreover, it identifies three distinct configurations of smart city project organizational design aimed at generating intended public value.

2. Methodology and sample

We conduct fsQCA (Ragin 2008). It embraces a configurational logic that accounts for the interaction effects among various characteristics within a case (Misangyi et al. 2017). fsQCA investigates causal complexity and conjunctural mechanisms through the logic of set theory, allowing the conceptualization of configurations and their conjunctural nature as combinations of fuzzy sets (Margherita and Braccini 2020; White and Burger 2022). For this study, we use as our sample 85 project proposals submitted in response to the Walloon Smart Territory call (2019). This is a valid sample because this initiative invited PAs to propose smart city projects aimed at adopting digital technologies or AI and related training to enhance public service value with the help of inter-organizational instruments. Therefore, this sample allows to analyse the theoretical conditions of smart city projects (inter-organizational instruments, technological solutions, and investment in training) in relation to the outcome of public value, grounded on enhanced public services. fsQCA requires the calibration of each condition and outcome, i.e., the grading of a scale of membership ranging from full membership to full non-membership. When working with textual data, an indirect calibration method is recommended (Ragin 2008). This method enables researchers' to categorize each case based on its degree of membership in the relevant condition and outcome sets. For the five conditions (PPPs, tenders, first-generation digital technologies, AI systems, training) and the outcome (public value) a three-level scale is employed. This scale identifies whether a condition is present (0.95) or absent (0.05) with 0.5 as a cross-over point, representing maximum ambiguity (Berné-Martínez et al. 2021). Following the selection of these calibration scales, a deductive thematic analysis was conducted to identify the presence, absence, and ambiguity of each condition and the outcome within the project proposals (Braun and Clarke 2006).

3. Findings, discussion, and conclusion

The fsQCA methodology provides three main analyses: necessary condition, sufficient condition, and robustness analysis. In this extended abstract, we focus on the complex solution of the sufficient conditions analysis (Table 1). The complex solution presents all the possible combinations of conditions for the outcome (Margherita and Escobar 2025). The results are presented according to the notation proposed by (Fiss 2011), which is widely adopted in studies employing the fsQCA methodology. In this notation, a filled circle (●) indicates the presence of

a condition contributing to the outcome, a crossed circle (⊗) represents the absence of that condition, and a blank space (–) denotes indifference of the condition with respect to the outcome.

	Solutions		
Condition	1	2	3
PPPs	●	●	⊗
Tenders	⊗	⊗	●
First-generation digital technologies	⊗	●	●
AI	●	⊗	⊗
Human resource training	-	●	●
Raw coverage	0.31	0.37	0.23
Unique coverage	0.20	0.19	0.05
Consistency	0.86	0.92	0.91
Solution coverage	0.62		
Solution consistency	0.86		
Legend: ●= Causal condition present ⊗ = Causal condition absent - = indifference			

Table 1. The sufficient conditions analysis: complex solution

The analysis reveals three main configurations. The first solution shows that smart city projects are designed to create public value through the use of PPPs combined with AI systems (Szpilko et al. 2023). This configuration is grounded in the idea that PPPs act as long-term collaborative instruments, enabling the continuous management of complex AI systems that require co-design and the ongoing monitoring and adjustment beyond the initial implementation phase to ensure public value realization (Kummitha 2019; Ahad et al. 2020). The second solution highlights the role of PPPs in managing first-generation digital technologies jointly with training programs for public servants (Esposito et al. 2025). In this case, PPPs facilitate the implementation of complex smart city projects that involve first-generation digital technologies requiring continuous updates over time, such as e-government systems capable of delivering multiple services over time (Aleisa 2024). These technologies demand high levels of digital competence among public employees; consequently, technology providers can provide ongoing training to ensure effective technology use and maintenance of the system (Chidama and Ononiwu 2023). Finally, the third solution emphasizes the role of traditional public tenders in developing smart city projects that foster public value creation. In this configuration, technology vendors are capable of delivering well-defined first-generation digital technologies that do not require frequent updates, while also equipping public servants with the necessary skills for their effective use (Margherita et al. 2023; Esposito et al. 2025). This study has a limitation: it does not allow us to analyse the achieved public value of smart city projects, but only their intended public value. Nevertheless, this limitation does not diminish the relevance of the research, as most smart city initiatives remain largely conceptual (Appio et al. 2019). In contrast, this work provides one of the first empirical perspectives on how such projects are actually being developed.

Keywords: Smart city project; organizational design; public value; fsQCA; artificial intelligence

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Intelligenza Artificiale e readiness organizzativa nella PA locale: il caso del Comune di Sezze

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1. Introduzione

Negli ultimi anni, la Pubblica Amministrazione (PA) italiana è stata coinvolta in un articolato processo di trasformazione digitale, guidato dal Piano Nazionale di Ripresa e Resilienza (PNRR) e da strategie orientate alla semplificazione e alla trasparenza amministrativa. In questo scenario, l'integrazione di tecnologie basate sull'Intelligenza Artificiale (AI) costituisce una delle principali sfide per le amministrazioni locali, che devono equilibrare esigenze di efficienza, accessibilità e inclusione. Il Comune di Sezze, situato nella provincia di Latina, rappresenta un esempio significativo di ente impegnato, nel periodo 2022-2025, in un percorso strutturato di digitalizzazione dei servizi informativi, culminato nell'analisi di fattibilità di un "chatbot AI civico" a supporto delle attività informativo-amministrative. Il presente contributo si propone di esplorare, attraverso un'indagine interna rivolta al personale comunale, le condizioni organizzative, il livello di competenze digitali e le percezioni associate a tale innovazione, adottando il quadro teorico della co-creazione di valore pubblico e del digital government come riferimento interpretativo.

Il presente studio non persegue obiettivi di rappresentatività statistica, bensì di generalizzazione analitica, coerentemente con l'impostazione del single embedded case study. Il Comune di Sezze è stato selezionato in quanto caso teoricamente informativo, caratterizzato da condizioni organizzative ricorrenti in un'ampia platea di enti locali di medie e piccole dimensioni: risorse digitali limitate, elevata pressione informativa multicanale e un capitale amministrativo consolidato. In tale prospettiva, i risultati non sono intesi come generalizzabili all'insieme delle amministrazioni locali, ma come trasferibili per analogia a contesti organizzativi che presentano condizioni strutturali e operative comparabili, mentre non si applicano direttamente a grandi amministrazioni metropolitane o a enti con elevata maturità digitale.

L'assenza di una triangolazione con indicatori oggettivi di processo o di performance rappresenta un limite dello studio; tuttavia, essa riflette consapevolmente l'attenzione rivolta alle dimensioni organizzative e percettive che precedono e condizionano l'adozione effettiva delle tecnologie di intelligenza artificiale nelle amministrazioni pubbliche.

2. Framework teorico

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Il digital government è considerato uno dei pilastri della trasformazione digitale nelle PA, insieme alla leadership digitale ("digital leadership") e alla gestione digitale delle risorse umane ("digital HRM") (Hunitie & Akhorshaideh, 2025). Negli ultimi anni, il dibattito scientifico sul digital government ha evidenziato come la transizione digitale nella PA non possa essere ridotta a una mera questione tecnologica. La digitalizzazione, per produrre benefici concreti e duraturi, deve infatti accompagnarsi a una profonda trasformazione organizzativa, capace di ripensare processi, competenze e relazioni all'interno delle PA (Mergel, Edelmann & Haug, 2019). Come osservano Dunleavy et al. (2006), l'introduzione di tecnologie digitali in assenza di una visione integrata può generare un effetto paradossale: anziché semplificare o innovare, si rischia di automatizzare rigidità preesistenti, rafforzando la burocrazia anziché trasformarla.

Questa analisi risulta particolarmente pertinente nel contesto italiano, in cui la digitalizzazione della pubblica amministrazione, sebbene incentivata da iniziative nazionali quali il PNRR, evidenzia ancora fenomeni di frammentazione e discontinuità. Gli studi di Bonomi Savignon et al. (2022) rilevano che, in particolare nei comuni di piccole e medie dimensioni, l'introduzione di strumenti digitali non si traduce necessariamente in una revisione dei processi di programmazione, controllo e gestione, riflettendo una digitalizzazione prevalentemente orientata alla conformità normativa anziché all'innovazione di valore. Contestualmente, l'adozione di soluzioni digitali può rappresentare un'opportunità per migliorare la qualità dei servizi offerti dalla PA e favorire il superamento della frammentazione territoriale nel quadro nazionale (Sacchi & Scarano, 2025).

La letteratura sul valore pubblico fornisce una cornice teorica utile per comprendere cosa significhi realmente "innovare" nella PA. L'approccio proposto da Moore (1995) e successivamente arricchito da studi più recenti (Bannister & Connolly, 2014; Criado & Gil-García, 2019) sottolinea che il valore creato dalle PA non può essere valutato esclusivamente in termini di efficienza economica, ma deve includere dimensioni fondamentali come l'equità, la trasparenza, la fiducia e l'inclusione (Deidda Gagliardo et al. 2024). In questo senso, le tecnologie digitali e in particolare l'intelligenza artificiale, devono essere valutate non solo per le loro performance tecniche, ma anche per la loro capacità di abilitare relazioni più eque, inclusive e significative tra cittadini e istituzioni.

In questo contesto, il concetto di readiness digitale riveste un ruolo strategico fondamentale. Esso non si limita alla semplice disponibilità delle tecnologie necessarie, ma implica la capacità di attivare competenze specifiche, promuovere una cultura organizzativa adeguata e implementare strutture di governance efficaci a supporto di processi di cambiamento trasformativo. Come evidenziato da Cinar, Trott e Simms (2022), la readiness digitale rappresenta una competenza organizzativa complessa, frutto dell'integrazione tra risorse umane, tecnologiche e cognitive, da sviluppare progressivamente attraverso iniziative di apprendimento, adattamento e sperimentazione.

La letteratura recente insiste inoltre sulla necessità di costruire una capacità digitale resiliente nella PA, intesa come la combinazione tra competenze digitali diffuse, flessibilità operativa e orientamento al miglioramento continuo (Dubei et al., 2023). L'introduzione dell'AI, in particolare, richiede non solo infrastrutture adeguate, ma anche una diffusa AI literacy, ovvero la comprensione critica degli strumenti intelligenti e delle loro implicazioni sul lavoro pubblico e sul rapporto con l'utenza (OECD, 2021; Eubanks, 2018).

La digitalizzazione nella PA può quindi generare valore pubblico soltanto se inserita in un percorso di trasformazione sistemica, in cui tecnologia e organizzazione si evolvono congiuntamente. La readiness non è una condizione data, ma un processo da costruire, che richiede attenzione alle persone, alla cultura e alla governance, oltre che alla dimensione tecnica. È in questa prospettiva che il presente studio si colloca, proponendo una lettura della readiness organizzativa all'adozione dell'AI centrata su quattro dimensioni interdipendenti: competenze, processi, percezione del valore e supporto organizzativo.

3. Metodologia

Lo studio adotta un disegno di caso singolo di tipo embedded (embedded single-case study design), secondo l'approccio metodologico proposto da Yin (2018). Tale impostazione consente di indagare un fenomeno contemporaneo, in questo caso, la readiness organizzativa e la percezione del valore pubblico connessa all'adozione di un chatbot AI, all'interno del suo contesto reale, quando i confini tra fenomeno e contesto non risultano chiaramente separabili. L'unità di analisi principale è costituita dal Comune di Sezze, mentre l'unità di analisi incorporata (embedded unit) è rappresentata dal personale comunale coinvolto nella survey interna. L'indagine, condotta nel luglio 2025 in collaborazione con il Dipartimento di Management della Sapienza Università di Roma, ha utilizzato un questionario strutturato somministrato digitalmente a tutto il personale (n=54), ricevendo 32 risposte valide (59,2%). Il questionario comprendeva sette sezioni: profilo organizzativo e professionale; attività prevalenti e rapporto con l'utenza; ripetitività e standardizzabilità delle richieste informative; livello di digital literacy e familiarità con strumenti AI; percezione di utilità e rischi; disponibilità alla sperimentazione e al coinvolgimento; suggerimenti qualitativi.

L'analisi dei dati è stata condotta attraverso (i) un'analisi descrittiva delle frequenze e delle percentuali relative alle principali variabili e (ii) un'analisi qualitativa interpretativa delle risposte aperte, mediante lettura tematica e categorizzazione induttiva (open coding). L'integrazione di metodologie quantitative e qualitative consente di offrire una prospettiva olistica e multilivello del fenomeno, contribuendo ad accrescere la validità interna della ricerca. L'obiettivo principale non risiede nella generalizzazione statistica, bensì nella generalizzazione analitica (Yin, 2018).

Si specifica che la raccolta dei dati si basa prevalentemente su informazioni autoriportate, al fine di cogliere le percezioni, le rappresentazioni e le disposizioni organizzative degli attori interni rispetto all'introduzione di strumenti di intelligenza artificiale. Tale scelta metodologica è coerente con l'obiettivo esplorativo dello studio e con il focus sulla readiness organizzativa, intesa come costrutto in larga misura cognitivo e culturale, particolarmente rilevante nelle fasi iniziali dei processi di innovazione digitale, antecedenti alla produzione di risultati misurabili in termini di performance.

4. Risultati

Profilo organizzativo e cultura digitale. Il campione analizzato è composto da 32 dipendenti su un totale di 54 unità (tasso di risposta pari al 59,2%), distribuiti tra dirigenti/responsabili di settore (31,3%), funzionari categoria D (25%) e personale operativo o di vigilanza (9,4%). La maggioranza dei rispondenti (59,4%) possiede un'anzianità di servizio superiore ai vent'anni, evidenziando un capitale amministrativo consolidato. Il 46,9% dichiara un buon livello di familiarità con strumenti digitali evoluti, mentre il 43,8% ha già utilizzato chatbot in ambito personale o professionale. Permane tuttavia un gap formativo: il 21,9% non ha mai partecipato a corsi di formazione digitale e il 25% vi ha preso parte oltre due anni fa.

Standardizzabilità dei flussi informativi e pressione comunicativa. Il 46,9% dei rispondenti considera le richieste informative ricevute altamente ripetitive e standardizzabili. Le tipologie più frequenti riguardano orari e contatti (62,5%), modulistica e documentazione (59,4%), stato delle pratiche (40,6%) e informazioni tributarie (21,9%). Parallelamente, il 50% giudica la qualità dell'accesso informativo "migliorabile", mentre solo il 31,3% la ritiene "molto buona". Questi risultati indicano una pressione informativa significativa, con richieste veicolate su canali multipli: telefono (56,3%), e-mail istituzionale (53,1%) e front office (43,8%).

Percezione di valore e rischi associati al chatbot. I benefici attesi includono la riduzione del carico telefonico (28,1%), la possibilità di dedicare più tempo ad attività complesse (28,1%), un miglioramento dell'efficienza del front office (12,5%) e una maggiore uniformità delle risposte (9,4%). Tra i rischi prevalgono le possibili risposte errate o generiche (56,3%), le difficoltà per utenti anziani o fragili (21,9%) e la potenziale perdita del rapporto umano (15,6%). Ne emerge

un atteggiamento di cauto ottimismo: il potenziale di efficienza è riconosciuto, ma la fiducia è condizionata dalla qualità del servizio e dall'inclusività.

Readiness al cambiamento e condizioni abilitanti. Il 37,5% dei rispondenti si dichiara favorevole con convinzione alla sperimentazione del chatbot e il 34,4% con riserva. Il 65,7% risulta disponibile a collaborare alla costruzione del sistema (ad es. definizione Q&A e validazione contenuti) e il 75% richiede supporti strutturati all'adozione (formazione interna, manuali operativi, referenti tecnici di settore). Le risposte qualitative sottolineano la necessità di accompagnamento culturale e comunicativo, con il mantenimento di canali tradizionali per utenze fragili.

Governance dell'innovazione e assetto istituzionale del progetto. L'analisi del contesto organizzativo evidenzia come il percorso di introduzione dell'intelligenza artificiale nel Comune di Sezze sia stato promosso da una chiara spinta politica, espressa dal Sindaco e dall'Assessore Fernandez, titolare della delega alla digitalizzazione. Tale indirizzo politico ha rappresentato il principale fattore abilitante dell'avvio dell'iniziativa, orientata all'esplorazione delle potenzialità dell'AI per il miglioramento dell'accessibilità e dell'efficienza dei servizi comunali.

Sul piano operativo e amministrativo, il progetto è stato ricondotto all'area del SUAP, individuata come struttura di riferimento per il coordinamento delle attività, sotto la responsabilità del dirigente Salvatore Molinari. L'implementazione dell'analisi di readiness e delle attività di ricerca è stata affidata a una ricercatrice incaricata attraverso un assegno di ricerca finanziato dal Comune, configurando una collaborazione strutturata tra amministrazione locale e ricerca accademica.

Pur in presenza di un chiaro indirizzo politico e di un presidio amministrativo definito, il progetto si colloca in una fase ancora esplorativa, caratterizzata dall'assenza di una governance formalizzata dell'innovazione in termini di ruoli trasversali, procedure codificate e meccanismi stabili di coordinamento intersettoriale. Tale configurazione emerge in coerenza con i risultati dell'indagine, che evidenziano una forte disponibilità individuale all'adozione dell'AI, accompagnata da una diffusa richiesta di supporti organizzativi e strategici più strutturati.

5. Discussione e conclusioni

La AI Readiness Matrix proposta in questo studio deve essere interpretata come uno strumento di natura esplorativa e diagnostica, finalizzato a supportare la riflessione manageriale e organizzativa nelle fasi iniziali dei percorsi di innovazione. Essa non ambisce a fornire previsioni deterministiche sull'adozione tecnologica, ma a rendere visibili tensioni, condizioni abilitanti e aree di intervento che influenzano la readiness delle organizzazioni pubbliche rispetto all'introduzione dell'intelligenza artificiale.

L'indagine interna consente di riflettere sul ruolo dell'Intelligenza Artificiale come leva di innovazione amministrativa e, al contempo, sulle condizioni organizzative necessarie affinché tale innovazione possa tradursi in valore pubblico sostenibile. In linea con la letteratura sul digital government, i risultati confermano che l'introduzione di tecnologie avanzate nella PA non può essere considerata una semplice innovazione tecnica, ma implica profondi cambiamenti organizzativi, culturali e cognitivi (Mergel, Edelmann & Haug, 2019; Janssen & van der Voort, 2016). I dati raccolti mostrano come la readiness digitale non dipenda unicamente dalla disponibilità di risorse tecnologiche o finanziarie, ma sia il frutto di un ecosistema organizzativo maturo, dove fattori umani (competenze, motivazione), strutturali (processi, leadership) e cognitivi (percezione del rischio/opportunità) si integrano. Questo approccio si rifà alle teorie della digital maturity nella PA (Capgemini, 2020) e alla nozione di digital capability come capacità collettiva di apprendere, adattarsi e innovare (Dubei et al., 2023). La presenza di un personale con elevata anzianità e consolidate competenze amministrative rappresenta una risorsa chiave in termini di conoscenza istituzionale. Tuttavia, come evidenziato da Cinar, Trott & Simms

(2022), la trasformazione digitale richiede politiche attive di change management per valorizzare il capitale esperienziale esistente e favorire una cultura dell'apprendimento continuo.

Dal punto di vista teorico, lo studio conferma che la digitalizzazione nella PA contribuisce alla creazione di valore pubblico solo quando la tecnologia è percepita come abilitante e complementare al lavoro umano, e non come sostitutiva o disumanizzante (Moore, 1995; Bannister & Connolly, 2014). La visione tecnologico-centrica, se non bilanciata, può infatti produrre effetti contro-intuitivi, come rigidità burocratica o esclusione digitale (Lips, 2022).

Sotto il profilo manageriale, si evidenziano tre implicazioni fondamentali. In primo luogo, la governance dell'innovazione deve essere improntata alla partecipazione, poiché il diretto coinvolgimento del personale nei processi di co-progettazione degli strumenti digitali contribuisce a rafforzare il senso di appartenenza organizzativa e ad attenuare eventuali resistenze al cambiamento (Criado & Gil-García, 2019; Mergel, 2016). In secondo luogo, il consolidamento della readiness presuppone investimenti mirati e strutturati nella formazione continua, sia in termini di alfabetizzazione digitale sia di competenze specifiche sull'intelligenza artificiale, mediante percorsi differenziati che rispondano alle esigenze delle diverse figure professionali presenti nell'ente (OECD, 2020). Infine, la trasformazione tecnologica deve essere guidata da principi di inclusione digitale e accessibilità, ponendo attenzione tanto alle disuguaglianze interne tra i dipendenti quanto a quelle esterne tra i cittadini, e promuovendo soluzioni che garantiscano l'accesso equo e la piena partecipazione di tutti agli strumenti digitali (OECD, 2021; Eubanks, 2018).

I risultati relativi alla governance dell'innovazione mostrano come, nel caso analizzato, l'adozione dell'intelligenza artificiale sia stata inizialmente sostenuta da un forte commitment politico, successivamente tradotto in un assetto amministrativo funzionale ma ancora in via di strutturazione. Questo evidenzia come, nei contesti della PA locale, la leadership politica possa svolgere un ruolo decisivo nell'innescare processi di innovazione digitale, mentre la loro istituzionalizzazione richiede il progressivo sviluppo di meccanismi di governance più formalizzati, in grado di trasformare l'iniziativa sperimentale in capacità organizzativa stabile (Dunleavy et al. 2006, Mergel et al., 2019).

La AI Readiness Matrix (vedi Tabella 1) proposta rappresenta un primo strumento operativo per valutare la predisposizione delle amministrazioni locali all'introduzione di chatbot o sistemi AI conversazionali. Essa consente di identificare le aree prioritarie di intervento (formazione, governance, percezioni), supportando la pianificazione strategica e la coerenza degli investimenti rispetto agli obiettivi di trasformazione digitale.

Per rafforzare l'utilizzo analitico e operativo della AI Readiness Matrix, si propone una sua formalizzazione attraverso l'identificazione di indicatori specifici per ciascuna delle quattro dimensioni: competenze digitali, processi, percezione dell'AI e supporto organizzativo (vedi Figura 1). L'obiettivo è trasformare la matrice da strumento descrittivo a framework valutativo trasferibile, applicabile anche in altri contesti della PA locale.

Readiness dimension	**Operational definition**	**Key indicators (examples)**	**Assessment scale**
Competenze digitali	Livello di alfabetizzazione digitale e familiarità con gli strumenti di IA tra il personale	% del personale che ha completato corsi di alfabetizzazione digitale/AI	Basso/Medio/Alto (o punteggio da 1 a 5)
Processi	Grado di standardizzabilità e digitalizzabilità delle attività informative	% di richieste di informazioni ripetitive % di processi documentati	Basso/Medio/Alto

Percezione dell'AI	Fiducia, aspettative e preoccupazioni relative all'uso dell'IA nei servizi pubblici	% di percezione positiva dell'IA (sondaggio) Principali preoccupazioni segnalate	Negativo/Neutro/Positivo (o punteggio da 1 a 5)
Supporto organizzativo	Infrastrutture, formazione e governance a sostegno dell'adozione delle tecnologie	Presenza di un piano di formazione Presenza di un responsabile tecnico AI Coinvolgimento nella progettazione del sistema	Assente/Parziale/Strutturato (o punteggio 1-5)

Tabella 1. Formalizzazione della matrice, fonte: propria elaborazione

Dimensione	**Livello rilevato a Sezze**	**Evidenze dalla survey**
Competenze digitali	Medio	46,9% ha buona familiarità digitale; ma 21,9% mai formato, 25% formazione >2 anni fa
Processi	Medio-Alto	46,9% richieste ripetitive e standardizzabili; 62,5% info su orari/modulistica
Percezione dell'AI	Medio (ottimismo cauto)	56,3% teme risposte errate; 28,1% vede beneficio in riduzione carico telefonico
Supporto organizzativo	Medio	75% richiede formazione; 65,7% disponibile a co-progettazione; governance ancora assente

Tabella 2. Readiness organizzativa, fonte: propria elaborazione

In prospettiva, lo studio suggerisce che il percorso verso una PA intelligente e sostenibile non si misura solo in termini di digitalizzazione dei processi, ma nella capacità di preservare la componente umana e relazionale del servizio pubblico, integrandola con le opportunità offerte dall'automazione. Come sostenuto da Dunleavy et al. (2006) e dalla più recente "human-centered AI" agenda dell'Unione Europea, la tecnologia può migliorare i servizi pubblici solo se incorporata in una visione etica, partecipativa e orientata al bene comune. Il Comune di Sezze si configura, in questo senso, come un laboratorio emblematico di AI readiness nella PA locale italiana.

6. Implicazioni teoriche e manageriali

Dal punto di vista teorico, i risultati di questa ricerca confermano e al tempo stesso ampliano alcune riflessioni centrali della letteratura sulla trasformazione digitale nel settore pubblico. In primo luogo, lo studio rafforza la prospettiva secondo cui l'adozione di tecnologie intelligenti nella PA non può essere interpretata esclusivamente come un cambiamento tecnico o strumentale, ma deve essere considerata come un processo complesso di ristrutturazione organizzativa, cognitiva e culturale (Mergel, Edelmann & Haug, 2019; Lips, 2019). La ricerca contribuisce inoltre al dibattito sul valore pubblico generato dalle innovazioni digitali, suggerendo che il valore non risiede unicamente nei guadagni di efficienza, bensì nella capacità della tecnologia di abilitare relazioni più trasparenti, inclusive e significative tra cittadini e istituzioni (Moore, 1995; Bannister & Connolly, 2014; Criado & Gil-García, 2019). In tal senso, l'adozione di chatbot o strumenti di

AI conversazionale si configura come un potenziale "abilitatore relazionale" – a condizione che sia progettato e implementato in modo coerente con i principi di accessibilità, trasparenza e co-produzione.

Un ulteriore contributo teorico riguarda il concetto di digital readiness come capacità organizzativa evolutiva e non lineare. I risultati dello studio sostengono la visione di Cinar, Trott e Simms (2022), secondo cui la readiness digitale si costruisce nel tempo attraverso un equilibrio dinamico tra competenze, cultura organizzativa e strutture di governance. Questa prospettiva si allinea anche al concetto di digital resilience, intesa come la capacità delle organizzazioni pubbliche di adattarsi e rispondere alle sfide digitali in modo flessibile e sostenibile (Dubei et al., 2023). L'adozione di soluzioni basate su intelligenza artificiale nella PA locale richiede un ripensamento integrato delle pratiche manageriali, andando oltre l'implementazione tecnica. La governance dell'innovazione dovrebbe essere strutturata in modo partecipativo, coinvolgendo attivamente il personale sin dalle prime fasi progettuali, al fine di favorire l'appropriazione dei processi e ridurre le resistenze al cambiamento. La co-progettazione dei contenuti del sistema, in particolare nel caso di chatbot informativi, consente di valorizzare la conoscenza operativa interna e contestualizzare le risposte alle esigenze specifiche del territorio (Mergel, 2016). In secondo luogo, la formazione rappresenta una leva strategica fondamentale; percorsi di digital upskilling e AI literacy vanno costruiti in modo mirato e differenziato per profilo professionale, alternando moduli pratici, momenti di confronto operativo e accompagnamento continuo (OECD, 2021). L'implementazione di strumenti di intelligenza artificiale necessita del supporto di un sistema di monitoraggio multidimensionale, che integri indicatori di efficienza quantitativi (ad esempio, il numero di interazioni gestite) con metriche qualitative quali la soddisfazione dell'utenza, l'inclusività e la qualità delle risposte fornite. Al fine di assicurare l'allineamento tra innovazione tecnologica e servizio pubblico, risulta opportuno adottare un approccio iterativo, user-centered, articolato in fasi di testing, validazione partecipata e aggiornamento continuo, nel rispetto dei principi europei di trasparenza, inclusività e centralità della persona nell'ambito dell'intelligenza artificiale (European Commission, 2021).

Parole chiave: Pubblica amministrazione locale; intelligenza artificiale; valore pubblico; digitalizzazione; readiness organizzativa; governance

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I sistemi informativi a supporto delle Centrali Operative Territoriali (COT): un'analisi empirica public value-oriented

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1. Sviluppo concettuale

La ristrutturazione delle reti di offerta di servizi sanitari e socio-sanitari territoriali, imposta a livello normativo dalla Missione 6 del PNRR e dal D.M. 77/2022, rende necessaria una revisione complessiva delle logiche manageriali sottostanti i processi di presa in carico (PIC) dei pazienti più fragili (Longo et al., 2022). La razionalizzazione dei servizi di community health (medicina di base e specialistica, cure domiciliari integrate, servizi di prevenzione, assistenza residenziale e semi-residenziale, ecc.) può essere favorita ricorrendo ad opportuni strumenti di networking e governance collaborativa (Meneguzzo, 1996). Essi possono consistere nell'implementazione di modelli organizzativi multidisciplinari e "integrati" di gestione dei processi di cura. L'integrazione a livello territoriale di diverse pratiche assistenziali può essere inquadrata nel contesto di riforma manageriale del sistema sanitario, la quale ha introdotto una serie di standard organizzativi volti ad assicurare un maggiore coordinamento funzionale tra i diversi attori istituzionali (aziende pubbliche e private del SSN, Enti locali e del terzo settore) e operatori professionali che contribuiscono alla erogazione di servizi a carattere sanitario e socio-assistenziale.

Sotto il profilo teorico, il lavoro di ricerca in preparazione si riconnette al filone di studi economico-aziendali e di public governance incentrati sulla performance dei network di interesse pubblico (Longo, 2005) e sul problema della creazione di Valore Pubblico (VP) a livello di filiera (Bryson et al., 2017). Il concetto di VP da prendere in considerazione per indagare le potenzialità dei network è definito dalla capacità degli attori (nodi) della rete inter-aziendale di soddisfare in modo efficiente ed efficace i bisogni collettivi che compongono la mission istituzionale dei soggetti economici aderenti alle reti in parola (Alford e O'Flynn, 2009). In particolare, possiamo definire il VP come la somma degli impatti positivi - outcome o effect - generati dalla rete sui beneficiari e, indirettamente, sugli altri soggetti in vario modo coinvolti nei setting assistenziali interessati (famigliari, caregiver, volontari, comunità nel loro complesso). Si prende in considerazione, pertanto, una dimensione specifica del VP creato dalla rete, rappresentata dalla performance in termini di efficacia del servizio. La dimensione dell'efficacia dei network va intesa come la capacità di soddisfare adeguatamente le aspettative dei fruitori dei servizi (community-level performance), rispettando gli obiettivi quali-quantitativi prefissati e assicurando dei risultati migliorativi rispetto alle condizioni di partenza dei singoli utenti (Provan e Milward, 1995, 2001; Cepiku et al., 2010).

Tutto questo pone una serie di sfide ai manager dei network che intendano ottimizzare i propri processi. Si sottolinea come la maggior parte dei contributi teorici che hanno proposto modelli interpretativi delle determinanti della performance dei network pubblici abbia identificato

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una serie di strumenti manageriali in grado di "spiegare" l'efficacia relativa di tali assetti gestionali. L'implementazione di sistemi integrati di gestione ed erogazione di servizi ad alto contenuto professionale, quali sono i servizi socio-sanitari, rappresenta un terreno sul quale è possibile "testare" la validità dei modelli concettuali che identificano i principali fattori abilitanti della performance dei network. L'integrazione e il raccordo a livello territoriale di servizi e pratiche di carattere sanitario, assistenziale e sociale, secondo l'obiettivo del potenziamento del welfare socio-sanitario community-based, costituisce un tentativo significativo di trasformazione degli assetti gestionali che intende superare la tradizionale prospettiva ospedalocentrica al fine di razionalizzare la spesa sanitaria pubblica, decentralizzare l'erogazione dei servizi primari e rendere più accessibili e prossimi i luoghi di cura per i più fragili (Cinelli et al., 2024).

In tal senso, il già citato D.M. 77/2022 identifica alcuni strumenti operativi e standard organizzativo-gestionali tramite i quali le aziende sanitarie sono chiamate ad attuare gli obiettivi di integrazione dei propri servizi sul territorio. Tra gli altri, si possono rammentare le seguenti innovazioni organizzative:

- le Case della Comunità (CdC) per l'erogazione dei servizi di natura extraospedaliera (di base, di prevenzione, diagnostici e di assistenza domiciliare integrata);
- gli Ospedali di Comunità (OdC) per quanto concerne le cure intermedie, long-term e di riabilitazione;
- le Centrali Operative Territoriali (COT), istituite a livello distrettuale e attivabili per la transizione dei pazienti lungo le varie fasi del percorso assistenziale (casa, ospedale, territorio, ecc.);
- il Numero Unico Europeo 116.117;
- lo sviluppo della telemedicina e di altri strumenti digitali a supporto dell'assistenza domiciliare;
- il rafforzamento dei Distretti socio-sanitari, quali articolazioni organizzative territoriali delle ASL cui è attribuito un set più ampio di funzioni manageriali che vanno dalla programmazione al coordinamento dei servizi sanitari di comunità.

É appena il caso di notare che il tema dell'integrazione fra i diversi livelli assistenziali e professionisti coinvolti nell'erogazione delle prestazioni rappresenta tuttora una sfida fondamentale per coloro che dovranno attuare i nuovi standard di organizzazione sanitaria disciplinati a livello nazionale, regionale e aziendale. In particolare, le Regioni costituiscono il livello istituzionale-amministrativo al quale è demandato il compito di stabilire i principi generali e gli standard di gestione dei meccanismi di integrazione appena richiamati, in osservanza delle disposizioni normative generali disciplinate dal D.M. 77/2022. In questo ambito, pertanto, gli enti regionali assumono la funzione di "Network Administrative Organization" (NAO), ovvero di autorità pubblica preposta alla regolamentazione, alla programmazione e al coordinamento delle attività svolte all'interno dei network socio-sanitari territoriali (si vedano i modelli di governance delle reti descritti da Provan e Kenis, 2008).

Fatte queste premesse, il presente lavoro focalizza in particolare l'attenzione sul ruolo della COT, quale meccanismo di integrazione dei network e di riconciliazione dei diversi step del percorso ospedaliero-territoriale di presa in carico della cronicità (Ferrara et al., 2021; Dalponte et al., 2022; Cinelli et al., 2024). Nello specifico, «l'obiettivo della COT è quello di assicurare continuità, accessibilità ed integrazione dell'assistenza sanitaria e sociosanitaria» (D.M. 77/2022, all. 1, p. 8). Le COT assicurano, quindi, un più elevato livello di coordinamento clinico e di raccordo fra i servizi e i professionisti ricompresi nei vari setting organizzativi della rete di offerta, così da gestire in modo più unitario ed efficace la PIC dei pazienti target individuati all'interno di specifici cluster di soggetti fragili, anziani o non autosufficienti (soggetti ad alta complessità socio-sanitaria). A livello internazionale il ruolo della COT viene etichettato con la locuzione "Transitional Care" (Zazzera et al., 2021). Si fa notare come la dimensione più appropriata per inquadrare tale strumento organizzativo sia proprio quella dei network, atteso che le COT aziendali - operanti a livello di singolo distretto - sono funzionali rispetto all'obiettivo di integrare

tra loro attività territoriali svolte da attori pubblico-privati diversi dalla sola ASL d'afferenza, quali possono essere ospedali e altre strutture di ricovero, residenze socio-sanitarie, servizi sociali dell'Ambito territoriale, enti non profit, ecc.

L'obiettivo perseguito da questo vettore organizzativo è quello di riconciliare i vari interventi clinico-assistenziali al fine di rendere più efficienti le transizioni ospedale-territorio, territorio-ospedale e territorio-territorio (Ferrara e Dalponte, 2023), attraverso le procedure di "ammissione e dimissione protette". Il fabbisogno di integrazione della rete complessa di attori e servizi sanitari e socio-sanitari, al quale fa fronte il modello delle COT, risponde pertanto all'obiettivo di rafforzare l'accessibilità, la continuità e la qualità delle cure a beneficio degli utenti con bisogni di salute più complessi (cronici, disabili, post-acuti, ecc.) e contribuire a innalzare i livelli di efficienza ed efficacia delle aziende sanitarie, grazie alla riduzione del numero di ospedalizzazioni non necessarie e di interventi clinici inappropriati.

Il funzionamento della COT non può prescindere dall'implementazione di opportuni strumenti di network management. Uno di questi è rappresentato dai sistemi di scambio di dati e informazioni fra gli attori coinvolti nel network, identificabile come uno dei fattori abilitanti della performance a livello di rete (Turrini et al., 2010). I sistemi informativi, in quanto strumenti necessari per dare forma a un assetto organizzativo aziendale ben funzionante (Paoloni e Grandis, 2007), sono indispensabili anche in un contesto networked al fine di mantenere costantemente interconnessi gli attori della rete e consentire la predisposizione di adeguati sistemi condivisi di performance management (raccolta ed elaborazione dei dati e misurazione, valutazione e comunicazione della performance). Non a caso, l'importanza cruciale dei sistemi informativi nei contesti inter-organizzativi è da mettere in relazione alla possibilità per il management di disporre di dati da utilizzare per alimentare i processi di pianificazione, programmazione e controllo. Nel caso dello strumento organizzativo preso in esame (la COT), l'integrazione del network è favorita dall'esecuzione di una serie di attività di raccolta, monitoraggio e trasmissione delle informazioni riguardanti i pazienti presi in carico. Tali attività hanno come obiettivo non solo lo svolgimento della funzione di raccordo tra gli operatori e di supporto logistico, ma anche la verifica degli esiti delle procedure di transito tra i diversi livelli e luoghi di cura. Tali attività consistono nella raccolta, nel tracciamento e nell'utilizzo dei dati concernenti lo stato di salute pre- e post-transizione, al fine di supportare i case manager nella formulazione delle decisioni cliniche.

2. Obiettivi

Considerato il quadro teorico fin qui richiamato, il presente progetto intende focalizzarsi sulla capacità dei network di servizi di dotarsi di adeguati sistemi informativi a supporto della gestione della performance, guardando più nello specifico al problema della qualità dei sistemi in parola (Bouckaert, 1993). Come è stato suggerito da alcuni studi di management pubblico tra i più accreditati, uno dei fattori chiave alla base dell'efficacia dei network d'interesse generale è costituito dalla presenza di condizioni strutturali atte a promuovere un costante scambio di dati e informazioni tra i partecipanti alle attività della rete, nell'ottica di una sempre maggiore integrazione tra le funzioni svolte dagli stessi.

La progettazione e l'implementazione di appropriati sistemi informativi a supporto dell'integrazione delle varie componenti della rete rappresenta un campo d'indagine che può essere approfondito nell'ambito operativo dei servizi sanitari e socio-sanitari territoriali. La qualità dei sistemi di rilevazione ed elaborazione delle informazioni riguardanti le transizioni tra setting e luoghi di cura (parametri di valutazione della performance) costituisce un aspetto critico per i manager delle reti di servizi socio-sanitari e, in particolare, per il funzionamento delle COT. Infatti, le COT sono impegnate nel favorire l'attuazione di profondi cambiamenti riguardanti gli standard operativi e i processi decisionali e di controllo.

La funzione di monitoraggio e coordinamento delle procedure di transizione tra luoghi di cura/setting assistenziali assicurata dalle COT consente alle reti di servizi distrettuali e ospedalieri

(composte da unità organizzative e professionisti appartenenti ad entità aziendali diverse dalla sola ASL competente nel proprio territorio) di disporre di un patrimonio informativo condiviso. Esso può comprendere, tra le altre cose:

- la classificazione dei bisogni di salute dei pazienti presi in carico;
- la disponibilità di posti letto nei luoghi di ricovero del territorio (funzione di commissioning);
- la composizione dei Piani Diagnostico Terapeutici Assistenziali (PDTA), anche tramite l'attivazione delle Unità di Valutazione Multidimensionale (UVM) e il tracciamento delle relative decisioni cliniche;
- gli esiti post-transizione.

Partendo da un framework fornito dalla letteratura sul management dei sistemi informativi aziendali (DeLone e McLean, 1992, 2003), si tenterà di analizzare le diverse dimensioni esplicative della qualità dei sistemi di rilevazione e gestione dei dati adottati dalle COT. Il modello concettuale richiamato tiene conto di una serie di condizioni indispensabili affinché i diversi soggetti operanti all'interno di un sistema aziendale siano in grado di scambiarsi tempestivamente e correttamente flussi di informazioni utili per il controllo dei processi interni. In tal senso, l'efficacia dei sistemi informativi aziendali dipende da almeno sei ambiti di misurazione, tra loro interconnessi: 1) la qualità dell'intero "processo di produzione e trasmissione" dei dati; 2) la qualità delle diverse tipologie di informazioni "prodotte" nell'ambito del sistema informativo aziendale (si rimanda alla metodologia di misurazione e valutazione della qualità delle informazioni proposto da Lee et al., 2002); 3) la qualità del servizio di raccolta, registrazione, processamento e invio dei dati, dal punto di vista delle tecnologie di connessione e archiviazione adottate; 4) il grado di effettivo utilizzo dei dati a fini manageriali; 5) il livello di soddisfazione da parte dei destinatari delle informazioni circa la qualità delle procedure applicate; 6) i benefici globali, in termini di performance individuali e organizzative, derivanti dall'utilizzo di un determinato sistema informativo.

L'adattamento del modello poc'anzi sintetizzato al contesto organizzativo dei network, già sperimentato in alcuni contributi sul tema dell'integrazione dei servizi socio-sanitari (Bianchi et al., 2017), implica un ulteriore elemento da tenere in considerazione per valutare la qualità di un sistema informativo. Esso corrisponde alla dimensione della governance complessiva del sistema informativo applicato a livello di network. Il concetto di governance, in questo ambito, coincide con l'insieme delle regole operative e dei criteri di assegnazione di responsabilità, compiti e ruoli tra i vari operatori preposti alla rilevazione, registrazione, analisi e trasmissione dei dati. La definizione di un adeguato assetto di governance volto a regolare le relazioni tra gli attori coinvolti, nonché gli standard di processo cui uniformarsi, rappresenta un passaggio fondamentale nella creazione di un sistema informativo di qualità. Si può affermare che l'esistenza di apposite soluzioni di governance dei sistemi informativi a supporto delle COT per la "gestione" e il monitoraggio dei transiti di pazienti costituisca una precondizione per il rafforzamento della performance dei network socio-sanitari (efficientamento dei processi e/o miglioramento della qualità delle prestazioni assistenziali fornite).

Pertanto, si analizzerà se e con quali soluzioni operative le Regioni, per il ruolo ricoperto come NAO - insieme alle ASL -, hanno affrontato il tema della governance dei sistemi informativi a supporto delle proprie COT. Si tenteranno di analizzare altresì i riflessi generati da tali meccanismi di coordinamento dei network sulle dimensioni della qualità dei flussi informativi generati e del loro utilizzo in ottica di miglioramento dei processi decisionali e di controllo, considerata la presenza di una varietà di attori che dovranno operare come "produttori" e "utenti" delle informazioni. La complessità del problema è dettata non solo dalla presenza di un sistema reticolare di attori interni ed esterni al quale adattare il modello di interpretazione della qualità del sistema informativo, ma soprattutto dal fatto che tale sistema dovrà consentire lo scambio di dati e informazioni provenienti da svariati servizi ricompresi nella rete, ciascuno dei quali caratterizzato da differenti standard operativi e modelli organizzativi.

Il lavoro si propone perciò di rispondere alle seguenti domande di ricerca (RQ):

- Quale ruolo possono esercitare i sistemi informativi adottati dalle Centrali Operative Territoriali (COT) nel favorire il miglioramento dei livelli di performance dei network di servizi socio-sanitari?
- Quali sono gli strumenti e i modelli prevalenti di governance dei sistemi informativi adottati nella realtà delle COT al fine di supportare i processi decisionali e di controllo dei network socio-sanitari?

3. Quadro metodologico

Dal punto di vista metodologico, il raggiungimento degli obiettivi di ricerca può essere conseguito adottando un modello di analisi qualitativo, basato sul ricorso ad un approccio mixed-methods già sperimentato in diversi lavori emersi sul tema della qualità (success) dei sistemi informativi a supporto dei network di servizi sanitari (Bianchi e Trimigno, 2019). La natura esclusivamente qualitativa del lavoro si giustifica alla luce della particolare novità del tema delle COT nel panorama manageriale dei servizi socio-sanitari italiani. Si segnala come l'analisi descrittiva dei sistemi informativi a supporto delle COT sarà condotta indagando alcune delle dimensioni individuate nel modello concettuale di DeLone e McLean (2003), ossia: la governance dei sistemi informativi; la qualità del sistema informativo complessivamente considerato (dalla "produzione" dei dati alla trasmissione delle informazioni rilevanti agli "utenti" della rete); la qualità delle informazioni scambiate; l'uso effettivo che i responsabili dei servizi intendono fare delle informazioni ricavate dal processo di raccolta ed elaborazione dei dati.

Questo tipo di approccio si compone di almeno tre fasi:

- selezione dei casi di studio più significativi, allo scopo di indagare le caratteristiche dei sistemi informativi a supporto delle COT. Si prenderanno in considerazione alcune esperienze tratte dai modelli organizzativi istituiti nel contesto delle ASL pugliesi finalizzati alla gestione delle transizioni fra i diversi setting e servizi del territorio;
- analisi desk, consistente nell'esame di documenti a valenza legislativa, regolatoria o istituzionale in materia di COT, rientranti nel contesto di riforma manageriale e organizzativa dell'assistenza territoriale (documenti programmatici compresi nel PNRR M6, D.M. 77/2022, documenti strategici e linee di indirizzo regionali, piani operativi aziendali, ecc.). In tal senso, la Regione Puglia ha adottato con la D.G.R. 625/2023 delle Linee guida riguardanti i requisiti funzionali e gli schemi operativi della piattaforma di gestione che ciascuna ASL dovrà implementare a supporto delle proprie COT, ai sensi di quanto previsto in tema di standard tecnologici e strutturali (infrastrutture informatiche integrate, applicativi di gestione aziendale, strumenti di telemedicina, software con accesso ai database aziendali e al Fascicolo Sanitario Elettronico, sistema informativo connesso alla Centrale 116.117) dalla D.G.R. 1532/2024, all. A, p. 3.5.
- review della letteratura di public performance management e information systems management nell'ambito dei network di servizi, così da individuare eventuali nuovi spunti teorici relativi ai fattori abilitanti della qualità dei sistemi informativi;
- interviste semi-strutturate somministrate ad attori chiave delle Cure di Transizione dei network socio-sanitari, nell'ambito del caso/dei casi studio (dirigenti regionali del Dipartimento Salute, direttori di distretti socio-sanitari, responsabili medici/infermieristici delle COT aziendali e distrettuali, manager delle altre aziende di servizi inclusi nella rete) finalizzate a far emergere le informazioni necessarie per rispondere alle domande di ricerca.

4. Risultati e impatti scientifici attesi

Si prevede che il progetto di ricerca fin qui delineato consentirà di comporre un quadro interpretativo più preciso delle regole, dei principi e dei meccanismi operativi alla base dei

modelli incipienti applicati dalle COT. La valutazione dell'efficacia di alcuni sistemi informativi adottati nell'ambito di un insieme circoscritto di esperienze di network sanitari permetterà di perfezionare la nostra conoscenza dei fattori organizzativi, tecnologici e di contesto in grado di facilitare la creazione di modelli di integrazione tra servizi assistenziali sempre più orientati alla continuità e alla personalizzazione delle cure.

Gli outcome del presente lavoro dovranno costituire un utile strumento di supporto per l'azione dei decisori pubblici e dei manager delle aziende coinvolte nella governance del sistema sanitario, fornendo una serie di suggerimenti che possano favorire il conseguimento degli obiettivi di tutela dei cittadini cronici e innalzamento dei livelli di efficacia, efficienza, equità e integrazione dei servizi. L'indagine qualitativa da condurre si pone, inoltre, l'obiettivo di individuare alcuni aspetti del percorso di implementazione delle COT che siano replicabili in altri contesti regionali o aziendali, al fine di uniformare dal punto di vista territoriale i modelli di servizio adottati. È utile ribadire come la capacità delle aziende sanitarie di dotare le proprie reti di sistemi informativi efficaci e improntati alla completezza e alla correttezza delle informazioni prodotte rappresenti un passaggio chiave per migliorare i propri sistemi di controlli, grazie al potenziamento delle banche dati relative alle prestazioni eseguite e ai risultati ottenuti.

Dal punto di vista scientifico, il lavoro intende contribuire alle conoscenze attualmente disponibili in tema di creazione e misurazione di VP, aggiungendo nuovi elementi empirici in grado di approfondire la dimensione dell'efficacia dei sistemi informativi a supporto delle reti di servizi pubblici. Il contributo si focalizzerà sul ruolo della governance dei sistemi informativi nel garantire una più forte integrazione tra i servizi e gli attori coinvolti nelle reti socio-sanitarie. Si evidenzia come l'originalità della ricerca in corso consista nell'applicazione di un modello di analisi della qualità dei sistemi di raccolta, gestione e scambio di informazioni aziendali in un ambito multi-attore ancora poco esplorato e significativamente complesso - vista la numerosità dei servizi da integrare nel funzionamento del network - qual è quello delle Cure di Transizione.

Parole chiave: Cure di transizione; public value; network management; reti socio-sanitarie

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Between the bright and dark side of co-production: analysing co-assessment in healthcare through the lens of paradox theory

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1. Introduction

Stakeholder engagement in public service processes has attracted increasing scholarly attention, sparking research under the concepts of co-creation and co-production (Brandsen et al., 2018; Cepiku et al., 2020). This literature has significantly treated its rhetoric as inherently positive, focusing on the generative power that the inclusion of groups of stakeholders has on value creation for the broader community (Bryson et al., 2017; Dudau et al., 2023; Acar et al., 2025). Accordingly, much of this research has emphasized the benefits of involving stakeholders in decision-making processes, public service design, delivery, and also assessment (Nabatchi et al., 2017; LoeXler & Bovaird, 2020; Barbera et al., 2025). Co- production supports democratic enhancement, as participation and empowerment mechanisms broaden the range of voices influencing public action (Pisarra et al., 2025). Through these collaborative arrangements, power becomes more shared, enabling a more balanced relationship between administrations and service users (Cepiku et al., 2020). By involving users and stakeholders directly in design and delivery processes, enhances resource eXiciency, leveraging the complementary knowledge, skills, and capacities of diXerent actors to produce more sustainable outcome (Jasper & Steen, 2021). Ultimately, these dynamics contribute to the creation of public values, not only in terms of improved service quality, but also through strengthened trust, increased legitimacy, and deeper representativeness of public needs. Drawing on Jasper & Steen (2019), Acar et al. (2025) diXerentiates between three categories of public values: service – including eXectiveness, eXiciency, quality, satisfaction, sutainability, diversity, etc.; relationship – comprising education and learning, consideration of needs and capacities, individual freedom, power relations, responsibility, trust, etc.; and democratic quality – embedding accountability, empowerment, inclusion, equity, legitimacy, transparency, participation, etc. While co-production appears to be an enabling condition for most of these values, for others uncertain relationships remain.

A growing body of literature has however complained with this romanticized view, by uncovering potential downsides of the co-paradigms and tensions in public value co-creation (Jasper & Steen, 2019; Virtanen & Jalonen, 2020; Sancino et al., 2023; Cui & Osborne, 2023). This research emphasizes the existence of a "dark side" of co-production and high potential of value (co)destruction (Steen et al., 2018; Oliver et al., 2019; Williams et al., 2020; Jasper & Steen, 2021). Scholars have noted how stakeholder participation can produce pitfalls and drawbacks related to unequal opportunities for participation, uneven service quality and disproportionate distribution of benefits. Stakeholders may prioritize self-interested goals and create value primarily for themselves rather than for the community; public administrations may

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opportunistically exploit the relationship to oXload responsibility onto citizens (Steen et al., 2018; Palumbo & Manna, 2018). In addition, factors such as the unequal power of certain groups or the competences required for eXective engagement may create inequalities rather than enhancing participation. Building on prior research (e.g., Williams et al., 2016), Steen et al. (2018) eXectively classified the pitfalls of co-production into seven evils, sparking an ongoing debate (Jasper & Steen, 2021). These evils include the rejection of responsibility by public organizations, failing accountability structures, transaction costs, loss of democratic, reinforced inequalities, implicit demands (from vulnerable indivituals) and participation pressures and, lastly, value co-destruction.

This overall picture suggests that bright and dark elements can coexist. Such coexistence the need for a more nuanced understanding of how these collaborative arrangements unfold in practice. For this reason, recent research has begun to address the potential tensions related to co-production through the lens of paradox theory. Paradoxes, defined as "contradictory yet interdependent elements that exist simultaneously and persist over time" (Smith & Lewis, 2011, p. 382). Paradox theory explains how organizations can eXectively and simultaneously address competing demands, thereby fostering long-term organizational sustainability. Organisational paradoxes are a pervasive feature of organisational life and emerge fromunderlying contradictions. For example, between social purpose and profit, change and stability, or autonomy and control. Once made salient, paradoxes manifest as concrete decision-making challenges. Due to their persistent nature, the opposing poles are equally significant and cannot be permanently resolved, requiring actors to manage competing demands through tightrope-like balancing, collaboration and flexibility (Stadtler, 2018). Paradoxes become pathological when rather than serving as a source of creativity and renewal, they assume the nature of pragmatic paradoxes, situations where power diXerentials and constrained agency prevent actors from flexibly managing contradictory demands (Berti & Simpson, 2021). Collaborations, including interorganisational arrangements, have increasingly been examined through a paradox lens, as they are inherently diXicult to manage (e.g., Jasper & Steen, 2021). Yet, despite the inherently paradoxical nature of these dynamics, the co- creation and co-production paradigm has not been extensively theorised through a paradox lens (Qi & Ran, 2024). In our view, the coexistence of the bright and dark sides of co-production can be conceived as an overarching paradox within the co-paradigm. For example, while the inclusion of multiple actors in co-production may be beneficial and is often emphasized as an inherently positive, a potential dark side remains: stakeholders may pursue heterogeneous goals in the creation of public value, which can come into conflict (Brandsen & Helderman, 2012; Farr, 2016; Osborne et al., 2016).

Building on paradox theory, this study seeks to unravel how the bright and dark sides of co-production manifest and how actors involved in co-production initiatives enact strategies to cope with such paradoxes. We conceive the dark side not as a "necessary evil", but as an integral component of the co-paradigm itself. Viewing the bright and dark sides as interrelated poles of a paradox allows us to reconcile seemingly opposing elements and, in turn, deepen our understanding of how public value is co-created and, at times, co-destroyed.

Specifically, the study focuses on co-assessment processes, namely the bundle of activities aimed at monitoring and evaluating public services (Sanchietti & Savignon, 2023). Traditionally, performance-related activities are undertaken by public oXicials or external consultants; however, in co-production, state and lay actors work together to assess service quality, problems, and/or areas for improvement (Bovaird & LoeXler 2012). While the co-production literature has primarily focused on co-design and co-delivery, it has largely overlooked co- assessment, that is, the role of citizens in "monitoring and evaluating public services" (Nabatchi et al., 2017, p. 772). Although co-assessment is retrospective in nature - being about toward past performance - it can also be leveraged prospectively to rethink and enhance services, ultimately strengthening public value co-creation.

Accordingly, this study addressed the following research question: how can the tensions experienced by actors involved in co-assessment processes be understood as manifestations of the overarching paradox between the bright and dark sides of co-production?

To answer this question, we conducted an in-depth single case study (Eisenhardt, 1989) of an Italian public healthcare organization that has long being engaged in co-assessment initiatives. In the healthcare sector, involving citizens - namely patients - in assessing the healthcare services and identifying strategic priorities for health interventions is pivotal to fostering a patient-centric approach in PHOs' planning and service provision (De Rosis, Barchielli, et al., 2022). The organization has followed a stakeholder engagement approach for decades, which has gradually been formalized through a series of structured initiatives, such as the stakeholder forum and the participation conference. These initiatives have evolved over time and are now held regularly, approximately three to four times a year, according to a predefined meeting schedule. When each initiative is established, a public call is issued, allowing any patient or citizen association to join. Participation in the meetings is voluntary. The meetings take place as structured encounters between organizational members and representatives of these associations. As scholarship has not adequately considered the perspectives of external stakeholders in co-assessment processes, data were collected through interviews (the actual number is 12 but interviews are currently being conducted). Interviews are currently ongoing with both state actors (i.e., PSOs' managers responsible for performance planning and measurement and specifically co-assessment initiatives) and lay actors (i.e., citizen and patient associations, third sector organizations). Interview protocols were designed to explore perceptions of co-assessment processes, challenges, benefits, and potential tensions, allowing participants to freely reflect on their experiences. Archival and document analyses were also conducted, including organizational reports, surveys, procedures, planning documents. Data analysis followed an abductive approach, iteratively moving between empirical evidence and theory. Two authors independently conducted a qualitative content analysis, coding interviews and documents based on the theoretical framework. Themes and patterns were identified and refined through iterative discussions, with discrepancies resolved collaboratively. This systematic procedure allowed for the identification and refinement of paradoxes characterizing the bright and dark sides of co-production in the co-assessment context. Our preliminary analysis uncovers a set of intertwined of paradoxes inherent in co- assessment within healthcare organizations. First, we observed a Short-term vs. Long-term tension, whereby actors alternated between prioritizing immediate operational gains and pursuing strategic, long-term goals requiring sustained investment. A second paradox emerged around Formalization vs. Creativity, as the need for structured, institutionalized procedures (e.g., predefined meetings and agendas) often clashed with the aspiration for more open, substantive, and creative debate capable of fostering diverse voices beyond formal boundaries. The Collectivism vs. Individualism tension further highlighted competing logics between advancing individual claims rapidly and the choice to aggregate interests collectively, a strategy that increased influence but risked slowing decision-making. Similarly, the Engagement for Legitimacy vs. Purposeful Engagement paradox illustrated how participatory initiatives were sometimes mobilized primarily to gain external legitimacy rather than to foster genuine shared decision-making and internal empowerment. A fifth tension, Centralization vs. Decentralization, reflected contradictions between reliance on formal, centralized channels for submitting proposals/service assessment and the desire to enable broader, more distributed contributions. We also found a persistent Continuity vs. Change paradox: while organizational stability and the long-term role of the participatory body were emphasized, leadership turnover repeatedly introduced uncertainty and discontinuity. Moreover, the Representativeness vs. EXiciency tension surfaced as eXorts to ensure inclusiveness and democratic representation competed with pressures to streamline participation to improve eXiciency. Finally, a Professionalization vs. Commitment paradox emerged, revealing the diXiculty of balancing the technical expertise required for informed debate with the need to give voice to all participants, even at the expense of technical

depth. Together, these paradoxes illustrate the complex and often contradictory forces shaping value creation within co- assessment processes. Some coping strategies (both and; more than; either or) were also identified but are currently under analysis.

Building on the paradox theory (Smith & Lewis, 2011), the research contributes to the literature on co-production and particularly on the bright and dark sides of this co-paradigm (e.g., Palumbo 2017; Steen et al., 2018; Oliver et al., 2019; Williams et al., 2020) in several ways. First, it provides a systematic conceptualization of the bright and dark sides of co-production. Second, it sheds light on the paradoxes in co-production processes, highlighting the bright vs dark as an overarching paradox. This means that these two sides can coexist. The paradoxes identified comprise both a process level, such as the formalization vs creativity, or the centralization vs decentralization, and an outcome level, such as the engagement for legitimacy vs purposeful engagement or the short term vs long term outcomes. We also find that such paradoxes may be perceived and articulated either jointly by associations and organizations or independently by each party. Building on this, the study identifies the coping strategies actors deploy to navigate these tensions.

Additionally, the study contributes to the co-production literature by focusing on co-assessment processes, which constitute a public service co-production phase often overlooked (Sanchietti & Savignon, 2023; Barbera et al., 2025). Then, by integrating the perspectives of patient associations and third sector organizations, the analysis further enhances the existing literature by going beyond the inflated public organization's view.

The study has also important implications for public managers involved in (or in the process of activating) co-assessment initiatives, highlighting the tensions that may realize and co-exist within these initiatives. Recognizing these tensions equips public managers with a more realistic understanding of the complexities that characterize co-assessment initiatives. Rather than interpreting tensions as signs of failure, managers can frame them as inherent features of co-production. Ultimately, giving awareness on coping strategies can enable public value creation (e.g., increasing democracy, equality, representativeness).

Keywords: Co-production; co-assessment; paradox theory; healthcare

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Tra creazione e distruzione: rendicontare il valore sostenibile negli ecosistemi dei servizi pubblici digitali

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1. Introduzione

L'avvento della digitalizzazione ha offerto opportunità senza precedenti per riorientare l'erogazione dei servizi pubblici e, più in generale, le amministrazioni pubbliche verso la creazione di valore per la società (MacLean & Titah 2022; Luna et al., 2024). In questo contesto, tali amministrazioni hanno introdotto sempre di più innovazioni digitali all'interno dei propri processi, con l'obiettivo di incrementare il loro contributo verso la creazione di valore pubblico (Gil-García et al., 2018; Savignon et al., 2024). Notevoli sforzi sono stati indirizzati verso l'introduzione di servizi digitali, ossia servizi erogati tramite tecnologie digitali (Lindgren et al., 2019). Tali servizi si stanno diffondendo in diversi ambiti della pubblica amministrazione: dall'università alla sanità, dalle organizzazioni culturali ai comuni. Progressivamente, i servizi digitali stanno trasformando le interazioni tra funzionari pubblici e cittadini, promuovendo il coinvolgimento di questi ultimi nella co-erogazione dei sevizi e rimodellando routine organizzative, ruoli e responsabilità (Agostino et al., 2021; Loeffler 2021). Queste trasformazioni hanno il potenziale di generare valore per molteplici stakeholder, tra cui i cittadini, i funzionari pubblici, le organizzazioni pubbliche che erogano i servizi, le altre amministrazioni e l'intera società (Luna et al., 2024). Sebbene un numero crescente di studi abbia esaminato gli antecedenti e i processi di innovazione digitale nel settore pubblico (Hong et al., 2022; Mu & Wang 2022), molta meno attenzione è stata prestata all'analisi degli effetti e del valore generato da tali innovazioni nei servizi pubblici (per eccezioni, si vedano ad esempio Pisarra et al., 2025; Leite 2025). La ricerca più recente in ambito di management pubblico ha sottolineato la necessità di analizzare i processi di creazione di valore all'interno di ecosistemi dei servizi (Osborne et al., 2022; Trischler et al., 2023; Ojasalo & Kuppinen 2024), in particolare in contesti tecnologico-digitali (Petrescu 2019; Trischler & Trischler 2022). Sulla base della Public Service Logic (PSL), gli ecosistemi dei servizi pubblici sono composti da molteplici attori interagenti - cittadini, organizzazioni pubbliche, tecnologie e processi di erogazione (Petrescu 2019) - che operano su livelli interrelati: macro, meso, micro e sub-micro, nei quali il valore può essere creato (o distrutto). Il livello macro si concentra sul value-in-society e comprende tre elementi: la fornitura di beni pubblici, il soddisfacimento dei valori sociali e la creazione, diretta o indiretta, di valore aggiunto per la società attraverso un servizio pubblico. Il livello meso riguarda l'impatto delle singole organizzazioni pubbliche, delle loro reti, dei processi e delle norme interne, nonché del contesto della comunità locale, sulla creazione di valore. Tale valore è detto value-in-production e si manifesta lungo due piani. Il primo riguarda la creazione di valore a livello di servizio tramite l'apprendimento organizzativo e il miglioramento o l'innovazione di nuove forme di servizi

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pubblici, attraverso il co-design e il re-design dei servizi pubblici. La seconda forma riguarda la creazione di valore per gli utenti dei servizi pubblici, per gli altri stakeholder e per i funzionari dei servizi pubblici attraverso il loro coinvolgimento nei processi di co-design e co-produzione dei servizi pubblici, indipendentemente dai risultati ottenuti. Questo valore include la competenza e l'empowerment acquisiti durante il servizio. Il livello micro analizza il ruolo degli individui e delle loro azioni nella generazione di valore. Questo comprende il valore aggiunto grazie all'uso dei servizi e si manifesta nell'ambito dei bisogni, delle aspettative e dell'esperienza del fruitore del servizio (value-in-use e value-in-context). Infine, il livello sub-micro considera i valori e le credenze personali e professionali degli individui (value-in-context).

La ricerca esistente si è principalmente concentrata sull'analisi del valore creato rispetto ai singoli livelli, specialmente nei contesti di analisi del valore generato dai servizi digitali. Ad esempio, Pisarra et al. (2025) hanno dimostrato come i servizi sanitari digitali rappresentino un'importante opportunità per la creazione di valore individuale, in termini di empowerment, soddisfazione e fiducia di pazienti e caregiver. Come tale valore venga creato (o distrutto) a livello di ecosistema, analizzando le interrelazioni tra i diversi livelli, rimane tuttavia una questione empirica aperta. Tale domanda empirica risulta ancora più rilevante nell'ambito dell'innovazione digitale dei servizi pubblici (Osborne et al., 2022).

Questo studio adotta come lente teorica la PSL e, in particolare, gli ecosistemi dei servizi pubblici (Osborne et al., 2022) per analizzare empiricamente la creazione di valore nei processi di innovazione digitale dei servizi attraverso molteplici livelli di aggregazione analitica (macro, meso, micro). Tale approccio consente di includere la prospettiva di una costellazione di attori coinvolti in tali innovazioni e di rendicontare in modo più esaustivo la natura intrinsecamente multisfaccettata del valore (Cui & Aulton 2023). In particolare, l'articolo presenta uno studio etnografico della durata di tre anni (Hammersley & Atkinson 1995), in cui i ricercatori sono stati direttamente coinvolti nel processo di digitalizzazione di un servizio sanitario pubblico sanitario. In sanità, la digitalizzazione si è intensificata in modo significativo al fine di migliorare l'erogazione dei servizi sanitari, soprattutto in risposta alle sfide poste dalla pandemia. In particolare, ci si riferisce alla diffusione delle tecnologie digitali nell'erogazione dei servizi di cura con il termine di telemedicina. Nel caso oggetto di studio, l'innovazione ha previsto la trasformazione di un percorso di cura dello scompenso cardiaco che prevedeva visite periodiche in presenza in un servizio di telemonitoraggio domiciliare supportato da una web app e da una piattaforma digitale. Tali strumenti digitali consentono ai pazienti di partecipare attivamente alla co-erogazione della cura fornendo dati clinici ai medici giornalmente. Tali dati vengono monitorati dai medici con una frequenza settimanalmente, al fine di rilevare potenziali situazioni di criticità e anticipare il deterioramento delle condizioni cliniche. L'iniziativa ha coinvolto due ospedali italiani e un'azienda farmaceutica fornitrice della web app, ed è stata implementata attraverso un trial randomizzato che ha suddiviso i pazienti in due gruppi - uno utilizzante il servizio digitale e l'altro inserito nel percorso tradizionale in presenza - al fine di valutarne gli effetti. L'approccio etnografico ha consentito di raccogliere una pluralità di dati necessari a "fare luce sulle questioni oggetto dell'indagine" (Hammersley & Atkinson 1995, p. 1) grazie a un coinvolgimento diretto e prolungato sul campo ("being there", Watson 1999). Nel corso dell'implementazione sono state raccolte molteplici fonti empiriche - osservazioni partecipanti, survey, interviste e fotografie - utili a esplorare la creazione di valore ai livelli macro, meso e micro. In particolare, la somministrazione della survey - uguale per domande di indagine nei due gruppi - ha seguito un approccio longitudinale, al fine di rilevare eventuali differenze nel tempo. Ciascun paziente ha pertanto compilato la survey in tre periodi diversi: prima del servizio di cura (t0), a tre mesi dall'inizio della cura (t1) e a sei mesi (t2) (quest'ultima rilevazione è attualmente in corso di svolgimento). Sulla base di scale validate in letteratura, la survey ha indagato alcuni elementi di valore, come la soddisfazione, la fiducia nel medico e nell'azienda sanitaria, l'empowerment del paziente, le sue competenze digitali. Le interviste sono ancora in corso di svolgimento e coinvolgono sia gli operatori sanitari coinvolti nel processo di innovazione del

servizio che i funzionari amministrativi e la direzione aziendale. Sebbene come metodologia l'etnografia rimanga ancora poco utilizzata nella ricerca in public administration e public management, essa offre un notevole potenziale per sviluppare una comprensione approfondita e olistica e una ricca "documentazione degli aspetti sociali e informali" (Huby et al., 2011; Gains 2011), quali la creazione di valore nei contesti dei servizi pubblici.

Lo studio ambisce a fornire un modello multidimensionale di valutazione del valore creato articolato su tre livelli, che consente di "alternare zoom in e zoom out" nell'analisi della creazione di valore dei processi di innovazione digitale dei servizi pubblici (Vargo & Lusch 2017, p. 50). I risultati preliminari mostrano come, per ciascun livello dell'ecosistema, sia possibile individuare effetti collocati lungo un continuum che va dalla creazione alla distruzione di valore, includendo anche la mancata opportunità di creazione di valore (Steen et al., 2018). Ad esempio, a livello micro, mentre i pazienti che utilizzavano il servizio digitale riportavano livelli significativamente più elevati di responsabilità percepita e di coinvolgimento attivo nel percorso di cura, i livelli di soddisfazione sono rimasti invariati rispetto a quelli dei pazienti nel percorso tradizionale. Inoltre, non sono state riscontrate differenze significative in termini di fiducia verso l'azienda sanitaria. Il telemonitoraggio ha però consentito ai pazienti (e i loro caregiver) di sentirsi maggiormente "sotto controllo" da parte dei medici e "al sicuro", senza dover aspettare le visite in presenza per la valutazione del proprio stato di salute. A livello meso, non sono stati registrati miglioramenti significativi nella literacy digitale dei pazienti, che è rimasta stabile, ma è stato rilevato un rafforzamento delle competenze dei medici specializzandi, i quali hanno iniziato a consultare la web app per monitorare i parametri vitali e identificare condizioni critiche. È stata inoltre osservato un approccio conservativo nelle visite di follow-up, che hanno continuato a svolgersi in presenza senza pertanto aumentare l'apprendimento organizzativo. Inoltre, se da un lato la partnership con l'azienda farmaceutica ha consentito di rafforzare il legame pubblico-privato, l'erogazione del servizio tramite tecnologie digitali ha inciso sul bilancio economico dell'azienda relativo a tale percorso di cura. A livello macro, sebbene non sia stato rilevato un incremento dell'accessibilità alle visite, sono emerse significative opportunità per migliorare la capacità di risposta ai bisogni dei pazienti, prevenendo il deterioramento clinico attraverso la raccolta dei dati (prendendo in carico in anticipo pazienti che riscontravano parametri critici grazie al telemonitoraggio), e per accrescere l'empowerment dei cittadini. L'aumento dell'accountability percepita ha rappresentato per gli operatori sanitari e l'azienda un'opportunità per una condivisione della responsabilità con i fruitori del servizio che deve però "essere gestita sia in termini organizzativi che di limitazione dell'accesso ai pazienti con le caratteristiche necessarie per partecipare".

Il modello evidenzia come il valore debba essere compreso non solo in relazione al livello specifico dell'ecosistema, ma anche ai diversi attori che lo compongono (utenti diretti del servizio, operatori pubblici, azienda pubblica, partner privati). Inoltre, i livelli sono fortemente interrelati tra di loro e si influenzano reciprocamente. Ad esempio, se la percezione di responsabilità dei cittadini aumenta con il servizio digitale, da un lato può creare un burden per i singoli e una conseguente insoddisfazione. Dall'altro, per l'azienda pubblica questo consente di aumentare nei cittadini la consapevolezza del loro ruolo nell'erogazione dei servizi. Sarà poi compito dell'amministrazione mettere in atto una serie di leve che consentono di trasformare il burden per i cittadini in valore addizionale nei loro percorsi di cura. Similmente, se la volontà dei pazienti di fornire dati personali non differisce significativamente tra i due gruppi, la digitalizzazione e il conseguente aumento dei dati clinici rappresenta un'opportunità per l'organizzazione, per il miglioramento dei percorsi di cura, e per la società, rispetto all'aumento dell'accessibilità dovuta alla prevenzione dei casi critici. Infine, lo studio sfida la logica dicotomica secondo la quale esiste (co-)creazione vs (co-)distruzione di valore, dimostrando come il valore si dispiega lungo uno spettro va dalla creazione alla distruzione, che dipende da fattori contestuali (come le capacità organizzative). Pertanto, gli effetti dei processi di innovazione digitale dei servizi pubblici devono essere valutati i) rispetto a tre livelli, ii) interrelati tra di loro e iii) attraverso una prospettiva non

dicotomica. Tali risultati contribuiscono allo sviluppo teorico della PSL e degli ecosistemi dei servizi pubblici (Petrescu, 2019; Osborne et al., 2022; Trischler et al., 2023) fornendo una verifica empirica del framework nel contesto dell'innovazione digitale. In aggiunta, questa ricerca contribuisce al dibattito sulla creazione e co-creazione di valore tra "incanto e disincanto" (Palumbo 2017; Dudau et al., 2019) rivelando una posizione intermedia tra creazione e distruzione.

Lo studio offre inoltre numerose implicazioni pratiche per i manager pubblici, fornendo un framework che consente alle organizzazioni di governare, monitorare, estendere e scalare l'innovazione digitale nei servizi pubblici, al fine di generare valore. Grazie alla sua natura dinamica lungo il continuum osservato a ciascun livello dell'ecosistema, il modello rappresenta uno strumento prezioso per decisori e policy-maker nel definire e prioritizzare le aree di creazione di valore nei contesti digitali. Inoltre, indicando le potenziali aree di conflittualità tra valore a diversi livelli lo studio evidenza come i manager e gli operatori delle aziende pubbliche debbano mettere in atto una serie di leve al fine di trasformare quello che potrebbe essere dis-valore per gli individui ma potenziale valore per l'organizzazione e la società nel suo complesso e viceversa.

Parole chiave: Service ecosystem; creazione di valore; telemedicina; sanità

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Ripensare la materialità per la pubblica amministrazione: un approccio integrato per rafforzare accountability e valore pubblico

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1. Introduzione

Negli ultimi decenni, i dibattiti internazionali sulla sostenibilità si sono concentrati su una molteplicità di sfide globali tra le quali: cambiamento climatico, degrado ambientale, inquinamento, deforestazione, povertà, disuguaglianze e precarietà occupazionale (Calvin et al., 2023). Questi temi richiedono sempre più risposte integrate e misurabili da parte delle organizzazioni private e pubbliche (Kaur & Lodhia, 2019). In tale contesto, la rendicontazione di sostenibilità ha assunto un ruolo crescente come strumento di accountability, con l'obiettivo di integrare le performance economiche con gli obiettivi dello sviluppo sostenibile.

Il Global Reporting Initiative (2013, p. 3) definisce la sostenibilità come "la pratica di misurare, comunicare e assumersi la responsabilità nei confronti degli stakeholder per le performance verso lo sviluppo sostenibile". Questa definizione evidenzia pertanto due dimensioni fondamentali. Da un lato, la misurazione e comunicazione sistematica degli impatti economici, sociali e ambientali. Dall'altro, la centralità dei meccanismi di accountability, intesi come processi che collegano le azioni organizzative alle aspettative sociali più ampie.

Nel settore pubblico, il ruolo delle Public Sector Organizations (PSOs) è particolarmente rilevante poiché esse operano come intermediari tra istituzioni politiche, cittadini e territorio, contribuendo direttamente al benessere collettivo (Cappellieri et al., 2025; Tallaki et al., 2024). I cittadini, a loro volta, richiedono che le amministrazioni pubbliche agiscano con trasparenza, responsabilità e orientamento alla sostenibilità, non solo nella gestione delle risorse, ma anche nella definizione di politiche capaci di promuovere l'uso responsabile dei beni comuni (D'Amore et al., 2024). La crescente domanda di accountability ha indirizzato le organizzazioni pubbliche verso politiche di nonfinancial reporting ma la loro adozione resta disomogenea e spesso limitata a iniziative volontarie (Manes-Rossi et al., 2020; Uyar et al., 2022). Inoltre, la letteratura evidenzia come, sebbene le PSOs abbiano cominciato a pubblicare report ambientali o di sostenibilità, siano ancora carenti strutture metodologiche condivise per identificare i temi rilevanti, coinvolgere efficacemente gli stakeholder e integrare i risultati nei processi decisionali (Cappellieri et al., 2025; Farneti & Guthrie, 2009).

In aggiunta, l'IPSASB (International Public Sector Accounting Standards Board) (2025) ha recentemente sottolineato la necessità di rendere la rendicontazione pubblica più coerente con i principi di sostenibilità, ponendo enfasi su materialità e coinvolgimento degli stakeholder come elementi cardine per la qualità informativa. Tuttavia, come osservano Morrison et al. (2025), l'applicazione del concetto di materialità alle PSOs resta "sottosviluppata e contestata", in quanto

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priva di una definizione metodologica specifica per contesti caratterizzati da pluralismo di attori, finalità pubbliche e accountability condivisa.

Alla luce di queste lacune e attraverso l'integrazione della stakeholder theory (Donaldson & Preston, 1995; Freeman, 1984) con il modello di collaborative advantage e strategic planning di Bryson et al. (2016; 2024), il presente lavoro si propone di definire un processo di materialità strutturato e sensibile al contesto delle organizzazioni pubbliche. L'analisi di materialità è quindi intesa come fase strategica della pianificazione pubblica, capace di allineare obiettivi istituzionali, istanze sociali e criteri di accountability. A seguito delle precedenti premesse, si riporta in seguito la domanda di ricerca: Come può essere progettato e implementato un processo di analisi della materialità strutturato e contestuale nelle PSOs, al fine di supportare l'accountability, aumentare l'engagement degli stakeholder e rafforzare la capacità decisionale sostenibile?

2. Framework teorico

2.1. La rendicontazione di sostenibilità nelle organizzazioni pubbliche

Il dibattito su contabilità e rendicontazione nel settore pubblico ha progressivamente superato la visione finanziaria tradizionale per abbracciare il concetto di public value (Moore, 2014; Steccolini, 2018; Stoker, 2006). In tale prospettiva, le organizzazioni pubbliche sono chiamate non solo a garantire efficienza e controllo della spesa, ma a creare valore collettivo rispondendo ai bisogni di cittadini e comunità. Tale concetto, come evidenziato da Jørgensen & Bozeman (2007), si fonda sul principio che le amministrazioni pubbliche debbano perseguire obiettivi che riflettano valori sociali condivisi, andando oltre la logica di performance economica per includere dimensioni di equità, inclusione e sostenibilità. In aggiunta, come osservano Garlatti et al. (2024), le pubbliche amministrazioni hanno il dovere di "andare oltre l'approccio finanziario per includere gli interessi pubblici che rappresentano la ragion d'essere di ogni ente pubblico". Tale ampliamento implica un orientamento verso la sostenibilità, estendendo la misurazione delle performance a dimensioni immateriali come inclusione, equità, qualità ambientale e benessere diffuso. In questa direzione, la rendicontazione di sostenibilità nel settore pubblico non deve essere percepita come mero adempimento tecnico, ma come strumento per rafforzare la legittimità democratica e la fiducia dei cittadini (Adams, 2023). Come noto, le PSOs operano in ambienti complessi, sfaccettati e politicamente eterogenei (Anessi-Pessina & Steccolini, 2005), nei quali la pluralità di stakeholder implica un equilibrio continuo tra interessi contrastanti. L'accountability assume pertanto una natura dialogica: le istituzioni devono non solo rendere conto, ma anche coinvolgere, negoziare e rendere visibile il processo decisionale (Cassano, 2013). Sebbene l'adozione di strumenti di nonfinancial reporting sia in crescita, le evidenze empiriche mostrano che tali pratiche rimangono immature (CIPFA, 2023). Molte PSOs pubblicano report di sostenibilità o integrati, ma raramente esplicitano i processi di engagement e i criteri di materialità utilizzati (Tirado-Valencia et al., 2019). Ciò comporta una perdita di coerenza tra obiettivi dichiarati, risultati ottenuti e aspettative sociali. La mancanza di integrazione tra rendicontazione e creazione di valore pubblico e la necessità di metriche orientate al public value sono state evidenziate in numerosi lavori di ricerca (Garlatti et al., 2024; Talbot, 2009; Bryson et al., 2014). Tali studi invitano a sviluppare modelli di reporting capaci di rappresentare non solo gli output, ma anche gli impatti sociali delle politiche pubbliche.

2.2. Materialità – principio e processo

Nella letteratura di economia aziendale, il concetto di materialità è stato storicamente definito come soglia oltre la quale un'informazione è rilevante per le decisioni economiche (Messier et al., 2005). L'evoluzione della rendicontazione di sostenibilità ne ha ampliato il significato, attribuendole anche una dimensione di sostenibilità (Fasan & Mio, 2017; Lai et al., 2017). Più

recentemente, secondo il GRI (2021), un tema è materiale, ovvero rilevante, se rappresenta "l'impatto significativo dell'organizzazione sull'economia, sull'ambiente e sulla società". Questa definizione sposta il focus dall'efficienza interna agli effetti esterni e collettivi. La Direttiva CSRD (2023) ha ulteriormente formalizzato il principio di doppia materialità, imponendo alle organizzazioni di rendere conto sia di come pressioni esterne influenzano la loro performance finanziaria, sia di come le loro attività influenzano la società e l'ambiente.

Nel settore pubblico, tuttavia, la traduzione operativa di questi principi incontra specifiche difficoltà. Le organizzazioni pubbliche rispondono a una molteplicità di stakeholder, con interessi spesso in conflitto e difficili da uniformare. È stata pertanto identificata una carenza di criteri standardizzati per definire e ponderare la rilevanza dei temi. Infine, la governance pubblica, fortemente influenzata da aspetti politici, tende spesso a favorire logiche di breve periodo e di legittimazione più che processi sistematici di stakeholder engagement (Bryson et al., 2022). Recenti studi suggeriscono quindi di interpretare la materialità non solo come soglia informativa, ma come processo partecipativo fondato su dialogo, confronto e deliberazione (Morrison et al., 2025; Puroila & Mäkelä, 2019). In questa prospettiva, l'analisi di materialità integrare stakeholder engagement e formulazione strategica, migliorando la coerenza e la trasparenza delle decisioni pubbliche.

2.3. Stakeholder Theory e Collaborative Advantage – framework integrato

La stakeholder theory costituisce un riferimento centrale per analizzare le relazioni tra organizzazioni e soggetti che influenzano o sono influenzati dalle loro attività (Donaldson & Preston, 1995; Freeman, 1984). Essa considera l'organizzazione come parte di un sistema relazionale in cui le decisioni assumono significato solo in rapporto agli interessi dei diversi attori coinvolti. Nel contesto delle organizzazioni pubbliche, questa prospettiva è particolarmente rilevante poiché tali enti operano in ambienti pluralistici caratterizzati da molteplici portatori di interesse con aspettative eterogenee (Bingham et al., 2005; Giacomini et al., 2025). In tale ambito, la teoria consente di interpretare la governance come un processo di interazione e negoziazione volto a generare valore pubblico (Bryson et al., 2016; Kaur & Lodhia, 2019). Nel campo della rendicontazione di sostenibilità, la stakeholder theory rappresenta un quadro utile per comprendere come il coinvolgimento degli stakeholder possa orientare la definizione delle priorità e accrescere la legittimità delle informazioni diffuse (Morrison et al., 2025; Vidè et al., 2025). Tuttavia, essa non fornisce chiare indicazioni operative su come tradurre le istanze dei portatori di interesse in obiettivi strategici.

A colmare questa lacuna interviene il lavoro di ricerca di Bryson et al. (2016, 2022), che attraverso il principio di collaborative advantage e il modello di strategic planning cycle indica un processo circolare di pianificazione strategica fondato su:

- Identificazione e mappatura degli stakeholder
- Analisi del contesto e definizione della missione
- Formulazione e negoziazione degli obiettivi
- Implementazione
- Valutazione e apprendimento

Bryson et al. (2022) distinguono inoltre tra goal formulation e goal formation: la prima rappresenta la definizione intenzionale e strutturata degli obiettivi, la seconda descrive la loro evoluzione dinamica nel tempo, influenzata da contesti e feedback. Questa distinzione apre alla possibilità di inserire la materialità come fase proattiva nella formazione degli obiettivi, rendendo il processo più partecipativo e fondato su evidenze. Il collaborative advantage si manifesta quando più organizzazioni, cooperando, ottengono risultati che non sarebbero raggiungibili individualmente (Huxham & Vangen, 2005). In termini di accountability pubblica, la valutazione di materialità può costituire lo strumento operativo per individuare tali obiettivi condivisi e generare valore pubblico co-prodotto.

Pertanto, l'integrazione con il processo di analisi di materialità offre una prospettiva concreta per strutturare il dialogo e la negoziazione, trasformando le istanze espresse dagli stakeholder in leve concrete per la pianificazione strategica e la rendicontazione.

Questa integrazione consente di concepire l'analisi di materialità come strumento di governance strategica articolato in cinque passaggi:

1. Mappatura degli stakeholder e analisi del contesto.

Il processo iniziale prevede l'identificazione e la mappatura degli stakeholder insieme all'analisi del contesto socio-politico e ambientale (CIPFA, 2023).

2. Coinvolgimento e identificazione delle tematiche.

Gli stakeholder vengono coinvolti tramite metodi partecipativi come focus group, interviste e questionari con l'obiettivo di raccogliere un insieme ampio di tematiche percepite come rilevanti (Giacomini et al., 2025).

3. Analisi di materialità.

Invece di definire direttamente gli obiettivi, è realizzato un processo strutturato di analisi di materialità, in cui i temi sono esaminati secondo criteri prestabiliti (rilevanza sociale, impatto ambientale, capacità istituzionale). Attraverso un processo di negoziazione e prioritizzazione, stakeholder e decisori discutono e ordinano i temi, individuando priorità condivise e potenziali trade-off (Giacomini et al., 2024; Morrison et al., 2025).

4. Formulazione degli obiettivi e integrazione strategica.

Gli obiettivi strategici derivano dai temi materiali prioritari, garantendo coerenza con le aspettative degli stakeholder e con le capacità organizzative. Tali obiettivi guidano quindi la progettazione, l'attuazione e la valutazione delle politiche (Bryson et al., 2022; Bryson & George, 2024).

5. Creazione di collaborative advantage e public value.

Fondando gli obiettivi strategici su temi materiali negoziati tra gli stakeholder, il processo accresce la condivisione, la legittimità e l'efficacia dell'attuazione, rafforzando così il vantaggio collaborativo e la generazione di valore pubblico (Bryson et al., 2016).

3. Metodologia e dati

La ricerca adotta la metodologia dell'action research (Susman & Evered, 1978), un approccio partecipativo che si basa su cicli iterativi di azione e riflessione finalizzati a produrre conoscenza teorica e soluzioni operative direttamente applicabili ai contesti osservati. Tale metodologia è particolarmente coerente con la natura pragmatica delle organizzazioni pubbliche, poiché consente di sviluppare un apprendimento collettivo e riflessivo attraverso la partecipazione attiva di ricercatori, decisori e stakeholder.

Il modello proposto viene sperimentato in due grandi amministrazioni pubbliche che operano in contesti istituzionali differenti, una situata in Italia e una in un altro Paese europeo o internazionale. La scelta di due PSOs con caratteristiche amministrative, politiche e organizzative eterogenee permette di testare il framework in contesti altamente complessi, caratterizzati da pressioni politiche e sociali rilevanti, da sistemi di governance multilivello e da diversi livelli di maturità nelle politiche e nei processi di sostenibilità. La città italiana ipotizzata si inserisce in un contesto contraddistinto da elevata complessità amministrativa, forte esposizione mediatica e dinamiche decisionali influenzate da molteplici priorità urbane e vincoli economici. La PSO internazionale rappresenta, invece, un ambiente più istituzionalizzato, con sistemi di pianificazione ambientale consolidati e una cultura amministrativa più stabilmente orientata ai principi di sostenibilità.

Il disegno metodologico segue il ciclo proposto dall'action research (Susman & Evered, 1978), articolato in cinque fasi principali: diagnosi, pianificazione, azione, valutazione e apprendimento. Ogni fase implica una continua interazione tra ricercatori e attori istituzionali, al fine di costruire un processo riflessivo e adattivo. Nello specifico:

1. Diagnosi.

In questa fase iniziale viene condotta un'analisi sistematica dei processi di rendicontazione e dei meccanismi di engagement esistenti nelle due amministrazioni. Attraverso una revisione della letteratura internazionale su approcci multi-stakeholder e metodologie di materialità nel settore pubblico, si individuano le principali criticità, tra le quali: frammentazione delle pratiche, assenza di standard comuni e limitata trasparenza nei criteri di selezione dei temi materiali.

2. Pianificazione dell'azione.

A partire dai risultati della diagnosi, i ricercatori e i rappresentanti istituzionali co-progettano un processo di materialità strutturato, che includa tre dimensioni fondamentali:

- un approccio multi-stakeholder, basato sul coinvolgimento di attori politici, cittadini, funzionari pubblici, imprese, organizzazioni del terzo settore e livelli istituzionali superiori (CIPFA, 2023);
- un approccio multi-source, che integri dati provenienti da documenti ufficiali, media, social network e interviste;
- una garanzia di indipendenza, assicurata dal coinvolgimento di un soggetto terzo (i.e. esperte/i non affiliati alle amministrazioni coinvolte) incaricato di supervisionare il processo e di validare i risultati.

3. Azione.

La fase operativa prevede la sperimentazione diretta del modello nei due enti selezionati. Il processo di materialità viene applicato attraverso attività di co-design, workshop partecipativi, interviste semi-strutturate e focus group. Il coinvolgimento attivo degli stakeholder consente di raccogliere percezioni, priorità e giudizi sulle questioni più rilevanti in termini di impatto sociale, ambientale e istituzionale.

4. Valutazione.

I dati raccolti vengono analizzati per costruire le matrici di materialità, individuando le priorità condivise e le divergenze tra i gruppi di stakeholder. Vengono inoltre stimati i costi e i tempi di implementazione del processo per valutarne la fattibilità operativa e l'efficienza in termini di risorse impiegate. L'obiettivo è comprendere se un approccio strutturato alla materialità possa essere realisticamente adottato da PSOs di diversa scala e capacità organizzativa.

5. Apprendimento e adattamento.

L'ultima fase mira a sistematizzare le conoscenze acquisite, discutendo i risultati con i partecipanti e formulando raccomandazioni operative per la replicabilità del modello in altri contesti.

La raccolta dati combina tecniche qualitative e analitiche, in un'ottica di triangolazione che rafforza la validità dei risultati.

- Analisi documentale di bilanci, piani strategici, delibere, report di sostenibilità, comunicati stampa e altri documenti ufficiali, per ricostruire il quadro istituzionale e le politiche esistenti in materia di sostenibilità.
- Content analysis di media locali, resoconti di consiglio comunale, comunicazioni ufficiali e post sui social media istituzionali, al fine di identificare la percezione pubblica dei temi ambientali e sociali e la loro rilevanza nel dibattito politico.
- Interviste semi-strutturate con una pluralità di attori: sindaci e consiglieri, dirigenti e funzionari, rappresentanti del settore privato e del terzo settore, cittadini e rappresentanti di enti sovraordinati (i.e. regioni o entità equiparate).
- Workshop partecipativi che consentono di rappresentare graficamente le connessioni tra obiettivi, interessi e aree di collaborazione tra gli stakeholder.

Le interviste vengono successivamente analizzate secondo la Gioia Methodology (2013), che permette di organizzare i dati in categorie concettuali progressive.

Infine, l'analisi dei dati mira a valutare la coerenza del framework rispetto agli obiettivi di accountability e sostenibilità. L'approccio comparativo tra le due grandi città selezionate consente di individuare pattern ricorrenti, quali la difficoltà di tradurre i processi partecipativi in decisioni

strategiche o l'assenza di criteri condivisi per la definizione delle priorità, insieme a specificità locali riconducibili alle diverse tradizioni amministrative e ai differenti sistemi politici. La validazione dei risultati viene effettuata tramite sessioni di feedback collettivo, durante le quali i ricercatori presentano le evidenze empiriche agli attori coinvolti per verificarne la coerenza interpretativa e discutere eventuali adattamenti del modello. Questa fase di confronto, centrale nell'action research, assicura che le conclusioni siano empiricamente fondate e socialmente condivise.

4. Risultati attesi e valore pubblico potenziale

Il lavoro di ricerca, attualmente nello stato di work in progress, si propone di generare risultati teorici e operativi rilevanti per l'evoluzione del dibattito sulla materialità nel settore pubblico e sul ruolo dei processi partecipativi nella definizione delle strategie di sostenibilità.

Dal punto di vista teorico, il contributo principale consiste in una concettualizzazione della materialità come processo dialogico e deliberativo, capace di integrare in modo sistematico il coinvolgimento degli stakeholder, la pianificazione strategica e le pratiche di accountability (Morrison et al., 2025; Puroila & Mäkelä, 2019). La letteratura recente, in particolare gli studi dedicati alle amministrazioni pubbliche, ha messo in evidenza come la materialità non possa essere intesa come un mero esercizio tecnico di selezione delle informazioni da comunicare, ma come un processo che richiede negoziazione, confronto strutturato e definizione condivisa delle priorità (Cappellieri et al., 2025; Giacomini et al., 2025). Il lavoro proposto approfondisce questa prospettiva, mostrando come la materialità possa divenire un dispositivo metodologico per superare la frammentazione decisionale e per rendere esplicito il contributo degli stakeholder alla definizione delle strategie pubbliche (Garlatti et al., 2024).

In secondo luogo, il lavoro offre un'integrazione tra modelli teorici spesso utilizzati separatamente. La stakeholder theory fornisce l'orizzonte interpretativo per comprendere la molteplicità delle relazioni tra PSOs e attori sociali, mentre il framework di Bryson consente di tradurre tali relazioni in processi strategici concreti (Bryson et al., 2016; Bryson & George, 2024). L'integrazione dei due approcci permette di passare da una visione descrittiva dell'engagement a un modello operativo in cui la materialità assume un ruolo centrale nella definizione degli obiettivi pubblici.

Dal punto di vista operativo, la ricerca mira a produrre una serie di risultati tangibili legati alla sperimentazione del modello relativamente alle PSOs selezionate. In primo luogo, ci si attende la costruzione di matrici di materialità pubblica orientate da criteri riconoscibili e trasparenti, quali la rilevanza sociale e l'impatto ambientale delle tematiche, come suggerito dagli indirizzi IPSASB (2025) e dalle applicazioni empiriche più recenti (Giacomini et al., 2025). Tali matrici consentiranno di rendere visibile il legame tra attese degli stakeholder e priorità strategiche, offrendo una base empirica per l'elaborazione dei piani di sostenibilità e delle politiche urbane.

Un secondo esito atteso riguarda lo sviluppo di meccanismi decisionali che permettano a decisori istituzionali, tecnici e cittadini di co-definire le priorità strategiche. Attraverso tali meccanismi, il processo decisionale potrà acquisire maggiore legittimazione, poiché sarà possibile tracciare in modo più chiaro il ruolo giocato dagli stakeholder nella definizione degli obiettivi di sostenibilità.

La comparazione tra le PSOs oggetto di analisi consentirà inoltre di osservare come le differenze di assetto istituzionale influenzino la profondità e la qualità del coinvolgimento degli stakeholder, aspetto più volte evidenziato nella letteratura sulla governance multilivello e sulla sostenibilità nelle amministrazioni locali (Farneti & Guthrie, 2009; Rocca et al., 2021).

Dal punto di vista delle implicazioni per la policy, il framework elaborato potrà supportare le amministrazioni pubbliche nel rafforzare la coerenza tra pianificazione strategica e processi di rendicontazione, migliorando al contempo la trasparenza e la fiducia dei cittadini. L'introduzione

di un processo strutturato di materialità potrà consentire di orientare le politiche verso la creazione di valore pubblico sostenibile, rendendo più esplicite le connessioni tra priorità sociali, obiettivi ambientali e scelte strategiche. Il modello potrà inoltre contribuire allo sviluppo di strumenti visuali e deliberativi capaci di facilitare la comunicazione delle priorità e la partecipazione informata degli stakeholder.

Parole chiave: Stakeholder Engagement; materialità; sustainability reporting; public management

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L'Intelligenza Artificiale come leva strategica nella programmazione razionale nella PA: un'indagine sui Comuni italiani

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1. Introduzione

Il tema della creazione del Valore Pubblico (di seguito VP) ha suscitato, negli ultimi decenni, un ampio dibattito nella letteratura che oggi lo definisce come l'obiettivo verso cui le organizzazioni pubbliche orientano la propria azione per rispondere efficacemente ai bisogni della collettività, generando benessere economico, sociale e ambientale (Moore 1995; Esposito e Ricci, 2015; Ziruolo et. al, 2023; Deidda Gagliardo et al., 2024).

Tuttavia, i profondi mutamenti economico-sociali, tra cui la crisi economica post-pandemica, la povertà, il cambiamento climatico e il calo inarrestabile del tasso di natalità, comunemente definiti wicked problems (WP), rendono sempre più complesso per i policymakers perseguire il VP (Geuijen et al., 2017; Costumato, 2024). Sul tema, parte della letteratura ha evidenziato che i WP incidono negativamente sul processo di programmazione in particolare nel contesto dell'ente locale, dove viene spesso definita "razionale", riferendosi al complesso processo di programmazione sia finanziaria (Bilancio di Previsione) che strategica/operativa (Documento Unico di Programmazione, Piano Esecutivo di Gestione e Piano Integrato di Attività e Organizzazione) (Boyne et al., 2004; Vial, 2019; Berardi, 2025).

A fronte di tali criticità, la letteratura ha individuato nel Knowledge Management (KM) uno strumento utile a supporto della programmazione razionale in contesti complessi, laddove, valorizzandone il capitale intellettuale (CI), concorre alla reingegnerizzazione dei processi delle organizzazioni (Fontana, 2009, Ziruolo 2022).

Al contempo, una parte della letteratura afferma che il solo impiego del KM non sia sufficiente a fronteggiare la complessità dei contesti decisionali contemporanei, poiché permangono vincoli informativi e cognitivi che riducono la razionalità pianificatoria, riconducibili all'apporto del CI dei soggetti coinvolti nei processi decisori delle organizzazioni (Boyne et al., 2004; Vial, 2019).

In questa prospettiva, alcuni autori evidenziano che l'utilizzo di tecnologie digitali, tra cui l'Intelligenza Artificiale (AI), la Blockchain e l'internet delle cose (IoT), diventa indispensabile nella gestione di un processo KM, in quanto capaci di automatizzare l'analisi dei dati, supportare le decisioni e potenziare la capacità cognitiva dei decisori pubblici impattando positivamente sul CI (Margetts, 2022; Jarrahi et al., 2023). In particolare, la letteratura evidenzia come l'AI, fungendo da catalizzatore del capitale intellettuale, può sostenere la pianificazione razionale, orientando i policymakers verso una programmazione orientata alla creazione del valore pubblico, obiettivo ultimo della Public Value Governance attraverso la reingegnerizzazione dei processi che

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sottendono la programmazione razionale (Moore, 1995; Cepiku, 2022; Jarrahi et al., 2023; Mergel et al., 2024; Berardi, 2025).

Il rapporto tra programmazione razionale e KM è ampiamente dibattuto in letteratura soprattutto da un punto di vista teorico, mentre le evidenze empiriche restano ancora limitate. Tale limite, come evidenziato da Mergel et al. (2024) e Neumann (2024), non consente di cogliere a pieno in che modo l'integrazione tra KM e AI si traduca concretamente in processi di programmazione razionale e in che modo la reingegnerizzazione dei processi concorra a creare VP.

Per contribuire a colmare tale gap, il presente studio propone di indagare, attraverso un case study, il ruolo dell'AI come leva di accelerazione del KM nei processi di programmazione razionale e quindi di creazione di valore pubblico, nel contesto della pubblica amministrazione indagandone il ruolo nei processi decisionali che portano alla programmazione razionale.

La ricerca si concentrerà sui comuni italiani con meno di 5.000 abitanti, in quanto la letteratura ha evidenziato come le "piccole comunità" rappresentano il livello di governo più vicino ai cittadini e, al tempo stesso, il più esposto ai WP (Oates, 1972; Ziruolo, 2000; Anselmi, 2003). La letteratura mostra infatti che, in tali contesti, i WP mettono a dura prova la sostenibilità economico-finanziaria e la capacità organizzativa degli enti, rendendo necessario un ripensamento della programmazione razionale (Barca, 2012; Carbonaro et al., 2018). Inoltre, a seguito dell'evento pandemico Covid-19 il PNRR ha previsto la possibilità in particolare per i piccoli enti di attingere a risorse finanziarie dedicate ad investimenti in AI proprio al fine di reingegnerizzare i processi degli enti.

Su tali premesse, vengono formulate le seguenti domande di ricerca:

RQ1. Qual è il livello di conoscenza, consapevolezza e uso dell'intelligenza artificiale nei processi di pianificazione razionale dei Comuni italiani?

RQ2. Quali capacità e condizioni abilitanti, organizzative, istituzionali e sociali, favoriscono o ostacolano l'applicazione dell'AI alla pianificazione razionale?

2. Contesto teorico di riferimento

2.1. Ripensare il paradigma della programmazione razionale alla luce dell'intelligenza artificiale

Le pubbliche amministrazioni non vivono di decisioni estemporanee, ma devono tradurre le intenzioni del mandato politico in attività pianificate, coerenti con gli obiettivi programmatici e trascritte in piani chiari e rendicontabili (Ziruolo, 2016; Cavallini e Orsetti, 2022). Così come nel settore privato, anche la gestione pubblica, recependo il paradigma del New Public Management (Hood, 1991), fonda i propri processi decisionali su una programmazione formalizzata che consente di gestire in modo più efficace ed efficiente l'intero ciclo di gestione dell'ente. Questo processo, definito in letteratura "programmazione razionale" (Boyne et. al, 2004), traduce le volontà politiche in procedure formalizzate declinate in appositi documenti che definiscono le attività, le risorse, i tempi e le condizioni per il raggiungimento degli obiettivi che per loro natura, devono essere specifici, misurabili, raggiungibili, realistici e definiti nel tempo (S.M.A.R.T.), rendicontabili e orientati alla creazione di valore pubblico (Hood, 1991; Moore, 1995; Boyne et al., 2004; Berardi, 2025)[1].

[1] In riferimento al contesto italiano, il legislatore, avendo recepito il paradigma della programmazione razionale, nel formulare indicazioni operative per la sua applicazione negli enti locali l'ha reso norma prima con l'introduzione del Documento Unico di Programmazione (DUP, d.lgs. 118/2011, allegato 4.1) e poi

Autori come Borgonovi et al. (2018), Cepiku (2018) e Del Bene e Bartocci (2018, p.133-155) affermano che la programmazione assume una valenza strategica, contribuendo a migliorare il complessivo governo delle amministrazioni solo se condotta in modo critico, ovvero se preceduta da un'attenta riflessione su ciò che l'ente deve prioritariamente perseguire e declinata in un set coerente di indicatori e target. Tuttavia, come osservano Boyne et al. (2004), tale approccio risulta nella pratica tecnicamente complesso, al punto che la pianificazione viene talvolta abbandonata o ridotta a mero adempimento formale. Le cause risiedono sia nei limiti cognitivi dei policymakers sia nei limiti tecnici e informativi: ad esempio, i dati necessari a supportare una programmazione realmente razionale risultano spesso difficili da reperire e ancor più da interpretare (Boyne et al., 2004, Berardi, 2025).

In questa prospettiva, Ramanujam et al. (1986) sostenevano che la pianificazione razionale può essere perseguita con successo solo laddove siano disponibili risorse sufficienti per assumere pianificatori specializzati o per dotare i dirigenti di strumenti efficaci che ne potenzino le capacità di pianificazione. Ne consegue che una parte della letteratura abbia adottato un approccio critico nei confronti della pianificazione razionale, in quanto considerata fagocitante di risorse umane e un onere aggiuntivo per i costi dell'organizzazione (Jenkins, 1978; Mintzberg, 1994; Van Dooren et. al, 2015).

L'introduzione degli strumenti digitali innovativi, tra cui l'AI, porta quindi a riconsiderare le potenzialità della programmazione razionale con margini più ottimistici di fattibilità ed efficacia. Tali strumenti, infatti, consentono di superare i vincoli cognitivi, tecnici e informativi dei policymakers nel formulare il ciclo di programmazione degli enti, attraverso l'automazione dell'analisi dei dati e dei processi decisionali (Margetts, 2022; Mergel et al., 2024).

Il supporto delle tecnologie digitali emergenti permette infatti di migliorare l'accuratezza delle decisioni umane, spesso soggette a errori e bias cognitivi, fungendo quindi da leva strategica per rafforzare l'efficienza delle amministrazioni e la loro capacità di creare VP (Bonomi Savignon, 2025). Inoltre, la letteratura puntualizza che l'introduzione di tecnologie digitali deve risultare funzionale allo scopo per il quale vengono utilizzate e quindi contestualizzate e adattate ad ogni singolo contesto e organizzazione in maniera consapevole, da qui la definizione di Knowledge Management (KM).

Implementare efficacemente la gestione della conoscenza nella programmazione razionale

Numerosi studi definiscono il KM come strumento strategico per la competitività delle organizzazioni, sia pubbliche che private, che consente di gestire al meglio i processi di creazione, condivisione e utilizzo della conoscenza, valorizza il patrimonio intellettuale, stimola l'innovazione e la capacità di problem solving (Stevens, 2010; Maurer et al., 2011; Massingham e Massingham, 2014) migliorando i processi decisionali promuovendo l'apprendimento continuo che genera valore per l'organizzazione (Chow et al.,2000; Berardi et al., 2022).

Altri studi definiscono il KM "managerialità consapevole", ovvero la combinazione di informazioni, esperienze, intuizioni, competenze, capacità e abilità di tipo manageriale che risultano di valore per un'organizzazione e per i suoi membri (Chow et al., 2000; Fontana, 2013; Fontana et al., 2024).

Nelle teorie del Public Management, il KM è riconosciuto come uno degli strumenti per superare i limiti della pianificazione razionale, che derivano non tanto da ostacoli politici, quanto da carenze organizzative, mancanza di strumenti adeguati e risorse conoscitive limitate (Boyne et al., 2004). Il KM contribuisce a colmare questo divario poiché, attraverso quel processo definito di reingegnerizzazione delle fasi della programmazione razionale, consente di acquisire,

ripreso nel Piano Integrato di Attività e Organizzazione (PIAO, art. 6, DL 80/2021) (Cavallini & Orsetti, 2022).

organizzare e condividere in modo più efficace il patrimonio informativo e cognitivo dell'ente, superando i vincoli intellettuali e informativi che ostacolano la razionalità pianificatoria (Boyne et al., 2004; Edvinsson, 2006; Fontana, 2013).

Tuttavia, nonostante l'impiego del KM, permangono ancora limiti di natura tecnica che riducono la capacità delle amministrazioni di realizzare una piena razionalità pianificatoria (Vial, 2019). In tale prospettiva, le tecnologie dell'AI possono potenziare il ruolo del KM, agendo come strumenti di empowerment per i policymakers (Fontana, 2013; Jarrahi et al., 2023).

Ad esempio, i sistemi di deep learning permettono di riconoscere schemi e relazioni nei dati non ancora noti all'ente, generando nuove informazioni. Allo stesso modo, strumenti di AI come il knowledge storing and retrieving ampliano la memoria organizzativa, rendendo più efficiente e sistematico il recupero della conoscenza implicita (Jarrahi et al., 2023, p. 89). Attraverso queste tecnologie, gli enti possono attingere a informazioni provenienti da molteplici canali (banche dati, documenti di programmazione di annualità passate, atti interni, ecc.), trasformandole in risorse utilizzabili nelle fasi di programmazione e monitoraggio dei piani.

L'AI può quindi offrire un contributo diretto alla governance locale supportando le analisi:

- interna (risorse e processi dell'ente)
- esterna (ambiente istituzionale e sociale)
- di contesto (fenomeni demografici ed economici)
- di scenario (sviluppi futuri e traiettorie di cambiamento)

e coadiuvando i policy makers nella definizione di modelli di sviluppo territoriale orientati a una visione di lungo periodo e alla creazione di valore pubblico (Fontana 2013; Mergel et al., 2024; Neumann et al., 2024; Bonomi Savignon, 2025).

In questa prospettiva, l'AI rappresenta lo strumento abilitante del Knowledge Management, capace di trasformare i dati pubblici in conoscenza utile per la programmazione razionale (Boyne, 2004; Vial, 2019) e fungendo da ruolo di catalizzatore del CI capace di sostenere la pianificazione razionale e concorrendo alla creazione di valore pubblico, (Moore, 1995; Cepiku, 2022; Jarrahi et al., 2023; Mergel et al., 2024; Berardi, 2025).

3. Metodologia della ricerca

Ai fini della nostra indagine il cluster empirico di analisi è composto dai 434 enti che hanno aderito all'ambito C "Miglioramento delle attività amministrative attraverso l'uso delle tecnologie informatiche" del progetto FAST Piccoli Comuni[2].

Questa iniziativa, promossa dal Dipartimento della Funzione Pubblica e finanziata dal PON Governance e Capacità Istituzionale 2014-2020 (Azioni 1.2.1 e 1.3.1), sostiene i Comuni con meno di 5.000 abitanti facendo loro utilizzare una piattaforma sperimentale di Knowledge Management basata su un software informativo che usa tecnologie di AI (Legal Desktop) per assistere gli amministratori e i dipendenti comunali nella redazione degli atti (Forum PA, 2023).

Dopo aver definito il cluster di analisi, la ricerca utilizzerà un approccio qualitativo-esplorativo (Del Bene e Bartocci, 2018, pp. 133-155) basato sul modello interpretativo dell'AI Maturity Model (AIMM) del settore pubblico sviluppato da Dreyling et al. (2024) (Tabella 1). Questo framework è stato riadattato dal contesto generale del settore pubblico a quello dei Comuni (Tabella 2), in linea con quanto suggerito dalla letteratura sui maturity models, che raccomandano una contestualizzazione dei costrutti alle specificità dell'ambiente analizzato (Becker et al., 2009; Fukas et al., 2021; Dreyling et al., 2024). L'adattamento del modello dal settore pubblico in generale al contesto degli enti locali, si ispira al modello di Dreyling et al.

[2] In questa fase del lavoro non è ancora possibile definire con precisione gli enti da includere nell'analisi, poiché si è in attesa dell'elenco aggiornato dei comuni che hanno aderito al progetto FAST, comprensivo sia di quelli che hanno già avviato le attività sia di quelli che non le hanno ancora iniziate.

(2024) riadattando l'AIMM di Fukas et al. (2021) e il maturity model (Becker et al. 2009) al fine di analizzare come l'AI stia sostenendo la capacità pianificatoria e decisionale dei Comuni (Jarrahi et al.,2023; Mergel et al., 2024).

La metodologia adottata è inoltre supportata da una parte della letteratura (Dreyling et al., 2024; Neumann et al., 2024; Babšek et al., 2025, p. 27), secondo cui gli AIMM, se opportunamente calibrati alle specificità della pubblica amministrazione, risultano strumenti validi, in ottica esplorativa, per interpretare la capacità delle amministrazioni comunali di integrare l'AI nei propri processi di programmazione.

Level And Description	**Technology And Tools**	**Data**	**People And Competence**	**Organization And Processes**	**Leadership And Strategy**	**Financial**	**Law, Ethics And Trust**	**Security And Privacy**
LEVEL 1: INITIAL AI is almost entirely absent. Technologies are basic, data are fragmented, competencies are limited, and processes are manual. There are signs of interest, but no structured initiatives.	Ad hoc AI Technologies	Ambiguous Data Availability	Ad hoc AI Technologies	Not Started	Min AI Strategy and Leadership	Minimal Budget	Min AI Specific Legal, Ethical and Trust Compliance	Min Security and Privacy Awareness
LEVEL 2: ASSESSING Early experiments begin to emerge. The organization starts exploring AI through Proofs of Concept or isolated initiatives, but without a stable strategy or governance framework.	Explored AI Technologies	Incomplete Data processing and availability	External AI Competences	Individually & Exploring	Pre AI Strategy and Leadership	Initial Pilotin g Budget	Initial Legal, Ethical and Trust Compliance	Initial Security and Privacy Implementation
LEVEL 3: DETERMINED AI is implemented in selected processes, staff receive specific training, and initial internal policies are defined. The organization formally acknowledges AI's potential as a	Implemented AI Technologies	Project based Data	Internal AI Competences	Organization AI approach	AI Strategy and Leadership	Integrated Budget and financial goals	Integral Legal, Ethical and Trust Compliance	Partial Security and Privacy Implementation

decision-support lever.								
LEVEL 4: MANAGED AI is firmly integrated into organizational processes. Data are interoperable, competencies are widespread, and leadership adopts a strategic and data-driven approach. Implementation is supported by dedicated budgets and formal policies.	Scalable AI Technologies	Consistent Data resources	Active AI Competences	AI Coordination & Integration	Formalized AI Strategy and Leadership	Dedicated Budget and financial goals	Formal Legal, Ethical and Trust Compliance	Formalized Security and Privacy Implementation
LEVEL 5: OPTIMIZED AI becomes the organization's cognitive infrastructure, continuously integrated into decision-making, predictive, and monitoring processes. Decisions are evidence-based, data flow in real time, and ethical and security policies are embedded by design.	Continuous Improvement of AI Technologies	Data-driven Services	Leading AI Competences	AI-enabled & AI-driven	Integrated AI Strategy and Leadership	Self-sustaining Budget and financial goals	Automated Legal, Ethical and Trust Compliance	Integrated Security and Privacy Implementation

Tabella 1. Artificial Intelligence Maturity Model for public sector (Dreyling et al., 2024)

L'AIMM è un modello a matrice di autovalutazione che consente di misurare il livello di avanzamento di un ente pubblico nell'adozione dell'AI (Dreyling et al., 2024). Il modello permette di categorizzare e misurare lo sviluppo dell'uso dell'AI nelle principali aree organizzative coinvolte nei processi di adozione, articolandole in otto dimensioni (Becker et al., 2009; Fukas et al., 2021; Dreyling et al., 2024):

- Technology: misura il grado di disponibilità e utilizzo di infrastrutture digitali e tecnologie AI;
- Data: valuta la qualità e l'interoperabilità dei dati necessari per alimentare i modelli informativi;
- People and Competence: considera le competenze digitali e analitiche del personale;
- Organization and Processes: misura il livello di integrazione dell'AI nei processi operativi e nei flussi di programmazione;

- Leadership and Strategy: valuta l'impegno politico-manageriale verso l'adozione dell'AI;
- Financing: analizza la capacità dell'ente di allocare risorse economiche dedicate alla digitalizzazione e all'integrazione dell'AI nei propri processi di programmazione;
- Law, Ethics and Trust: misura l'attenzione ai temi di trasparenza, etica e fiducia nell'uso dell'AI;
- Security and Privacy: valuta l'esistenza di policy e procedure per la protezione dei dati e la gestione dei rischi digitali.

Ciascuna dimensione è valutata attraverso cinque livelli di maturità (Initial, Assessing, Determined, Managed, Optimized), che rappresentano la scala evolutiva descrivendo il percorso graduale di adozione e integrazione dell'AI all'interno dell'organizzazione (Becker et al., 2009; Dreyling et al., 2024). Una descrizione più dettagliata dei livelli è riportata nella Tabella 1.

Il nostro studio adatta l'AIMM proposto da Dreyling et al. (2024) contestualizzandolo al contesto dei comuni italiani (Tabella 2). Le otto dimensioni e i cinque livelli sono stati rielaborati in chiave operativa riferendoli direttamente ai processi di programmazione razionale. (Boyne et al.,2004; Berardi, 2025).

	Technology And Tools	**Data**	**People And Competence**	**Organization And Processes**	**Leadership And Strategy**	**Financial**	**Law, Ethics And Trust**	**Security And Privacy**
Ruolo nella programmazione razionale	Misura la disponibilità di strumenti digitali e piattaforme integrate a supporto della programmazione. Riflette il grado in cui la tecnologia agisce come leva cognitiva e non solo operativa nei processi decisionali.	Misura la qualità, l'integrazione e l'interoperabilità dei dati che alimentano i piani e i documenti di programmazione (DUP, PEG, PIAO).	Rappresenta il livello di maturità del capitale umano, che passa da un approccio esecutivo nella redazione dei documenti a un coinvolgimento attivo nei processi di analisi e progra	Indica il livello di incorporazione dell'AI nelle fasi del ciclo programmatorio. Dalla mera sperimentazione si passa alla piena integrazione di strumenti intelligenti nelle attività di analisi, pianificazione e controllo.	Riguarda la visione politico-manageriale dell'ente. Valuta se la leadership riconosce l'AI come leva strategica per migliorare la qualità delle decisioni e orientare la programmazione verso evidenze misurabili.	Considera la disponibilità di risorse economiche e dedicate alla digitalizzazione e alla gestione dei sistemi AI. La stabilità dei finanziamenti è condizione per consolidare una razionalità amministrativa sostenibile.	Richiama la dimensione valoriale e dell'amministrazione pubblica, dove trasparenza, etica e responsabilità guidano l'integrazione dell'AI e rafforzano la fiducia tra istituzioni e cittadini.	Analizza il livello di attenzione verso la protezione dei dati e la gestione consapevole dei rischi digitali, elementi che condizionano la credibilità e l'affidabilità della programmazione basata su AI.

			mmazione, fino alla co-progettazione con l'AI.					
LEVEL 1: INITIAL	L'ente elabora i piani con strumenti base (Word, Excel). Non dispone di software gestionali integrati né di funzioni automatizzate.	I dati sono frammentati, spesso cartacei e non aggiornati; la raccolta è manuale e priva di criteri di validazione.	Il personale redige i documenti senza competenze digitali o statistiche; prevale un approccio descrittivo.	I processi di programmazione sono gestiti manualmente, senza strumenti digitali o supporti di intelligenza artificiale. L'AI è totalmente assente.	L'innovazione tecnologica non è considerata nella visione politica o gestionale.	Nessuna risorsa destinata a digitalizzazione o strumenti analitici.	Assenza di riferimenti a principi etici, trasparenza o uso responsabile dei dati.	Nessuna misura di sicurezza informatica o protezione dei dati.
LEVEL 2: ASSESSING	L'ente utilizza software gestionali standard (contabilità, protocollo, personale) non collegati alla programmazione. Prime prove di cruscotti o report digitali.	I dati sono digitalizzati ma non strutturati né integrati; vengono raccolti da singoli uffici senza regole comuni.	Alcuni dipendenti mostrano interesse per le tecnologie e seguono corsi introduttivi.	L'ente usa funzioni digitali di base, ma l'AI è sperimentata solo in modo episodico e senza influenza reale sui processi di programmazione.	L'innovazione è citata nei documenti politici e programmatici come tema di modernizzazione, non come leva strategica.	Fondi sporadici (PNRR o progetti digitali) finanziano iniziative o attività formative.	Prime misure di trasparenza e pubblicazione dati, senza un quadro etico formalizzato.	Misure minime di sicurezza (backup, password, antivirus di base).
LEVEL 3: DETERMINED	L'ente utilizza software di supporto alla programmazione	I dati sono archiviati digitalmente, con controll	I responsabili di servizio o altro personale	L'AI o strumenti analitici vengono impiegati per raccoglie re,	Gli amministratori riconoscono l'AI come strumento di	Le risorse economiche e finanziano l'adozione e la sperimentazione di	Vengono rispettati i principi di trasparenza e	Sono attive policy di sicurezza di base per la protezione delle

	(cruscotti, sistemi di monitoraggio obiettivi). Alcune operazioni sono semi-automatizzate.	i di qualità; impiegati per analisi di contesto e previsioni di base a supporto dei piani.	hanno ricevuto formazione specifica su data analysis o gestione dell'AI; nasce un gruppo interno di riferimento.	ordinare ed elaborare informazioni operative (analisi di contesto, fabbisogni, previsioni di base) che alimentano i piani.	supporto cognitivo alla programmazione, includendola nei piani come leva di efficienza e trasparenza.	strumenti AI o di gestione avanzata dei dati.	rendicontazione; il trattamento dati è conforme ai regolamenti interni e al GDPR.	informazioni.
LEVEL 4: MANAGED	L'ente dispone di piattaforme integrate per la programmazione e il controllo; l'AI è utilizzata per analisi predittive e supporto decisionale.	I dati sono interoperabili, aggiornati e aggregabili per area strategica; vengono utilizzati per orientare scelte e priorità.	Le competenze digitali sono diffuse; il personale è formato all'uso e all'interpretazione di strumenti AI.	L'AI è stabilmente integrata nei processi di programmazione: analizza dati, genera evidenze e supporta l'elaborazione o la revisione periodica dei piani.	La leadership promuove un approccio evidence-based e data-driven; l'AI è riconosciuta come infrastruttura cognitiva di governo.	Budget stabile dedicato allo sviluppo e alla manutenzione di soluzioni AI nei processi di programmazione.	Adozione di codici etici sull'uso dei dati pubblici e dell'AI; pubblicazione di report trasparenti sugli impatti generati.	Sicurezza formalizzata e controllata con protocolli e audit periodici.
LEVEL 5: OPTIMIZED	L'AI è pienamente integrata in tutte le fasi della programmazione: analisi di contesto, simulazione di scenari, elaborazione di target e	I dati alimentano in tempo reale i sistemi di programmazione; l'AI elabora previsioni e scenari che	Il personale possiede competenze interdisciplinari (management, dati, etica) e promuove la	I processi di programmazione sono pienamente AI-enabled: l'AI elabora autonomamente scenari e aggiornamenti che orientano	La leadership considera l'AI una leva strategica per generare valore pubblico e rafforzare l'accountability	Le risorse economiche sono destinate alla piena integrazione dell'AI: modelli predittivi, interoperabilità dei dati, manutenzione algoritmica.	L'uso dell'AI rispetta principi etici by design: algoritmi trasparenti, verificabili e orientati al valore pubblic	La sicurezza e la privacy sono integrate nei sistemi AI e monitorate automaticamente.

	monitoraggio dei risultati.	guidano le decisioni.	co-progettazione con le tecnologie.	la pianificazione in modo dinamico e continuo.	verso i cittadini.		o.	

Tabella 2. Matrice di maturità dell'AI applicata ai comuni italiani- Adattamento degli autori all'AI Maturity Model di Dreyling et al. (2024)

Per utilizzare operativamente la matrice e per rispondere alle nostre domande di ricerca, lo studio prevede una doppia fase di raccolta dei dati. La prima fase è finalizzata al posizionamento dei Comuni all'interno dell'AIMM (RQ1). Il posizionamento sarà ottenuto mediante una rilevazione basata su questionari valutati con scala Likert a 5 punte, in cui ogni valore da 1 a 5 corrisponde direttamente ai livelli della matrice AIMM (Groves et al., 2011). Il questionario sarà rivolto agli stakeholder interni (sindaci, assessori, responsabili dei servizi) e sarà strutturato in gruppi di item, ciascuno dei quali riflette una delle otto dimensioni dell'AIMM in linea con quanto già applicato da Becker et al. (2009) e Dreyling et al. (2024), secondo il quale i maturity models possono essere compilati tramite procedure standardizzate di autovalutazione, come appunto i questionari.

La seconda fase di raccolta dati, invece, è finalizzata a interpretare i motivi che facilitano o ostacolano l'eventuale utilizzo dell'AI nei processi di programmazione (RQ2).

A tale scopo verranno intervistati gli stakeholder interni agli enti (Groves et al., 2011) e saranno eseguite analisi documentali degli strumenti di programmazione degli enti, tra cui il Documento Unico di Programmazione (DUP), il Piano Esecutivo di Gestione (PEG) e il Piano Integrato di Attività e Organizzazione (PIAO) integrando la metodologia della content-analysis con il metodo Delphi (Del Bene e Bartocci, 2018, pp. 133-155; Cavallini e Orsetti, 2022).

4. Risultati attesi

Lo studio intende offrire una prima riflessione sull'implementazione dei sistemi AI nel contesto dei piccoli comuni italiani, che dovrebbe essere capace di supportare i decisori pubblici nel ripensare in modo più accurato le proprie priorità e modalità di programmazione, determinando la cosiddetta "intelligenza collaborativa" (Wilson e Daugherty, 2018, p. 5; Jarrahi et al., 2023). Inoltre, lo studio intende chiarire in che misura i policymakers stiano valorizzando il potenziale ancora inespresso dell'AI, in un contesto pubblico nazionale che, come rilevato dal Digital Decade Report (2024), presenta limitate competenze digitali tra i dipendenti e una scarsa propensione all'adozione di soluzioni informatiche, con ricadute negative sull'intera economia nazionale (Digital Decade Report, 2024). Nello specifico, i risultati attesi della ricerca e il contributo teorico apportato alla letteratura cui si ambisce sono i seguenti:

- Rilevare eventuali differenze di applicazione dell'AI nella programmazione degli enti, mostrando pratiche virtuose e non, o pattern di governance che spiegano perché alcuni comuni riescano a integrare l'AI nella pianificazione razionale mentre altri restano a uno stadio iniziale (Mergel et al., 2024; Neumann et al., 2024);
- Individuare i fattori che favoriscono o ostacolano l'adozione dell'AI, evidenziando come la gestione della conoscenza (KM) agisce o non agisce da leva per superare i limiti informativi e cognitivi della pianificazione tradizionale (Boyne et al., 2004; Fontana, 2013; Jarrahi et al., 2023).

Keywords: Knowledge management; artificial intelligence; rational planning; public value governance

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Integrating Sustainable Development Goals in Local Strategies: Insights and Lessons from the Italian Experiences

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1. Introduction and aims of research

The adoption of the United Nations' 2030 Agenda has further accelerated the shift towards sustainability (Allen et al., 2019; Liu et al., 2018). The 2030 Agenda calls on Member States to carry out regular and inclusive progress reviews at both national and subnational levels, incorporating input from civil society, the private sector, and other stakeholders, in accordance with national contexts, policies, and priorities (United Nations 2015). Each national government determines how to integrate and align the goals with its planning processes, policies, and strategies across all dimensions of sustainability (environmental, economic, social). Local contexts, with their unique social, economic, and environmental characteristics, require tailored approaches to effectively implement the Sustainable Development Goals (SDGs) (OECD 2020; Sinervo et al., 2024; Wray, 2015). By defining specific targets and tracking progress through measurable indicators, local authorities can address their distinct challenges, foster inclusive development, and contribute to the broader global sustainability agenda (United Nations, 2015; De Matteis and Borgonovi, 2021).

Although the localisation of the SDGs in local contexts has been recently examined (Krellenberg et al., 2019; Valencia et al., 2019), these studies have not explicitly focused on integrated approaches to sustainability management within municipal organisations. Nevertheless, they emphasize that leadership appears to be a fundamental factor in the implementation of the SDGs. Furthermore, aspects such as participation and inclusiveness (across levels, actors, and sectors), the establishment of a sustainability department or the appointment of coordinators with adequate authority, and the allocation of sufficient economic and human resources are also identified as critical elements. A major challenge arising from the absence of an integrated approach is that SDG implementation often results in isolated projects with limited or no lasting impact (Grainger-Brown & Malekpour, 2019; Kranz & Gustfsson, 2021). Beyond embedding the SDGs into existing strategies, an integrated approach is also needed to avoid "cherry-picking" among the goals and to ensure they are pursued as a coherent and interdependent whole (Stafford-Smith et al., 2017).

Within this broader context, Italy has undertaken a structured and comprehensive approach to defining and implementing the SDGs in alignment with the 2030 Agenda. The process began with the development of the Italian National Sustainable Development Strategy (NSDS), first adopted in 2017 and updated in 2022. This document serves as a strategic reference for integrating sustainability into national policies, addressing social, economic, and environmental dimensions across various sectors. Regional and local governments have played a crucial role in adapting the national strategy to the specific needs and priorities of their respective territories.

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In this process, Italian metropolitan cities emerge as pivotal actors. Due to their demographic, economic, and social significance, these areas serve as laboratories of sustainable urban transformation (Mazzeo, 2018; Fiorani et al., 2024). Analysing their specific contexts provides valuable insights into how urban areas contribute to the achievement of the SDGs and how locally tailored policies can address local priorities while aligning with broader international, national and regional strategies (Cohen et al.,2023), However, the extent to which metropolitan cities align their strategic documents with global sustainability agendas varies significantly, influenced by both global pressures and local specificities (Guarini et al. 2022; McLennan et al., 2014).

This study, which is a work in progress, seeks to address the following research questions:

RQ1. How do metropolitan cities integrate SDGs into their strategic plans?

RQ2. Which SDGs are most frequently addressed by metropolitan cities, and are there notable differences related to the local context?

The research focuses on the Italian context, characterized by significant regional diversity and socio-economic disparities. To explore these questions, the study draws on two complementary theoretical perspectives: strategic planning and management theory and the theory of territorial differentiation.

The first provides a framework for understanding how municipalities translate global sustainability goals into local strategies. Strategic planning helps define long-term directions and transform them into specific goals and actions (Poister and Streib 2005), while management ensures their continuous implementation, coordination, and improvement. This perspective also highlights the importance of balancing top-down and bottom-up approaches (Albrechts and Balducci 2013).

The second perspective, territorial differentiation theory, explains why the localization of SDGs varies across cities (Storper, 1997; Rodríguez-Pose, 1998). It emphasizes how socio-economic structures, institutional capacities, and spatial characteristics shape local policy outcomes. In Italy, where governance and resources differ markedly between regions, this territorial lens is crucial to understanding the uneven integration of the SDGs.

By combining these two approaches, the study develops a framework to analyze both the process of SDG integration and the territorial diversity that characterizes its implementation across Italian metropolitan cities.

2. Materials and method

2.1. Research context

Italian governance systems

Italy is a unitary state operating under a multilevel governance system that consists of three levels of subnational government: Municipalities, Provinces or Metropolitan Cities (whose territory coincides with that of the former Provinces), and Regions. They are all autonomous entities with their own statutes, powers and functions in accordance with the principles established by the Constitution. Metropolitan Cities are fourteen, ten established by Law No. 56/2014 for ordinary statute regions (Bari, Bologna, Florence, Genoa, Milan, Naples, Reggio Calabria, Rome, Turin and Venice) and four (Catania, Messina Palermo and Cagliari) instituted by the laws of their respective special statute regions.

Their primary functions focus on the strategic development of the metropolitan area and overarching territorial planning, and are related to economic development, mobility, the environment, and the circular economy. Other areas of focus involve revising administrative boundaries, pursuing financial autonomy, providing training and empowerment for personnel, and fostering a new approach to relations between the State, Region, and Local Authorities. To support this, the law introduces a new tool: the Metropolitan Strategic Plan (MSP) (Molinaro, 2020). The MSP serves as a framework for the authority, as well as for municipalities and

municipal unions, in carrying out their responsibilities. In this context, the MSP is a three-year performance plan that defines the general, sectoral, and cross-cutting development objectives for the metropolitan area, identifying intervention priorities, the resources needed to achieve them, timelines, and implementation methods, in accordance with environmental sustainability principles.

The National Strategy for Sustainable Development

In Italy, the implementation of the 2030 Agenda is guided by the National Strategy for Sustainable Development (NSSD), approved in 2018 by the Interministerial Committee for Economic Planning (CIPE, now CIPESS) and updated in 2022. The strategy defines the national framework for planning, programming, and assessing policies aimed at achieving the Sustainable Development Goals (SDGs).

The NSDS is based on five main areas of action, aligned with the "5 Ps" of the 2030 Agenda: People, Planet, Prosperity, Peace, and Partnership. The NSDS relies on a multi-level governance model, connecting national, regional, and local strategies. Since 2018, the Ministry for the Environment and Energy Security (MASE) (formerly MITE) has played a key role in coordinating this system, promoting dialogue, collaboration, and exchange of good practices among administrations.

Italy also promotes a "whole-of-society" approach, involving civil society, businesses, academia, and other stakeholders to foster a true "culture of sustainability". Regular assessments, such as the Voluntary National Reviews (VNRs) submitted to the United Nations, help evaluate progress, identify gaps, and improve strategies toward achieving the SDGs.

Metropolitan Agendas for Sustainable Development

Localizing the SDGs means adapting global goals to local contexts, since every community faces different challenges and priorities. Achieving sustainability depends largely on local action and leadership. Therefore, actions aimed at achieving the SDGs must be tailored to local specificities, taking into account the socio-economic, environmental, and cultural context of each territory.

All Italian Metropolitan Cities are developing their own Metropolitan Agendas for Sustainable Development (MASD), a voluntary tool that:

- strengthen the focus on sustainability in urban and metropolitan planning;
- promote joint sustainable development initiatives with local institutions and stakeholders;
- raise awareness and encourage public and private engagement in sustainability issues.

The MASE supports Metropolitan Cities throughout this process, helping them integrate the Agendas with their MSP and develop indicators to monitor progress toward NSDS objectives.

This support has also led to the creation of new institutional and governance structures, such as:

- Inter-institutional Roundtables (one with Regions and Autonomous Provinces, another with Metropolitan Cities), which promote multi-level dialogue and policy coherence;
- Territorial Steering Committees, which oversee and enhance the effectiveness of local policy design, implementation, and monitoring.

Voluntary National and Local Reviews

The Voluntary National Review (VNR) is a process through which UN member states assess and report their progress in implementing the 2030 Agenda and its SDGs. At the local level, the Voluntary Local Review (VLR) serves a similar purpose, allowing local authorities to define their priorities and specific territorial characteristics. When this process includes detailed indicator

analysis, active participation from citizens and stakeholders, and an evaluation of policy coherence, it becomes a truly strategic planning tool for sustainable development.

2.2. Research Methodology

This research adopts a qualitative approach, employing document analysis to investigate how Italian metropolitan cities integrate SDGs into their strategic plans. As defined by Bowen (2009), document analysis is a systematic process for reviewing and interpreting texts to elicit meaning and develop empirical knowledge. Its naturalistic and unobtrusive nature, as highlighted by Jensen (2002: 243), makes it particularly suitable for examining institutional processes, as it involves data that are "found rather than made," free from researcher influence. Focusing on strategic plans (i.e. Metropolitan Agendas for Sustainable Development and the MSPs), policy documents, and official reports highlights the interplay between global sustainability objectives and local adaptations. Documents reflect institutional priorities and tools for shaping policy frameworks, offering rich insights into how cities align their strategies with UN Agenda 2030 while addressing regional specificities. According to Tight (2019), these documents serve as interpretative schemas that frame policy options and legitimize specific goals and approaches.

In addition, a comparative framework is developed to identify patterns of convergence (shared goals and common strategies) and differentiation (context-specific adaptations and localized approaches).

3. Preliminary findings

The findings presented in the following matrix (Table 1) represent the preliminary results of an ongoing comparative analysis between the MSPs and the MASDs of Italy's metropolitan areas. They provide an initial overview of how local governments are aligning their strategic objectives with the SDGs. Emerging patterns highlight differences in governance capacity, policy coherence, and citizen participation, offering early insights that can guide future policy design and research on urban sustainability and strategic integration.

The comparative approach is based on five key analytical dimensions:

- Main Strategic Objectives: This dimension focuses on identifying the main strategic priorities defined in each MSP and assessing how these align with the SDGs. It aims to explore whether the metropolitan strategies are framed around global sustainability principles (economic, social, and environmental), and how local priorities are "territorialized" that is, translated into context-specific actions and measurable outcomes. The comparison will also examine the degree of coherence between the strategic vision of each metropolitan plan and national or regional sustainable development frameworks (Echebarria et al. 2018; Krellenberg et al., 2019)
- Thematic Areas: Examination of cross-cutting topics such as sustainable mobility, energy, social inclusion, and resource management. The goal is to determine whether the thematic priorities of metropolitan governance reflect an integrated vision of sustainability, combining economic competitiveness, social cohesion, and environmental protection, and to assess how these are translated into coordinated sectoral policies (Guarini et al. 2022; UNSDG, 2017).
- Tools and Methods: This dimension analyses the instruments and methodologies adopted to design and implement the strategies, including action plans and system actions that operationalise objectives. The analysis highlights the degree of methodological innovation, the role of evidence-based planning, and the capacity to translate strategic visions into tangible, measurable outcomes (Kirst and Lang, 2019).
- Monitoring and reporting tools: This dimension analyses the systems for monitoring, evaluation, and reporting adopted by metropolitan administrations to track the implementation and effectiveness of their strategic plans. It explores how key performance indicators (KPI),

performance dashboards, and sustainability assessments are used to (Allen et al, 2017; Valencia et al, 2019; Klopp and Petretta 2017):

- evaluate progress towards strategic objectives and SDGs;
- ensure transparency and accountability;
- support adaptive governance and evidence-based decision-making.
- Participatory implementation: This dimension explores the forms of citizen and stakeholder participation embedded within metropolitan planning and implementation processes. It considers how cities engage local communities, private actors, universities, and NGOs in co-design, co-decision, and co-implementation, thus reinforcing democratic legitimacy and social innovation. Participation is not only a governance mechanism but also a tool to build collective ownership, improve the relevance of projects, and foster social cohesion (Fiorani et al., 2024; Caprotti et al., 2017).

This structured framework allows for a consistent and evidence-based comparison, facilitating the identification of best practices and critical gaps among Italy's metropolitan cities.

This analysis aims to bridge the gap between strategic metropolitan planning and sustainability governance in Italy. By comparing key policy documents from the metropolitan cities, the study seeks to understand how sustainability principles are operationalized at the urban level, and to what extent the SDGs are embedded within local policy frameworks. The purpose is not only to measure the degree of alignment with global sustainability objectives, but also to identify innovative practices, institutional challenges, and areas where policy coherence can be strengthened. Ultimately, these insights will contribute to enhancing metropolitan governance models that are inclusive, evidence-based, and aligned with the broader vision of sustainable urban development promoted by the 2030 Agenda.

Metropolitan City	**Main Strategic Objectives/ Integrated SDGs (Agenda 2030)**	**Thematic areas**	**Tools and Methods**	**Monitoring and reporting Tools**	**Participatory implementation**
Bari	1. Digitalization, innovation and competitiveness (**8,9,11**) 2. Safety, emissions' reduction and public transport (**3,7,9,11,13**) 3. Sustainable tourism and cultural enhancement (**4,8,11,12**) 4. Education, research and workforce ecosystem (**4,8,9**) 5. Housing first, active inclusion to	Integral ecology Equal intra-generation opportunities Cultural capital Sustainable mobility Energy transition	SWOT analysis Multilevel governance Sustainable Urban Mobility Plan (PUMS), Sustainable Energy and Climate Action Plan (PEAC), Special Economic	Qualitative monitoring of objectives, actions and expected results. Mobility indicators for PUMS. Biannual monitoring of emissions (PEAC). Sustainability (qualitative) assessment	Participatory workshops and youth consultations. Economic and social partnerships (stakeholder engagement). Digital participation (PUMSPARTECIPA public consultation and surveys).

Metropolitan City	**Main Strategic Objectives/ Integrated SDGs (Agenda 2030)**	**Thematic areas**	**Tools and Methods**	**Monitoring and reporting Tools**	**Participatory implementation**
	address inequalities and poverty (**1,5,10,11**) 6. Protection of marine ecosystems, climate adaptation (**11,13,14**) 7. Urban regeneration, social cohesion (**10,11**) 8. Enhancement of artistic heritage, sustainable urban services (**8,11**) 9. Sustainable agriculture and food transition (**2,12,13,15**) 10. Green transition and adaptation to climate changes (**1,3,6,7,9,11,12,13, 14,15**) 11. Innovation, Industry 5.0 and attractiveness (**8,9,17**)	Social inclusion Environmental sustainability	Zones (ZES) and Masterplan for Industrial Development Areas (ASI)	of MSP to SDGs and NSSD VLR	Municipality survey. "Re-Start" public forum.
Bologna	1. Metropolitan Bologna: sustainable, responsible and attractive (**8,9, 1,12,13,17**) 2. Urban and environmental regeneration (**6,7,11, 13,15**) 3. Mobility (**9,11,13**)	Energy and climate Social inclusion Sustainable mobility	SWOT analysis 4 pilot actions Policies structured into objectives,	Involvement municipal/ owned companies into the reporting mechanisms. Identification of sectoral indicators	Listening path with stakeholders during the MSP design Periodic meetings with the Council of Development, and the

Metropolitan City	Main Strategic Objectives/ Integrated SDGs (Agenda 2030)	Thematic areas	Tools and Methods	Monitoring and reporting Tools	Participatory implementation
	4. Manufacture, new industry and training (**4, 8,9,12**) 5. Culture, knowledge, creativity and sport (**3,4,5,11**) 6. Education and learning (**4,8,10**) 7. Health, welfare and wellbeing (**1,3,10,11**)	Environmental sustainability Circular economy Culture as a lever for inclusion. .	lines, actions, instruments Integrated governance and multi-level cooperation Metropolitan Jobs and Sustainable Development Pact Sustainable Urban Mobility Plan (PUMS) Metropolitan Territorial Plan (PTM) Sectoral Plans	systems (in particular PUMS and welfare) VLR	Roundtable of municipal/owned companies Steering Committee of PUMS Territorial networks, cultural districts, educational institutions and economic partners
Cagliari	1. Social Cohesion and Quality of Life (**8,11**) 2. Economic Competitiveness and Innovation (**9,11)** 3. Protecting and Enhancing the Environment and Landscape (**13)**	Sustainable tourism Waste management and circular economy Sustainable mobility	13 Priority System Actions translate strategic objectives into integrated projects The consistency checks of the MASD with the current planning tools and of the	KPI for objectives and System Actions LABMET (Metropolitan Laboratory) Biannual progress meetings	A 22-month participatory process involving 17 municipalities, 400 stakeholders, and over 2,300 citizens through forums and territorial labs. Living Labs

Metropolitan City	Main Strategic Objectives/ Integrated SDGs (Agenda 2030)	Thematic areas	Tools and Methods	Monitoring and reporting Tools	Participatory implementation
	4. Improving Mobility and Territorial Connectivity (**9**) 5. Building an Integrated and Participatory Governance System (**17**)		project proposals with the funding lines The alignment of the territory's interests within a medium- to long-term vision.		Geodesignhub, a web platform supporting collaborative territorial planning
Catania	1. Local economic development, sustainable management of cultural heritage and flows (**8,11,12**) 2. Quality education, reduction of inequalities, qualified employment (**4,8,10**) 3. Economic growth, sustainable industrializati on, territorial cooperation (**8,9,17**) 4. Innovation as a lever for development and advanced skills (**4,8,9**) 5. Qualification of productive sectors and sustainability of supply	Territorial security Climate emergency Environmental sustainability Sustainable mobility Energy transition Social inclusion Urban regeneration	Socio-economic analysis. Benchmarking Steering Committee. 5 Flagship Projects. Governance based on service agreements and integrated management tools. Territorial marketing plan. SMART strategy.	Tableau du Board dashboard based on 54 KPI indicators Qualitative evaluation of project effectiveness Reporting and adaptive governance Sustainabilit y assessment (qualitative) of SDGs. Impact assessment of regeneration and heritage management	Interviews, workshops and seminars with/for stakeholders. Extended steering committee and agreements with public bodies. Consultations with local actors for macro-areas and criticalities, and with economic and social actors in the Flagship Projects. Digital participation and civic communication through website and social media.

Metropolitan City	Main Strategic Objectives/ Integrated SDGs (Agenda 2030)	Thematic areas	Tools and Methods	Monitoring and reporting Tools	Participatory implementation
	chains (**8,9,12**) 6. Sustainable cities, climate resilience, environmental protection (**11,13,15**) 7. Effective institutions, governance, and partnerships (**16,17**) 8. Well-being, inclusion, services for citizens (**3,10,11**) 9. Resilient infrastructure and sustainable mobility (**9,11**) 10. Resilient Innovation and transparent digital administration (**9,16**)				
Florence	1. Universal Accessibility (**9,10,11,13,16**) 2. Broadly Distributed Opportunities (**4,8,9,11,12,17**) 3. Lands of Well-Being (**2,6,7,12,15**)	Multimodal mobility Sentient city Cooperative governance Inclusive community Innovative manufacturing	Permanent observatory on interinstitutional aggregation (Easy Metro City) Laboratory for the Operationalization of the Metropolitan Strategic Plan (O-MSP)	VLR with identification of objectives and actions aligned with the NSSD	80 interviews with key informants 5 meetings with mayors and administrative officers from 41 municipalities Online questionnaire (768 respondents)

Metropolitan City	Main Strategic Objectives/ Integrated SDGs (Agenda 2030)	Thematic areas	Tools and Methods	Monitoring and reporting Tools	Participatory implementation
		Entrepreneurial education 100% reuse Integrated attractiveness Accessible landscape Networked supply chains Safe environment			Next Generation Lab: focus group with 50+ young citizens Sustainability Labs: 4 thematic focus groups (People, Planet, Prosperity, Peace) involving 100 stakeholders 20 video spots featuring local actors
Genoa	1. Coordinate and integrate territorial, economic, and social resources through multi-level cooperation (**11,16,17**) 2. Define general, sectoral, and cross-cutting objectives with clear priorities, resources, and timelines (**16,17**) 3. Strengthen collaboration between local authorities, private actors, and the third sector (**11,17**)	Energy transition Sustainable metropolitan spaces Integration between coastal and inland areas Circular economy and land use	Four-phase strategic planning process Territorial context analysis and homogeneous zones Stakeholder mapping and influence/interest matrices Budget alignment with strategic priorities	Annual updates and 3-year revision cycle KPI for each project Open data and digital platforms (PON Metro, Smart City paradigm) VLR	Highly structured: 7 public meetings, 27 focus groups Clearly documented participatory pathway emphasizing broad stakeholder engagement. Operational co-design of priorities and projects Participatory monitoring; open data tools;

Metropolitan City	**Main Strategic Objectives/ Integrated SDGs (Agenda 2030)**	**Thematic areas**	**Tools and Methods**	**Monitoring and reporting Tools**	**Participatory implementation**
	4. Use "homogeneous zones" to better implement territorial policies (**9,10,11**)				citizen feedback channels
Messina	1. Interconnect territorial domains (**1,2,3,5,6,8,9, 10, 11, 17**) 2. Foster interconnections between production sectors (**2,4,6,7,8,9,11,12,13, 14,15,17**) 3. Interconnect the territory's stakeholders (**1,5,6,9,11,3, 14,16,17**)	Sustainable mobility and smart cities Circular economy Eco-systems and biodiversity Sport and sustainable tourism in protected areas Adaptation to climate change and risk reduction	Multilevel actions Pilot actions *Life restart* and *Icarus flight* projects Environmental regeneration	Use of *Datalab* for continue monitoring of SDGs, through an agreement with Milan metropolitan city. 2022 VLR presented at UN in New York	4 participatory laboratories, 2 thematic roundtables, 1 focus group, 35 stakeholder interviews
Milan	1. Territorial cohesion, mobility and infrastructure **(9,11)** 2. Ecological transition: energy efficiency, renewables, decarbonisation **(7,11,12,13)** **3.** Circular economy and sustainable	Energy transition Circular economy Climate resilience Ecological regeneration	Alignment with PNRR, SNSvS, Lombardy SDS Territorialisation of SDGs; competence–SDG matrix NetLab, DataLab,	SDG monitoring via DataLab dashboard VLR (regional + metropolitan) with 36 priority targets	Thematic workshops and municipal coordination tables NetLab and School of Sustainability programs Engagement of municipalities,

Metropolitan City	Main Strategic Objectives/ Integrated SDGs (Agenda 2030)	Thematic areas	Tools and Methods	Monitoring and reporting Tools	Participatory implementation
	production **(8,9,12)** 4. Climate adaptation, environmental protection, resilience **(11,13,15)** 5. Digital transformation, innovation, smart governance **(9,16,17)** 6. Inclusive growth, social equity, local well-being **(1,3,4,10,11)**	Sustainable economic development Digital transformation Equity, participation, long-term sustainability values	School of Sustainability Coherence analysis between metropolitan plans and SDGs Steering Committee and inter-institutional coordination table Support to municipalities for SDG localisation Collaboration with regional actors, universities, civil society networks	Integration of monitoring into MSP cycles Alignment with regional environmental observatory tools Open data tools and indicator updates	regional actors, universities, civil society networks Collaborative design of metropolitan trajectories
Naples	1. Culture as a driver of development (**8,11,12**) 2. Schools as pillars of legality and integration (**8,11**) 3. Digital Highways (**9,17**) No net land take (**8,9,11,12,15**) Oxygen as a common good	Social and economic development of the territory Enhancing quality of life through environmental protection	Identification of 6 strategic axes and 16 associated actions and funding. For each action, relevant BES (Benessere Equo e Sostenibile, Equitable and Sustainable Well-being) indicators are identified, alongside	Monitoring through a Coordination Committee Adherence to the Provinces' BES program Commitment to the Carbon Disclosure	The initiative involved 92 municipalities, engaged over 50 stakeholders, and facilitated more than 100 meetings and 120 interviews. Additionally, it organized 6 thematic tables, over 50 local communication and awareness events, and more than 10

Metropolitan City	Main Strategic Objectives/ Integrated SDGs (Agenda 2030)	Thematic areas	Tools and Methods	Monitoring and reporting Tools	Participatory implementation
	(**7,9,11,12,13, 15**) Safe cities (**6,11,13,14**)		specific municipal indicators.	Project (CDP)	national communication and awareness events.
Palermo	1. Enhance the attractiveness of the area (**8,9,11**) 2. Rebalance territorial differences (**1,10,11**) 3. Improve links and connections (**9,11,13**) 4. Improve territorial governance (**16,17**)	Support and promote innovation Protect environmental heritage Restore autonomy and independence Improve coordination between stakeholders and between territories	Governance through: project monitoring, stakeholder partnerships and metropolitan forums, inter-institutional roundtable and technical roundtable of municipal administrations, direct and EU funding	Strategic monitoring Procedural monitoring Inter-institutional monitoring	A 12-month participatory process involving 82 municipalities, 200 stakeholders, and over 1,800 citizens through online questionnaires.
Reggio Calabria	1. Identity and Territory (**11,15**) 2. Innovation and Society (**9,10,16**) 3. Sustainability and Transitions (**7,8,12,13**) 4. Accessibility and Governance (**11,16,17**)	Metropolitan Governance Social Innovation Regeneration Metropolitan Generation Economic Transition Connection	Sharing and inclusion (stakeholder engagement, co-design, participatory processes) Circularity of the process (iterative planning, monitoring dashboard) Integrated knowledge (interdisciplinary collaboration, shared data, evidence-based design)	Projects**:** project tracking system, KPI dashboards. Objectives/Results: indicators framework, results dashboards. Process: network analysis, participation trackers, surveys. Coherence: policy alignment matrix,	Iterative and inclusive participatory process developed through thematic forums and public meetings involving: Institutions (Metropolitan City, municipalities, national & regional bodies) University & research centres Upper secondary schools Professional associations Active citizens

Metropolitan City	Main Strategic Objectives/ Integrated SDGs (Agenda 2030)	Thematic areas	Tools and Methods	Monitoring and reporting Tools	Participatory implementation
			Ecosystem approach (ecological assessment tools, sustainability metrics, nature-based solutions	coherence dashboards. Annual review in the Metropolitan Assembly with cross-area trend comparison. VLR	
Rome Capital	1. Balanced and equitable territorial development **(1,10,11)** 2. Environmental sustainability and climate resilience **(11,12,13)** 3. Mobility, connectivity and energy transition **(7,9,11,13)** 4. Protection and valorisation of natural and cultural heritage **(11,15)** 5. Digital transition and administrative innovation **(9,16,17)** 6. Multi-level governance and policy coherence **(16,17)**.	Sustainable mobility and low-carbon transport Climate action, energy transition, environmental regeneration Natural resources, agriculture, food systems, and landscape protection Digital transition, open data, smart governance Culture, identity, social inclusion Metropolitan cohesion and	Experimental convergence between MSP and MASD under the project "Metropoli Capitale – Sosteniamo il Futuro" SDG-based analytical framework (ASviS & Urban@it): 21 thematic PPTs covering all 16 SDGs + SDG 11 Use of homogeneous zones and territorial analysis to align SDG priorities with metropolitan sub-areas	VLR with SDG-aligned indicators Dedicated sustainability dashboard under development Performance monitoring integrated into MSP cycles Open data portals and periodic indicator updates Internal coordination through the "Sustainability Steering Unit"	Structured participatory processes involving: 121 municipalities Universities and research centres Civil society organisations Sectoral actors Use of stakeholder workshops, thematic roundtables, territorial forums Digital platforms and focus groups for consultation

Metropolitan City	Main Strategic Objectives/ Integrated SDGs (Agenda 2030)	Thematic areas	Tools and Methods	Monitoring and reporting Tools	Participatory implementation
		reduction of socio-territorial disparities	Integration with sectoral planning tools: PUMS (mobility) PAESC / Covenant of Mayors (climate & energy) Regional sustainable development strategy PON/POR funds PNRR investments		Collaborative design of MSP and MASD actions to support shared ownership of SDG-oriented strategies
Turin	1. Metropolitan economy, innovation, research, quality employment **(8,9)** 2. Territorial cohesion and improved governance across urban, peri-urban, rural, alpine areas **(11,16,17)** 3. Environmental sustainability, ecological	Sustainable mobility and low-carbon transport Ecological and landscape regeneration Green infrastructure (e.g., metropolitan green belt) Innovation and	Integrated territorial planning (urban–rural–alpine) Green infrastructure framework Coherence analysis between strategic objectives and SDGs	Internal monitoring of strategic objectives within MSP cycle Integration of performance metrics on mobility, environment, innovation, cohesion Periodic updates on priority	Thematic roundtables and stakeholder forums Municipal coordination platforms Engagement of businesses, universities, civil society, local communities Collaborative design of

Metropolitan City	Main Strategic Objectives/ Integrated SDGs (Agenda 2030)	Thematic areas	Tools and Methods	Monitoring and reporting Tools	Participatory implementation
	resilience, protection of natural/landscape heritage **(11,12,13,15)** 4. Sustainable mobility, accessibility, integrated public transport **(9,11,13)** 5. Social inclusion, wellbeing, cultural vitality, reduced territorial disparities **(1,4,10,11)**	knowledge economy Social inclusion and cultural development Governance strengthening and inter-municipal coordination	Tools for inter-municipal cooperation and scenario building	projects and multi-level programmes VLR	metropolitan priorities Support for municipalities in co-developing SDG-aligned projects
Venice	1. Sustainable metropolitan governance aligned with SDGs **(11,12,13,15, 16,17)** **2.** Territorial cohesion across lagoon, mainland, peripheral municipalities **(11,15)** 3. Ecological transition, environmental protection, climate resilience, land-use sustainability **(12,13,15)** 4. Sustainable mobility and lagoon-adapted transport **(9,11,13)**	Environmental /ecological protection (lagoon + mainland ecosystems) Waterborne transport and sustainable mobility Territorial cohesion and landscape/heritage valorisation Sustainable tourism and inclusive socio-economic development	P.AGE.S.: process to translate the Strategic Plan into a full MASD Institutionalised metropolitan governance framework Integrated planning and monitoring tools (performance monitoring, unified programming documents) Coordination with national/regio	PerformPA platform for performance and sustainability monitoring Agenda-aligned indicators (environmental, social, economic, governance) Periodic review and alignment with national/regional strategies	Collaborative governance involving all municipalities Engagement of civil society and territorial stakeholders Co-design and adoption of Strategic Plan and MASD Shared programming tools and inter-municipal coordination mechanisms

Metropolitan City	Main Strategic Objectives/ Integrated SDGs (Agenda 2030)	Thematic areas	Tools and Methods	Monitoring and reporting Tools	Participatory implementation
	5. Socio-economic development, sustainable tourism, inclusive growth **(8,10,11)** 6. Institutional capacity, multi-level coordination, long-term vision **(16,17)**	Governance, coordination, strategic planning	nal sustainability strategies Shared planning tools and bottom-up proposals from municipalities		

SDG glossary: 1. No Poverty; 2. Zero Hunger; 3. Good Health and Well-being; 4. Quality Education; 5. Gender Equality; 6. Clean Water and Sanitation; 7. Affordable and Clean Energy; 8. Decent Work and Economic Growth; 9. Industry, Innovation and Infrastructure; 10. Reduced Inequalities; 11. Sustainable Cities and Communities; 12. Responsible Consumption and Production; 13. Climate Action; 14. Life Below Wate; 15. Life on Land; 16. Peace, Justice and Strong Institutions; 17. Partnerships for the Goals

Table 1. Comparative Matrix – MSPs and MASDs of Italy's metropolitan areas

4. Discussion

The comparative matrix highlights how Italy's metropolitan cities integrate sustainable development principles reported in their MASDs within their strategic planning frameworks (MSPs). To better capture the different stages through which metropolitan cities are integrating the SDGs, three descriptive labels can be introduced: Pioneering Integrators, Transitional Implementers, and Emerging Adopters. These categories do not represent fixed classifications, but rather interpretative tools designed to highlight common patterns, varying levels of maturity, and the evolving governance approaches observed across metropolitan contexts. Together, these three labels offer an interpretative framework for understanding the diverse pathways through which cities are approaching the SDGs, acknowledging the different starting points, governance capacities, and speeds of advancement that characterize contemporary urban sustainability efforts.

4.1. Pioneering Integrators

This category refers to cities that have reached an advanced stage in embedding the SDGs within their governance systems. In these urban areas, sustainability is understood as a shared cultural framework, shaping both long-term strategic vision and everyday policy choices. Their approaches combine foresight with concrete action while promoting participatory practices that involve citizens and local stakeholders in shaping the city's sustainable trajectory.

They perform strongly across all five analytical dimensions:

- Main Strategic Objectives are explicitly framed in SDG language and balance economic, social, and environmental goals.
- Thematic Areas are articulated as integrated trajectories (e.g. energy transition, circular economy, social inclusion, climate resilience), rather than isolated policy sectors.
- Tools and Methods include structured strategic planning processes, coherence analyses, and evidence-based instruments (e.g. SDG matrices, homogeneous zones, dedicated labs).

- Monitoring and reporting rely on advanced systems such as KPIs, dashboards, VLRs and dedicated data platforms, enabling continuous rather than episodic evaluation.
- Participatory implementation is formalised through multi-step, well-documented processes (forums, focus groups, thematic labs) that involve municipalities, stakeholders and citizens and support co-design and co-monitoring.

These cities can be considered front-runners in translating the 2030 Agenda into metropolitan governance models, combining long-term vision with concrete instruments for implementation and accountability.

This group tends to include metropolitan cities such as Bologna, Cagliari, Florence, Genoa, Messina, Milan, Reggio Calabria, Rome Capital and Turin, which show the most robust mix of SDG integration, monitoring capacity and participatory governance.

4.2. Transitional Implementers

This group is characterised by metropolitan cities that have embraced sustainability as a guiding principle and have begun aligning their strategic goals with the SDGs. Their commitment is evident, but governance processes are still undergoing consolidation: coordination among institutions remains uneven, and collaboration with communities, experts, and private actors is developing but not yet fully structured.

- Main Strategic Objectives are broadly aligned with the SDGs (e.g. social cohesion, sustainable mobility, environmental protection), but the linkage to specific targets is sometimes more implicit than explicit.
- Thematic Areas reflect an integrated sustainability vision, yet sectoral policies may still be only partially coordinated.
- Tools and Methods include strategic plans, agendas, inter-municipal coordination tools and some innovative instruments, but the degree of methodological standardisation and evidence-based planning varies.
- Monitoring and reporting are present (e.g. different types of monitoring, performance systems, periodic reviews), though indicator systems may be incomplete or not fully SDG-based, and continuous feedback loops are still emerging.
- Participatory implementation goes beyond formal consultation and involves multiple actors, but processes are less structured or less systematically documented than in pioneering cases.

These cities are in a transition phase, advancing beyond initial engagement but not yet characterized by fully integrated implementation.

Within the current sample, this pattern appears to fit metropolitan cities such as Palermo and Venice, which show clear SDG-oriented strategies and relevant tools, but comparatively less mature monitoring architectures or participation paths than the pioneering group. Bari also fits within this group but represents a less mature profile, characterised by extensive participation yet weaker evidence of SDG-based monitoring and methodological formalisation.

4.3. Emerging Adopters

Metropolitan cities in this group are at an early stage of SDG integration. The 2030 Agenda is present in political discourse and in some strategic documents, but its translation into coherent, operational and measurable strategies is still limited.

- Main Strategic Objectives refer to sustainability in general terms, often without a systematic alignment with specific SDGs or targets.
- Thematic Areas may include individual sustainability-related sectors (e.g. environment, mobility, social services), but they are not yet framed within an integrated SDG-based narrative.

- Tools and Methods rely largely on existing planning instruments, with only limited innovation or explicit SDG localisation tools; experimental projects prevail over system-wide approaches.
- Monitoring and reporting are usually based on periodic or project-based reports, with weak or fragmented indicator systems and little use of dashboards or VLR-type tools.
- Participatory implementation is mostly confined to traditional consultation practices, with fewer structured formats for co-design, co-decision and co-monitoring.

These cities are taking their first steps towards structured SDG integration. They often face constraints related to institutional capacity, yet they also display significant potential for progress through learning, inter-city cooperation and support from national and regional frameworks.

In the present sample, this trend seems to align with the metropolitan area of Naples and Catania.

5. Conclusions and implications

The comparative analysis of the MSPs and MASDs reveals that Italian metropolitan cities have embraced the 2030 Agenda as a guiding reference for policy design, translating global principles into locally meaningful priorities (Molinaro, 2020). However, this translation remains uneven (Hartman, 2016). Some cities have developed advanced governance architectures that embed SDGs into strategic objectives, thematic policies, monitoring systems, and participatory processes, while others still approach sustainability through sectoral or project-based initiatives with limited alignment to SDG targets.

A clear territorial pattern emerges when comparing SDG integration across Italian metropolitan cities. Northern cities of Milan, Turin, Bologna, and Genoa, with the exception of Venice, together with the central cases of Florence and Rome Capital, consistently fall into the category of Pioneering Integrators, characterised by robust governance architectures, structured monitoring systems, and institutionalised participatory processes. In contrast, Southern cities display a more heterogeneous landscape. Reggio Calabria, Messina and Cagliari exhibit advanced practices and join the Pioneering group, whereas Bari and Palermo behave as Transitional Implementers, showing meaningful but uneven progress in embedding the SDGs into strategic planning and monitoring. Naples and Catania remain Emerging Adopters, with limited operationalisation of SDGs, fragmented monitoring tools, and less formalised participatory infrastructures. This differentiation confirms the relevance of territorial factors in shaping institutional capacity and strategic innovation, and highlights a persistent North–South divide, albeit mitigated by notable Southern exceptions, across the Italian metropolitan governance system.

These results highlight several theoretical contributions and broader implications. This study advances strategic planning and management theory by demonstrating how SDGs act as integrative governance devices that merge planning and implementation; extends SDG localisation literature by identifying distinct maturity pathways among metropolitan cities; contributes to territorial differentiation theory by revealing hybrid and evolving geographies of institutional capacity; and offers a replicable five-dimension analytical framework that future comparative studies can adopt. It further enriches participatory governance theory by showing that iterative and multi-actor participation is central to mature SDG integration.

As for the implications, first, Italy's metropolitan governance system, supported by the NSSD and multi-level coordination, appears to be fostering progressive convergence across cities, even though different starting points and capacities produce uneven implementation patterns. Second, from a policy perspective, the findings suggest that accelerating SDG integration requires reinforcing capacities at the metropolitan scale, particularly in data management, cross-sectoral coordination, and participatory governance. Peer-to-peer exchange across cities, supported by national and regional frameworks, could further facilitate learning and convergence.

In conclusion, the Italian experience provides a valuable empirical lens for understanding how metropolitan authorities translate the SDGs into operational strategies within complex multilevel governance systems. While the process remains uneven, the trajectories observed across the 14 metropolitan cities point to a growing institutional commitment to sustainability and a progressive transformation of metropolitan governance cultures. Strengthening monitoring tools, participatory mechanisms, and inter-institutional cooperation will be essential to ensure that local strategies contribute effectively to the broader objectives of the 2030 Agenda and to foster resilient, inclusive, and sustainable metropolitan futures.

Keywords: Sustainable Development Goals (SDGs); Metropolitan Agendas for Sustainable Development (MASD); Metropolitan Strategic Plan (MSP)

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Building Financial Sustainability in Public Research Networks: Insights from an Action Research Study within SUS-MIRRI.IT

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1. Introduction

Within the broader context of the transition toward a more sustainable economic model, Italian research infrastructures play a fundamental role in generating and providing data and tools, while also supporting innovation and training. Ultimately, they play a crucial role in enhancing European competitiveness and fostering the creation of new shared knowledge (Brandão et al., 2024; Ribeiro, 2020; Draghi, 2025). It is precisely within the framework described above that the SUS-MIRRI.IT project was established, funded by the National Recovery and Resilience Plan (PNRR) under the NextGenerationEU program. The University of Turin is responsible for coordinating the project. The total budget allocated amounts to about €16.9 million, which supports the involvement of 24 operational units, belonging to 15 national institutions, distributed across the entire Italian territory. The project's main goal is to strengthen and enhance the microbial resources preserved in Italian biobanks and culture collections, by improving their characterization, management, and accessibility. Eventually, the project aims to unlock the potential of these resources to foster the development of innovative solutions and products of biotechnological interest, thereby contributing to the promotion of a sustainable, resilient, and circular bioeconomy. The SUS-MIRRI.IT project aims to establish a coordinated national network of microbial biobanks that promote scientific innovation and knowledge transfer throughout Italy and Europe. To achieve this goal, SUS-MIRRI.IT is actively engaged in enhancing infrastructures with cutting-edge technologies and quality management systems for microbial collections, creating a national platform to promote the Italian catalog of microorganisms and related metadata, and developing services and training programs targeted at the academic and industrial sectors. The project operates within the strategic framework of MIRRI-ERIC (Microbial Resource Research Infrastructure of the European Research Infrastructure Consortium). The latter is a European research infrastructure that operates in a distributed manner across the European territory, specifically dedicated to the characterization, provision, preservation, and valorization of microbial resources. In line with the political and regulatory framework of the European Union, which increasingly highlights the importance of environmental sustainability and the valorization of biological resources, and consequently the transfer of knowledge that makes this possible, the consolidation of an Italian network of research infrastructures assumes a twofold significance. Firstly, it represents a driver of specialized competences and a catalyst for technological innovation; moreover, such a network contributes to generating economic, social, and environmental value over the long term. Given the strategic

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relevance of this infrastructure, established within the post-COVID-19 recovery funding initiatives, ensuring its long-term financial sustainability represents a key challenge for publicly funded research infrastructures, whose continuity often relies on project-based financing. It therefore becomes essential to address in detail the issue of financial sustainability, not only to safeguard the scientific and social impact throughout the project's duration, but also to align with the broader European agenda, which integrates the concept of long-term economic resilience into the very notion of sustainability. The research presented below illustrates the process of developing a Performance Measurement System (PMS) based on infrastructure-specific KPIs, generated through the involvement of multiple internal and external stakeholders. This system was designed to support the strategic framework and ensure the long-term financial sustainability of the SUS-MIRRI.IT network. The scientific literature defines PMSs as evaluative instruments primarily aimed at monitoring the effectiveness of organizational management and the capacity to deliver value to stakeholders (Moullin, 2004). These systems are predominantly examined within the theoretical frameworks of Stakeholder Theory (Freeman, 1984) and Agency Theory (Eisenhardt, 1989), as these perspectives provide complementary interpretations of the role and objectives of management control mechanisms (Truant, 2024). From a Stakeholder Theory perspective, PMSs are conceived as tools of accountability and dialogue, designed to balance the diverse interests of stakeholders and to support decision-making processes oriented toward shared value creation (Nielsen et al., 2019). Conversely, Agency Theory views PMSs as mechanisms to reduce information asymmetries and align the interests of principals and agents, thereby enhancing efficiency and transparency in governance relationships (Dawson et al., 2016). In this article, however, we have chosen to go beyond the traditional opposition between Agency Theory and Stakeholder Theory by adopting the perspective of Dialogic Accounting. Indeed, while Stakeholder Theory recognizes the need to be accountable to a plurality of actors, Dialogic Accounting represents its evolution (Manetti et al., 2021). This approach transforms accountability into a space for dialogue and exchange, where stakeholders actively participate in defining value and meaning. Following Brown and Dillard (2015), our approach aims at a democratization of accounting, capable of integrating pluralism and participation within governance processes Research in this field has furthermore largely focused on analyzing the design characteristics of PMSs, their impact on organizational performance, and the mechanisms of strategic and motivational alignment they can foster (Ferreira et al., 2009; Monica Franco-Santos et al., 2018). However, limited attention has been paid to the drivers and barriers affecting the implementation of such systems in complex public contexts, such as research infrastructures, where the multiplicity of actors, the long- term orientation, and the public nature of funding create distinctive challenges in terms of both managerial sustainability and accountability to society. The article positions itself within a completely new perspective, as it is carried out through the application of the Action Research (AR) methodology (Apostol et al., 2021; Coghlan & Brannick, 2014), which serves as a guiding framework for the incorporation of a KPI scheme within the Sus.MIRRI research infrastructure, under the theoretical lens of Dialogic Accounting-DA (Bebbington et al., 2007). DA refers to the collaborative involvement of diverse constituencies in designing and refining accounting tools and practices that facilitate the generation, interpretation, and communication of relevant and timely information (Bebbington et al., 2007). It challenges conventional, monologic approaches by fostering spaces of dialogue among stakeholders with differing viewpoints, thereby democratizing accounting and subjecting it to broader public accountability (Kingston et al., 2019). Rooted in Paulo Freire's pedagogical philosophy (1983, 1996), DA aspires to address contested and complex social issues, to engage with power asymmetries, and to promote both individual and collective awareness around sustainability concerns (George et al., 2023; Brown & Dillard, 2021). In this sense, AR and DA share a common orientation toward empowerment, reflexivity, and social transformation, combining practical experimentation with critical reflection to foster enduring organizational and societal change. Additionally, from a methodological perspective, the adoption of the AR methodology responds

to the need, emerging from the theoretical considerations discussed above, to develop a participatory and context-sensitive approach capable of integrating multiple stakeholder perspectives into the design of the management control system. This methodological choice enables both the generation of practical, actionable knowledge and the co- construction of evaluative instruments that are aligned with the complex and collaborative nature of research infrastructures.

2. Methodology

The AR approach is particularly suited to this context, as it is designed for situations where technical expertise among participants is limited and change must emerge through cycles of practice and reflection rather than being imposed externally. Within AR, learning is often embedded in real-time problem-solving within participants' professional environments, enabling them to translate theoretical insights into action. The cyclical process of planning, acting, observing, and reflecting encourages participants to internalize learning progressively and to integrate new practices into the organization's routines and culture. Within this framework, the conceptual perspective of DA enriches AR by emphasizing participatory knowledge creation and deliberative engagement. The first reason for the reliance on-action research as the main method is two specific aspects of the Sus.MIRRI issue. Firstly, employees are somewhat inexperienced in the financial and control areas, meaning that performance management through traditional methods will not be successful. Secondly, the infrastructure is functioning in a decentralized and dynamic governance setting, thus a method requiring collaboration, dialogue, and adaptation a step further as the essential elements would be the most suitable one. By recruiting the researchers and the practitioners as co-learners, the action research not only serves as a blueprint for putting the KPI system into practice but also as a channel for the skills necessary for the maintenance of the system to be developed. The research design follows cycles, which are iterative. Each cycle starts with collaborative planning in which the researchers along with the staff of Sus.MIRRI decide on the areas where performance indicators are most likely to be applicable and provide value. A ready-made framework is not presented; instead, the process helps to visualize the abstract concepts using simple, experience-based tools that reflect the daily activities of workers. Then, a practical run of the stage with provisional KPI templates and low-barrier digital instruments is done which are introduced in the training sessions only for explanation and hands-on practice.

The observation phase, in this case, largely depends on the actual use of the tools, besides just counting the accuracy and completeness of the reports. This means that along with engagement patterns and informal dialogues between the members, the observation also includes the ability with which the staff approach the system. Finally, the researchers and officials reflecting on questions of success, obstacles, misunderstanding, and in agreement on how the system should be changed for the coming implementation enter jointly the reflection stage which concludes each round. As a result, the KPI framework is practically brought to life, gaining new features and becoming more fundamentally a co- owned and contextually embedded management tool than just the researcher-driven initiative.

The project, then, cares a lot about the nature of participatory action research. Through each cycle, the project advances staff skills and turns them into robust users of the performance concepts and tools. The process, however, is experiential which means that the employees of the respective organizations learn the benefits of monitoring only after they embark on the actual process and they, then, move to actually defining the indicators and interpreting dashboards. In this way, external demands at first become a part of the internal routines and the dialogues among colleagues are what actually make the shared understanding get consolidated. This, in turn, leads to the establishment of a learning culture that, with time, becomes a fine complement to the technical system itself. The research data are gathered through a varied combination of

documentation done during the cycles, the direct observation of daily activities, and workers' interviews and focus groups that provide the perceptions of clarity, relevance, and challenges of the concerned parties. The reliability of these materials is ensured by triangulation, and this also helps in capturing both the formal and informal aspects of the implementation process. The methodology is thus expected to have a dual-pronged effect - to serve as a functioning KPI system specifically designed to address the infrastructural and human constraints of Sus.MIRRI and as a process of organizational learning that, on the one hand, fosters accounting awareness, and on the other hand, provides a basis for continuous improvement.

3. Expected results

Given the work-in-progress nature of the present contribution, the authors can reflect on the expected findings of the AR approach. The experience in Sus.MIRRI allowed the authors to familiarize themselves with the challenges connected to the adoption of MCS in a public context, made of organizational units that did not feature advanced levels of accounting literacy. The work has been at the same time stimulating and challenging, due to the existence of both barriers to overcome and opportunities to grow from the experience. Overall, the study aims to identify and discuss a series of challenges, barriers and risks associated with the adoption of MCS in 15 institutions with 24 operational units across Italy, as well as provide scholars with empirical evidence on the matter of MCS adoption. Along with the challenging aspects of the research, the authors note several opportunities and enablers for future research to build upon, in order to facilitate the integration of MCS in a publicly funded research environment. In exploring the above, several contributions are provided by the research, both theoretical and practical. From a theoretical perspective, the study aims to answer several calls for research on MCS and the public sector, as the area is generally considered to be under represented in the literature, despite its growing importance, especially in light of the funding received as part of the PNRR and the post-pandemic recovery. Several, narrower gaps are also addressed in said stream of research, namely the importance of cultural aspects when it comes to MCS adoption, the adaption of MCS to a non-financial, public and scientific organizational unit, and the role MCS plays in mitigating the tensions arising from the heterogeneous nature of R&D project alliances. From a practical point of view, the study aims to deliver a series of best practices and recommendations for MCS adoption in scientific project alliances that could easily be expanded and applied to several other facets of the public administration. Risks associated with lack of accounting literacy, tensions across units and difficulties of MCS implementation are discussed with the help of empirical data and the field experience of the authors, in an effort to provide scholars, practitioners and policymakers with a case study for future use. Given the significant size and importance played by the Sus.MIRRI alliance, the authors are confident that the results could be easily generalized and be of interest to several institutions worldwide, keen on adopting a MCS to better understand and monitor their financial and non-financial performance, but wanting to avoid risks and difficulties associated with said adoption.

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On the configuration of management control packages in inter-organizational settings: Experiences from public healthcare services

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1. Introduction

Post-New Public Management (NPM) reforms marked a shift from competitive to collaborative institutional environments, where public and private organisations, together with service users, cooperate to achieve improved outcomes (O'Flynn, 2007; Lodge C Gill, 2011). Consequently, public sector governance in Western countries has increasingly relied on networks and inter-organisational arrangements aimed at enhancing service delivery and outcomes (Ansell C Gash, 2008; Emerson et al., 2012).

Among the key challenges related to the creation of such networks and arrangements we may find the management and control of the performance at the organizational and inter-organizational level. In this sense, some authors devoted their attention to the exercise of management control (MC) in public or hybrid network aiming at delivering public services (Agostino C Arnaboldi, 2018; Steccolini, 2019; Thomasson et al., 2020; Dudau et al., 2020). Most of these authors agree that MC in this setting need to rely on both formal and informal control mechanisms – such as budgeting, performance indicators and dashboards on the one hand, and socialization, values and rituals on the other.

This view is consistent with the scientific literature that conceive MC as a 'package' – or 'system' depending on the level of interdependence among control mechanisms (Malmi C Brown, 2008; Bedford et al., 2016; Grabner C Moers, 2013; Merchant C Otley, 2020).

However, the scientific debate on control packages in the public sector is largely uncovered by extant literature (Van der Kolk C Schokker, 2016; Felicio et al., 2021; Barretta C Noto, 2023). This is mostly related to some of the barriers that make the study and research about MC packages complex in public settings, such as the blurred boundaries of public sector organizations (Van der Kolk, 2019).

To the author's knowledge, there remains a gap in understanding the antecedents of the configuration of MC packages in inter-organisational initiatives within the public sector. The objective of this article is therefore to address this gap by examining whether the genesis of the collaborative setting – i.e., initiated by the strategic apex (top-down) or by employees (bottom-up) – leads to different configurations of control packages.

To do that, the research investigates the case of the collaboration between a Teaching Hospital and a Local Health Authority in Italy. Starting from 2021, these two public healthcare organisations started various collaborations aimed at improving public healthcare services delivery. In particular, one of these collaborations focused on the robotic surgery and was promoted by the top management of the healthcare organizations; while the other, related to the paediatric surgery, was proposed by the healthcare professionals involved in the service delivery. The study develops a case study combining an interventionist research approach (Dumay, 2010; Jönsson, 2010) – as one of the authors is the top manager of the Teaching Hospital – with a set of

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semi-structured interviews, to be conducted by the other author to the key informants involved in the collaborative settings.

2. Theoretical background

2.1. Management control as a package

According to Malmi and Brown (2008), management control (MC) is a "package" that includes "all the devices and systems managers use to ensure that the behaviours and decisions of their employees are consistent with the organisation's objectives and strategies" (p. 290). Malmi and Brown (2008) define five typologies of management controls, namely planning, cybernetic controls, reward and compensation systems, administrative controls, and cultural controls.

Table 1 summarises the Malmi and Brown (2008) control taxonomy.

<table>
<tr><td colspan="8">Cultural controls</td></tr>
<tr><td colspan="2">Clans</td><td colspan="3">Values</td><td colspan="2">Symbols</td></tr>
<tr><td colspan="2">Planning</td><td colspan="4">Cybernetic controls</td><td rowspan="2">Reward and compensation</td></tr>
<tr><td>Long-range planning</td><td>Action planning</td><td>Budgets</td><td>Financial measurement systems</td><td>Non-financial measurement systems</td><td>Hybrid measurement systems</td></tr>
<tr><td colspan="8">Administrative controls</td></tr>
<tr><td colspan="2">Governance structure</td><td colspan="3">Organisational structure</td><td colspan="2">Policies and procedures</td></tr>
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Figure 1. Management control systems package. Source: Malmi and Brown, 2008

Planning, cybernetic and reward/compensation controls are those specifically referring to the performance management (PM) cycle.

Planning is an ex-ante form of control that includes action plans and medium-long term plans. These are typically used to set the goals and targets an organisation aims to achieve. Cybernetic controls are represented by information and decision support systems aimed at detecting performance gaps and undertake corrective actions. Amongst cybernetic mechanisms we find budgets, financial measurement systems, non-financial measurement systems, and hybrid measurement systems (i.e. both financial and non-financial).

Reward and compensation systems focus on extrinsic motivation and aim at improving individuals and groups performance by achieving congruence between their goals and the organisational ones. The basic argument is that the presence of rewards and compensation leads to increased effort.

Administrative controls include the organisation design and structure, the governance structure, policies, and procedures. The organisational structure is a form of control that works through functional specialisation and contributes to control through the reduction of behaviour variability and, consequently, improves the coordination between groups and individuals. Governance structure consists of the formal lines of authority and accountability, as well as the systems that are in place to ensure that representatives of the various functions and organisational units meet to coordinate their activities both vertically and horizontally. Lastly, policies and procedures are mechanisms to specify (and when possible to standardise) processes and operations through the preventative definitions of the actions to be performed.

Amongst cultural controls, Malmi and Brown (2008) include values, symbols, and clan controls. Value-based controls build on the explicit and formal set of organisational definitions that are continuously communicated by managers to provide basic values, purpose, and direction for the organisation. Individuals may embrace these values either because they internalise them, or because these are set and required by the organisation to which they belong. In both cases, values influence their behaviour. The elicitation of the vision, the mission, and other values are examples of such mechanisms. Controls based on symbols take place when visible messages are created to develop an organisational culture (e.g. a dress code). Lastly, clan controls are based on the idea that individuals are exposed to socialisation processes that foster specific values and attitudes. These processes are connected to the creation of groups (i.e. clans) and it is through their "rituals" and "ceremony" that values and beliefs are developed.

2.2. Management control packages in the public sector

The concept of MC package has been widely discussed in the extant literature (Grabner C Moers, 2013; Merchant C Otley, 2020), although the debate within the public sector context still lags behind (Barretta C Busco, 2011; van der Kolk, 2019; Felicio et al., 2021).

Van der Kolk (2019) identifies among the challenges that make the design and analysis of MC packages particularly complex the porous organizational boundaries that characterize public sector organizations and their collaborative networks. In particular, while much of the literature on public sector reforms has focused on the emergence of collaborative networks, partnerships, and public–private arrangements, less emphasis has been placed on understanding how control systems operate within these complex inter-organizational contexts, and how they contribute to aligning diverse goals, fostering trust, and ensuring accountability across multiple actors.

According to Kenis and Provan (2006), control in public networks is essential to ensure efficiency and effectiveness. MC design depends on contextual factors and therefore does not allow for a "one size fits all" solution. Their study highlights the importance of combining both formal and informal mechanisms, as well as the effectiveness of the latter.

Romzek et al. (2012) proposed a preliminary theory of informal accountability to guide network members in ensuring that intended results are achieved without having to rely exclusively on formal systems. Building on this, Agostino and Arnaboldi (2018) developed research showing that MC in public networks is a multi-level and hybrid system integrating formal and informal mechanisms. They pointed out that formal mechanisms, such as indicators and reporting, should be complemented by socialization practices in order for control to be effective. This approach requires balancing accountability and collaboration while considering the dynamic relationships among network members.

Further developments in this research stream can be found in Barretta and Noto (2023), who focused on interdependencies among control mechanisms at both the network and single-organization levels. Their findings suggest that the effectiveness of MC in public networks and inter-organizational settings depends on the balancing and coupling of formal and informal control mechanisms, as well as their ability to adapt across organizational levels.

To the best of the authors' knowledge, what has been neglected in the extant literature is the analysis of differences in MC package design between networks having different genesis – i.e. those arising from voluntary initiatives and those emerging from regulatory interventions or government mandates (Barretta C Busco, 2011). According to Krogh (2022), the latter require adaptive strategies to compensate for bureaucratic rigidities resulting from regulation. Accordingly, the author suggests adopting informal mechanisms to foster collaboration among institutions.

Conversely, in networks developed through voluntary "bottom-up" intiatives, collaboration is often driven by shared objectives and values among proponents and network members (Milward C Provan, 2006; Head, 2008). However, Macciò and Cristofoli (2017) demonstrate that

formal mechanisms – through rules and standardized procedures – can also be pivotal to support network endurance, thus suggesting their adoption.

The objective of this study is to understand how the configuration of MC packages may differ based on the genesis – voluntary or mandatory – of public networks. This topic is particularly relevant in professional bureaucracies – i.e., organizations in which coordination and control are exercised through skills and competences (Mintzberg, 1983), such as healthcare organizations or universities. In these organizations, middle management positions are often held by hybrid professionals, such as physicians, whose values are strongly influenced by professional logics and backgrounds (Spyridonidis et al., 2015). Therefore, voluntary collaborations are mainly driven by the values and objectives of professionals working across different organizations, promoting bottom-up cooperation. Conversely, top-down collaborations may encounter stronger resistance from professionals when perceived as conflicting with their professional values and logic. As such, we may expect that collaborations generated by voluntary bottom-up initiatives could rely more on cultural and informal mechanisms than mandatory programmes.

3. Method

According to Van der Kolk (2021), considering the complex context in which public sector organizations operate, qualitative research methods can be considered the most promising avenue to study and analysed MC packages. On the same page, Merchant and Otley (2020) called for more field-based studies to better connect with the practical concerns of managers and to adopt a holistic view of control and control mechanisms. As such, they suggested for the development of case studies, field experiments and action research approaches.

This study focuses on the case of a Teaching Hospital (TH) based in Italy, and the collaborative settings put in place with the reference Local Health Authority (LHA).

In Italy, public healthcare is mainly provided by two kinds of organisations, LHAs that are responsible for the health of the population living in a defined region – and thus provide or buy healthcare services for this population – and Autonomous Hospitals, (such as THs) that provide complex inpatient and outpatient care services. The co-existence of these organizations may require multiple forms of collaboration to address integrated care (Nuti et al., 2016).

The reason why the authors focused on this specific case study is because the characteristics of the inter-organisational setting – which comprehend both top-down and bottom-up forms of collaborations – and the accessibility of information relating to the case allowed them to undertake an in-depth analysis. As previously mentioned, the research was conducted using the combination of an interventionist approach (see, amongst others, Jönsson, 2010; Bracci, 2017; Lukka C Vinnari, 2017) and multiple semi-structured interviews with key informants who were identified amongst the representatives of the organisations involved in the initiatives (Barretta C Noto, 2023).

One of the authors is an academic who occupied the top management position in the TH; this allowed him to actively contribute to the design and implementation of the management control package used to support the initiatives. Although it is intrinsic to the interventionist approach that the researcher is part of the process analysed and thus cannot be considered neutral, to provide a more objective view of the analysis of the results, the other researcher – who did not play any role within the analysed initiatives – will conduct a total of 8 semi-structured interviews with key informants from the organisations involved.

4. Preliminary results

Empirical setting

Two key collaborative initiatives have been developed between the TH and the LHA in the last years. The first one is related to the robotic surgery activity and was promoted top-down by

the top managers of the health organizations. The second one refers to paediatric surgery and was initiated and promoted top-down by the professionals involved.

The collaboration in the field of robotic surgery between the two healthcare organizations, formalized through the Inter-organizational agreement signed in June 2022, has been characterized by the joint work of mixed surgical teams engaged in the delivery of robotic surgery services at the TH hub. The activities have focused on the specialties of urology and gynaecology, benefiting patients under the care of professionals from the LHA.

The implementation of this partnership has generated positive effects across several dimensions of organizational and system performance, including: strengthening the capacity to meet the healthcare needs of the local community, by promoting equitable access to robotic surgery services for patients across the region; enhancing the TH Robotic Surgery Centre, both by increasing surgical volumes and optimizing the use of the robotic system (efficiency), and by ensuring higher appropriateness of surgical procedures (effectiveness); providing professionals from the LHA with access to the TH Robotic Surgery Centre, thereby fostering continuous training, skill development, and the accumulation of practical experience in the field of robotic surgery.

During 2024, mixed surgical teams performed a total of 38 robotic procedures, including 5 in gynaecology and 33 in urology, with an average monthly volume of 3.2 interventions. Overall, since the formalization of the inter-organizational agreement in June 2022, a total of 104 robotic procedures has been performed in collaboration between professionals from the two organizations.

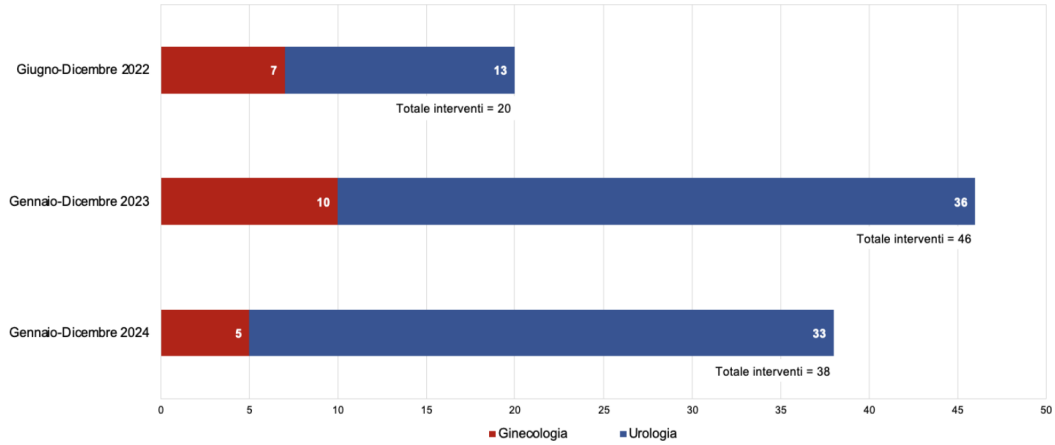


Figure 2. Volumes of discharge of robotic surgery

The inter-organizational pathway for paediatric surgery, was established under professional proposal in July, and became fully operational in 2023. The initiative involves close collaboration between the surgical teams of TH and the staff and healthcare facilities of LHA, with the dual aim of ensuring that children receive care as close as possible to their place of residence, while also promoting the quality and safety of clinical services and fostering the development of paediatric surgical and anaesthesiologic skills within LHA facilities.

In particular, the Inter-organizational agreement provides that the TH paediatric surgeons carries out outpatient consultations at LHA sites. Following this, a joint clinical and care team composed of professionals from both organizations — including a paediatric surgeon, paediatric anaesthetist, paediatrician, and nursing staff — performs the surgical intervention at the same hospital where the consultation was held, in line with principles of equity and proximity of care.

Since the launch of the collaboration in 2022 until December 2024, a total of 1,472 outpatient consultations (including 900 first visits) have been conducted, leading to the identification of 457 eligible patients, 325 surgical waiting list entries across the territorial hospitals, and 238 surgical

procedures performed. When comparing the 2024 surgical activity with that of 2023, a significant overall increase (+48%) emerges, reflecting a positive and consistent growth trend across all four hospitals.

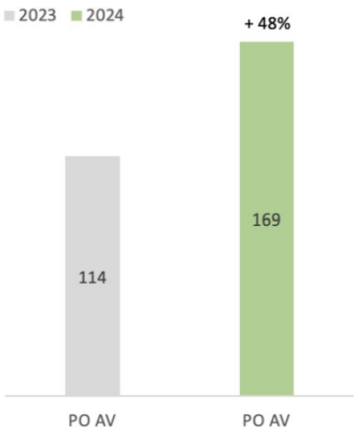


Figure 3. Volumes of discharge of paediatric surgery

5. Discussion and conclusion

The objective of this article is to explore whether the genesis – top-down or bottom-up – of a collaborative action in public organization networks determine differences in the design and implementation of MC packages. In this sense, the article contributes to an un-addressed gap of the management accounting literature in the public sector (Barretta C Busco, 2011; van der Kolk, 2019).

The case selected will allow to understand how, in the same organizational and network context, MC packages were developed to address the inter-organizational initiative control.

This study presents some limitations. First, results are only considering the perspective of the general director of the TH; as mentioned in the introduction and in the method sections, the study will be further developed through a set of interviews to the key informant involved in the collaborative projects. Moreover, the work focuses on two inter-organizational initiatives within the same public network setting. Although this choice allows to isolate for any disturbances coming from the organizational settings, a bias in the development of the MC packages may have occurred.

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Comunità Energetiche Rinnovabili in Partenariato Pubblico-Privato: strumento di governance collaborativa per la creazione di valore pubblico sostenibile

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1. Introduzione

Obiettivo dell'articolo è offrire una panoramica su un importante modello di "governance collaborativa" basato sul Partenariato Pubblico-Privato (PPP), che di fatto vuole essere un punto di incontro tra le istituzioni, i cittadini e le amministrazioni locali ai fini della diffusione e creazione di valore pubblico sostenibile. Il modello proposto è quello delle comunità energetiche rinnovabili (CER) strutturate sulla base di un accordo di Partenariato Pubblico-Privato. Tale modello negli ultimi mesi è dibattuto sui tavoli politici e di "governance locale" in quanto rappresenta un innovativo e straordinario strumento di "governance collaborativa circolare", destinato a creare valore pubblico sostenibile, fungendo da leva per la transizione energetica. In Italia il Partenariato Pubblico Privato è uno strumento fondamentale per la promozione delle comunità energetiche; dall'integrazione tra PPP e CER scaturisce un modello innovativo (Martiniello, 2025), diretto alla creazione di valore sociale per la comunità (Martiniello et al., 2025).

Per la sua ottimizzazione e gestione, il modello si avvale dell'intelligenza artificiale (IA), al fine di favorire efficienza operativa, massimizzando i benefici economici, sociali e ambientali, diventando un servizio pubblico di interesse locale, che crea valore condiviso all'interno della comunità. Grazie a sistemi avanzati basati sull'IA, e ai suoi algoritmi, si gestiscono, analizzano ed elaborano i dati sui comportamenti degli utenti che ne fanno parte al fine di effettuare previsioni sulla produzione e sulla domanda energetica. Tra le tecnologie intelligenti sfruttate nelle CER, sono molto utilizzate le smart grid, infrastrutture intelligenti che collegano i partecipanti alla comunità energetica, utili per gestire in modo smart ed intelligente i sistemi di accumulo avanzati per l'elettricità non immediatamente utilizzata (Bosone et al., 2024).

Nella pratica, una comunità energetica è un sistema basato su impianti di produzione di energia di piccola o media scala, spesso integrati con sistemi di accumulo a breve termine, reti di distribuzione intelligenti (smart grids) e tecnologie per la gestione della domanda. Queste comunità sono costituite da gruppi di cittadini, Piccole e Medie Imprese (PMI) o Pubbliche Amministrazioni (PA) e rappresentano non solo un'integrazione ma anche una valida alternativa ai grandi impianti industriali e alle reti gestite da operatori professionali.

Dal punto di vista strutturale e formale, l'accordo tra le parti si configura come strumento che consente agli enti pubblici di sviluppare un modello perfettamente resiliente e sostenibile, utile a gestire rischi e crisi future sia di tipo energetico che geopolitico. Uno strumento fondato su contratti intelligenti, in cui le parti (gli utenti), possono scambiare l'energia in eccesso con i vicini, incoraggiando e sostenendo la promozione di una gestione efficiente, efficace ed economica delle risorse locali, che consente di ridurre la dipendenza dalle reti centralizzate (Tushar et al., 2020).

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Lo strumento delle Comunità Energetiche Rinnovabili, è stato introdotto inizialmente nell'ordinamento europeo con la Direttiva UE n. 2018 del 2001 già definita come. RED II; successivamente è stato recepito in Italia attraverso la disciplina di cui al decreto legislativo dell'8 novembre 2021, n. 199. Il decreto ha l'obiettivo di promuovere il consumo e l'autoconsumo di energia da fonti rinnovabili al fine di raggiungere e soddisfare i target di decarbonizzazione previsti dalla Comunità Europea entro gli anni 2030 e 2050. Con l'obiettivo di accelerare la transizione energetica, la direttiva RED II definisce un quadro normativo che rende le fonti rinnovabili protagoniste del sistema energetico europeo. Al centro di questa trasformazione vi è l'inclusione attiva degli utenti finali, chiamati a svolgere un ruolo diretto nella produzione e condivisione dell'energia.

Nell'articolo ancora in fase di elaborazione, si dimostra che integrando le CER con lo strumento di PPP, si contribuisce a realizzare un modello innovativo, che permette ai suoi membri di ridurre la dipendenza dai fornitori tradizionali di energia, aumentare l'autoconsumo e migliorare la gestione delle risorse energetiche, rendendo le pubbliche amministrazioni più resilienti a fluttuazioni di prezzo e interruzioni di servizio, ma anche più attente alle questioni ambientali. Essendo un modello aperto, democratico e sostenibile è importante scegliere la forma giuridica più adeguata; si potrebbe adottare il modello della cooperativa a mutualità prevalente, quello dell'impresa sociale, diretto a favorire oltre l'ingresso di cittadini, anche delle associazioni e delle piccole medie imprese (PMI) in un percorso che incarna perfettamente i canoni dell' economia circolare.

Gli impatti positivi sul territorio sono notevoli sia in termini di creazione di valore per i membri che per la comunità. Il modello che si crea infatti consente di coniugare sostenibilità ambientale, sviluppo locale e innovazione attraverso la collaborazione tra enti pubblici e privati contrastando anche il fenomeno dei cambiamenti climatici.

Nonostante le recenti crisi globali, e i conflitti geopolitici, che hanno amplificato il grado di dipendenza energetica dall'estero influenzando anche i settori della PA tale modello, migliora allo stato attuale la risposta alle medesime crisi nelle organizzazioni del settore pubblico. Si mitigano le crisi anche nel settore pubblico, attraverso la produzione locale di energia, la riduzione dei costi energetici e la promozione della sostenibilità. Le Comunità Energetiche permettono di distribuire energia rinnovabile prodotta localmente, riducendo la dipendenza dalle fonti fossili e migliorando la resilienza energetica, contribuendo alla riduzione delle emissioni di gas serra; nell'adozione di fonti di energia pulita, inoltre supportano gli importanti obiettivi di sviluppo sostenibile (SDG).

In Italia il Partenariato Pubblico Privato è uno strumento indispensabile per la promozione di progetti innovativi come le comunità energetiche rinnovabili perché creano valore per la comunità. In tale modello l'energia non è più considerata una semplice merce ma può diventare un servizio pubblico, grazie alla sua capacità di raggiungere obiettivi sociali e di promuovere lo sviluppo economico e civile delle comunità locali rispondendo ai valori ESG. Spesso, il privato da solo non riesce a farvi fonte a causa degli ingenti investimenti e interventi di grande portata. Mediante tale strumento si contribuisce alla creazione di una partnership strategica tra il mondo pubblico e privato in ottica di realizzazione di opere di interesse pubblico, utili a livello ambientale, economico e sociale per la comunità. Il modello è perfettamente in sintonia con l'SDG 11 "Rendere le città e gli insediamenti umani inclusivi, sicuri, duraturi e sostenibili" e l'SDG 7 "Garantire a tutti l'accesso a un'energia conveniente, affidabile, sostenibile e moderna". Le CER come modello territoriale virtuoso, inoltre promuovono la cittadinanza attiva, realizzando quell'imperativo di inclusione che è pilastro dello stesso Piano Nazionale di Ripresa e Resilienza, creando valore sul territorio in cui sono ubicate, attraverso la costruzione di un ecosistema sostenibile in cui varie categorie di stakeholder (in particolare i cittadini) sono coinvolti nella programmazione.

2. Breve review della letteratura

In letteratura gli studi che analizzano la relazione e gli impatti del modello delle CER in PPP e la creazione di valore nel settore pubblico italiano sono veramente scarsi. Tendenzialmente sono considerate una valida risposta alla necessità di ridurre le emissioni di gas serra, favorendo l'indipendenza energetica e promuovendo uno sviluppo sostenibile (Angelini, 2024), e i pochissimi e recenti tentativi di studio hanno riguardato il modello nella fattispecie della distribuzione di rischi e benefici tra i partecipanti all'operazione (Martiniello & Capparelli, 2025).

In Italia il Partenariato Pubblico Privato (PPP) è uno strumento indispensabile per la promozione di progetti innovativi come le CER, perché esse creano valore per la comunità (Martiniello et al., 2025), infatti tra auspicabili modelli di "governance sostenibile" nello scenario italiano, quello delle comunità energetiche rinnovabili (CER) sembra assumere una certa importanza. Oggi più di ieri esse rivestono il ruolo di attori principali per lo sviluppo e l'affermazione degli obiettivi ESG, degli SDG, dell'economia circolare e della transizione energetica (Aura, 2022). Il binomio CER-PPP configura un modello in cui l'energia non è più considerata una semplice merce, ma può diventare un servizio pubblico, grazie alla sua capacità di raggiungere obiettivi sociali e di promuovere lo sviluppo economico e civile delle comunità locali, rispondendo ai valori ESG. Da servizio pubblico, se combinato alla sussidiarietà, potrebbe diventare anche un servizio pubblico di interesse locale (Pi et al., 2024). La logica di questo assunto trova ragione nell'inefficienza energetica del privato, che da solo non riesce a soddisfare le medesime esigenze energetiche dei cittadini. Integrando il pubblico nel privato si riesce ad ottemperare a questa mancanza. Inoltre a causa degli ingenti investimenti e interventi richiesti per la sua creazione, in molti casi il privato non è in grado di creare strutture simili; mediante tale approccio al contrario si facilita la creazione di una partnership strategica, tra il mondo pubblico e privato, in ottica di realizzazione di opere di interesse collettivo, utili a livello ambientale, economico e sociale per la comunità.

Configurandosi altresì come iniziative 'socio-tecniche' di transizione energetica a livello locale, le CER sono finalizzate al coinvolgimento di diversi attori e organizzazioni in progetti di comunità dell'energia" (De Vidovich, et al., 2023), influenzando e stimolando la coesione sociale e la partecipazione attiva nelle decisioni e nelle scelte della comunità (Cilio, et al., 2023). Strutturalmente ambiscono a differenti modelli organizzativi, convogliati in una tripartizione di modelli: il"public lead", il "pluralista", e il modello delle "community energy builder" (De Vidovich, et al., 2023).

Recentemente hanno guadagnato popolarità nelle comunità locali, promuovendo la solidarietà e la costruzione del bene comune (Eroe, 2023). Si possono mettere in luce i "possibili approcci di "commoning" che le caratterizzano (o potrebbero caratterizzarle) laddove la produzione e distribuzione di energia è intesa come "bene comune urbano" (Bernardi e Tricarico, 2021). Buona parte degli studiosi ne descrive lo scopo principale, come soddisfacimento dei bisogni ambientali, economici e sociali dei propri associati, che vengono messi in primo piano rispetto ai profitti finanziari (Cielo A., et al, 2021; De Vidovich et al, 2023). Si inseriscono perfettamente nell'ottica del nuovo paradigma dell'economia circolare in quanto favoriscono il passaggio, verso un sistema energetico a zero emissioni di carbonio, utilizzando fonti energetiche rinnovabili. Contribuiscono quindi a superare l'approccio lineare dell'attuale modo di produrre energia basato sul possesso dell'impianto e sul consumo individuale.

Un modello sostenibile, che oltre a rispondere perfettamente ai parametri del nuovo paradigma dell'economia circolare, risponde ai principi della corporate social responsibility (CSR) perché contribuisce di fatto alla sostenibilità ambientale, mantenendo l'equilibrio tra rispetto dell'ambiente e progresso socio-economico (Aura, 2022). Il modello è perfettamente in sintonia con l'SDG 11 "Rendere le città e gli insediamenti umani inclusivi, sicuri, duraturi e sostenibili" e l'SDG 7 "Garantire a tutti l'accesso a un'energia conveniente, affidabile, sostenibile e moderna". Esse creano valore sul territorio in cui sono ubicate attraverso la costruzione di un ecosistema sostenibile, in cui varie categorie di stakeholder (in particolare i cittadini) sono coinvolti nella programmazione. Sono dinamiche in cui gli abitanti di una comunità partecipano,

interpretano, co-progettano, e sono coinvolti nell'identificazione delle risorse locali, assumendo un ruolo attivo da protagonisti nella definizione e gestione del processo di transizione dei propri territori verso una prospettiva di auto-sostenibilità (Bolognesi & Magnaghi, 2020). Fondamentale, infatti, è il contributo che queste realtà potranno dare al processo di decarbonizzazione (Eroe, 2023).

Alcuni studi sul modello italiano delle CER (società "Aria Diana", che vede coinvolto il Comune di Roseto Valfortore e l'azienda Fortore Energia di Lucera entrambi in provincia di Foggia) che prevedono la partecipazione dell'ente pubblico, in rappresenta della collettività, dimostrano come sia possibile "redistribuire indirettamente i vantaggi economici di una produzione territorialmente prossima ai possibili beneficiari, incamerando nel bilancio parte dei proventi dell'impianto e usandoli per gli scopi della collettività" (Magnani e Scotti, 2024). Altri studi sempre focalizzati su casi italiani (Candelise e Ruggieri, 2022; De Santi et al., 2022), mettono in risalto il potenziale nesso che potrebbe esserci tra i modelli di "governance partecipativa" e il grado di promozione di modelli di consumo più sostenibili.

3. Metodologia

L'analisi è condotta attraverso un duplice aspetto: prima è stata effettuata una revisione narrativa della letteratura nell'ambito CER in PPP e creazione di valore pubblico locale, combinata con un approccio ti tipo qualitativo: il caso studio. Una metodologia molto utilizzata nell'ambito degli studi aziendali e che, per le sue peculiarità, si rivela necessaria quando si intende approfondire le dinamiche nelle quali si sviluppa una specifica esperienza. Il caso studio permette infatti di osservare il fenomeno attraverso l'analisi del contesto nel quale si colloca e di ottenere un'ampia fonte di dati grazie alla molteplicità delle tecniche di raccolta ed analisi dei dati.

Pertanto, l'impianto di indagine è stato articolato in due parti. La prima parte ha riguardato l'analisi della letteratura di riferimento con una particolare attenzione a quei contributi scientifici che hanno approfondito il ruolo strategico delle CER in PPP nella valorizzazione del territorio e nella promozione e creazione di valore pubblico sostenibile sul territorio. Per agevolare e rendere più analitico lo studio, sono state formulate alcune domande di ricerca, per definire l'ambito della ricerca e guidare il processo di revisione.

La seconda parte ha inteso approfondire l'oggetto di studio attraverso l'osservazione e l'analisi del primo caso di Comunità Energetica Rinnovabile (CER) in Italia ad operare con un partenariato pubblico-privato (PPP). Si tratta della CER ubicata in Provincia di Lecco; successivamente sono analizzate le 4 CER della Regione Calabria ubicate in 3 province diverse: Vibo Valentia, Catanzaro e Cosenza. Infine si è passati ad analizzare le ragioni che motivano la nascita e la distribuzione delle CER prevalentemente al Nord della penisola italiana. Nello specifico si sta valutando se l'evidenza alla base della localizzazione al nord piuttosto che al sud è correlata ad aspetti di carattere morfologico, economico o legislativo, considerando che purtroppo dal punto di vista normativo in Italia la situazione non è stata eccelsa. Un grande contribuito a questa mancanza è stato dato dal l'entrata in vigore, il 24 gennaio 2024, del cosiddetto "Decreto CER" 14 , che ha previsto nuovi strumenti di sostegno economico e incentivi mirati per stimolare l'adesione dei cittadini, delle imprese e delle amministrazioni locali a progetti di energia condivisa. Si tratta di un passaggio cruciale che testimonia la volontà del legislatore di consolidare il ruolo delle CER come attori centrali della transizione energetica italiana. In tal guisa si rafforzano le basi normative per la diffusione delle comunità energetiche sul territorio nazionale.

4. Risultati

Nella prima fase dell'analisi condotta mediante l' analisi della letteratura emerge chiaramente un quadro approssimativo, che configura uno stato dell'arte molto carente; gli studi che viaggiano in questa direzione sono essenzialmente pochissimi e frammentati.

Nella seconda fase della ricerca ancora in fase di sviluppo, dopo aver analizzato il primo esemplare di CER in PPP italiano e i casi di CER presenti nel territorio calabrese, il lavoro giunge alle sue conclusioni.

Successivamente previa ricostruzione di un chiaro framework teorico di riferimento, si passa all'identificazione di alcuni elementi che devono necessariamente contraddistinguere auspicabili modelli di CER in PPP, affinché gli stessi possano assumere un ruolo centrale nei processi creazione e di sviluppo sostenibile locale . Se da un lato il modello delle comunità energetiche a struttura pubblico privata rappresenta un volano per la creazione di valore dall'altro fa emergere una serie di questioni legate alla compatibilità normativa e operativa.

Dall'analisi svolta ci si è resi conto della necessità di considerare che, la partecipazione di un soggetto pubblico ad una CER, impone di prestare attenzione alle conseguenze che tale partecipazione genera sulle possibili attività della CER. Tale considerazione emerge in ragione della speciale disciplina amministrativa che pervade l'attività delle Pubbliche Amministrazioni e dei soggetti ad esse equiparati. Nello specifico tre sembrano gli aspetti che necessitano di una maggiore considerazione:

- prima di tutto, nel caso di una CER costituita sul modello del PPP, è necessario chiedersi "dove" si ponga il pubblico e "dove" si ponga il privato. In particolare prevedere un ente pubblico all'interno di una CER significa introdurre nel modello norme relative a quel settore, che di fatto introdurrebbero elementi di rigidità che mal si conciliano con le esigenze di flessibilità cui sono improntate le CER.
- Altra questione potrebbe essere rappresentata dalla soggettività giuridica autonoma delle CER che porta con sé una serie di sfide molto complesse, se posta in relazione diretta con le caratteristiche proprie del Partenariato Pubblico Privato.
- Ultima criticità da considerare ma non per importanza è la possibile allocazione del rischio fra pubblico e privato. In effetti nei progetti di CER la capacità di utilizzare efficacemente l'energia prodotta è abbastanza rilevante, per cui il rischio di domanda diventa un aspetto non indifferente.

Altre considerazioni legate agli effetti che determinano una maggior densità delle CER in PPP nella zona settentrionale del territorio italiano, sono in via di definizione e ultimazione.

5. Implicazioni Manageriali

Il presente articolo si propone di integrare la letteratura esistente e di contribuire a stimolare il dibattito sulla necessità di rafforzare sinergie e partecipazione attiva tra cittadini, enti pubblici e privati nella produzione, condivisione e autoconsumo di energia da fonti rinnovabili, perseguendo altresì finalità ambientali, sociali e di redistribuzione economica, senza perseguire profitti finanziari come scopo primario. In particolare rivestono il ruolo di attori principali nel contribuire concretamente, al raggiungimento progressivo di obiettivi ESG (Obiettivi Ambientali, Sociali e di Governance) degli stakeholders di territori che le stanno implementando, in diversi modi. Le CER richiedono modelli di "governance partecipativa", dove i membri (privati, imprese, enti pubblici, cittadini) hanno voce in capitolo e come tali si vengono a creare profonde implicazioni manageriali per i medesimi attori coinvolti per cui sarebbe necessario:

- creare adeguate strutture di coordinamento (es. cooperative, consorzi, PMI);
- effettuare una chiara definizione dei ruoli degli attori (produttore, consumatore, prosumer);
- prevedere una gestione democratica e trasparente dei processi decisionali.

Inoltre poiché le CER spingono verso modelli economici basati su valore condiviso e autoconsumo collettivo, per cui a livello manageriale dovrebbe essere utile:

- elaborare strategie per richiamare e fidelizzare nuovi membri della comunità;
- implementare adeguati meccanismi di condivisione dei benefici economici.

Infine le CER oltre ad essere organizzazioni che beneficiano di incentivi pubblici (come ad esempio forme di detrazioni o tariffe incentivanti), esse necessitano anche di cospicui investimenti iniziali, per cui tale necessità fa sorgere a livello manageriale altre questioni importanti, come:

- la necessità di una pianificazione finanziaria a lungo termine;
- il bisogno di effettuare un'adeguata analisi costi-benefici per gli investimenti in impianti rinnovabili, utili alla struttura;
- valide ed elevate competenze di natura tecnica, finanziaria, amministrativa e giuridica nella gestione di fondi europei, PNRR, ecc.

Parole chiave: Creazione di valore; sostenibilità ambientale; CER; PPP

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Public Value Creation Mechanisms in Municipal Elderly Services: A Multi-Level Analysis of Organizational Practices and Wellbeing Experiences

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1. Introduction

The global population is experiencing unprecedented demographic aging, with projections indicating that by 2050, the number of individuals aged 65 and over will double to 2.1 billion, while those aged 80 and above will triple to 426 million (WHO, 2025). This significant increase in life expectancy has shifted attention toward promoting ecosystems aimed not only at extending lifespan but also at fostering healthy, inclusive, and fulfilling existence (Domaszewska et al., 2022). According to the literature, physical and cognitive changes associated with aging can generate feelings of emotional distress and social exclusion among elderly people, making them particularly vulnerable to isolation and marginalization, a phenomenon most evident in so-called "super-aged societies" (Hu et al., 2023).

Italy represents one such society, being the oldest country in the European Union (ISTAT, 2024). Over the past two decades, Italy has faced emerging healthcare, pension, and social needs related to demographic aging. In response, the role of local authorities has been redefined, evolving from administrative units to proximity social infrastructures capable of alleviating pressure on the national healthcare system and coordinating elderly care networks (Maino & Ferrera, 2023). In this context, characterized by progressive population aging and growing interdependence between technologies, public actors, and local communities, the traditional conception of public services based on administrative efficiency and outcome measurement appears increasingly inadequate for interpreting the complexity of elderly wellbeing. Understanding how public entities create and sustain such wellbeing requires theoretical models capable of moving beyond an instrumental logic of service delivery, orienting instead toward perspectives that consider value as a co-generated experience between institutions, citizens, and social contexts.

Despite the growing body of research in this area, particularly following Osborne's (2017) seminal work, important gaps remain. First, as Osborne (2017) himself states, Public Service Organizations "do not create value for citizens; they can only offer a public service. It is how the citizen uses this offer and how it interacts with their life experiences that creates value." Consistent with this reflection, Ongaro et al. (2025) have argued that existing studies present gaps as they have focused predominantly on normative or institutional conceptions of the "public good," neglecting the relational and affective dimensions that mediate citizen engagement in public services. On one hand, Virtanen and Jalonen (2024) have highlighted how Public Service Logic has effectively emphasized the importance of interactions between providers and beneficiaries, without sufficiently exploring the underlying mechanisms that facilitate value

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creation. On the other hand, Ongaro et al. (2025) have noted that PSL literature has neglected the affective, relational, and experiential dimensions of public value creation. Therefore, the first gap concerns the lack of studies on the psychological and experiential mechanisms through which individuals perceive, internalize, and benefit from public services.

A further limitation concerns context. PSL research has thus far neglected the specific context of elderly care services. For instance, Lindqvist & Westrup (2020) focused on refugee children's learning experiences, Black & Gallan (2015) on patient participation in healthcare networks, and Engen et al. (2021) on citizen interaction with tax agencies, overlooking how value is created in the context of demographic aging and elderly wellbeing. The present research represents one of the first attempts to specifically apply the Public Service Logic framework to the context of services for the elderly.

2. Research questions

Through a qualitative case study in an Italian context, this research explores how municipal services for the elderly generate public value and experiential wellbeing, integrating PSL with the PERMA model from Positive Psychology. The study aims to answer the following research questions:

RQ1: What service delivery model configurations adopted by municipal social services are most effective in maximizing public value perceived by the elderly?

RQ2: How does participation in municipal services translate into value from the elderly's perspective, and how does this value articulate across its functional, social, emotional, and cognitive dimensions?

3. Theoretical background

3.1. Public service logic andvValue creation mechanisms

Public Service Logic (PSL) is a recent research stream that integrates principles from Service-Dominant Logic (SDL) and Public Value Theory, proposing a shift toward public value generation within public service ecosystems (Osborne et al., 2022; Ojasalo & Kauppinen, 2024). "Public value creation" refers to a relational and interactive process originating from daily interaction dynamics between institutions, professionals, and citizens (Osborne, 2018; Sønderskov & Rønning, 2021; Eriksson & Andersson, 2023). This theoretical perspective responds to the need to adapt public service research paradigms to the growing complexity of the contemporary public sector, called to address new and increasingly numerous challenges, such as population aging (Jenhaug, 2021).

Abandoning both the Public Administration perspective and the New Public Management paradigm, PSL shifts toward a governance paradigm where users and citizens are considered active partners in public value generation, and the effectiveness of public services depends not only on organizational efficiency but also on the quality of interactions and relationships between ecosystem actors (Hardyman et al., 2015; Osborne, 2018). According to this perspective, local authorities act not only as service providers but also as facilitators of value creation flows, mechanisms that connect policy objectives, service delivery processes, and social outcomes at both institutional and individual levels.

Building on this relational interpretation, Virtanen and Jalonen (2024) expanded the PSL framework by introducing the concept of public value creation mechanisms, four mechanisms that facilitate the emergence of public value:

- Expected service utility: This aspect emphasizes the importance of developing services that meet users' specific needs, thus generating satisfaction and potential benefits for society. The underlying thesis is that services intentionally designed to meet specific social needs promote

public value by improving living standards, strengthening community bonds, and encouraging equitable distribution of resources and opportunities.

- Public leadership: Considering the diversity of interests and the often complex and controversial nature of public policy issues, the leadership function assumes a central role in inspiring profound change by promoting a culture that values accountability and performance.
- Human-centered co-design and co-creation practices: By adopting a user-centered approach and encouraging active participation from diverse actors, public services can promote inclusivity and responsiveness to community needs and expectations.
- Value-in-use: Value does not derive exclusively from the service provider but from the interaction between provider and user. The perception of value is subjective and depends on the user's unique experiences, preferences, and interpretations.

These authors place such mechanisms within a broader structure of "public value creation flows," defined as the flows through which value is generated, transferred, and realized through relationships at multiple levels of the public service ecosystem. In this perspective, public value does not coincide with the interaction process but represents its emergent outcome. This means that public value creation is a relational and dynamic process that develops along interaction flows between actors, while public value constitutes the collective result of this process, the social and institutional impact deriving from citizens' value-in-use experiences.

These flows clearly describe where and how value takes shape in the public system and are distinguished into: 1) Policy objectives for public service delivery, indicating that value is created at the political level, where institutions define the purposes, priorities, and objectives of public services; 2) Implementation of public service delivery, indicating that value is then translated into practice through organization, leadership, and collaboration among actors delivering services; 3) Value-in-use for service users, where value manifests in users' concrete experience, what is useful, meaningful, and capable of generating wellbeing for them; 4) Social public value: public value is finally realized in its impact on the community, in terms of equity, social cohesion, and improvement of overall social wellbeing.

Together, mechanisms and flows form a dynamic and continuous process in which leadership, user experience, and collaboration guide the transformation of initial policy objectives into use value and, ultimately, into public value at the social level. In other words, flows indicate where value emerges, while mechanisms describe how it takes shape through interactions between public actors, citizens, and partner organizations. In the specific field of elderly care, this model highlights the interdependence between institutional design and relational practice, where the effectiveness of municipal services depends as much on empathy, dialogue, and continuity as on procedural efficiency.

3.2. Positive psychology and the PERMA model

Although PSL has effectively sought to describe the structural mechanisms through which value is produced within ecosystems, it tends to neglect the psychological and experiential dimensions that influence how citizens perceive, interpret, and benefit from public services in their daily lives (Ongaro et al., 2025), resulting in a limited understanding of how value is generated.

To identify the experiential and affective dimensions of public value generation, this study draws on insights from Positive Psychology (PP), which focuses on factors that enable individuals and communities to thrive (Seligman & Csikszentmihalyi, 2000; Seligman, 2011). The field of Positive Psychology focuses on studying positive experiences, character traits, and emotions, with the goal of understanding and improving individual wellbeing and prosperity. Its intent is to shift traditional psychology's attention from an approach exclusively focused on mental illness and pathologies toward study and promotion of positive aspects of human functioning.

Since its introduction (Seligman & Csikszentmihalyi, 2000), research in Positive Psychology has extended to various fields, including education, workplace, therapy, public policy, business, and marketing (Okeke et al., 2022). In Public Administration, Douglas et al. (2019) advocated for "Positive Public Administration," calling for a shift from diagnosing failures to understanding conditions under which public organizations promote prosperity, meaning, and democratic value.

In this theoretical context, Seligman's (2011) PERMA model offers a solid conceptual framework for examining public value creation at the micro level of public service ecosystems. Based on wellbeing theory, PERMA is an acronym identifying five elements of wellbeing that, when combined, promote human flourishing (Rossetti et al., 2024). These elements are: (1) Positive emotions, including happiness, life satisfaction, hope, pride, wellbeing, contentment, and joy; (2) Engagement, meaning a deep level of absorption and concentration; (3) Relationships, in terms of bonds, connections, and social integration; (4) Meaning, referring to motivations, identity, sense of purpose, personal value, and the feeling of being part of something greater; and (5) Accomplishment, including growth, success, autonomy, competence, and goal achievement.

The integration of Positive Psychology into the PSL framework thus expands understanding of value creation, connecting institutional service delivery processes to affective, motivational, and relational outcomes that underpin both individual and collective wellbeing.

4. Methodology

4.1. Case selection

The study adopts a multi-phase qualitative approach based on a single case study (Creswell, 2009; Yin, 2014) aimed at exploring how public value is created, experienced, and perceived within municipal services for the elderly. The research is based on a pragmatic-interpretive epistemology (Ravasi, 2024), which assumes that social reality is constructed through actors' interpretations and that the researcher's role is to reveal how these interpretations give meaning to organizational practices.

The case study comprises Municipality VIII of Rome, chosen for its particular socio-demographic characteristics that make it a relevant context for analyzing services for the elderly. Rome, with a population of 2,813,544 inhabitants as of December 31, 2022, is experiencing progressive demographic aging, with average age increasing from 44.6 years in 2013 to 46.6 in 2022. With an aging index of 233.8 (approximately 233.8 people over 65 for every 100 young people aged 0-14), Municipality VIII, despite being one of the least populated, has one of the highest concentrations of elderly in the city.

Given these characteristics, Municipality VIII was selected as a critical case, as it represents a context where the phenomenon of demographic aging and related challenges of social service management manifest particularly intensely. This configuration makes it a privileged analytical terrain for investigating public value creation mechanisms in municipal services for the elderly population, while offering transferable insights to other urban contexts characterized by similar dynamics.

4.2. Data selection

Data collection occurred between June 2024 and September 2025 and integrated primary and secondary sources to ensure data triangulation and information depth (Yin, 2009). Secondary data were provided by Municipality VIII and collected from the website and social media pages of Roma Capitale and Municipality VIII. Primary data were collected through three consecutive and interconnected phases (Stake, 1995; Malhotra et al., 2017). The entire primary data collection process was based on intentional and progressive sampling logic, consistent with the sequential qualitative design adopted (Creswell, 2009; Stake, 1995).

Phase 1: Focus group

The first phase involved conducting a focus group (8 participants) with staff from the Municipality VIII department responsible for managing, activating, and monitoring services for the elderly. This phase aimed to map services for citizens over 65 and identify networks of institutional and third-sector actors involved, as well as relational dynamics underlying identified services. The focus group lasted approximately 2 hours and was recorded with participants' consent. During the session, participants worked together to reconstruct the service delivery framework for citizens over 65, identifying main actors involved, contact points, and interaction flows.

Phase 2: In-depth interviews with operators

The second phase conducted 19 semi-structured in-depth interviews with key figures from Municipality VIII. Interview objectives were to deepen analysis of organizational and service management methods, explore the logic behind coordination between public and private actors, and identify perceived obstacles and improvement opportunities. Interviewees were selected through purposive sampling by role and function, including managers, social workers, and third-sector representatives. Each interview lasted between 60 and 80 minutes and was conducted in person at municipal offices. Interviews were structured based on the four value creation flows identified by Virtanen and Jalonen (2024): expected service utility for users, public leadership practice in public services context, human-centered co-design and co-creation practices, and value-in-use perspective.

Phase 3: In-depth interviews with elderly users

The third phase included users over 65 attending Municipality VIII social centers. The choice to focus on this user type was motivated by accessibility, autonomy, and communicative capacity criteria, which made it possible to conduct in-depth interviews. Elderly interview participants were selected through simple random sampling among center members who met eligibility criteria: age $\geq$ 65 years, regular attendance (at least twice weekly), ability to participate in qualitative interview, and informed consent to participation. The final number of interviews (n=22) was determined according to interpretive saturation principle, reached when reported experiences and meanings repeated consistently with respect to PERMA model analytical dimensions.

4.3. Data analysis

Data analysis followed a hybrid deductive-inductive approach, inspired by Grounded Theory principles but guided by pre-existing theoretical concepts considered as sensitizing concepts (Blumer, 1954; Bowen, 2006; Charmaz, 2006). Consistent with the pragmatic-interpretive epistemology adopted, such concepts were not used as rigid or a priori categories but as flexible interpretive lenses guiding empirical exploration, allowing constant dialogue between theory and data (Strauss & Corbin, 1998). Specifically, the models of Virtanen and Jalonen (2024) and Seligman (2011) were employed to orient analytical reflection on public value creation mechanisms and experiential wellbeing dimensions, respectively, without constraining the coding process to predefined schemes.

Analysis involved three coding cycles: first-order codes, second-order themes, aggregate dimensions (Gioia, Corley & Hamilton, 2013). The first phase (first-order codes) involved decomposing qualitative data into distinct components, careful examination, and comparison to identify similarities and differences (Saldaña, 2013). This study used in vivo coding (participants' language) to preserve meaning attributed by interviewees. Subsequently, the second phase

(second-order themes) aimed to establish an organized framework at categorical, thematic, conceptual, and/or theoretical level based on the initial set of first-cycle codes. Finally, categories were further analyzed and systematized to elicit main themes (aggregate dimensions). To enhance reliability, coding was performed with Atlas.ti (Sinkovics et al., 2008). Two researchers coded data independently and subsequently shared their coding structure, discussing until reaching agreement on final codebook structure.

5. Preliminary findings

The thematic analysis reveals a coherent and interconnected picture of how public value is generated and experienced within elderly services in Municipality VIII. From the organizational perspective, municipal services appear to rely on four core mechanisms that structure the way value is produced. A first mechanism, Relational Proximity, reflects the capacity of services to cultivate stable and meaningful human bonds with elderly users. Operators describe intentional relational practices, trust-building, continuous presence, emotional availability, and recognition of the person and their life story, which they consider not as ancillary, but as a constitutive element of service delivery. Closely connected to this is Functional Support for Daily Life, referring to the concrete and personalized assistance that facilitates autonomy and alleviates the practical burdens of everyday living. This includes support in accessing services, flexible interventions, and efforts to reduce daily strains.

A third mechanism concerns Care Ecosystem Coordination, where the Municipality assumes the role of orchestrator within a complex network of territorial actors involved in elderly care. This coordination involves intercepting needs, fostering shared governance arrangements, and sustaining a collaborative care infrastructure. Finally, Fragility Prevention and Social Activation captures proactive strategies aimed at preventing psycho-physical deterioration and promoting active engagement among the elderly through monitoring, social participation, and recognition of social identity and role.

These organizational mechanisms resonate strongly with what emerges from the user experience perspective. Elderly participants describe a wellbeing experience shaped by five interrelated themes. Emotional Wellbeing is expressed through feelings of joy, gratitude, and serenity, nurtured by the perception of being in a protected and caring environment. Motivation and Activation reflects the energizing effect of services, which stimulate participation and counter forms of passivity and isolation through daily motivation and physical-cognitive engagement. Social Relationships stands out as a transversal theme: users emphasize the importance of new friendships, reciprocal support, and the capacity of services to act as an antidote to loneliness. This relational dimension extends into a broader Sense of Belonging to Community, articulated through social recognition, shared identity, and territorial rootedness. Finally, experiences of Accomplishment emerge from feelings of self-efficacy, personal progress, and continuous learning fostered through participation.

Taken together, these findings suggest a cascade effect in which organizational mechanisms shape the conditions that enable individual wellbeing outcomes. While the theoretical integration of these levels is still under development, the preliminary evidence indicates a clear alignment between how services are structured and how they are experienced, reinforcing the centrality of relational, motivational, and social factors in public value creation for the elderly.

6. Expected theoretical and managerial contributions

This work-in-progress aims to make several theoretical and practical contributions. Theoretically, the research seeks to provide empirical validation and psychological micro-foundation to the Public Service Ecosystem approach. While PSL literature, particularly the model proposed by Osborne et al. (2022), has outlined the multi-level architecture of value

creation, this study aims to highlight its functioning at the sub-micro level, that of subjective experience and individuals' psychological wellbeing. This provides a concrete response to the gap identified by Virtanen and Jalonen (2024) and Ongaro et al. (2025), connecting organizational practices of public services to individuals' psychological wellbeing outcomes. The research also proposes a contextual extension of PSL, validating the framework in a Mediterranean context characterized by Italian welfare cultural specificities that differ significantly from Nordic and Anglo-Saxon contexts where the theory was originally developed. This contributes to the debate on theoretical model portability across different institutional and cultural contexts.

From a managerial perspective, the study suggests the importance of investing in the relational dimension of services, recognizing that operators perform a role beyond functional assistance requiring specific relational and emotional competencies. The awareness that many elderly primarily need companionship and listening should orient organizational practices toward models that value time dedicated to interaction, resisting pressure from purely quantitative metrics. This could involve revising operators' workloads, reducing bureaucratic burdens to free time for direct user interaction, and redefining performance evaluation criteria to include qualitative dimensions related to user wellbeing.

Ecosystem coordination emerges as a strategic competence for local authorities, requiring proactive mobilization of territorial networks and connection of various community resources. The identified preventive dimension contributes to debate on public institutions' emerging role as enabling platforms, suggesting that municipal social services could represent an investment with indirect returns on the healthcare system, reducing future costs through prevention of cognitive decline and social isolation.

7. Limitations and future research directions

As work-in-progress, this study presents limitations. Research focuses on a single municipal context; therefore, results are analytically transferable to urban welfare ecosystems with similar characteristics but not statistically generalizable to other contexts with different institutional, cultural, or demographic configurations. Reliance on self-reported experiences may introduce subjectivity elements, though triangulation between operators and users mitigates this bias and enriches results' interpretive validity. Additionally, PERMA framework captures only part of elderly people's complex lived experience, requiring cautious result interpretation and recognition that other wellbeing dimensions beyond those identified may be relevant. The study focuses on elderly regularly attending social centers, potentially excluding more isolated or fragile individuals who could most benefit from these services but face barriers to participation.

Future research directions include: comparative studies among different municipal contexts to better understand how cultural specificities influence value creation mechanisms, potentially extending analysis to other European countries with different welfare traditions to test framework transferability; longitudinal exploration of elderly wellbeing evolution over time to better understand long-term service participation effects and identify critical moments in aging trajectories where interventions could be most effective; investigating modalities for reaching elderly not attending social centers, developing inclusion strategies extending service benefits to broader populations, particularly most isolated and vulnerable who may face mobility, cognitive, or motivational barriers; analyzing economic sustainability of identified service models, examining PSL mechanism implementation costs and their returns in individual wellbeing and health system savings terms, potentially demonstrating prevention's economic viability through reduced hospitalization and long-term care costs; and quantitative validation of emerging constructs to enhance generalizability and develop standardized measurement instruments for PERMA dimensions in public service contexts, enabling broader assessment and comparison across different settings.

Keywords: Public service logic; public value; elderly services; wellbeing; PERMA model

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Integrating Public Sector Accounting and Public Value: Evidence from Public Housing Systems

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1. Purpose

Public sector accounting (PSA) has long been criticized for its narrow focus on efficiency and financial stewardship, often neglecting the multidimensional nature of public value. In this study, we explore how PSA systems can be reframed to integrate economic and social sustainability, thus enhancing the capacity of public service organizations to generate public value through inter-institutional collaboration. Drawing on a case study of public housing management in Italy, this research examines how control systems and measurement practices can evolve to account for PV, supporting a more equitable and sustainable approach to public service delivery. Specifically, the paper investigates how PSA systems can foster coordination between institutions (public housing providers and municipalities), enabling decisions that balance financial constraints with social objectives. By operationalizing the concept of public value in an accounting framework, the study contributes to ongoing debates about how measurement systems shape both the perception and the realization of social outcomes in public management. Thus, this study contributes to PSA theory by identifying interdependence as a mechanism through which accounting systems incorporate public value dimensions, thereby extending the understanding of control as an enabling infrastructure.

2. Theoretical background

Recent scholarship has urged a rethinking of PSA as a relational, rather than purely technical, system of accountability (Barbera et al., 2024). Traditional PSA systems—anchored in financial performance indicators—have been described as monological tools that fail to capture the often conflicting values underpinning public service delivery (Vollmer et al., 2024). This perspective aligns with broader debates on public values (Bryson et al., 2017; Osborne, 2020), suggesting that accounting can play a generative role in shaping dialogue and cooperation across organizational boundaries.

The integration of PSA and public value (PV) frameworks opens a new line of inquiry in public management research. Scholars such as Grossi et al. (2023) have proposed that accounting systems can serve as enabling conditions for PV creation, supporting the alignment between financial sustainability, social equity, and institutional trust. Building on this theoretical framework and conceptualizing PSA systems as packages (Bedford, 2020), the study shows how

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they vary in their degree of interdependence between financial and non-financial components. The more interdependent these systems are, the greater their potential to integrate diverse values and guide decision-making toward collective outcomes. In brief, this study extends PSA theory by identifying interdependence as the mechanism through which accounting systems incorporate public value dimensions.

PSA systems aimed at public value creation can thus be viewed as packages in which financial and non-financial controls interact with varying degrees of interdependence. When these components remain loosely connected—as in traditional PSA focused on stewardship—accounting tends to emphasize compliance and cost containment, limiting its capacity to inform broader social outcomes. Conversely, higher levels of interdependence allow control elements to reinforce or enable one another, creating the conditions under which public value considerations can meaningfully shape decision-making.

3. Methods

This study adopts an exploratory case study design (Yin, 2018) in the context of the public housing sector of the Umbria region, Italy. The selected public organization manages affordable housing for approximately 20,000 residents, offering a unique empirical setting to observe how PSA systems mediate between economic constraints and social missions.

A mixed-methods approach (Mele & Belardinelli, 2018) was used to capture both qualitative and quantitative dimensions of value creation. Data collection occurred between April and December 2024 and involved:

- Document analysis of accounting reports, budgets, and performance dashboards;
- Five focus groups (81 pages of transcripts) with institutional stakeholders, housing managers, and service users to inductively explore perceptions of "what counts as value";
- A survey (44-item questionnaire, 6-point Likert scale, N=406, 5% response rate) designed to operationalize value dimensions and measure their perceived relevance;
- Quantitative analysis combining financial data with tenants' and housing characteristics to examine the relationship between public organizations in terms of financial and non-financial dimensions.

This methodology allowed the research team to identify key public value dimensions and translate them into measurable indicators within the PSA framework.

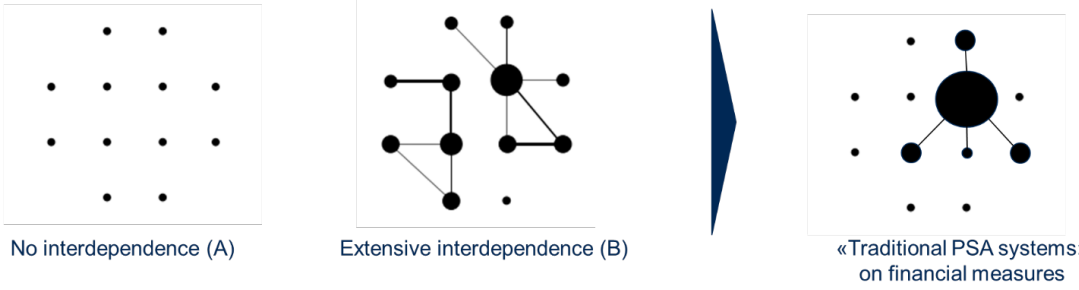


Figure 1. Conceptual framework of PSA packages and internal "value" interdependence

4. Findings

4.1. Defining and measuring public value

Osborne et al.'s (2022) introduced a framework for value analysis which offers a multistage approach to explore how value is manifested at different levels of the Public Service Ecosystem

along the design, production, and consumption/use processes, including: value-in-production, i.e., derived from being involved in co-design/co-production; value-in-use, i.e., derived from experiencing public services, both in the short/medium run and user's whole-life experience; value-in-context, i.e., derived from how a public service impacts upon the needs of a user, in relation to his/her life experiences; value-in-society, i.e., related to how public services contribute to the fulfillment of public/democratic values. In this view, users are co-producers of the service itself, contributing to the creation of value, which reflects the impact that services have for users, stakeholders and society as a whole. The shift in the users' role - from co-producers to co-creators - overcomes the linear, producer-dominant process of users' involvement implied in co-production, recognizing their pivotal role in co-creating the value within services, which results from the interaction between the PSO offering and users' life experiences. Adopting this framework, the analysis identified ten dimensions of public value, including accessibility, fairness, responsiveness, trust, and sustainability. These dimensions were grouped into three clusters reflecting the perspectives of key stakeholders. The results show that "value" is not only derived from the efficiency of resource use but also from the relational capacity of public organizations to generate institutional trust and mutual accountability. Table 1 shows the dimensions of public value identified for each ecosystem level. Specifically, the model assesses how public value is generated across macro, meso, and micro levels within the Umbria region. At the macro level, the focus is on the broader regional context and the strategic role of public institutions in shaping territorial development. In Umbria, public value emerges through three main dimensions: addressing housing needs for vulnerable populations, contributing to the socio-economic development of regional areas, and strengthening the region's capacity to attract and efficiently manage public resources. These functions establish the structural conditions that guide long-term social protection and regional resilience.At the meso level, the model examines inter-organizational actors—municipalities, public agencies, third-sector organisations, and housing institutions—whose coordinated actions translate regional objectives into operational practices. In the Umbrian case, public value is generated through support for the economic and social sustainability of municipalities, through the enabling role played in fostering third-sector initiatives, and through the proactive management of regional public housing assets as a lever for social protection. This level highlights how collaborative governance and shared resource management reinforce territorial cohesion and service quality.At the micro level, the model focuses on tenants and their lived experiences within the housing ecosystem. Here, public value is expressed through enhanced security of tenure, strengthened dignity, improved social inclusion, and a deeper sense of belonging for individuals and families.

Overall, the model shows that in the case study under analysis, public value is co-produced through the interaction of regional strategies, organizational cooperation, and the concrete benefits experienced by residents. It highlights how each level reinforces the others, creating a virtuous cycle in which institutional capacity, collaborative practices, and individual wellbeing mutually strengthen one another. By aligning policy, governance, and daily lived experiences, the ecosystem not only addresses immediate social needs but also contributes to long-term territorial sustainability, social cohesion, and a more inclusive regional development trajectory.

Ecosystem level	Dimensions of public value
Macro-level Regional context	- Addressing housing needs in vulnerable populations - Contributing to the socio-economic development of the regionale area - Enhancing the capacity to attract and efficiently manage public resources
Meso-level Inter-organizational actors	- Support for the economic and social sustainability of municipalities - Enabling function in support of third sector initiatives - Proactive management of regional public housing assets as a lever for social protection
Micro-level Tenants	- Security of tenure - Dignity - Social inclusion - Sense of belonging

Table 1. Ecosystem levels and public value dimensions for public housing systems

4.2. Integrating PSA systems with value dimensions

The study confirms that public housing "agencies" traditionally prioritize financial performance indicators—such as rent collection rates or arrears reduction—that often lead to inequitable outcomes (Kavanagh & Kowalski, 2021; McDonald & McCandless, 2023). However, when PSA systems were redesigned to include social indicators, such as avoided evictions, tenant recovery plans, and community stability metrics, the inter-institutional decision-making process shifted.

The avoided eviction measure proved particularly powerful in demonstrating both social and economic sustainability in an inter-organizational perspective. Avoiding a single eviction generated an estimated cost saving of €8,500 per year for single-member households (and up to €18,000 for families of two), preventing additional burdens on municipal budgets associated with emergency housing and social services. By adopting an extended public service perspective and the logic of differential costs, the system saves 2.4 million euros... ensuring that families with at least 2 members do not lose their homes. This differential cost analysis provided tangible evidence of how socially oriented actions can produce collective economic benefits.



Figure 2. The adoption of an extended public service perspective: economic and social municipalities

4.3. Reframing PSA as an integrative control system

By conceptualizing PSA systems as interdependent packages, the study reveals how accounting can become a connective infrastructure that bridges organizations, enabling shared understanding of public value creation. The empirical evidence suggests that hybrid systems—combining financial metrics with participatory indicators derived from stakeholder engagement—

are more effective in fostering coordination and sustaining trust between public housing "agencies" and municipalities. In summary, evidence from stakeholder discussions suggested that the integration of social indicators enhanced mutual understanding and trust between housing agencies and municipalities.

5. Discussion and implications

The findings contribute to the broader literature on PSA and public management by illustrating how accounting systems can be enabling rather than constraining. Integrating public value into PSA frameworks offers three key implications:

- Reconceptualizing control as collaboration: Traditional PSA systems reinforce silos accountability structures focused on internal efficiency. In contrast, value-oriented systems encourage joint accountability across organizational boundaries, emphasizing shared outcomes such as social equity and resilience.
- Expanding the scope of measurement: The introduction of social indicators like avoided evictions demonstrates how PSA can move beyond cost containment to measure the relational and distributive effects of policy actions. This aligns with recent calls to reembed accounting in its societal context (Barbera et al., 2024).
- Enhancing legitimacy and trust: By making visible the social impact of financial decisions, integrated PSA systems can strengthen the legitimacy of public organizations, reinforcing citizen trust and engagement in times of social strain.

More broadly, this research supports a paradigmatic shift from internal value chains to external value creation (Osborne et al., 2022). Public sector accounting, when reimagined as a relational system, can act as a bridge between financial rationality and social responsibility, helping public institutions balance efficiency with equity, and performance with purpose. In this sense, different forms exist through which interdependencies operate, compensating, reinforcing, or enabling, each illuminating how PSA components can collaborate to integrate PV dimensions. Social indicators may compensate for the blind spots of financial measures, counterbalancing their tendency to prioritize short-term efficiencies. Participatory or user-centered metrics can enable financial indicators to be interpreted within a broader public value frame, reducing the risk that fiscal pressures produce inequitable outcomes. These dynamics resonate strongly with public housing systems, where organizations must reconcile affordability, sustainability, and fairness.

Systems with greater interdependence are more resilient in complex environments, as they facilitate coordinated rather than piecemeal adjustments. This reinforces the theoretical linkage between PSA and PV by framing accounting not as a static reporting device, but as an evolving infrastructure capable of sustaining collective value creation across institutional boundaries.

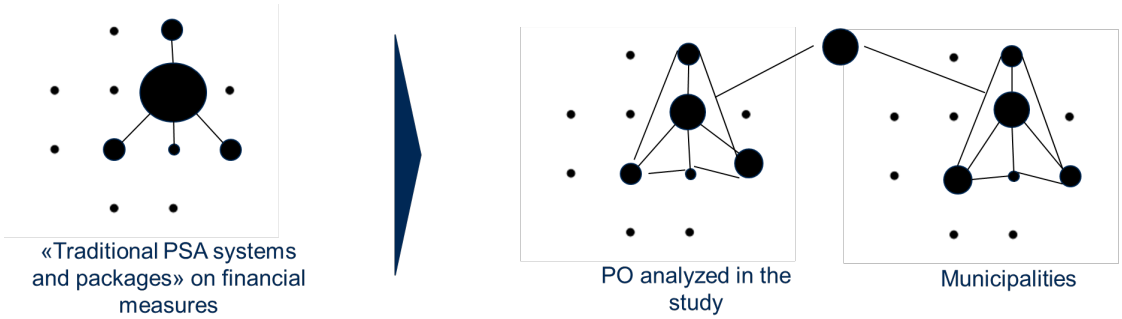


Figure 3. Integration of PSA and PV systems for social and economic sustainability

By introducing hybrid indicators (financial + social), PSA systems create a shared interpretive framework, which in turn facilitates deliberation, coordinated budgeting, and trust

among institutions. The observed integration dynamics may depend on institutional density, policy autonomy, and leadership continuity—factors that warrant further cross-case exploration.

6. Originality

This research contributes to the emerging dialogue on the relational nature of accounting by demonstrating, empirically, how PSA systems can evolve into tools for public value co-creation. It provides a rare illustration of how value can be embedded within control systems, offering both conceptual and practical advancements:

- Conceptual: It extends PSA theory by proposing an interdependence model linking financial and non-financial accounting mechanisms, thus addressing the critique of monological control systems.
- Empirical: It provides a detailed, mixed-method analysis of how an expanded PSA system operates in practice, showing how it integrates social and economic logics through the case of public housing.
- Practical: It offers actionable insights for policymakers and practitioners aiming to reform budgeting and performance systems in line with social equity and sustainability goals.

By linking accounting practices to the co-production of value, the study moves beyond the dichotomy of "efficiency versus equity," suggesting that well-designed PSA systems can serve as both measurement tools and vehicles of public inter-organizational integration. In doing so, it bridges ongoing debates in the literature on public value, social equity, and the future of public sector accounting. Thus, by conceptualizing PSA systems as interdependent infrastructures that embed public value dimensions, this study reconceptualizes control from a mechanism of compliance to one of collective value creation.

Keywords: Public Sector Accounting; public value; public housing; inter-organizational collaboration; public service ecosystem

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Governance of services for minors and sustainable public value: an analysis of the foster care system in Italy

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1. Introduction

Public childcare and protection services are unique due to their complexity, the vulnerability of those involved, and their governance challenges. This complexity is linked to numerous factors, not least the number and typologies of involved stakeholders (various professional profiles and different types of public administrations, private entities, and family networks) and service process, which involve a variety of phases and actions with never sure outcomes. Furthermore, the vulnerability extends not only to the minor, who is the primary recipient of the service, but also to their family of origin, which finds itself temporarily or permanently unable to meet the child's needs.

Foster care is one such service that has recently been subject of in-depth academic and policy-making reflection, which has led, in Italy, to the updating of the national guidelines for foster care, approved by the State-Regions Conference (February 8, 2024).

The topic is also closely intertwined with the more general issue of public service governance (Rhodes, 1997; Cepiku, 2013; Osborne, 2016), and consequently of the complex of mechanisms, rules, procedures, bodies, and decision-making and control mechanisms that serve to manage the provision of services of collective interest to a wide range of stakeholders, given not anymore the heritage of the monolithic management of these services by the State. Governance thus occurs on multiple levels — within the organisation, among different public bodies, and between these and third parties — and is, at the same time, oriented towards solutions that foster the highest value, while also being sustainable over time.

Data on foster care services, among other things, highlight a phenomenon far from being marginal: for instance, in Italy, in 2023, approximately 15,000 minors were reported as placed in foster families and approximately 18,000 as placed in residential communities (Ministry of Labor and Social Policies and Istituto degli Innocenti, 2024a). These numbers do not consider unaccompanied foreign minors; including them, the figures for 2023 would be approximately 16,000 and 26,000, respectively.

The current exploratory research aims to investigate the current critical issues in the governance and collaboration model of public foster care services for minors and how they impact the creation of sustainable public value within the Italian childcare and protection system.

Given that the Italian foster care system is highly multi-actor (local authorities, local health authorities, juvenile courts, third sector organisations, foster families, residential communities) and multi-level (central government, regional government, and local services), the chosen approach was qualitative. This aimed to capture processes, logics, routines, and collaborative

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dynamics not intelligible if using only quantitative data, and, above all, to correlate them to the entire value chain.

To help identify critical issues and define improvement measures in the specific context of foster care, this study analyzes the voices of key players to investigate factors that hinder and elements that promote the flow of value and virtuous collaboration among relevant stakeholders. As stated, the study employs qualitative methods, including conducting and analysing interviews with key players in the foster care process (families, juvenile courts, child and adolescent ombudsmen, non-profit organizations, local authorities, health authorities) to gather opinions on areas for improvement with a view to co-creating value in the best interest of the child.

This extended abstract is organized as follows: the next section provides a brief overview of the organization of foster care services in Italy, as well as notes on the size and allocation of funds, including some references to the limited business management literature on the topic; section 3 delves into the research method; section 4 summarizes the preliminary results of the data analysis. The abstract ends with a conclusive section, primarily aimed at illustrating the subsequent phases of the ongoing research.

2. Literature and context

In Italy, the number of children in foster care is increasing overall. According to official data from the Ministry of Labor and Social Policies, in 2023 there were 42,002 children in foster care, with a foster family or in residential care (including unaccompanied foreign minors), compared to 41,683 in 2022 (Ministry of Labor and Social Policies and Istituto degli Innocenti, 2024b:10). However, excluding unaccompanied foreign minors, since generally placed in other support programs, the figure drops to 33,310, that is, to a level substantially unchanged from 2022 (33,299) (Ibidem). Further limiting the observation to minors in residential care and minors in foster family care for no less than five nights per week (and excluding unaccompanied foreign minors), the figure drops to 30,936, showing an increase compared to 2022 (30,588) (Ibidem; Ministry of Labor and Social Policies and Istituto degli Innocenti, 2024a:11). However, there are significant differences between the recourse to foster family care and to residential care: the former is decreasing, while the latter is increasing. These trends result in significant lost opportunities for creating human, social, and economic value.

In 2023, there were 15,992 minors in foster family care, including unaccompanied foreign minors, with a 2.4% decrease compared to 2022; excluding unaccompanied foreign minors, there were 15,006, with a 1.4% decrease compared to 2022; considering only foster care for at least 5 days, net of unaccompanied foreign minors, there were 12,632 foster family placements, with a 1% increase compared to 2022, when there were 12,507, but a decrease compared to 2021 and 2020 (Ministry of Labor and Social Policies and Istituto degli Innocenti, 2024b:14; 2024a:13). In 2023, there were 26,010 minors in residential care, with a 2.8% increase compared to 2022, when there were 25,301. Excluding unaccompanied foreign minors, there were 18,304 minors in residential care; this figure shows a 1.2% increase compared to 2022, when the minors were 18,081, more than in previous surveys (Ministry of Labor and Social Policies and Istituto degli Innocenti, 2024b:40-41; 2024a:35).

With this problematic scenario in the background, Bill 1866, containing “Provisions on foster children”, was presented to the Chamber of Deputies on May 13, 2024, approved by the Chamber on October 21, 2025, and then sent to the Senate for review. The bill (Article 1) provides for the establishment of a national register of foster families, family-type communities, and public and private care institutions at the Department for Family Policies of the Presidency of the Council of Ministers, and the establishment of a register of minors placed with foster families or in family-type communities or public or private care institutions at each juvenile court and ordinary court. The purpose of the national register is to monitor the existence of conditions for foster care,

to protect the "best interests of minors who are temporarily deprived of a suitable family environment, avoiding situations of inappropriate placement". To carry out this monitoring function, the Department for Family Policies of the Presidency of the Council of Ministers draws on information held by the regions and local authorities (as parties to the foster care process) that is relevant in this regard. The register of children in foster care, established at each juvenile court and each ordinary court, on the other hand, dedicates a specific chapter to each child in the foster care process, with detailed notes concerning, for example, the details of the foster care order, the name of the foster carer, any special needs of the child, and so on (Italian Parliament, Chamber of Deputies, 2025).

The bill (article 2) also provides for the establishment, within the Department for Family Policies, of a National Observatory on public and private care institutions, family-type communities, and foster families to analyze data from the national register of public and private care institutions, family-type communities, and foster families, report to the competent authorities, promote inspections and site visits, and submit an annual report. The legislative approach is to promote, through the system of registers and the observatory, transparency, traceability, and detailed monitoring of the foster care process, allowing for the identification of critical issues and the definition of measures to resolve them, thus also supporting foster families, always in the best interests of the child.

While the specialized literature about social work, pedagogy, developmental psychology, and juvenile justice is well developed (e.g., Buehler et al, 2000; Lawrence et al, 2006; Giordano et al., 2021; Mortari and Sità, 2021), studies that delve into the phenomenon from a business administration perspective are rare. One exception is the 2006 study conducted by Cergas Bocconi, which focused on municipal spending on minors in need (Gugiatti, 2006). The study clearly showed that the gap between the cost per child housed in reception facilities and that of foster care was approximately €8,000, highlighting how the ethical imperative of reducing the need for institutionalization of minors in need was combined with efficiency parameters.

The economic dimension is indeed significant, and it was confirmed in the aftermath of the 2001 reform, which amended Law No. 184 of 1983, which introduced new regulations on the adoption and foster care of minors. Indeed article 5, paragraph 4, provides that: "The State, the regions, and local authorities, within the scope of their respective powers and within the limits of their respective budgets, shall intervene with support and financial assistance measures for foster families". A simple reading of this provision alone highlights how, given the enormous territorial disparities in terms of resource availability that characterize the Italian State, the actual enforceability of minors' right to grow up in a family is already strongly influenced.

Undoubtedly, the issue of good governance of public services is essential to ensuring valuable services and efficient resource use (Borgonovi et al., 2021). With explicit reference to social welfare, it appears distant from needs, even with regard to broader childcare services (Longo and Maino, 2022), as well as lagging behind in promoting the dissemination of appropriate governance mechanisms (Bertolo et al., 2021). Other dimensions worthy of investigation and refinement include the role of private institutions and families, which has been considered strategic since the promulgation of Law 184 of 1993 (VV. A.A., 1984), the Third Sector in general (Tonizzo and Nova Micucci, 2023; Zamagni, 2025), and the dimension of co-production and co-planning (Osborne et al, 2016; Zamagni, 2025).

Given the conceptual premises and the research question that motivated our study, our interest in this initial phase has been precisely to understand the current critical issues that impede the smooth governance of public services for minors in need. The following paragraph delves into the methodological aspects of the study.

3. Method

To investigate the current critical issues in the governance and collaboration model of public foster care services for minors and how they impact the creation of sustainable public value within the Italian childcare and protection system, we decided to adopt a qualitative approach (Van Thiel, 2014) throughout three steps.

Within a larger and still ongoing study, we first conducted a desk analysis to gather all relevant legislation and policies concerning family foster care and residential childcare in Italy.

We then choose to extract data from three different regional systems to grasp the variegate situation of Italian foster care programs.

At this stage, we have also completed a first set of semi-structured interviews concerning child support processes, including both adoption and foster care. We conducted these interviews with key stakeholders, both public and private, at national and local level (State, Regions, local authorities such as municipalities, local health authorities, local juvenile courts, accredited third sector organisations). Questions concerned criticalities in foster care services and related governance mechanisms. Table 1 lists the interviews that have already been transcribed and analysed.

Finally, after sharing the transcription with the interviewees to gather any further information and be sure of the content, we extracted the main themes (Van Thiel, 2014). Finally, we shared the analysis results to agree on the extracted themes and improve reliability.

Findings are briefly introduced in the next section.

Intervieews	**Region**	**Date (dd/mm/yyyy)**
1. Adoptive Parent	Region 1	19.03.2024
2. Adoptive Parent	Region 2	15.03.24
3. Association 1 Referent (President)	Region 1	22.02.2024
4. Association 2 Referent (Health Director)	Region 2	29.03.2024
5. Association 3 Referent (Former President)	Region 2	16.04.2024
6. Member of International Adoption Commission and member of Regional Committee for foster care	National	19.03.2024
7. Psychologist committed in a Territorial Health Area	Region 1	11.04.2024
8. Territorial Foster care and adoptions team: Technical coordinator and Psychologist	Region 3	27.03.2024
9. Territorial Foster care and adoption team: Psychologist	Region 3	27.03.2024
10. Social services of a Municipality: Social Worker	Region 1	25.03.2024
11. Territorial Foster care and adoption team: Cognitive process coordinator and Social Worker	Region 3	27.03.2024
12. Territorial Foster care and adoption team: Social Worker	Region 2	08.05.2024

Table 1. Referents interviewed

4. Preliminary results

The documentary analysis and the initial set of interviews conducted so far, as part of our broader research on the topic, have highlighted how foster care is a complex public policy, requiring a high level of coordination, a sophisticated information system, highly specialized professional skills, and accountability measures. In other words, the public value of foster care services depends not only on the actions of single operators — a social worker, a judge, a foster family, or each single institution, such as the court, a foster home, or a network of foster families — but rather, on the creation of a true organizational ecosystem capable of learning, collaborating, and monitoring in a structural manner.

The new Italian National Guidelines for Family Foster Care (2024) and for the Reception of Minors in Residential Services (2024), updating the previous 2012 policies, emphasize the need to strengthen the local integration among municipal, healthcare, and judicial authorities, as well as with other stakeholders (e.g., educational communities and residential facilities). Furthermore, as a cornerstone of the new guidelines, the outcome monitoring system is included among the mandatory elements of the interventions. Moreover, formally, foster care is recognized as a public service with a high level of governance. Essentially, the guidelines require local services to undergo a paradigm shift, requiring them to adapt their institutional capacity to structure processes, manage data in an integrated manner, and systematically and continuously evaluate outcomes.

Although many of these elements were already present in previous guidelines, the interviews raised, since the first phase, a variety of critical issues regarding human capital, the ineffectiveness of interventions, and the level of trust among providers, which prevented the achievement of the policy's planned objectives. The Italian context has also been characterized by a continuous decline in families available for foster care.

On the first front, issues emerged related to the high turnover of providers and the precariousness of contracts, which impedes stability and continuity of the offered public service. The ineffectiveness of the intervention is naturally related to the failure of the foster care system, both in terms of the child's failure to reunite with his/her family of origin and in terms of the programme of induction in foster families or residential services. Ineffectiveness should also be assessed in relation to the allocation of financial resources, which appears to be biased toward residential facilities rather than, for instance, support for families of origin through early interventions. Another element that emerges from the interviews is the difficulty in building relationships of trust between professionals and foster carers, as well as the rapid loss of trust even for organizational reasons (transparency of processes, plainness in decision-making, and provider/professional operational continuity).

Despite the urgent need to strengthen collaboration between all relevant levels (central, regional, and local) and among the various involved stakeholders, including foster families and private social services, current governance mechanisms (such as coordination committees or memoranda of understanding) appear to have limited effectiveness.

5. Conclusion

Minors' foster care is a service that cannot be interpreted solely within traditional administrative categories. It creates value only when its transformative potential is unlocked to the involved stakeholders: first and foremost the minor, to whom is returned stability and emotional continuity; the family of origin, possibly and hopefully, when they overcome their difficult times; and the community as a whole, which, through a foster family or a referral center, mobilizes its own resources to support the most vulnerable and develops greater local solidarity. The previous section, however, highlighted how the creation of conditions of sustainable public value depends heavily, for the context we analysed, on collaborative governance models, as well as on interventions aimed at human capital and the need to make public action accountable.

Indeed, the work highlights areas of risk in terms of lack of access to foster care, due to gaps in information or training and awareness on the part of potential foster parents, and in terms of foster care failure, in the sense of early termination or termination of the human relationship at the natural end of the foster care period, due to discomfort or lack of awareness that characterized the process. Based on the survey results, the study thus discusses actionable levers and relevant reference practices to limit these risks and improve processes, experiences, and impacts on individuals and society.

As the literature on co-production has, however, already emphasized (Nabatchi et al.; Cepiku et al. 2022), the "how to" approach, to developing co-produced services is a dimension just as important as recognizing their value, especially in a multi-level governance context (Sicilia et al. 2016). What we analysed in this study is precisely an emblematic case of multi-level governance in which it is not a given that everyone is aligned and inspired by the same logic, nor that public managers are effectively capable of listening to the community and individuals, nor that the role of the Third Sector is effectively valued and as such in the different Italian regions.

Eventually our work aims to develop an interpretative framework, supported by the survey carried out, which could be a helpful reference to enhance collaborative governance and systematically direct actors towards awareness-raising tools and facilitating pathways, with a view to promoting, with the support of foster family care, the co-creation of value that is primarily human and social, and therefore economic. As the literature has pointed out, a strategic issue is how to involve citizens and other stakeholders (Bryson et al, 2017; Ansell, Torfing, 2021; Nasi et al. 2024) in the design, delivery, and evaluation of public services, an issue that is far from simple in the context of minors in difficulty.

Keywords: Foster care; Public value; Italy

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The Development of IPSAS 46: Public Sector Measurement

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1. Introduction

Accounting plays a key role in promoting effective, sustainable, and future-oriented governance of scarce public resources. Within the public sector, the increasing role of stakeholders in shaping accounting practices is essential to reinforcing the credibility of the information produced and to contributing to more informed, participatory, and legitimate democratic processes (Dabbicco et al., 2025; Carnegie and West, 2005). Public sector measurement is also a critical component of accounting, serving as a co-architect of the common good by providing information that supports both accountability and decision-making (Grossi and Argento, 2022; Kaur and Lodhia, 2018).

Since measurement provides a way to describe resources and obligations in monetary terms, the measurement method employed impacts our perception of an entity's past performance and financial position at a given point in time. Well aware of the measurement's potential to influence an entity's value, both accounting researchers and standard-setting bodies have devoted considerable attention to its theoretical and practical implications.

For private sector entities, the initial and subsequent measurement of assets and liabilities are well-established practices whose implications have long been examined through extensive academic research. An example is the ongoing debate over the dualistic approach to historical cost and current value accounting models (Laux and Leuz, 2010; Sterling, 1981). Unlike the private sector, the public sector's distinct nature and characteristics have remained largely unexplored until the spread of New Public Management (NPM) reforms. One of the key innovations brought forward by such reforms is the adoption of accrual accounting systems, as "a method of recording expenses as they are incurred and income as it is earned during an accounting period" (Connolly and Hyndman, 2006, 272). Historically, instead, governments worldwide employed budgetary and cash-based accounting systems, recording financial transactions only when cash was exchanged. The shift from cash to accrual accounting has been widely advocated to promote sustainable socioeconomic development and to respond to pressures for better, more standardised public sector financial management systems (Azhar et al., 2022).

However, accrual accounting implementation also has profound effects on accounting practices, offering both politicians and citizens a more comprehensive picture of a public sector organisation's wealth, which is the sum of both its financial and non-financial assets and liabilities. While measuring the change in an asset's value over time is an essential part of accrual accounting, valuing non-financial resources in the public sector is one of the main challenges public sector entities still face. When transposing measurement methods designed for private

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sector organisations to public sector entities, there is a risk that public value is not properly considered. Heritage assets, for instance, are non-financial assets that governments have a duty to conserve and maintain on behalf of current and future generations and that are difficult to measure in practice due to their social, cultural, and/or historical significance (Woon et. al., 2019; Biondi and Lapsley, 2014). Considering the nature, purpose, and essence of the public sector organisations and assets when developing accounting valuation methods is therefore essential not only to comply with accountability and transparency requirements but also to accurately reflect public value (Pallot, 1992).

Real-world measurement challenges highlighted the limitations in existing approaches, and gaps in solutions soon emerged in both academic and standard-setting literature. At the International Public Sector Accounting Standards Board (IPSASB) level, in particular, there has long been no comprehensive approach to measurement in financial reporting. Measurement bases were scattered across multiple International Public Sector Accounting Standards (IPSAS), and, eventually, they were not always aligned with the measurement principles included in the 2014 Conceptual Framework (IPSASB, 2014). Practical difficulties also emerged when dealing with transaction and borrowing costs, as they required a more coherent accounting treatment, and with the approval of IFRS 13 in 2011, because the adoption of a new definition of fair value that included reference to the "highest and best use" raised questions about its application in the public sector[5].

Against this background, the IPSASB launched a dedicated Measurement Project in 2015, though active discussion did not begin until 2017. Since then, the public sector measurement project's task force and the Board have committed significant time and effort to enhancing the quality and consistency of measurement practices. Until, in 2023 a suite of three pronouncement transpired: 1) the IPSAS 46 - Measurement, the main component of the project that brought together the high-level guidance on measurement; 2) the updated Chapter 7 - Measurement of Assets and Liabilities in Financial Statements, reflecting changes occurred in the conceptual framework since its conception; 3) the IPSAS 45 - Property, Plant and Equipment, which replaces the original issue of accounting for heritage and infrastructure assets. Nevertheless, the measurement project has been extended to include an application phase, which concluded in 2025.

2. Purpose

This research (work-in-progress) delves into the process that informed the development and issuance of the public sector measurement standard, IPSAS 46. Specifically, it explores the key measurement decisions' underlying rationale, with particular focus on how the board's final position took shape in the public sector standard-setting context.

For each key measurement decision identified, we aim to explain, using an internal approach, why the solution was ultimately chosen and why any alternatives considered were excluded, extending beyond what is stated in the basis for conclusions. In terms of the IPSASB due process, this research retraces the measurement project's pathway by looking at why the project was undertaken through a consultation paper (CP), how the transition from the consultation paper (CP) to the development of exposure drafts (EDs) 76 and 77 unfold and how the evolution of exposure drafts (EDs) 76 and 77 result in IPSAS 46, Measurement.

3. Methodology

[5] Under IFRS 13 § 27, a fair value measurement of a non-financial asset takes into account a market participant's ability to generate economic benefits by using the asset in its highest and best use or by selling it to another market participant that would use the asset in its highest and best use (IASB, 2011).

The methodology primarily employs a qualitative approach, with an intrinsic case study carried out according to Stake's (1995) proposal. Case study-based research is generally adopted in the social sciences to provide a holistic understanding of complex phenomena. The intrinsic case study is considered well-suited to investigating measurement within the IPSASB context for several reasons.

Because the case under consideration is of particular interest for both its unique features and significance, this methodology enables a deeper understanding of the dynamics at play in these specific circumstances. The author's specific interest and direct involvement in the project's development may also contribute to a more informed account of how the measurement case evolved within the IPSASB standard-setting process with an internal lens. Studies that build on this methodology typically employ multiple data sources to develop a nuanced understanding of the case under investigation. This strategy, which improves data credibility and supports a clearer interpretation of the overall case, is considered particularly valuable for standard-setting, where some information may remain undisclosed or only partially documented in a single public record (Kim et al., 2023; Handley et al., 2020). Therefore, this study's outcome is not intended to be projected outward but rather to help readers gain deeper insights into the specific case under consideration.

In line with the case study methodology, data triangulation deploys three primary sources. An in-depth analysis of existing IPSASB measurement-related documents from 2019 to 2025 is conducted. This suite includes measurement agenda papers, board minutes, comment letters, consultation paper, and exposure drafts. A semi-structured questionnaire is distributed to reach all those involved in the measurement project within the IPSASB (including board members, technical advisors, staff, and observers) and to ensure that our research captures more effectively why and how different ideas traveled throughout the project's development. The questionnaire has been refined based on input from interviews with available board members and staff. Participant and direct observation at the IPSASB measurement meetings are combined.

4. Preliminary Findings

Initially, we outline the primary factors that led the IPSASB to address public sector measurement challenges, specifically through a CP (IPSASB, 2019). From a high-level perspective, the key factors identified at this stage are those that more broadly led to the commencement of a measurement project. Despite fair value is being considered as one of the main driver to adopt a strategic approach to the issue, a preliminary analysis of responses to the questionnaire suggests two more factors were essential to be address in the CP, namely: (i) providing more detailed guidance on the implementation of historical cost, replacement cost, fulfillment cost, and fair value, and the circumstances under which these measurement bases will be used; and (ii) issuing amended IPSAS with revised requirements for measurement at initial recognition, subsequent measurement, and measurement-related disclosure.

When studying the transition from the CP to EDs, we instead consider whether there was a significant change in direction during the transitions from the CP to EDs 76 and 77 (IPSASB 2021a, 2021b), why it occurred, and how it has been documented. Our initial analysis, supported by questionnaire respondents, helped identify what is perhaps the most relevant change across the entire measurement project: the development of a public sector-specific measurement basis, current operational value (COV)[6]. COV is considered a key measurement decision worth analysing, particularly given the contrasting stakeholders' opinions on its development, definition, and practical implications. In line with the IPSASB literature, we intend to investigate the

[6] Current Operational Value (COV), as defined in IPSAS 46 § 6, is the amount the entity would pay for the remaining service potential of an asset at the measurement date (IPSASB, 2023a).

rationale behind the COV in light of its counterpart, fair value (FV). ED 77 is a core document for both COV and FV, as it introduces generic guidance on fair value for the first time and proposes COV to address stakeholder views that a new measurement basis is required as an alternative to fair value for assets held for their operational capacity rather than financial capacity. In the public sector, in fact, assets are primarily held to provide public services rather than to generate cash flows (i.e., to produce future economic benefits) (Anessi-Pessina et al., 2022).

In addition to FV and COV, the IPSASB made significant progress by proposing a measurement hierarchy (now referred to as the subsequent measurement framework and the relationship between the three levels) in ED 76 to guide the development of standard-level valuation guidance and to help stakeholders apply the principles in practice. In contrast to the initial measurement, the IPSASB distinguished among models, bases, and techniques in the subsequent measurement (IPSASB, 2023b).

Ultimately, during the transition to the measurement standard, we reflect on stakeholders' comments on ED 76 and ED 77 and how they helped shape the new measurement standard, IPSAS 46. Specifically, we will consider whether there was a consensus, alternative views, and significant changes in direction from the EDs to IPSAS 46. One of the main concerns identified during the transition, which we believe warrants a clearer explanation of the rationale, relates to the exclusion of the income approach as a measurement technique for estimating COV. From a bird's-eye view, respondents' feedback on this point is highly diverse, suggesting careful examination of this specific matter.

5. Research Contribution

This research contributes to both streams of research on accounting standard-setting processes and public sector measurement. Literature on IPSASB standard-setting is extensive and covers a range of aspects, such as the legitimacy, transparency, quality, and adoption of IPSAS standards (Christiaens et al., 2015; Grossi and Soverchia, 2011), the structure and internal organization of the standard setter (Polzer et. al., 2021), as well as stakeholder participation in the due process (De Wolf and Christiaens, 2023; Conrath-Hargreaves et. al., 2021; Kidwell and Lowensohn, 2019). While most studies focus on constituents' feedback at a single stage of the process (e.g., comment letters received on single-exposure drafts), our ongoing research traces, through an internal lens, how the measurement issue evolved across the entire process, from the CP to IPSAS 46. Meanwhile, by discussing how key measurement decisions are made within the IPSASB, this research sheds light on salient valuation issues relevant to public sector entities reporting under accrual accounting, thereby contributing to the literature on measurement in financial reporting.

Both the measurement and standard-setting processes are complex topics that, at the IPSASB level, have evolved through continuous feedback and interactions. Hence, by retracing the standard-setting process from the issuance of the measurement consultation paper (CP) to the measurement standard (IPSAS 46), this study aims to make a dual contribution to readers. First, it will enable a more comprehensive understanding of the main public sector measurement issues the IPSASB addressed. Because the measurement accounting standard is highly technical, its implementation may be complex and lead to divergent interpretations. To avoid this potential confusion, understanding the rationale for including or excluding specific elements from the measurement guidance at each project stage is essential. Such insight is further necessary given the unpredictability of situations that may arise, thus, to support public sector entities in complying with the standard more consistently and effectively while taking their own case into account. By analysing key factors shaping the evolution of measurement, we also expect to obtain preliminary indications of whether the solutions proposed during the work stage are satisfactory for public sector entities in achieving accountability and decision-making objectives. A potential

way forward to gain a more in-depth understanding of stakeholders' perspectives is to conduct semi-structured interviews with users of the measurement accounting standard.

Second, it clarifies who contributes to drafting public sector accounting standards and how decisions are justified in the presence of alternative conceptions, using measurement as a case. Academic literature increasingly emphasises both the role of IPSAS in the European context and the process that informs accounting standard-setting for matters prone to high levels of discretion (Ajekwe, 2022; Biondi et al., 2021; Adam et al., 2020; Kidwell and Lowensohn, 2019). This ongoing study, which focuses on the underlying reasons for the IPSASB's approach to developing the measurement standard, responds to renewed interest among academics, practitioners, and policymakers. Besides analysing the subject itself, it shed light on the contrast between initial expectations and the outcome, as ideas envisioned at the outset of the project evolved through stakeholders' proposals. Thus, it extends beyond Caruana's (2021) work, which critically examines the project's initial stages.

Because IPSAS 46 is a newly issued accounting standard, limited research has so far explored public sector measurement in light of its updated guidance. Moreover, since its effective date is 1 January 2025, its practical implementation remains an emerging issue (Caruana, 2025). Ultimately, the authors' close connection with the IPSASB community will enrich the study with first-hand insights while fostering the relationship between the IPSASB and the academic community.

Keywords: Measurement; public sector; financial reporting; IPSAS 46

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Exploring Transformative Approaches to Sustainability Management in Italian Local Governments

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1. Introduction

The integration of the United Nations Sustainable Development Goals (SDGs) into sub-national governance represents one of the most significant institutional challenges of the 2030 Agenda (Meuleman and Niestroy, 2015). While national governments bear primary responsibility for voluntary national reviews and reporting, the achievement of most SDG targets ultimately depends on decisions taken at the municipal level, including urban planning, public services, infrastructure investment, and community engagement. The SDSN Italy SDGs City Index (Ottobrini et al., 2024) confirms that Italian provincial capitals have, on average, achieved only 53.9% of SDG targets, with substantial heterogeneity across geographic areas and municipality sizes.

A growing body of literature has examined how local governments adopt and disclose sustainability-related commitments (Guarini et al., 2021 and 2022; Mori, 2024; Bartocci and Burchi, 2025; Raimo et al., 2025). However, the field still lacks systematic frameworks for distinguishing symbolic adoption, in which SDG language appears in planning documents without structural integration, from transformative management, in which sustainability capabilities are embedded throughout the full planning, programming, and control cycle. This distinction is theoretically and practically important because local planning processes often remain fragmented across administrative silos, weakly supported by measurement systems, and unevenly shaped by differences in organizational capacity across municipalities (Zeemering, 2018). Under these conditions, sustainability commitments may satisfy reporting or reputational expectations while amounting to little more than rhetorical relabelling of existing policies, leaving underlying governance patterns largely unchanged.

This work addresses this gap by applying the Transformative Sustainability Management (TSM) framework developed by Bhatia et al. (2024) to the Italian municipal context. TSM identifies four organizational capabilities that characterize genuine sustainability integration: strategy formulation, operationalization and measurement, collaboration, and reflexive capability. We operationalize these capabilities through a computational content analysis of the two principal planning documents that Italian municipalities are required to produce: the DUP (Documento Unico di Programmazione), a multi-year strategic planning instrument, and the PIAO (Piano Integrato di Attivita e Organizzazione), the annual operational plan that should translate DUP objectives into concrete actions.

The study makes three contributions, with an explicit focus on the quality of the public planning process. First, it reframes SDG localization from a question of whether sustainability is mentioned in plans to whether it is embedded as a high-quality planning and control cycle (i.e., a coherent set of capabilities that connects strategic intent, operational translation, measurement, collaboration, and organizational learning). Second, it operationalizes the TSM framework in the context of Italy's legally mandated instruments (DUP and PIAO), showing how these documents can be used to diagnose where the planning cycle breaks down (e.g., strong discourse but weak

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operationalization and measurement; weak DUP–PIAO alignment; limited feedback loops). Third, it offers actionable implications for public managers and policymakers by identifying capability gaps that can be targeted to improve planning quality – such as strengthening KPI architectures (baseline/targets), ensuring cross-unit coherence between DUP and PIAO, and institutionalizing reflexive routines – thereby reducing the risk of symbolic compliance and supporting substantive sustainability integration.

The remainder of the manuscript is structured as follows. Section 2 reviews the literature on SDG localization and sustainability management in local government. Section 3 presents the TSM theoretical framework. Section 4 describes the research questions, design and methodology. Section 5 presents the sample and data. Section 6 details the operationalization of TSM capabilities into measurable variables. Section 7 concludes by outlining the expected results and the research's potential contributions.

2. Literature review

2.1. SDG localization in Italy

The localization of the SDGs has attracted increasing scholarly attention over time. Research consistently shows that local governments are pivotal actors in SDG implementation, given that at least 65% of the 169 SDG targets require sub-national action (OECD, 2020). In the Italian context, the SDSN Italy SDGs City Index series (2018, 2020, 2022, 2024) has established a longitudinal baseline for tracking municipal SDG performance across the provincial capitals (Cavalli and Farnia, 2018).

A parallel stream of research has examined how municipalities disclose sustainability commitments. Guarini et al. (2021) show that embedding SDGs in city strategic planning requires not merely formal adoption, but managerial integration across the planning cycle. Mori (2024) documents the prevalence of symbolic compliance in Italian municipalities, where SDG references appear in strategic documents without corresponding operational translation. Recent evidence further deepens this picture. Bartocci and Burchi (2025) analyse the 2023–2025 DUP of 109 Italian provincial capitals through a combination of human content analysis and automated text analysis, showing that sustainability language is unevenly distributed and often remains nominal rather than substantively embedded in local planning. Their findings also suggest that, even where SDG-related language is present, municipalities frequently fail to connect it to gap analysis, indicators, and monitoring systems, pointing to a still fragile managerial internalization of sustainability in local programming. Raimo et al. (2025) identify population size and geographic location as significant predictors of SDG performance, with northern municipalities systematically outperforming southern ones.

2.2. Sustainability management in public organizations

The public management literature has progressively moved beyond compliance-oriented frameworks to examine sustainability as an organizational capability. New Public Governance perspectives highlight the role of inter-organizational collaboration and adaptive learning in sustainability transitions (Osborne, 2006). In local government contexts, this translates into requirements for cross-departmental coordination, stakeholder engagement, and iterative monitoring, capabilities that go well beyond what annual reporting exercises demand (Zeemering, 2018). These challenges are further compounded by the fact that SDG localization is inherently context-specific and requires knowledge, resources, and data that are themselves localized (Weitz et al., 2018; Allen et al., 2019; Grossi and Trunova, 2021; Grossi and Welinder, 2024). While Agenda 21 had already promoted a multisectoral, multilevel, and multi-actor approach to sustainability (Meadowcroft, 2011; Meuleman and Niestroy, 2015), the 2030 Agenda provides limited guidance on how global and local goals should be interconnected or prioritized in urban

settings (Grossi and Trunova, 2021; Sinervo et al., 2024). As a result, municipalities enjoy considerable autonomy in resource allocation, strategic planning, and the implementation of sustainability objectives, but they do so under highly uneven institutional and technical conditions (Guarini et al., 2022; Muiderman et al., 2023).

More recently, the literature has increasingly distinguished between formalistic and substantive sustainability integration. From this perspective, Da Ponte et al. (2020) show that sustainability may be formally acknowledged in public procurement documents while remaining only weakly embedded in evaluation and decision-making processes. Their findings suggest that the presence of sustainability language does not necessarily translate into substantive organizational integration. Evidence from Italian municipalities points in the same direction: sustainability appears to be more developed in strategic visions and general objectives than in gap analysis, operational programming, and especially in measurement and control systems. Particularly, Bartocci and Burchi (2025) report that sustainability is more frequently embedded in strategic vision and general objectives than in gap analysis, operational programming, and, above all, measurement and control systems. Their findings suggest that the core challenge is not merely the rhetorical acknowledgement of sustainability, but the development of organizational capabilities required to translate sustainability goals into coordinated action, indicators, and monitoring routines. This is especially relevant in a context where cities differ significantly in their access to funding, technical expertise, and data infrastructures, and where the absence of detailed shared guidelines may encourage fragmented approaches or forms of reporting decoupled from programming and implementation (Guarini et al., 2022; Muiderman et al., 2023; Bisogno et al., 2024; Manes Rossi, 2024; Cappellieri et al., 2025). Bhatia et al.'s (2024) TSM framework provides the most operationally developed account of what transformative integration requires at the organizational level.

2.3. Content analysis in public sector research

Content analysis has a long tradition in public administration and accounting research as a method for assessing voluntary disclosure (Beattie and Thomson, 2007; Tregidga et al., 2014). The combination of hermeneutic and automated approaches - increasingly referred to as mixed-method content analysis - allows researchers to maintain theoretical fidelity in dictionary construction while achieving scalability in application (Loughran and McDonald, 2016; Gentzkow et al., 2019). Recent methodological advances have extended automated text analysis to the SDG domain. In particular, Bebbington and Unerman (2020) call for accounting scholarship to develop rigorous empirical approaches capable of capturing how organizations engage with the SDGs beyond surface-level disclosure. In this direction, cosine similarity techniques have been applied to measure the semantic proximity between organizational documents and SDG reference texts, for instance, to map the interlinkages among SDG targets through vector-based comparison of goal descriptions (Song and Jang, 2023). Building on this methodological strand and on standard information-retrieval approaches to text similarity, we apply TF–IDF vectorization and cosine similarity to assess the degree to which DUP and PIAO documents are aligned with each of the 17 SDG reference texts (Salton and Buckley, 1988; Manning et al., 2008; Jurafsky and Martin, 2024). We treat similarity scores as interpretable proximity measures and triangulate them with dictionary-based indicators and robustness checks on thresholds.

3. Theoretical framework: Transformative Sustainability Management

Bhatia et al. (2024) define Transformative Sustainability Management (TSM) as the set of organizational capabilities that enable public administrations to embed sustainability not as a formal compliance exercise, but as a structural principle of governance. Unlike instrumental approaches, which treat sustainability as an external constraint to be managed, TSM requires that

sustainability values permeate the entire organizational logic, from political vision formation through operational programming to performance monitoring and institutional learning.

The framework articulates four interconnected capabilities, each corresponding to a distinct phase of the strategic management cycle.

3.1. Strategy formulation capability

Strategy formulation is the capacity to translate global sustainability objectives (the SDGs) and political values into a coherent local vision explicitly connected to the 2030 Agenda. A municipality with strong strategy formulation capability will not merely cite the SDGs as a formal reference, but will map local priorities across multiple sustainability dimensions, establish connections between global targets and local conditions, and communicate a clear narrative of direction and ambition. Critically, this capability requires distributional balance: a municipality that reduces sustainability to environmental management has a weak strategy formulation capability, even if its environmental commitments are robust.

3.2. Operationalization and measurement capability

Operationalization and measurement is the capacity to render the sustainability vision actionable through concrete objectives, quantifiable key performance indicators, financial allocations, and chronological programming. This capability bridges the gap between strategic ambition and administrative reality. A municipality with strong opperationalization capability will attach specific KPIs and financial resources to each sustainability objective, thereby enabling accountability and progress tracking. The absence of this capability – strategically ambitious documents without measurable targets or budgetary commitments – is a hallmark of symbolic adoption.

3.3. Collaboration capability

Collaboration is the capacity to build coherence both horizontally (across departments and with external stakeholders) and vertically (across governance levels and across planning instruments). In the Italian institutional context, the most directly measurable dimension of this capability is the alignment between the DUP and the PIAO: the degree to which operational commitments in the PIAO reflect and translate the strategic objectives articulated in the DUP. Participatory processes and multi-stakeholder engagement provide additional indicators. Low DUP-PIAO alignment is a structural indicator of governance fragmentation, regardless of the quality of individual documents.

3.4. Reflexive capability

Reflexive Capability is the capacity for institutional self-assessment and adaptive learning: the ability to monitor results, identify gaps between plans and outcomes, feed these findings back into future planning cycles, and communicate transparently with stakeholders. Operationally, this capability manifests in monitoring systems, dashboards, public reporting, and the presence of genuine gap analysis in planning documents - that is, the explicit acknowledgement of where the municipality currently stands relative to SDG targets and how much distance remains to be covered.

4. Research questions, design and methodology

Building on the TSM perspective and on the distinction between symbolic and transformative sustainability integration in public organizations, this study addresses three questions.

RQ1: To what extent do Italian provincial-capital municipalities embed the SDGs across the full planning and control cycle (from strategic intent to operationalization and measurement) as documented in DUP and PIAO?

RQ2: How do the four TSM capability dimensions (strategy formulation, operationalization and measurement, collaboration, and reflexive capability) vary across municipalities when measured through a document-based text analytics pipeline?

RQ3: Are higher TSM capability scores associated with better sustainability outcomes and do "best vs worst" municipalities exhibit systematically different capability profiles?

4.1. Overall approach: mixed-method content analysis

We adopt a mixed-method content analysis design that combines Hermeneutic Text Analysis (HTA) for theoretical grounding with Automated Text Analysis (ATA) for systematic application across the sample. HTA informs the construction of coding dictionaries and the operationalization logic - that is, the mapping from theoretical constructs to textual indicators. ATA, implemented through a custom Python pipeline, applies these dictionaries consistently across all 18 municipal document pairs (DUP + PIAO) while also computing semantic similarity measures that go beyond keyword matching.

This approach follows the methodological tradition of mixed content analysis in accounting and public management research (Beattie and Thomson, 2007; Krippendorff, 2018), adapted for the computational analysis of long-form public documents. The two types of analysis are complementary rather than sequential: HTA-informed dictionaries are iteratively refined against the corpus, while ATA results are interpreted in light of the theoretical framework established through HTA.

4.2. Document selection: DUP and PIAO

The DUP (Documento Unico di Programmazione) is the principal multi-year strategic planning instrument for Italian municipalities under Legislative Decree 267/2000 and subsequent TUEL provisions. It articulates the municipality's strategic objectives over a three-year horizon, organized by mission and programme, and constitutes the formal basis for budget allocation. The PIAO (Piano Integrato di Attivita e Organizzazione), introduced by Decree-Law 80/2021, integrates previously separate planning instruments and covers the annual cycle of activities, performance targets, and organizational management.

The DUP-PIAO pair provides a uniquely revealing window into the gap between strategic intention and operational implementation. A municipality that articulates sustainability commitments in its DUP but fails to translate them into PIAO performance objectives reveals a deficit in Collaboration and Reflexive Capability, regardless of the quality of its strategic discourse. Conversely, a municipality with modest DUP language but strong PIAO-level operationalization may exhibit greater effective capability than its strategic document alone would suggest.

4.3. Computational pipeline

The automated analysis pipeline processes each municipality's PDF documents through the following stages: (1) text extraction via pdfplumber; (2) preprocessing - lowercasing, whitespace normalization, and removal of non-alphanumeric characters; (3) sentence segmentation using punctuation and newline markers, retaining only sentences of more than 20 characters; and (4)

application of six analytical modules producing the variable groups described in Section 6. The pipeline produces per-municipality Excel reports and a consolidated dataset across the sample. To mitigate document-length (verbosity) bias, occurrence-based indicators are normalized by total words.

5. Sample and data

5.1. Population and stratification strategy

The population of interest consists of the 109 Italian provincial capitals for which both DUP and PIAO documents are publicly available. We adopt a stratified purposive sampling design intended to maximize variation across the two principal dimensions of heterogeneity identified in the literature: geographic location and municipality size.

Geographic stratification follows the ISTAT classification of Italian macro-regions: North, Centre, and South and Islands. The size stratification identifies three classes: large municipalities (more than 250,000 inhabitants), medium-sized municipalities (between 50,000 and 250,000 inhabitants), and small municipalities (fewer than 50,000 inhabitants).Within each of the nine cells of the 3x3 stratification matrix, we select two municipalities: the best performer and the worst performer on the SDSN Italy SDGs City Index 2024 composite score. This extreme-case selection strategy maximizes within-cell variation in sustainability outcomes, ensuring that the TSM analysis is conducted on units spanning the full range of SDG performance in each stratum. The result is a sample of 18 municipalities:

Municipality	***Zone***	***Size Class***	***SDG Role***	***SDSN 2024 Score***
Bologna	North	Large	Best	64.7%
Genova	North	Large	Worst	56.0%
Trento	North	Medium	Best	71.5%
Alessandria	North	Medium	Worst	50.8%
Lecco	North	Small	Best	65.5%
Verbania	North	Small	Worst	50.5%
Firenze	Centre	Large	Best	58.0%
Roma	Centre	Large	Worst	55.2%
Ancona	Centre	Medium	Best	61.0%
Pistoia	Centre	Medium	Worst	43.1%
Macerata	Centre	Small	Best	61.2%
Frosinone	Centre	Small	Worst	49.9%
Cagliari	South/Islands	Large	Best	60.8%
Catania	South/Islands	Large	Worst	34.4%
L'Aquila	South/Islands	Medium	Best	55.4%
Crotone	South/Islands	Medium	Worst	34.5%
Nuoro	South/Islands	Small	Best	55.7%
Isernia	South/Islands	Small	Worst	37.3%

Table 1. Sample composition

5.2. External validity benchmark: SDSN City Index 2024

The SDSN Italy SDGs City Index (Ottobrini et al., 2024), produced by Fondazione Eni Enrico Mattei within the SDSN Italy network, provides the most methodologically rigorous and academically cited measure of SDG performance for Italian municipal capitals. Now in its fourth edition (2018, 2020, 2022, 2024), the Index covers the provincial capitals across 42 elementary indicators distributed across 16 of the 17 SDGs (SDG 14 is excluded for internal comparability reasons). Target normalization is based on the average performance of the top five municipalities per indicator, thereby providing a peer-referenced benchmark rather than an absolute threshold.

We use SDSN City Index 2024 scores in two ways: (1) as the stratification criterion for sample selection (Section 5.1); and (2) as an external outcome variable for cross-validation - testing whether municipalities with higher TSM capability scores, as measured by our computational pipeline, also exhibit higher SDG performance outcomes.

6. Operationalization of TSM capabilities

To operationalize the four TSM capabilities in the Italian municipal context, we adapt the analytical scheme developed in our earlier work and align it with the DUP-PIAO document pair used in this study. Table 2 summarizes the capability dimensions, their observable characteristics, and the main variables, data sources, and suggested indicators used to identify transformative sustainability management in planning documents. For each capability, we compute a standardized score by aggregating normalized indicators (per 10,000 words where relevant and z-standardized across municipalities). We assess robustness using alternative weighting schemes and threshold values for similarity-based indicators.

Capabilities	***Characteristics***	***Variables, data sources, and suggested indicators***
Strategy formulation	Integration of sustainability into the political vision	- No. of occurrences in the DUP associated with the "political vision" phase - Cosine analysis between the DUP and the SDG declarations - Share (%) of text in the DUP tagged to sustainability themes - Explicit link between the mayor's programme and at least one SDG target (binary 0/1)
	Understanding of external and internal conditions	- No. of occurrences in the DUP associated with the "gap analysis" phase - Use of SWOT analysis, PEST analysis, benchmarking, BSC, etc. documented in the DUP (0-4 score)
	Defining significant macro-objectives	- No. of occurrences in the DUP associated with the "identification of objectives" phase - Use of SDG/BEST targets documented in the DUP - No. of macro-objectives that map onto at least one SDG indicator / total macro-objectives (ratio)

Capabilities	***Characteristics***	***Variables, data sources, and suggested indicators***
	Using participatory processes	- Use of participatory tools documented in the DUP - Stakeholder events per 10 000 inhabitants in the plan cycle
Operationalization and measurement	Definition of specific programs	- No. of occurrences in the DUP associated with the "setting a SDG agenda" phase
	Use of trackable indicators at managerial level	- Use of KPIs documented in the PIAO - % KPIs with baseline and target
	Implementation of monitoring systems	- Use of dashboards documented in the DUP and PIAO - Public access to dashboard (0/1)
Collaboration	Aligning units and objectives with the strategy	- Comparison between the DUP and the PIAO - Cosine similarity between the wording of DUP objectives and PIAO KPIs (0/1) - No. of PIAO actions that cite the DUP objective code
	Defining cross-cutting objectives	- Definition of cross-sectoral or cross-unit objectives in the PIAO
	Promoting collaborative practices	- Use of inclusive and participatory tools documented in the DUP - Budget allocation (EUR) for collaborative projects
	Focusing on outcomes	- Analysis of outcomes indicators in the DUP and PIAO - Citizens' satisfaction survey published in last 2 years (0/1)
Reflexivity	Creating information feed-back loops	- Longitudinal comparison of KPIs in the DUP and PIAO - % of KPIs with three or more yearly data points (time-series depth) - Existence of a lessons-learned report per cycle (0/1)

Table 2. TSM capability-based analytical framework. Source: our elaboration based on Bhatia et al. (2024, p. 1189) and Bartocci and Burchi (2025)

7. Concluding remarks

The expected findings are the following. First, we anticipate marked heterogeneity in how Italian municipalities embed the SDGs across the planning and control cycle, with "best performers" exhibiting a more complete bundle of TSM capabilities rather than stronger SDG rhetoric alone. In particular, stronger SDSN outcomes should be associated with: (i) strategy formulation that moves from generic SDG references to explicit gap analysis and SDG-linked macro-objectives; (ii) operationalization and measurement evidenced by the presence of trackable KPIs with baselines/targets and monitoring systems (e.g., dashboards); (iii) collaboration

capability reflected in higher DUP–PIAO alignment (strategic objectives translated into operational actions and KPIs) and cross-cutting objectives; and (iv) reflexive capability signaled by feedback loops, longitudinal KPI tracking, and explicit learning mechanisms (e.g., lessons-learned reporting). Second, we expect capability complementarities: high strategy formulation without operationalization, collaboration, and reflexive mechanisms will be indicative of symbolic adoption, whereas substantive sustainability integration will require coherence across the four capability dimensions. Third, we expect territorial and size-related differences to manifest primarily through the operationalization/collaboration/reflexive dimensions—capabilities that depend more directly on organizational infrastructure and managerial systems than on strategic discourse.

The study aims to contribute to public management and SDG localization research by (1) shifting the empirical focus from the presence of SDG language to the capability architecture underpinning sustainability integration; (2) offering a replicable, document-based measurement approach that operationalizes TSM in a legally mandated planning setting (DUP/PIAO); and (3) providing an external-validity check by relating capability scores to observed SDG performance. Practically, the capability scorecard produced by the pipeline can help public managers diagnose whether weaknesses lie in strategic framing, measurement infrastructure, cross-unit alignment, or institutional learning, thereby supporting targeted interventions to close specific capability gaps and reduce the risk of symbolic compliance.

Keywords: Sustainability; SDG; local government; strategic planning; content analysis; Italy

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Creating Public Value Through Digital Twin Enactment: Institutional Conditions and Climate Resilience Governance in London

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1. Introduction

Compared to previous waves of transformations in public administration, the digital transformation (DT) of the last two decades marks a significant shift, demanding a reimagining of many government operations (Manny et al., 2021). For many years, gradual digitalization has been one of the added-value domains, improving the efficiency and effectiveness of the public sector processes (Alford & O'Flynn, 2009; Cordella & Bonina, 2012). Beyond just digitization and digitalization, digital transformation involves thoroughly reconfiguring organizational structures, decision-making procedures, and value creation mechanisms rather than merely automating current bureaucratic processes (Mergel et al., 2019). This shift affects how public sector organizations define their missions, engage with the public, and address traditional and emerging issues.

Cities across the world are investing heavily in digital twins as instruments of urban climate resilience. These systems combine real-time data integration, dynamic simulation, and scenario-based decision support in ways that promise to move urban governance from reactive crisis management toward more anticipatory, coordinated approaches (Batty, 2017; West et al., 2021; White et al., 2021). The policy appeal is especially visible in climate governance, where flooding, heat stress, infrastructure disruption, and cascading failures pose cross-sectoral, spatially differentiated challenges that exceed the capacities of siloed administrative systems.

However, technology adoption proves far more complex than only technical implementation. Cities deploy a large amount of funding and resources in digital technologies and platforms, which turn out to be underutilized, lacking integration with decision-making, and not delivering the value intended (Ferré-Bigorra et al., 2022; Mazzetto, 2024; Trencher & Karvonen, 2019). Therefore, there is an interesting puzzle considering that cities can get almost identical systems from the same vendors, access similar data sources, and work on almost equivalent processing infrastructure. If technology is not the main differentiator between cities, then what is it?

We argue that digital twins do not generate public value solely through technical capabilities. Much of the institutional and organizational conditions shape how digital twins are enacted in practice, and therefore, different enactments produce different configurations of public value. The core research question is: How do institutional and organizational conditions shape the enactment of digital twins and the creation of public value in climate resilience governance? In addition, we propose four guiding questions that can shape the empirical investigation: (1) What institutional-organizational conditions characterize climate-relevant digital twin initiatives in London? (2) How are digital twins enacted across organizations and use domains? (3) What public value configurations and trade-offs emerge from these enactments? (4) Through what mechanisms do institutional-organizational conditions shape enactment and value outcomes over time?

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Overall, digital initiatives in public administration have generated public value by enhancing the effectiveness, transparency, and quality of public services across various sectors (Desai & Manoharan, 2024; Volodina & Grossi, 2025). They have enabled the public sector to adapt to societal needs, facilitating shifts in social and public values, and helping governments serve their citizens better, while overcoming technological and institutional changes (Bannister & Connolly, 2014; Lindgren & Van Veenstra, 2018). Within this domain, this paper is relevant because it examines how public organizations can leverage the power of digital tools, particularly digital twins, to address key sustainability challenges. Climate resilience is arguably the most important goal for sustainability, requiring long-term thinking, systems integration, and adaptive governance. Second, the research focuses on public value and the common good beyond efficiency metrics to examine how digital twin enactment provides resilience, legitimacy, accountability, equity, and adaptive learning capacities. Third, focusing on institutional arrangements and governance, the research contributes to understanding how organizational design and management capacity enable or constrain digital transformation in public contexts. A question that is becoming increasingly important as artificial intelligence and automation are reshaping public administration.

The paper proceeds as follows. Section 2 develops the theoretical framework. Section 3 presents a three-layer conceptual model. Section 4 describes the research design. Section 5 offers preliminary insights from initial document analysis. Section 6 states the expected contributions.

2. Theoretical Framework

2.1. Technology Enactment Framework

Fountain's (2001) Technology Enactment Framework (TEF) provides a fundamental understanding of how technologies are not impartial instruments with inherent effects. Instead, they are shaped by the institutional context in which they are integrated. Therefore, objective technology, referring to the raw technical capabilities available in the market, passes through an "institutional filter" comprising cognitive, structural, and organizational arrangements, producing "enacted technology." Enacted technology refers to how systems are actually designed, implemented, and utilized in specific organizational contexts. Subsequent authors have extended TEF into digital government contexts. (Cordella & Iannacci, 2010) demonstrate that policy drivers and institutional contexts shape the design and use of public information systems. (Gil-Garcia, 2012) shows that organizational capabilities, institutional arrangements, and environmental conditions jointly explain variation in e-government outcomes. These extensions confirm that enactment-based approaches remain well-suited to complex, data-intensive public-sector technologies.

In this case, TEF is especially appropriate for digital twins because they are not stand-alone tools but integrative, data-dependent infrastructures that require coordination across multiple actors, systems, and organizational boundaries. This paper takes TEF a step further by laying out five key institutional and organizational factors that come before everything else in the analysis. Initiating from the original concepts of the framework, first, cognitive frames shape how actors define climate risks, interpret digital twin capabilities, and prioritize governance problems, thereby shaping which uses are seen as legitimate and valuable. Structural arrangements concern the formal rules governing authority, accountability, procurement, and compliance, and determine who is authorized to invest in and act on digital twin outputs. Organizational forms, including coordination arrangements, cover departmental structures, inter-organizational routines, and coordinating roles that determine whether digital twin outputs travel across sectoral and jurisdictional boundaries. In addition, we introduced:

- Data Governance Institutions. The rules, protocols, and procedures that regulate data ownership, sharing, quality standards, and ethical use. This is an important dimension of institutions because the efficacy of digital twins relies on the ongoing integration of data

beyond one organization, making data governance central to the enactment of the technology (Janssen et al., 2020).
- Boundary-spanning expertise refers to the actors and practices that translate between technical, managerial, and policy domains, converting technically sophisticated outputs into actionable governance decisions (Guston, 2014; Star & Griesemer, 1989).

2.2. Public Value as the Outcome Lens

The paper positions public value as the lens for evaluating the consequences of enactment, rather than as a coequal causal framework alongside TEF. Building on Moore's (1995, 2013), public value foundations and their digital government applications (Cordella & Bonina, 2012; Panagiotopoulos et al., 2019; Twizeyimana & Andersson, 2019), the paper operationalizes public value through four grounded and empirically traceable outcome dimensions that are normatively substantively relevant to climate resilience governance.

Starting with resilience effectiveness that refers to the extent to which digital twin enactment strengthens anticipatory, adaptive, or transformative governance capacities that lead to improved forecasting, better cross-organizational coordination, more targeted infrastructure interventions, or more informed adaptation planning. Democratic legitimacy and accountability refer to transparency, explainability, oversight, and the degree to which digital twin use remains contestable and publicly accountable; data-intensive systems may improve analysis while simultaneously reducing democratic scrutiny, making this dimension analytically non-trivial. Equity and rights protection refers to inclusion, distributional fairness, privacy, and data rights, recognizing that public value is compromised when benefits are unevenly distributed or when data governance erodes fundamental rights (Bannister & Connolly, 2014; Haraguchi et al., 2024). Next, adaptive learning refers to whether digital twin enactment strengthens institutional reflection, cross-organizational learning, and the capacity of governance systems to revise practices over time. This is a dimension particularly important under the persistent uncertainty of climate governance.

Together, these dimensions operationalize public value as outcomes that can be assessed as products of enactment rather than preconditions for it. Following (Weigl et al., 2024)Public values are treated as potentially conflicting configurations rather than a unitary good, which is especially important in multi-actor, multi-jurisdictional metropolitan governance settings.

2.3. Mechanisms Linking Conditions, Enactment, and Public Value

In this paper, we specify six mechanisms linking the conditions, enactment, and public value. The framing mechanism connects cognitive frames to the governance purposes for which digital twins are designed and the forms of evidence considered legitimate. The coordination mechanism links organizational forms to whether digital twin outputs cross departmental and inter-organizational boundaries. The data mechanism connects governance arrangements to interoperability and trustworthiness. The translation mechanism connects boundary-spanning expertise to the conversion of technical outputs into actionable decisions. The authorization mechanism connects structural support to whether digital twin initiatives remain pilots or become institutionalized. The learning mechanism connects enactment experiences and feedback to subsequent institutional adjustment. These mechanisms are consistent with scholarship showing that governance outcomes depend on socio-technical alignment rather than technical sophistication alone (Nochta et al., 2021; Richter et al., 2025).

3. Conceptual Framework

Figure 1 presents the analytical model, which can be explained in three layers. The first layer specifies the five institutional and organizational conditions as predecessors of enactment. The second layer captures enactment of the digital twin on its direct functional use (what the twin is actually used for), its impact on decision integration (whether outputs influence public decisions), its organizational embedding (whether use is routinized or episodic), and cross-boundary integration (whether the twin connects datasets and decision arenas across organizations). The third layer assesses public value outcomes across the four dimensions described above. Feedback loops from the outcome of enactment back to institutional conditions capture learning and adaptation processes over time. The mechanisms described above operate across these layers to explain how specific institutional configurations produce specific enactment patterns and value configurations.

The core proposition is that the same objective technology can produce substantively different governance outcomes depending on the institutional environment through which it is enacted.

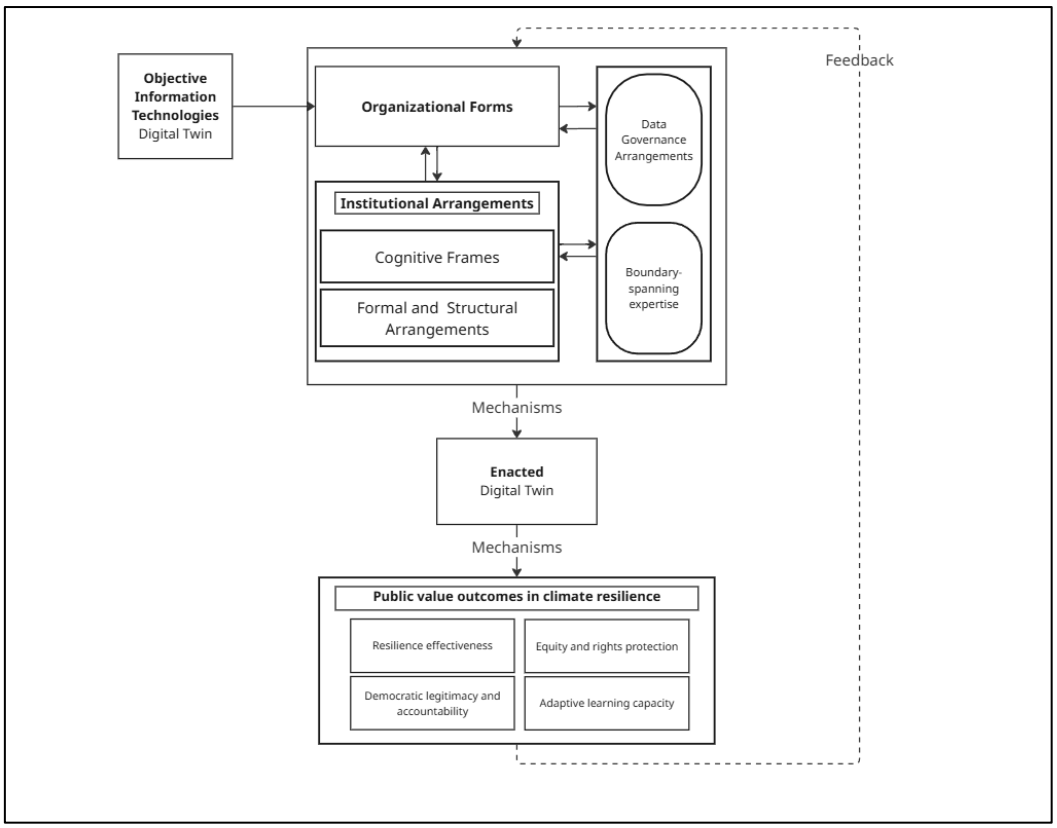


Figure 1. Conceptual Framework

4. Research Design

In this research, we will use an intensive single-case study approach to examine London's digital twin for climate resilience. Acknowledging the drawbacks of using a single case study instead of a comparative approach, case studies are suitable when: (1) the case is essential for theoretical testing, (2) the case is atypical or enlightening, (3) the case allows for thorough observation and analysis, or (4) the case exhibits considerable within-case variety that facilitates comparative reasoning (Yin, 2018). From this perspective, for the stage of digital twins' development and implementation, and the complex institutional arrangement, London meets a number of requirements.

First, London represents a most likely case for digital twin success: well-resourced, technologically advanced, and politically committed to both digital governance and climate action. If institutional conditions produce meaningful variation in enactment and public value within London, this strengthens the claim that institutions matter more than technology. Second, London has several partially integrated operational digital twins and data infrastructure, enabling evaluation of actual governance use rather than anticipated effects. Third, London's complex multi-level governance structure with the Greater London Authority (GLA), 32 borough councils, national agencies, and major infrastructure operators, including Transport for London and Thames Water, generates substantial within-case variation in institutional arrangements across a single metropolitan area. Fourth, London's digital governance and resilience investments have sufficient temporal depth to permit analysis of institutional learning and adaptation over time.

London is therefore conceptualized not as a single unified digital twin but as a metropolitan ecosystem of partially connected digital twins and data initiatives relevant to climate resilience governance, with a framing that better reflects the distributed reality of metropolitan governance.

Data Collection and Analysis

The study combines three main evidence sources. Semi-structured interviews (approximately 15–20) will be conducted with public managers, technical specialists, climate and resilience officers, and governance intermediaries involved in digital twin initiatives. Interviews prioritize concrete decision episodes, focusing on moments when digital twin outputs did or did not influence planning, coordination, emergency response, or governance change. Document analysis covers climate adaptation strategies, digital twin specifications, governance frameworks, and data policies. Observational material will be collected where feasible. Fieldwork is planned for 2026. Analysis proceeds in two stages: within-subcase process narratives tracing mechanisms, followed by structured cross-subcase comparison matrices examining how variation in conditions corresponds to variation in enactment and public value configurations.

5. Preliminary Insights

London's climate governance context has been significantly shaped by two recent shocks: flash floods in July 2021 and a 40°C heatwave in July 2022. These events prompted the Mayor to commission an independent review, published as the London Climate Resilience Review in July 2024, which produced 50 strategic and operational recommendations directed at the GLA, the UK government, 32 borough councils, and major infrastructure operators (G.L.A., 2024). The Review reflects a governance landscape characterized by distributed responsibilities, fragmented data flows, and significant coordination challenges despite London's technical sophistication and resource base.

Digital twin and data governance initiatives operate within this complex setting. At the national level, the UK National Digital Twin Program established the Gemini Principles as an information management framework for connected digital twins in the built environment, providing the interoperability architecture within which London public sector bodies develop their own initiatives (CDBB, 2022). At the metropolitan level, the GLA has produced London-wide climate risk maps with Bloomberg Associates and is piloting a decision-making tool to incorporate climate considerations into major investment decisions. At the operational level, digital twin applications for flood risk management, drainage monitoring, and infrastructure resilience are being developed across boroughs and infrastructure operators, with varying degrees of institutional embedding.

Three preliminary patterns emerge from this initial mapping. First, institutional complexity appears to constrain enactment even where technical capacity is strong: boundary-crossing data integration remains problematic despite formal sharing agreements and standardized interfaces.

Second, enactment appears more developed and better integrated in emergency management contexts where the imperative for real-time coordination is unambiguous than in strategic planning and adaptation, where governance arrangements are more contested. Third, boundary-spanning roles of actors combining technical literacy with governance and policy knowledge appear disproportionately important in making digital twin outputs actionable, a pattern consistent with recent empirical findings on digital twin implementation challenges in public administration (Richter et al., 2025). These patterns will be developed and tested through the planned fieldwork.

6. Expected Contributions

This paper contributes to three strands of literature. First, it advances digital twin research in public administration by shifting the analytical focus from technical potential to institutional enactment, providing an explanation for why technically comparable systems produce divergent governance outcomes. This extends recent scholarship showing that digital twins tend to falter at the transition from research and demonstration into routine public decision-making (Nochta et al., 2021; Richter et al., 2025).

Second, it refines the theoretical relationship between technology enactment and public value scholarship by establishing a clear analytical architecture: TEF explains how institutional conditions shape enacted technologies; public value scholarship provides the evaluative vocabulary for assessing what those enactments produce. This clarification directly addresses a conceptual conflation that recurs in the digital government literature, where enabling conditions are sometimes treated as value outcomes.

Third, the paper contributes to climate resilience governance research by identifying specific mechanisms through which digital twin enactment may strengthen or compromise governance capacities for anticipation, coordination, accountability, inclusion, and institutional learning in a complex metropolitan setting. By treating public value trade-offs rather than a unitary public good as the expected outcome of enactment, the paper is better positioned to capture the contested and distributed nature of value creation in multi-level urban governance.

7. Limitations of the research

As a work in progress, several limits need to be recognized. The one case design facilitates comprehensive description and mechanism identification while constraining generalizability. Findings constitute indicative theoretical propositions that warrant validation across larger samples. The context-specific insights might limit transferability to developing nations or non-democratic regimes. Because the technology environment is dynamic, some digital twin features may change, while problems with institutional governance are likely to change more slowly. However, notwithstanding these constraints, the research tackles significant deficiencies at the convergence of digital transformation, public value generation, and climate governance, which is an area that is becoming increasingly vital for public management scholarship and practice as technological development transforms opportunities and challenges for public entities dedicated to the common good.

Keywords: Digital twins; technology enactment; public value; climate resilience; urban governance; digital transformation; public administration; institutional arrangements

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Rethinking Sport in Public Governance: Policy Challenges and Accountability Perspectives

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1. Background and aim

A report by KPMG Australia Sport Consulting (Zubrik, Miranda and Gardiner, 2021) emphasized as COVID-19 showed, among the others, the impact that sport activities have on our wellbeing, suggesting that sport should be part of governments' social agenda. The report highlighted that, apart from the well-known health benefits of sport (eg: reduced risk of chronic disease; improved mental health and wellbeing; improved education and employment outcomes) there are other factors to be considered and quantified such as increased levels of trust; urban renewal; reduced anti-social behaviour; increased community pride and identity creation; increased social connectedness and inclusion.

Indeed, at a policy level, the social value of sport has been widely recognised in the last decades. The White Paper on Sport of the EU Commission (European Commission, 2007) has a specific chapter, entitled "The Societal Role of Sport", in which it is highlighted the role of sport even in the process of EU identification. At government level there are several reports and documents indicating the social impacts of sport (eg: Taylor et al., 2015; Sport NZ, 2017; Australian Government, 2018). Also several national sport federations have been issuing analysis and reports emphasising this further role of sport (eg: Aronsson, 2008; Moss et al., 2016; CONI, 2018). Even in the field of consulting (apart from the above cited one by KPMG) reports and publications are nowadays highlighting these aspects (e.g.: EY, 2015; Ajadi, 222; KPMG Ireland, 2023; PWC, 2025).

At an academic level, several studies and researches have been dealing with these aspects in the last years. Particularly investigating the role of sport for social inclusion and community wellbeing, seen in different fields and contexts.

In a sociological perspective the issue has been studied upon different perspectives. It has been highlighted its capacity to contribute in tackling social exclusion faced in different areas of life (Collins and Kay, 2014; Kingsley and Spencer-Ca valiere, 2015). They have been analysed the barriers to be tackled for avoiding exclusion (Kingsley, Spencer-Cavaliere and Tink, 2017). It has been investigated its capacity to foster youngster inclusion (Holt, 2016; Ekholm and Dahlstedt, 2017) as well as in tackling youngsters' anti-social behaviours, (Haudenhuyse, 2017). The common line in these researches is the assumption that sport must be considered a social institution in almost every society, because it combines characteristics found in any institution with a peculiar appeal in relation to the processes of socialization and social change (Frey and Eitzen, 1991).

In terms of policy studies, apart from the well-known importance of fostering sport practice as health preventive therapy and important tool for youth growth (WHO, 2018, 2020; UNESCO,

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2021) it has been depicted also its capacity to improve people and community wellbeing (Porro, Martelli and Testa, 2020); its relevance as a tool for welfare (Heinemann, 2005; Ekholm, 2016) and even its applicability as a means of crime prevention (Ekholm, 2013).

In urban and development studies, apart from the well-known construct of urban redesign through main sport events (eg: Campbell Jr, 1999; Chalkley and Essex, 1999; Burbank, Andranovich and Heying, 2002), sport has been investigated also as a tool for urban development (eg: Austrian and Rosentraub, 2002; Kozma, Teperics and Radics, 2014) and renewal of suburbs, thus improving citizens daily life (eg: Spirou and Bennett, 2002; Smith, 2010). Last but not least, in recent years, they started investigating sport potentials for eco-green development and creation of environmentally sustainable infrastructures (eg: Kim and Chung, 2018; Millington and Darnell, 2019).

Whitin managerial studies, sport has been considered for its specific core aspects on competition and the business developed around events with massive participation. It has been indeed investigated in terms of its relevance both in elite sport events management (Smith and Stewart, 2010) as well as in its relevance with sponsorship development (Morgan, Taylor and Adair, 2020) and its interaction with participants and fans as main stakeholders (Smith and Stewart, 2010). Recently some scholars are reflecting if it is the case of depicting sport peculiarities highlighting that commonly accepted theories would need modification in the sport context, even arriving at a unique aspect of sport through an empirical or theoretical/conceptual approach (Andrew, Grady and Kim, 2021).

When coming to public management studies, several aspects have been analysed. An investigated issue has been the relation between national sport organizations and central government agencies, drafting their roles in terms of elite and grassroots sport (Sam, 2009). It has been highlighted the difficulty in measuring the qualitative nature of the public value of sport for the greater good within the organization (Brookes and Wiggan, 2009; Byers, Hayday and Pappous, 2020) and then the legacy of Olympic Games (Gillett and Tennent, 2022). It has been investigated also its value in terms of enhancing volunteering commitment (Girginov, Peshin and Belousov, 2017) as well as community engagement and the relations with third sector organisations (Bostock et al., 2020). An emerging issue regards the relation between local administrations and non-profit organisations in managing sport facilities in time of austerity (Iversen, 2018; Parnell et al., 2019; Cocco, Mayer and Montanaro, 2023).

Nevertheless the different investigated aspects, the role of sport as means of public value remains an item of interest for public management studies without any specific general framework and/or references, but most of all without sistamatic investigation. Indeed, in the past, it has been seen its value in terms of Social Return on Investment but mostly for sport facilities (King, 2014). It has been also experimented balanced scorecard for evaluating local sport development programmes identifying some problems of “quantification” for such a peculiar field (Walmsley, 2012), but still, these initiatives remained in some sense disconnected, still considering the different relevant aspects of public value of sport separately (Hoye and Parent, 2016).

Therefore, although the increased consideration, in the last years, of the importance of sport for public wellbeing and the relevance of the relations between sport and public bodies (from national to local) there is not yet a systematic investigation and no reference framework for considering the different multi-faceted components which contributes to the generation of public value through the different components of sport.

Starting from the above considerations, this extended abstract reports about an ongoing research activity which, (starting from the analysis, at academic level, of the Italian situation) aims, first of all to shed light on the matter in order to lay the foundation for a different approach both at academic level and at policy one.

2. Analysis of the context

Finding that the study of the interaction between sport and the public sector has not yet found its unequivocal place, we also considered that, from a political and administrative perspective, sport continues to be considered a corollary of other areas of public interest, rarely linked to healthcare, being primarily framed within departments that deal with very different fields, from culture to education or youth policies, all the way to tourism. These aspects, while confirming the importance of sports policy, also highlight its fragility.

The failure to identify a univocal place for sport, given its multidimensionality and complexity, is evident not only among practitioners but also at the academic level, where several topics are gaining relevance and deserve further exploration.

Moreover we also reflected on the fact that, in Italy, recent legislative developments – first of all an amendment of the Constitution recognising the value of sport and the enactment of a comprehensive Sports Reform – have laid the foundation for a new approach to the management and valorisation of sport, able to give awareness of its vital role in society. Furthermore, the Italian context also takes on particular significance with respect to investments and public-private partnerships related to the Milan-Cortina Winter Olympic Games of 2026.

The economic and business aspects of sport and the public-private interaction in public value creation therefore deserve, by our point of view, further investigation, especially in terms of policy, governance, regulations, and specific reporting of the various entities within the "sports system".

Now the point is that if at policy level there are several aspects which deserve a specific reflection, the role of the Academia should be more proactive in promoting, both as research and as third mission, a different conceptualisation of sport to address the necessity of its consideration in terms of public value creation.

The point is that, at Academic level, when talking about sport there is a kind of dichotomy between sport sciences and management and accountability ones, where academics from the first side engage research in public policy while the second rarely consider sport as a core topic. Recent researches (e.g. Dowling et al., 2018; Ouyang et al., 2023) show that, since 1990, research on sports policies has gained academic attention, focusing on elite sports, physical education, and sport for all. Through a systematic literature reviews it was found that nearly half of the research on these issue concentrates on organizational analyses at the meso level, referring to theories related to governance, the Sports Policy Factors Leading to International Sporting Success model, advocacy coalition framework, and network theories to understanding political dynamics, having an emphasis more on policy formation and implementation rather than evaluation. In other words, the research reflected the shift from sport management towards management governance and accountability fields rather than being a specific field within policy studies.

3. A starting point: the Italian current situation within AccountabilityAcademia

As a preliminary stage of investigation, in order to pose a different reflection upon the recognition of the public value of sport both at academic and policy level, we decided to collect data within the Italian Academia asking to the members of the Italian Accountability Association (SIDREA) which devoted an interest on the issue[5] information about their research interests,

[5] Within the Italian Academic Accountability Association (SIDREA), using the tools they made available, we could communicate the initiative to all its members thus establishing a dedicated Study Group. We also took advantage by the opportunity to use specific conferences and congresses to share the aims of the initiative we were about to undertake. The promotion of the group's goals and subsequent membership requests began in the summer of 2024, and in September 2024, a specific presentation meeting was held within the SIDREA National Congress. In December 2024, the membership period ended achieving a total of 59 adherents. There have been then organised – since the first one in December 2024, where the

scholarly activities, teaching responsibilities, and professional networks, organized across distinct areas of inquiry. The requests were made through the use of Qualtrics thus giving us the possibility to collect data and elaborate a dataset.

These preliminary results reveal a diverse and interdisciplinary landscape of scholarly engagement within the Sport Policy and Sport Management themes. Its content enables the identification of shared research areas, significant scholarly outputs, teaching contributions, collaborative networks, and emerging lines of inquiry. Taken together, these elements effectively capture the intellectual profile and research capacity of several Italian researchers, offering a solid foundation for thinking about the creation of a shared framework and method to give shape and substance to the depiction and measurement of the public value of sport. We briefly report, hereafter the main aspects.

3.1. Emerging Research Themes

A set of recurring and interconnected thematic clusters emerges, characterizing the current focus of several Italian researchers and collectively reflecting a multidimensional understanding of sport as a social, economic, cultural, and institutional phenomenon. The scholarly dialogue reveals an increasingly interdisciplinary approach, informed by both long-standing research traditions and contemporary transformations in sport systems. The following integrated themes define the current research landscape:

Conceptual Foundations and Definitions of Sport. A central concern which came out is the evolving definition and conceptual boundaries of sport. Colleagues emphasized the need to interrogate what constitutes "sport" in contemporary societies, examining its formal and informal manifestations, the rise of new practices, and the implications for governance, participation, and policy development, thus providing the foundation for subsequent debates on inclusion, measurement, and institutional responsibilities.

Measurement of Social, Economic, and Community Impact. Assessment of sport's multifaceted impact represents another core theme. Discussions underscored the methodological complexity of capturing economic, social, cultural, and educational contributions and highlighted the necessity of robust, multidimensional models capable of evaluating community benefits, organizational performance, and long-term societal outcomes. Scholars stressed the importance of integrating qualitative and quantitative approaches within comprehensive impact frameworks.

Risk Management and Sustainability. Risk and sustainability emerged as key concerns across organizational levels. Exchanges highlighted the growing pressures on sport institutions to adopt sustainable practices, manage operational and reputational risks, and comply with evolving regulatory standards. This theme intersects with broader issues of ethical governance, environmental responsibility, and the long-term viability of sport organizations.

Economic Dimensions and Business Models. The economic architecture of sport and the diversity of organizational forms constitute another possible significant area of inquiry. Conversations explored financial models, economic impacts, and regulatory oversight, particularly within professional sport. Moreover, alternative business models — such as cooperatives, associations, and community-based initiatives — have been found as needing further examination looking at their potential to support sustainable governance and democratized participation.

Sport and Education Across Learning Contexts. The educational role of sport emerged as a recurrent topic, with scholars highlighting how sport should be studied in its ability to foster personal development, civic learning, and social integration. Discussions focused on pedagogical

operational foundations for the work to be undertaken were laid, sharing objectives and methods – several online plenary meetings during 2025, where specific aspects were gradually refined.

approaches, curricular inclusion, and the need for educators who combine managerial competencies with socio-pedagogical perspectives.

Violence, Safety, and Ethical Responsibility. Issues of violence, safeguarding, and ethical conduct appear also prominent. Several scholars stressed the need for policies and organizational practices that protect both physical and psychological well-being, emphasizing preventive strategies, accountability mechanisms, and the ethical responsibilities of governing bodies.

Cultural and Social Dimensions of Sport. The cultural significance of sport — as a site of identity formation, symbolic expression, and community cohesion — figured prominently with several scholars highlighting how sport can simultaneously foster inclusion and reproduce inequalities, linking these dynamics to broader debates on representation, belonging, and social cohesion.

Disability, Inclusion, and Access. Inclusion, particularly regarding disability, emerged as a foundational principle in contemporary sport management. Particularly the need to address accessibility, adaptive sport models, and governance frameworks that promote equitable participation, underscoring the value of cross-sector collaboration in building inclusive sport ecosystems.

Governance and Regulatory Evolution. Governance served as a unifying theme across discussions, with researchers highlighting the necessity to examine how sport organizations — from grassroots associations to national federations — navigate regulatory challenges, stakeholder expectations, and structural reforms. Key issues include transparency, accountability, institutional autonomy, and the implications of policy changes for organizational effectiveness.

3.2. Relevant Bibliographic Foundations

The analysis of the data collected through the Qualtrics allowed us also to depict the fact that it does already exist an established scholarly traditions and simultaneously emerging challenges in sport policy and management. In other words, the present scenario reveals a sustained scholarly interest in financial regulation, organizational structures, and social accountability within the sports sector. Key reference domains in this sense include: 1) Governance studies in sport organizations; 2) Impact assessment and measurement frameworks; 3) Literature on management control and accountability in sport; 4) Studies on business models and reforms in the sports system.

3.3. Research Projects and networks

Another relevant issue regards the fact that many Italian scholars in accountability are already working on research projects, even at international level, particularly in the following aspects: 1) Impact measurement and evaluation; 2) Sustainability and risk management in sport; 3) Governance structures and regulatory dynamics; 4) Educational and inclusive approaches to sport participation.

A very interesting further aspect regards the fact that most of the involved scholars are already engaged in a range of networks at national and especially international level, underscoring a strong embeddedness within wider scholarly and professional communities.

3.4. Ongoing challenges

Another reflection, we enucleated from the collected data and information, regards the ongoing debate and the current challenges the Accountability Academia should face to depict the public value of sport.

A preliminary one concerns the definition of sport and the construction of conceptual and taxonomic frameworks capable of capturing its diverse forms, from amateur to professional

practice, and involving heterogeneous target groups and organizational settings. Parallel to this, there is the theme of sport as a vehicle for social inclusion which, first of all, should (through systematic reviews, case studies, and empirical analyses) give a basis to clearly illustrate its importance in public value creation through community integration, youth development, and the design of inclusive ecosystems.

A strictly related aspects is, in this regard, the elaboration of frameworks for assessing social impact across organizations, events, and urban regeneration initiatives. Indeed, it has been stressed the fact that current literature reviews highlight gaps in existing evaluation tools and call for the development of multidimensional, comparable, and theory-informed models capable of capturing sport's societal outcomes.

Consequently, a further strand focuses on the measurement of sport's economic and social impact, with researchers which should examine accounting systems, reporting tools, SROI methodologies, and the role of organizations as agents within wider socio-economic ecosystems. Complementary it ought to be addressed financial controls, anti-doping systems, and the evolving regulatory architecture governing professional and amateur sport.

The theme of sport policy ought to be similarly oriented toward understanding how regulatory reforms — from grassroots to elite levels — shape the development of specific disciplines, organizational models, and athlete careers, including the socio-economic implications of recent legislative changes.

Governance thus remains a central cross-cutting concern, to be studied at multiple levels: international bodies, national systems, federations, clubs, and mega-events. This claims to investigating co-governance challenges, mechanisms of accountability, stakeholder-inclusive business models, and the performance implications of good governance practices.

Another emerging issue deals with risk and sustainability management, examining both mega-events and sport clubs through perspectives that include regulatory frameworks, organizational resilience, environmental considerations, and innovative conceptual lenses such as the U-Theory.

A peculiar one emphasises the cultural and creative value of sport, and its synergies with broader "Made in Italy" industries highlighting sport's function as a cultural catalyst and as a strategic node within wider value networks.

A final critical research trajectory considers the need of tackling possible "disvalue". It regards violence and safety in sport, raising the need to analyse systemic responses to hooliganism, antisocial behaviour, and stadium security, especially during important major events which in the last years are linked to the necessity to implement measures to prevent any possible terrorist attack.

4. Conclusive remarks for an agenda to depict the public value of sport

The dialogue initiated among the Italian Accountability Academic Association reveals that already exists a rich and interconnected set of research directions – on which several scholars have already started working – that collectively might advance the understanding of sport as a complex social, economic, and cultural institution and thus depict its public value. But the relevant point is that these themes, ranging from conceptual foundations to governance and inclusion, are not articulated yet to form a coherent agenda for future inquiry and underline the multidimensional nature of contemporary sport policy and sport management within a dynamic and interdisciplinary scholarly community committed to advancing conceptual clarity, methodological rigor, and policy-relevant insights across the sport sector. At the same time, our initial investigation of the status quo in the Accountability Academia reveals a potential rich and multifaceted research agenda at the intersection of sport policy, management, governance, and societal impact. Therefore academic discussions across different thematic clusters might underscore a shared effort to theorize and systematize the complexity of the sport sector, while

advancing innovative analytical and methodological approaches to depict and measure its public value.

Keywords: Sport; public value; governance; accountability; social Impact

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I controlli informali come leve della responsabilità sociale nel settore pubblico

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1. Background teorico e obiettivi della ricerca

L'intensificarsi delle istanze volte a favorire la diffusione di modelli di sviluppo sempre più equi e sostenibili, provenienti dalla società civile, dagli organismi nazionali e sovranazionali e dai diversi stakeholders, stanno spingendo le aziende, sia private che pubbliche, ad accrescere il proprio impegno verso una più consapevole e matura integrazione dei principi di responsabilità sociale (RS). Tale impegno non si riflette soltanto nel soddisfacimento delle esigenze di accountability e di rendicontazione esterna (Raucci et al., 2020), ma investe anche i meccanismi di funzionamento dei sistemi direzionali. In questa prospettiva interna, le funzioni e gli impieghi dei sistemi di controllo di gestione (SCG) risultano particolarmente rilevanti nel supportare una più profonda integrazione degli approcci di RS sia a livello strategico che operativo (Johnstone, 2019; Laguir et al., 2019), promuovendo e plasmando dall'interno l'incorporazione della cultura e dei valori della sostenibilità sociale (Bebbington, 2007; D'Onza, 2022).

Recenti studi sul ruolo dei SCG come leve per una efficace integrazione dei principi di RS nei contesti organizzativi hanno evidenziato i possibili percorsi di sviluppo di meccanismi di 'sustainability control', capaci di indurre comportamenti individuali coerenti con gli obiettivi di RS e opportunamente bilanciati con quelli economico-finanziari (Burritt e Schaltegger, 2010; Gond, 2012; Castellano e Felden, 2021; Schaltegger et al., 2022). Infatti, i SCG, sia nei loro meccanismi formali di funzionamento, ispirati a logiche codificate e di cybernetic control, sia in quelli informali, riguardanti i processi di comunicazione non proceduralizzati e le interazioni tra gli attori organizzativi, hanno come obiettivo finalistico quello di accrescere i livelli di goal congruence tra l'azienda e i suoi attori interni (Malmi e Brown, 2008; Tessier e Otley, 2012; Marchi et al., 2018). In particolare, Merchant e Van der Stede (2007) teorizzano quattro tipologie di controllo in base all'oggetto a cui fanno riferimento. Essi distinguono i controlli sui risultati e sulle azioni, basati su meccanismi formalizzati di funzionamento e di impiego manageriale, e i controlli del personale e della cultura interna, che agiscono secondo meccanismi informali. Nel dettaglio, i controlli sui risultati indirizzano i comportamenti dei dipendenti stabilendo ex-ante gli obiettivi da raggiungere e verificando ex-post i risultati raggiunti, mentre i controlli sulle azioni prescrivono o limitano direttamente le azioni che i dipendenti devono compiere (o evitare), per assicurare che il loro comportamento sia conforme agli obiettivi aziendali. Per altro verso, i controlli del personale impiegano i diversi meccanismi di gestione dei dipendenti, dalla selezione iniziale, ai percorsi di formazione, apprendimento e sviluppo della carriera, per renderli capaci, motivabili, auto-regolati nello svolgere i compiti e per tale via consapevoli dei comportamenti da tenere per perseguire gli obiettivi. I controlli culturali, invece, si sostanziano in quell'insieme di meccanismi attraverso cui l'azienda orienta i comportamenti dei dipendenti, veicolando valori, principi, norme, convinzioni e aspettative condivise. Queste dimensioni culturali sono impiegate come strumenti per indirizzare le persone nell'adozione di comportamenti desiderati senza

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necessità di controlli diretti o formali. Le evidenze empiriche sottolineano come sia i controlli del personale che i controlli culturali, pur nella loro valenza informale, possono risultare efficaci, almeno quanto quelli formali, nell'influenzare gli esiti aziendali (Laguir et al., 2019). Essi, quindi, opportunamente impiegati, possono costituire importanti strumenti organizzativi con cui modellare anche i processi di condivisione dei principi e dei valori organizzativi di RS tra i dipendenti.

In particolare, le positive percezioni dei dipendenti riguardo ad usi manageriali dei controlli culturale e del personale coerenti con la promozione dei principi di RS possono indurre negli stessi processi di interiorizzazione di tali principi agendo sui bisogni individuali secondo le dinamiche concettualizzate della Self-Determination Theory (Ryan e Deci, 2000; Gagné e Deci, 2005). Tale teoria, infatti, evidenzia come tra i bisogni fondamentali che ciascun individuo tende a soddisfare assumono particolare rilievo la competenza, intesa come la percezione di avere opportunità di sviluppo e di realizzazione di sé, l'autonomia decisionale, e la relazionalità, quale espressione del senso e del significato soggettivo dell'appartenenza ad una comunità di riferimento. Nel bisogno di relazionalità rientra anche l'esigenza dei dipendenti di sentirsi parte della propria organizzazione e degli scambi interpersonali al suo interno. Il soddisfacimento di tale bisogno facilita l'identificazione degli individui con gli obiettivi e i valori dell'organizzazione in cui operano (Ryan e Deci, 2000), tra questi vi sono anche quelli legati alla RS. In queste prospettive di analisi, gli studi sulle dimensioni affettivo-relazionali della RS, compresi quelli nel contesto pubblico (D'Aprile e Talò, 2014; Hammon et al., 2023), sottolineano come le modalità in cui i dipendenti percepiscono che la propria azienda adotti approcci che rispecchiano e soddisfano le loro aspettative di RS, sia all'interno che nei confronti degli stakeholders esterni (Ng et al., 2019), possono indurre in loro risposte comportamentali coerenti con le finalità di RS che l'azienda mira a promuovere.

Questi processi di operazionalizzazione dei principi di RS costituiscono un argomento di rinnovata importanza soprattutto nel settore pubblico (Albareda et al., 2008; Hammon et al., 2023). Ciò in ragione dello stretto legame che intercorre tra tali principi e i tradizionali valori, responsabilità e finalità istituzionali che dovrebbero ispirare e guidare l'azione delle organizzazioni pubbliche nella creazione di valore pubblico (Abdelmotaleb e Saha, 2019; Bracci et al., 2019; Amici e Cepiku, 2020). In tal senso, come sottolineato dalle ricerche sulla RS nel contesto pubblico (Aguilera et al., 2007; D'Aprile e Talò, 2014; Abdelmotaleb e Saha, 2019), la promozione dei principi di RS dovrebbe andare a "rinvigorire" la forza dei valori insiti nei fini e nell'operato delle organizzazioni pubbliche, come quelli dell'accountability, della giustizia ed equità, della solidarietà, dell'inclusione sociale. Per tali organizzazioni, quindi, le potenzialità dei controlli culturali e del personale nello stimolare positive esperienze di RS a livello individuale può rivelarsi una leva particolarmente importante (Van der Kolk et al., 2019; Hammon et al., 2023).

Tuttavia, gli effetti dei SCG in termini di incorporazione dei principi di RS sul piano individuale costituiscono una tematica ancora poco esplorata nel settore pubblico. Soprattutto, si sa relativamente poco su come i dipendenti pubblici senza incarichi manageriali reagiscono all'impiego manageriale dei controlli culturale e del personale in queste prospettive di studio. Difatti, la letteratura sui SCG ha assunto come principale prospettiva di investigazione quella dei manager e delle loro "intenzioni di controllo", essendo i principali utilizzatori di tali sistemi (Tessier e Otley, 2012; Cepiku et al., 2017; Raucci e Paolini, 2022), mentre gli usi informali dei SCG da parte dei manager sono scarsamente esplorati nelle prospettive percettive del controllo da parte dei loro subordinati (Tessier e Otley, 2012; Van der Kolk et al., 2019; Van der Merwe e Botha, 2019), sebbene l'uso manageriale dei SCG possa veicolare in questi ultimi precise percezioni e cognizioni del valore della RS per l'organizzazione e dell'agire dei suoi manager secondo logiche coerenti con tali principi.

Su queste basi, adottando un approccio tendente ad integrare l'impiego informale dei SCG con le prospettive di incorporazione della RS nel settore pubblico, il presente lavoro si propone

di esplorare il ruolo dei controlli culturale e del personale nell'accrescere le percezioni di RS da parte dei dipendenti pubblici senza ruoli manageriali.

2. Metodologia di ricerca

Per perseguire gli scopi della ricerca, è in corso un'analisi empirica su un campione di Comuni italiani. Una survey è impiegata per raccogliere i dati tra i dipendenti senza incarichi manageriali operanti all'interno di Comuni con popolazione compresa tra 20.000 e 59.999 abitanti. Tale fascia demografica, infatti, in base ai dati Istat riflette una significativa quota di Comuni italiani. Al fine di misurare i costrutti di interesse, nel questionario somministrato ai dipendenti comunali sono state inserite domande mutuate dalla letteratura di riferimento, leggermente adattate al contesto delle municipalità in cui lo studio in oggetto si inquadra. In particolare, i controlli culturale e del personale sono stati misurati ciascuno da una scala a 5 items mutuata dal lavoro di Merchant e Van der Stede (2007), come adottata da Van der Kolk et al. (2019). Si tratta di scale di tipo Likert a 5 punti che esplorano le percezioni dei dipendenti riguardo ai controlli informali implementati dalle rispettive organizzazioni. Le percezioni di RS sono state misurate mediante la scala di Turker (2009), come già applicata al settore pubblico (Hammon et al., 2023). La validità delle scale di misurazione è stata testata mediante un'analisi fattoriale esplorativa; i factor loadings superiori alla soglia di 0,50 per tutti gli items hanno permesso di verificare la validità convergente di tutte le scale; parimenti, l'assenza di significativi major cross loadings ne ha confermato la validità discriminante. Sulla base dei dati raccolti attraverso la somministrazione del questionario, vengono quindi condotte analisi inferenziali per verificare l'influenza dei controlli informali sulle percezioni di CSR.

3. Risultati e contributi della ricerca

Le risultanze dell'indagine statistica rivelano che sia il controllo culturale che quello del personale hanno un significativo impatto positivo sulle percezioni di RS dei dipendenti pubblici. Tali risultati sono in linea con i precedenti studi sull'efficacia dei controlli informali nel facilitare la condivisione e l'identificazione con i valori aziendali, che includono quelli relativi alla responsabilità sociale (Abdelmotaleb e Saha, 2019; Bracci et al., 2019). Lo sviluppo delle percezioni di RS da parte dei dipendenti pubblici senza ruoli manageriali costituisce un risultato importante, in quanto le stesse sono a loro volta capaci di influenzare le attitudini e i risultati lavorativi dei soggetti che le sperimentano. In particolare, le percezioni di un orientamento aziendale attento alle relazioni interpersonali interne e socialmente responsabile per il tramite dei suoi manager e delle relative modalità di impiego informale dei SCG possono indurre nei dipendenti schemi interpretativi e comportamentali che li inducono a fare propri e a replicare simili principi nello svolgimento delle loro performance individuali.

In questa prospettiva, il presente lavoro intende contribuire alla ricerca sull'integrazione dei SCG con le c. d. micro-foundations della RS all'interno del settore pubblico (Bracci et al., 2019; Johnstone, 2019). In particolare, il lavoro si propone di aggiungere nuove rilevanti evidenze sull'importanza degli usi manageriali dei controlli informali per rafforzare, 'dall'interno', l'impegno delle aziende pubbliche nelle pratiche di RS (Johnstone, 2019). Attraverso lo studio di simili impieghi dei SCG, il lavoro contribuisce altresì agli emergenti studi di 'micro-RS', esplorando i fattori abilitanti le percezioni di RS (Aguilera et al., 2007; Albareda et al., 2008; Hammon et al., 2023). In quest'ottica, lo studio integra i risultati esistenti basati sulle percezioni dei SCG da parte del management con ulteriori evidenze basate sulle spesso trascurate percezioni di controllo dei dipendenti senza incarichi manageriali (Tessier e Otley, 2012).

Lo studio suggerisce al management pubblico e ai policy maker di valorizzare la dimensione relazionale legata ai controlli culturale e del personale all'interno della struttura meccanicistica dei SCG, anche se questi controlli, in quanto informali, risultano meno visibili e in genere non

costituiscono uno strumento deliberatamente progettato per focalizzare l'attenzione dei dipendenti sugli obiettivi organizzativi. Tale maggiore valorizzazione e gli effetti che da questa ne conseguirebbero renderebbero infatti possibile sviluppare una forza lavoro più allineata con gli obiettivi organizzativi, e, nello specifico, più coinvolta nella gestione 'socialmente responsabile' del servizio pubblico. Inoltre, la promozione dei principi di inclusione sociale e di pari opportunità trai i dipendenti consentirebbe la costruzione di modelli organizzativi più equi e sostenibili, garantendo così il perseguimento di quei valori e obiettivi pubblici più ampi che le organizzazioni pubbliche incarnano from within (Aguinis e Glavas, 2012; Burns e Jollands, 2020).

Tuttavia, allo stato attuale lo studio presenta una serie di limitazioni che saranno superate con il successivo sviluppo della ricerca. Le evidenze si basano su un ristretto numero di osservazioni. Considerata la soggettività dei dati utilizzati, che, in quanto tali, sono influenzati dal contesto organizzativo e dalla relativa interpretazione soggettiva, l'ampliamento – in corso - del campione di questa indagine consentirà di estendere la generalizzabilità dei risultati ottenuti. Inoltre, negli sviluppi futuri della ricerca si intenderà esplorare il ruolo di ulteriori variabili intervenienti all'interno del modello causale osservato, così come gli impatti delle percezioni di RS sul piano attitudinale, comportamentale e di in-role and extra-role performance dei dipendenti pubblici.

Parole chiave: Controlli informali; responsabilità sociale; public management

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Digital Twin urbani e creazione di valore pubblico. Analisi multicase dei processi di programmazione e sostenibilità nelle città italiane

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1. Introduzione

Negli ultimi anni le amministrazioni pubbliche sono state chiamate a confrontarsi con sfide sempre più complesse, generate dalla sovrapposizione di crisi economiche, sociali, ambientali e sanitarie che hanno segnato gli ultimi decenni. L'intreccio di questi fenomeni ha messo in evidenza la fragilità dei modelli manageriali tradizionali, spesso orientati al breve periodo e caratterizzati da risposte emergenziali piuttosto che da una pianificazione strategica di lungo respiro (Giovanelli L., 2024). A lungo, infatti, il settore pubblico ha fatto ricorso a misure quali tagli lineari alla spesa, processi di ottimizzazione non strutturale e approcci decisionali esclusivamente reattivi, che se da un lato permettono di affrontare l'immediato, dall'altro non garantiscono sostenibilità e resilienza nel medio-lungo termine (Cepiku, D., et al., 2019). Questo scenario ha reso evidente la necessità di ripensare i modelli di governo aziendale, dotandoli di strumenti capaci di gestire la complessità crescente e di anticipare gli effetti di fenomeni globali e locali (Veronesi, G. et al.,2023).La parola Governare è un concetto che può assumere diverse interpretazioni, trae la sua radice più profonda e originaria dal significato di «reggere il timone»: cioè mantenere saldamente il controllo dello strumento che permette di condurre una nave verso una destinazione precisa. In questo senso, governare significa guidare con attenzione e consapevolezza, manovrare con fermezza, tenere sotto controllo e prendersi cura del percorso per assicurarsi che si arrivi al traguardo prefissato (Bertini, U., 2013; Giovannelli 2024). Tuttavia, affinché questa guida sia effettiva e significativa, è necessario considerare un orizzonte temporale sufficientemente ampio. Se infatti l'attenzione si limita al breve periodo o all'immediato, non è possibile formulare strategie lungimiranti né valutare adeguatamente le conseguenze delle decisioni. Senza uno sguardo esteso nel tempo, molte riflessioni sulla sostenibilità, sulla resilienza e sul valore pubblico rischiano di restare astratte, perché mancano le basi per un governo che sappia realmente anticipare e gestire la complessità. Di conseguenza, governare in modo efficace significa prima di tutto saper estendere lo sguardo oltre l'oggi, immaginare e pianificare percorsi a lungo termine, con la capacità di adattarsi e correggere la rotta in base ai cambiamenti che si manifestano nel tempo. Nel contesto della gestione pubblica, il termine "governare" viene comunemente inteso come la responsabilità di guidare e amministrare uno Stato, sia sotto il profilo politico che amministrativo. Il concetto di governo, invece, si declina in diversi modi: può riferirsi alla forma politica assunta da uno Stato oppure rappresentare il potere esecutivo incaricato di applicare le leggi e rispondere ai bisogni collettivi. Inoltre, il termine identifica anche l'organo esecutivo stesso, come nel caso del sistema costituzionale italiano, in cui il Governo è composto dal Presidente del Consiglio e dai Ministri, e detiene il compito decisionale di indirizzare e coordinare l'amministrazione pubblica (Giovanelli L., 2024).

In questo contesto di crescente complessità e necessità di visione a lungo termine, le amministrazioni pubbliche si trovano a dover adottare nuovi strumenti e approcci in grado di

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migliorare la capacità di pianificazione e gestione, sfruttando le potenzialità offerte dall'innovazione tecnologica.

Parallelamente, l'evoluzione tecnologica ha messo a disposizione delle amministrazioni pubbliche un insieme sempre più articolato di soluzioni innovative in grado di trasformare in profondità il modo in cui vengono pianificati, gestiti e valutati i servizi pubblici. La crescente disponibilità di dati, l'affinamento delle tecniche di intelligenza artificiale e lo sviluppo di piattaforme integrate hanno favorito la nascita di nuovi strumenti di supporto alle decisioni. Tra questi, i digital twin urbani rappresentano una delle innovazioni con il maggiore potenziale trasformativo. Essi consistono in modelli digitali dinamici e interattivi, continuamente aggiornati grazie a flussi di dati provenienti da sensori, sistemi informativi urbani, reti di monitoraggio e infrastrutture digitali distribuite. Attraverso tali modelli, è possibile riprodurre, simulare e analizzare il funzionamento di una città in tempo reale, valutando le interazioni tra elementi fisici, ambientali, tecnologici e sociali.

L'utilizzo dei digital twin consente alle amministrazioni non solo di osservare ciò che accade nella città, ma anche di prevedere scenari futuri, di valutare l'impatto potenziale delle politiche pubbliche e di sperimentare virtualmente soluzioni alternative prima di implementarle nel mondo reale. Questa capacità di simulazione e previsione rappresenta una leva fondamentale per migliorare la qualità delle decisioni pubbliche, aumentandone trasparenza, efficacia e capacità di risposta. Inoltre, tali strumenti favoriscono una maggiore integrazione tra le diverse dimensioni della sostenibilità — economica, ambientale e sociale — che costituiscono il cuore delle politiche orientate al valore comune e ai principi dell'amministrazione responsabile.

In Italia, l'interesse verso i digital twin è cresciuto in parallelo alle trasformazioni introdotte dal PNRR, che ha promosso investimenti significativi in digitalizzazione, interoperabilità dei dati e sistemi intelligenti. Alcune grandi città, come Torino, Milano e Bologna, hanno avviato sperimentazioni di modelli digitali urbani che integrano simulazioni relative alla mobilità, alla qualità dell'aria, alla gestione energetica, alla sicurezza urbana e alla pianificazione territoriale. Nonostante queste iniziative rappresentino un primo passo verso l'adozione sistematica dei digital twin, esse risultano ancora eterogenee per approccio tecnologico, obiettivi, governance dei dati e maturità organizzativa. Ciò mette in luce la necessità di sviluppare analisi più approfondite e comparabili, che permettano di comprendere in che modo tali strumenti possano contribuire in modo concreto alla generazione di valore pubblico e al miglioramento dei processi decisionali.

A fronte di tali dinamiche, emerge con forza l'esigenza di interrogarsi su come e in quale misura i digital twin urbani possano diventare veri e propri strumenti per governare in maniera innovativa, capaci di orientare la pubblica amministrazione verso decisioni più consapevoli, partecipate e sostenibili. Il loro contributo potenziale non si esaurisce nella dimensione tecnologica, ma riguarda anche aspetti organizzativi, culturali e metodologici: dall'evoluzione delle competenze interne alla capacità di costruire ecosistemi collaborativi, dall'integrazione nei processi programmatori alla definizione di nuovi modelli di monitoraggio e valutazione.

La presente ricerca si inserisce in questo contesto, con l'obiettivo di arricchire il dibattito scientifico e manageriale sul ruolo delle tecnologie emergenti nella creazione di valore pubblico, esplorando il potenziale dei digital twin come leve per migliorare la programmazione integrata e contribuire al raggiungimento degli obiettivi di sostenibilità urbana.

2. Analisi della letteratura

Negli ultimi anni, il concetto di digital twin urbano si è progressivamente affermato come uno degli strumenti più promettenti per affrontare la crescente complessità della governance delle città. La letteratura scientifica evidenzia come i modelli tradizionali di pianificazione e gestione urbana, prevalentemente reattivi e settoriali, risultino sempre meno adeguati di fronte a sfide sistemiche quali il cambiamento climatico, la pressione demografica, la transizione ecologica e la necessità di creare valore pubblico sostenibile (Deng et al., 2021). Tale discrasia trova maggiore

enfasi in un contesto sociale in cui si sta affermando, in maniera quantomeno preponderante, l'uso dell'intelligenza artificiale che porta con se nuove sfida, ma anche nuovi strumenti di gestione della cosa pubblica.

In questo contesto, Deng et al. (2021) propongono il concetto di Digital Twin City come nuovo paradigma di governance urbana, fondato sull'integrazione continua tra mondo fisico e digitale. Attraverso una revisione sistematica della letteratura, gli autori mostrano come i digital twin permettano di superare una governance frammentata, favorendo un approccio proattivo e sistemico basato su simulazione, previsione e supporto alle decisioni. Il digital twin non è quindi inteso come semplice strumento tecnologico, ma come infrastruttura cognitiva a supporto delle politiche pubbliche.

Questa visione trova riscontro in numerosi casi studio applicativi, che dimostrano come i digital twin possano incidere concretamente sui processi decisionali. Un esempio significativo è rappresentato da IPPODAMO, sviluppato nell'area metropolitana di Bologna (Bujari et al., 2021). In questo caso, il digital twin è utilizzato per la gestione delle infrastrutture urbane e per la programmazione della manutenzione, tradizionalmente caratterizzata da una forte frammentazione tra attori pubblici e privati. Il sistema consente di costruire una visione unificata e predittiva del territorio, migliorando coordinamento, trasparenza e capacità di pianificazione, elementi centrali per una governance urbana orientata al valore pubblico.

Un approccio analogo emerge anche nel caso di Matera, dove il digital twin è sviluppato secondo il paradigma della Urban Intelligence (De Benedictis et al., 2025). Qui, l'integrazione di dati morfologici, sensori IoT, modelli di simulazione e contributi partecipativi consente di supportare non solo la pianificazione urbana ordinaria, ma anche la gestione delle emergenze e l'ottimizzazione dei servizi. Il caso di Matera evidenzia come il digital twin possa diventare uno spazio di apprendimento collettivo e uno strumento di governance collaborativa, capace di coinvolgere amministrazioni, stakeholder e cittadini.

Altri contributi (Gholami et al., 2022) si concentrano sull'uso dei digital twin come strumenti di supporto alle politiche di sostenibilità e benessere urbano. Lo studio condotto a Imola dimostra come un digital twin tridimensionale possa essere utilizzato per valutare il comfort termico e progettare reti pedonali verdi, supportando decisioni basate su simulazioni microclimatiche validate con dati reali. In questo caso, il digital twin rafforza la capacità delle amministrazioni di anticipare gli effetti delle scelte progettuali, riducendo l'incertezza decisionale.

La dimensione partecipativa e collaborativa della governance emerge con forza anche nel progetto di Torino, analizzato da Boccardo et al. (2024). Il digital twin urbano torinese è concepito come piattaforma condivisa, capace di integrare GIS, modelli 3D e tecnologie immersive per favorire il dialogo tra amministrazioni, tecnici e cittadini. Tuttavia, gli autori sottolineano come il successo di tali strumenti dipenda dalla capacità di rappresentare la complessità urbana e di superare barriere organizzative e culturali.

Un caso emblematico di applicazione del digital twin alla pianificazione urbanistica è quello di Zurigo, analizzato da Barresi (2023). Qui, il digital twin è utilizzato come strumento predittivo per supportare decisioni di lungo periodo orientate alla sostenibilità. Allo stesso tempo, l'autrice evidenzia criticità rilevanti, tra cui il rischio di approcci eccessivamente tecnocratici e la dipendenza da infrastrutture tecnologiche complesse, richiamando l'attenzione sulla necessità di una governance consapevole dei dati e dei processi decisionali.

Il tema della trasparenza e dell'accessibilità è centrale nel framework Snap4City, applicato al caso studio di Firenze (Adreani et al., 2024). La piattaforma open-source consente l'integrazione di dati in tempo reale e la loro diffusione attraverso interfacce 3D accessibili anche ai cittadini. Questo approccio rafforza la dimensione democratica della governance urbana, favorendo processi decisionali più inclusivi e informati.

Infine, una prospettiva critica e sistematica è offerta da Caprari et al. (2022), che collocano i digital twin nel contesto delle politiche europee del Green Deal. Gli autori evidenziano come, nonostante il forte potenziale, i digital twin siano ancora in una fase sperimentale, con un gap

significativo tra sviluppo tecnologico e reale integrazione nei processi di governance e programmazione urbana. Analogamente, il caso di Bologna analizzato da Benedetti et al. (2022) mostra come la digitalizzazione e i digital twin possano supportare strategie di rigenerazione urbana ed economia circolare, ma richiedano modelli decisionali strutturati e competenze adeguate al fine di generare valore pubblico duraturo.

Come visto, la letteratura di riferimento identifica i digital twin urbani come strumenti ad alto potenziale per trasformare la governance urbana, spostandola da una logica reattiva a una logica predittiva, integrata e orientata alla sostenibilità. Ad ogni buon conto, emerge chiaramente che il valore di tali strumenti non risiede esclusivamente nella tecnologia, ma nella loro capacità di essere integrati nei processi decisionali, organizzativi e partecipativi delle amministrazioni pubbliche.

Sebbene i digital twin stiano emergendo come tema di grande interesse a livello internazionale, diversi aspetti rimangono ancora poco esplorati, soprattutto nell'ambito del management pubblico. Gran parte delle ricerche disponibili si concentra principalmente su questioni tecniche, ingegneristiche e informatiche, approfondendo architetture, algoritmi e integrazione dei dati. Poco spazio è invece dedicato alla prospettiva manageriale: manca cioè un'analisi che consideri i digital twin come strumenti di governance e di programmazione, capaci di migliorare concretamente la qualità delle decisioni e di generare valore pubblico.

Un'altra lacuna riguarda l'assenza di modelli consolidati per valutare l'impatto dei digital twin sui processi decisionali e sulla sostenibilità delle politiche urbane. Non esistono ancora framework chiari che consentano di misurare in modo sistematico quanto questi strumenti possano influenzare la qualità della pianificazione e l'efficacia delle azioni amministrative.

Il contesto italiano rappresenta un caso particolarmente interessante, sia per le opportunità offerte dal PNRR sia per le specificità istituzionali delle amministrazioni locali, ma allo stesso tempo manca una mappatura sistematica delle esperienze in corso. Non esiste un confronto comparato tra città che possa portare all'identificazione di buone pratiche replicabili e modelli organizzativi efficaci.

Inoltre, l'adozione dei digital twin richiede competenze avanzate in analisi dei dati, intelligenza artificiale e modellazione, così come una governance dei dati efficace. Nonostante ciò, la letteratura ha finora dedicato poca attenzione a questi aspetti, così come al potenziale dei digital twin di supportare la sostenibilità urbana e la resilienza sociale e ambientale.

La presente ricerca nasce proprio con l'obiettivo di affrontare queste lacune, offrendo un contributo sia teorico sia operativo per comprendere come i digital twin possano diventare strumenti di innovazione nella gestione pubblica.

3. Domanda di ricerca e sviluppo delle ipotesi

Alla luce del contesto descritto, la ricerca si pone l'obiettivo centrale di rispondere a una domanda fondamentale: in che modo l'adozione dei digital twin urbani può realmente contribuire a migliorare i processi di programmazione integrata, la capacità previsionale e la creazione di valore pubblico all'interno delle amministrazioni locali italiane? Questa domanda guida rappresenta il fulcro di un'indagine approfondita che mira a esplorare il potenziale innovativo di una tecnologia emergente nel campo della governance pubblica, cercando di comprendere se e come essa possa incidere positivamente sulla qualità delle decisioni e sulla gestione delle città.

Da questa domanda principale derivano una serie di sotto-interrogativi specifici, che permettono di articolare il percorso di ricerca in modo più dettagliato e sistematico. Il primo di questi riguarda le condizioni necessarie affinché i digital twin possano essere efficacemente integrati nella programmazione pubblica: quali sono, infatti, le caratteristiche tecnologiche, organizzative e culturali che favoriscono o ostacolano l'adozione di questi strumenti? Questo aspetto è cruciale per capire quali elementi devono essere presenti all'interno delle amministrazioni per trarre il massimo vantaggio da questa innovazione.

Un secondo interrogativo si concentra sull'impatto che i digital twin hanno sulla capacità delle amministrazioni di sviluppare strategie a lungo termine. In un contesto caratterizzato da sfide complesse e spesso imprevedibili, saper guardare avanti e anticipare scenari futuri diventa fondamentale per una governance efficace e sostenibile.

La ricerca si propone inoltre di indagare quali dimensioni del valore pubblico – ambientale, sociale, economica o organizzativa – risultano maggiormente influenzate dall'utilizzo dei digital twin. Questo permette di comprendere in modo più preciso dove l'impatto tecnologico si traduce in benefici concreti per la collettività e per l'efficienza dell'azione amministrativa.

Infine, un aspetto non meno importante riguarda i rischi e le criticità che possono emergere dall'adozione di tali tecnologie. La ricerca si propone di identificarli con attenzione, individuando anche possibili strategie per mitigarli, al fine di garantire un utilizzo responsabile e sostenibile dei digital twin.

Questa indagine vuole valutare se i digital twin rappresentino una reale opportunità per rafforzare l'efficacia dell'azione pubblica, contribuendo a delineare un nuovo paradigma manageriale, più resiliente, sostenibile e orientato all'impatto. Si tratta dunque di un contributo significativo, che intende far luce su come l'innovazione tecnologica possa diventare un fattore chiave nella trasformazione delle amministrazioni locali italiane, migliorandone la capacità di rispondere alle sfide attuali e future.

Sulla base del quadro teorico e dei gap individuati, la ricerca propone alcune ipotesi volte a esplorare il ruolo dei digital twin nel miglioramento della governance urbana e nella creazione di valore pubblico. In primo luogo, si ipotizza che l'adozione dei digital twin possa aumentare significativamente la capacità delle amministrazioni di prevedere scenari futuri e di analizzare in maniera più accurata le implicazioni delle scelte politiche. Questo potenziamento della capacità previsionale è ritenuto fondamentale per rafforzare la pianificazione di lungo periodo e per ridurre la natura reattiva dei processi decisionali tradizionali.

In secondo luogo, si ipotizza che l'uso dei digital twin migliori la qualità della programmazione integrata, facilitando l'allineamento tra i diversi strumenti i piani programmatori, i piani urbanistici e i piani ambientali. Una maggiore integrazione favorirebbe coerenza, trasparenza e capacità di coordinamento tra settori e uffici, contribuendo a rendere più efficiente l'azione amministrativa.

In terzo luogo, la ricerca considera il contributo dei digital twin alla creazione di valore pubblico nelle dimensioni ambientale, sociale ed economica. Ciò include la possibilità di ridurre emissioni e consumi energetici, promuovere mobilità sostenibile, garantire inclusione sociale e equità territoriale, aumentare l'efficienza delle risorse e favorire la trasparenza e la partecipazione dei cittadini.

Un'ulteriore ipotesi riguarda i fattori abilitanti: si ritiene che l'efficacia dei digital twin dipenda dal possesso di competenze digitali adeguate, da una governance dei dati solida e interoperabile, da una cultura organizzativa orientata all'innovazione e dalla collaborazione con università, imprese e cittadini.

Infine, la ricerca considera i rischi potenziali derivanti dall'assenza di tali fattori, come opacità decisionale, interpretazioni errate dei dati, esclusione sociale di gruppi vulnerabili, dipendenza da fornitori esterni e inefficacia degli investimenti. Queste ipotesi guideranno l'analisi empirica volta a comprendere come i digital twin possano essere strumenti digitali efficaci di innovazione nella pubblica amministrazione.

4. Metodologia

La ricerca si basa su un approccio qualitativo di tipo esplorativo, fondato sull'analisi di casi studio multipli, con l'obiettivo di comprendere in profondità come i digital twin urbani vengano adottati e utilizzati dalle amministrazioni locali italiane come strumenti di supporto alla governance, alla programmazione integrata e ai processi decisionali. La scelta di un disegno

qualitativo risulta coerente con la natura della domanda di ricerca, che mira a indagare fenomeni complessi, ancora in fase di sviluppo, e difficilmente riducibili a variabili misurabili attraverso indicatori standardizzati.

L'approccio dei casi studio consente infatti di analizzare il fenomeno dei digital twin nel suo contesto reale, tenendo conto delle interazioni tra fattori tecnologici, organizzativi, istituzionali e culturali. In particolare, l'adozione di un disegno a casi multipli permette di rafforzare la validità analitica della ricerca, favorendo il confronto tra esperienze differenti e l'individuazione di pattern ricorrenti, nonché di specificità legate ai contesti territoriali e amministrativi.

La selezione dei casi è avvenuta attraverso un campionamento intenzionale, coerente con le finalità esplorative e interpretative della ricerca. Sono state individuate tre città italiane, Torino, Bologna e Brescia, che rappresentano contesti particolarmente significativi per l'analisi dei digital twin urbani, pur presentando caratteristiche differenti in termini di dimensione urbana, assetto istituzionale e maturità dei processi di digitalizzazione.

I criteri adottati per la selezione dei casi sono tre. In primo luogo, la presenza di iniziative strutturate di digital twin urbano, già avviate o in fase avanzata di sviluppo, che consentano di analizzare non solo la progettazione, ma anche le modalità di utilizzo e integrazione nei processi amministrativi. In secondo luogo, la disponibilità e accessibilità di fonti documentali e materiali informativi, elemento essenziale per garantire la trasparenza dell'analisi e la possibilità di ricostruire in modo accurato le scelte strategiche e operative adottate dalle amministrazioni. In terzo luogo, la diversità territoriale e organizzativa dei contesti selezionati, al fine di osservare differenti modelli di governance, approcci alla gestione dei dati e ambiti di applicazione dei digital twin.

Torino e Bologna rappresentano due casi emblematici di grandi città metropolitane con una lunga tradizione di innovazione urbana e sperimentazione digitale, mentre Brescia costituisce un esempio particolarmente interessante di città di dimensioni medio-grandi, caratterizzata da un forte orientamento alla sostenibilità ambientale e all'integrazione tra politiche industriali, energetiche e urbane. Questa combinazione consente di esplorare il fenomeno dei digital twin in contesti non omogenei, aumentando la capacità della ricerca di individuare elementi trasferibili e buone pratiche replicabili.

La raccolta dei dati è stata condotta attraverso l'analisi di fonti secondarie, selezionate al fine di ricostruire in modo coerente e comparabile i percorsi di sviluppo e implementazione dei digital twin urbani nei casi di studio considerati. In particolare, l'attività di raccolta si è concentrata su materiali pubblicamente disponibili, che consentono di osservare come le amministrazioni locali descrivono, strutturano e utilizzano tali strumenti all'interno dei propri processi di pianificazione e governance.

Una prima tipologia di fonti riguarda la documentazione istituzionale prodotta dalle amministrazioni comunali coinvolte. Sono stati esaminati contenuti reperibili sui siti web ufficiali dei Comuni e degli enti ad essi collegati, inclusi documenti di programmazione strategica, materiali informativi relativi ai progetti di digital twin, atti amministrativi, presentazioni pubbliche e comunicazioni istituzionali. Tali fonti hanno permesso di ricostruire il quadro strategico e organizzativo entro cui i digital twin sono stati sviluppati, nonché gli obiettivi dichiarati e gli ambiti di applicazione previsti.

Una seconda tipologia di fonti è costituita dalla letteratura scientifica e dai contributi accademici relativi ai casi analizzati. Questi materiali hanno consentito di integrare la prospettiva istituzionale con un'analisi critica di tipo teorico e applicativo, offrendo elementi utili per comprendere il ruolo dei digital twin nei processi decisionali e nella governance urbana.

Accanto a tali fonti, sono stati analizzati anche documenti di carattere divulgativo e tecnico, quali report di progetto, descrizioni delle piattaforme digitali, materiali prodotti da partner tecnologici e contributi pubblicati su riviste specialistiche e portali dedicati all'innovazione urbana. Pur non avendo finalità scientifiche in senso stretto, queste fonti risultano utili per

comprendere il funzionamento generale dei digital twin, le principali funzionalità dichiarate e il livello di maturità delle soluzioni adottate.

Nel complesso, l'utilizzo combinato di fonti istituzionali, accademiche e tecnico-divulgative ha permesso di raccogliere informazioni sufficientemente articolate per analizzare il fenomeno dei digital twin urbani in relazione agli obiettivi della ricerca, mantenendo al contempo un livello di astrazione adeguato alla natura esplorativa dello studio. La triangolazione delle fonti ha inoltre contribuito a rafforzare la coerenza interna dell'analisi, riducendo il rischio di una lettura parziale o esclusivamente descrittiva delle esperienze considerate.

5. Risultati

L'analisi dei casi studio di Torino, Bologna e Brescia consente di evidenziare come i digital twin urbani, pur condividendo alcuni elementi tecnologici di base, vengano sviluppati e utilizzati secondo logiche differenti, strettamente connesse alle priorità strategiche, alle caratteristiche territoriali e al grado di maturità organizzativa delle amministrazioni locali. Nei tre casi analizzati, il digital twin non emerge come semplice strumento di rappresentazione della città, ma come infrastruttura digitale a supporto di specifici obiettivi di governo urbano, legati alla pianificazione, alla gestione operativa e alla sostenibilità.

Nel complesso, i risultati mostrano come i digital twin si configurino come strumenti progressivamente orientati alla previsione e al supporto decisionale, sebbene con livelli diversi di integrazione nei processi amministrativi. Torino, Bologna e Brescia rappresentano tre modalità distinte di sviluppo: rispettivamente un approccio fortemente basato sulla conoscenza fisica e morfologica del territorio, un modello sistemico e predittivo orientato alla sostenibilità e alla partecipazione, e una strategia data-driven finalizzata alla costruzione di una piattaforma integrata per la governance urbana.

5.1. Il digital twin di Torino: conoscenza puntuale del territorio e supporto alla gestione urbana

Nel caso di Torino, il digital twin urbano nasce principalmente dall'esigenza di colmare un deficit conoscitivo nella rappresentazione e gestione del territorio urbano. Il progetto si fonda su un'imponente attività di acquisizione e integrazione di dati tridimensionali ad alta risoluzione, ottenuti attraverso tecniche fotogrammetriche e scansioni LiDAR, che consentono di costruire un modello estremamente accurato della città. Questa scelta riflette una chiara priorità: dotare l'amministrazione di una base informativa omogenea, aggiornata e condivisa, capace di restituire una visione unitaria della realtà urbana.

Il digital twin torinese è sviluppato come strumento operativo a supporto della gestione del territorio, con applicazioni inizialmente concentrate su ambiti considerati strategici, quali la manutenzione del verde urbano, la gestione delle infrastrutture viarie e la pianificazione degli interventi per l'eliminazione delle barriere architettoniche. In questo senso, il modello digitale consente di individuare criticità puntuali, stabilire priorità di intervento e migliorare il coordinamento tra settori amministrativi, contribuendo a rendere più efficienti i processi decisionali e allocativi.

Un elemento rilevante che emerge dal caso torinese è il ruolo del digital twin come strumento di razionalizzazione e integrazione delle informazioni, più che come piattaforma predittiva avanzata. Sebbene siano già presenti applicazioni orientate alla valutazione del potenziale energetico e all'efficienza degli edifici, il valore principale risiede nella capacità del modello di fornire una base conoscitiva solida e condivisa, funzionale a decisioni più rapide, informate e coerenti. Il digital twin si inserisce dunque all'interno di una strategia più ampia di modernizzazione della gestione urbana, orientata all'efficientamento dei processi e al miglioramento del servizio pubblico.

5.2. Il digital twin di Bologna: piattaforma predittiva e governance orientata alla sostenibilità

Il caso di Bologna si distingue per un approccio più sistemico e orientato alla previsione, in cui il digital twin viene concepito come infrastruttura cognitiva a supporto della pianificazione strategica e della transizione ecologica. Il progetto di Civic Digital Twin si fonda sull'integrazione di dati eterogenei provenienti da sensori ambientali, sistemi di monitoraggio urbano, fonti amministrative e contributi derivanti dall'analisi dei comportamenti urbani. Tale integrazione è finalizzata alla costruzione di un modello dinamico, in grado di simulare scenari futuri e valutare l'impatto delle politiche pubbliche prima della loro implementazione.

A differenza del caso torinese, il digital twin bolognese non si concentra esclusivamente sulla rappresentazione fisica della città, ma include dimensioni ambientali, energetiche e sociali. L'obiettivo è supportare decisioni complesse in ambiti quali la mobilità sostenibile, la qualità dell'aria, la mitigazione delle isole di calore e l'adattamento ai cambiamenti climatici. In questo contesto, il digital twin diventa uno strumento di sperimentazione virtuale, capace di ridurre l'incertezza decisionale e di orientare le politiche urbane verso obiettivi di sostenibilità e resilienza.

Un aspetto particolarmente significativo del caso bolognese è l'estensione del paradigma del digital twin anche a elementi puntuali del patrimonio urbano, come dimostra l'esperienza del gemello digitale della Torre Garisenda. Questo progetto evidenzia come il digital twin possa essere utilizzato non solo per la pianificazione urbana, ma anche per la tutela e la gestione del patrimonio storico e culturale, attraverso simulazioni predittive basate su dati ambientali e strutturali. Tale integrazione rafforza il ruolo del digital twin come strumento trasversale, applicabile a scale e ambiti differenti, e capace di connettere esigenze di conservazione, sicurezza e valorizzazione.

Nel complesso, il caso di Bologna mostra un utilizzo del digital twin fortemente orientato alla governance predittiva, in cui la tecnologia diventa leva per politiche pubbliche basate su evidenze scientifiche, integrazione dei dati e coinvolgimento degli stakeholder.

5.3. Il digital twin di Brescia: una strategia data-driven per la smart city

Il caso di Brescia si colloca in una fase diversa del percorso di sviluppo dei digital twin urbani, caratterizzata da una forte enfasi sulla costruzione delle infrastrutture digitali di base necessarie a una governance data-driven. Il progetto di digital twin è esplicitamente inserito nelle linee programmatiche di mandato dell'amministrazione comunale e viene concepito come piattaforma strategica per supportare la trasformazione della città in chiave smart.

Elemento centrale del modello bresciano è la realizzazione di un data lake urbano, pensato come archivio unico e integrato dei dati della città. Questa scelta riflette l'esigenza di superare la frammentazione informativa e di creare un patrimonio digitale strutturato, su cui innestare successivamente modelli di analisi, simulazione e previsione. Il digital twin, in questo contesto, assume il ruolo di strumento di integrazione, correlazione e modellazione dei dati, piuttosto che di simulazione avanzata immediatamente operativa.

Le finalità dichiarate del digital twin di Brescia riguardano un ampio spettro di ambiti, dalla gestione del traffico alla sicurezza urbana, dall'efficienza energetica alla pianificazione urbanistica. Tuttavia, ciò che emerge con maggiore chiarezza è l'orientamento alla costruzione di una piattaforma abilitante, destinata a supportare nel tempo decisioni più informate e coordinate. Il rispetto delle normative sulla privacy e la gestione di dati anonimi e minimizzati rappresentano ulteriori elementi qualificanti, che indicano una particolare attenzione alla governance dei dati come prerequisito per un utilizzo responsabile della tecnologia.

Nel caso di Brescia, il digital twin appare dunque come un investimento strategico di medio-lungo periodo, volto a creare le condizioni organizzative e tecnologiche per una governance urbana più efficace, piuttosto che come strumento già pienamente integrato nei processi decisionali quotidiani.

6. Conclusioni

Il presente studio ha analizzato il ruolo dei digital twin urbani come strumenti emergenti di supporto alla governance pubblica e alla creazione di valore pubblico, collocandosi all'intersezione tra public management, innovazione digitale e studi urbani. Muovendo dalla constatazione dei limiti strutturali dei modelli tradizionali di gestione pubblica (spesso caratterizzati da approcci reattivi, settoriali e orientati al breve periodo) la ricerca ha messo in evidenza come i digital twin possano rappresentare una leva strategica per rafforzare la capacità delle amministrazioni locali di governare la complessità urbana in una prospettiva di lungo termine.

L'analisi congiunta della letteratura e dei casi studio di Torino, Bologna e Brescia ha mostrato come i digital twin non debbano essere interpretati esclusivamente come soluzioni tecnologiche avanzate, bensì come infrastrutture cognitive, organizzative e decisionali, capaci di integrare dati eterogenei, supportare processi di simulazione e previsione e migliorare la qualità delle decisioni pubbliche. I risultati evidenziano che il valore dei digital twin non risiede tanto nella sofisticazione tecnica in sé, quanto nella loro integrazione nei processi di programmazione, coordinamento e valutazione delle politiche urbane.

Il confronto tra i casi analizzati mette in luce differenti traiettorie di sviluppo del digital twin urbano. Torino evidenzia il ruolo del digital twin come strumento di ricostruzione e razionalizzazione della conoscenza territoriale, funzionale a migliorare la gestione operativa e il coordinamento interno. Bologna rappresenta un'evoluzione verso un uso maggiormente predittivo e strategico, in cui il digital twin diventa un laboratorio virtuale per la sperimentazione di politiche orientate alla sostenibilità e alla resilienza urbana. Brescia, infine, mostra come la costruzione di solide infrastrutture di governance dei dati costituisca una condizione abilitante fondamentale per lo sviluppo futuro di una governance urbana data-driven. Nel loro insieme, questi casi suggeriscono una progressione concettuale che va dalla gestione del presente alla pianificazione del futuro, passando per la costruzione delle capacità organizzative necessarie.

Dal punto di vista teorico, la ricerca contribuisce ad arricchire il dibattito sul valore pubblico introducendo una prospettiva che integra in modo sistematico l'innovazione digitale all'interno delle teorie della governance pubblica. In particolare, lo studio propone il concetto di digital twin governance come paradigma emergente, inteso non solo come insieme di strumenti tecnologici, ma come configurazione di pratiche organizzative, culturali e strategiche che ridefiniscono il modo in cui le amministrazioni pianificano, controllano e valutano l'azione pubblica. Questo approccio consente di superare una visione tecnocentrica dell'innovazione, mettendo in evidenza il carattere socio-tecnico dei digital twin e il loro potenziale nel favorire politiche urbane più sostenibili, inclusive e orientate all'impatto.

Dal punto di vista pratico, la ricerca offre indicazioni rilevanti per le amministrazioni pubbliche interessate ad adottare o sviluppare digital twin urbani. I risultati suggeriscono che l'efficacia di tali strumenti dipende in larga misura dallo sviluppo di competenze interne, da assetti organizzativi adeguati e da modelli di governance dei dati chiari e interoperabili. L'adozione dei digital twin non può quindi essere considerata come un semplice investimento tecnologico, ma come un processo di cambiamento organizzativo che richiede visione strategica e capacità di integrazione nei processi decisionali esistenti. In questo senso, il framework interpretativo proposto può supportare le amministrazioni anche nella valutazione ex ante ed ex post degli investimenti digitali, contribuendo a misurarne l'efficacia e a orientarne l'evoluzione nel tempo.

Per i policy maker a livello nazionale ed europeo, emergono inoltre alcune indicazioni strategiche. In particolare, la necessità di definire standard tecnici comuni per i digital twin urbani, al fine di garantire interoperabilità, qualità dei dati e possibilità di confronto tra esperienze diverse. Parallelamente, appare cruciale sviluppare politiche pubbliche dedicate alla governance

dei dati urbani, capaci di bilanciare esigenze di sicurezza, trasparenza, tutela della privacy e partecipazione dei cittadini.

Come ogni studio qualitativo basato su casi studio, la presente ricerca presenta alcune limitazioni che è opportuno esplicitare. In primo luogo, il numero limitato di casi analizzati non consente generalizzazioni di tipo statistico. Tuttavia, l'obiettivo dello studio è quello di produrre generalizzazioni analitiche, utili a comprendere meccanismi, dinamiche e condizioni abilitanti rilevanti anche per altre amministrazioni locali. In secondo luogo, l'analisi si basa prevalentemente su fonti documentali e materiali secondari, il che può limitare la capacità di cogliere pienamente le dinamiche informali e i processi decisionali interni alle amministrazioni. Inoltre, la natura ancora sperimentale di molti progetti di digital twin rende complessa una valutazione completa degli impatti di lungo periodo sulla qualità delle decisioni pubbliche e sulla creazione di valore pubblico misurabile. Infine, la ricerca privilegia la prospettiva istituzionale delle amministrazioni, lasciando in secondo piano il punto di vista di cittadini e stakeholder esterni, che rappresenta una dimensione cruciale per valutare inclusività e legittimità dei processi decisionali supportati dai digital twin.

Queste limitazioni aprono interessanti direzioni per ricerche future. Studi quantitativi potrebbero approfondire la misurazione degli impatti dei digital twin sulle performance amministrative, sugli esiti delle politiche urbane e sulla creazione di valore pubblico nel medio-lungo periodo. Ulteriori ricerche potrebbero inoltre esplorare il ruolo dei cittadini e degli stakeholder nei processi decisionali supportati dai digital twin, analizzando in che misura tali strumenti favoriscano effettivamente partecipazione, trasparenza e fiducia nelle istituzioni. Infine, un confronto comparato a livello europeo potrebbe contribuire a identificare modelli di digital twin governance replicabili e adattabili a contesti istituzionali differenti, rafforzando il contributo della ricerca al dibattito internazionale sulla trasformazione digitale della pubblica amministrazione.

Parole chiave: Digital twin urbani; governance urbana; valore pubblico, trasformazione digitale; pianificazione integrata; sostenibilità urbana

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Track 2: GLI STUDI DI FINANCIAL ACCOUNTING TRA INTELLIGENZE AZIENDALI E BENE COMUNE

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Internally Generated Intangible Assets and the Prudence-Conservatism Debate: A Systematic Literature Review

Raffaele Morrone[1], Pietro Fera[2]

1. Introduction

In recent decades, modern economies have undergone a profound structural transformation, which has been widely interpreted as a shift from a "tangible-based" paradigm to a "knowledge-based" or, more precisely, an "intangible-based" paradigm (Brynjolfsson & Hitt, 2000; Lev, 2000; Corrado et al., 2005). This transition signifies a substantial shift in the underlying mechanisms by which value is created. Firms' competitiveness increasingly depends less on their stock of traditional physical assets and more on intangible assets (Lev & Zarowin, 1999; Beattie & Smith, 2013). The growing centrality of intangible assets shows that these resources have become one of the main drivers of competitiveness and value creation today (Peters & Taylor, 2017). Suppose a growing proportion of the value generated is attributable to intangible assets that are challenging to observe, measure, or trade. In that case, there is an increased risk that financial statements prepared in accordance with conventionally "tangible-oriented" logics may appear deficient or, on occasion, misleading to users of accounting information (Lev & Gu 2016; Barth & McClure, 2023). This phenomenon gives rise to a true informational paradox: the very resources that are most strategic for value creation risk being the least represented in the firm's information system. (Lev, 2018; IASB, 2024; Hussinki et al., 2024). At the conceptual level, this necessitates the definition, classification, and measurement of resources that are non-physical in nature, frequently inseparable from the firm, and characterised by elevated uncertainty regarding their future economic benefits. From a regulatory perspective, the recognition of intangibles poses significant challenges, particularly in determining the conditions for balance sheet recognition, the criteria for their inclusion, and the methods employed for their valuation (Barker et al., 2022). Although international accounting standards provide a structured regulatory framework for addressing these issues, the present study focuses specifically on one category of intangibles: those that are internally generated. These assets are critical resources for a firm's competitive advantage; yet, in most cases, they do not meet the strict recognition criteria set by accounting standards and are therefore excluded from the balance sheet (Oswald & Zarowin, 2007). This study examines the recognition of internally generated intangibles within the broader theoretical Framework of prudence or conservatism, whose application today may conflict with the dynamics of value creation in the modern economy. Although part of the academic literature uses 'prudence' and 'conservatism' as synonyms, it is worth noting that in the international standard-setting process, the term 'prudence' is referenced exclusively (Basu, 1997; Watts, 2003; Barker, 2015) This terminological distinction serves as the starting point for understanding the evolution of the concept of prudence within the IASB's Conceptual Framework. In the 2010 revision of the Conceptual Framework, prudence was explicitly removed as a qualitative characteristic of financial information. The decision was primarily motivated by the IASB's objective to emphasize

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the principle of neutrality, which is regarded as a fundamental component of faithful financial reporting (IASB, 2010; Pelger, 2020). In its traditional sense, prudence is characterized by an asymmetric approach to recognizing gains and losses. Consequently, it was perceived as potentially conflicting to portray economic reality without bias. As clarified by the IASB any deliberate asymmetry in the estimation of accounting values could undermine faithful representation, making prudence conceptually incompatible with neutrality (IASB, 2010). However, following intense debate both in academic and within the standard-setting bodies, prudence was reintroduced in 2018. The new Framework defines it as "the exercise of caution when making judgements under conditions of uncertainty. The exercise of prudence means that assets and income are not overstated. Liabilities and expenses are not understated" (IASB, 2018). The IASB justified the reintroduction of prudence, offering two principal arguments in support of this decision (IASB, 2018; Pelger, 2020). On the one hand, the IASB acknowledges the existence of a "natural tendency for management to be optimistic," which may result in overly favourable assessments. Prudence, in this sense, serves as a corrective mechanism, thereby strengthening the discipline of professional judgement (IASB, 2018). Conversely, the principle of prudence provides a foundation for the IASB in developing standards intended to mitigate the risk of managerial bias (IASB, 2018). From this perspective, cautious prudence is not intended to produce systematically understated economic values, but rather to mitigate the risk that subjective estimates might lead to unrealistically optimistic financial statements (Mora & Walker, 2015). Cautious prudence, therefore, serves the goal of achieving neutrality and faithful representation. Moreover, the 2018 Framework clarifies that asymmetric prudence is not considered a qualitative characteristic of financial information. However, the IASB concedes that future standards may, in some instances, incorporate asymmetric accounting treatments. Such choices must be based on an overall assessment of relevance and faithful representation, rather than on the application of an asymmetric prudence principle (IASB, 2018). Supporting this view, the IASB notes that "not all asymmetry is inconsistent with neutrality" (IASB, 2018). This results in an approach to prudence that, while nuanced, introduces elements of discretion which may reduce the theoretical consistency of the Framework (Orthaus et al., 2023). In the academic literature, the concept of prudence is interpreted in a broader and more nuanced way, as it is often associated with and at times conflated with the term conservatism, giving rise to two distinct strands of interpretation (Watts, 2003; Ruch & Taylor, 2015). The first line of research, dominant until the early 2000s, treats prudence and conservatism as synonyms. Studies on the IASB's Framework explicitly assume this synonymy, recalling how prudence has historically been used as an alternative label for conservatism in standard-setting documents (Barker, 2015). Other authors refer to "prudence-conservatism" and define it as a higher threshold of verifiability for recognising gains compared to losses (Măciucă et al., 2015). The second, more recent and conceptually refined, advocates a clear distinction between prudence and conservatism, criticizing their interchangeable use and highlighting the implications this distinction holds for the conceptual Framework and the neutrality of accounting information (Orthaus et al., 2023). Conservatism is defined as any accounting method that leads to book values being lower than the corresponding economic values (Beaver & Ryan, 2005). It interprets prudence as a specific form of conservatism justified by a cautious response to uncertainty (Barker, 2015). That conditional conservatism is more accurately seen as a specific form of asymmetry characterised by the earlier recognition of losses compared to gains. Finally, other authors highlight how the terminological overlap has led to confusion and argue for a more precise taxonomy distinguishing between a qualitative concept (prudence) and an observable positive phenomenon (conservatism) (André et al., 2015). Within the second line, academic debate introduces a further refinement by distinguishing between conditional and unconditional conservatism, which represent fundamentally different applications. Conditional conservatism is expressed as the asymmetric recognition of economic outcomes, resulting in greater timeliness in recognising losses than gains. In this case, accounting reactions are triggered by unfavourable informational events (bad news) and involve a higher threshold of verifiability

for recognising profits, as formalised in Basu's (1997) model. In practice, conditional conservatism closely resembles the notion of asymmetric prudence. Unconditional conservatism, on the other hand, refers to the application of systematically prudent valuation criteria set ex ante, which lead to book values being lower than fair value regardless of the emergence of new economic information (Watts, 2003). This form of conservatism stems from measurement choices embedded in accounting policies, resulting in a structural, non-responsive distortion relative to changes in the firm's prospects (Beaver & Ryan, 2005). The extant literature presents a fragmented picture, and this plurality of definitions has instead created an uneven landscape, in which the analytical categories used by scholars often diverge from those adopted by the international standard setter. At the same time, the evolution of the IASB's Conceptual Framework has contributed to the exacerbation of this disparity. The removal of prudence in 2010, motivated by concerns that it might compromise neutrality, and its subsequent reintroduction in 2018 in the form of cautious prudence, explicitly distinguished from the asymmetric prudence of traditional accounting, outlines a regulatory framework that does not align with the prevailing definitions found in empirical research. While the Framework under discussion here emphasizes a form of prudence that is compatible with faithful representation and free from systematic bias, much of the existing literature continues to ground its models in conservatism, especially in its conditional form, namely, in the differing timeliness of loss versus gain recognition. This working paper aims to investigate the apparent disconnection between the IASB's conceptual stance, rooted in neutrality, and the academic view, which characterizes accounting behavior as structurally prudent. This theoretical divide assumes particular significance in the analysis of intangible assets, and even more so in the case of those that are internally generated. These are a crucial category of resources in an increasingly knowledge-intensive economy, and simultaneously one of the most challenging to represent in accounting terms. The challenges associated with identifying, separating, and measuring such resources, in conjunction with the high uncertainty surrounding their future economic benefits, have resulted in their systematic exclusion from recognition under IFRS standards. However, this exclusion is not solely the result of formal recognition criteria; it also risks implicitly reflecting prudential logics that lack explicit grounding in the 2018 Framework. The existing literature on intangibles has thoroughly examined the limitations of IFRS recognition criteria. However, it has rarely explored how the tension between cautious prudence and conditional conservatism affects the way these assets are represented. Moreover, there is a need for further research into the impact of this tension on the ability of financial statements to accurately capture the processes involved in generating intangible assets. Through a systematic literature review, the objective is to present a comprehensive reconstruction of the conceptual evolution of prudence and conservatism in the accounting literature domain. At the same time, another aim of this paper is to highlight the growing misalignment between these theoretical developments and the regulatory choices embedded in the IFRS framework. Furthermore, despite the extensive academic debate on conservatism, little attention has been devoted to understanding how the conceptual ambiguity surrounding prudence may translate into practical consequences for innovative firms. Specifically, the valuation of internally generated intangibles, including R&D, organisational capabilities, software, brand development, and data-related assets, is subject to significant interpretation by managerial judgement. It is therefore essential to provide a more precise conceptual framing of prudence to assess whether the current accounting model unintentionally penalises innovation-intensive firms by systematically understating their economic potential. Moreover, it is acknowledged that the rules for intangibles under IFRS were designed mainly during a period when knowledge-intensive business models were less prevalent. This study posits that the emerging misalignment between economic reality and accounting representation cannot be addressed without a thorough examination of the conceptual foundations that underpin standard setting. In this respect, prudence becomes a lens through which to understand why certain assets remain unrecognised, how managerial judgement is constrained, and whether

neutrality, as currently interpreted, can still serve the informational needs of capital markets. The systematic literature review facilitates a structured analysis of a highly fragmented body of studies, in which the terms 'prudence' and 'conservatism' have been used as synonyms, at times as distinct concepts, and occasionally as only partially overlapping interpretive tools. In this review, internal intangibles are considered a proxy for a firm's innovative capacity, enabling an investigation into how prudence and conservatism affect the extent of underreporting of intangible investments and the ability of financial statements to capture value creation processes. From this starting point, the review examines the theoretical, informational, and policy implications of the current conceptual discontinuity. On the one hand, elucidating the function of prudence enables an assessment of whether and to what extent cautious prudence maintains informational neutrality or, conversely, impedes a more comprehensive representation of created economic value. On the other hand, the analysis underscores how inconsistencies between IFRS prudence and conservatism may influence standard-setting decisions, potentially leading to a revaluation of the criteria established in IAS 38. Finally, the study emphasises the necessity for a reinvigorated conceptual discourse between academic research and accounting standard-setting. It is imperative to bridge this divide to enhance the coherence of the Conceptual Framework and to ensure that financial reporting evolves in a manner consistent with the structural transformation of modern economies. By clarifying the conceptual foundations of prudence and evaluating their implications for recognizing internally generated intangibles, this paper contributes to ongoing discussions on how accounting can better capture the drivers of value creation in an increasingly intangible-based economic landscape.

Keywords: Conservatism; prudence; systematic literature review

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Female Leadership and the Dynamics of Generational Succession in Family Firms: A Multi- Case Qualitative Analysis

Gabriella Bosco[1], Diana Ferullo[2], Natalia Aversano[3], Paolo Tartaglia Polcini[4]

1. Introduction

Family businesses are highly developed worldwide and play a fundamental role in global economies (Miroshnychenko et al., 2021). Over the last two decades, several studies have analysed the strengths and weaknesses of family firms, highlighting both their resilience and vulnerabilities (Harms, 2014; López-Pérez et al., 2018). Family businesses contribute substantially to employment, innovation, and long-term value creation, and they have recently shown particular attention to sustainability and responsible governance (Olson et al., 2003). At the same time, they have responded to recent shocks, such as the COVID-19 pandemic, by accelerating digitalisation and adopting new business models (Saura et al., 2023). In this context, increasing attention is being devoted to the role of women in family businesses, particularly during generational transitions, where leadership dynamics and gender-related factors may significantly shape succession processes and outcomes.

Despite these strengths, succession remains one of the most critical and risky moments in the life of family firms. A large body of research shows that survival rates decline sharply at each generational handover and that only a minority of family businesses successfully reach the third or fourth generation (Moreno-Gené & Gallizo., 2021). However, generational transition in family businesses can also represent an opportunity for innovation, especially when successors seek to introduce strategic and organizational changes during the handover (Hauck & Prügl., 2015). Studies on succession have identified a variety of factors that influence the success or failure of generational transitions, including planning, governance, communication, and the preparation of successors (Handler, 1994; Le Breton-Miller et al., 2004; Gallucci & Gentile, 2006; De Massis et al., 2008; Bennedsen et al., 2007). These contributions show that succession is not a single event but a complex process involving preparation, transition, integration, and consolidation phases, each of which can be shaped by the family's influence on relationships, organisational processes, and strategic choices.

At the same time, there is growing recognition that family influence can be both a resource and a constraint. On the one hand, the overlap between family and business can generate strong commitment, long-term orientation, and patient capital (Olson et al., 2003). On the other hand, it can also create agency-related tensions, emotional attachment, and intra-family conflicts that complicate leadership transitions (Schulze et al., 2003; Chrisman et al., 2004). An important implication of this literature is that we still need to understand better how specific family dynamics shape succession processes in practice and how successors navigate the tension between continuity and change.

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Within this broader debate, the role of women in family businesses has attracted increasing attention.

Previous studies have shown that women often play important, but sometimes invisible or undervalued, roles in family firms and succession processes (Curimbaba, 2002; Hougaz, 2015). Although research on women's roles in family businesses has expanded over the past decade, studies specifically addressing female leadership in succession processes remain fragmented and heterogeneous. Prior research has examined how female successors negotiate their leadership roles within family firms (Xian et al., 2020), identified gender-related factors shaping succession outcomes (Kubíček & Machek, 2019), and explored issues of visibility and legitimacy faced by women next-generation leaders, particularly in male-dominated succession contexts (Brophy et al., 2023). While these contributions offer valuable insights, they tend to focus on specific dimensions of succession rather than adopting a holistic, process-based perspective. This study builds on this literature by integrating gender and leadership theories with a processual view of generational transition, thereby clarifying how female leadership shapes succession dynamics across different phases.

At the same time, leadership and psychology research suggests that women tend to display higher levels of transactional leadership behaviours and emotional intelligence, which are associated with effective management of complex and emotionally charged situations (Bass et al., 1996; Hackman et al., 1992; Salovey & Mayer, 1990; Sanchez-Núñez et al., 2008).

This creates an unresolved puzzle for family business research. On the one hand, numerous studies show that women tend to display leadership resources such as adaptability, the ability to combine firmness with empathy, and strong emotional competence, which can be particularly valuable in managing complex organisational change and people-intensive processes like succession (Singh et al., 2023; Hsu et al., 2022). On the other hand, the literature has broadly examined separately, first, the role of women and female leadership in family firms and the specific challenges and opportunities faced by daughters and other female successors (Floris, 2021; Boukhabza & Ouhadi, 2024) and, second, the factors that influence family business succession processes more generally (Morris et al., 1996; Baltazar et al., 2023). What is still missing is systematic studies examining how female leadership shapes the generational transition in small and medium-sized family businesses and whether the presence of a female successor increases the likelihood of a successful handover.

To address this gap, the present study focuses on the following research question: RQ: How does female leadership shape the management and outcomes of the generational transition in small and medium-sized family firms?

Building on a process-based view of succession, this study conceptualises generational transition as a multi-phase phenomenon comprising preparation, transition, integration, and consolidation (Handler, 1994; Le Breton-Miller et al., 2004). Within this perspective, female leadership is expected to influence the generational transition in different ways across its phases. During the preparation phase, women tend to engage in relational work and informal coordination among family members; during the transition phase, they facilitate role clarification and help contain emotional tensions; during the integration phase, they support cultural alignment while introducing managerial and strategic changes; and during the consolidation phase, they contribute to post-transition monitoring and the gradual stabilisation of the new leadership, drawing on transactional leadership and emotional intelligence (Bass et al., 1996; Salovey & Mayer, 1990). This paper addresses these unresolved questions by positioning itself at the intersection of three streams of family business research: (1) studies on succession and generational transition processes (Handler, 1994; Le Breton-Miller et al., 2004; De Massis et al., 2008), (2) research on the consequences of family involvement and agency-related dynamics (Schulze et al., 2003; Chrisman et al., 2004; Olson et al., 2003), and (3) the emerging literature on gender and women's roles in family firms (Curimbaba, 2002; Hougaz, 2015). Recent studies have increasingly focused on succession as a dynamic and processual phenomenon (Baltazar et al., 2023; Singh et al., 2023),

on the evolving role of family influence and socioemotional dynamics in shaping leadership transitions (Miroshnychenko et al., 2021; Moreno-Gené & Gallizo, 2021), and on gender and leadership in family firms, particularly with regard to daughters' involvement and female succession (Floris & Dettori, 2021; Boukhabza & Ouhadi, 2023). By engaging with these recent contributions, this study positions itself within contemporary debates in the family business literature and extends them by adopting a gendered and process-based perspective on generational transition .

By drawing on transactional leadership and emotional intelligence theories (Bass et al., 1996; Salovey & Mayer, 1990) and connecting them to succession process models, the study seeks to illuminate how female leadership contributes to and is shaped by family influence in small- and medium-sized family businesses.

Specifically, the present paper aims to determine whether the generational transition within small and medium-sized family enterprises is easier to manage and more likely to succeed when a woman represents the next generation, and to understand through which relational, organisational, and strategic mechanisms this occurs. To address this aim, the study employs a qualitative multiple-case study design, based on semi-structured interviews with male and female successors in Italian family

firms. This qualitative approach is particularly suited to exploring paradoxical and not yet fully understood phenomena, such as the interplay between family influence, gendered leadership behaviours, and the dynamics of generational transition (De Massis & Kotlar, 2014; Reinecke et al., 2016).

Empirically, the study shows that, in the six Italian small and medium-sized family firms analysed, generational transitions led by female successors tend to be easier to manage and more likely to result in a successful handover than those led by male successors. Female leaders are better able to balance respect for the founder's legacy with the introduction of strategic and organizational changes, to manage relationships with family and non-family stakeholders, and to use emotional intelligence to contain conflict across the different phases of the transition. From a practical standpoint, the findings suggest that owners and advisers should deliberately involve daughters and other women in succession planning, design multi-stage transition paths that leverage their relational and emotional skills, and invest in developing these competences across generations. In terms of originality, the paper offers one of the first process-based and gendered analyses of generational transition in small and medium-sized family firms, tracing how female leadership and family influence jointly shape the dynamics and outcomes of succession.

The paper is structured as follows: after this introduction, the next section develops the theoretical background and articulates the unresolved puzzle that guides the study. The subsequent section presents the research methodology. The fourth section discusses the empirical findings and their implications. The final section concludes by outlining theoretical contributions, managerial implications, limitations, and directions for future research.

2. Theoretical background

Defining what constitutes a family business is difficult, and the literature presents many, sometimes opposing, viewpoints. Chua et al. (1999), for example, propose a behavioural definition that emphasises a family's intention to shape and pursue a shared vision for the firm over time. Westhead and Cowling (1998) show that different operational criteria based on ownership, management, and succession identify very different populations of family firms, underlining how sensitive empirical results are to the definition adopted. Similarly, Astrachan and Shanker (2003) distinguish broad, intermediate, and narrow definitions of family businesses depending on the degree of family involvement and the intention to maintain family control across generations.

In this line, Harms (2014) defines a family business as "a company […] closely identified with at least two generations of a family and where this link has had a mutual influence on company policy and the interests and

objectives of the family" (p. 248), thus explicitly highlighting the importance of generational transition.

The definition of family business adopted in this paper follows Anderson and Reeb (2003), who characterise family firms as companies in which founding family members hold a significant ownership stake and at least one family representative sits on the board of directors. Despite the variety of definitions, family businesses share some common characteristics. First, they are organizations in which members of the same family are directly involved in ownership and are often responsible for managing the firm. Second, family members tend to share a distinctive mentality and culture, which can facilitate rapid decision-making and long-term orientation (Bigliardi & Dormio, 2009).

Against this background, the theoretical literature on family firms can be organised into three main streams of research. A first stream focuses on succession and generational transition processes, conceptualising succession as a multi-stage process shaped by preparation, governance, communication and the development of successors (Handler, 1994; Le Breton-Miller et al., 2004; De Massis et al., 2008). This literature shows how the quality of the relationship between founder and successor, the degree of formal planning and the possible involvement of external managers critically influence survival and renewal across generation.

A second stream examines how family involvement can operate both as a resource and as a potential source of failure in generational transitions. This literature highlights how family ownership, emotional bonds and intra-family relationships shape succession planning, leadership development, governance structures and, ultimately, the likelihood that the phases of preparation, transition, integration and consolidation will be successfully completed (Olson et al., 2003; Gallucci & Gentile, 2006; De Massis et al., 2008; Bennedsen et al., 2007; Ibrahim et al., 2001). On the one hand, shared values, a long-term orientation and patient capital can support investments in successors and foster continuity across generations; on the other hand, resistance to change, inadequate training, family conflicts and strong emotional attachment can weaken the process, generating agency-related tensions and making it difficult to transfer authority from one generation to the next (Schulze et al., 2003; Chrisman et al., 2004; Dyck et al., 2002; Sharma et al., 2003). A third, more recent stream connects studies on gender and women's roles in family firms with theories of leadership and emotional intelligence, exploring how female successors influence the generational transition. Research on women in family firms shows that daughters and other female family members often make substantial, yet only partially visible, contributions to the coordination of family relationships, support for the founder and the management of day-to-day operations (Curimbaba, 2002; Hougaz, 2015; Campopiano et al., 2017; Floris & Dettori, 2021). At the same time, leadership studies suggest that women, more than men, tend to display transactional leadership behaviours – alternating firmness and support as circumstances change – and higher levels of emotional intelligence, which help them manage conflict, navigate change and maintain relationships in emotionally charged contexts such as succession (Bass et al., 1996; Hackman et al., 1992; Salovey & Mayer, 1990; Sanchez-Núñez et al., 2008; Abdullah et al., 2019; Panda & Banik, 2019; Hsu et al., 2022). Taken together, this body of work provides the basis for examining whether and how female leadership can transform family influence into a resource for successful generational transition, particularly in small and medium- sized family firms.

2.1. Elements of success and failure in a generational change in the family business

Family businesses are a significant component of the global economy, profoundly influencing job creation, wealth generation, and economic stability across many nations. Although their importance varies from country to country, family businesses generally form a

predominant part of business activity Worldwide (Sharma et al., 2012). Family businesses contribute substantially to their countries' Gross Domestic Product (GDP). According to a 2018 Credit Suisse report (Global Wealth Report, 2018), family businesses are often more profitable and resilient than non-family businesses, contributing significantly to economic growth. An estimated 70-90% of global businesses are under family control, ranging from small to large conglomerates. These businesses are significant employers. For example, in the United States, family businesses employ 60% of the workforce and generate 78% of all new jobs. Their ability to create and maintain jobs is critical to economic stability. Despite the perception that they may be conservative in their business practices, many family businesses are at the forefront of innovation. Their long-term vision allows them to invest substantially in research and development, often valuing long-term benefits over short-term gains. The generational transition represents one of the most critical moments for family businesses, with survival rates decreasing significantly with each transition. Studies (Moreno-Genè et al., 2021; Nwke et al., 2020) indicate that only about 30% of family businesses transition to the second generation, while 12% remain in family hands until the third generation, and only 3% survive the fourth generation. Family businesses have been the subject of research for some years. Various aspects of this type of business have been analysed. It has been found that they are companies that pay particular attention to sustainability (Olson et al., 2003). Furthermore, in recent years, they have demonstrated particular responsiveness to digitalization, often ahead of trends (Zapata- Cantu et al., 2023). This is highlighted by some studies (Ward, 2016).

The process of generational transition in family businesses is challenging, and effective planning can alleviate many of these difficulties. While many studies have examined generational transitions within family enterprises, several aspects remain unclear and warrant further research (Sharma et al., 2003; Bennedsen et al., 2007; De Massis et al., 2008). As previously discussed, the generational handover is a critical phase in a family business's lifespan, often jeopardising its very survival. Therefore, strategically planning this transition is crucial to significantly enhancing the business's prospects for continued success. (Gallucci et al., 2006). It would seem that there are phases that should precede successful generational transitions.

Table 1 highlights the phases (such as preparation, transition, integration, and consolidation phases) that precede a successful generational transition and the behaviors that characterize an unsuccessful one.

Phases for successful generational change transition	The reason why generational transition failure
PREPARATION PHASE:	**Resistance to Change** **Inadequate Training and Development: Family Conflicts** **Lack of Strategic Vision Lack of Succession Planning** **Emotional attachment and identity issues**
Succession Planning **Leadership development** **Governance Structures**	
TRANSITION PHASE:	
Role Classification **Communication** **Legal and Financial Considerations**	
INTEGRATION PHASE:	
Cultural Alignment	

Strategic Planning Professionalization	
CONSOLIDATION PHASE:	
Performance monitoring **Continuous Learning** **Legacy Preservation**	

Table 1. Phases of success and common failure behaviors in the generational transition process

The Preparation phase is further divided into three specific stages: Succession Planning, which involves early and detailed planning to identify and prepare potential successors; Leadership Development, which focuses on offering education, training, and mentorship to the upcoming leaders; and Governance Structures, which include setting up formal bodies like family councils and boards of directors to support decision-making and resolve conflicts.

The Transition Phase is further divided into three stages: Role Clarification, which involves clearly defining the responsibilities of outgoing and incoming family members to avoid overlap and conflict; Communication, which emphasizes maintaining open and transparent dialogue among family members to manage expectations and address concerns; and Legal and Financial Considerations, which covers aspects like ownership transfer, tax implications, and estate planning.

The Integration Phase includes three main stages: Cultural Alignment, which ensures the new generation respects the company's history and values while bringing new ideas; Strategic Planning, involving new leadership in aligning their vision with the company's future objectives; and Professionalisation, focused on adopting professional management practices for efficient operations and preparing for future challenges.

The Consolidation Phase is also segmented into three sub-phases: Performance Monitoring, which involves regularly evaluating the new leadership and business performance to ensure alignment with established goals; Continuous Learning, which promotes ongoing adaptation to evolving business trends and practices; and Legacy Preservation, which focuses on safeguarding the family's legacy while encouraging growth and innovation.

When evaluating the factors that influence a successful generational transition in family businesses, it is also crucial to identify factors that may lead to failure during this process. Research often highlights the most common reasons for unsuccessful generational transfers, particularly in small businesses (Ibrahim et al., 2001). The main causes of failure in these transitions include:

- Lack of succession planning: which involves the absence of a clear and structured succession plan, can lead to confusion and conflict during the transition process. Family businesses often delay succession planning due to emotional attachments and the complexity of family dynamics.
- Resistance to change: The older generation may resist new ideas and changes proposed by the younger generation, leading to a clash of visions and strategies. This resistance can stem from a fear of losing control or believing that traditional methods are best (Dyck et al., 2002; Sharma et al., 2003).
- Inadequate training and development: It refers to the failure to prepare the next generation properly through education, training, and gradual responsibility transfer, which can result in unprepared successors lacking the necessary skills and knowledge to lead the business successfully (Le Breton-Miller et al., 2004; Word, 2016).

- Family conflicts: refer to interpersonal conflicts within the family, such as sibling rivalry or disputes between generations, which can significantly disrupt the transition process. These conflicts often originate from issues related to power distribution, role allocation, and wealth-sharing.
- Lack of strategic vision: Without a shared strategic vision for the future of the business, the transition process can become aimless and prone to disagreements over the company's direction and goals.
- Emotional attachment and identity issues: It concerns the founder's or current leader's emotional attachment to the business, and the difficulty in separating personal identity from the business role can hinder the process of letting go and transferring leadership to the next generation.

Considering the research's contribution to understanding the factors that make the generational transition within family businesses a moment of success or failure, it is possible to investigate the positive impact that female leadership can have on this delicate moment.

2.2. Female Influence in Small and Medium-Sized Businesses during periods of generational Transition

Based on previous studies, the female propensity, as a character trait, can act positively even in a delicate moment, such as the generational transition within a small- and medium-sized business. (Ward, 2016; Carlok & Ward, 2001).

The first theory to consider is the transactional leadership theory. This theory was developed between the 1970s and 1980s, and its two foremost exponents are Bernard M. Bass and Bruce J. Avolio (Bass et al.,1996).

These authors identify "transnationality" as a fundamental element for a successful leader. This term refers to the ability of those in positions of responsibility to quickly shift from a harsher to a softer, more understanding leadership style. (Bass et al., 20023).

In-depth studies (Bass et al., 1996; Bono et al., 2004; Maher et al., 1997;; Hackman et al., 1992) on transactional theory have shown that this characteristic is more prevalent in women than in men. In this case, a second theory worth highlighting is emotional intelligence. This theory, which originated in the 1990s, was proposed by Salovey et al. (1990). These researchers described emotional intelligence as the ability to process information based on one's emotions and those of others, using them to guide thinking and behaviour.

Emotional intelligence is crucial in managing a company because it enables you to understand, use, and manage emotions effectively to promote high individual and team performance. It helps leaders

motivate employees, navigate conflicts, communicate effectively, and create a positive work environment, thereby increasing job satisfaction, employee loyalty, and business performance. (Salovey et al.,2003).

A leader with emotional intelligence would better navigate complex, delicate moments within the company, such as the generational transition.

Some studies (Sanchez-Nunez et al.,2008), (Abdullah, 2019), (Panda et al.,2019) highlight how emotional intelligence is a characteristic mainly of women. They use it excellently both in their professional and private lives.

Given the points highlighted above, three main insights emerge from the literature. First, succession in family firms is not a single event but a complex process that unfolds through preparation, transition, integration and consolidation phases, each of which can be critically affected by the influence of the family (Handler, 1994; Le Breton-Miller et al., 2004; Gallucci & Gentile, 2006; De Massis et al., 2008). Second, family involvement can act both as a valuable resource – by providing long-term orientation, social capital, and patient capital – and as a source of tensions, emotional attachment and intra-family conflicts that complicate leadership transitions

(Olson et al., 2003; Miller et al., 2007; Schulze et al., 2003; Chrisman et al., 2004). Third, research on gender and leadership suggests that women are often associated with transactional leadership behaviours and emotional intelligence, which appear beneficial for managing conflict, navigating change and maintaining relationships (Bass et al., 1996; Hackman et al., 1992; Salovey & Mayer, 1990; Sanchez-Núñez et al., 2008; Abdullah et al., 2019; Panda & Banik, 2019). Taken together, these streams of research suggest a paradox that has yet to be fully explored. Suppose female successors are more likely to adopt leadership behaviours and emotional competencies that should help them cope with the emotional, relational, and strategic challenges of generational transition. Why do we still know so little about how they actually manage these processes in practice, especially in small- and medium-sized family businesses? Moreover, how does the influence of the family, in terms of legacy, control, monitoring and expectations, shape the way female successors relate to other family members, reorganise internal processes and pursue strategic renewal, and how do these dynamics differ from those observed when male successors take over (Bennedsen et al., 2007; Ibrahim et al., 2001; Dyck et al., 2002; Morris et al., 1997)

Although some studies have examined the presence of women in family firms and emphasised their positive contribution (Curimbaba, 2002; Hougaz, 2015), we still lack a detailed understanding of how female leadership interacts with family influence throughout the different phases of generational transition. In particular, there is a need for in-depth qualitative research that traces how family values, emotional bonds, and intra-family power relations shape successors' leadership behaviours and, in turn, how successors' actions feed back into family relationships, organisational processes, and strategic trajectories. The present study addresses this gap by using a qualitative multiple case study of Italian small and medium-sized family businesses to explore the following overarching research question: How does female leadership, in interaction with family influence, shape relationships, organisational processes, and strategic change during the generational transition, and how does this differ from male leadership?

From a theoretical perspective, this study argues that female leadership influences generational transition not directly, but through specific underlying mechanisms. Drawing on transactional leadership theory and emotional intelligence (Bass et al., 1996; Salovey & Mayer, 1990), we suggest that female successors are more likely to engage in emotional regulation, relational mediation, and adaptive leadership behaviours that are particularly relevant in emotionally charged and relationally complex contexts such as family business succession (Sanchez-Núñez et al., 2008; Hsu et al., 2022). These mechanisms help contain intra-family tensions, facilitate the gradual transfer of authority, and balance continuity with change across the different phases of the generational transition.

3. Methodology

The methodology used to answer the research question is qualitative and follows a multiple-case study design. In line with recommendations for qualitative research in family business studies (De Massis et al., 2014; Reinecke et al., 2016), we adopt a primarily inductive, theory-building approach to develop a richer understanding of how female leadership shapes generational transitions in practice. Qualitative methodology is particularly suited to exploring complex, not yet fully understood, and potentially paradoxical phenomena, such as the interplay between family influence, gendered leadership behaviours, and the dynamics of succession, because it relies on in-depth accounts of participants' experiences rather than numerical data (Berríos & Lucca, 2006). The multiple case study focuses on analyzing multiple cases to highlight similarities and differences among them (Yin, 2009; Yin ., 2012). The difference between the single case study and the multiple case study is that, in the multiple case approach, there is the potential to obtain more information on the phenomenon and generalise the results more quickly.

In this study, we conducted interviews with male and female protagonists of the generational transition in small and medium-sized family businesses to explore how they approached this

delicate moment in their companies and how they perceived the influence of their gender and of family dynamics on the process. Rather than testing predefined hypotheses about gender differences, we aimed to build an empirically grounded understanding of how women and men describe their experiences of succession and to identify recurring patterns in how female successors, in particular, navigate the tensions between continuity and change.

4. Data collection: Interviews carried out

The data were collected through interviews using a semi-structured questionnaire. The study adopts a qualitative multiple-case study design aimed at developing an in-depth and processual understanding of generational transition dynamics. Data were collected through semi-structured interviews and analysed using an interpretive approach based on iterative coding and comparison. Specifically, interview transcripts were examined through within-case analysis to capture each succession experience, followed by cross-case comparison to identify recurring patterns related to leadership behaviours, family influence, and succession phases. This approach is consistent with qualitative research in family business studies and is particularly suitable for exploring complex and under-researched phenomena.

The questions were chosen based on the literature on generational transition management. As indicated in Table 2, six people were interviewed. Those interviewed were all protagonists in the first person of a generational change within their family businesses.

Participant	Gender	Position	Interview Duration (minutes)	Company
A	Female	CEO	21	Blu Plast - Italy
B	Male	Marketing Director	19	Blu Plast - Italy
C	Male	Export Director	25	Arbiter - Italy
D	Female	Board component	17	Arbiter-Italy
E	Male	CEO	22	Svas-Italy
F	Female	R&S Director	30	CoopCulture-Italy

Table 2. Participants' Interview Details

5. Results and discussion

In this section, the empirical evidence is interpreted in light of the theoretical frameworks discussed above: the process models of generational transition, the perspectives on family influence and the theories of transactional leadership and emotional intelligence.

The interviews were conducted face-to-face, and the content was listened to by three individuals to compare interpretations. In all three cases, the listeners highlighted a difference in the approach to generational transition between men and women. Women showed a greater propensity for change and were better prepared for the moment of generational change, even when they had not been adequately prepared.

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Subject D indeed stated: "Even though the generational transition within the company was sudden, I immediately faced a new challenge, taking into account the legacy of my grandfather and my father, but I changed some things in the management, considering my ideas and the work experience I had abroad."

The interviews also revealed that women are more versatile in management methodologies than men. For instance, subject A stated: "Since my father stepped back and handed me the company's reins, I have tried to appear confident with the collaborators and to alternate moments of group gratification with moments when it was necessary to be tough. This has led the collaborators to recognize me as a leader soon. I cannot say they respect me as much as they respected my father, but we are on the right track."

Although men were enthusiastic about their generational transition experience, they found it more difficult to abandon ideas, even if obsolete, that were carried forward by their fathers and, more often, by their grandfathers.

Subject E stated: "Even though I knew that some practices used by my grandfather were outdated, my bond with him was so strong that it took me months to say: 'We should not do this anymore.' I felt bound; changing things, he devised, made me feel like I was disrespecting him." He continued: "I had a great deal of difficulty being recognized by the collaborators as the leader; for a long time, and perhaps even today, my father's way of doing business remained deeply ingrained in them."

In all cases, the women highlighted that the previous generation monitored them periodically after the generational transition in which they were involved. This monitoring had already been considered when planning the generational transition (where such planning had been carried out). On the other hand, men require monitoring by previous generations, but not regularly; monitoring occurs only when a decision is made, which makes them feel less responsible.

In particular, subject C stated: "I still cannot make decisions without my father's and my uncles' approval; I still feel very insecure."

In each case examined, particularly in each interview conducted, a connection was found between the experience of generational change and the phases described in Table 1.

Regarding positive generational change experiences, especially those in which women represented the second generation, interviewees stated that the preparation phase for the generational transition and the consolidation phase, particularly regarding post-transition performance monitoring, were essential to ensuring this delicate process was positive for the company and did not compromise its stability.

Conversely, interviewees who found the generational change challenging indicated that poor preparation for the transition, family conflicts, and the absence of post-transition monitoring (reasons for the transition's failure, as shown in Table 1) made the integration process arduous. In general, women have a positive impact on the generational transition due to their patience and versatility, which are fundamental to its success.

From a theoretical perspective, these findings can be read in continuity with the process models of generational transition and with the theories of family influence, transactional leadership, and emotional intelligence discussed in the theoretical background. The emphasis that female successors place on preparation and on post-transition performance monitoring is consistent with process views of succession that underline the importance of the preparation and consolidation phases for ensuring continuity and stability (Gallucci & Gentile, 2006; Le Breton-Miller et al., 2004). At the same time, women's ability to combine respect for the founder's legacy with the introduction of managerial and strategic changes reflects a leadership style that alternates

firmness and support, in line with the notion of transactional leadership (Bass et al., 1996) and with the idea that emotionally intelligent leaders are better equipped to manage complex, emotionally charged transitions (Salovey & Mayer, 1990; Sanchez-Núñez et al., 2008). By contrast, the difficulties reported by male successors in abandoning obsolete practices and in taking autonomous decisions illustrate how strong emotional attachment and intra-family dependency can generate agency-related frictions and resistance to change, as suggested by studies on family influence and agency issues in family firms (Schulze et al., 2003; Chrisman et al., 2004). Overall, the cases suggest that female leadership can act as a mechanism through which family influence is channelled into constructive relational, organisational, and strategic change during the generational transition, rather than becoming a source of blockage or conflict.

6. Conclusions, Limitations, and Future Research

This study analyses for the first time the impact of female leadership on a particularly critical moment in the life of family businesses: the generational transition. The findings highlight the positive contribution of women to generational succession within family firms. The interviews revealed that women demonstrate considerable adaptability and a tendency towards transactional and dynamic behaviours, which have proven crucial for successful generational transition. In this regard, our results align with previous research (Bass et al., 1996; Bono et al., 2004; Maher et al., 1997; Hackman et al., 1992), which underlines the significance of transactional leadership and defines such character traits as essential for effective business management.

Taken together, these findings offer several theoretical contributions to family business research. First, they extend existing succession studies by demonstrating that the gender of the successor is not a neutral attribute, but can shape how preparation, transition, integration, and consolidation phases unfold in practice. Second, they deepen agency-based perspectives on family firms by showing how female successors' emotional intelligence and transactional leadership behaviours can mitigate intra- family tensions and facilitate the transfer of control while preserving the firm's legacy. Third, by linking micro-level leadership behaviours to process outcomes, the study encourages future research to move beyond the simple distinction between successful and unsuccessful succession and to examine how different leadership styles – and in particular female leadership – affect the quality and sustainability of generational transitions over time.

From a practical standpoint, the findings enrich the existing body of research and offer valuable insights for family businesses facing similar challenges, such as the strategic placement of women in critical roles. Encouraging and facilitating a more active role for women in generational succession could promote organisational stability and innovation and advance greater gender equity in the sector.

Despite its contributions, this study has several limitations. The empirical analysis focuses exclusively on companies operating in Italy, and the number of cases is necessarily limited. These aspects restrict the generalisability of the results but also open up opportunities for future research. Subsequent studies could investigate the impact of women on generational succession in family businesses worldwide, compare different institutional and cultural contexts, and adopt longitudinal designs to capture how female leadership influences generational transitions over time.

Keywords: Female leadership; generational transition; family firms; succession

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Cybersecurity Expenditures and Intangible Assets: The IAS 38 Control Criterion under the DORA Framework

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1. Introduction

In recent years, cyber risk has become a structural driver of operational vulnerability in the financial sector, exposing institutions to severe disruptions, reputational damage and significant remediation costs (Anderson et al., 2013; Bouveret, 2018). At the same time, the growing digitalisation of financial services has deepened financial institutions' dependence on complex ICT infrastructures, cloud services and interconnected digital supply chains, amplifying the potential impact of cyber incidents on system wide stability (FSB, 2020; ESMA, 2022). Against this backdrop, the EU Digital Operational Resilience Act (DORA) establishes a comprehensive and binding framework for managing ICT risks, mandating systematic investments in digital operational resilience and introducing a dedicated oversight regime for critical ICT third party providers supporting core financial functions (European Commission, 2020; EIOPA, 2024).

DORA requires financial entities to map and classify critical ICT assets and services, implement robust controls for incident prevention and response, and manage ICT third party risk through stringent contractual, governance and monitoring arrangements (European Commission, 2020; EBA, 2022). As a result, financial institutions make significant and recurring expenditures in cybersecurity capabilities, resilience testing, business continuity solutions, data and system recovery arrangements, and ICT outsourcing relationships. These expenditures are not merely operational costs, but strategic investments in the preservation of going concern value, the continuity of revenue generating activities and the protection of customer trust (Gordon et al., 2018; PwC, 2023).

From a financial reporting perspective, DORA driven expenditures interact in a complex way with the recognition criteria for intangible assets under IAS 38, which require the existence of an identifiable resource controlled by the entity and capable of generating future economic benefits (IASB, 2004; IFRS Foundation, 2024). In particular, IAS 38 conceptualises control as the power to obtain future economic benefits from an underlying resource and to restrict others' access to those benefits, a notion traditionally anchored in legal rights, enforceable contracts and exclusive availability (IASB, 2004). However, DORA's emphasis on interdependence with critical ICT third party providers and on resilience obligations embedded in contractual and regulatory arrangements challenges the conventional view of control as individually held, exclusive dominion over an asset, especially where resilience outcomes are co produced along extended digital supply chains (Noerr, 2024; FMA, 2025).

This evolving regulatory and technological landscape raises the question of whether the current accounting treatment of cybersecurity and digital resilience expenditures – typically expensed as incurred and accompanied by limited, high level disclosures – provides a faithful representation of the underlying economic phenomena in the financial statements of regulated entities (Lev, 2018; IFRS Foundation, 2024). Moreover, the existence of a binding and permanent regulatory framework such as DORA suggests that these expenditures are not contingent or episodic outlays, but recurring components of a digitally dependent business model, with potential

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structural implications for how control and future economic benefits are conceptualised in accounting.

2. Literature review

The accounting literature has long highlighted the challenges associated with recognising and measuring intangible assets, particularly in knowledge and technology intensive sectors (Lev, 2001; Wyatt, 2005). Several studies document a widening gap between the economic relevance of internally generated intangibles and their visibility in financial statements, due to strict recognition criteria and conservatism in standard setting (Oswald & Zarowin, 2007; Li & Liu, 2012; IFRS Foundation, 2024). The control criterion in IAS 38 has attracted specific attention, as it effectively limits recognition to situations in which legal or contractual rights provide clear evidence that the entity can obtain future economic benefits and restrict others' access (IASB, 2004; Ramanna, 2008).

Recent literature on digitalisation and intangibles suggests that emerging forms of value creation – such as platforms, data ecosystems and networked infrastructures – often rely on shared or distributed control, making the application of existing accounting concepts increasingly problematic (Cañibano & García Ayuso, 2013; Andon et al., 2020). In parallel, research on cybersecurity and accounting has begun to explore how cyber incidents, security investments and data related risks affect financial reporting, risk disclosures and valuation (Melone et al., 2019; Richardson et al., 2019; Audit Analytics, (2022). However, most contributions treat cybersecurity expenditures as risk management or compliance costs rather than as candidates for recognition as intangible assets.

On the regulatory side, an emerging strand of literature examines the implications of DORA and related digital resilience initiatives for financial stability, risk governance and ICT outsourcing practices (FSB, 2020; European Commission, 2020; EIOPA, 2024). These studies emphasise the centrality of third party dependencies and the creation of critical ICT infrastructures that are effectively shared across multiple financial institutions. Yet, the intersection between DORA driven digital resilience obligations and the accounting treatment of related expenditures under IAS 38 remains largely unexplored. In particular, while recent studies have focused on the effects of single cyber events or breach disclosures on market prices and risk perceptions, event based approaches such as Janvrin and Wang (2022) concentrate on discrete episodes rather than on the ongoing, regulation driven nature of digital resilience investments, leaving open the question of how such investments should be conceptually framed within the intangibles reporting framework.

This paper aims to fill this gap by bridging three streams of research:

- the debate on the recognition and measurement of intangible assets and the limitations of the control criterion in IAS 38;
- the evolving literature on cybersecurity and digital operational resilience in financial institutions; and
- the regulatory analysis of DORA with particular focus on ICT third party risk and oversight.

By doing so, it offers a novel perspective on the conceptual and practical challenges of representing DORA related cybersecurity investments in financial reporting and differentiates itself from event based approaches by placing prudential regulation as a structural and continuous investment context, rather than focusing solely on the accounting consequences of isolated incidents.

3. Purpose

This study examines the extent to which the Digital Operational Resilience Act (DORA) can be regarded as a catalyst for a critical reassessment of the control criterion in IAS 38 for cybersecurity related intangible investments. Specifically, it investigates how mandatory investments in Digital Operational Resilience and the stringent oversight of critical ICT third party providers challenge the traditional understanding of control as the "ability to obtain future economic benefits" and the "power to restrict others' access", revealing conceptual and practical tensions that are not adequately addressed by current accounting standards and the existing literature (IASB, 2004; IFRS Foundation, 2024; Lev, 2018).

By focusing on the under explored intersection between prudential digital resilience regulation and financial reporting, the paper seeks to identify whether a qualitative reframing of control is needed to ensure a faithful representation of DORA driven digital resilience investments in the financial statements of regulated financial institutions. The study also explores how current practice – which typically routes DORA related expenditures through the income statement without capitalisation and provides only generic narrative disclosures under sustainability and risk reporting frameworks – compares with the conceptual ambitions of IAS 38 and recent calls for improved transparency on intangibles (IFRS Foundation, 2024; EFRAG, 2021). In doing so, the analysis not only assesses the technical appropriateness of the prevailing accounting treatment, but also considers its informational implications for users, in light of the evolving regulatory landscape and ongoing debates on intangibles reporting and the value relevance of non financial information.

4. Design/methodology/approach

The research adopts an exploratory, qualitative multiple case study design based on semi structured interviews with senior managers from two banks and one insurance company subject to DORA requirements (Yin, 2014; Eisenhardt et al., 2016). The cases were selected to capture variation in business models and ICT outsourcing strategies while remaining within the same regulatory perimeter, thus allowing for analytical rather than statistical generalisation.

The interview protocol elicits participants' views on:

- the nature, scope and drivers of DORA related cybersecurity and digital resilience investments;
- the perceived locus of control over key digital assets and resilience capabilities in the presence of critical ICT third party providers; and
- the challenges encountered when mapping these investments onto existing IAS 38 recognition and measurement criteria.

Interviews focus on both current practices (e.g. expensing vs capitalisation, internal vs external reporting) and perceived tensions between regulatory expectations, internal risk management narratives and financial reporting outcomes. To enhance the reliability of the findings, the design also incorporates triangulation between interview evidence and internal documentation made available by the institutions (ICT policies, risk management frameworks, extracts from financial statements and non financial reporting), anchoring managers' perceptions in concrete organisational and accounting artefacts.

The resulting material is analysed through iterative thematic coding, combining deductive codes derived from the IAS 38 framework and the DORA regulatory architecture with inductive codes emerging from managers' narratives (Gioia et al., 2013). This process leads to the identification of macro themes for the discussion and findings section, including: emerging configurations of shared or networked control along digital supply chains; the distinction between expenditure perceived as "compliance cost" versus "strategic intangible investment"; and perceived gaps or ambiguities in accounting guidance for representing digital operational resilience in financial statements. Short verbatim excerpts from the interviews are used to

illustrate these macro themes, showing how managers concretely articulate the tension between regulatory language, risk management logics and the constraints of the IAS 38 framework.

5. Discussion and findings

The analysis of the three cases reveals, first, that DORA related cybersecurity and digital resilience expenditures are almost uniformly recognised as period expenses in the income statement, with no systematic attempt to assess them against the recognition criteria for intangible assets under IAS 38 (IASB, 2004; IFRS Foundation, 2024). Managers in both banks and the insurance company tend to frame these outlays as "regulatory compliance costs", tightly linked to meeting supervisory expectations and avoiding sanctions, despite acknowledging that they contribute to the long term preservation of service continuity, customer trust and franchise value. This framing blurs the boundary between pure operating expense and strategic investment in digital resilience capabilities, reinforcing a conservative accounting treatment that may understate the stock of internally generated intangibles related to cyber resilience (Lev, 2018; Gordon et al., 2018). In some interviews, for example, ICT heads describe DORA initiatives as necessary "tickets to play" for remaining in the market, while at the same time recognising that they durably strengthen continuity and incident management capabilities.

Second, the cases suggest the emergence of "networked" or "shared" control configurations, in which the resilience outcomes sought by DORA are co produced with critical ICT third party providers through contractual, technical and governance arrangements (European Commission, 2020; Noerr, 2024). Managers describe a situation in which internal resources (e.g. security teams, incident response processes, governance structures) are tightly coupled with external infrastructures (e.g. cloud platforms, security as a service, managed detection and response), making it difficult to attribute exclusive control over the underlying digital resilience capabilities to a single entity. In this context, they report difficulties in mapping their practical understanding of control – which is distributed across internal and external actors – onto the IAS 38 notion of control as the power to obtain future economic benefits from a resource and to restrict others' access, a notion largely conceived with individually held or legally enforceable rights in mind (IASB, 2004; Ramanna, 2008). This conceptual misalignment contributes to a de facto bias towards immediate expensing, even where the underlying resilience capabilities exhibit characteristics typically associated with intangible assets, such as identifiability, future economic benefit and a multi period horizon (IFRS Foundation, 2024). At the same time, the regulatory requirement to map and classify critical ICT assets and to formalise stringent contractual clauses with critical ICT third party providers provides structured evidence on resource boundaries and usage and governance rights, which could at least partially serve as documentary support for satisfying the IAS 38 identifiability requirement.

Third, the study finds a systematic disclosure gap. While financial entities provide narrative information on cybersecurity and operational resilience mainly in the context of sustainability, governance and risk reporting – often under the umbrella of broader ESG and sustainability reporting frameworks – they offer very limited, if any, specific disclosures linking DORA driven expenditures to the recognition, measurement or presentation of intangible assets (EFRAG, 2021; ESMA, 2022).

The resulting reporting practice is characterised by a sharp separation between financial statements, where DORA related expenditures are treated as undifferentiated operating expenses, and sustainability oriented reports, where resilience investments are discussed in high level qualitative terms without a clear connection to the accounting treatment prescribed by IAS 38. This separation reduces users' ability to understand how digital resilience investments affect both current performance and the build up of longer term capabilities, and suggests that existing disclosure regimes do not fully capture the economic substance of cybersecurity related intangibles (Lev, 2018; IFRS Foundation, 2024).

However, the mandatory regulatory requirement to map and classify critical ICT assets and services and impose stringent contractual arrangements on critical ICT third-party providers (CTPPs) arguably provides the necessary rigorous evidence of resource boundary and enforceable rights to satisfy the identifiability criterion of IAS 38.

Collectively, these macro themes indicate that DORA functions as a catalyst exposing the limitations of the current control criterion for capturing digital resilience investments, and point to the need for a qualitative reframing of control – and possibly of related disclosure requirements – to ensure a more faithful representation of such investments in the financial reporting of regulated financial institutions. The findings also hint at potential avenues for standard-setting, including clarifying how control may be evidenced in settings where economic benefits and resilience outcomes are generated within shared or networked arrangements, and how narrative disclosures can better bridge the gap between prudential digital resilience regulation and accounting representations. In this respect, the paper suggests that a better alignment between financial and sustainability reporting could be achieved by explicitly linking risk-management and ESG sections to the recognition and classification choices applied to digital resilience expenditures in the financial statements.

6. Originality, value and limitations

This study contributes to the emerging debate at the intersection of digital resilience regulation and financial reporting by proposing DORA as a critical test case for reassessing the control criterion in IAS 38, with specific reference to cybersecurity and digital operational resilience investments. Unlike prior work that has largely treated cyber and resilience expenditures as operational risk management issues or has examined them under the umbrella of sustainability and risk disclosures, the paper explicitly interrogates their accounting treatment as potential intangible assets, highlighting how DORA induced obligations and ICT third party oversight expose conceptual blind spots in the current standard setting framework (Lev, 2018; IFRS Foundation, 2024). Compared to studies centred on specific data breach events or market reaction analyses, the approach adopted here privileges a regulatory and conceptual perspective, focusing on recurring and systemic investments in digital operational resilience rather than on isolated incidents, and showing how such investments interact with the definition of control and with IAS 38 recognition criteria.

The paper offers value for both standard setters and practitioners by articulating how networked configurations of control, co produced with critical ICT third party providers, challenge traditional, entity centric notions of control and by documenting the resulting accounting and disclosure practices in banks and insurance companies subject to DORA. For financial institutions, the findings clarify the implicit assumptions underpinning the prevailing expensing approach and the separation between financial statements and sustainability oriented reporting, thereby informing more transparent and conceptually grounded policy choices on recognition and disclosure of digital resilience investments. For standard setters and regulators, the study provides empirically grounded insights into how current notions of control and disclosure requirements operate in practice when confronted with DORA driven digital resilience obligations.

The research is subject to several limitations. First, the evidence is based on a small number of qualitative case studies (two banks and one insurer) and relies on some limited managers' perceptions due to a regulatory context that is still in the initial stages of application (the data of the mandatory application was the 17th of January 2025 with D.LGS. 10 March 2025, n.23), which constrains statistical generalisability but is appropriate for theory building in a novel domain (Yin, 2014; Eisenhardt et al., 2016). Second, the study focuses on the IAS 38 control criterion and does not undertake a full measurement or valuation analysis of cybersecurity related intangibles, leaving scope for future research to develop quantitative models and to explore cross

country differences in reporting practices under varying supervisory expectations. Third, the empirical analysis is limited to the perspective of supervised financial institutions and does not include the views of regulators or auditors, which could provide further insight into interpretive expectations on control and disclosure. Fourth, the paper does not examine in detail the interaction between DORA and emerging sustainability related reporting standards (such as ESRS), which may further shape the narrative and quantitative disclosures on digital resilience in the future.

Keywords: Cybersecurity costs; digital operational resilience Act (DORA); IAS 38; intangible assets; control; financial reporting; ICT risk

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L'intelligenza artificiale nei sistemi di early warning contabili: verso un nuovo modello di rilevazione della crisi d'impresa

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1. Introduzione

La crisi d'impresa è una tema che tocca da vicino sempre più imprese. I numeri del fenomeno sono, infatti, preoccupanti: si registra un incremento delle aziende in crisi in modo ininterrotto da 4 anni. Nel 2022 l'avvio di nuove procedure è salito di oltre il 61%, toccando +29% nei primi sei mesi del 2025. Le liquidazioni giudiziali sono l'iter più utilizzato (Il Sole 24 Ore, 2025), affiancate dallo strumento stragiudiziale della composizione negoziata con quasi 600 istanze presentate nel 2023, 1.089 nel corso dell'anno 2024 ed 834 solo nel primo semestre del 2025 (Unioncamere, 2025). In questo preoccupante contesto, il presente studio si interroga se le nuove tecnologie possano supportare le aziende a prevenire fenomeni di crisi d'impresa, cogliendo i primi segnali agli albori delle difficoltà aziendali, permettendo un migliore processo di risanamento. Pertanto, il presente lavoro analizza il potenziale delle nuove tecnologie e in particolare dell'intelligenza artificiale (IA) nei sistemi contabili di early warning per la rilevazione della crisi d'impresa.

L'interesse di studiosi e società verso l'individuazione ed emersione precoce dei sintomi di crisi deriva dalla consapevolezza che una comprensione tardiva del fenomeno può cagionare effetti irreversibili sullo stato di salute aziendale, pregiudicando definitivamente il suo stato vitale, sino a condurre l'impresa verso la liquidazione e dunque all'uscita dal mercato. Viceversa, la tempestiva emersione e gestione della crisi aziendale genera plurimi benefici, apprezzabili dall'impresa che sperimenta la crisi, dai suoi interlocutori negoziali (cd. stakeholders) e dal sistema economico nel suo complesso (Brodi, 2018).

Tale prospettazione ha indotto la dottrina economico aziendalistica ad elaborare, nel corso degli anni, metodi di previsione della crisi atti ad anticipare l'individuazione e l'emersione dei sintomi di crisi. Le attenzioni poste dalla letteratura in materia risultano avvalorate principalmente dalle seguenti considerazioni: (i) la crisi d'impresa non deve essere interpretata come un fenomeno episodico ma sistemico ed in quanto tale affrontata, (ii) le crisi aziendali producono effetti dannosi sull'intera economia nazionale e non soltanto sugli stakeholder direttamente interessati, (iii) l'individuazione precoce delle crisi e quindi la prevenzione delle stesse consente

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di aumentare le possibilità di ritorno in bonis o, in alternativa, l'uscita dal mercato con un minor sacrificio da parte di tutti i soggetti coinvolti.

È possibile distinguere, a seconda del livello di complessità e sofisticazione, metodi di previsione della crisi fondati sugli indici e metodi fondati sui modelli (Guatri, 1986). I primi sono rappresentati da rapporti (ratios) tra grandezze di bilancio, che possono assumere natura patrimoniale, economica o finanziaria. I secondi forniscono, invece, una visione sistemica sulla complessiva condizione aziendale attraverso la considerazione congiunta di una pluralità di indicatori. Nell'approccio di previsione della crisi basato sugli indici manca una visione integrata che metta in correlazione tutti gli indicatori, in modo da fornire un quadro di sistema sulla complessiva situazione aziendale; per siffatta ragione risulta maggiormente opportuno rifarsi a metodologie di previsione basate su modelli, i quali sono in grado di tener conto di una pluralità di indicatori.

La dottrina ha dunque elaborato, nel tempo, diversi modelli che consentono di prevenire la crisi attraverso una sua individuazione tempestiva. Le prime forme embrionali di modelli predittivi vennero concepite ed elaborate negli anni Trenta, nel periodo immediatamente successivo alla grande depressione del 1929. Tali strumenti erano ottenuti prevalentemente dall'opportuna combinazione delle tradizionali analisi di bilancio e di particolari metodiche matematico-statistiche.

È però dagli anni '60 dello scorso secolo che le ricerche accademiche hanno iniziato a concentrarsi su questa tematica, elaborando alcuni tra i principali modelli per la previsione delle crisi aziendali (Altman, 1968; Deakin, 1972; Ohlson, 1980; Zmijweski, 1984).

Il principale autore che si è occupato di modelli di previsione della crisi aziendale è Altman, il cui più importante contributo è rappresentato dal modello Z-score (Altman, 1968). Nonostante il lavoro condotto da Altman sia pioneristico nell'ambito dell'implementazione di modelli di previsione della crisi aziendale, lo Z–score rappresenta ancora oggi un modello riconosciuto, valido e sempre centrale nelle indagini nell'ambito della previsione della crisi. Infatti, il contributo di Altman (1968) è stato fonte di ispirazione per numerosi studi successivi sull'argomento: nel tempo ricercatori e professionisti hanno sviluppato metodi e tecniche di previsione delle crisi che vanno oltre i tradizionali modelli matematici e statistici, con l'obiettivo di prevedere il fallimento delle imprese in modo più rapido e accurato (Barboza et al., 2017).

Al fine di semplificare la tassonomia dei diversi modelli forniti dalla letteratura, questi possono idealmente essere raggruppati in tre classi, a seconda del metodo di classificazione utilizzato. La maggior parte di essi utilizza metodi di classificazione statistica parametrica: analisi discriminanti – siano esse lineari (Altman, 1968) o quadratiche (Lachenbruch et al., 1973) – e tecniche econometriche su dati qualitativi (Ohlson, 1980; Zmijewski, 1984). Altri studi utilizzano metodi statistici non parametrici come il partizionamento ricorsivo (Frydman et al., 1985) e gli stimatori del kernel (Calia e Ganuci, 1997). Più recentemente sono state sviluppate analisi ispirate all'IA, come le reti neurali (Altman et al., 1994; Bardos & Zhu, 1997) o gli algoritmi genetici (Varetto, 1998).

Il principio delle reti neurali consiste nello sviluppo di un cosiddetto algoritmo di apprendimento che imita l'elaborazione delle informazioni da parte del sistema neurologico umano. Ogni neurone risiede in una cosiddetta "funzione di trasferimento", che elabora un insieme di informazioni (input) per ottenere un risultato (output). I diversi modelli di previsione del fallimento che utilizzano le reti neurali si distinguono per la complessità della rete (cioè il suo numero di strati e il numero di neuroni per strato) e per la funzione di trasferimento utilizzata (Atiya, 2001; Charalambous et al., 2023; du Jardin, 2023; Dube et al., 2023; Jabeur et al., 2020; Kim et al., 2022; Mai et al., 2019; Tsai & Wu, 2008). Varetto (1998) e Barney et al. (1999) sono stati i primi Autori a considerare un altro metodo, anch'esso relativo all'IA: gli algoritmi genetici. Il funzionamento è simile a quello delle reti neurali: un algoritmo elabora le informazioni disponibili, i rapporti contabili selezionati e la situazione di ciascuna società (in crisi e sana).

L'algoritmo, per iterazioni successive, deduce regolarità e regole generali del processo di crisi che può poi applicare ad altre società.

La consolidata consapevolezza dell'importanza del fenomeno e della sua indagine, nell'ambito della dottrina economico aziendalistica, ha indotto ad una crescente comprensione del legislatore europeo e nazionale circa la diretta correlazione tra emersione precoce della crisi e possibilità di interventi di turnaround atti ad un ritorno in bonis delle imprese. L'importanza di una precoce rilevazione della crisi d'impresa ha assunto dunque negli ultimi anni una rilevanza sempre maggiore che ha condotto il legislatore, nell'ambito della complessiva riforma del diritto concorsuale, ad introdurre nel nuovo Codice della crisi d'impresa e dell'insolvenza (D.Lgs. n. 14 del 2019) il principio dell'early worning, il quale funge da principio ispiratore dei comportamenti degli attori operanti nell'ambito della crisi d'impresa e delle procedure stesse. L'introduzione di obblighi di rilevazione precoce è avvenuta attraverso la modifica dell'art. 2086 del Codice civile che, nella sua attuale versione, prevede l'obbligo per l'imprenditore di istituire un assetto organizzativo, amministrativo e contabile adeguato alla natura e alle dimensioni dell'impresa, anche in funzione della rilevazione tempestiva della crisi. Nonché attraverso l'introduzione nell'ambito del Codice della crisi di obblighi di rilevazione precoce dei segnali di crisi: l'art. 3 del Codice prevede infatti che l'imprenditore, sia individuale che collettivo, deve adottare misure idonee a rilevare tempestivamente lo stato di crisi e fornisce taluni "segnali" sintomatici della stessa (riguardanti i debiti per retribuzioni, verso fornitori, verso banche e intermediari finanziari e verso creditori pubblici qualificati, rappresentati dagli Enti fiscali e previdenziali). Le previsioni del legislatore in materia di emersione precoce della crisi, da un lato, dunque, rimandano al soggetto economico in merito alla più idonea predisposizione di assetti per la rilevazione tempestiva della crisi, dall'altro forniscono talune specifiche previsioni sintomatiche della stessa. Pertanto, gli imprenditori (e gli organi di controllo per le specifiche funzioni che il legislatore stesso affida loro) dovranno implementare sistemi di prevenzione e previsione della crisi in grado di rilevare una sua eventuale emersione, adattando gli stessi alle peculiarità dell'impresa, non bastando, evidentemente, i limitati indicatori esplicitamente forniti dal legislatore, i quali non forniscono un'ottica complessiva dello stato di salute aziendale.

È proprio in tale contesto nazionale che appare opportuno indagare sulla possibilità di introdurre l'IA per migliorare i meccanismi di previsione della crisi sin d'ora elaborati attraverso le tradizionali tecniche contabili e parzialmente adottati dal Legislatore. Tra le tecnologie abilitanti emergono i big data, la blockchain e l'IA (Trequattrini et al., 2021; Lombardi et al., 2022). Negli ultimi anni quest'ultima sta assumendo un ruolo centrale, diffondendosi sia tra le persone, che nelle aziende pubbliche e private, rivoluzionando sia la vita delle persone che i processi aziendali (Wirtz et al., 2019; Arduni e Beck, 2025). L'IA imita, infatti, quanto più possibile, per mezzo di macchine normalmente elettroniche, l'attività mentale dell'uomo (Boden, 2019; Mitchell et al., 2013; Trequattrini & Schimperna, 2023). Impatti cominciano a rilevarsi anche nei processi di accounting (Khaled AlKoheji e Al-Sartawi, 2022; Fasano et al., 2025). In particolare, l'impatto dell'IA sulla contabilità è particolarmente evidente nell'area dell'acquisizione e dell'elaborazione dei dati (estrazione, confronto e convalida dei dati), poiché le tecnologie basate sull'IA sono in grado di individuare le informazioni rilevanti, estrarle dai documenti e metterle a disposizione dei contabili o dei revisori, che possono così dedicare più tempo alle aree che richiedono un livello di giudizio più elevato (Brennan et al., 2017; Jin et al., 2022).

Inoltre, se da un lato l'IA sembra essere un fattore potenziante il capitale umano (Trequattrini et al., 202l), dall'altro, la sua introduzione ha portato con sé cambiamenti significativi nel modo in cui le organizzazioni gestiscono le attività e nella natura degli stessi posti di lavoro (Kaplan, 2016). Tale tecnologia potenzia il capitale umano grazie alla capacità di processare grandi quantità di dati in modo generalmente più accurato dell'uomo e soprattutto in modo più celere, permettendo di ottenere in poco tempo analisi spazio-temporale molto approfondite (Duan et al., 2019) .

Un crescente interesse per tale tematica e un gap in letteratura emerge da una ricerca sul database scientifico Scopus il 03 dicembre 2025 con le seguenti parole chiave, "artificial intelligence" OR "AI" and "business* crisis*" OR "corporate crisis*" OR "bankruptcy" dalla quale sono emersi 82 documenti relativi all'area "Business, Management and Accounting", con 16 articoli nel 2025.

Molti di questi studi hanno, però, analizzato le cause finanziarie e non finanziarie del fallimento, in quanto fenomeno multidimensionale (Ooghe e De Sofie, 2008), altri hanno concentrato l'attenzione sul processo che porta le imprese al fallimento (Levratto, 2013). In questa prospettiva la nostra domanda di ricerca (RQ) è la seguente:

RQ: Gli algoritmi di IA possono migliorare la capacità predittiva degli indicatori contabili tradizionali di crisi d'impresa?

A partire dai limiti degli indicatori tradizionali previsti dal D.Lgs. 14/2019, lo studio si propone di analizzare come le tecniche di machine learning possano essere applicate nella previsione precoce della crisi d'impresa. Attraverso un metodo qualitativo (Hair Jr. et al., 2003; Krippendorff, 2013) si cercherà di raggiungere gli obiettivi di ricerca prefissati. Tale scelta è appropriata dato che il metodo qualitativo permette ai ricercatori di raggiungere i propri obiettivi di ricerca in determinate situazioni "Situations in which qualitative research is likely to be the preferred method include 1) which little known about a research problem or opportunity, 2) where previous research only partially on incompletely explains the research question, 3) when current knowledge involves subconscious, psychological, or cultural material that is not accessible using survey and experiments, and 4) if the primary purpose of the research is to propose new ideas and hypotheses that can eventually be tested with quantitative research. (Haier et al. p. 276)".

Nel primo step della ricerca è stato creato un campione di imprese italiane per le quali erano disponibili informazioni sullo stato di attività/crisi e per le quali erano disponibili i dati economico/finanziari. Il focus sul contesto italiano è essenziale in questa prima fase per assicurare la robustezza dei risultati, essendo la normativa sulla crisi d'impresa strettamente nazionale. Nel secondo step, sono state raccolti attraverso la banca dati AIDA i dati economico-finanziari necessari all'implementazione del modello di previsione classico e quello tramite IA. Nel terzo step, sono state confrontate le evidenze dei modelli statistici classici e la previsione effettuata attraverso algoritmi di IA nel prevedere situazioni di insolvenza o perdita della continuità aziendale.

I risultati preliminari evidenziano una maggiore capacità dell'IA di individuare tempestivamente i segnali di crisi, pur richiedendo un'interpretazione professionale per garantire trasparenza e affidabilità del giudizio. Il professionista contabile dovrà, però, in tale ottica acquisire nuove competenze, come quelle tipiche del data analyst e di interpretazione dei risultati dell'IA. Inoltre, l'integrazione delle pratiche professionali classiche con quelle derivanti dalle nuove tecnologie abilitanti apre anche questioni etiche e normative, tra cui la responsabilità nei processi decisionali e la trasparenza degli algoritmi. In questa prospettiva, i risultati sembrerebbero mostrare la necessità di sviluppo di explainable AI per la contabilità, al fine di permettere al professionista di poter correttamente interpretare i risultati dell'AI.

Il paper offre implicazioni teoriche e pratiche. Nella prima prospettiva, risponde a molte call, tra cui quella del XLI Convegno AIDEA, e colma un gap in letteratura su come l'IA possa superare i limiti dei modelli predittivi della crisi classici. Contribuisce, dunque, al filone di ricerca sull' importanza di individuazione dei segnali di crisi d'impresa (Altman, 1968; Deakin, 1972; Ohlson, 1980; Zmijweski, 1984; Brodi, 2018) sul ruolo delle nuove tecnologie nei processi di accounting (Khaled AlKoheji & Al-Sartawi, 2022; Trequattrini & Schimperna, 2023; Fasano et al., 2025). Nella seconda prospettiva, i risultati ottenuti sono rilevanti per la professione contabile, per i revisori, gli organi di controllo, i CFO e i commercialisti, e per la progettazione di sistemi di controllo interni integrati con tecnologie predittive, contribuendo al dibattito sull'evoluzione digitale dell'accounting.

Questo studio presenta alcune limitazioni, dovute alla focalizzazione esclusivamente al contesto italiano, all'analisi su un unico anno e all'applicazione di un metodo esclusivamente qualitativo. Tuttavia, questo è solo un primo studio sul tema, con la normativa sulla crisi d'impresa cambiata da poco tempo; una volta trascorso più tempo dall'introduzione del nuovo Codice della Crisi d'impresa sarà possibile effettuare analisi più approfondite e con confronti spazio-temporali. Sarà utile nelle future ricerche anche effettuare questionari a professionisti contabili esperti sul tema.

Parole chiave: Accounting; controllo; IA applicata alla prevenzione della crisi

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Le aree di bilancio maggiormente interessate da condotte illecite: red flags ed evidenze empirico-giurisprudenziali dalle pronunce della Cassazione

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1. Sviluppo concettuale e inquadramento teorico

Il financial accounting è chiamato a rappresentare in modo fedele e attendibile la situazione economico-finanziaria dell'impresa a supporto e beneficio delle decisioni di investimento, di credito e di regolazione dei mercati (Ball & Brown, 1968; Beaver, 1968; OIC 11, 2018; IASB, 2018; FASB, 2024). Nel tempo, il ruolo del financial reporting si è ampliato oltre la sola decision usefulness per gli investitori, includendo in modo crescente le funzioni di stewardship e di accountability verso la collettività. L'informazione finanziaria deve quindi garantire trasparenza, responsabilità e una allocazione efficiente delle risorse, al servizio dell'interesse pubblico e della stabilità di lungo periodo.

In un contesto così delineato, l'attendibilità della rappresentazione contabile, nonché la qualità dell'informativa finanziaria, sono divenute temi centrali tanto nella letteratura accademica quanto nell'ambito regolatorio. Gli strumenti di early warning per la prevenzione delle manipolazioni assumono quindi una valenza che va oltre la tutela del singolo soggetto, alimentando l'attenzione attorno al fenomeno della alterazione dei dati contabili.

La redazione del bilancio d'esercizio implica per sua natura un fisiologico margine di discrezionalità. Del resto, come ampiamente evidenziato in letteratura, il bilancio è prevalentemente il risultato di stime e congetture (Azzini, 1957; Ferrero, 1965; Masini, 1979; Onida, 1971; Provasoli, 1974; Zappa, 1957). Tale discrezionalità, seppur inevitabile e in parte necessaria per la rappresentazione della realtà economica (Capalbo, 2016), non può trasformarsi in mero arbitrio (Giunta & Pisani, 2008), in quanto esiste un "limite di ragionevolezza" oltre il quale le valutazioni si traducono in una rappresentazione alterata della realtà (Cass. civ., Sez. I, 12/05/2022, n. 15087). Se da un lato infatti si può sostenere che l'esercizio consapevole della discrezionalità, quando avvenga entro i limiti fissati dall'ordinamento e dai principi contabili, debba presumersi ragionevole, d'altro canto sarebbe ugualmente sbagliato ritenere che il mero rispetto della regolarità formale ne implichi di per sé un uso corretto e che quindi, non si sia giunti ad una rappresentazione di fatti non rispondenti al vero (Cass. pen., Sez. V, 15/05/2014, n. 20738).

Per quanto la dottrina classica di economia aziendale abbia riconosciuto negli anni l'importanza di tale margine decisionale agli amministratori nelle valutazioni di bilancio, è altrettanto evidente che questo porti con sé il rischio di essere utilizzato non per migliorare la qualità informativa del bilancio, ma per finalità opportunistiche.

La letteratura su earnings management e earnings quality ha infatti ampiamente documentato che l'eccessivo arbitrio nei processi valutativi e stimativi del bilancio può risultare in una

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alterazione della qualità dell'informazione finanziaria, influenzando le decisioni di investitori, creditori e altri stakeholder e distorcendo l'allocazione delle risorse.

La dottrina distingue, pur evidenziandone la continuità, tra earnings management e frode di bilancio. Numerose e talvolta differenti sono le definizioni di "gestione degli utili" fornite negli anni (ex multis: Beneish, 2001; Healy & Wahlen, 1999; Ronen & Yaari, 2008; Schipper, 1989) divenendo un termine di uso comune nelle sue sfaccettature (e.g. earnings management, manage earnings, managing earnings, management of earnings) quando ci si riferisce alla gestione del bilancio in generale. Tanto spiega come non esista necessariamente una tendenza a migliorare o a peggiorare i risultati ma piuttosto ad adattarli, volta per volta, alle specifiche esigenze degli amministratori (Capalbo, 2003). Ulteriori studi invece lo considerano come predittivo di frode (Ettredge et al., 2010; Perols & Lougee, 2011) e avente natura informativa (Guay et al., 1996; Subramanyam, 1996). Ciò che accomuna tali condotte sono tuttavia le conseguenze che vanno ben oltre la singola impresa. Sebbene con intensità differenti, gli impatti infatti possono coinvolgere dipendenti, settori, ambiente e famiglie, creando distorsioni di mercato e innescando effetti negativi indiretti più ampi che si estendono alla società in generale (Adut, 2008; Greve et al., 2010; Perols & Lougee, 2011).

Tanto premesso, in questo scenario si colloca il concetto di red flags, intesi come segnali di allarme, finanziari e non finanziari, che indicano condizioni, eventi o combinazioni di indicatori associati a un elevato rischio di manipolazione o di frode (Romney et al., 1980). La maggior parte della ricerca sui red flags è stata condotta dal punto di vista della professione di revisore contabile (Pincus, 1989; Albrecht & Romney, 1986; Munteanu et al., 2024) e la letteratura evidenzia come questi non siano prove di frode, ma condizioni frequentemente presenti nei casi di irregolarità, utili come meccanismo di allerta precoce (Robertson, 1997; Romney et al., 1980).

Numerosi contributi hanno indagato l'individuazione delle anomalie di bilancio. Si vedano, ad esempio, Bell & Carcello (2000); Beneish (1999); Herawati (2015); Kaminski et al. (2004); Lee et al. (1999) e Malgwi & Morgan (2017), solo per citarne alcuni. Dal punto di vista metodologico, negli anni si sono affermati numerosi modelli basati su accruals anomali (Jones, 1991; Dechow et al., 1995), indici sintetici di rischio di manipolazione (Beneish, 1999; Beneish et al., 2013), score di previsione di errori significativi (Dechow et al., 2011) e tecniche di data mining. Sebbene tali contributi abbiano prodotto strumenti ampiamente utilizzati, spesso si collocano al di fuori di ciò che gli utilizzatori non specialisti o le altre parti interessate possono osservare o misurare. È inoltre necessario che si fondino su indicatori trasparenti, interpretabili e ancorati a evidenze empiriche robuste richiedendo una conoscenza accurata delle aree di bilancio a maggiore vulnerabilità. Rimane pertanto meno indagata la dimensione realmente prospettica di questi segnali di allarme (i.e. red flags) e meno frequente è anche la verifica longitudinale della capacità effettiva di anticipare comportamenti manipolativi in contesti reali.

Il presente lavoro (work in progress) si colloca pertanto in questo filone di ricerca proponendo un approccio empirico per una mappatura delle aree di bilancio maggiormente oggetto di contestazione, basato sulle pronunce della Corte di Cassazione italiana.

2. Obiettivi della ricerca

Nello scenario sopra descritto, il presente contributo intende perseguire due obiettivi principali:

- mappare empiricamente, tramite un'analisi quali-quantitativa di una popolazione di pronunce della Cassazione, le voci di bilancio più frequentemente oggetto di contestazione. Il fine è individuare le aree a maggior rischio di condotte illecite e identificare contestualmente i principali red flags per i cluster ricorrenti;
- verificare la presenza di red flags negli esercizi precedenti al primo anno di bilancio contestato, con lo scopo di valutarne anche la capacità anticipatoria, e individuare eventuali

segnali integrativi attraverso un'analisi longitudinale dei bilanci delle società oggetto di contestazione.

La ricerca, al suo livello attuale, presenta i risultati già conseguiti in relazione al primo obiettivo con una parziale costruzione concettuale dei red flags. La validazione empirica di tali indicatori su bilanci societari costituirà invece la fase successiva del progetto.

3. Metodologia

L'impostazione metodologica per il primo obiettivo di ricerca è stata strutturata sulla raccolta di una popolazione significativa di pronunce civili e penali della Cassazione italiana. L'approccio adottato combina la classificazione quantitativa dei dati, ovvero delle voci di bilancio individuate quali oggetto di contestazione, con una analisi qualitativa del contenuto delle sentenze e delle ordinanze prese in esame, al fine di integrare le informazioni contabili con le motivazioni e le tipologie di condotte.

Da questa prima indagine, orientata anche a definire i principali cluster delle aree maggiormente esposte, saranno individuate nella fase successiva, ancora da realizzare, le società coinvolte nelle pronunce esaminate. Lo studio empirico di questo campione di aziende, con i rispettivi prospetti di bilancio, è condotto sui dati disponibili in AIDA, banca dati sviluppata da Bureau van Dijk, che fornisce informazioni economico-finanziarie e societarie sulle imprese italiane. Mediante una analisi longitudinale dei bilanci degli 1–3 anni precedenti il primo anno oggetto di contestazione (orizzonte temporale ritenuto idoneo e confermato in letteratura: Ettredge et al., 2010; Munteanu et al., 2024), si andrà infine a verificare la presenza o meno dei red flags quantitativi e qualitativi individuati, anche con lo scopo di valutarne la capacità anticipatoria.

Ai fini di questo lavoro di ricerca, le pronunce di legittimità si sono rivelate particolarmente utili poiché rappresentano l'esito finale del processo, momento in cui le questioni di fatto e le condotte vengono valutate in modo definitivo, salvo i limitati casi in cui la pronuncia della Cassazione stabilisce un rinvio in Corte d'Appello. Peraltro, la scelta di utilizzare le pronunce della cassazione deriva anche dalla possibilità di utilizzare un database unitario su base nazionale.

Inoltre, sono state incluse le decisioni sia penali che civili in quanto il focus del lavoro è l'elemento oggettivo[5] del falso in bilancio. Escludendo infatti il profilo soggettivo, anche la giurisprudenza civile fornisce un contributo essenziale per l'analisi. L'integrazione delle due sezioni permette poi di verificare la validità dei risultati a più livelli: se ad esempio una certa area contabile emerge spesso in entrambi i contesti, la sua classificazione come "area a rischio" diventa più solida e significativa. Sebbene all'interno del lavoro le due sezioni siano state analizzate separatamente, ciò fatto per chiarezza e trasparenza metodologica, il presente contributo mira a superare la tradizionale dicotomia tra ambito penale e civilistico, valorizzando l'analisi tecnico-contabile in quanto tale.

Le decisioni sono state individuate mediante il portale ItalgiureWeb, piattaforma ufficiale del Centro Elettronico di Documentazione (CED) della Corte, che consente di combinare filtri testuali, normativi e cronologici sulle sezioni "SNPEN" (Penale) e "SNCIV" (Civile) con accesso integrale alle decisioni. Per entrambe le sezioni, la ricerca è stata delimitata al periodo "2020–2025"[6], selezionando tutte le pronunce depositate.

[5] Per meglio specificare, l'art. 2621 c.c., così come modificato dall'art. 9 della legge 69/2015 individua la componente oggettiva del reato in una duplice configurazione: (i) la esposizione di "fatti materiali rilevanti non rispondenti al vero" intesa come condotta attiva; (ii) la omissione di "fatti materiali rilevanti la cui comunicazione è imposta dalla legge" intesa come condotta omissiva.

[6] Per la sezione civile, ultima rilevazione effettuata in data 2 ottobre 2025; per la sezione penale, in data 30 settembre 2025.

L'orizzonte temporale scelto, seppur relativamente recente, si è rivelato il più idoneo per bilanciare due esigenze: da un lato, permette di cogliere l'evoluzione giurisprudenziale e contabile più attuale; dall'altro, tiene conto dei tempi fisiologici del processo, generalmente lunghi, ed è frequente che i fatti di bilancio esaminati risalgano anche a dieci o quindici anni prima del deposito della decisione. Per tale motivo, nel database sono stati individuati anche gli anni dei bilanci oggetto di contestazione, laddove disponibili, fornendo informazioni utili per (i) una contestualizzazione temporale maggiormente precisa, (ii) una lettura diacronica dei risultati e (iii) soprattutto per l'identificazione dei bilanci necessari per la successiva analisi dei red flags.

Per la sezione penale, il criterio di ricerca che si è rivelato più efficace è dato dalla combinazione dell'espressione "false comunicazioni sociali" con il filtro temporale "2020–2025", così da intercettare i procedimenti in cui il reato di falso in bilancio costituiva l'oggetto specifico del giudizio. Per la sezione civile invece, la selezione è stata ancorata all'art. 2423 c.c., privilegiando un approccio volto a individuare tutte le pronunce in cui la clausola generale di chiarezza, verità e correttezza del bilancio funge da parametro di legittimità.[7]

Il corpus iniziale così ottenuto è stato sottoposto a una revisione qualitativa manuale allo scopo di escludere i casi "fuori tema" (decisioni in cui le irregolarità di bilancio non costituivano il nucleo della controversia). Complessivamente quindi, per il periodo 2020–2025, sono state individuate 104 decisioni penali e 75 civili, per un totale di 179 pronunce valide con le quali è stato costruito un database in formato Excel ai fini della mappatura delle aree più frequentemente contestate[8].

Per ciascuna sentenza, sono state sistematicamente rilevate le informazioni identificative principali (e.g. sezione, numero e registro generale, data di udienza e deposito), l'anno o gli anni dei bilanci oggetto di contestazione nonché le società coinvolte (laddove presenti), le voci di bilancio interessate, la tipologia di condotta accertata e l'esito del giudizio. Le voci di bilancio considerate sono state derivate dagli schemi civilistici di Stato Patrimoniale (art. 2424 c.c.) e Conto Economico (art. 2425 c.c.), utilizzati come riferimento iniziale per la classificazione[9]. In particolare, sono state distinte: Immobilizzazioni immateriali, materiali e finanziarie; Rimanenze (con evidenza dei lavori in corso su ordinazione); Crediti; Fondi; Debiti; Costi inesistenti; Fatture da emettere e da ricevere.

È indubbio che l'alterazione di una singola voce può naturalmente essere letta da una duplice prospettiva poiché ad esempio, una appostazione di crediti inesistenti produce di conseguenza effetti anche sui ricavi. Al fine di evitare una sovrastima artificiale dell'incidenza di specifiche aree di bilancio, nell'analisi delle pronunce le voci sono state pertanto classificate in base alla contestazione effettivamente formulata. Inoltre, una medesima pronuncia può ricomprendere più alterazioni contabili, riflettendo la natura spesso combinata delle condotte. Mutuando quindi dal corpus di pronunce individuate, la popolazione oggetto di analisi è costituita dall'insieme delle alterazioni contestate.

Considerato infine che l'elemento oggettivo in materia di false comunicazioni sociali, focus del presente lavoro, si articola lungo quattro pilastri della rendicontazione, recognition,

[7] In una prima fase di sperimentazione, l'inserimento di ulteriori riferimenti normativi (e.g. artt. 2424 ss. c.c.), comportava un eccessivo restringimento dei risultati e la conseguente esclusione di numerose decisioni di rilievo.

[8] Nell'insieme di pronunce considerato rientrano anche le decisioni che giungono a conclusioni non definitive (e.g. rinvio o parziale rinvio). Tale scelta segue la logica e lo scopo dell'indagine, che non mira ad accertare la responsabilità o il reato, bensì a identificare le aree di bilancio maggiormente esposte. La rilevanza di una voce non dipende quindi dall'esito finale del giudizio, ma dal fatto stesso che sia stata oggetto di contestazione.

[9] L'analisi delle prime sentenze ha tuttavia suggerito degli adattamenti, aggregando alcune voci e introducendo ulteriori sottocategorie nei casi in cui le motivazioni delle pronunce fornivano un maggior dettaglio di informazioni e soprattutto per le contestazioni ricorrenti.

measurement, presentation e disclosure, questo studio approfondisce in particolare le contestazioni di carattere quantitativo, sebbene queste risultino frequentemente correlate a profili di natura qualitativa.

Sul piano analitico, la ricerca combina quindi (a) una analisi delle frequenze di contestazione per area di bilancio; (b) una analisi delle co-occorrenze tra voci, mediante matrici con probabilità condizionate per identificare cluster ricorrenti; (c) una analisi qualitativa delle motivazioni giurisprudenziali, per ricostruire le logiche economico-aziendali e le tecniche contabili sottostanti.

4. Risultati preliminari

I risultati preliminari suggeriscono che le contestazioni per frode tendono a concentrarsi in specifiche aree di bilancio che comportano un elevato grado di discrezionalità e che le tecniche solitamente utilizzate rientrano in un numero limitato di categorie. L'analisi evidenzia inoltre che i comportamenti fraudolenti si verificano spesso attraverso combinazioni di pratiche, riflettendo la natura intrinsecamente integrata del bilancio.

In riferimento all'analisi giurisprudenziale delle pronunce della Cassazione nella sezione penale sono state identificate 206 contestazioni totali, di cui 204 di carattere quantitativo, oggetto di indagine. Le frequenze per area di bilancio[10] (Figura 1) evidenziano una concentrazione su crediti (circa 28,7%) e debiti (24%), cui si affiancano, con incidenze minori ma significative, le immobilizzazioni materiali (12,4%) e immateriali (8,8%).

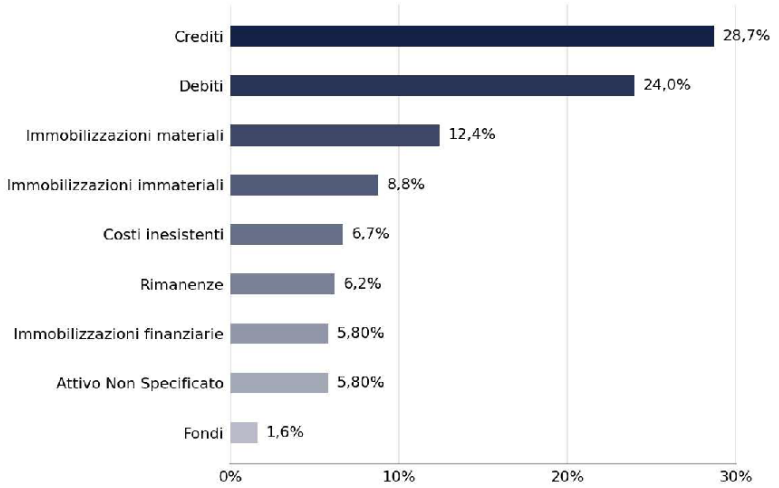


Figura 1. Cassazione Penale: voci contestate per area di bilancio espresse in percentuali (2020-2025)

Per le pronunce civili, sono state rilevate 110 alterazioni totali, di cui 98 quantitative distribuite così come mostrato in Figura 2. Le aree maggiormente contestate risultano Crediti (23,5%) e Debiti (23,5%) che, seppur presenti in egual misura percentuale, non risultano altrettanto frequentemente alterati insieme, situazione che accade invece per le sentenze penali. Seguono poi le Rimanenze (15,3%) e le Immobilizzazioni, Materiali e Immateriali (10,2%) e Finanziare (9,2%).

[10] Le percentuali riportate esprimono le frequenze relative delle voci contestate.

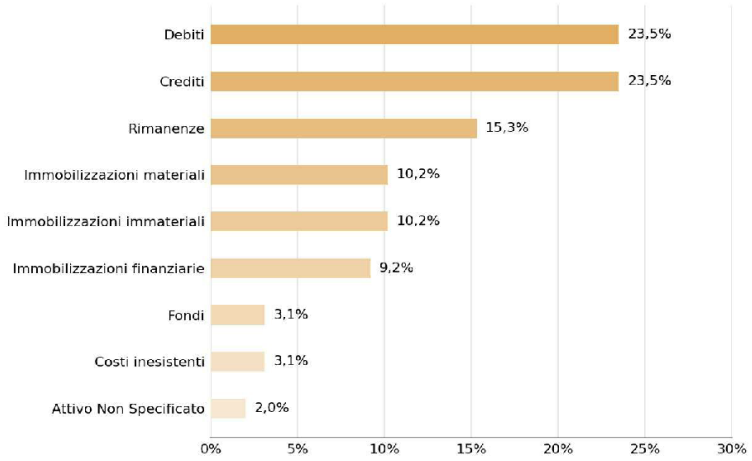
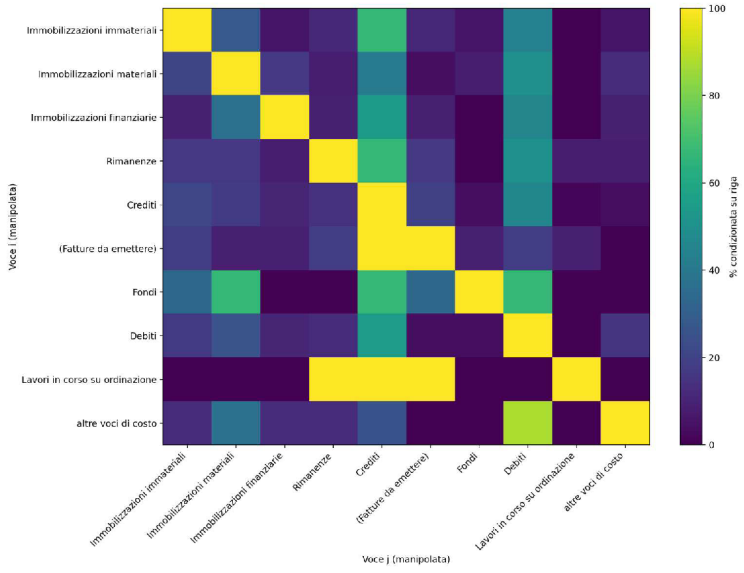


Figura 2. Cassazione Civile: voci contestate per area di bilancio espresse in percentuali (2020-2025)

Le matrici di co-occorrenza[11], costruite per entrambe le sezioni, mostrano come le condotte contestate si manifestino raramente in forma isolata, ma tendano a coinvolgere congiuntamente più voci di bilancio. Dal punto di vista metodologico, la normalizzazione per riga rende le matrici adatte a leggere relazioni (i.e. dato *i* manipolata, quanto spesso compare *j*), ma impone cautela interpretativa sulle voci a bassa frequenza (e.g. fondi, lavori in corso).

Nella sezione penale (Figura 3) la matrice suggerisce che le alterazioni contabili interessano frequentemente più poste collegate. In particolare, si evidenzia una forte compresenza tra Crediti e Debiti, sia in termini relativi che assoluti. Emergono legami significativi anche con le Rimanenze che co-occorrono spesso con Crediti e Debiti; lo stesso accade per le Immobilizzazioni Immateriali e Materiali. Questi *pattern* sono coerenti con condotte in cui la manipolazione non riguarda solo poste di fine esercizio, ma coinvolge anche aree di capitalizzazione e valutazione dell'attivo, in modo da sostenere la rappresentazione complessiva di solidità e performance.



[11] Espresse in percentuali condizionate per evitare l'effetto distorsivo dovuto alla numerosità delle voci (e.g. è evidente che i crediti si manifestano in valore assoluto più di altre poste) e individua le relazioni anche tra voci meno frequenti.

Figura 3. Cassazione Penale: co-occorrenze delle voci di bilancio contestate (2020-2025)

Nella sezione civile (Figura 4) si osserva una struttura meno interconnessa rispetto a quella penale. Anche in questo caso, le voci più ricorrenti risultano Crediti e Debiti ma la loro co-alterazione è moderata, suggerendo che molte controversie restino focalizzate su singole aree di valutazione e rappresentazione piuttosto che su schemi coordinati di poste di bilancio. Tra le immobilizzazioni, quelle materiali co-occorrono maggiormente con Crediti e Debiti, mentre le Rimanenze mostrano legami più moderati.

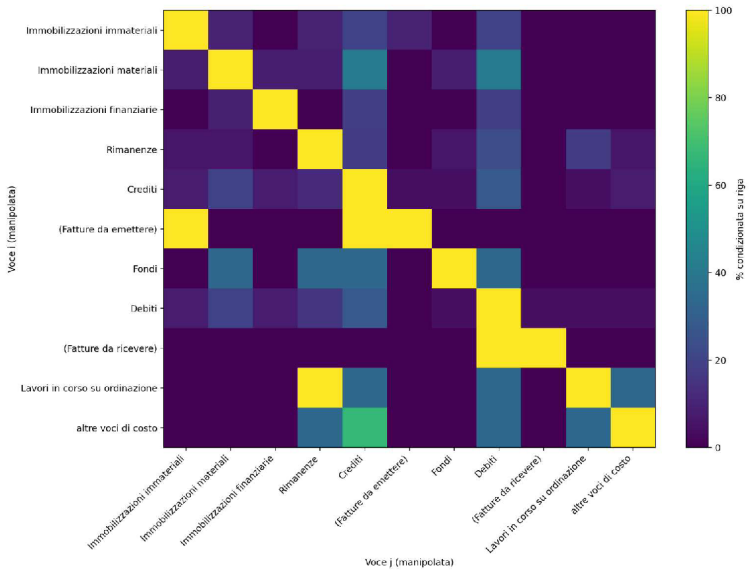


Figura 4. Cassazione Civile: co-occorrenze delle voci di bilancio contestate (2020-2025)

La lettura qualitativa delle motivazioni tratte dalle pronunce consente poi di tradurre tali pattern in schemi di condotta ricorrenti. Tra i più rilevanti:

- anticipazione o omessa rilevazione di ricavi, talvolta con contratti simulati, uso strumentale dei conti "Fatture da emettere" (e più raramente "Fatture da ricevere") e creazione di proventi straordinari fittizi (Cass. pen., Sez. V, 10/06/2016, n. 24402; Cass. civ., Sez. Trib., n. 2613/2024; Cass. civ., Sez. V, n. 27647/2020; Cass. civ., Sez. Trib., n. 4398/2020; Cass. civ., Sez. Trib., n. 14538/2025);
- iscrizione e mantenimento di crediti inesistenti o inesigibili, fondi svalutazione inadeguati e registrazione di falsi crediti IVA; al contrario con svalutazioni arbitrarie o omissioni di crediti certi ed esigibili (Cass. pen., Sez. V, n. 23168/2020; Cass. civ., Sez. I, n. 17297/2024; Cass. civ., Sez. I, n. 12687/2023);
- capitalizzazione impropria di costi, iscrizione di avviamenti privi di fondamento economico, sopravvalutazione di immobilizzazioni e mancato allineamento degli ammortamenti alla reale vita utile (Cass. civ., Sez. Trib., n. 27935/2022; Cass. civ., Sez. Trib., n. 29342/2022);
- valutazioni errate di magazzino e differenze sistematiche tra giacenze fisiche e rimanenze; nei casi in cui sono coinvolti i Lavori in corso su ordinazione si riscontrano valori senza fondamento negoziale o imputazioni arbitrarie (Cass. civ., Sez. I, 12/07/2017, n. 17350; Cass. pen., Sez. V, 16/12/2010, n. 49252; Cass. civ., Sez. Trib., n. 6433/2021, Cass. civ., Sez. Trib., n. 3273/2024; Cass. civ., Sez. Trib., n. 26650/2020; Cass. pen., Sez. V, 10/01/2011, n. 251);

- operazioni infragruppo o transazioni correlate a condizioni non di mercato: conferimenti e cessioni di rami d'azienda a valori incongrui e trasferimenti simulati con registrazioni di ricavi privi di sostanza economica (Cass. civ., Sez. Trib., n. 14014/2024; Cass. civ., Sez. V, n. 14872/2020);
- occultamento di debiti (anche fiscali e previdenziali) e mancata iscrizione di fondi rischi e oneri, specie in presenza di contenziosi prevedibili o passività potenziali (Cass. civ., Sez. I, n. 10873/2024; Cass. civ., Sez. I, n. 17297/2024; Cass. civ., Sez. I, n. 7433/2023; Cass. civ., Sez. I, n. 12687/2023), unitamente a carenze sistematiche dell'informativa in nota integrativa.

Mutuando quindi dai risultati della analisi empirico-giurisprudenziale, le aree di bilancio maggiormente coinvolte in contestazioni sono state raggruppate in 4 cluster principali in modo da poter identificare per ciascuno i potenziali red flags:

- Crediti: iscrizioni o tenuta in contabilità senza prospettive di recuperabilità e fondi svalutazione inadeguati;
- Immobilizzazioni, con capitalizzazioni non lecite e sopravvalutazioni che si riflettono in modo speculare sugli ammortamenti;
- Rimanenze, comprendendo anche i lavori in corso su ordinazione, con errate valutazioni di fine esercizio o imputazioni arbitrarie;
- Debiti e Fondi, con omissioni, mancate iscrizioni e sottoesposizioni.

Da una disamina della letteratura sul tema, è stato possibile derivare un insieme di red flags, non esaustivo ma coerente con i pattern emersi dalle decisioni. A titolo esemplificativo, si riportano: incremento della vita media degli incassi (rapporto crediti/fatturato); crescita dei crediti a un ritmo superiore all'aumento delle vendite; prolungamento della vita utile delle immobilizzazioni o riduzione del tasso medio di ammortamento; incrementi significativi di attività immateriali in riferimento al totale attivo e agli anni precedenti; miglioramenti improvvisi dei margini lordi o operativi non spiegati da cambiamenti nel modello di business; incoerenza tra variazione delle rimanenze e costo del venduto, con incrementi delle scorte non in linea con i margini industriali o con l'andamento dei volumi; strutture di finanziamento sbilanciate, con rapporti anomali tra patrimonio netto, immobilizzazioni e indebitamento di lungo termine, letti in combinazione con indicatori di redditività e liquidità (Brennan & McGrath, 2007; Ettredge et al., 2010; Singleton, 2010; Perols & Lougee, 2011; du Toit et al., 2015; Schilit et al., 2018; Munteanu et al., 2024; du Toit, 2024).

Anche nella prassi è quindi evidente che gli strumenti solitamente impiegati per manipolare un bilancio siano alla fine riconducibili a un numero ristretto di categorie. D'altro canto, ogni alternazione ha sempre un impatto più ampio, specialmente quando si protrae nel tempo; pertanto, una prima condotta spesso innesca un processo progressivo e integrato che conduce inevitabilmente ad altre. Come inoltre dimostrato anche dai risultati empirici di questa analisi, ogni tentativo di dissimulare l'impatto reale dei fatti di gestione, genera ripercussioni nell'assetto complessivo e nel tempo, data la natura stessa del bilancio e delle relazioni che intercorrono tra le sue componenti. Basti pensare ad esempio alla scelta di intervenire in sede di assestamento con una sovrastima o sottostima delle rimanenze: questa impatterà necessariamente sull'esercizio successivo realizzando degli effetti a catena. Infine, un elemento ricorrente, emerso in modo convergente sia dalle pronunce giurisprudenziali sia dalla letteratura, è che i red flags non possono e non devono essere interpretati singolarmente. Nessun indicatore è di per sé sufficiente. Piuttosto, è la combinazione dei segnali a costituire una base analitica solida per formulare un giudizio di rischio.

5. Valore scientifico potenziale e sviluppi futuri

Alla luce delle evidenze discusse, il lavoro intende offrire contributi potenziali sul piano accademico e applicativo. La rassegna delle pronunce della Cassazione, assunta come base conoscitiva per derivare pattern ricorrenti di irregolarità, senza alcuna pretesa di esaurire la

complessità del fenomeno, consente di costruire un osservatorio privilegiato sui comportamenti concretamente riscontrati nei contesti reali. Tale prospettiva propone da un lato una classificazione empiricamente fondata delle aree di bilancio più vulnerabili; dall'altro, fornisce una base per la concettualizzazione dei red flags realmente rappresentativi integrando gli approcci dominanti nella letteratura tradizionale.

Sul piano applicativo, una possibile implicazione risiede nello sviluppo di linee guida contabili operative. Lo studio identifica infatti le aree di bilancio più esposte al rischio di manipolazione e che pertanto richiedono una guida rafforzata.

Rimangono tuttavia necessari, per una valutazione più solida, sviluppi ulteriori per identificare sistemi di early warning maggiormente interpretabili e integrabili, anche nell'ottica della verifica longitudinale dei red flags nei bilanci delle imprese coinvolte, prevista nella fase successiva del lavoro.

In tema di proseguimento della ricerca, la lettura delle condotte sarà ulteriormente arricchita considerando il contesto aziendale in cui esse emergono, con particolare riferimento a situazioni di crisi o di deterioramento economico-finanziario. Tale prospettiva consentirà di collegare più chiaramente le scelte di bilancio e i red flags individuati alle motivazioni sottostanti le condotte illecite.

D'altronde, nel dibattito sul ruolo del financial accounting come elemento di fiducia per gli stakeholder e per la tutela del bene comune, strumenti informativi capaci di rafforzare l'affidabilità, la trasparenza e la prevedibilità dei comportamenti d'impresa assumono una valenza anche istituzionale.

Parole chiave: Irregolarità di bilancio; red flags; analisi giurisprudenziale; Corte di Cassazione

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The Role of Personality in Shaping Managerial Engagement with Artificial Intelligence in Accounting Research

Francesca di Donato[1], Alice Pennesi[2], Sara Trucco[3]

1. Introduction

The aim of our research is fourfold. First, we seek to explore how the need for verification and error analysis affect managerial trust in Artificial Intelligence (AI) systems. Second, we aim to investigate the extent to which AI acts as a catalyst for original thinking and is perceived as a driver of success and innovation by managers. Third, we intend to assess how AI supports interpersonal functions and contributes to organizational efficiency in managerial work. Fourth, we aim to explore managerial behavior in using AI for corporate disclosure and reporting. By addressing these objectives, our study provides a comprehensive perspective on the cognitive, relational, and practical aspects of using AI in accounting.

Despite the growing body of research on competences, decision-making processes, structures, and AI governance (Arkhipova et al., 2024), the literature does not systematically examine managers' personality profiles nor test typological models as antecedents of AI trust, usage, and purpose. Recent studies on AI and governance focus primarily on board roles, capabilities, and oversight (e.g., transparency, auditability, AI committees) and some authors highlight the need for further research to deepen our understanding of the relationships and interconnections between Artificial Intelligence and accounting, including new mappings of empirical experiences (Sutton et al. 2016).

This study addresses a significant theoretical and empirical gap by integrating Holland's person– environment fit perspective into the analysis of managerial engagement with AI (Holland 1973). Moreover, given the scarcity of research examining accounting issues through a personality lens, we aim to contribute to this underexplored area of the literature (Taggar & Parkinson, 2007; Cewińska et al., 2017).

Building on Holland's Model of Occupational Choice (HMOC), we extended the framework by incorporating generational cohorts to capture the diversity of managerial perspectives (Holland 1973). Specifically, we considered Baby Boomers, Generation X, Millennials, and Generation Z as key demographic dimensions influencing attitudes toward innovation and AI adoption (Kpmg 2017; Eger et al. 2021). This integration allows us to analyze personality traits among managers and also how generational differences shape managerial behaviors, decision-making styles, and the way in which managers use AI.

To strengthen the interpretive power of our framework, we intertwined Holland's Model of Occupational Choice (HMOC) not only with generational cohorts but also with the managerial positions held by the respondents.

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Therefore, we answer the following research question: "How do managerial personality profiles and generational cohorts influence trust in, usage of, and perceived purposes for AI systems in accounting and corporate reporting?"

The study collected data from an online survey from accounting managers working in firms and organizations of various sizes and sectors across Italy. Furthermore, the next step will be to carry out in depth-interviews. Qualitative data were analyzed using thematic analysis, while quantitative data were examined through descriptive statistics.

2. Literature review

2.1. The Application of Holland's Theory in Accounting Research

Artificial intelligence (AI) is recognized as one of the most transformative digital technologies, characterized by a wide range of applications involving multiple stakeholders (Esposito et al., 2021; Lo Piano, 2020; Shaffer et al., 2020; Odonkor et al. 2024). In recent years, interest in its potential, its impacts, and its limitations has grown in both academic and professional contexts (The Economist, 2020; Zemánková, 2019; Al-Okaily, M. 2025, Khan and Gupta 2025). In particular, scholars and practitioners are increasingly examining the outcomes and organizational experiences stemming from the adoption of new algorithms and AI-based systems (Al-Sayyed et al., 2021; Sutton et al., 2016). To date, much of the research suggests that the human being represents the weakest component in the decision-making process and that automation constitutes the solution for overcoming limitations in training and human capabilities (Sutton et al., 2018). However, human expertise must be developed and promoted so that individuals can contribute unique capabilities to decision-making environments—not to compete with AI, but to complement it within a collaborative human–machine decision process (Calandra 2023).

Accounting is currently at a turning point, where data analytics and AI are reshaping the very nature of professional judgment and expertise (Sutton et al., 2016). One of the earliest significant contributions in this field is the study by Birnberg and Shields (1984), considered pioneering for introducing AI-based cognitive models into the verification of financial and economic information. More recently, the literature has increasingly focused on automated functions within accounting, auditing, and reporting processes (Yang, and Zhou, N. 2025; Johri 2025). Faccia et al. (2019) analyze the potential of these technologies and identify future research opportunities, while Al-Sayyed et al. (2021), adopting a theoretical perspective, show how accounting professionals may benefit from AI in tasks such as automated posting of accounts receivable and payable (through invoice and payment categorization), payroll processing, automated bank reconciliation, and automated auditing activities (Al-Sayyed et al. 2021).

Despite the widespread interest in automation and AI, the assessment of their actual applications and effectiveness remains an open research question across multiple sectors (Losbichler & Lehner, 2021). Furthermore, significant questions persist regarding the relationship between technology and

accounting (Sutton et al., 2016). Given the relative "youth" of this research stream, several scholars highlight the need for further, more detailed investigation (Moll & Yigitbasioglu, 2019; Bakarich & O'Brien, 2020).

Digital technologies are significantly reshaping the management accounting profession and, more broadly, managerial roles (Quattrone, 2016; Moll & Yigitbasioglu, 2019; Möller et al., 2020). These technologies improve the work of management accountants by enabling real time data availability and increasing the automation of low value-added tasks (Bhimani & Willcocks, 2014; Guthrie & Parker, 2016; Badia & Donato, 2022). AI shifts the core of work toward cognitive and relational competencies, while automating repetitive tasks and requiring interpretive and supervisory capabilities (sensemaking) in a logic of human–machine integration rather than linear substitution (Calandra, 2023).

These developments also introduce organizational challenges: they require adaptations to established techniques and reshape interactions between management accountants and other functions, generating new forms of responsibility and accountability (Fenwick & Edwards, 2016; Visani, 2017; Rikhardsson and Yigitbasioglu, 2018; Montemari and Nielsen, 2021). This transformation of expertise and accountability raises questions about the future role of management accountants in digital contexts (Oesterreich & Teuteberg, 2019; Knudsen, 2020).

2.2. AI Applications in Accounting

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3. Research design

3.1. Holland model and Generational Cohort Theory

To frame our investigation, we adopted Holland's Model of Occupational Choice (HMOC) as a conceptual theoretical framework. The HMOC organizes six occupational personality types (RIASEC) in a hexagonal structure: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional (see Figure 1). The proximity of categories reflects their psychological similarity, while opposite positions indicate greater differences in characteristics and preferences (Holland 1979; Chen et al. 2012). Building on this framework, we extended the model by integrating generational cohorts—such as Baby Boomers, Generation X, Millennials, and Generation Z—into the analysis. According to Generational Cohort Theory, individuals can be grouped into distinct generations based on the time period in which they were born (Eger et al. 2021). This classification is based on the notion that people born within the same time period and geographic region often share similar values, beliefs, and life experiences, which in turn shape their attitudes, behaviors, and preferences (Parment 2013; Nwobodo, S., & Weissmann, M. A. 2024).

This integration allows us to capture not only the personality-based orientation of managerial work but also the influence of generational diversity on attitudes toward innovation and AI adoption. By combining these dimensions, our approach provides a richer lens for understanding how occupational typologies and generational characteristics jointly shape managerial behavior in contemporary organizations.

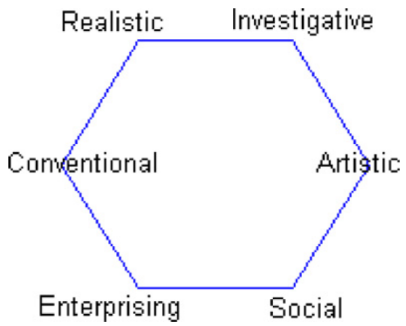


Figure 1. HMOC hexagon (Holland, 1979 and Chen et al. 2012, p. 374)

To capture the diversity of managerial perspectives, we integrated generational differences into our framework. According to KPMG (2017) the main cohorts analyzed are: Baby Boomers (born approximately 1946 - 1964) (Johnson, and Thompson 2025); Generation X (born approximately 1965 - 1979), (Johnson, and Thompson 2025); Millennials (born approximately 1980 - 1995), (Ahmad et al. 2024); and Generation Z (born approximately 1996 - 2010) (Imjai et al 2024). While these categories are not exact, they generally correspond with findings from previous studies (Durocher et al., 2016; Baudot et al., 2022; Dermarkar, et al. 2024).

By considering these cohorts, the study examines how age-related values and experiences intersect with managerial roles and influence attitudes toward AI adoption and organizational transformation.

3.2. Research method

The aim of our research is to: (a) explore how the need for verification and error analysis influences managerial trust in AI; (b) investigate how AI stimulates original thinking and is perceived as a driver of success and innovation; (c) assess how AI supports interpersonal functions and enhances organizational efficiency in managerial work; d) understand the way in which managers use AI in corporate disclosure.

To achieve these objectives, we conducted an online survey of Italian managers in 2025 (Gassen, J., and Schwedler, K. 2010; Damerji, H., and Salimi, A. 2021). The items of the questionnaire were designed ad-hoc to the objectives of this exploratory study, on the basis of the prior literature (Chen et al. 2012). Survey research is a widely used research method in accounting studies to assess managers' perceptions and behaviors (e.g. Vo Van, H. et al. 2024; Jackson and Allen 2024; Al-Okaily, M. 2025).

For most questions, participants were asked to express their views using a seven-point Likert scale as suggested by previous studies (Gassen, J., & Schwedler, K. 2010). The online survey was pre-tested on seven individuals, all of whom have academic backgrounds and expertise in accounting. Following feedback from the pre-test group, the questionnaire was slightly revised to address their concerns. The online survey link was shared with the selected participants via email, accompanied by a message from the participating organizations outlining the study's purpose and significance. To enhance the response rate, the deadline was extended twice and two reminder messages were circulated through the organizations' networks. All responses were automatically stored in a database. To ensure accurate response tracking and prevent duplicate participation, respondents' IP addresses were encrypted in one direction and paired with a cookie identifier. The survey period started in October 2025. The sampling procedure followed a random strategy: Italian companies were contacted by email and professional networks without applying sectoral or dimensional filters in advance. The participation was entirely on a voluntary basis. The survey consisted of a 15-question questionnaire, completed by 106 executives, directors and managers from companies operating in Italy.

In addition, we are going to conduct in-depth interviews with Italian managers to explore emerging dynamics in the adoption of AI in managerial work and to validate the trends identified through the survey and to understand managerial behavior in using AI for corporate disclosure and reporting.

4. Results

Preliminary findings from this study answer the following RQ "How do managerial personality profiles and generational cohorts influence trust in, usage of, and perceived purposes for AI systems in accounting and corporate reporting?" and are summarized in Figure 2 and in Figure 3. In particular, Figure 2 presents the mapping of managerial attitudes toward Artificial Intelligence (AI), interpreted through the lens of Holland's RIASEC model. This framework is therefore used to illustrate how different personality types, Realistic, Conventional, Investigative, Social, Enterprising, and Artistic, engage with AI in the workplace by managers at different levels. Each profile is associated with the corresponding generational cohort and the approach adopted by managers in using AI in accounting. For example, Realistic profiles are mainly associated with Generation X and Baby Boomers; "they generally like to work with things more than with people. The R type is described as conforming, frank, genuine, hardheaded, honest, humble, materialistic, modest, natural, normal, persistent, practical, shy, and thrifty" (Chen et al 2012, p. 375). Conventional profiles, mainly represented by Generation X; "the Conventional (C) type generally likes to follow orderly routines and meet clear standards, avoiding work that does not have clear directions. The C type is described as conforming, conscientious, careful, efficient, inhibited, obedient, orderly, persistent, practical, thrifty, and unimaginative" (Chen et al 2012, p. 375).

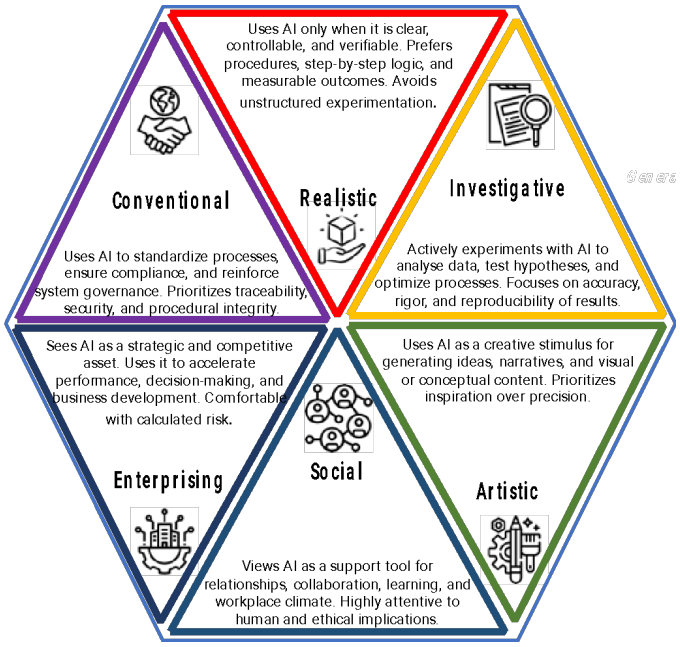


Figure 2. Mapping of managerial attitudes toward Artificial Intelligence (AI)

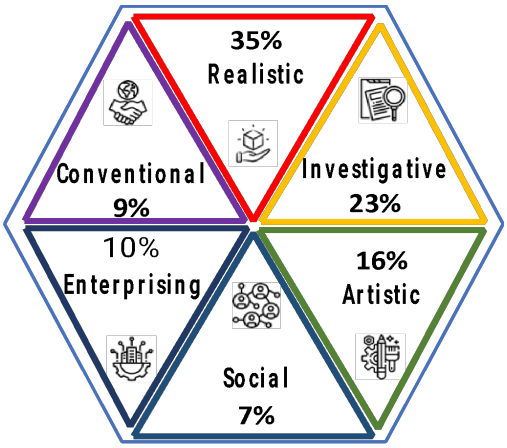


Figure 3. Percentage Distribution of Managerial Attitudes toward Artificial Intelligence (AI)

Conversely, Artistic profiles are more common among Millennials and Generation Z; "the Artistic (A) type generally likes to work with creative ideas and self-expression more than routines and rules. The A type is described as complicated, disorderly, emotional, expressive, idealistic, imaginative, impractical, impulsive, independent, introspective, intuitive, nonconforming, open, and original" (Chen et al 2012, p. 375). Investigative profiles are prevalent among Millennials, "the Investigative (I) type generally likes to explore and understand things or events, rather than persuade others or sell them things. The I type is described as analytical, cautious, complex, critical, curious, independent, intellectual, introverted, methodical, modest, pessimistic, precise, rational, and reserved" (Chen et al 2012, p. 375). Social profiles are mainly found among Generation X and Millennials, "the Social (S) type generally likes to help, teach, and counsel people more than engage in mechanical or technical activity. The S type is described

as convincing, cooperative, friendly, generous, helpful, idealistic, kind, patient, responsible, social, sympathetic, tactful, understanding, and warm" (Chen et al 2012, p. 375). Finally, Enterprising profiles are typical of Millennials; "the Enterprising (E) type generally likes to persuade or direct others more than work on scientific or complicated topics. The E type is described as acquisitive, adventurous, agreeable, ambitious, attention-getting, domineering, energetic, extroverted, impulsive, optimistic, pleasure-seeking, popular, self-confident, and sociable" (Chen et al 2012, p. 375).

Preliminary data collected by our survey reinforces these distinctions among profiles (Figure 3). In particular, we can notice that the Realistic profile dominates (35%); Investigative (23%) and Artistic (16%) follow. Finally we found a lower representation of Social (7%), Conventional (9%); and Enterprising (10%) profiles.

Furthermore, the survey results were analyzed using Python, as described below.

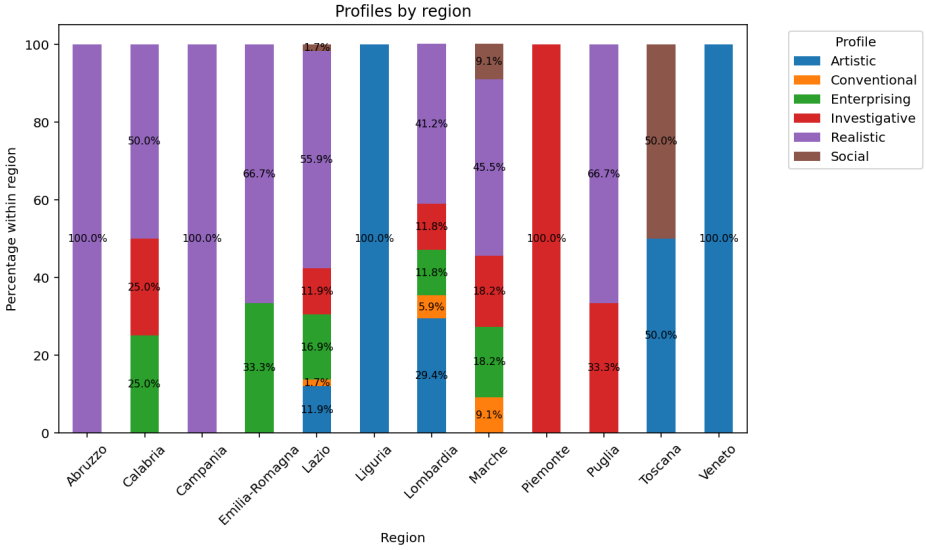


Table 1. Regional distribution of profiles

The distribution of Holland profiles varies across regions (Table 1). Several regions are characterized by the predominance of a single profile: for example, in Abruzzo and Campania, only the Realistic profile is present. Similarly, in Liguria and Veneto, the sole profile found is Artistic. Finally, in Piemonte, we identified only the Investigative profile. Other regions, such as Lazio, Lombardia and Marche, show a more diversified composition. Overall, the pattern indicates strong territorial heterogeneity, with some regions displaying homogeneous profile structures and others characterised by more balanced distributions.

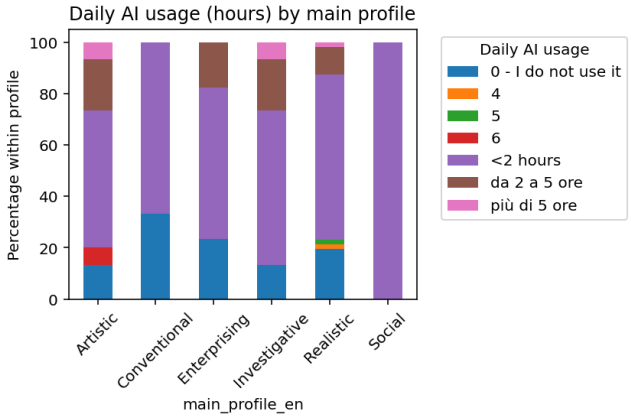


Table 2. Daily AI usage by profile

Across all profiles, the majority of respondents report using AI for less than two hours per day (Table 2). This pattern is particularly evident in Social profiles. Profiles such as Artistic and Investigative present the highest shares of respondents reporting between two and five hours, or more than five hours, of daily AI use. However, extended use remains a minority behaviour across all groups. The results suggest that daily AI engagement is generally low, with only modest variation between profiles.

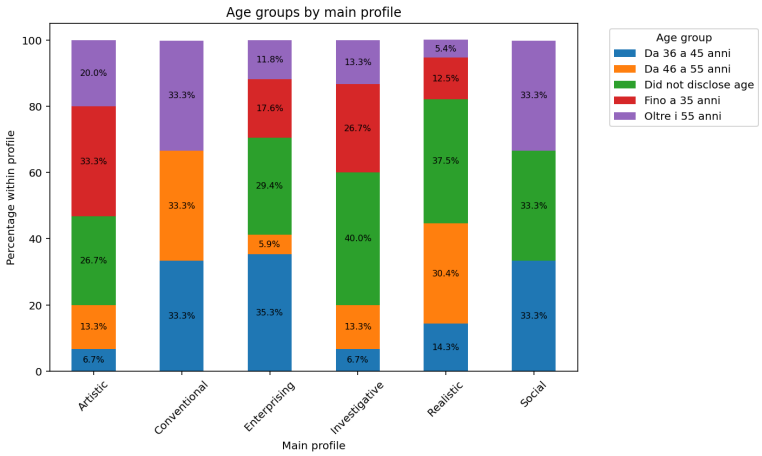


Table 3. Age composition by profile

Age distributions differ across the six profiles, though no single pattern appears dominant (Table 3). The Artistic profile includes the highest share of younger respondents (up to 35 years old). The Conventional profile is more represented in the 36–45 and 46–55 age groups. The Social profile shows a comparatively higher concentration of respondents over 55. Several profiles, including Investigative and Realistic, include sizeable proportions of respondents who did not disclose their age. Overall, the profiles display mixed and heterogeneous age structures.

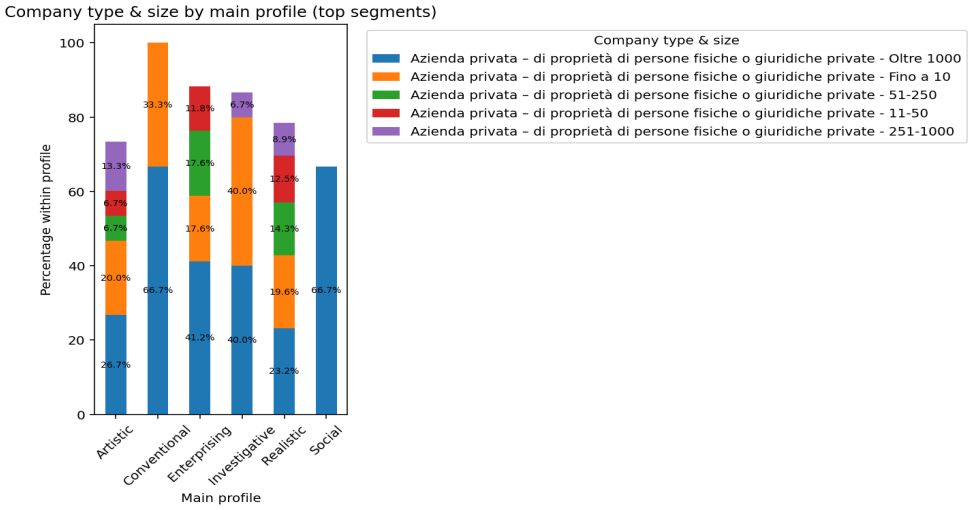
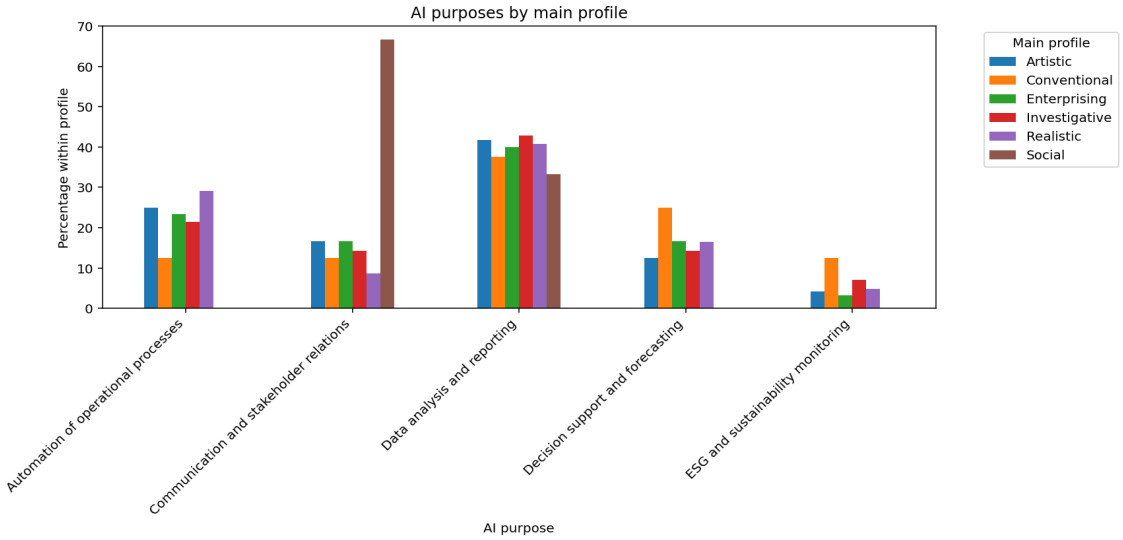


Table 4. Company type and size by profile

An additional analysis explores the interaction between company type (public vs. private) and organisational size (number of employees) (Table 4). Given the composition of the sample, the most frequent categories correspond to private organisations across different size groups. For all profiles, the largest proportion of respondents work in small private firms (up to 10 employees), with shares exceeding 60 per cent for the Conventional, Realistic and Social profiles. Medium-sized private organisations (11–50 and 51–250 employees) appear more frequently among the Enterprising and Investigative profiles. Larger organisations (>1000 employees), although less common, are present in profiles such as Artistic and Social. Public organisations do not appear among the most represented segments. Overall, the results suggest that organisational size is more variable across profiles than organisational type, with respondents predominantly concentrated in small private firms regardless of profile.



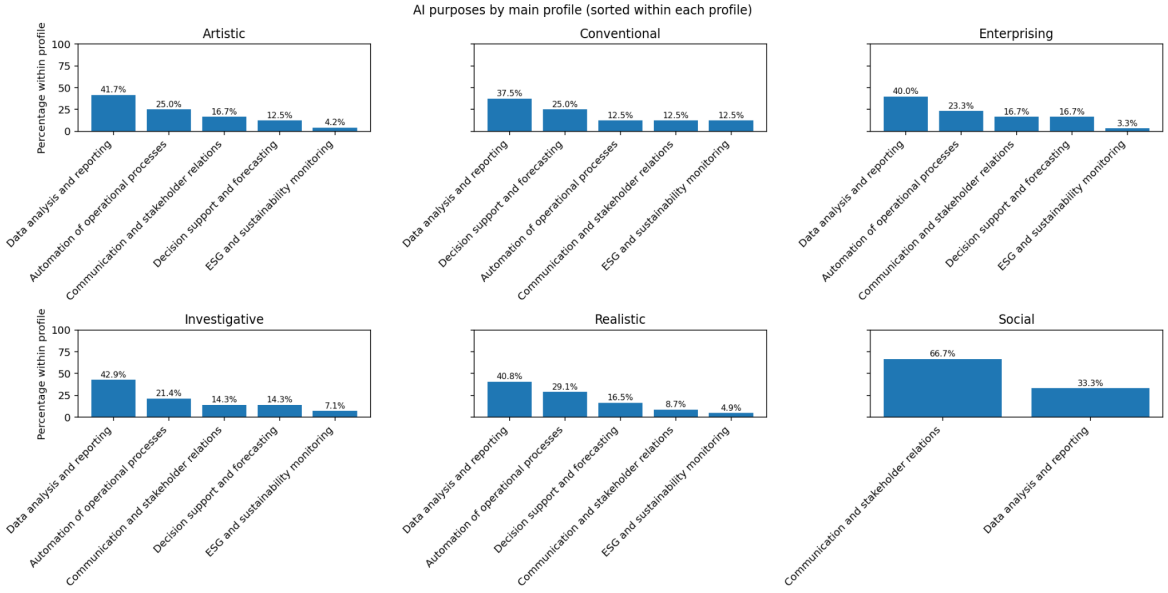


Table 5. AI purposes by main profile (sorted within each profile)

The comparative analysis of the profiles reveals differentiated patterns in the adoption of AI in professional activities (Table 5). The Artistic, Enterprising, Investigative, and Realistic profiles exhibit a homogeneous structure of use, with Data analysis and reporting representing the predominant purpose, followed by Automation of operational processes. This indicates a common orientation toward employing AI as a technical-operational instrument aimed at increasing efficiency and productivity. The Conventional profile, while sharing the same dominant purpose, demonstrates a more diversified distribution across categories such as Decision support and forecasting, communication-related activities, and ESG monitoring, reflecting the profile's propensity to manage structured and multi-dimensional tasks. The Social profile constitutes the most notable exception, displaying a strong concentration of AI use in Communication and stakeholder relations, suggesting that AI is primarily perceived as a relational support tool rather than an analytical or operational one. Collectively, these findings show that AI adoption is not uniform but varies systematically according to the attitudinal characteristics of each profile, indicating that cognitive predispositions and professional orientations play a significant role in shaping how AI is perceived and utilised.

5. Conclusion

Our study has some theoretical contributions. First, this study contributes to the theoretical development of Holland's RIASEC model by extending its application to the domain of managerial behavior in the context of AI adoption (Holland, 1973). Second, it contributes to that stream of literature that analyzes the technological acceptance of AI among managers (Norzelan, et al. 2024), offering a nuanced perspective grounded in psychological typologies. Third, the study contributes to the growing stream of literature that examines the use of AI in accounting practices (Bui and Jaradat 2020). This perspective complements existing research focused on technical capabilities and organizational factors, by emphasizing the role of individual dispositions and cognitive styles in shaping the practical use of AI tools within accounting environments (Khan and Gupta 2025). Fourth, it contributes to that stream of literature that highlights the implications of AI for the board of directors and the use of AI in corporate disclosure (Agnese et al. 2025).

From a managerial viewpoint, findings from this study offer valuable insights into how generational and personality-based differences shape the adoption of AI by managers in different

types of firms. The broader, long-term objective is to foster research that responds to prior scholars' call for further inquiry, focusing on identifying and disseminating alternatives to the HMOC that more accurately reflect the dynamic and investigative nature of modern accounting practice (Chen et al. 2012).

Future research is needed to extend the empirical base of this study by collecting additional data through the online survey and by conducting in-depth interviews among managers using the questionnaire provided in Annex 1. In this way, we can validate the proposed model, allowing for a more robust understanding of the psychological features influencing AI adoption in managerial work and in producing the corporate disclosure. Moreover, this study will investigate the degree of overlap or divergence among the identified profiles by examining their relative positions within Holland's hexagonal model; this will help determine whether the theoretical proximity of profiles is confirmed by empirical evidence. The research will also explore differences across managerial levels, namely Chief Executive Officers (CEOs), General Managers, Functional Directors, and Middle Managers, as well as across different types of firms (private, public, and third sector).

Keywords: Holland's theory; artificial intelligence; accounting research; online survey; in depth-interview; decision-making; managerial engagement; manager stereotypes

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Digital Orientation and Young-Female Governance for Sustainable Performance in Innovative SMEs

Ludovica Antenozio[1], Francesco Appio[2]

1. Introduction

Nowadays, digitalization and sustainability have become two of the most critical drivers of business development. To achieve a sustainable competitive advantage in an increasingly dynamic environment, firms must pursue these objectives jointly, integrating digital transformation with environmental and social responsibility. Digital orientation (DO) has emerged as a crucial strategic posture that enables firms to recognize and exploit opportunities offered by digital technologies to achieve competitive advantage (Antenozio et al., 2026; Ardito et al., 2021; Kindermann et al., 2021, 2024; Mishra et al., 2024; Ranjan, 2024). It reflects s a firm's overall digital mindset, as its willingness to adopt, integrate, and strategically leverage digital tools and resources across operations, innovations, and stakeholder relations (Kindermann et al., 2024; Quinton et al., 2018).

Literature conceptualizes DO as a multidimensional construct encompassing technological and organizational capabilities, as well as the firm's ability to coordinate both internal and external actors (Kindermann et al., 2021). Specifically, it involves four interrelated dimensions, as digital technology scope, digital capabilities, digital ecosystem coordination and digital architecture configuration. Digital technology scope refers to a set of digital technologies adopted, including cloud computing, big data, artificial intelligence that allow firms to achieve strategic growth. Digital capabilities delineate the human and organizational competences that enable firms to embed digital technologies effectively into workflows, enhancing and optimizing productivity and efficiency. Digital ecosystem coordination captures the ability to collaborate and interact with stakeholders in open technological ecosystems. Finally, digital architecture configuration concerns the IT infrastructure and systems configuration that better support scalability, integration and digital processes reliability (Kindermann et al., 2021). In this sense, DO represent a new form of managerial intelligence, a strategic orientation that guides how firms deeper engage with technological opportunities (Teece, 2016).

Sustainability, in turn, has become an indispensable component of competitive strategy (Qin et al., 2024), as global challenges increasingly demand a balance between economic growth and social-environmental responsibility (Gorgels et al., 2022). Corporate sustainability extends beyond regulatory compliance to encompass the integration of environmental and social objectives into business model and governance structures, with the aim of improving economic, ecological and social performance (Bendig et al., 2023; Bos-Brouwers, 2010). As highlighted by Bos-Beouwers (2010), sustainability in small and medium-sized enterprises (SMEs) manifests through innovation processes that reconcile efficiency with responsibility where eco-innovation, waste reduction, and stakeholder inclusivity become central mechanisms for achieving long-term viability. Building on this view, sustainable competitiveness arises when firms align digital transformation with environmental responsibility, leveraging digital technologies to optimize

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resource use, reduce emissions, and improve traceability across value chains (Lin et al., 2024). Digital orientation plays a catalytic role in this alignment. Firms that strategically commit to digitalization, through integrated use of ICT, data analytics, and automation, enhance their capacity to innovate while simultaneously strengthening their environmental performance and innovation capabilities, establishing sustainability as a by-product of digital maturity (Ardito et al., 2021; Zahoor & Lew, 2022). Zahoor and Lew (2022) show that strategic orientation characterized by digital proactiveness and learning foster dynamic capabilities to sustain superior environmental and social outcomes in international context. Similarly, Ardito et al. (Ardito et al., 2021), highlight that when digital and environmental orientations are coherently pursued, they mutually reinforce each other, positively affect SMEs' innovation and sustainability performance by enabling eco-innovations and improving access to knowledge resources. Digital tools act as enablers for environmental initiatives by facilitating data integration, stakeholder collaboration, and transparency, key drivers of sustainable performance. Conversely when digital and environmental initiatives are fragmented or complete for limited managerial attention, their complementarity may weaken (Linde et al., 2021), highlighting the need for coherent strategic alignment.

Focusing on SMEs is particularly relevant in this debate as they constitute the backbone of most economies (Katsinis et al., 2024), and their smallness constitutes the key factors of their capacity to innovate and adapt to digital and environmental transformation (Sabando-Vera et al., 2025) that is fundamental to sustainable growth (Passaro et al., 2023). Although SMEs face structural constraints, such as limited financial and human resources, that may hinder large-scale sustainability initiatives (Blackburn et al., 2013; Jiang et al., 2023), they benefit from flexibility, entrepreneurial culture, and the proximity of decision-making proximity. This organizational agility allows them to more rapidly adopt new technologies and integrate sustainability into operational practices (Parasotskaya et al., 2021). Whitin this group, innovative SMEs, those investing systematically in research, development, and digitalization, offer an especially rich context to investigate how digital orientation translates into sustainability outcomes. These firms are typically more technologically embedded, and open to change than traditional SMEs (Antenozio et al., 2026; Di Berardino & Antenozio, 2025; Hervas-Oliver et al., 2016). They provide an ideal setting to study how different forms of managerial intelligences interact to generate sustainable competitiveness (Merín-Rodrigáñez et al., 2025).

Governance within innovative SMEs also plays a decisive role in shaping the effectiveness of digital orientation. Without appropriate governance structures capable of embracing digital transformation, adopting a long-term perspective, and remaining open to change, innovative SMEs struggle to fully capitalize on the benefits of digital orientation. In SMEs, ownership, leadership, and management roles often overlap making demographic characteristics of top managers especially influential in determining strategic direction (Bannò & Filippi, 2024; Di Berardino & Antenozio, 2025; Hambrick & Mason, 1984). Compared with large companies, board and top management teams in innovative SMEs tend to be younger, more entrepreneurial, and technologically oriented (Collevecchio et al., 2024). These demographics traits foster openness to experimentation, higher risk-taking, and a greater inclination to embed sustainability into digital strategies. Among these demographic factors, gender and age diversity has attracted increasing scholarly attention (Aslanbeigui et al., 2025; Bannò & Filippi, 2024; Chen et al., 2023; Fernández-Temprano & Tejerina-Gaite, 2020; Lückerath-Rovers, 2013; Tejerina-Gaite & Fernández-Temprano, 2021). Female board members contribute collaborative and inclusive leadership styles (Torchia et al., 2011; Xie et al., 2020), a heightened sensitivity to stakeholder relationships (Bannò et al., 2023), and a long-term orientation that prioritizes sustainable growth (Javed et al., 2023; Nair, 2020). Younger members, in turn, bring digital fluency, adaptability, and proactive engagement with technological innovation (Fernández-Temprano & Tejerina-Gaite, 2020; He et al., 2023) and they are more typically exposed to social and environmental change (Collevecchio et al., 2024). Young-female directors combine these attributes being both

digitally literate and environmental responsibility (Collevecchio et al., 2024; Nadeem et al., 2020; Xie et al., 2020). Their dual perspective positions them as a catalyst capable of aligning digital orientation with sustainability objectives, especially within innovative SMEs where the boundaries between leadership and operations are fluid and managerial influence is direct.

Empirical studies suggest that gender-diverse boards tend to emphasize ethical behaviour, stakeholder dialogue, and environmental accountability (Bannò & Filippi, 2024; Torchia et al., 2011), while younger members promote innovation and dynamic change (Collevecchio et al., 2024). Together, these demographic traits strengthen the firm's ability to develop strategic complementarities between digitalization and sustainability. The combination of female leadership and youth thus represent a unique governance configuration capable of translating digital resources into long-term sustainable competitiveness.

Building on these considerations, this study conceptualizes digital orientation as a critical enabler of sustainability in innovative SMEs and positions governance diversity as a relevant mechanism that enhances the firm's ability to pursue long-term environmental and sustainable objectives. Accordingly, the research address two main research questions: RQ1 "How does digital orientation influence sustainability in innovative SMEs?" and RQ2 "How young-female board members guide digital orientations toward sustainable competitiveness?"

2. Purpose of the research

The objective of this study is to investigate how digital orientation affect sustainability of innovative SMEs, and how this relationship is shaped by governance diversity, particularly the presence of young and female board members. Despite the growing attention to digital transformation and sustainability, the literature still lacks an integrated understanding of how DO contributes to sustainable competitiveness, especially in the context of SMEs where resource constraints and strategic flexibility coexist.

While existing research has extensively explored the effects of DO on financial and innovation performance among SMEs (Ardito et al., 2021; Escoz Barragan & Becker, 2025; Kindermann et al., 2024; Ranjan, 2024), few studies have examined its influence on environmental and social outcomes. Yet, as digitalization reshapes corporate processes, it also provides powerful instruments to enhance sustainability through data-driven decision-making, energy optimization, and stakeholder transparency (Bendig et al., 2023; Lin et al., 2024). The potential of DO to foster sustainability thus depends not only on the deployment of digital technologies but also on the managerial intelligences that guides their strategic use. This paper responds to this gap to conceptualize sustainable competitiveness as the outcome of an interaction between digital and managerial intelligences.

By focusing on a diverse sample of innovative SMEs, this research provides a more granular understanding of how DO shapes sustainability outcomes, emphasizing the unique challenges and opportunities faced by smaller firms in aligning digital and environmental strategies. It also offers valuable insights for policymakers aiming to support SMEs in their dual digital and green transitions, helping to bridge the gap between theoretical research and real-world applications. The empirical analysis advances existing research in two main directions: (i) by deepening the understanding of how DO enhances sustainability and environmental competitiveness in the SME context, and (ii) by incorporating demographic diversity variables to examine how young-female governance moderates the DO–sustainability relationship.

By contributing to both theory and practice, this study aims to serve as a reference point for future research exploring how digital and managerial intelligences jointly foster sustainable competitiveness in innovative SMEs. Ultimately, it guides firms toward more effective digital transformation strategies that not only improve performance but also strengthen their environmental and social responsibility.

3. Methodology

We constructed an ad hoc balanced panel dataset of 250 Italian innovative SMEs observed over a ten-year period (2013-2022), resulting in 2.500 firm-year observations. The sample was selected using probability-proportional-to-size sampling to ensure heterogeneity across firm status, industry, and geographical location, thereby enhancing the external validity of our results within the European SME context. SMEs were identified according to the European Commission (2002) and definition[3], the Italian Chamber of Commerce classification.

Data were collected from multiple sources, including AIDA Bureau van Dijk, Crunchbase, SME websites through the Wayback Machine, and the Italian Chamber of Commerce registers. These sources provided both structured (financial and governance) and unstructured (textual) data, allowing a comprehensive analysis of firms' digital orientation and sustainability. To ensure data accuracy, we implemented a multi-step validation process, cross-referencing records across different databases and performing extensive data cleaning to mitigate inconsistencies. The use of the Wayback Machine enabled the tracking of historical changes in each SME's digital footprint, allowing for a dynamic measurement of DO over time.

Digital Orientation, the main independent variable, was operationalized as a multidimensional construct encompassing the four interrelated dimensions (i) digital technology scope, (ii) digital capabilities, (iii) digital architecture configuration, and (iv) digital ecosystem coordination. Using textual data extracted from firms' official websites and the Chamber of Commerce registers, we performed keyword frequency analysis in MAXQDA to identify terms associated with these dimensions[4]. The resulting measures were aggregated through Principal Component Analysis (PCA) to generate a composite index of DO. A back-translation process ensured consistency between English and Italian terminology.

The dependent variable, sustainability performance, was measured through green certifications, reflecting a firm's commitment to environmental management and sustainable practices. Specifically, we calculated the ratio between the number of green certifications and the total certifications obtained by each SME per year. This dynamic indicator captures the intensity of environmental certification relative to other quality and process certifications, providing a standardized measure across industries and years.

To capture managerial intelligences, we included both board diversity and compositional variables. The Young-Female Board variable identifies female directors under 35 years old sitting on the board of directors. Following the Italian Youth Policy definition, we set the threshold at 35 years. The variable was computed in by identifying all female directors under 35 across SMEs and Years, weighting by the total number of board members to capture the overall representation of young women on the board. Additionally, we controlled separately for female board representation (ratio of female to total directors) and young board representation (ratio of directors under 35 to total directors), to isolate the independent effects of gender and age diversity.

To account for firm heterogeneity, several control variables were included. Firm size was measured as the natural logarithm of the number of employees (Awad & Martín-Rojas, 2023; Hervas-Oliver et al., 2021; Zhang et al., 2022). Firm age was measured as the natural logarithm of the number of years since establishment (Nunes et al., 2012; Zhang et al., 2022). Manufacturing industry was introduced as a dummy variable (1 for manufacturing, 0 otherwise) to capture

[3] Micro, small and medium-sized enterprises (SMEs) are enterprises which employ fewer than 250 people, and which have an annual turnover not exceeding EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million, "Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises" https://ec.europa.eu/smes/

[4] See Kindermann (Kindermann et al., 2021) and Escoz Barragan and Becker (Escoz Barragan & Becker, 2025) for the list of the word for the step involved in this research approach.

sectoral differences, given that manufacturing tends to be more innovation-intensive and male-dominated, while services exhibit higher female participation and softer forms of innovation (Brush et al., 2019; OECD, 2023). For governance structure, we controlled for average board age (Tejerina-Gaite & Fernández-Temprano, 2021), board size (La Rocca et al., 2024), and board composition ratios weighted over the total number of directors in the sample.

To test the proposed hypotheses, we employed the two-step System Generalized Method of Moments (GMM) estimator, which is well-suited for dynamic panel data structures. This approach accounts for unobserved heterogeneity and potential endogeneity by using lagged dependent variables as instruments (Arellano & Bond, 1991). The GMM estimator also corrects for autocorrelation and heteroskedasticity, ensuring consistent and efficient coefficient estimates.

Model specification tests, including the Hansen test for instrument validity (Sargan, 1958) and the Arellano-Bond AR(2) test for serial correlation, confirmed the reliability of our empirical strategy. Robustness checks using fixed-effects and random-effects models were performed, confirming the stability of the results across different estimation techniques. This methodology provides a rigorous empirical framework to assess how digital orientation drives sustainability performance in innovative SMEs, and how young-female governance amplifies this relationship through the interaction of technological and managerial intelligences.

4. Preliminary results

Preliminary results show that DO positively influences the sustainability performance of innovative SMEs. Firms with a stronger digital orientation, those more willing to adopt and integrate digital technologies into their processes, stakeholder relations, and strategic decision-making, display a higher likelihood of obtaining green certifications over time. This result suggests that digital orientation fosters an open and adaptive mindset, enabling SMEs to embrace change, experiment with new solutions, and incorporate environmental responsibility into their business models. In this sense, digital orientation acts as both a technological and cultural driver of sustainability, promoting transparency, efficiency, and proactive engagement with environmental and social challenges. The preliminary analysis further reveals that young board members strengthen this relationship. Their behavioural traits, such as openness to innovation, adaptability, and greater environmental and social sensitivity, enhance the firm's ability to translate digital initiatives into sustainable outcomes. Young leaders tend to approach digital transformation not only as a source of competitiveness but also as an opportunity to align business objectives with broader sustainability goals. Their future-oriented vision and familiarity with technological change make them particularly effective in embedding sustainability within digital strategies.

These preliminary findings highlight how the integration of digital and managerial intelligences can accelerate sustainable competitiveness. Digital orientation provides the strategic and technological foundation, while young board members contribute the behavioural and cognitive conditions needed to ensure that digital transformation evolves toward environmentally and socially responsible directions.

5. Theoretical and managerial implications

This study contributes to the growing debate on how digital and managerial intelligences jointly foster sustainable competitiveness in innovative SMEs. From a theoretical perspective, the paper advances the strategic management and sustainability literature in three ways. First, it extends the digital orientation literature by demonstrating that DO does not only enhance financial and innovation performance but also serves as a strategic capability that enables firms to achieve sustainability-oriented outcomes. By aligning digital transformation with environmental responsibility, DO emerges as a multidimensional orientation that integrates technological,

organizational, and relational resources to support long-term value creation. Second, the study conceptualizes sustainable competitiveness as the result of an interaction between technological resources and managerial cognition. This integrative approach emphasizes that digital transformation becomes effective only when accompanied by governance structures capable of guiding it toward responsible and ethical goals. Third, the analysis enriches the literature on governance diversity by highlighting the fundamental role of young and female board members. Their behavioural traits, openness to change, digital fluency, and sensitivity to environmental and social issues, act as complementary assets that translate digital orientation into sustainability performance. This result underscores the importance of considering demographic and cognitive diversity as part of firms' intangible capital.

From a managerial perspective, the findings offer several practical implications. Managers of innovative SMEs should recognize Digital Orientation as a dual strategic lever as it not only improves competitiveness but also drives sustainability when managed coherently across its four dimensions. Digital investments should therefore be strategically aligned with sustainability goals, ensuring that technological progress supports environmental efficiency, energy optimization, and transparency in stakeholder relations. Moreover, the results emphasize the strategic value of inclusive and generationally diverse governance. Involving young and female board members can strengthen SMEs' capacity to innovate responsibly, infuse long-term sustainability perspectives into strategic decisions, and accelerate the alignment between digital and green transitions. Training and mentoring programs aimed at enhancing the participation of young women in governance positions could amplify these benefits, fostering new forms of leadership aligned with the principles of sustainable and digital transformation.

Finally, from a policy standpoint, the study provides useful guidance for institutions and regulators. Policymakers should design integrated programs that link digitalization incentives to sustainability objectives, encouraging SMEs to pursue digital maturity while adopting environmental standards. Promoting diversity in governance through targeted funding or gender-youth inclusion initiatives, can further support the development of SMEs capable of combining innovation, responsibility, and competitiveness.

This work in progress study contributes to both theory and practice by positioning digital orientation and governance diversity as complementary intelligences that, when harmonized, enable SMEs to pursue sustainable growth grounded in technological innovation and ethical stewardship.

6. Research limitations

This study has several limitations that should be acknowledged. First, the sample focuses exclusively on Italian innovative SMEs, which may limit the generalizability of the findings to other geographical or institutional contexts. While Italy provides a particularly relevant setting due to its strong concentration of SMEs and increasing emphasis on sustainability-oriented innovation, extending the analysis to different countries would allow for comparative insights on how DO fosters sustainability under diverse regulatory and cultural frameworks. Second, the measurement of sustainability relies on the presence of green certifications, which, although objective and comparable indicators, may not fully capture the broader scope of firms' sustainability engagement, such as social responsibility initiatives, or informal environmental practices. Future studies could combine certification data with textual or survey-based evidence to obtain a more comprehensive view of sustainability performance. Moreover, future research could explore unobserved firm-specific factors, such as internalization or collaborations that may still influence the observed relationships. Exploring these dimensions in future research would help refine understanding of how digital and managerial intelligences jointly shape sustainable competitiveness in SMEs.

Keywords: Digital orientation; innovative SMEs; sustainability; corporate governance; board diversity

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Artificial intelligence inside the sport industry: the Olympic AI Agenda

Mario Nicoliello[1]

1. Introduction

The advent of advanced technologies has instigated profound transformations across industries, altering how organisations operate, innovate and create value. As emphasised in the literature (Henning-Thurau et al., 2023; Akter et al., 2022; Dwivedi et al., 2022), the integration of Artificial Intelligence (AI) has the potential to foster sustainable progress with significant societal implications. The transformative wave is particularly pertinent in the field of sport, where digital innovation redefines the contours of operational efficiency, audience engagement and environmental sustainability (Hajli, 2025). The research examines the intersection of AI and the business model of the Olympic Games, focusing on the International Olympic Committee's (IOC) recently launched Olympic AI Agenda (IOC, 2024), in order to show how advanced technologies can catalyse innovative business ecosystems, while maintaining ethical integrity and sustainability.

The Olympic Games, a global phenomenon transcending sports, embody a complex nexus of stakeholders, including athletes, organisers, sponsors and fans, therefore in its intricate ecosystem, AI emerges as a critical enabler, capable of transforming the operational aspects and the broader value proposition for all stakeholders. The Olympic AI Agenda, introduced by the IOC in 2024, represents a strategic roadmap aimed at leveraging AI to enhance solidarity, fairness and sustainability while mitigating associated risks (IOC, 2024). The research explores how this AI Agenda reshapes the business model underpinning the Games and investigates its broader implications for the Olympic Movement.

The IOC, in its Olympic Agenda 2020+5, identified digitalisation as a pivotal trend influencing modern society (IOC, 2021). The subsequent evolution of this vision culminated in the Olympic AI Agenda, a program designed to harness the transformative power of AI to support athletes, optimise operations and enhance audience engagement. At its core, the Agenda aims to align technological advancement with the values of Olympism, including excellence, respect and friendship; however, the integration of AI into the Olympic ecosystem also raises critical questions about data privacy, fairness and the preservation of human-centric values in an increasingly digital world, these questions form the crux of the research's inquiry, as it seeks to understand the dual role of AI as both an opportunity and a challenge.

Therefore, the research question guiding the research is the following: how does the Olympic AI Agenda transform the Olympic Games and what are the implications of the transformation for the broader Olympic Movement?

In order to address the question, the research employs a case study methodology, grounded in a documentary investigation of official IOC documents, including the Olympic AI Agenda. The approach enables a detailed analysis of the Agenda's five focus areas (supporting athletes; ensuring equal access to AI benefits; optimising Games operations with a focus on sustainability; growing engagement with people; driving efficiency across the IOC's management) and examining the five domains the research uncovers the multifaceted impact of AI on the Olympic

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ecosystem, from operational efficiencies and enhanced audience experiences to the ethical challenges inherent in AI deployment.

The case study, currently work in progress, highlights several key themes that encapsulate the transformative potential of AI within the Olympic context. First, AI's ability to personalise athlete training and optimise talent identification represents a paradigm shift in sports performance and development; through advanced data analytics and machine learning, AI enables hyper-personalised coaching and training programs, fostering a new era of athletic excellence; additionally, AI's role in promoting clean competition and safeguarding athletes underscores its alignment with the core values of Olympism.

Second, the operational efficiencies introduced by AI extend across event management, logistics and venue sustainability; streamlining processes and reducing costs, AI enhances the environmental footprint of the Games while contributing to the United Nations' Sustainable Development Goals.

Third, AI redefines audience engagement, creating immersive, personalised experiences for fans; from augmented reality features and interactive content to tailored viewing experiences, AI transforms how audiences interact with the Games, extending the value chain for broadcasting, sponsorships and merchandising.

However, the integration of AI is not without challenges, therefore the research examines the ethical and governance issues associated with AI deployment, including concerns about data privacy, algorithmic fairness and the potential for job displacement. The IOC's governance framework, as outlined in the Olympic AI Agenda (IOC, 2024), aims to address challenges, fostering responsible AI use, ensuring transparency and promoting accessibility.

2. Literature Review

2.1. The intersection of artificial intelligence and sport sector

The transformative power of advanced technologies has become a defining feature of contemporary business ecosystems, with Artificial Intelligence (AI) standing out as a pivotal driver of innovation. Across industries, AI has reshaped how organisations operate, innovate and engage with stakeholders, and sports, an inherently global and multifaceted industry, has embraced these technological advancements, making the sector an ideal lens through which to explore the broader implications of AI (Ray, 2024).

Akter et al. (2022) have demonstrated that digital technologies, including AI, blockchain and the Internet of Things (IoT), contribute significantly to operational efficiencies and revenue growth. Technologies, they argue, are instrumental in fostering sustainability and addressing societal challenges. Within sports, AI's potential extends beyond operational improvements, providing data-driven insights that enhance performance, optimise resource allocation and create immersive audience experience (Geissler et al., 2024). Burt et al. (2021) have highlighted the importance of scenario planning to navigate the risks and opportunities of technology adoption, emphasising the need for stakeholder collaboration and critical reflection, creating a framework highly relevant to the Olympic Games, which involve a diverse array of stakeholders, from athletes and coaches to sponsors, fans and policymakers. One of AI's most significant contributions to sports lies in its ability to revolutionise athlete performance, since through advanced data analytics, AI enables hyper-personalised training programs, optimising performance and reducing the risk of injury (Popp et al., 2024). Ceipek et al. (2021) have shown how IoT innovations facilitate real-time monitoring of information that improve decision-making. In the Olympic context, AI's role extends to talent identification, where predictive algorithms analyse performance metrics and physical attributes to identify emerging athletes. The ethical implications of such applications, particularly regarding data privacy and fairness, are explored by Dwivedi et al. (2022), who call for transparent governance frameworks to mitigate biases and ensure equitable access to these technologies.

The Olympic Games, as a mega-event, require extensive coordination and resource management, therefore AI-driven optimisations in transportation, logistics and venue design can significantly reduce costs and environmental impact. Harwood and Eaves (2020) argue that innovations align with the United Nations' Sustainable Development Goals (SDGs), highlighting the potential for AI to drive sustainability in large-scale events. Zheng and Kiritsis (2022) provide empirical evidence on the use of digital twins and cognitive AI systems in event management, demonstrating how technologies enable real-time adjustments and improved outcomes.

Audience engagement, a cornerstone of the Olympic Games' global appeal, has been fundamentally transformed by AI, because personalised content delivery, augmented reality (AR) experiences and interactive features have redefined how fans interact with sports. Hennig-Thurau et al. (2023) explore the potential of AI to enhance storytelling, an element that can be used offering fans tailored narratives that deepen their connection to the Games, in order to enrich the spectator experience and to expand commercial opportunities through sponsorships, broadcasting and merchandising. However, as Raisch and Krakowski (2021) caution, the innovations come with challenges, particularly around data security and user consent, therefore robust governance mechanisms are essential to address the issues, ensuring that technological advancements do not compromise ethical standards.

The governance of AI in sports presents a complex interplay of opportunities and challenges (Kim and Manah, 2024). Harwood and Eaves (2020) stress the importance of involving multiple stakeholders in the development of ethical guidelines, arguing that collaborative approaches are critical to balancing innovation with societal impact. Burt et al. (2021) similarly highlight the need for continuous adaptation to evolving technological landscapes, a sentiment reflected in the IOC's commitment to ongoing vigilance and responsible AI use.

Rietsche et al. (2022) explore the implications of quantum computing, highlighting its potential to process complex datasets and generate insights at unprecedented speeds. Similarly, studies on the metaverse by Dwivedi et al. (2022) suggest new possibilities for virtual fan engagement, including immersive experiences and community-building initiatives. Both the advancements challenge traditional notions of sports management, opening new avenues for research and practice, reflecting the complexity of integrating AI into the Olympic ecosystem, where operational efficiencies and audience engagement must be balanced with ethical considerations and societal impact. The literature underscores the importance of critical reflection and stakeholder collaboration in navigating these challenges, emphasising that the successful integration of AI requires a nuanced understanding of its implications (Secinaro et al, 2025).

2.2. Technological transformation in sport sector

The evolution of technology in sports can be traced to the increasing complexity and global reach of the industry. As noted by Akter et al. (2022), advanced technologies like AI, blockchain and IoT have reshaped traditional business practices and have introduced new paradigms of value creation, allowing organisations to leverage vast amounts of data to enhance decision-making processes, optimise resources and improve stakeholder engagement.

In the field of sports, these capabilities are particularly relevant given the industry's multifaceted nature, which spans athletic performance, event management and fan interactions. In particular, AI-driven innovation forms the cornerstone of technological transformation in sports, because harnessing the power of machine learning, natural language processing and predictive analytics, organisations can generate insights previously unattainable. In the context of business models, AI-driven innovation introduces new revenue streams and operational efficiencies. The ability to predict consumer preferences, tailor marketing strategies and deliver personalised content transforms the way organisations engage with their audiences (Cohen and Fishbain, 2025).

The integration of AI into event management and logistics has revolutionised the way large-scale events, as for instance the Olympic Games, are organised. Harwood and Eaves (2020) argue that AI-driven optimisations in transportation, venue management and resource allocation significantly reduce costs and environmental impact. The concept of digital twins, as explored by Zheng and Kiritsis (2022), further illustrates the potential of AI in operational contexts, since creating virtual replicas of physical assets, digital twins enable real-time monitoring and predictive analysis, ensuring that events run smoothly and efficiently.

The proliferation of digital platforms and the increasing demand for personalised experiences have compelled sports organisations to adopt innovative approaches to fan interaction. AI plays a central role in the transformation enabling organisations to analyse consumer behaviour and deliver tailored content that strengthen the emotional connection between fans and their favourite teams or athletes. The consequences are also for business models, fundamentally altering how value is created, delivered and captured (Osterwalder, 2004). Traditional revenue streams, like ticket sales and broadcasting rights, are increasingly supplemented by digital innovations that leverage AI to enhance consumer experiences and operational efficiencies. The convergence of technological and business strategies enables organisations to build more resilient and adaptive models, ensuring long-term sustainability in a rapidly evolving industry (Assiouras et at., 2025).

As emphasised by the International Olympic Committee (IOC) in its Olympic AI Agenda (2024), AI has the potential to bridge gaps in resource availability, ensuring that athletes and organisations in underrepresented regions benefit from technological advancements. The inclusivity aligns with the broader values of Olympism and underscores the importance of ethical governance in implementing AI-driven strategies.

3. Methodology

The research employs a combination of thematic analysis and documentary investigation as the primary research methods to explore the relationship between the International Olympic Committee (IOC) and the evolving role of artificial intelligence (AI) in the context of the Olympic Games.

The IOC-issued Olympic AI Agenda served as the primary document for the investigation. It outlines the IOC's official stance on AI technology, highlighting their strategic objectives, ethical guidelines and how AI is envisioned to impact various aspects of the Olympic Games.

Thematic analysis was utilised to identify, analyse and report patterns (themes) within the data collected from the Olympic AI Agenda, the approach was chosen for its flexibility in analysing complex, unstructured documents such as policy papers, strategic agendas and institutional reports (Braun and Clarke, 2006 and 2019).

The first step involved thoroughly reading the Olympic AI Agenda, noting down preliminary thoughts, questions and potential areas of interest. After that, key concepts and references to AI within the agenda were coded and codes were applied to segments of text that highlighted specific instances where AI is mentioned in relation to the Olympics, including ethical considerations, technological advancements and the potential impact on stakeholders. The coded data was then grouped into broader themes, for instance, themes "AI in Sports Performance", "Ethical Considerations", "AI for Enhancing Viewer Experience" and "Sustainability and AI" emerged as significant topics across the document. The initial themes were reviewed and refined to ensure they were coherent and accurately represented the content of the IOC-issued agenda. After that finalised themes were named to capture the essence of the categories, ensuring that they were meaningful and aligned with the research focus on AI's role in the Olympic Games.

4. The analysis

4.1. Olympic AI Agenda

The results distilled from the Olympic AI Agenda reveal a road-map for deploying artificial intelligence across the strategic arenas of the Olympic ecosystem. The Agenda positions AI as a high-impact catalyst for athlete support, clean competition and safe-sport initiatives, envisioning data-driven talent-identification, hyper-personalised training plans and real-time injury-prediction models, extending machine-learning techniques to anti-doping analytics and large-scale monitoring of online abuse. These performance gains, however, come with privacy, bias and over-automation risks; hence the IOC pledges to act simultaneously as Pioneer (building shared AI assets), as Catalyst (nurturing IA initiatives) and Guardian (ensuring equity and safety).

The Agenda addresses equal access to AI benefits, a historically sensitive issue for National Olympic Committees (NOCs) in the Global South. Mandating remote-coaching tools and solidarity funding, the Agenda reframes AI both as a competitive advantage for well-resourced federations and as a levelling technology. The corollary risk is a widening digital divide if infrastructure or know-how remains uneven; the IOC therefore introduces an AI-engagement programme with Worldwide Olympic Partners to spread education and resources.

The document highlights AI's capacity to optimise Games operations and sustainability, considering that the use-cases range from generative design of low-carbon venues to predictive transport routing and automated workforce scheduling. While these efficiencies promise cost and emissions savings, they enlarge the attack surface for cyber-threats and concentrate operational reliance on opaque algorithms. Learning loops from Paris 2024 are thus framed as proof-of-concept pilots that will feed into a formal AI solutions pipeline for future host cities.

AI is cast as the engine for growing engagement with people: athletes, on-site spectators and remote fans alike. From one side, personalised content curation, augmented-reality navigation in venues and automated highlight generation represent the imaginative frontier, on the other side algorithmic echo-chambers, sentiment manipulation and intellectual-property misuse are explicit red flags. In order to balance novelty with responsibility, the governance framework foregrounds transparency about data capture and algorithmic decision rules in all fan-facing applications.

4.2. Key Findings

The analysis of the Olympic AI Agenda reveals, in the initial development of the research currently in progress, the growing significance of artificial intelligence (AI) in shaping the future of the Olympic Games. Four key areas emerge until now where AI is expected to drive innovation and improve various aspects of the Games: athlete support, operational optimisation, audience engagement and governance. AI and Athlete Support

AI is positioned as a transformative tool for supporting athletes across multiple dimensions. Analysing vast amounts of data, AI can identify emerging athletes at an earlier stage of their careers, allowing more efficient talent scouting and ensuring that potential Olympians receive the appropriate training and support to maximise their development. In terms of training personalisation, AI technologies enable the creation of individualised training programs that are tailored to an athlete's unique needs and capabilities. Furthermore, machine learning algorithms can analyse performance metrics, adjust training loads and offer insights into injury prevention and recovery, helping athletes to optimise their performance minimising the risk of injury.

AI also plays a crucial role in clean competition supporting anti-doping efforts. The IOC's AI Agenda emphasises AI's potential in enhancing drug testing and detecting irregular patterns in an athlete's performance. AI systems can analyse large datasets to flag anomalies that may suggest doping, contributing to a cleaner and more equitable competitive environment.

Additionally, AI is used to enhance safe sport practices, since predictive models can monitor athletes' movements and physiological data to detect potential injury risks, allowing for early interventions. AI tools can assess mental health, ensuring that athletes' psychological well-being is prioritised alongside physical health, which is critical for their overall performance and longevity.

Operational Optimisation

AI's potential extends beyond athlete support to optimise various operational aspects of the Olympic Games, like the cost reduction. The IOC's AI Agenda highlights AI's ability to streamline operations and reduce the costs associated with hosting the Games, in fact automating logistical tasks, optimising resource allocation and improving supply chain management, AI can ensure that resources are used more efficiently and waste is minimised.

The Agenda notes how AI can improve ticketing systems, crowd control and the management of events, providing real-time insights into attendee behaviour. Predictive analytics can be employed to optimise crowd flows, ensuring that venues run smoothly and that attendees have a seamless experience. Furthermore, AI can assist in automating routine operational tasks, thus reducing the burden on staff and volunteers.

The role of AI in advancing sustainability initiatives is also emphasised in the Agenda. With growing concern about the environmental impact of large-scale events, the IOC is keen on leveraging AI to minimise waste and optimise energy consumption. AI can optimise lighting, temperature controls and waste management systems, helping to reduce the overall environmental footprint of the Games. Additionally, AI is used to track resource use throughout the event, ensuring that sustainability goals are met.

Knowledge transfer is another key benefit of AI, as it allows the IOC to gather insights from past Olympic Games and use them to improve future editions. AI platforms can aggregate data on everything from venue management to fan engagement, creating a repository of best practices and lessons learned, in order to help ensure that the organising committees of future Games are better equipped to handle the complexities of the event.

Audience Engagement

The IOC recognises the potential of AI to enhance audience engagement, providing fans with a more personalised and immersive experience. AI technologies enable the creation of personalised content, where recommendations are tailored to individual preferences and viewing habits, helping the increase of fan loyalty and ensuring that Olympic content reaches the right audience through customised channels.

Moreover, the integration of AI with immersive technologies (e.g, virtual and augmented reality, VR/AR) is set to transform how fans experience the Games. In particular, the technologies allow fans to engage with events in innovative ways, offering virtual access to venues, live-action simulations and behind-the-scenes content; through AI, fans can interact with the Games in real-time, receiving live insights, updates and even predictive performance analytics.

The IOC's AI Agenda highlights AI's ability to create enhanced fan experiences. Chatbots and AI-driven virtual assistants are increasingly used to improve fan service providing immediate answers to queries about tickets, venues and schedules. AI systems can analyse live data from events to offer personalised experiences, providing real-time commentary and insights that provide to individual fan interests, making the experience more engaging and interactive.

Governance and Ethical Considerations

With the increasing reliance on AI, the IOC has emphasised the importance of addressing governance and ethical considerations. The Agenda places a strong focus on data privacy, acknowledging the vast amounts of personal data that AI systems collect. The IOC is committed to ensuring that all data handling practices comply with international regulations, as the General Data Protection Regulation (GDPR), to protect athletes' and fans' privacy.

In addition to privacy concerns, the Agenda stresses the importance of developing AI algorithms that are transparent and unbiased, particularly when it comes to performance analysis, recruitment and anti-doping measures. Addressing potential biases in AI, the IOC aims to ensure that all decisions made by AI systems are fair and just, maintaining the integrity of the Olympic Games.

The IOC acknowledges the need for clear lines of responsibility when it comes to AI-driven decisions, it is crucial that AI technologies, whether used in competition results or event management, are subject to oversight and scrutiny to maintain public trust and ensure that the Games are conducted fairly.

The Agenda outlines risk mitigation strategies to address potential issues, like algorithmic failures, data breaches or the misuse of AI, including regular audits of AI systems, development of contingency plans and promoting a culture of transparency and ethical AI development.

The findings underscore the vast potential of AI to transform the Olympic Games. AI's applications span across enhancing athlete performance, optimising operational processes, engaging with audiences in new ways and ensuring ethical and governance standards are upheld. However, as AI becomes more integrated into the Olympic framework, the need for responsible management and oversight becomes increasingly important to address the challenges of data privacy, fairness and accountability. The IOC's strategic vision for AI presents an exciting future for the Olympic Games, where technology can enhance both the athlete experience and the overall quality of the event.

Implications

Integrating AI, the IOC demonstrates how advanced technologies can reshape traditional business models, operational practices and stakeholder interactions. The implications extend beyond the Olympic Games, offering insights for other global sporting events and industries that aim to harness AI for innovation and growth.

One key implication is the enhancement of athlete support systems. AI's ability to provide personalized training, injury prevention strategies and anti-doping measures contributes to a more ethical and performance-driven athletic environment. The operational efficiencies achieved through AI – including optimised logistics, energy-efficient venue designs and real-time decision-making – highlight the potential for significant cost savings and sustainability gains, which are increasingly critical in a resource-constrained world.

AI's role in audience engagement has far-reaching implications. Personalised and immersive fan experiences, using augmented reality and real-time analytics, redefine the spectator's relationship with the Games. The innovations expand revenue streams through targeted marketing, merchandising and virtual events, illustrating how AI can drive economic growth while fostering global community building.

The IOC's AI Agenda serves as a guiding example of how organisations can balance innovation with ethical considerations, but its long-term effectiveness remains to be seen. The challenges emphasise the importance of transparency, stakeholder collaboration and continuous monitoring in implementing AI-driven initiatives.

Limitations

While this research provides a comprehensive analysis of AI's impact on the Olympic Games, it has some limitations. One significant limitation is the reliance on documentary analysis, which primarily focuses on the IOC's official documents. While these sources offer valuable insights, they may not fully capture the perspectives of all stakeholders, including athletes, fans and sponsors. Future studies could address this gap, incorporating qualitative methodologies like interviews and focus groups to provide a more holistic understanding of AI's implications.

Another limitation lies in the evolving nature of AI technologies. As AI continues to advance, new opportunities and challenges may emerge that were not anticipated in this research. For instance, developments in quantum computing and the metaverse could introduce additional complexities to the integration of AI in sports. The findings of the research should therefore be interpreted as a snapshot of the current landscape, with the understanding that the field is dynamic and subject to rapid change.

The scope of the research is primarily centred on the Olympic Games, which, while globally significant, may not fully represent the diversity of sports events and contexts. Regional and local sporting events may encounter unique challenges and opportunities in implementing AI.

Future Developments

Building on the implications and limitations of this research, several avenues for future development can be identified. First, a longitudinal study that tracks the implementation and outcomes of the IOC's AI Agenda over multiple Olympic cycles would provide valuable insights into the long-term effects of AI integration. Such a study could assess whether the anticipated benefits in athlete performance, operational efficiency and audience engagement are realised, and how ethical challenges are addressed over time.

Second, future research could explore the scalability of AI initiatives across different levels of sports. While this study focuses on the Olympic Games, there is significant potential for AI to impact grassroots and community sports. Investigating how AI can democratise access to resources and opportunities for underrepresented regions and demographics would contribute to a more inclusive understanding of technological transformation in sports.

Third, interdisciplinary research that combines insights from technology, ethics and sports management could further enrich the discourse on AI in sports. For instance, exploring the intersection of AI and sustainability or examining how AI shapes cultural narratives around fairness and competition, would provide a deeper understanding of its societal implications. Partnerships between academia, industry and governing bodies could facilitate the development of best practices and innovative solutions.

Keywords: Olympic Games; olympic AI agenda; international olympic committee; thematic analysis

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Entrepreneurial Autonomy as a Socio-Cognitive Driver for Social Value Creation in Peripheral Regions. Evidence from a case study

Carmelo Arena[1], Antonella Silvestri[2], Stefania Veltri[3]

1. Introduction

A prevailing assumption in entrepreneurship research is that peripheral regions and resource-constrained environments are characterized by economic, social, and institutional barriers that primarily constrain, rather than enable, entrepreneurial action (Welter, 2011). While previous scholars explain how entrepreneurs operate within these constraints, we lack a theoretical understanding of the process by which entrepreneurs first critically challenge and then systematically transform these constraints.

This study addresses this gap by investigating the generative process of radical social value creation. We pose the following research question (RQ1):

RQ1: How do SME leaders exercise entrepreneurial autonomy to cognitively reframe and practically overcome perceived contextual limitations, thereby creating novel social business models?

We examine this question through a critical single-case study (Yin, 2018) of Green Energy, a small-to-medium enterprise (SME) in Calabria, Southern Italy. Green Energy established the first Italian free football school, the Invictus Share A.S.D. embedding a specific mission for the social inclusion of children.

2. Theoretical Framework: Entrepreneurial Autonomy

To develop a micro-foundational model of this phenomenon, we adopt the Entrepreneurial Autonomy perspective, a framework informed by the emancipation theory of Paulo Freire (Freire, 1970; Siqueira et al., 2023). This lens posits autonomy not as mere independence, but as a critical, three-stage process:

- Limit-Situations: The objective structural barriers (e.g., poverty, institutional voids, social exclusion) of a given context. Entrepreneurial autonomy begins with the critical awareness that these situations are not immutable realities but socially constructed, oppressive structures that can be transformed.
- Untested Feasibility: The new, emancipatory vision that emerges from this critical awareness. In an entrepreneurial context, this is the radical social business model that articulates an alternative, more just reality, defying the logic of the existing limit-situations.

3. Methodology

We employ a qualitative, single-case study methodology, an approach selected for its suitability in gaining deep, contextual insights into complex real-world phenomena (Yin, 2018).

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The Green Energy case is particularly relevant as it offers a unique opportunity to analyze the specific mechanisms through which an SME successfully creates and sustains social value within a peripheral context, a setting often marginalized in mainstream research.

This extended abstract draws upon the preliminary findings from the first research phase. This initial phase consisted of in-depth, semi-structured interviews primarily with the SME's founders. This focus was essential for capturing the foundational cognitive and motivational drivers underpinning the venture and for exploring the limit situations, or critical challenges, from the entrepreneur's strategic perspective.

The study is currently progressing into its second phase, which is dedicated to rigorous data triangulation. This step is essential for enhancing the validity and reliability of our early findings. This triangulation involves two streams: (1) a comprehensive documental analysis (e.g., internal reports, mission statements, press releases) and (2) conducting further interviews with stakeholders. These stakeholders include (a) ecosystem actors (such as partners and sponsors) to validate the operational processes and external relationships, and (b) the direct beneficiaries (families) to assess the perceived impact and effectiveness of the social value created.

4. Preliminary Findings

Our analysis of the founder's data provides strong preliminary support for the entrepreneurial autonomy process:

- Stage 1: Critical Awareness of Limit-Situations: The founder's agency was initiated by a profound awarness of the interlocking contextual constraints:
  - Economic Constraint: The persistent financial crisis in Calabria, making private sports a luxury and excluding low-income families.
  - Social Constraint: The systemic marginalization of children with disabilities, evidenced by a total absence of adequate public or private structures for children with autism.
  - Institutional Constraint: A perceived environment of clientelistic logics and institutional obstructionism from the local municipality.
- Stage 2: Formulating the Untested Feasibility: This critical awareness catalysed a radical vision. The founder articulated this untested feasibility as a "small revolution" to "create social progress". The vision was explicitly emancipatory: to "put all children on the same level" through a high-quality, free, and inclusive model, thereby nullifying the oppressive logic of the "limit-situations."
- Stage 3: Enacting the "Limit-Acts": The founder then engaged in transformative limit-acts to realize this vision:
  - The Act of Systemic Replacement: The primary limit-act was the orchestration of a social ecosystem. By mobilizing a network of partners (sponsors, volunteers), the SME actively built a parallel support system that replaces the failing or absent state institutions. This ecosystem is sustained by relational governance.
  - The Act of Symbolic Inclusion: A specific limit-act that exemplified the mission was creating mixed football team embedding autistic children. This symbolic act directly challenged the "limit-situation" of social exclusion, providing tangible generated value and proving the untested feasibility was, in fact, possible.

5. Discussion

This study, while preliminary, offers distinct theoretical and practical contributions to the field of entrepreneurship.

This study offers distinct theoretical and practical contributions. Theoretically, we propose a micro-foundational, socio-cognitive model of social value creation. We argue that in peripheral regions, radical social business models are not a mere response to institutional voids but are

generated by an entrepreneur's emancipatory autonomy. This shifts the analytical focus from structural determinants to the cognitive processes of constraints awarness and agentic action. We further extend Siqueira et al.'s (2023) framework by applying it to the SME and ecosystem level. We conceptualize the limit-act not as a single action but as the complex, relational work of social ecosystem orchestration. Finally, we re-conceptualize constraints. Challenging their traditionally negative framing, we posit that severe constraints (e.g., institutional clientelism, poverty) function as cognitive catalysts. They trigger the critical awareness that is an essential prerequisite for envisioning and enacting emancipatory business models otherwise unthinkable in stable market contexts. Practically, we provide an actionable process model for entrepreneurs in peripheral regions. We suggest that success in creating systemic social change is not contingent on resource acquisition but on: (1) critically reframing the problem as an oppressive limit-situation to be solved, not merely navigated; (2) articulating a radical untested feasibility that inspires collective action; and (3) systematically orchestrating an ecosystem of partners to build a new, sustainable reality. The goal is to foster these ecosystem orchestrators as they build new, resilient social infrastructures from the ground up.

Keywords: Social entrepreneurship; entrepreneurialautonomy; social value; case study

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Identifying Critical Factors for Biodiversity Integration in Management Control Systems (MCS) using the Fuzzy Delphi Method

Carmelo Arena[1], Marion Ligonie[2], Marie Redon[3], Stefania Veltri[4]

1. Introduction

The contemporary organizational landscape is confronting a profound shift in risk perception. The global biodiversity crisis is no longer a peripheral environmental concern but is now recognized as a systemic economic risk, comparable in magnitude to climate change (WEF, 2024). This urgency is crystalizing into regulatory and market expectations. Emerging global frameworks, most notably the Taskforce on Nature-related Financial Disclosures (TNFD), are compelling organizations to transition from vague environmental statements to the rigorous measurement, management, and disclosure of their comprehensive nature-related impacts, dependencies, risks, and opportunities.

However, this transition exposes a critical implementation bottleneck. The management adage "what gets measured, gets managed" is contingent upon the systems that perform the measurement and management. Current corporate practice reveals a significant gap between disclosure ambitions and internal control realities.

On the one hand, external reporting on biodiversity remains nascent, fragmented, and largely superficial. Recent analysis of UK-listed companies confirms that while many firms acknowledge biodiversity, their disclosures are often narrative, lack quantitative metrics, and fail to integrate biodiversity considerations into core financial reporting (Maroun & Ecim, 2024; Hummel & Jobst, 2024). This suggests a lack of robust internal data aggregation, indicating that biodiversity is not yet a systematically managed issue.

On the other hand, this external reporting gap reflects a deeper, internal problem: Management Control Systems (MCS), defined as the formal and informal mechanisms, including budgets, Key Performance Indicators (KPIs), incentive structures, and diagnostic systems, that translate strategy into operational action, are fundamentally unprepared to govern the complexities of biodiversity (Hübel & Wenzig, 2025; Zhao & Atkins, 2021).

While the antecedent literature on Sustainability Control Systems (SCS) has matured, its focus has been predominantly on quantifiable global metrics such as carbon. Biodiversity, characterized by its site-specific, complex, non-linear, and multi-faceted nature, presents a far greater challenge. Exploratory research confirms this gap; even in sectors with high nature-dependency like the food industry, companies are only beginning to experiment with integrating biodiversity. These initial efforts are often informal, lack specialized KPIs, and struggle to connect high-level corporate commitments to operational management controls.

This creates a dual challenge: organizations are being pushed to report on data they do not have, produced by control systems they have not yet built. Therefore, there is an urgent need to

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define what these "Biodiversity MCS" should look like, moving beyond ad-hoc experimentation toward a validated framework.

2. Research Objectives and Questions

This study aims to bridge this critical gap. The general objective is to identify, prioritize, and validate a framework of critical factors essential for the effective design and implementation of "Biodiversity MCS". The research seeks to move beyond theoretical models by providing actionable, expert-validated guidance.

To achieve this, the study addresses two primary Research Questions (RQs):

RQ1: What are the primary drivers and most significant barriers that organizations face when attempting to integrate biodiversity considerations into their MCS?

RQ2: What are the most critical Key Performance Indicators (KPIs) and specific control practices required for organizations to effectively manage their corporate biodiversity impacts and dependencies?

3. Methodology: The Fuzzy Delphi Method (FDM)

To address these questions regarding a novel and complex topic, the chosen methodology is the Fuzzy Delphi Method (FDM).

The conventional Delphi technique is an established methodology for structuring consensus among a heterogeneous expert panel (Ghag & Sonar, 2024; Küchler et al., 2023). It is well-suited for this research, as biodiversity integration into MCS is a nascent field where structured expert judgment is more valuable than scarce historical data. The study will recruit a stratified panel (estimated N=25) comprising three key groups: academics (MCS/SCS scholars), practitioners (CSOs, Sustainability/Finance managers), and specialized consultants (biodiversity/TNFD experts).

The Fuzzy component, integrating fuzzy set theory, is a critical methodological enhancement. The evaluation of factors related to biodiversity is inherently ambiguous, subjective, and linguistic. A conventional Likert scale fails to capture the subjective space between semantic ratings (e.g., "Important" versus "Very Important").

FDM addresses this by converting linguistic variables into Triangular Fuzzy Numbers (TFNs). This approach mathematically models the vagueness, mitigates the ambiguity of expert responses, and ultimately improves the stability and convergence rate of the consensus.

Instrument Development (Round 1): A comprehensive questionnaire listing potential drivers, barriers, and KPIs will be developed based on an extensive literature review.

Expert Rating (Round 1): The panel will rate the "importance" of each factor using a 7-point linguistic scale.

Fuzzification: These linguistic responses will be mathematically converted into TFNs. An aggregated TFN (e.g., using a fuzzy geometric mean) will be calculated for each factor.

Consensus Check & Defuzzification (Round 2): Factors will be "defuzzied" to derive a score for ranking. For factors not achieving consensus in Round 1, participants will receive an anonymized feedback report (showing their score versus the group's fuzzy average) and will be asked to re-evaluate their position.

Final Analysis: The process concludes upon reaching consensus, resulting in a finalized, prioritized list of "Critical Factors".

4. Expected Contributions

This study is poised to deliver a threefold contribution, precisely positioned to address the gaps identified in the current literature and practice:

- Theoretical Contribution: The study will extend the theory of Sustainability Control Systems (SCS) by providing a specific framework for biodiversity. The current literature on SCS is dominated by carbon-centric models or limited, exploratory case studies. By employing a rigorous, multi-stakeholder consensus methodology (FDM), this research moves beyond exploration. It will provide a structured theoretical framework that articulates how MCS must be adapted to govern a complex, non-financial, and site-specific construct, thereby distinguishing the control requirements for biodiversity from simpler, global control metrics like carbon.
- Practical/Managerial Contribution: This contribution is twofold. Firstly, it addresses the "what" and "how" of implementation. While previous studies highlight the lack of quality reporting, this research provides the solution: a validated framework of critical drivers, barriers, and KPIs. Instead of diffusing limited resources on experimental controls, managers (CFOs, CSOs, Controllers) can use this framework to prioritize action and design effective control systems from the outset. Secondly, by achieving consensus among academics, practitioners, and consultants, the framework will possess a degree of legitimacy and practicality that is essential for its adoption in the field.
- Methodological Contribution: The study will demonstrate the utility of the Fuzzy Delphi Method (FDM) in solving a pressing environmental management accounting problem. Current research on biodiversity in MCS has relied on qualitative, exploratory case studies, which are excellent for identifying initial themes but cannot provide a prioritized or validated model. This study will show how FDM is a superior methodology for managing the inherent ambiguity and linguistic uncertainty (e.g., "what is critically important?") surrounding a nascent topic. It provides a blueprint for future research in sustainability strategy, showing how to build robust consensus where historical data is scarce, and expert opinion is paramount.

Keywords: Biodiversity; fuzzy delphi method; management control; survey

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The Role of Executive Compensation policies in Shaping ESG Performance: A Panel Analysis of European Firms

Carla Morrone[1], Giacomo Gotti[2], Marco Venuti[3], Sergio Longobardi[4]

1. Introduction and theoretical background

The year 2015 marked a turning point in global sustainability policy with the adoption by the United Nations of the "Agenda 2030", a comprehensive programme for Sustainable Development structured around 17 Sustainable Development Goals (SDGs) and 169 related targets to be achieved by 2030 across the environmental, economic, social, and institutional dimensions. Reaching these objectives requires the active participation of all sectors of society, including private enterprises, public institutions, civil society, and decision-makers.

As noted by several authors (Berenberg, 2018; Sætra, 2021), the SDGs can be associated with environmental, social and governance (ESG) criteria, since each goal can be linked to one or more of these dimensions. Taken together, they encompass the three fundamental pillars of sustainability: environmental protection, social responsibility, and economic development. These pillars constitute the practical basis for advancing sustainable development, which the United Nations Brundtland Commission (1987) defined as meeting current needs without jeopardizing the ability of future generations to satisfy their own.

The academic debate has increasingly emphasized the growing attention paid by stakeholders to ESG and sustainability factors (Ahuja & Rani, 2025; Garzella & Capurro, 2024; Gyönyörová et al., 2021). In this context, companies are increasingly adopting incentive systems with the aim to align companies' actions to stakeholders' expectations (Berrone & Gomez-Mejia, 2009; Haque, 2017; Remo-Diez et al., 2025).

This topic has been primarily addressed in the literature through the agency and stakeholder theories (Freeman, 1984; Jensen & Meckling, 1976). A more integrative framework is provided by the agency–stakeholder theory, which reconceptualizes the principal-agent conflict as a contractual nexus that extends to multiple stakeholders (e.g., customers, employees, institutional investors and local communities) (Hill & Jones, 1992).

One effective mechanism for responding to stakeholder demands and regulatory pressures — as well as demonstrating environmental and social commitment — is the implementation of governance remuneration systems linked to ESG or sustainability metrics (Cohen et al., 2023; Veltri et al., 2025). As noted by Veltri et al. (2025), the relationship between ESG-linked executive compensation and ESG performance constitutes an emerging research frontier. Although prior evidence generally supports a positive association (Derchi et al., 2021; Radu & Smaili, 2022), further empirical investigation is warranted (Morrison et al., 2024; Veltri et al., 2025). For example, Veltri et al. (2025) bring to light the risk that this impact remains symbolic rather than substantial, and – to the best of authors knowledge –, no studies have been conducted on European context in the last years (Morrison et al., 2024).

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In this scenario, the present study investigates the differential influence of financial-based and ESG-based executive compensation on firms' ESG outcomes, both contemporaneously and over the short-term. The empirical analysis relies on a panel of 2,176 European listed companies observed over the 2018–2023 period, a timeframe marked by increasing regulatory pressures (e.g., Non-Financial Disclosure Directive (2014/95/EU) and Corporate Sustainability Reporting Directive (2022/2464/EU)).

2. Data and methods

The study aims to assess whether the inclusion of ESG objectives in executive compensation schemes influences firms' overall ESG performance. In this context, the econometric analysis employs a panel data approach to estimate the influence of executive compensation policies on firms' sustainability performance. The dataset comprises 2,176 companies retrieved from Refinitiv and observed over the period 2018–2023.

The dependent variable, ESG_it, represents the aggregate ESG score of firm i in year t, which captures its environmental, social, and governance performance. The main explanatory variables are two dummy indicators generated to capture different configurations of executive compensation policies: D_{it}^{no}: takes the value 1 if the firm does not implement any executive compensation policy, while D_{it}^{perf}: takes the value 1 if the firm's compensation schemes are solely linked to financial performance indicators. The reference category for both dummies includes firms that adopt compensation policies tied to both financial and ESG performance. The model includes a set of control variables related to several aspect of the firms: governance and transparency ($CSRreport_{it}$, $CEOdual_{it}$), audit committee characteristics ($Auditindep_{it}$), and financial structure variables ($\ln Assets_{it}$, $DebtEquit_{it}$). The baseline specification is a Fixed Effects (FE) model:

$$ESG_{it} = \alpha_i + \beta_1 D_{it}^{no} + \beta_2 D_{it}^{perf} + \gamma' Z_{it} + \delta_t + \varepsilon_{it} \quad (1)$$

where α_i captures firm-specific unobserved heterogeneity, δ_t denotes year fixed effects, and Z_{it} is the vector of control variables. The FE specification controls unobserved heterogeneity across firms and across time.

To account for the possibility that changes in compensation structures affect sustainability performance with a temporal lag, a dynamic version of the model is estimated by including the one-period lag of the two compensation dummies:

$$ESG_{it} = \alpha_i + \beta_1 D_{it-1}^{no} + \beta_2 D_{it-1}^{perf} + \gamma' Z_{it} + \delta_t + \varepsilon_{it} \quad (2)$$

Since Fixed Effects models cannot estimate the impact of time-invariant variables (such as industry sector), an alternative specification is estimated using a Correlated Random Effects (CRE) model following Mundlak (1978). This approach introduces the firm-specific means of the time-varying regressors ($\bar{X}_i$) into the specification of random-effects, modeling explicitly the correlation between the unobserved individual effects and the explanatory variables:

$$ESG_{it} = \alpha + \beta_1 D_{it}^{no} + \beta_2 D_{it}^{p} + \gamma' Z_{it} + \theta_1 \bar{D}_i^{no} + \theta_2 \bar{D}_i^{p} + \theta' \bar{Z}_i + \phi_S + \pi_1 Poll + \pi_2 St + \delta_t + \mu_i + \varepsilon_{it} \quad (3)$$

where *Poll* and *St* are time-invariant dummy variables equal to one if the firm operates in a polluting industry and if it is included in the STOXX 600 index, respectively. In addition, ϕ_S is a vector of dummies to control for the economic sector of activities and μ_i is the idiosyncratic random component. This formulation enables the decomposition of the total effect into a within-

firm component (representing temporal variation) and a between-firm component (reflecting cross-sectional structural differences). A lagged version of the CRE model is also estimated to capture delayed effects in this richer specification.

All models are estimated using heteroskedasticity- and autocorrelation-consistent standard errors clustered at the firm level, following evidence of first-order serial correlation obtained through the Wooldridge test ($p < 0.001$). The Breusch–Pagan test confirmed significant variance across firms, justifying the use of panel methods. The Hausman test rejected the null hypothesis of no systematic differences between FE and RE estimates, indicating that the simple Random Effects estimator would be inconsistent. Finally, the joint significance test of the firm-level means in the Mundlak specification ($\chi^2 = 347.61$, $p < 0.001$) confirmed the presence of correlation between the regressors and the unobserved individual effects, validating the CRE correction.

Overall, this empirical strategy – combining Fixed Effects, dynamic Fixed Effects, and Mundlak specifications – provides a robust analytic framework to assess both the short-term within-firm dynamics and the long-term firm structural differences in the relationship between executive compensation design and ESG performance.

3. Results and discussion

Table 1 reports the estimates from four panel data models aimed at assessing the relationship between executive compensation policies and firms' ESG performance. Models (1) and (1-lagged) are fixed-effects specifications, while Models (2) and (2-lagged) are estimated using the Mundlak correlated random effects approach, which also incorporates the time-invariant variables (polluting sector and STOXX600 inclusion) and sectoral dummies. Standard errors are robust and clustered at the firm level.

The results are highly consistent across specifications. The coefficients associated with the two compensation policy dummies are negative and highly significant in all models, confirming the existence of a strong link between the structure of executive incentives and firms' ESG performance. Specifically, firms that do not implement any structured compensation policy show ESG scores on average 7.5 to 7.8 points lower than those adopting integrated schemes that link incentives to both financial and ESG objectives. Similarly, firms that base compensation exclusively on financial performance exhibit ESG scores about 2.7 to 2.8 points lower in the contemporaneous specification. When the lagged versions of these dummies are considered, the estimated coefficient remain statistically significant, but their magnitudes roughly halve (−3.5 for the absence of policy and −1.3 for financial-only schemes). This attenuation suggests that the primary impact of compensation design materializes contemporaneously, whereas its persistence over time is weaker but still observable.

These findings align with both agency and stakeholder theory perspectives. From an agency theory standpoint, the introduction of explicit ESG-related incentives provides a mechanism to align managerial behaviour with broader sustainability objectives, thereby improving the firm's ESG standing. From a stakeholder theory perspective, the adoption of measurable ESG incentives may be interpreted as a response to stakeholder pressure, signalling the firm's commitment to environmental and social accountability. Improvement in ESG ratings thus reflects greater alignment between corporate conduct and stakeholder expectations.

The control variables behave as expected and display stable signs across models. The publication of a CSR or sustainability report is strongly and positively associated with the ESG score (coefficient of approximately +9.4, $p < 0.01$), confirming that transparency and formal reporting are proxies for a broader sustainability orientation. Such reporting practices enhance accountability both in the agency perspective and in the stakeholder perspective, reinforcing the explanatory power of both theoretical frameworks.

The CEO duality variable (when the same individual holds both CEO and Chair roles) shows a negative and significant effect, indicating that concentrated leadership structures weaken

governance oversight and are associated with lower ESG performance. This result supports the theoretical view that power concentration reduces board independence and, consequently, the effectiveness of both shareholder and stakeholder monitoring.

Conversely, the independence of the audit committee has a positive and highly significant association with the ESG score, pointing to the role of board oversight in enhancing sustainability governance. An independent audit committee enhances managerial accountability and strengthens the internal control environment, fully consistent with both theoretical lenses adopted.

Among the financial controls, firm size (proxied by log total assets) shows a strong positive effect, implying that larger firms achieve higher ESG scores—possibly due to greater visibility, resources, and stakeholder scrutiny. The debt-to-equity ratio enters with a small but significant negative sign, suggesting that more leveraged firms face financial constraints or strategic trade-offs that limit investment in ESG practices.

The inclusion of time-invariant covariates in the Mundlak models provides further insights. Firms operating in polluting sectors show, on average, ESG scores about 3 points lower, reflecting both the structural environmental challenges and stricter stakeholder expectations that characterize these industries.

By contrast, firms listed in the STOXX 600 index display ESG scores roughly six points higher, consistent with the idea that inclusion in a major market index is associated with greater investor attention and higher transparency and sustainability standards. These outcomes corroborate both agency and stakeholder theories by illustrating how market visibility and institutional pressures foster responsible corporate behaviour.

The significance and stability of these time-invariant effects underscore the value of the Mundlak specification in capturing persistent cross-sectional differences that are not identifiable under a fixed-effects framework.

Variable	**Mod. 1 (FE)**	**Mod.1 (FE lagged)**	**Mod. 2 (Mundlak)**	**Mod.2 (Mundlak lagged)**
Absence of compensation policy	-7.493***	-3.521***	-7.761***	-3.607***
	(0.809)	(0.770)	(0.802)	(0.779)
Compensation only linked to performance	-2.764***	-1.274***	-2.843***	-1.251***
	(0.320)	(0.284)	(0.326)	(0.289)
CSR_report	9.440***	9.355***	9.486***	9.210***
	(0.560)	(0.726)	(0.557)	(0.718)
CEO_duality	-0.995**	-0.952**	-1.046**	-1.100**
	(0.449)	(0.460)	(0.455)	(0.451)
audit_indipend	0.067***	0.0668***	0.068***	0.068***
	(0.007)	(0.007)	(0.007)	(0.007)
ln_assets	2.740***	2.735***	2.727***	2.597***
	(0.419)	(0.498)	(0.413)	(0.486)
debt_equit	-0.013**	-0.009**	-0.0130**	-0.009*
	(0.006)	(0.005)	(0.006)	(0.005)
Polluting sector (time invariant)	-	-	-2.981***	-2.893***
			(0.781)	(0.785)
stoxx600 (time invariant)	-	-	6.200***	5.970***
			(0.736)	(0.738)
Constant	-20.901**	-19.36*	-58.94***	-54.44***

	(9.049)	(10.89)	(3.731)	(3.817)
Time dummies	*yes*	*yes*	*yes*	*yes*
Sectorial dummies (time invariant)	-	-	*yes*	*yes*
N	11,049	8,974	10,750	8,733

* p<0.10; ** p<0.05; *** p<0.01

Note: For the sake of simplicity, coefficients of the firm-level means (Mundlak correction terms) are omitted from the table but included in the estimation.

Table 1. Results of the panel estimation (standard errors in parentheses)

Overall, the results confirm that executive compensation design is a critical determinant of corporate sustainability performance and serves as an effective governance mechanism to align managerial actions with both shareholder and stakeholder interests. The consistent and substantial differences between firms with integrated ESG-linked incentives and those without such mechanisms highlight the role of managerial motivation systems as a lever for aligning corporate strategy with sustainability objectives.

The robustness of the findings across fixed-effects and Mundlak specifications, and across both contemporaneous and lagged formulations, strengthens the conclusion that the integration of ESG criteria into compensation policies has a measurable and enduring positive role on firms' ESG performance.

4. Conclusions

In order to examine whether and to what extent the inclusion of ESG-related objectives in executive compensation schemes enhances firms' overall ESG performance – building on agency–stakeholder theory (Hill & Jones, 1992) – the research explores how incentive alignment mechanisms works for boosting sustainable practices.

The empirical evidence provides a clear answer to the research question: linking executive remuneration to ESG targets exerts a significant and positive role on firms' sustainability outcomes. Firms adopting integrated compensation schemes that combine financial and ESG metrics consistently outperform those relying solely on financial criteria or lacking formalized incentive systems. These findings confirm that executive compensation design represents a strategic governance lever for embedding sustainability principles into managerial behaviour and corporate decision-making.

From a theoretical standpoint, the study contributes to bridging agency and stakeholder perspectives by demonstrating how incentive systems can mitigate information asymmetries (agency approach) while simultaneously responding to external legitimacy pressures (stakeholder approach) (Freeman, 1984; Jensen & Meckling, 1976; Morrison et al., 2024). In doing so, it advances the understanding of how compensation mechanisms operate as dual alignment tools—internally aligning managerial interests with corporate purpose and externally aligning corporate conduct with stakeholder expectations. The use of a panel data approach further strengthens these conclusions by disentangling short-term behavioural responses from persistent cross-firm structural effects.

From a managerial and policy perspective, the results underscore the importance of designing incentive contracts that integrate measurable ESG metrics alongside traditional financial indicators. Boards and remuneration committees should recognize that such integration not only

improves sustainability performance but also enhances transparency and investor confidence. For regulators and standard setters, the evidence highlights the role of governance-based levers—such as remuneration disclosure requirements—in fostering the diffusion of sustainability-oriented practices across markets.

Overall, the findings demonstrate that integrating ESG criteria into executive compensation represents not merely a symbolic gesture, but a substantive governance practice that enhances firms' capacity to deliver sustainable value creation.

The study is not without limitations. A first limitation of the results is related to endogeneity and potential reverse causality, as firms with a stronger pre-existing sustainability orientation may be more likely to adopt ESG-linked executive compensation schemes. As a result, it is important to highlight that observed associations may partly reflect selection effects rather than purely causal relationships. Furthermore, the analysis focuses on European listed firms, which may limit generalizability to other institutional and cultural contexts. Lastly, the use of aggregate ESG scores – though comprehensive – may conceal heterogeneity across the environmental, social and governance dimensions.

In the next steps of this project research, the analysis will be extended by employing disaggregated ESG metrics (i.e., environmental score, social score and governance score), exploring non-linear effects, or investigating the moderating influence of national governance systems and stakeholder relevance. Qualitative or mixed-method approaches could also shed light on the internal decision-making processes linking compensation policies to sustainability outcomes.

Keywords: ESG performance; executive compensation; agency theory; stakeholder theory; corporate governance

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Market liberalization and Non-Financial Disclosure: implications for firm performance in the utilities sector

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1. Introduction

In recent decades, the European economic landscape has undergone profound institutional, regulatory, and economic transformations (Foster et al., 2005). Two key and interrelated phenomena have characterized this evolution across several sectors. On the one hand, markets have been progressively liberalized to foster competitiveness and improve efficiency (Bognetti and Obermann, 2008). On the other hand, the gradual and increasingly stringent introduction of Non-Financial Disclosure (NFD) requirements has aimed to enhance transparency, environmental and social accountability, and corporate responsibility (Testa, 2024). Within this broader context, the public utilities sector, comprising entities engaged in the provision of electricity, gas, water, and environmental services, has been particularly affected.

In Europe, the process of liberalization has profoundly altered the role of public authorities in regulating essential services (Wacziarg and Welch, 2008). Historically, the characteristics of service provision were defined by public administrations, both central and local, either directly or through public enterprises. However, since the 1980s and 1990s, there has been an increasing influence of market logic on these decisions (Stiglitz, 2000). This evolution is driven by three fundamental imperatives: (i) to safeguard consumers from predatory or exploitative practices by corporations in a dominant position; (ii) to invigorate investment by curbing the capriciousness of political decisions; and (iii) to enhance the efficacy of services through the introduction of competitive dynamics (Barros and Martínez-Zarzoso, 2022). In Italy, this phenomenon has manifested itself with varying intensity and in different ways depending on the sector in question. For instance, during the 1990s, companies operating within the energy sector, particularly those involved in the distribution and sale of electricity and natural gas, began operating in progressively liberalized markets. This transition was consistent with EU directives that promote competition, efficiency, and the freedom of choice for end users (Bojnec and Križaj, 2021). In contrast, utilities that are active in the management of integrated water services operate primarily in a non-liberalized environment. This context is marked by a monopolistic and highly regulated structure, wherein the provision of services is entrusted through concessions or in-house provision, and access to the market is strictly controlled by public authorities (Grafton et al., 2022).

Concurrent with economic and institutional transformations, there has been a marked strengthening of policies aimed at sustainability and transparency (Imperiale et al., 2023). The reporting of sustainability practices by utilities can be interpreted from different perspectives. On the one hand, these companies contribute to sustainable development by creating public value, providing essential services that improve collective well-being (Moore, 1995). On the other hand, they inevitably generate negative impacts on the environment, such as pollution, loss of

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biodiversity, and deforestation (Coluccia et al., 2024). The aforementioned contradictions contribute to the complexity and strategic nature of NFD in the utilities sector. The gradual adoption of accountability tools, both voluntary and mandatory, has partially addressed the difficulties of reliably assessing the contribution of utilities to sustainable development (Bebbington and Unerman, 2020). Indeed, a growing number of companies have initiated the reporting of non-financial indicators, even in the absence of explicit regulatory mandates (KPMG, 2020; 2024). In any case, the introduction of Directive 2014/95/EU, implemented in Italy with Legislative Decree 254/2016, has established the mandatory reporting of non-financial information for specific corporate categories, effective from the 2017 financial year. This regulatory innovation signified a pivotal advancement in the domain of corporate governance, extending the ambit of corporate disclosure to encompass environmental, social, and governance (ESG) dimensions, in addition to traditional economic and financial performance metrics (Pizzi et al., 2021). More recently, the adoption of Directive 2022/2464/EU, known as the Corporate Sustainability Reporting Directive (CSRD), has further strengthened and expanded the scope of non-financial disclosure requirements, extending their applicability to a broader range of companies and aligning reporting standards with the EU Taxonomy and the Sustainable Finance framework (European Commission, 2022).

The extant literature has given increasing attention to the impact that these two key processes can have on the operational and economic performance of companies, particularly in the utilities sector.

According to classical economic theory, the increased competition that results from liberalization should promote greater allocative efficiency. Companies operating in liberalized markets face competitive pressures that can stimulate customer-oriented behavior and organizational innovation (Boubakri et al., 2005). Conversely, in non-liberalized sectors, companies tend to prioritize regulatory compliance and long-term infrastructure management, often under public ownership or concession arrangements (Baccini et al., 2022). However, empirical evidence has shown mixed results, as the degree of market openness, the characteristics of corporate structure and governance, and specific territorial dynamics have the potential to amplify or attenuate the expected effects (Pollitt, 2025).

The obligation to disclose non-financial information can also have different effects on company performance. From the perspective of governance theory and institutional legitimacy (Freeman et al., 2021), NFD can be a strategic lever capable of generating reputational value, reducing information risks, strengthening stakeholder confidence, and attracting capital (Latella and Veltri, 2024). However, mandatory disclosure can also entail compliance costs and highlight management inefficiencies, generating non-linear or even counterproductive effects on company performance, particularly in the short term (Ioannou and Serafeim, 2023). This phenomenon is particularly salient in companies operating within controversial or environmentally exposed sectors, such as utilities, which frequently engage in activities that simultaneously generate both positive and negative externalities (Martínez-Ferrero et al., 2023).

In this context, the interaction between market liberalization and NFD obligations is particularly interesting, but it is still underestimated in the scientific literature. Both can encourage companies to adopt more responsible management practices, thereby generating synergistic effects (Mejía-Dugand et al., 2017). However, the combination of competitive pressures and regulatory compliance can also generate management tensions, negatively affecting corporate performance if companies lack the organizational resources and skills to address both challenges (Lieberherr and Truffer, 2015). Therefore, understanding how these two processes interact is crucial for analyzing performance dynamics in the utilities sector.

In light of the theoretical and empirical ambiguities identified, the following research objectives are proposed:

- to assess the effect of market liberalization on the performance of utilities, distinguishing between companies operating in fully liberalized sectors and companies operating in non-liberalized sectors;
- to investigate the impact of the regulatory requirement for NFD on utilities' performance, comparing firms subject to and exempt from the obligation, and distinguishing the period preceding and following the enforcement of the mandatory reporting requirement;
- to assess the existence of possible joint or interactive effects between market liberalization and the NFD requirement in relation to the performance of utilities;
- to determine how specific company and regional characteristics may moderate these effects.

To analyze these relationships, the study focuses on two distinct yet complementary performance measures, aimed at capturing both the operational efficiency and economic profitability of companies:

- business productivity, estimated using Total Factor Productivity (TFP) and calculated using the ACF approach. This measure is indicative of the technical and operational efficiency of the business, as it takes into account the combined use of multiple inputs (capital and labour) in the output generation process (value-added);
- business profitability, estimated using the Return on Assets (ROA). This measure is a financial indicator that reflects the effectiveness of management in the use of available assets, and is particularly relevant in capital-intensive sectors, such as utilities.

The research adopts a quantitative approach based on panel data analysis, applying a fixed effects model. The analysis is conducted on a sample of Italian companies in the utilities sector, operating in the energy (ATECO 35 - Production, transmission, and distribution of electricity) and water (ATECO 36 - Collection, treatment, and supply of water) sectors, observed in the period between 2015 and 2024. This interval facilitates a longitudinal analysis of the company's performance. In contrast to conventional cross-sectional regressions, panel analysis allows for the identification of intricate relationships between variables over time, controlling for unobservable heterogeneity among companies and isolating specific effects that remain constant over time. Consequently, it enhances the reliability of causal inferences.

In the regression model, the dependent variables representing the company's performance are: (i) TFP, which serves as a proxy for operational efficiency; and (ii) ROA, which functions as a measure of the company's overall profitability. The explanatory variables include:

- Liberalization: dummy variable, which assumes the value 1 for companies operating in liberalized sectors (i.e., energy) and 0 for those operating in non-liberalized sectors (i.e., water);
- Non-Financial Discosure: dummy variable, which assumes the value 1 for companies that are subject to non-financial reporting requirements and 0 for those that are not subject to non-financial reporting requirements, as outlined in Legislative Decree 254/2016;
- Liberalization × Non-Financial Disclosure: interaction term between the two explanatory variables, useful for detecting any joint effects on productivity and profitability.

To improve the robustness of the model and isolate the specific effects of the institutional variables of interest, several control variables are also included, divided into three categories: firm-level, governance-level, and territorial-level.

The firm-level control variables included in the model are as follows:

- Age: the number of years since the firm's founding, used as a proxy for organizational experience and maturity;
- Size: measured by total assets, to account for potential economies of scale;
- Financial leverage: proxied by the debt-to-equity ratio, which reflects the firm's capital structure and exposure to financial risk;

- Private ownership: the percentage of equity held by private entities, included to capture differences in strategic orientation, management practices, and disclosure behaviors between publicly and privately owned firms.

The governance-level control variables included in the model are as follows:

- Board Size: total number of directors on the board;
- Board Independence: proportion of independent directors serving on the board;
- Board Age: average age of board members, used as a proxy for generational composition and experience;
- Board Education Level: average level of education among board members, indicating the board's human capital and potential cognitive diversity;
- Board Gender Diversity: proportion of female directors on the board, capturing gender-based diversity;
- CEO Duality: a dummy variable that indicates if the Chief Executive Officer also holds the role of Board Chair;
- CSR Committee: a dummy variable that indicates if the company has a formally established Corporate Social Responsibility (CSR) committee.

The territorial-level control variables included in the model are as follows:

- Regional GDP: a proxy for the level of economic development per capita in the geographical area where the firm operates, capturing differences in local wealth and infrastructure;
- Regional Population: an indicator of market size, reflecting the potential demand for utility services within the region;
- Institutional Quality: a proxy for the quality of local institutions and the intensity of regulatory frameworks, which may influence firm performance and compliance behavior.

This articulation enables the consideration of structural heterogeneity among companies, both internally (firm-level and governance-level) and externally (territorial-level). Consequently, it enhances the reliability of inferences regarding the relationships between liberalization, transparency requirements, and performance.

The regression model on panel data with fixed effects is illustrated in the following equation:

$$Performance_{it} = \beta_0 + \beta_1 Lib_{it} + \beta_2 NFD_{it} + \beta_3 (Lib_{it}\ x\ NFD_{it}) + \beta_4 X_{it}^{firm} + \beta_5 X_{it}^{gov} + \beta_5 X_{it}^{terr} + \alpha_i + \gamma_t + \varepsilon_{it}$$

where:

- $Performance_{it}$ alternatively represents the two dependent variables (TFP and ROA) for company *i* in year *t*;
- Lib_{it} is the dummy liberalization for company for company *i* in year *t*;
- NFD_{it} is the dummy Non-Financial Disclosure for company *i* in year *t;*
- $Lib_{it}\ x\ NFD_{it}$ is the interaction term between Lib and NFD for company *i* in year *t;*
- X_{it}^{firm} is the vector of firm-level control variables for company *i* in year *t;*
- X_{it}^{gov} is the vector of governance-level control variables for company *i* in year *t;*
- X_{it}^{terr} is the vector of territorial-level control variables for company *i* in year *t;*
- α_i represents the fixed individual effects (for each firm), which capture the unobserved heterogeneity that is constant over time;
- γ_t represents temporal effects (per year), to control for macroeconomic or regulatory shocks;
- ε_{it} is the idiosyncratic error term.

The data sources used to construct the dataset include AIDA Bureau van Dijk, for companies' information, CONSOB for the identification of companies subject to non-financial reporting requirements, and ISTAT for territorial variables.

Preliminary results indicate that market liberalization has a positive impact on firms' productivity, thereby confirming the hypothesis that competition can stimulate greater technical and operational efficiency. However, no systematic effects on ROA are observed, indicating that competitive pressures could translate into lower profit margins, at least in the short to medium term.

Non-financial reporting requirements have a positive impact on ROA, presumably attributable to reputational benefits and improved relationships with stakeholders and institutional investors. The effect on TFP, however, is not statistically significant, suggesting that the adoption of NFD does not directly affect operational efficiency, but rather strategic and relational aspects.

The interactive effect between liberalization and NFD reveals an interesting result: companies operating in liberalized markets and subject to NFD requirements achieve the highest levels of ROA, all other conditions being equal. This phenomenon could be indicative of a synergistic effect, wherein mandatory transparency serves to enhance corporate competitiveness within open market contexts. However, in the absence of adequate management resources, this combination can also increase operational complexity, generating divergent effects on TFP, especially among smaller companies.

Finally, the results of the moderation analyses indicate that company and regional characteristics play a crucial role. A higher percentage of private ownership is positively correlated with superior performance, both in terms of TFP and ROA, in corporate entities, in contrast to those under public control. Additionally, the presence of a CSR committee and greater diversity on the board, particularly in terms of independence and gender representation, are positively correlated with enhanced profitability. Finally, a positive relationship has been demonstrated between regional GDP per capita and productivity, suggesting that companies operating in more developed contexts benefit from positive externalities.

The present study represents a novelty on a theoretical level but also has practical and political implications. From a theoretical perspective, the study contributes to the development of literature on the performance of utilities in the context of institutional reforms, offering a combined analysis of market factors and regulatory transparency requirements in essential public services. From a managerial perspective, the results highlight the importance of a solid governance structure to maximize the benefits deriving from non-financial reporting and market liberalization. On the public policy front, the findings indicate that the implementation of liberalization initiatives must be coupled with the formulation of territorial support policies to avert potential regressive consequences in less developed regions. Moreover, for NFD to evolve from a mere bureaucratic obligation into a strategic instrument, it is imperative to furnish explicit guidelines and technical assistance to companies, thereby enabling its effective implementation.

Future studies may include: (i) extending the sample to other European countries; (ii) including ESG indicators extracted directly from sustainability reports; (iii) qualitative analysis to explore managerial adaptation mechanisms in greater depth.

Keywords: Market competition; ESG disclosure; corporate governance; energy utilities; water utilities

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Converging ESG frameworks: exploring interoperability across ESRS, GRI, SASB/IFRS

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1. Introduction and research background

Research on consolidation and harmonization of sustainability reporting has increased in recent years, reflecting the growing importance of environmental, social, and governance (ESG) accountability in both academic and professional domains (Kolk, 2004; Fifka and Drabble, 2012; Milne & Gray, 2013; Carungu et al., 2025; Pizzi et al., 2025; Hobber and Schipper, 2025). Over the past few decades, a variety of international sustainability reporting standards have been developed to guide organizations in disclosing their ESG impacts. Since the 1990s, the Global Reporting Initiative (GRI) has offered one of the most widely used frameworks for sustainability disclosure, culminating in the publication of the GRI Standards (Petera and Wagner, 2015). Similarly, the Sustainability Accounting Standards Board (SASB) introduced a sector-specific approach centered on financial materiality, distinguishing it from GRI's focus on impact materiality orientation. In 2022, the International Sustainability Standards Board (ISSB) assumed responsibility for the SASB Standards following the merger of the Value Reporting Foundation (VRF) with the IFRS Foundation. With this transition, the ISSB aimed to establish globally consistent sustainability disclosure, recently issuing IFRS Sustainability Disclosure Standards (IFRS S1 and S2) (Carungu, 2025; Carungu et al., 2025).

At the European level, sustainability reporting has also gained momentum following the European Green Deal in 2019 and the subsequent introduction of the Corporate Sustainability Reporting Directive (CSRD) and European Sustainability Reporting Standards (ESRS) (Hummel and Jobst, 2024). The CSRD introduced the principle of double materiality, combining GRI's impact-oriented perspective with SASB/ISSB's financial materiality focus, thereby enhancing corporate accountability to stakeholders while ensuring relevance for investors (Panfilo et al., 2025).

The rapid proliferation of frameworks, including the Integrated Reporting Framework (since 2010), the UN Global Compact (since 2000), and ISO 26000 (since 2010), has further emphasized the need for greater harmonization. Recent initiatives, such as the GRI–ESRS Interoperability Index (developed jointly by GRI and EFRAG in 2024) and ESRS–ISSB interoperability guidance, reflect growing efforts to align reporting practices across jurisdictions. Likewise, the 2024 GRI–ISSB collaboration seeks to minimize duplication and facilitate the combined application of these standards. These interoperability initiatives acknowledge that many companies continue to report under multiple standards—a practice commonly referred to as double reporting—which increases operational complexity and reporting costs (Wahyuni, 2025). Despite these developments, aligning SASB/ISSB, ESRS, and GRI standards remains technically and practically challenging, particularly in ensuring consistency across frameworks while supporting sustainable development. Large international corporations, in particular, face difficulties in comprehensively

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reporting on environmental, social, and economic impacts. For instance, GRI–ISSB interoperability guidance identifies common requirements between GRI 302/305 (energy and emissions) and IFRS S2 (climate), enabling companies to reuse GRI-aligned data to meet ISSB requirements for greenhouse gas emissions and climate risk management. This technical collaboration also harmonizes terminology, governance concepts, and materiality approaches, thereby enhancing alignment between stakeholder-oriented reporting (GRI) and investor-oriented reporting (ISSB).

This convergence supports the development of a coherent global sustainability disclosure ecosystem, in which reports prepared under different standards—ESRS, GRI, or SASB/ISSB—can interact and be interpreted in an integrated manner (Wagenhofer, 2024). Companies that adopt multiple standards may benefit in several ways: they can meet the expectations of diverse audiences, including both stakeholders and investors, while reducing redundant efforts and enhancing the credibility and comparability of their disclosures. Although empirical evidence from both academia and professional fields consistently shows that the GRI framework remains the most widely adopted sustainability reporting standard worldwide (KPMG, 2023; Michelon et al., 2022; Enciso-Alfaro & García-Sánchez, 2023), qualitative comparative studies reveal persistent tensions between investor-oriented frameworks (e.g., ISSB/IFRS) and stakeholder- or impact-oriented frameworks such as GRI. Harmonization and interoperability are frequently identified as the most promising strategies to reconcile differences that exist across different standards (Wagenhofer, 2024; Dinh et al., 2023). However, concrete evidence on how organizations operationalize interoperability in practice—particularly how they avoid double reporting and manage potential duplication of sustainability KPIs—remains limited (Adams & Abhayawansa, 2021; La Torre et al., 2020). This gap underscores the need for empirical research to clarify the current state of corporate practices in navigating multiple sustainability reporting standards.

In light of these developments, this study aims to investigate how European firms are addressing the interoperability challenge among the GRI standards, ESRS, SASB, and the recently introduced IFRS sustainability disclosure standards. In particular, given the mandatory adoption of the ESRS in the EU and the growing global demand for sustainability reporting, it is increasingly urgent to investigate whether—and how—organizations are responding to the convergence of sustainability reporting frameworks. Accordingly, this study addresses the following research question:

How do firms navigate multiple sustainability reporting standards and address interoperability issues?

To explore this question, we draw on institutional theory to examine the role of external and internal pressures—exerted through laws, norms, and professional recommendations—that shape organizational behavior. A central concept within institutional theory is isomorphism, the process through which organizations become similar in pursuit of legitimacy. Isomorphism can be coercive, arising from legal and political pressures (e.g., EU legislation); mimetic, through imitation of successful or widely recognized practices (e.g., the adoption of GRI); or normative, driven by professionalization and industry standards (e.g., ISSB) (DiMaggio & Powell, 1983). Firms operating in international contexts face institutional pressure and often also conflicting institutional logics, resulting in increased complexity and challenges in adopting multiple sustainability reporting standards. Therefore, understanding the areas of convergence or divergence among major sustainability frameworks—and how organizations prioritize or reconcile these competing logics—becomes essential for explaining variations in reporting practices and the challenges of implementing interoperable standards.

2. Methodology and expected results

The study is exploratory in nature, as the topic is both timely and highly debated. Inspired by the recent call for papers on "Interoperability Challenges: Exploring the opportunities and technical and practical difficulties in aligning ISSB, ESRS, and GRI standards, particularly in achieving consistency across reporting frameworks and advancing sustainable development" published by the Sustainability Accounting, Management and Policy Journal, this research seeks to nest inside this debate to sketch the state of play of European firms in this evolving context.

To achieve this goal, the study design follows three steps: (i) conducts a brief review of the literature on interoperability challenges in sustainability standards; (ii) compares key aspects of the major reporting frameworks to understand the degree of standard general requirements overlap; and (iii) performs a qualitative content analysis of firms' sustainability reports to assess the extent to which this path toward convergence/divergence of interoperable standards concretely reduce/increase double reporting.

Starting with the first step, a search of the Scopus database on the interoperability of sustainability reporting standards shows that, despite its growing policy relevance, scholarly research on this topic remains limited. Only 15 peer-reviewed papers were published between 2019 and 2025, with the majority appearing in 2025, indicating that academic inquiry into this emerging field is still in its early stages.

Building on this preliminary literature review, the study then undertakes a comparative analysis of the general requirements and principles of ESRS, GRI, and SASB/ISSB (IFRS) in relation to interoperability challenges. Drawing on established interoperability tools—such as the ESRS–GRI Interoperability Index, the ISSB Interoperability Index, and the GRI–ISSB interoperability guidance—the analysis assesses the alignment efforts pursued by the respective standard-setting bodies (GRI, ISSB, and EFRAG). The comparison focuses on key dimensions, including reporting scope, materiality concepts, topical coverage, disclosure structure, and assurance requirements. Table 1 summarizes the findings of this preliminary assessment, highlighting the main areas of interoperability and alignment across the ESRS, GRI, and ISSB/IFRS standards.

Dimension	**ESRS**	**GRI**	**IFRS S1–S2**	**Interoperability highlights**
Issuing Body	EFRAG (EU CSRD)	GRI	IFRS Foundation (ISSB)	Formal cooperation between GRI–EFRAG, GRI–ISSB and EFRAG – ISSB
Primary Objective	Regulatory compliance and transparency under EU law	Stakeholder accountability	Investor-focused sustainability-related financial disclosures	Avoid double reporting
Target audience	Multiple stakeholders	Multiple stakeholders	Investor and capital markets	Multiple international audiences
Materiality Concept	Double materiality (financial + impact)	Impact materiality	Financial materiality	ESRS bridges both perspectives
Reporting Scope	EU-based large entities and listed SMEs	Voluntary, global application	Global, capital-market-oriented disclosures	Firms may report under both ESRS and ISSB, using GRI metrics to

				address stakeholder needs
Topical Coverage	Environment (E1–E5), Social (S1–S4), Governance (G1)	Universal, Topic-specific (200+, including 300–400 series)	IFRS S1: General requirements; IFRS S2: Climate-related disclosures	ESRS E1–E5 mapped to GRI 300 series; IFRS S2 partially aligned with GRI 302/305
Material Topics Examples	E1 Climate, E2 Pollution, S1 Own Workforce, G1 Governance	GRI 302 Energy, 305 Emissions, 403 Occupational Health, 406 Non-discrimination	IFRS S2 Climate-related risks/opportunities; IFRS S1 general sustainability governance and metrics	ESRS E1–E5 ↔ GRI 302/305 equivalence; IFRS S2 ↔ GRI 305 (GHG) cross-compatibility
Disclosure Approach	Structured, mandatory datapoints; linked to EU Taxonomy	Principles-based, qualitative and quantitative disclosures	Prescriptive, risk and opportunity-based (aligned with TCFD)	GRI and ISSB coordinate metrics and terminology for the reuse of disclosures. ESRS integrates impact (emphasized by GRI) with risks and opportunities (emphasized by ISSB/SASB)
Assurance Requirement	Mandatory (limited assurance, moving toward reasonable)	Voluntary, recommended	Voluntary (depends on jurisdiction)	-
Interoperability Tools	ESRS - GRI Interoperability Index; ESRS – ISSB interoperability guidance	ESRS - GRI Interoperability Index; GRI–ISSB Interoperability Guidance	GRI–ISSB Interoperability Guidance ESRS – ISSB interoperability guidance	Mapping of equivalent disclosures, shared glossary, and data reusability protocols
Practical Implications	Required for EU firms; ensures investor and stakeholder relevance	Provides detailed impact metrics usable for ESRS and ISSB reporting	Supports investor comparability and financial risk assessment	Reduces double reporting; enhances global–regional alignment; increases comparability

Table 1. Key aspects between ESRS, GRI, and ISSB (IFRS S1 & S2) and Interoperability

The third step of the research design aims to more directly capture interoperability challenges in practice. To this end, the analysis focuses on the European context, specifically, on Italian listed firms. This setting is particularly relevant because, unlike other reporting frameworks, the ESRS are mandatory within the EU. Consequently, many large companies that previously disclosed sustainability information under the NFRD using the GRI Standards are now required to transition to the ESRS framework.

In this phase, the study conducts a qualitative content analysis of Italian companies that apply more than one sustainability reporting standard, assessing the extent to which interoperability is

reflected in their disclosures. This analysis makes it possible to identify practical strategies, recurring challenges, and potential areas of duplication arising either from the simultaneous adoption of multiple reporting standards or from the ongoing transition of many firms from GRI to ESRS.

To identify these companies, the study begins with the 2024 CONSOB report, which lists 150 firms that disclose sustainability information, either in standalone sustainability reports or within their management reports. This information is then cross-referenced with data from other sources, including the SASB Standards reporter website and the GRI reporter website. This process yields a sample of companies, presented in Table 2, which provides the foundation for examining how interoperability challenges are navigated when multiple sustainability reporting standards are adopted. It also allows for the identification of commonalities and divergences (e.g., presence of overlapping KPIs) in the way these standards are operationalized within corporate reports.

Company	**GRI**	**ESRS**	**SASB / IFRS (ISSB)**	**Sources and notes**
Leonardo SpA	–	✓	✓	The 2024 Integrated Report states that Leonardo applies the ESRS and includes a "SASB Content Index" for the Aerospace & Defense sector.
Pirelli SpA	–	✓	✓	The 2024 Annual Sustainability Report declares alignment with the "SASB Auto Parts Standard" and coverage of ESRS requirements
Saipem SpA	–	✓	✓	The 2024 Consolidated Sustainability Report discloses ESG topics according to ESRS obligations and SASB standards.
SNAM SpA	–	✓	✓	The 2024 Sustainability Statement / Consolidated Sustainability Report indicates the use of ESRS and SASB for the Oil & Gas Midstream sector.
Prysmian SpA / Prysmian Group	✓	✓	✓	The 2024 report follows ESRS standards as required by the CSRD. Prysmian previously published SASB- and GRI-based reports.
Unidata SpA	✓	✓	–	Unidata has used the GRI Standards and reports mappings to the ESRS in its sustainability disclosures.
RETI SpA	✓	✓	–	Listed on EGM, RETI voluntarily publishes sustainability reports. The 2024 Integrated Report references both ESRS and GRI and provides a mapping between the two.

Table 2. Sample selection

Using the available interoperability documents—linking GRI to ESRS, ESRS to SASB, and GRI to SASB/ISSB—this study aims to develop an indicator-level mapping across the different frameworks and their material topics that goes a step further by analyzing how individual disclosures and metrics correspond across frameworks. This approach can provide a more granular understanding of overlaps, differences, and practical implementation challenges, something that the broad interoperability indexes do not fully capture (Paoloni et al., 2025; Niccolò et al., 2025).

In terms of expected results, the analysis aims to provide company-level evidence of how these frameworks interact in practice, offering insights for practitioners on operationalizing multiple standards and identifying potential redundancies or gaps in reporting. We anticipate a relatively strong alignment between GRI and ESRS, given their shared emphasis on impact materiality and broad stakeholder orientation. By contrast, larger discrepancies are expected between ESRS and SASB, reflecting the sector-specific focus of SASB standards and the current draft status of ESRS sector standards, which may be delayed following the EU Omnibus package. Some alignment with the new IFRS sustainability disclosure standards is also anticipated, particularly regarding general requirements.

Overall, the study aims to map areas of convergence and divergence across frameworks and provide a detailed indicator-level alignment of different sustainability standards. Anchoring the analysis in institutional theory, the study also examines how organizations respond to multiple (internal and external) institutional pressures shaping sustainability disclosure practices. This approach enables an in-depth understanding of firms' capacity to interpret, prioritize, and operationalize interoperability across different reporting frameworks in practice.

3. Conclusion and contributions

This study aims to map areas of convergence and/or divergence across major sustainability reporting frameworks and provide a detailed indicator-level alignment of different standards. From a theoretical perspective, the study contributes to the sustainability reporting and accounting literature by providing new insights into how firms navigate interoperability under competing institutional logics, particularly in a context of regulatory change and the convergence of reporting frameworks.

From both scholarly and practitioner perspectives, the study provides a foundation for the future development of comparable reporting-quality metrics capable of assessing the effects of mixed-standard adoption (e.g., ESRS and GRI, or GRI and SASB/IFRS) on firm-level outcomes such as cost of capital, firm value, or corporate reputation. Such metrics could enable more rigorous empirical evaluations of how interoperability—or the lack thereof—affects corporate performance and reporting quality.

From a policy-making perspective, and guided by the Interoperability Indexes, the research offers empirical evidence on the degree of alignment among major sustainability reporting standards and the potential for streamlining corporate reporting processes. These insights can inform regulators and institutions in designing tools for unified disclosure mappings, facilitating multi-standard reporting while reducing the disclosure burden for firms.

Keywords: ESG frameworks; interoperability, GRI; SASB; ESRS; instituitional theory

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Family Businesses in the Made in Italy Ecosystem: Interactions between Corporate Culture and Knowledge Management Dynamics

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1. Positioning and Theoretical Framework

Until the twentieth century, management studies paid limited attention to the distinction between family and non-family businesses, as most firms operated as family-run entities (Aldrich & Cliff, 2003). Subsequent historical, political, and cultural developments progressively clarified the boundaries between family and firm, resulting in a well-defined separation and prompting the literature to treat them as distinct , though interrelated, systems (Heck & Trent, 1999). Given the complexity of the family-business relationship, research on family firms has coalesced around several theoretical frameworks that explain their unique governance, behavior, and performance characteristics (Chrisman et al., 2005; Chrisman et al., 2008). Notable among these are agency theory, stewardship theory, the resource-based view (RBV), and Socioemotional Wealth (SEW), which serve as foundational reference points for rigorous theoretical inquiry.

These major theoretical perspectives provide complementary insights into the dynamics of family firms. However, they differ in the extent to which they account for the non-economic foundations of family firms. Agency theory emphasizes potential conflicts between ownership and management, which are often mitigated in family firms by overlapping decision-making roles and shared long-term objectives. However, this alignment does not fully eliminate risks such as nepotism or intergenerational tensions, which can undermine managerial efficiency and decision-making (Schulze et al., 2001). In contrast, stewardship theory posits that family managers often act as stewards, motivated by responsibility, continuity, and reputational capital. These factors foster collaboration and long-term orientation but may also result in conservative decision-making and limited innovation (Miller and Le Breton-Miller, 2006; Le Breton-Miller et al., 2011). The RBV further expands this framework by identifying unique, hard-to-imitate resources, such as trust, internal cohesion, and tacit knowledge, that can provide a sustainable competitive advantage for family firms (Habbershon & Williams, 1999; Zahra et al., 2007).

Among these frameworks, SEW emerges as a central theoretical lens for this study. In particular, this study adopts the SEW perspective as its primary interpretative framework, as it explicitly accounts for the non-economic goals that shape family firm behavior. While incorporating elements from previous theories, SEW emphasizes the emotional and symbolic bonds that the owning family forms with the firm, assigning these factors a critical role in shaping strategic decisions and long-term orientation. The literature demonstrates that protecting family identity, ensuring generational continuity, and preserving control are non-economic objectives that can guide organizational choices, sometimes at the expense of short-term efficiency (Gomez-Mejia et al., 2007). Further research highlights how SEW shapes family firms' responses to institutional pressures, risk-taking behavior, and approaches to social responsibility, reflecting a dynamic balance between emotional priorities and competitiveness (Berrone et al., 2010).

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Accordingly, building on this perspective, this study argues that family values represent the primary symbolic foundation of organizational life in family firms, influencing not only strategic choices but also internal organizational dynamics. This approach facilitates an understanding of how values, identity, and non-economic objectives influence Corporate Culture (CC), and Knowledge Management (KM) processes in family businesses within the Made in Italy context. It provides an analytical lens for examining both organizational choices and the mechanisms that support intergenerational continuity.

Collectively, these theoretical perspectives demonstrate that family firms operate at the intersection of economic and non-economic logics, where financial objectives are closely linked to the preservation of resources, core values, and family identity. In this context, family values are conceptualized as the key driver of organizational behavior, encompassing emotional, symbolic, and relational dimensions that guide the owning family's decision-making. These values evolve over time and are embedded in CC, which shapes shared norms, behavioural expectations, and collective orientations that promote cohesion, trust, and sustained commitment. CC can thus be interpreted as the organizational infrastructure through which family values are institutionalised and enacted in daily organisational practices.

The effective transmission and reinforcement of these cultural elements depend significantly on KM systems. In this framework, KM is conceptualized not merely as a set of technical processes, but as a culturally embedded mechanism through which family values are enacted, transmitted, and renewed across generations. KM encompasses both formal and informal mechanisms for creating, disseminating, and retaining knowledge rooted in family values across generations. By enabling the circulation of explicit and tacit knowledge, KM preserves cultural meanings, organisational routines, and core practices while supporting adaptation to evolving internal and external conditions. Accordingly, this study proposes a conceptual relationship in which family values shape CC, and CC, in turn, influences KM processes, which sustain continuity and adaptive capacity in family firms. This interdependence between family values, CC, and KM necessitates a dual focus: first, on how KM processes operationalise and disseminate family values throughout the organization, and second, on how these institutionalised values shape and consolidate the CC of family firms.

2. Literature review

The literature extensively discusses KM in family firms (Audretsch et al., 2025; Bohorquez-Lopez et al., 2024; Pham et al., 2025). A recurring theme is that intergenerational knowledge transfer, while essential for sustaining organizational continuity, often remains tacit and confined within the family nucleus. This internal orientation can limit engagement with external knowledge sources, thereby constraining opportunities for innovation and adaptation (Cabrera-Suárez et al., 2018; Woodfield and Husted, 2017). In this respect, knowledge in family firms cannot be understood solely as a strategic or economic asset, but rather as a resource deeply embedded in the symbolic and emotional dimensions of the family, linking the firm’s heritage to its identity and long-term vision.

This inwardly focused knowledge system has a dual effect. It strengthens cohesion, identity, and brand reputation, providing stability and continuity. Conversely, it can create vulnerabilities, such as organizational insularity, reduced absorptive capacity, and resistance to new technologies or external ideas (Patel & Fiet, 2011; Brinkerink, 2018). These challenges are often intensified during generational transitions, when emotional ties and intra-family conflicts may interfere with rational decision-making, thereby affecting the firm’s capacity for growth and innovation (Chrisman et al., 2005; Lansberg et al., 1997).

Within this context, KM processes emerge as a critical organizational mechanism through which such tensions between continuity and adaptation are managed. Corporate governance is equally crucial in this context, as governance structures determine how knowledge is formalized,

shared, and safeguarded within family firms. Board composition, the extent of family involvement, and the presence of independent directors influence both strategic decision-making and openness to external knowledge sources. Research demonstrates that governance mechanisms are essential for balancing emotional attachments with rational organizational needs, particularly during generational transitions when conflicts may impede effective knowledge transfer (Gjergji et al., 2019). A robust governance system can mitigate risks of insularity, enhance absorptive capacity, and support alignment between family values, long-term vision, and the firm's KM practices (Melis, 2000; Melis 2004).

Within this framework, KM processes are essential not only for preserving knowledge but also for operationalizing family values and embedding them in daily practices. In line with the theoretical framework adopted in this study, KM is therefore conceptualized as the mechanism through which family values are translated into organizational practices and sustained over time. The effectiveness of KM is closely linked to CC, which establishes the norms, behaviors, and shared orientations through which knowledge is codified, communicated, and internalized across the organization (Cuozzo et al., 2025; Arduini et al., 2024). In this sense, corporate culture acts as the enabling infrastructure that shapes how knowledge processes unfold within the organization. CC functions as both the conduit and the stabilizing infrastructure for knowledge transfer, ensuring that family values and tacit knowledge are translated into collective practices while enabling adaptation to changing environments.

By integrating KM processes with the firm's value-based and cultural framework, family businesses can maintain continuity, reinforce identity, and sustain competitive advantage over time (Barney, 1986; Bolton et al., 2013; Gorton and Zentefis, 2020). Furthermore, scholars emphasize that CC and KM are mutually reinforcing: culture provides the interpretive framework within which knowledge is created, shared, and transferred, while sustained knowledge practices progressively reshape cultural patterns and reinforce collective learning (Nonaka, 1994; Nonaka and Takeuchi, 2007). However, in family firms, this relationship is further intensified by the central role of family values, which shape both cultural orientations and knowledge dynamics. Three main perspectives have emerged, functionalist, metaphorical, and dynamic, all converging on the idea that knowledge flows and cultural systems are deeply intertwined (Smircich, 1983; Krefting and Frost, 1985). This interdependence is particularly significant in family businesses, where values and identity strongly influence both cultural patterns and knowledge processes (Craig and Moores, 2006).

Accordingly, this study builds on this literature by proposing that KM operates as a mediating mechanism between family values and corporate culture, enabling the preservation, transmission, and renewal of identity-based knowledge across generations.

3. Gap and Research Questions (RQs)

Despite extensive literature on KM and CC in family businesses, limited attention has been devoted to understanding how KM processes function as a connecting mechanism between family values and corporate culture, particularly within context-specific settings such as "Made in Italy." Italian family firms serve as custodians of a unique heritage of skills, practices, and values that exemplify national production excellence, integrating economic, symbolic, and emotional dimensions. Although international studies emphasize the role of KM and CC in intergenerational knowledge transfer, they largely overlook how these processes are concretely enacted and aligned with identity-based logics in specific socio-cultural contexts.

In these firms, cultural and productive heritage are closely linked to brand identity and the distinctive practices associated with Made in Italy. Specifically, further investigation is needed into how tacit knowledge and family values are formalized and transmitted while maintaining the uniqueness of products and processes, and how KM systems and CC facilitate both innovation

and continuity, while mitigating risks of isolation and organizational rigidity common in family firms.

Accordingly, this study addresses this gap by conceptualizing KM not only as a mechanism for intergenerational transfer, but as a strategic and culturally embedded process through which family values are translated into corporate culture and organizational practices. Therefore, the research gap centers on the need to analyze KM processes in Italian family firms not only as mechanisms for intergenerational transfer, but also as strategic levers for enhancing and preserving the cultural and productive heritage that defines Made in Italy.

To address this gap, the present study aims to answer the following research questions: RQ1: What are the defining elements of the KM process in family businesses

RQ2: How do family values contribute to the formation and consolidation of CC in family businesses, through KM processes?

4. Methodology and Sample Selection

To address the research questions, this study adopts a qualitative and exploratory approach based on a multiple-case study design, to investigate how family values are embedded in the corporate culture of family firms and influence KM processes. The analysis is structured in three steps. First, a questionnaire is used to gather initial insights on the role of family and corporate values. This preliminary phase is intended to support case familiarization and refine the subsequent data collection process. Second, in-depth interviews with family members and managers explore the transmission of values and their impact on organizational practices. Third, on-site observations examine how these values are enacted in daily routines and integrated into KM processes.

For the empirical component, a sample of family-owned firms operating in the agri-food sector will be selected, as a theoretically relevant context for observing the interaction between identity, tradition, and knowledge processes within the Made in Italy ecosystem. This context enables the analysis of companies where family values, corporate culture, and KM processes are closely intertwined with tradition, production excellence, and the transmission of specific skills. The sample will include firms of varying sizes and generations to capture the dynamics of value and knowledge transfer both across generations and within daily organizational practices. This variation allows for analytical generalization across different organizational configurations. The objective is to observe how the characteristics of the agri-food sector influence the implementation and effectiveness of KM processes in Italian family businesses.

To ensure full clarity regarding the empirical analysis and to guarantee the complete replicability of the study, the sample of family firms will be identified using the authoritative AIDA database (Bureau van Dijk). To narrow the scope of the research and include only companies relevant to our objectives, we will select firms operating in the agri-food sector that are considered representative of Made in Italy. These firms will be identified using sectoral codes, firm size, and ownership structure, with particular attention to organisations characterised by concentrated family ownership and multi-generational involvement in management or governance. Selection criteria will also include the presence of established intergenerational dynamics and identifiable KM practices. In line with the study conducted by Grosso et al. (2021), to identify the agri-food sectors most directly connected to the Made in Italy for extraction from AIDA, the ATECO codes (National Statistical Industrial Classification) reported in Table 1 will be considered.

ATECO CODES (N°)	Description
101	Meat and meat-based products
102	Fish, crustaceans and molluscs
103	Fruits and vegetables

104	Oils and Fats
105	Milk and dairy products
106	Grains, flour, starches
107	Bakery and flour-based products
108	Other food products (e.g. coffee, tea, sugar, dietary food)

Table 1. ATECO codes and descriptions

5. Methodology and Sample Selection

Drawing on the SEW perspective and existing literature on KM and corporate culture in family firms, this study anticipates that KM processes serve as a critical mediating mechanism through which family values are translated, enacted, and reinforced within corporate culture. In particular, family values, such as continuity, trust, and identity preservation are anticipated to influence the design and implementation of KM practices, favouring relational, experience-based, and tacit forms of knowledge transfer, particularly through informal interactions and intergenerational mentoring. Furthermore, CC is likely to function as the interpretive framework that stabilises and legitimises these practices, ensuring their coherence and persistence over time.

Consistent with prior research, the findings are also anticipated to reveal a structural tension between continuity and adaptation. While value-driven knowledge systems enhance cohesion and identity, they may also limit openness to external knowledge and innovation. Firms that implement more structured and hybrid KM approaches, integrating both tacit and explicit knowledge processes, are expected to exhibit a greater ability to balance tradition with innovation. In the context of Made in Italy, the study is anticipated to demonstrate that the strong interplay among territorial identity, symbolic heritage, and production practices amplifies the influence of family values on both corporate culture and knowledge dynamics, thereby reinforcing the significance of identity-based knowledge as a key driver of long-term competitiveness.

The findings are anticipated to demonstrate that KM serves as a strategic lever enabling family firms to preserve their identity while fostering innovation, thereby overcoming the traditional trade-off between continuity and change.

6. Originality

This study offers an original contribution to the family business literature by developing an integrated perspective on the relationship between family values, organisational culture, and KM processes. While these concepts have been widely examined, they are rarely theorised as part of a coherent and interdependent system.

The originality of the work lies in the conceptualisation of KM as a connecting and mediating mechanism linking family values and organisational culture within the distinctive context of the Italian agri-food sector, a setting in which productive identity, family history, and symbolic capital converge in a singular manner. Rather than examining these elements in isolation, as is frequently the case in the literature, the research analyses them as a dynamic and mutually reinforcing system shaping organisational continuity and adaptive capacity.

By positioning KM as a culturally embedded process, the study advances theoretical understanding of the identity-laden, embodied, and tacit nature of family-based knowledge, showing how such knowledge is transformed into a cultural infrastructure that sustains both tradition and innovation.

7. Theoretical and Practical Implications

The study advances scholarship on family firms by illustrating how family values, once incorporated into organisational culture, become a generative mechanism for the creation,

transmission, and renewal of knowledge. The study reconceptualises KM not as a purely technical function, but as an institutionalised process of identity transfer within family firms, thereby contributing to the literature on both KM and family business.

The focus on the Made in Italy context additionally offers a contextualised theoretical contribution, demonstrating that territorial embeddedness and symbolic heritage significantly shape the cultural and knowledge-related dynamics of family enterprises. This suggests that identity-intensive contexts amplify the role of values in structuring both cultural patterns and knowledge processes, offering avenues for future comparative research across different institutional and cultural settings.

In line with these insights, family firms can strengthen continuity and competitiveness by implementing knowledge-management systems that make explicit the values, routines, and tacit competencies rooted in the family's history through selected practices. Structured mechanisms – such as intergenerational mentoring, formal moments of shared reflection, and digital tools for codification – facilitate the translation of values into organisational capabilities. In particular, the findings suggest that making tacit, value-based knowledge more visible and transferable can reduce the risk of knowledge loss during generational transitions.

At the same time, governance systems that balance value orientation with external openness can mitigate the risk of cultural closure and foster the absorption of new knowledge. This balance is critical for avoiding the trade-off between continuity and innovation that often characterises family firms. The approach proposed in this study thus provides operational guidance for aligning tradition, identity, and innovation over the long term.

Keywords: Corporate culture; family business; agri-food; KM; made in Italy

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Economia circolare e sostenibilità nel settore tessile della Sardegna: risultati preliminari da un'analisi cluster

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1. Inquadramento teorico e obiettivi

Nel quadro della transizione verso modelli di produzione e consumo più sostenibili, l'Unione Europea ha individuato nell'economia circolare (EC) una leva per ridurre la pressione ambientale dei settori industriali più impattanti. Tra questi, il tessile occupa una posizione centrale, risultando tra i primi comparti per emissioni di elementi inquinanti (Parlamento Europeo, 2020; EEA, 2025).

Per affrontare queste criticità, la Commissione Europea ha lanciato la Strategia per i Tessili Sostenibili e Circolari (2022), parte integrante del Piano d'Azione per l'Economia Circolare e in coerenza con gli obiettivi del Green Deal (Commissione Europea, 2019). Questa strategia mira a promuovere prodotti durevoli, riparabili e riciclabili, inserendosi in un quadro normativo più ampio, che regola il settore attraverso un complesso insieme di strumenti legislativi che coprono tutte le fasi del ciclo di vita del prodotto. Tra questi, il Regolamento sull'Ecodesign per i Prodotti Sostenibili (ESPR) si concentra sul design del prodotto come leva cruciale per ridurre gli impatti ambientali e introduce il Passaporto Digitale del Prodotto, strumento essenziale per tracciare i dati lungo tutto il ciclo di vita (Commissione Europea, 2024). La strategia prevede anche regole armonizzate sulla Responsabilità Estesa del Produttore (EPR), che obbliga le imprese a contribuire finanziariamente alla gestione del fine vita dei prodotti, stimolando al contempo il miglioramento del design e della qualità dei beni (Commissione Europea, 2022; Minucci, 2023; Osservatorio sul Riutilizzo, 2024; EEA, 2025).

In Italia, il Decreto Ministeriale n. 259/2022 ha introdotto la Strategia Nazionale per l'Economia Circolare, mentre il Ministero dell'Ambiente e della Sicurezza Energetica (MASE) ha predisposto una proposta di decreto EPR per il settore tessile. Questa attribuisce ai produttori l'obbligo di contribuire alla gestione del fine vita dei prodotti tramite consorzi, con eco-contributi modulati e misure di sostegno per le piccole-medie imprese (PMI). La regolamentazione nazionale ed europea converge dunque verso un nuovo modello tessile, orientato alla circolarità, alla qualità e alla trasparenza lungo l'intera filiera (Assoambiente, 2024).

Parallelamente all'evoluzione normativa, la letteratura scientifica ha progressivamente chiarito il significato e le implicazioni dell'EC, configurandola come un paradigma economico alternativo al modello lineare tradizionale take-make-dispose (Ellen MacArthur Foundation, 2013). Tra le diverse definizioni proposte, Geissdoerfer et al. (2017) descrivono l'EC come un sistema rigenerativo, in cui l'impiego di risorse, la produzione di rifiuti, le emissioni e le dispersioni energetiche sono minimizzati attraverso il rallentamento, la chiusura e l'accorciamento dei cicli dei materiali e dell'energia. Kirchherr et al. (2017) ne enfatizzano, invece, la dimensione sistemica e multiscalare (micro, meso, macro), associandola alla sostituzione del concetto di "fine vita" con strategie di riduzione, riuso, riciclo e recupero. Ancora,

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Ghisellini et al. (2016), pur senza proporre una definizione univoca, sottolineano il ruolo chiave della responsabilità condivisa tra imprese, consumatori e policy-maker.

L'EC si realizza attraverso strategie di riduzione, riutilizzo e riciclo - 3R - (Austin e Rahman, 2022), che trovano applicazione concreta nei Circular Business Models (CBM) (Urbinati et al., 2017). I CBM costituiscono una tipologia distintiva all'interno dei più ampi ambiti dei Sustainable Business Model (SBM) e dei Business Model Innovation (BMI). In quanto sottogruppo degli SBM, i CBM integrano obiettivi ambientali e sociali nelle operazioni aziendali di base, mirando a disaccoppiare la crescita economica dal consumo di risorse e dal degrado ambientale (Urbinati et al., 2017; Centobelli et al., 2020; Kirchherr et al., 2017). Allo stesso tempo, in quanto forma di BMI, i CBM si discostano dalla logica lineare, introducendo nuove modalità per creare, trasferire e catturare valore attraverso i principi della circolarità (Franzò et al., 2021). Questa innovazione spesso richiede una riconfigurazione della value proposition, una riprogettazione delle supply chain e l'adozione di nuovi revenue model (Bocken e Konietzko, 2022).

I CBM sono progettati a livello micro, ossia a livello aziendale, con l'obiettivo di rendere operative le strategie dell'EC (Bocken et al., 2016; Das e Bocken, 2024; Ritala et al., 2023). Tali strategie si articolano in quattro principali approcci:

- Slowing, per estendere la durata dei prodotti attraverso design durevole, riparazione e riutilizzo (Urbinati et al., 2017).
- Narrowing, per ridurre il consumo di risorse per unità di output (efficienza dei materiali e dell'energia) (Darmandieu et al., 2022).
- Closing, per creare cicli chiusi di recupero e reimmissione (riciclo, rigenerazione) (Brydges, 2021; Caldera et al., 2022).
- Regenerating, per promuovere un impatto positivo su ecosistemi e comunità (Ritala et al., 2023; Benites e Osmond, 2021).

Queste strategie sono implementate attraverso sei pattern principali che consentono alle aziende di chiudere i cicli delle risorse ed estendere il valore dei materiali: manutenzione, riuso, rigenerazione, riciclo, riutilizzo alternativo e impiego di risorse organiche (Lüdeke-Freund et al., 2019). In parallelo, Urbinati et al. (2017) propongono una tassonomia dei CBM articolata lungo due dimensioni: la proposta di valore al cliente e il network di valore. Da questa analisi emergono quattro livelli di adozione della circolarità: tradizionale, circolare a valle, circolare a monte e completamente circolare, con quest'ultima che implica una trasformazione sistemica dell'intero modello di business.

L'integrazione dei CBM può essere analizzata attraverso il Business Model Canvas (Osterwalder e Pigneur, 2010), evidenziando come la circolarità agisca su tutti i blocchi del modello: dalla progettazione del prodotto, ai canali di marketing, includendo le relative logiche di generazione del profitto (Centobelli et al., 2020; Del Vecchio et al., 2022; Urbinati et al., 2021). Narrowing, slowing, closing e regenerating costituiscono, inoltre, le leve strategiche mediante le quali il management traduce i principi dell'EC in pratiche organizzative e operative, favorendo la transizione verso CBM (Ünal et al., 2018). Tecnologicamente abilitanti e guidate dall'innovazione, esse permettono alle aziende di trasformare modelli lineari in sistemi rigenerativi (Santolin et al., 2024; Urbinati et al., 2023). Nel settore tessile e dell'abbigliamento, l'adozione di pratiche di EC rappresenta una leva strategica particolarmente rilevante, considerando le criticità ambientali che lo caratterizzano. Questo comparto, tra i più intensivi in termini di risorse ed emissioni, è indicato tra i principali responsabili dell'inquinamento globale e, secondo le stime, potrebbe arrivare a generare fino al 25% delle emissioni mondiali di carbonio entro il 2050 (Ellen MacArthur Foundation, 2021). A queste criticità si aggiungono le distorsioni generate dal modello del fast fashion, che ha contribuito ad accelerare i ritmi di produzione e consumo, riducendo la durabilità dei capi e incrementando significativamente la quantità di rifiuti tessili (Auke e Simaens, 2019; Vijeyarasa e Liu, 2022).

In risposta, l'EC offre soluzioni trasformative, quali progettazione per durabilità, sostituzione dei materiali vergini con fibre riciclate o bio-based, modelli basati su servizi

(noleggio, resale, riparazione) (Niinimäki et al., 2020; Sandin e Peters, 2018; Persson e Hinton, 2023) e sistemi di take-back e riciclo a ciclo chiuso (Abdelmeguid et al., 2024; Jia et al., 2020). Tecnologie come blockchain, IoT e RFID facilitano tracciabilità e trasparenza, supportando strategie di circolarità e coinvolgimento dei consumatori (Sandvik e Stubbs, 2019; Abbate et al., 2024; Agrawal et al., 2021; Charnley et al., 2022). Tuttavia, per una reale transizione sono necessari cambiamenti sistemici, quali ad esempio maggiore collaborazione lungo la supply chain, incentivi normativi e cambiamento nei comportamenti dei consumatori (Agrawal et al., 2021; Jäämaa e Kaipia, 2022). Centobelli et al. (2022) e Dissanayake e Weerasinghe (2022) identificano le pratiche manageriali chiave per CBM nel settore tessile, basate sulle 3R, che includono l'uso di materiali sostenibili, investimenti in tecnologie per l'efficienza e la depurazione, supply chain corte, sistemi di ritiro e certificazioni ambientali. Le tecnologie digitali, inoltre, agiscono come abilitatori trasversali, consentendo l'ottimizzazione predittiva e il monitoraggio in tempo reale.

Partendo da queste premesse, pare interessante analizzare la propensione verso la sostenibilità e l'EC nel settore tessile, esaminando al contempo le modalità con cui le imprese gestiscono e si interfacciano con le pressioni provenienti dal contesto istituzionale e dagli stakeholder (PE), successivamente integrate nei rispettivi BM. L'analisi di tali pressioni si fonda su un duplice riferimento teorico – la Stakeholder Theory (ST) e la Institutional Theory (IT) – che offrono prospettive complementari nell'interpretazione del comportamento organizzativo. Da un lato, la ST (Freeman et al., 2010; Laplume et al., 2008) evidenzia come le imprese rispondano alle aspettative di un'ampia pluralità di attori per mantenere legittimità e garantire accountability. Dall'altro, la IT (DiMaggio e Powell, 1983) sottolinea come le organizzazioni tendano a conformarsi a norme e modelli dominanti per ottenere legittimazione nel campo istituzionale di riferimento.

Questa chiave interpretativa ben si adatta al tessuto economico della Sardegna, caratterizzato da frammentazione, prevalenza artigianale e forte radicamento territoriale. In questo contesto produttivo, periferico e ad alta densità relazionale, le imprese tessili non agiscono soltanto in risposta alle pressioni esterne, ma possono perseguire anche forme di legittimazione istituzionale e sociale, dove l'adozione di pratiche sostenibili rappresenta al tempo stesso una sfida e un'opportunità per la valorizzazione del capitale locale. Per tali ragioni, il progetto di ricerca, allo stato attuale ancora in fase di realizzazione, si propone di osservare il settore tessile sardo per: 1) identificare, con idonea metodologia quantitativa, gruppi di aziende omogenee per l'approccio alla sostenibilità, all'EC e alle pressioni esterne; 2) osservare, con un approccio mixed-method, le somiglianze intra-cluster e le differenze inter-cluster, al fine di individuare le pratiche che abilitano un orientamento positivo alla sostenibilità e alla circolarità.

2. Metodologia

Per rispondere agli obiettivi del lavoro è stata condotta un'indagine indirizzata alle imprese operanti nel settore tessile della Sardegna e identificate mediante la piattaforma Telemaco, un servizio delle Camere di Commercio (gestito da InfoCamere) che permette di accedere a tutte le banche dati del Registro Imprese. In questo modo è stato possibile estrapolare, qualora presente, indirizzo e-mail e numero di telefono, informazioni impiegate successivamente per contattare le aziende. Gli eventuali dati mancanti sono stati poi integrati con una ricerca ad hoc. La raccolta dei dati è avvenuta mediante il supporto di un questionario, inviato via e-mail e somministrato con l'ausilio della piattaforma Survey Monkey. L'indagine è stata condotta durante i mesi di

maggio-settembre 2025 e ha prodotto un numero di risposte complete pari a 75. Considerando le risposte pervenute, il tasso di risposta è stato di circa il 20%[4].

Il questionario utilizzato nell'indagine, strutturato in sezioni tematiche e composto prevalentemente da domande a risposta multipla, rileva inizialmente le caratteristiche di base dell'impresa e approfondisce successivamente le pratiche di sostenibilità ed economia circolare, nonché il grado di adozione delle tecnologie digitali. La sezione conclusiva è infine orientata all'analisi degli aspetti riconducibili alla IT (DiMaggio e Powell, 1983) e alla ST (Freeman et al., 2010; Laplume et al., 2008) e al livello di conoscenza del quadro normativo di riferimento. Ove richiesto, i partecipanti hanno espresso il proprio livello di accordo o partecipazione attraverso una scala Likert a 5 punti (1 = "per nulla"; 5 = "totalmente").

Al fine di approfondire la propensione alla sostenibilità delle aziende tessili sarde è stata condotta una Cluster Analysis focalizzata su due sezioni tematiche del questionario. La prima contenente 14 item riferiti all'orientamento alla circolarità e sostenibilità e la seconda riguardante 9 item volti a comprendere come sono gestite le pressioni esterne del livello istituzionale e degli stakeholder che sono poi riflesse nel loro BM. In particolare, l'integrazione delle dimensioni riconducibili alla ST e alla IT nella Cluster Analysis consente di operazionalizzare concetti come la percezione delle pressioni esterne e istituzionali in indicatori misurabili. In tal modo, è possibile classificare le imprese sulla base sia dell'adozione di pratiche sostenibili e circolari, sia della loro sensibilità verso i meccanismi di legittimazione e adattamento che caratterizzano il campo istituzionale e relazionale in cui operano.

Prima di procedere alla Cluster Analysis, gli item sono stati sottoposti ad Analisi Fattoriale Esplorativa (EFA), condotta mediante il software STATA MP 18.

3. Risultati

3.1. Il campione

Di seguito vengono presentate alcune delle statistiche descrittive relative alle 75 aziende che hanno collaborato allo studio. Le imprese incluse nell'indagine, spesso a conduzione familiare, presentano una struttura di piccola dimensione. Circa il 70% dichiara, infatti, un fatturato annuo inferiore a €100.000 e l'85% si definisce a prevalente orientamento artigianale. La maggior parte opera come ditta individuale (60%), con uno o nessun dipendente. Ancora, il 35% delle imprese opera nell'ambito dell'abbigliamento in senso ampio, mentre il 19% è attivo nel tessile per interni (ad esempio tappeti e cuscini). Ulteriore caratteristica riguarda la localizzazione geografica che evidenzia una forte concentrazione nei centri urbani, con una progressiva diminuzione man mano che si passa a città di dimensioni più ridotte. Cagliari, Sassari e Olbia si configurano come poli di riferimento, ospitando il numero più elevato di imprese. Tale distribuzione è verosimilmente riconducibile a fattori quali la maggiore densità demografica, la presenza di infrastrutture più sviluppate e l'esistenza di reti commerciali più articolate, che complessivamente offrono condizioni più favorevoli allo svolgimento delle attività economiche.

I dati sull'adozione delle tecnologie digitali evidenziano che soltanto il 30% delle imprese dichiara di aver effettuato investimenti in tecnologia. La Figura 1 presenta due mappe costruite sulla base di indici sintetici calcolati su scala comunale, ottenuti mediando le risposte fornite dalle imprese agli item relativi alla digitalizzazione. La mappa di sinistra rappresenta l'"Indice di conoscenza delle tecnologie digitali", mentre quella di destra illustra l'"Indice di adozione degli

[4] Il campione iniziale era costituito da 846 imprese. A seguito dello *screening* preliminare, è risultata eleggibile circa la metà delle imprese inizialmente selezionate. Una quota significativa delle imprese originariamente individuate risulta, infatti, cessata o ha nel frattempo modificato il proprio *core business*. Le risposte complete pervenute sono state 75, su un totale di 375.

strumenti e processi digitali". Entrambe le rappresentazioni evidenziano una distribuzione territoriale della digitalizzazione coerente con la gerarchia urbana regionale: le imprese situate nei principali centri urbani e nelle relative aree periurbane mostrano livelli più elevati di digitalizzazione, beneficiando di maggior disponibilità di infrastrutture, servizi di consulenza specializzata e capitale umano qualificato. Al contrario, le imprese localizzate nei comuni dell'entroterra presentano livelli inferiori, confermando la persistenza di un "digital divide" territoriale che, nel lungo periodo, può accrescere le disparità di competitività tra aree centrali e periferiche. Tale divario riflette differenze strutturali nell'accesso a risorse immateriali, elementi centrali nei processi di innovazione.

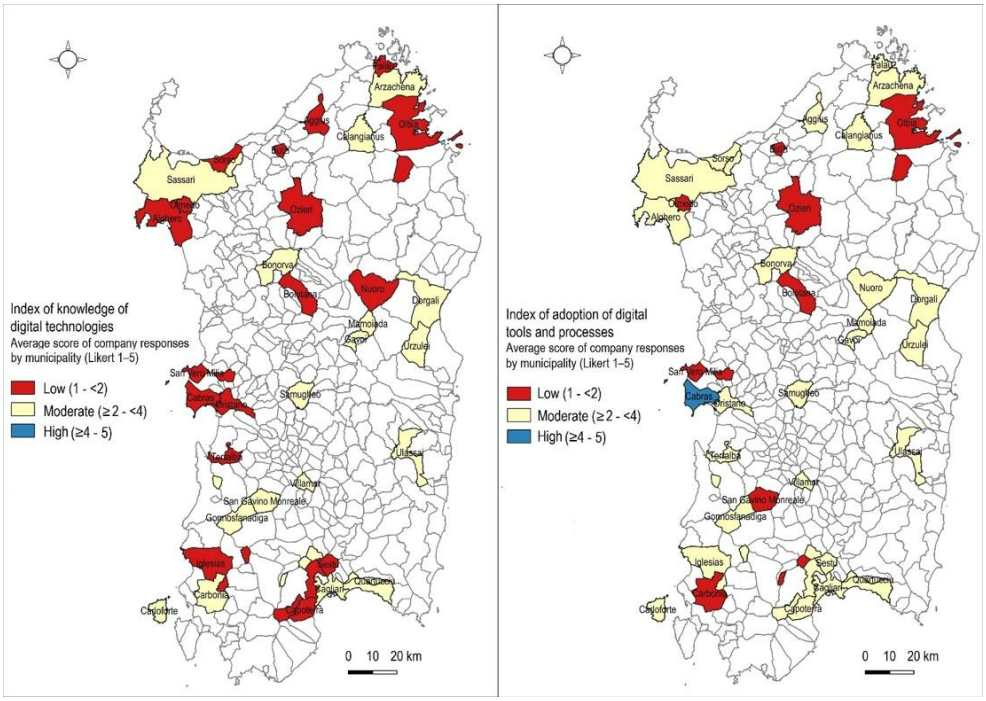


Figura 1. Indici di digitalizzazione nel settore tessile sardo: conoscenza delle tecnologie digitali (a sinistra) e adozione di strumenti e processi digitali (a destra)

3.2. L'analisi fattoriale esplorativa

Le verifiche preliminari di idoneità degli item utilizzati per l'EFA sono state effettuate tramite il metodo di estrazione principal-factor. La coerenza interna relativa a ciascuna delle dimensioni considerate è stata valutata mediante l'indice di Cronbach, il quale ha evidenziato un livello di affidabilità elevato per entrambe (EC: α = 0,9008; PE α = 0,8919). Il supporto all'applicazione dell'EFA è stato ulteriormente confermato dalla matrice delle correlazioni, dal test di sfericità di Bartlett e dalla misura di adeguatezza del campione Kaiser–Meyer–Olkin (KMO), come riportato nella Tabella 1.

	EC	**IT**
Crombach's alpha	0.9008	0.8919
Correlation matrix	0.0000	0.0070
Bartlett test of sphericity	0.0000	0.0000
Kaiser-Meyer-Olkin test	0.8300	0.8490

Tabella 1. Test preliminare EFA

È stata successivamente condotta un'EFA in modo distinto sugli item relativi alle dimensioni EC e PE, in accordo con quanto proposto da Dorrego Viera et al. (2024). Per la dimensione EC, l'analisi ha suggerito una struttura bi-fattoriale sulla base del criterio di Kaiser (eigenvalue > 1), come riportato nella Tabella 2.

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	**5.8526**	**4.5834**	**0.7009**	**0.7009**
Factor2	**1.2692**	**0.4408**	**0.1520**	**0.8528**
Factor3	0.8284	0.1996	0.0992	0.9520
Factor4	0.6288	0.3428	0.0753	1.0273
Factor5	0.2860	0.1317	0.0343	1.0616
Factor6	0.1543	0.0710	0.0185	1.0801
Factor7	0.0833	0.0262	0.0100	1.0901
Factor8	0.0571	0.0711	0.0068	1.0969
Factor9	-0.0140	0.0698	-0.0017	1.0952
Factor10	-0.0838	0.0464	-0.0100	1.0852
Factor11	-0.1302	0.0367	-0.0156	1.0696
Factor12	-0.1668	0.0255	-0.0200	1.0496
Factor13	-0.1923	0.0298	-0.0230	1.0266
Factor14	-0.2221	.	-0.0266	1.0000

Tabella 2. Risultati analisi fattoriale su EC

Tale soluzione a due fattori è stata ulteriormente corroborata dall'osservazione del punto di flesso ("elbow test") nel grafico Scree-plot, illustrato nella Figura 2.

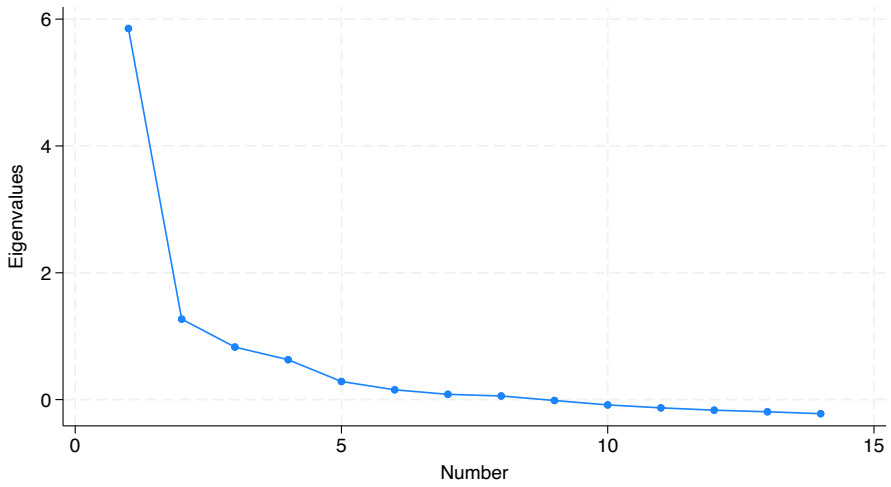


Figura 2. Scree plot degli eigenvalues per la EC

Per migliorare l'interpretabilità della soluzione, è stata altresì applicata la rotazione Promax, poiché gli item riconducibili alla dimensione EC risultavano correlati a livello teorico ed empirico. In linea con Howard (2016), l'assegnazione degli item ai fattori è avvenuta considerando un valore di loading superiore a 0,40 sul fattore primario, inferiore a 0,30 sul fattore alternativo, e una differenza tra i due coefficienti almeno pari a 0,20.

Il Fattore 1 (denominato "Produzione sostenibile") comprende cinque item, mentre il Fattore 2 (denominato "Pratiche circolari nell'industria tessile") include quattro item, come riportato nella Tabella 3.

Variable	Factor1	Factor2	Uniqueness
EC1	0.4401	0.1571	0.7067
EC2	0.6228	0.0808	0.5511
EC3	0.7388	-0.0801	0.5120
EC4	0.7749	-0.0259	0.4207
EC5	0.7061	-0.0835	0.5584
EC6	0.2977	0.4343	0.5824
EC7	0.2706	0.5720	0.4316
EC8	0.3496	0.4475	0.5078
EC9	0.6657	-0.1557	0.6451
EC10	0.4933	0.4605	0.298
EC11	-0.1554	0.9039	0.3113
EC12	-0.1270	0.8401	0.394
EC13	0.4388	0.3753	0.4879
EC14	0.0611	0.6921	0.4714

Tabella 3. Loading factors dopo rotazione Promax a due fattori

Per la dimensione PE, l'EFA ha evidenziato una soluzione mono-fattoriale (vedi Tabella 4), in quanto soltanto il primo fattore presentava un eigenvalue superiore a 1. Di conseguenze non si è resa necessaria l'applicazione di una rotazione[5].

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	**4.47084**	**3.98002**	**0.9**	**0.9**
Factor2	0.49081	0.09863	0.0988	0.9988
Factor3	0.39218	0.28303	0.0789	1.0777
Factor4	0.10915	0.05904	0.022	1.0997
Factor5	0.05011	0.1158	0.0101	1.1098
Factor6	-0.06569	0.06326	-0.0132	1.0965
Factor7	-0.12896	0.00547	-0.026	1.0706
Factor8	-0.13442	0.08174	-0.0271	1.0435
Factor9	-0.21617	.	-0.0435	1

Tabella 4. Risultato EFA - PE

Tutti i nove item relativi alla dimensione PE sono stati mantenuti all'interno del fattore denominato "Pressioni istituzionali ed esterne". La tabella 5 sintetizza la composizione interna dei tre fattori individuati, due per EC e uno per PE.

Fattore 1 (EC1) Produzione sostenibile	
EC2	Utilizziamo materiali naturali.
EC3	Utilizziamo coloranti naturali o processi di tintura a basso impatto.

[5] Le verifiche complementari hanno ulteriormente confermato la soluzione a un solo fattore: l'analisi delle componenti principali ha individuato una componente dominante (eigenvalue = 4,885; varianza spiegata = 54,3%), mentre la Horn's parallel analysis (270 repliche, stima media) ha restituito valori di eigenvalue corretti pari a 4,31014 per la prima componente e 0,71854 per la seconda. Applicando il criterio di mantenere soltanto i fattori con eigenvalue corretto superiore a 1, è stata quindi supportata la ritenzione di un unico fattore.

EC4	Utilizziamo materiali riciclati (ad esempio fibre rigenerate).
EC5	Comunichiamo attivamente l'impegno del nostro *brand* per la sostenibilità.
EC9	Facciamo affidamento su fonti di energia rinnovabile nel processo produttivo.
Fattore 2 (EC2) Pratiche circolari nelle industrie tessili	
EC7	Progettiamo prodotti che riducono l'uso di imballaggi.
EC11	Offriamo servizi di riparazione o incoraggiamo i clienti a riparare i prodotti.
EC12	Promuoviamo iniziative che facilitano il riutilizzo dei nostri prodotti da parte dei clienti.
EC14	Promuoviamo la raccolta e il riciclo dei prodotti usati.
Fattore 3 (IT) Pressioni istituzionali ed esterne	
IT1	La nostra azienda è soggetta a regolamenti ambientali che influenzano le nostre pratiche.
IT2	Le politiche pubbliche incidono sull'adozione di pratiche sostenibili e circolari nelle nostre operazioni.
IT3	I nostri clienti si aspettano o richiedono l'utilizzo di materiali sostenibili.
IT4	I nostri *stakeholder* ci incoraggiano a migliorare il nostro impatto ambientale.
IT5	Sperimentiamo pressioni da parte della società e dei media riguardo alla sostenibilità.
IT6	Gli standard di settore incoraggiano l'adozione di pratiche di economia circolare.
IT7	Abbiamo adottato pratiche di economia circolare seguendo l'esempio delle aziende leader del settore.
IT8	Monitoriamo attivamente le iniziative ambientali dei nostri concorrenti.
IT9	Implementiamo pratiche di economia circolare per mantenere la nostra reputazione all'interno del settore.

Tabella 5. Composizione interna dei fattori individuati

3.3. L'analisi dei cluster

La cluster analysis ha permesso di individuare tre gruppi tra le aziende rispondenti che denotano altrettanti differenti 'modelli' di approccio alla produzione e di interazione con le tematiche sostenibili e circolari. La tabella 6 presenta la media degli Z-scores che consentono di delineare in via preliminare la configurazione e le caratteristiche dei cluster alla luce dei tre fattori identificati nelle imprese oggetto di studio.

Variable	**Tradizionalisti a basso coinvolgimento (n = 24)**	**Sperimentatori (n = 10)**	**Leader circolari integrati (n = 41)**
(EC1) Produzione sostenibile	-0.71 (0.70)	-1.05 (0.30)	0.67 (0.71)
(EC2) Pratiche circolari	-1.08 (0.57)	0.80 (0.51)	0.44 (0.73)
(IT) Pressioni istituzionali ed esterne	-0.87 (0.81)	-0.19 (0.45)	0.56 (0.80)

Tabella 6. Media dei fattori (z-score) per ciascun cluster

Le 24 aziende (~32%) che compongono il primo cluster sono state definite come "Tradizionalisti a basso coinvolgimento". Tale classificazione, derivante dagli Z-score più bassi sui tre fattori considerati, evidenzia un utilizzo limitato di input sostenibili e di energia rinnovabile, una presenza marginale di servizi circolari (quali riparazione, riutilizzo e sistemi di raccolta e restituzione) e pressioni istituzionali deboli. La configurazione in parola può suggerire, in primo luogo uno stadio embrionale di circolarità, caratterizzato dall'avvio di prime sperimentazioni (ad es., alcune pratiche di design for X), da un'adozione contenuta di strumenti

digitali e da interventi selettivi di aggiornamento (es. macchinari eco-efficienti e sistemi chiusi di trattamento delle acque). Il profilo che ne emerge è tipico di imprese che incontrano maggiori difficoltà nell'innovare e nell'implementare pratiche manageriali orientate alla tecnologia. Alternativamente, questo può suggerire il limitato coinvolgimento di queste aziende sulle tematiche sostenibili e circolari e la mancata interazione con gli input che giungono dai regolatori, dai clienti e dagli stakeholder. Queste rappresentano quindi i soggetti più resistenti al cambiamento e, ragionevolmente, non in grado di percepire i vantaggi e le opportunità di una transizione circolare.

Il secondo gruppo è quello più esiguo in termini numerici poiché composto da sole 10 aziende (~13%), che interpretano la sostenibilità alla stregua degli "sperimentatori" dal momento che prestano maggiore attenzione verso le pratiche circolari con nessuna o scarsa attenzione verso la produzione sostenibile e una apparente neutralità verso le pressioni di natura esterna. In altre parole, il cluster degli sperimentatori risulta maggiormente orientato ai servizi circolari a valle (ad es., riparazione, riutilizzo, sistemi di raccolta e restituzione), mentre mostra ritardi rispetto ai fattori abilitanti a monte, quali l'impiego di materiali a basso impatto, l'adozione di energia rinnovabile e il miglioramento dell'efficienza dei processi. Questo profilo suggerisce una fase transizionale, nella quale le imprese sperimentano modelli di circolarità basati sui servizi senza disporre, tuttavia, di una base produttiva pienamente allineata. Potrebbe, pertanto, suggerire la situazione di aziende in 'transizione' che ancora non hanno pienamente e coscientemente integrato la circolarità nel proprio BM. Queste, quindi, nel prossimo futuro possono trasformarsi in leader della circolarità o arretrare verso posizioni contrarie ove la sperimentazione non suggerisca o evidenzi vantaggi tangibili.

Il terzo e ultimo cluster, primo per dimensione tra i tre esaminati (41 aziende), comprende il 55% delle aziende analizzate e può essere definito come quello dei "leader circolari integrati". Tali imprese presentano, infatti, punteggi superiori alla media in relazione sia alla produzione sostenibile sia all'adozione di pratiche circolari, risultando allo stesso tempo maggiormente coinvolte ed attive nel gestire le pressioni esterne (ad es., regolamenti, richieste dei clienti, standard di settore). La rilevanza numerica di questo gruppo riflette una vocazione verso una produzione intrinsecamente sostenibile, spesso a carattere artistico o artigianale, meno esposta alle dinamiche tipiche del fast fashion.

Le imprese appartenenti a questo cluster adottano, inoltre, pratiche di progettazione orientate alla durabilità, privilegiando l'impiego di materiali locali e, in numerosi casi, riciclati o riutilizzati. In una prospettiva evolutiva, tali aziende potrebbero consolidare il proprio vantaggio competitivo ampliando l'offerta di servizi – anche post-vendita – collegati ai prodotti

(come la riparazione e la manutenzione), potenziando i sistemi di tracciabilità dei materiali e dei processi (ad es. attraverso i digital product passports) o, ancora, sviluppando collaborazioni con altre aziende per attività di remanufacturing. Nei confronti di queste, considerando anche la positiva interazione con le pressioni istituzionali, è fondamentale che i regolatori e il sistema economico siano pronti a creare e mantenere un set di incentivi che consolidi la loro posizione di leader della sostenibilità.

4. Considerazioni finali

In questo primo step, il progetto di ricerca, ancora nella sua fase preliminare, ha approfondito l'orientamento alla sostenibilità e alla circolarità delle imprese artigianali del settore tessile della Sardegna. Queste sono state classificate attraverso una Cluster Analysis basata da un lato sulle pratiche e l'orientamento verso la sostenibilità e la circolarità, dall'altro sulla percezione e gestione delle pressioni istituzionali ed esterne. L'analisi cluster svolta sui tre fattori emersi – due per l'EC e uno per l'PE – ha verificato l'esistenza di 3 gruppi distinti di imprese. Il cluster più numeroso, formato da 42 imprese, individua quelle realtà che si collocano nello stadio più avanzato di circolarità, caratterizzato da livelli elevati di produzione sostenibile e da una maggiore coscienza verso le pressioni e le dinamiche istituzionali e di mercato. Per contro, i cluster

rimanenti mostrano livelli di circolarità inferiori rispetto al gruppo dei leader, ma condividono una crescente consapevolezza del ruolo della sostenibilità. In particolare, il cluster degli sperimentatori, pur ridotto numericamente, lascia intravedere margini di evoluzione verso modelli più maturi, qualora vengano rafforzati approvvigionamenti sostenibili, investimenti in energie rinnovabili, pratiche di design-for-X e sistemi di tracciabilità.

I risultati, da un lato, sembrano segnalare che alcuni contesti artigianali possano configurarsi come veri e propri "laboratori di sostenibilità territoriale". Dall'altro, mostrano anche una certa asimmetria nella capacità delle imprese di assorbire le pressioni esterne: se, infatti, alcune realtà internalizzano tali sollecitazioni traducendole in innovazione di processo e di prodotto, altre ne restano parzialmente impermeabili. L'ulteriore approfondimento quali-quantitativo previsto mirerebbe a esaminare con maggiore precisione la composizione interna dei cluster, integrando variabili strutturali e socio-organizzative utili a chiarire le dinamiche sottostanti ai differenti profili emersi. Lo studio delle variabili strutturali e socio-organizzative risulta dunque fondamentale per comprendere, da un lato, se e in che modo caratteristiche demografiche, organizzative e produttive influenzino l'orientamento delle imprese alla sostenibilità e alla circolarità, contribuendo a delineare le traiettorie evolutive sottostanti ai differenti profili emergenti. Dall'altro, tale analisi consentirà di chiarire, in un'ottica coerente con la IT e ST, il ruolo moderatore svolto da queste variabili nei processi di adattamento e risposta alle pressioni istituzionali e alle sollecitazioni provenienti dagli stakeholder.

Appare, infatti, plausibile ipotizzare che una maggiore anzianità dell'impresa o dell'imprenditore si associ a una minore propensione al cambiamento, con effetti potenzialmente limitanti sulla capacità di integrare pratiche orientate alla sostenibilità e alla circolarità. Analogamente, nelle imprese familiari caratterizzate da una continuità intergenerazionale stabile e da strutture decisionali accentrate possono manifestarsi forme di path dependency che riducono la sensibilità alle pressioni istituzionali e competitive favorevoli alla transizione circolare. Tali dinamiche potrebbero invece attenuarsi in presenza di passaggi generazionali più recenti e di leadership più giovani.

Il progetto presenta alcuni limiti che è necessario evidenziare. I risultati preliminari presentati sono allo stato attuale scarsamente generalizzabili. Per tale ragione, una nuova somministrazione della survey, mirata a coinvolgere un numero più ampio di imprese, consentirebbe di consolidare la robustezza empirica dell'analisi e di accrescere la generalizzabilità dei risultati. Inoltre, sarebbe utile estendere l'indagine a imprese appartenenti a contesti territoriali differenti, così da aprire prospettive comparative e valutare se – e in che misura – unità economiche operanti nello stesso settore e con configurazioni organizzative analoghe contribuiscano all'impiego sostenibile delle risorse naturali e sociali.

Infine, un approfondimento qualitativo del profilo delle imprese, attraverso la metodologia del multiple case study, risulterebbe fondamentale per identificare best practices e meccanismi organizzativi sottostanti, offrendo indicazioni utili sia per la definizione di politiche di supporto sia per la progettazione di strumenti manageriali replicabili.

Parole chiave: Economia circolare; sostenibilità; settore tessile; circular business model; cluster analysis

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Pratiche di sostenibilità nelle PMI: un'analisi preliminare nei territori di Verona e Vicenza

Paolo Roffia[1]

1. Introduzione

La sostenibilità rappresenta oggi una delle sfide più rilevanti per il sistema economico europeo e per il tessuto imprenditoriale italiano. Negli ultimi anni, la crescente attenzione verso le tematiche ESG ha accelerato la necessità per le imprese di ripensare modelli organizzativi, processi e strumenti manageriali in un'ottica di lungo periodo. Tale trasformazione riguarda non solo le grandi imprese, ma anche le piccole e medie imprese (PMI), che costituiscono oltre il 99% del sistema produttivo nazionale e che sono sempre più chiamate ad affrontare pressioni competitive, normative e reputazionali (Baumgartner & Ebner, 2010; Lozano, 2015). Nonostante ciò, la letteratura accademica evidenzia come il tema della sostenibilità nelle PMI sia ancora caratterizzato da approcci frammentari e da un significativo divario informativo, che rende complessa una valutazione sistematica delle pratiche adottate (Spence, 2016; Del Baldo, 2012).

In particolare, permane una distanza tra le pratiche di sostenibilità effettivamente adottate dalle PMI — spesso distinguibili tra pratiche formali e informalmente incorporate nelle routine aziendali — e la loro formalizzazione secondo logiche strutturate di misurazione e reporting. Tale divario è influenzato dalla limitata disponibilità di risorse, dalle competenze manageriali e dalla natura stessa delle PMI, spesso guidate da logiche intuitive e informali piuttosto che da processi codificati (European Commission, 2023). Al tempo stesso, numerosi contributi sottolineano come la sostenibilità possa rappresentare una leva strategica in grado di rafforzare competitività, reputazione, innovazione e relazioni con gli stakeholder e pertanto configurarsi come un obiettivo strategico (Nidumolu, Prahalad & Rangaswami, 2009; Hörisch, 2022; Seuring & Müller, 2008). Risulta quindi fondamentale promuovere attivamente la ricerca della sostenibilità e comprendere in quali condizioni le imprese, in particolare le PMI, scelgono di perseguirla e integrarla nelle proprie strategie.

In questo contesto, il presente lavoro – configurato come work in progress – si inserisce all'interno di un progetto di ricerca volto a comprendere le pratiche concrete di sostenibilità adottate dalle PMI dei territori di Verona e Vicenza, con l'obiettivo di esplorare la relazione tra consapevolezza, comportamenti, motivazioni e strutture di governance. In particolare, il lavoro intende contribuire alla letteratura colmando il divario tra l'analisi teorica della sostenibilità nelle PMI e l'effettiva comprensione delle pratiche adottate, ancora limitatamente indagate attraverso evidenze empiriche sistematiche. L'elemento di novità del lavoro risiede nell'analisi congiunta dell'informalità delle patiche di sostenibilità e del ruolo della governance, con specifico riferimento alle imprese familiari e alla prospettiva della Socioemotional Wealth (SEW). Particolare attenzione è dedicata al ruolo della leadership imprenditoriale e, nelle imprese familiari, al contributo della Socioemotional Wealth (SEW), che influenza profondamente orientamenti, priorità e scelte non economiche (Jenkins, 2006; Stoian & Gilman, 2017; Cruz et al., 2014; Berrone, P., Cruz, C., & Gómez-Mejía, L. R., 2012).

2. Literature review, Sviluppo concettuale, e research questions

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Il concetto di sostenibilità ha conosciuto un'evoluzione rilevante negli ultimi decenni. A partire dal Rapporto "Our Common Future" (UNWC, 1987), lo sviluppo sostenibile è stato definito come un equilibrio intergenerazionale orientato alla tutela delle risorse naturali e del benessere sociale. Successivamente, la visione proposta da Elkington (1998) — il triple bottom line — ha ulteriormente ampliato il perimetro concettuale definendo tre pilastri fondamentali della sostenibilità aziendale: ambientale, sociale ed economico. Questa articolazione è divenuta la base teorica per numerosi studi empirici e modelli organizzativi (Hansen et al., 2009; Norman & MacDonald, 2004; Jay & Gerard, 2015).

La letteratura più recente riconosce però che tali tre dimensioni non sono sufficienti a descrivere la complessità della sostenibilità contemporanea. Si è diffuso il riconoscimento di un quarto pilastro: la corporate governance (Bebbington & Unerman, 2018; Confetto & Covucci, 2021), intesa come insieme di processi decisionali, meccanismi di controllo, ruoli e pratiche che consentono all'impresa di orientarsi al lungo periodo. La governance non rappresenta una mera estensione tecnica dell'ESG, ma una dimensione costitutiva che permette la realizzazione concreta degli altri tre pilastri, garantendo trasparenza, accountability, dialogo con gli stakeholder e capacità di misurare e rendicontare gli impatti (Aguilera et al., 2007; Eccles & Klimenko, 2019; Camilleri, 2023; Cantele et al. 2024). Tale punto è particolarmente rilevante nel contesto europeo, dove gli standard ESRS rafforzano gli obblighi di disclosure su strategia, governance e processi di gestione dei rischi. In questo contesto, emerge la necessità di comprendere non solo la presenza di pratiche sostenibili, ma anche il loro grado di formalizzazione, distinguendo tra comportamenti informali, radicati nelle routine aziendali, e pratiche strutturate, supportate da strumenti e processi formalizzati.

Chiarito il quadro concettuale entro il quale collocare il tema della corporate sustainability, emerge la questione fondamentale del perché le organizzazioni — e in particolare le PMI — dovrebbero impegnarsi nella sostenibilità. Limitare la risposta ai soli obblighi normativi significherebbe trascurare motivazioni più profonde, strategiche e identitarie. Numerosi studi evidenziano come la sostenibilità rappresenti un driver competitivo capace di influenzare la resilienza organizzativa, l'innovazione, la reputazione e la qualità delle relazioni con gli stakeholder (Porter & Kramer, 2006; Hart & Dowell, 2011; Adams et al., 2016). Per le PMI, ciò si traduce nella possibilità di accedere a nuove catene di fornitura, rispondere a pressioni crescenti da parte dei clienti e mantenere credibilità nei mercati globalizzati (Johnson & Schaltegger, 2016; Bos-Brouwers, 2010). Cantele et al. (2024) sottolineano come l'adozione di pratiche sostenibili è spesso guidata da un processo di apprendimento organizzativo progressivo, dove l'impresa sviluppa progressivamente capacità e routine coerenti con la sostenibilità, prima in forma tacita e poi strutturata.

Oltre agli aspetti competitivi, le PMI manifestano spesso motivazioni valoriali legate al ruolo dell'imprenditore, alla sua cultura, leadership e radicamento territoriale (Jenkins, 2006; Russo & Tencati, 2009). In molte realtà italiane, l'impresa è considerata un attore sociale responsabile del benessere della comunità locale e dei propri dipendenti, con conseguente attenzione spontanea — seppur talvolta non formalizzata — a tematiche ambientali e sociali (Klewitz & Hansen, 2014; Cantele & Zardini, 2018). Queste pratiche intuitive e contestuali costituiscono veri e propri "semi" di sostenibilità che non sempre trovano riscontro nei framework di misurazione ESG.

Nel caso delle imprese familiari, largamente diffuse nel contesto veneto, tali dinamiche sono ulteriormente rafforzate dalla prospettiva della Socio-Emotional Wealth (SEW). La SEW descrive il valore socio-emotivo che le famiglie imprenditoriali attribuiscono all'impresa, orientando le decisioni verso obiettivi non strettamente economici: reputazione, identità, continuità generazionale, legami con il territorio, fiducia degli stakeholder (Gómez-Mejía et al., 2007; Berrone et al., 2012; Deephouse & Jaskiewicz, 2013). In linea con la letteratura sulla SEW, tale costrutto può essere ulteriormente articolato secondo il modello FIBER (Family control and influence, Identification of family members with the firm, Binding social ties, Emotional attachment, Renewal of family bonds), che consente di interpretare in modo più analitico le

motivazioni non economiche che guidano il comportamento delle imprese familiari (Berrone et al., 2012).

Ai fini del presente studio, adottiamo una definizione di impresa familiare che considera "familiare" ogni impresa nella quale una famiglia esercita un'influenza sostanziale sulla proprietà, sulla governance o sul management, contribuendo a determinare visione di lungo periodo, obiettivi strategici e processi decisionali (Chua, Chrisman & Sharma, 1999; Astrachan, Klein & Smyrnios, 2002; Roffia, Moracchiato, Liguori & Kraus, 2021). Operativamente, tale influenza sarà rilevata attraverso indicatori relativi alla concentrazione proprietaria, alla presenza di membri della famiglia negli organi di governo e al coinvolgimento diretto nella gestione.

In quest'ottica, la sostenibilità diventa una forma di tutela del patrimonio socio-emotivo, uno strumento per consolidare relazioni e rinsaldare il ruolo dell'impresa nel sistema locale. Ne deriva che la sostenibilità nelle PMI si configura come un intreccio complesso di elementi strategici, culturali e identitari. Alla luce di questo quadro teorico, il presente studio si propone di rispondere alla seguente domanda di ricerca:

RQ1: In che modo le PMI integrano i quattro pilastri della sostenibilità (ambientale, sociale, economico e di governance) e quali motivazioni — strategiche, valoriali o identitarie — guidano tale integrazione?

La domanda di ricerca muove dalla consapevolezza che le PMI non adottano la sostenibilità in modo uniforme, ma secondo logiche che combinano obiettivi economici, vincoli organizzativi, valori imprenditoriali e, nel caso delle imprese familiari, meccanismi socio-emotivi. Comprendere tali differenze è cruciale per interpretare i livelli di maturità sostenibile e per chiarire quali dimensioni della sostenibilità risultino maggiormente presidiate a livello di pratica.

Coerentemente con la letteratura su PMI e imprese familiari, proponendoci di misurare l'orientamento alla sostenibilità come un costrutto multidimensionale comprendente pratiche ambientali, sociali, economiche e di governance, formuliamo inoltre la seguente ipotesi di ricerca esplorativa:

HP1: Le PMI familiari mostrano livelli più elevati di orientamento alla sostenibilità rispetto alle PMI non familiari, in virtù dell'influenza della Socioemotional Wealth (SEW) che orienta le decisioni verso obiettivi di lungo periodo, reputazione e continuità generazionale (Gómez-Mejía et al., 2007; Berrone et al., 2012).

Oltre alla dimensione legata alla proprietà familiare, la letteratura suggerisce che nelle PMI l'attenzione alla sostenibilità non sia omogenea tra i diversi pilastri. Numerose ricerche evidenziano che le PMI tendono a sviluppare in via prioritaria iniziative a carattere ambientale e sociale, spesso intuitive, informali e collegate al territorio, mentre risultano meno strutturate nelle dimensioni economica e, soprattutto, di governance. Tale sbilanciamento deriva dalla maggiore visibilità degli impatti ambientali e sociali nella relazione con clienti, comunità locali e dipendenti, nonché dalla presenza di valori imprenditoriali che favoriscono comportamenti responsabili anche in assenza di formalizzazione.

HP2: Nelle PMI le pratiche di sostenibilità ambientale e sociale risultano più diffuse e maggiormente integrate rispetto alle dimensioni economica e di governance, a causa della loro immediata rilevanza relazionale e territoriale, in linea con l'evidenza empirica che evidenzia una priorità attribuita agli aspetti più visibili e reputazionali della sostenibilità (Sun et al., 2024).

Tali ipotesi, di natura preliminare, verranno verificate attraverso l'indagine empirica prevista nella seconda fase dello studio.

3. Obiettivi della ricerca

Il presente lavoro si propone di analizzare le pratiche di sostenibilità adottate dalle piccole e medie imprese nei territori di Verona e Vicenza, con l'obiettivo di comprendere come tali imprese interpretino e integrino i quattro pilastri della sostenibilità — ambientale, sociale, economico e di governance — nel loro modello di business. In primo luogo, l'obiettivo è mappare in modo

sistematico il grado di presenza, diffusione e formalizzazione delle pratiche riconducibili a ciascuna dimensione, distinguendo fra iniziative strutturate e comportamenti informali, spesso radicati nelle routine e nella cultura organizzativa delle PMI, nonché nella definizione di una tassonomia delle pratiche e dei livelli di maturità sostenibile, sviluppando un sistema di misurazione (score) in grado di cogliere il diverso grado di formalizzazione delle pratiche di sostenibilità (Cantele et al., 2024). Tale analisi consente di offrire un contributo alla letteratura fornendo una lettura integrata e operativa dell'orientamento alla sostenibilità nelle PMI, contribuendo a superare approcci frammentari e prevalentemente teorici ancora presenti in letteratura.

Un secondo obiettivo riguarda l'analisi delle motivazioni che guidano tali pratiche, esplorando sia i driver strategici — competitività, innovazione, reputazione — sia quelli valoriali, con particolare attenzione alla leadership imprenditoriale e ai meccanismi socio-emotivi tipici delle imprese familiari. In quest'ottica, la tassonomia P–P–P–G proposta da Confetto & Covucci (2021) offre un quadro interpretativo utile a comprendere come le imprese attribuiscano priorità differenti alle varie dimensioni della sostenibilità e come tale attribuzione rifletta valori, identità e visioni imprenditoriali.

In termini applicativi, la ricerca mira a produrre output operativi utili a studiosi e practitioner, tra cui una tassonomia delle pratiche di sostenibilità nelle PMI, una matrice di maturità sostenibile e una classificazione (cluster) delle imprese in base all'orientamento alla sostenibilità e alle caratteristiche di governance.

Un terzo obiettivo consiste nell'esaminare il ruolo della natura familiare dell'impresa. Sulla base della letteratura sulla Socioemotional Wealth (SEW), ci proponiamo di comprendere se e in che misura la proprietà familiare influenzi l'orientamento alla sostenibilità, in particolare nelle dimensioni sociale e di governance, tipicamente connesse alla reputazione, alla continuità e ai legami con il territorio.

Un ulteriore obiettivo è valutare la distribuzione della sostenibilità lungo le diverse dimensioni, verificando se — come suggerito dalla letteratura recente — le PMI tendano a presidiare maggiormente la sostenibilità ambientale e sociale rispetto a quella economica e di governance, e quali fattori spiegano tale sbilanciamento.

Infine, la ricerca mira a costruire una prima classificazione dei livelli di maturità sostenibile delle PMI del campione, sviluppando un modello descrittivo utile per interpretare diversità, punti di forza e aree critiche del loro approccio alla sostenibilità.

Tale classificazione costituirà la base per la successiva fase empirica del progetto e potrà rappresentare un riferimento utile sia per la ricerca futura sia per l'elaborazione di strumenti manageriali e policy di supporto alle PMI.

4. Metodologia

La metodologia adottata in questo studio riflette la natura esplorativa del progetto e si articola in due fasi principali, complementari tra loro. L'obiettivo è garantire una comprensione approfondita sia del quadro teorico sia delle pratiche effettivamente adottate dalle PMI, combinando un approccio qualitativo-interpretativo (fase 1) e un approccio quantitativo-descrittivo (fase 2).

4.1. Fase 1 – Rassegna sistematica della letteratura

La prima fase consiste nella realizzazione di una systematic literature review (SLR), attualmente in via di completamento. La SLR è condotta seguendo le linee guida proposte da Tranfield, Denyer & Smart (2003) e Snyder (2019), che prevedono la definizione di stringhe di ricerca, criteri trasparenti di inclusione e esclusione, codifica tematica dei risultati e tracciabilità dell'intero processo. La ricerca bibliografica ha coinvolto le principali banche dati (Scopus, Web

of Science, Google Scholar), focalizzandosi su lavori relativi alla sostenibilità nelle PMI, alla governance sostenibile, all'innovazione sostenibile, alle imprese familiari e alla SEW.

Tale fase è inoltre arricchita dalla considerazione di contributi recenti che propongono strumenti operativi per la misurazione della sostenibilità, come il modello multidimensionale a struttura formativa di Cantele et al. (2024) e la tassonomia P–P–P–G di Confetto & Covucci (2021), che offrono basi concettuali utili alla costruzione dello strumento di rilevazione empirica. L'integrazione di tali contributi consente di mappare con maggiore precisione le dimensioni emergenti della sostenibilità e di indirizzare le scelte di operazionalizzazione delle variabili nella fase successiva.

4.2. Fase 2 – Disegno e somministrazione del questionario (2026)

La seconda fase prevede la progettazione e la somministrazione di un questionario strutturato rivolto alle PMI delle province di Verona e Vicenza. Il questionario sarà costruito combinando scale validate presenti nella letteratura e adattate al contesto delle PMI (Torres & Maciel, 2019), integrando gli item derivati dalle dimensioni individuate in Cantele (2024) e dalla tassonomia di Confetto & Covucci (2021). Il campione sarà reclutato attraverso contatti diretti con imprenditori e per il tramite di associazioni di categoria locali; per ridurre il rischio di bias di risposta, il questionario sarà indirizzato prioritariamente a imprenditori, owner-manager o top manager e saranno effettuate verifiche ex post di non-response bias

Il questionario indagherà le seguenti aree principali:

- pratiche ambientali, incluse iniziative di efficientamento energetico, gestione risorse, emissioni e rifiuti;
- pratiche sociali, con attenzione al capitale umano, alle relazioni con gli stakeholder, al benessere organizzativo e alla comunità locale;
- pratiche economiche, riguardanti continuità, investimenti, resilienza e gestione delle risorse finanziarie;
- strutture di governance, comprese politiche, responsabilità e processi decisionali relativi alla sostenibilità;
- valori e cultura imprenditoriale, con particolare focus sulla leadership e sull'identità familiare;
- elementi SEW relativi alla reputazione, alla continuità generazionale e al legame con il territorio.

Le diverse pratiche saranno inoltre aggregate in indicatori sintetici (score) per ciascuna dimensione della sostenibilità, al fine di consentire analisi comparative e successive modellizzazioni statistiche.

Le risposte saranno raccolte tramite una scala Likert a 7 punti, integrando anche domande aperte per cogliere elementi qualitativi utili all'interpretazione dei comportamenti. Saranno inoltre rilevate variabili di controllo quali dimensione, settore, natura familiare, presenza di certificazioni e appartenenza a filiere internazionali.

4.3. Analisi dei dati

L'analisi dei dati quantitativi seguirà un approccio multilivello, includendo anche l'utilizzo di modelli di Partial Least Squares Structural Equation Modeling (PLS-SEM), coerenti con la natura esplorativa dello studio e con la misurazione di costrutti multidimensionali formativi. L'affidabilità e la validità delle scale saranno valutate mediante indicatori standard (ad es. alpha di Cronbach e analisi fattoriale esplorativa), coerentemente con la natura esplorativa dello studio. In primo luogo verranno effettuate analisi descrittive per mappare la diffusione delle pratiche sostenibili tra le PMI del campione. Saranno inoltre sviluppate analisi di clustering finalizzate all'identificazione di profili differenziati di maturità sostenibile tra le PMI del campione.

Successivamente verrà condotta un'analisi fattoriale esplorativa (EFA) per verificare la coerenza delle dimensioni teoriche individuate nella fase 1. Tale scelta è coerente con studi che analizzano la sostenibilità come costrutto multidimensionale (Cantele et al., 2024).

In aggiunta, verranno sviluppate analisi di cluster per identificare profili differenti di maturità sostenibile, in linea con gli approcci proposti da Baumgartner (2014) e con la letteratura sugli stadi evolutivi della sostenibilità nelle PMI. I dati qualitativi derivanti dalle risposte aperte saranno analizzati tramite analisi tematica, utile per cogliere sfumature legate alla motivazione imprenditoriale, alla leadership e alla SEW.

L'integrazione dei risultati permetterà di interpretare in modo coerente le due ipotesi formulate (Hp1 e Hp2) e di comporre una visione articolata dell'approccio alla sostenibilità nelle PMI venete.

5. Risultati attesi

I risultati attesi si articolano su più livelli e riflettono la natura esplorativa del progetto.

In primo luogo, ci si attende di riscontrare una diffusione significativa di pratiche sostenibili informali nelle PMI, distinte da pratiche formali più strutturate e riconducibili a sistemi espliciti di gestione e rendicontazione, spesso non identificate come "pratiche di sostenibilità" ma radicate nelle routine operative, nella cultura organizzativa e nei valori dell'imprenditore. Tale fenomeno è ampiamente documentato nella letteratura che sottolinea come le PMI — pur non adottando formalmente sistemi ESG — manifestino comportamenti coerenti con la sostenibilità attraverso scelte quotidiane, relazioni con il territorio e attenzione verso utenti interni ed esterni (Johnson & Schaltegger, 2016; Jenkins, 2006; Cantele, 2024).

Un secondo risultato atteso riguarda la presenza di livelli eterogenei di maturità sostenibile, che si rifletteranno nella diversa intensità con cui le imprese adottano le pratiche riconducibili ai quattro pilastri della sostenibilità. Ci si aspetta di identificare profili distinti di maturità, coerenti con modelli evolutivi già osservati nella letteratura (Baumgartner, 2014), che si distribuiscono lungo un continuum che va da pratiche intuitive e sporadiche fino a sistemi strutturati di gestione e rendicontazione. Tali evidenze potranno contribuire alla costruzione di una matrice di maturità sostenibile, utile per classificare le imprese in funzione del livello di sviluppo delle pratiche ESG.

Un terzo risultato atteso concerne lo sbilanciamento tra le dimensioni della sostenibilità. In linea con studi recenti, prevediamo che le PMI presidino maggiormente le dimensioni ambientale e sociale rispetto a quelle economica e di governance, poiché i comportamenti relativi a ambiente e persone risultano più tangibili, immediatamente percepibili dagli stakeholder e spesso più coerenti con i valori imprenditoriali e territoriali (Russo & Tencati, 2009; Confetto & Covucci, 2021). Ci si attende invece una minore strutturazione nella dimensione di governance, che tipicamente richiede formalizzazione, processi decisionali chiari e competenze manageriali più avanzate.

Un quarto risultato atteso riguarda il ruolo della natura familiare dell'impresa. Coerentemente con l'ipotesi Hp1, ci si aspetta che le PMI familiari mostrino un orientamento alla sostenibilità più forte rispetto alle PMI non familiari, soprattutto nelle dimensioni sociale e di governance, grazie alla presenza della Socioemotional Wealth (SEW) e alla volontà di proteggere identità, reputazione e continuità generazionale (Gómez-Mejía et al., 2007; Berrone et al., 2012). Tali imprese potrebbero dimostrare una maggiore sensibilità alle aspettative degli stakeholder locali e una maggiore propensione a pratiche che rafforzano la fiducia e il radicamento nel territorio.

Un quinto risultato atteso riguarda la verifica dell'ipotesi Hp2, secondo cui le PMI tendono a presidiare maggiormente le dimensioni sociale e ambientale della sostenibilità rispetto a quelle economica e di governance. Ci aspettiamo che l'indagine empirica confermi tale sbilanciamento, mettendo in evidenza che le PMI attribuiscono priorità a pratiche immediatamente riconducibili

al benessere del territorio, dei dipendenti e della comunità, mentre mostrano minore strutturazione nelle dimensioni che richiedono processi formali, politiche scritte e sistemi di responsabilità.

Infine, ci si attende di ottenere una prima mappatura delle pratiche sostenibili nelle PMI del territorio, utile per individuare pattern ricorrenti, aree critiche e potenziali ambiti di intervento da parte di associazioni di categoria, istituzioni e policy maker. Tale mappatura servirà come base per sviluppare azioni di accompagnamento alla transizione sostenibile delle PMI, anche in vista dell'estensione futura degli obblighi di rendicontazione.

6. Conclusioni

Le evidenze emerse dal quadro teorico e dagli obiettivi di ricerca delineano una prospettiva articolata sul ruolo della sostenibilità nelle PMI dei territori di Verona e Vicenza. La sostenibilità si configura come un fenomeno complesso, stratificato e multidimensionale, che non può essere ridotto a un semplice adempimento normativo, ma deve essere interpretato come un insieme di pratiche, valori e processi che si sviluppano nel lungo periodo all'interno dell'impresa.

Da un lato, la letteratura mostra come spesso le PMI — pur operando con risorse limitate — abbiano un orientamento spontaneo e spesso informale alla sostenibilità, soprattutto nelle dimensioni ambientale e sociale, grazie al forte legame con i territori e alla vicinanza alle comunità locali. Questo orientamento rappresenta una risorsa importante, ma al tempo stesso evidenzia la necessità di strumenti e percorsi di formalizzazione che permettano di trasformare tali intuizioni in pratiche strutturate e misurabili, anche attraverso l'adozione di strumenti di valutazione e score sintetici delle performance di sostenibilità.

Dall'altro, le dimensioni economica e di governance risultano meno presidiate, in linea con l'eterogeneità dei livelli di maturità sostenibile nelle PMI. Tale sbilanciamento suggerisce la necessità di sviluppare modelli di governance più chiari e processi più formalizzati, soprattutto in vista delle evoluzioni normative europee e dell'aumento delle richieste da parte delle filiere produttive.

Un elemento particolarmente significativo riguarda il ruolo delle imprese familiari e della Socioemotional Wealth (SEW) nell'analisi della sostenibilità nel contesto delle PMI. Le evidenze teoriche suggeriscono che la sostenibilità possa essere utilizzata come strumento per preservare identità, reputazione e continuità generazionale. In tale prospettiva, le imprese familiari potrebbero rappresentare un laboratorio privilegiato per osservare l'integrazione valoriale e strategica della sostenibilità nelle PMI, in particolare nelle dimensioni sociale e di governance.

Le conclusioni preliminari di questo lavoro sono che è importante comprendere non soltanto se le PMI adottano pratiche sostenibili, ma quando e perché tali pratiche emergono e si consolidano. Questo approccio consente di superare interpretazioni puramente prescrittive e di cogliere la sostenibilità come processo evolutivo, incrementale e dipendente dalla cultura imprenditoriale.

Dal punto di vista operativo, la futura indagine empirica prevista per l'autunno 2026 rappresenterà un passaggio cruciale per validare le ipotesi formulate (Hp1 e Hp2), per misurare i livelli di maturità sostenibile e per individuare eventuali cluster di comportamento tra le PMI. I risultati della survey offriranno una base solida per orientare sia la ricerca futura sia le azioni di accompagnamento delle associazioni imprenditoriali e delle istituzioni locali.

In conclusione, questo lavoro contribuisce a porre le basi per una comprensione più profonda della sostenibilità nelle PMI venete, evidenziando la necessità di sviluppare strumenti concettuali e operativi che tengano conto delle specificità territoriali, della natura familiare delle imprese e della centralità dei valori imprenditoriali. La sostenibilità nelle PMI non si configura soltanto come un insieme di pratiche, ma come una lente attraverso cui leggere identità, scelte e aspirazioni delle imprese in un contesto in rapida evoluzione.

Keywords: Sustainability; PMI; ESG; family firm; SEW

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Il ruolo di governance e accountability per la sostenibilità: verso la proposta di un framework

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1. Contesto di riferimento

Il secondo dopoguerra fu caratterizzato da una rapida industrializzazione che, da un lato, ha sostenuto la crescita economica di molti Paesi e, dall'altro, ha determinato un utilizzo intensivo delle risorse naturali, sovente senza alcuna attenzione né alla loro scarsità né alle conseguenze ambientali (Brown, 1985; Catton, 1982). La consapevolezza di tali problematiche si sviluppò progressivamente nei decenni successivi, fino a raggiungere un momento di svolta nel 1987, quando la Commissione Brundtland delle Nazioni Unite definì la sostenibilità come "soddisfare i bisogni del presente senza compromettere la capacità delle generazioni future di soddisfare i propri" (World Commission on Environment and Development, 1987).

Dalla definizione di sostenibilità proposta dalla Commissione Brundtland a oggi, il concetto ha conosciuto un'evoluzione significativa. Inizialmente focalizzato sul bilanciamento tra sviluppo economico e tutela ambientale, il concetto di sostenibilità si è progressivamente ampliato fino a includere anche la dimensione sociale, comprendente aspetti quali i diritti dei lavoratori e il benessere umano (Bansal e Song, 2017). In questa prospettiva, la Dichiarazione dell'Organizzazione Internazionale del Lavoro del 1998 sui principi e diritti fondamentali nel lavoro ha rappresentato un momento cruciale per l'affermazione della sostenibilità sociale, collocandosi in continuità con i più ampi sforzi di sostenibilità promossi all'interno dei quadri di governance globale.

Facendo un rapido balzo in avanti nella storia, un momento di cruciale importanza per l'affermazione della sostenibilità nella pratica d'impresa è rappresentato dal lancio dell'Agenda 2030 per lo Sviluppo Sostenibile. In questo contesto, una molteplicità di attori pubblici e privati, insieme a organizzazioni della società civile, ha progressivamente esercitato pressioni sulle imprese – in particolare sulle multinazionali – affinché affrontassero in modo concreto le sfide della sostenibilità (George et al., 2016; Leone, 2025). Gli Obiettivi di Sviluppo Sostenibile (conosciuti con l'acronimo inglese SDGs, Sustainable Development Goals) richiedono l'integrazione delle dimensioni economica, sociale e ambientale della performance. Tali dimensioni sono state progressivamente incorporate nelle strategie d'impresa (Aras e Crowther, 2009; George et al., 2012), e gli SDGs possono essere considerati come una bussola che orienta le imprese oltre la mera massimizzazione del valore per gli azionisti, invitandole "a compiere scelte intertemporali per salvaguardare l'equità intergenerazionale" (Bansal e DesJardine, 2014, p. 70, nostra traduzione).

La definizione di sostenibilità evidenzia la natura poliedrica del concetto, richiamando la necessità di preservare congiuntamente le risorse naturali e l'equità sociale, sollecitando al contempo un ripensamento dei modelli di governance e delle pratiche d'impresa. Proprio questa ampiezza di prospettive spiega perché la sostenibilità sia divenuta un tema di crescente rilievo in ambito accademico, stimolando il contributo di discipline diverse e tra loro eterogenee,

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dall'ecologia alla sociologia, dall'economia al management. Nell'area economico-aziendale, in particolare, l'interesse si è tradotto in filoni di ricerca distinti che hanno coinvolto studiosi di etica (Bansal e Song, 2017) e strategia d'impresa (Hansen e Schaltegger, 2016), business internazionale (Burritt, et al., 2020; Sharma, 2025), governance d'impresa (Aguilera et al., 2021; Kavadis e Thomsen, 2023) e contabilità e controllo (ad esempio, Hsiao et al., 2022; Schaltegger et al., 2022). Tale pluralità di approcci, se da un lato ha sostenuto una maggiore specializzazione e un arricchimento delle conoscenze, dall'altro lato ha determinato una certa frammentazione del dibattito (Aversa et al., 2024). Infatti, ciascuna disciplina tende a considerare soltanto una delle molteplici dimensioni del fenomeno, fondandosi su presupposti ontologici ed epistemologici propri (Kuhn, 2012). Questa disomogeneità rappresenta al tempo stesso una fonte di vitalità e una sfida per lo sviluppo di una visione realmente integrata della sostenibilità, nonché per il suo effettivo perseguimento e la sua concreta implementazione da parte delle imprese.

In linea con questa impostazione, una delle principali sfide degli studi sulla sostenibilità riguarda la necessità di ampliare la comprensione della governance e dell'accountability. Mentre la letteratura riconosce che entrambe le prospettive sono fondamentali per affrontare le sfide della sostenibilità e implementare efficacemente gli SDGs (Arjaliès e Bansal, 2018; Bebbington e Unerman, 2020), il superamento della frammentazione del dibattito appare una condizione imprescindibile. La prospettiva della governance consente di esaminare le strutture formali e informali che definiscono le regole e le responsabilità all'interno dell'impresa (Hambrick et al., 2008). Come sottolinea Elkington (2006, p. 522, nostra traduzione): "la corporate governance riguarda fondamentalmente questioni come la finalità dell'impresa – per chi e nell'interesse di chi le imprese dovrebbero essere gestite, e come". L'accountability, invece, riguarda i processi attraverso i quali le imprese spiegano, giustificano e rendono comprensibili le proprie attività agli stakeholder, in particolare con riferimento agli impatti sociali e ambientali, assumendosi al contempo la responsabilità delle conseguenze delle proprie azioni (Gray et al., 1996; Zadek, 1998).

Il modo in cui le imprese considerano effettivamente la governance e l'accountability come strumenti per promuovere la sostenibilità resta oggetto di dibattito. L'impegno verso la sostenibilità può essere determinato da forme di attivismo azionario (Goranova e Ryan, 2014) o dalla discrezionalità manageriale (Aragon-Correa et al., 2004), più che da un autentico orientamento ad ampliare la responsabilità d'impresa (Dillard e Vinnari, 2019). Nella pratica, molte imprese si affidano a un mosaico di standard adottati su base volontaria per valutare la propria performance in materia di sostenibilità (Howard-Grenville, 2021). Tuttavia, la proliferazione di standard, indicatori e sistemi di valutazione, talora caratterizzati da opacità, ha generato un vero e proprio "mercato degli standard" della sostenibilità, con effetti talvolta perniciosi sulla reale efficacia di tali metriche e sulla comparabilità (Barkemeyer et al., 2015; Christmann e Taylor, 2006; Reinecke et al., 2012).

In ultima analisi, il dibattito appena richiamato riporta al tema della finalità dell'impresa (Elkington, 2006), e alla questione su chi l'impresa debba rendere conto e per quali ragioni (Agyemang, 2024). Ciò continua a sollevare interrogativi centrali, che possono essere formulati come segue: Come vengono interpretate le pratiche di sostenibilità all'interno dei confini disciplinari della governance e dell'accountability? Quale influenza esercitano i meccanismi di governance sull'efficacia degli strumenti di accountability (e viceversa)? In che modo i contesti settoriali e culturali incidono sull'interpretazione e sull'attuazione delle pratiche di sostenibilità nei rispettivi ambiti di governance e accountability? Per affrontare tali questioni sarà necessario fare leva sulla ricca ed eterogenea letteratura su governance e accountability per la sostenibilità, al fine di elaborare una visione coerente e realmente unitaria del concetto di sostenibilità.

2. Formulazione del problema di ricerca

In questo studio facciamo leva sulla letteratura di governance e accountability per analizzare come le imprese definiscono, costruiscono e implementano la sostenibilità. La ricerca, ancora in fieri, mira a sviluppare un framework integrativo che metta in luce le intersezioni concettuali tra i due approcci e la loro reciproca influenza sui processi di transizione e affermazione della sostenibilità all'interno delle imprese. Due sono le chiavi di lettura adottate: da un lato, la governance declinata nei meccanismi formali e relazionali; dall'altro, l'accountability intesa come rendicontazione stakeholder-oriented e meccanismi interni di costruzione. Queste prospettive consentono di indagare come possano attivarsi meccanismi più efficaci di promozione della sostenibilità, contribuendo a colmare i gap teorici e a rafforzare le pratiche manageriali.

3. Quadro teorico di riferimento

3.1. Governance della sostenibilità tra strutture e relazioni

La governance si riferisce a "strutture formali, strutture informali e processi" (Hambrick et al., 2008, p. 381, nostra traduzione) attraverso cui le strategie delle imprese vengono allineate alle sfide della sostenibilità (Hussain et al., 2018; Montiel et al., 2021). Aumentare la consapevolezza degli azionisti rispetto alle questioni di sostenibilità e alle loro fonti di legittimazione (Kavadis et al., 2024), adottare codici di condotta d'impresa (Kolk e Van Tulder, 2002) e creare ruoli manageriali specifici dedicati alla sostenibilità – come il ruolo di Chief Sustainability Officer (Shui et al., 2022) – sono tutti esempi di pratiche attraverso cui le imprese sviluppano soluzioni di governance orientate alla sostenibilità.

È possibile sostenere che la governance rappresenti, solo in prima approssimazione, un sistema di strutture e processi volto ad allineare le decisioni manageriali agli interessi degli azionisti. Essa costituisce, piuttosto, un quadro più ampio che definisce come le imprese si relazionano con una pluralità di stakeholder e rispondono alle aspettative sociali (Aguilera e Ruiz Castillo, 2025; Filatotchev e Nakajima, 2010), determinando in ultima istanza il loro ruolo all'interno del sistema economico e sociale. Lungo questo scritto assumeremo la seconda prospettiva perché ci consente di riconoscere la governance come un fattore propulsivo della sostenibilità. Infatti, la governance fornisce le regole, le strutture decisionali e i meccanismi attraverso cui gli obiettivi ambientali e sociali possono essere integrati all'interno delle strategie d'impresa (Aguilera et al., 2021; Aragón-Correa et al., 2020; Wang et al., 2024).

Le prime ricerche sulla sostenibilità hanno affrontato la governance da un punto di vista formale, fondando la propria analisi sull'economia dei costi di transazione (Williamson, 1985, 1991) e sulla teoria dell'agenzia (Meckling e Jensen, 1976). In questo filone di letteratura, la governance è rappresentata come uno strumento progettato per minimizzare l'opportunismo, l'asimmetria informativa e i rischi di scambio, attraverso la definizione di termini contrattuali precisi e la responsabilizzazione legale dei dirigenti (Aguilera e Ruiz Castillo, 2025; Poppo e Zenger, 2002). I manager sono chiamati a predisporre accordi contrattuali e organizzativi dettagliati, nei quali siano specificati ruoli, responsabilità e rimedi in caso di contingenze (Poppo e Zenger, 2002). Nel trattare gli obiettivi di sostenibilità, questa prospettiva ha fatto leva sui meccanismi di governance per spiegare come le imprese garantiscano la conformità ai requisiti ambientali e sociali (Aguilera et al., 2021; Hussain et al., 2018; Leone et al., 2026). Ad esempio, Berrone e Gomez-Mejia (2009) analizzano se la remunerazione dei dirigenti possa trarre beneficio da una buona performance ambientale; Post et al. (2011) indagano in che modo la composizione del consiglio di amministrazione influenzi l'implementazione delle strutture e dei processi di governance ambientale. Numerosi studiosi si sono, inoltre, concentrati sulla valutazione dell'efficacia dei codici di condotta nella regolamentazione del comportamento responsabile lungo le catene di fornitura, esaminando se tali strumenti siano in grado di prevenire pratiche scorrette e di favorire l'adesione a standard di sostenibilità (Van Tulder et al., 2009). In questa letteratura, la governance formale può tradursi nella progettazione di incentivi legati a obiettivi di sostenibilità, nell'istituzione di sistemi di controllo interno (es. ESG KPIs o comitati di controllo

per la sostenibilità; Gebhardt et al., 2023), nella codificazione dei processi (codici di condotta, procedure di due diligence; es. Yu, 2008) e nell'utilizzo di verifiche esterne per certificare le informazioni non finanziarie (es. Short et al., 2016).

Con il tempo, tuttavia, gli studiosi hanno riconosciuto i limiti di una governance puramente formale, superando la concezione di un mero insieme di contratti e meccanismi di protezione dall'opportunismo per considerarla come un sistema capace di indirizzare le azioni individuali verso il bene collettivo dell'impresa e dei suoi stakeholder (Aguilera e Ruiz Castillo, 2025; Bacq e Aguilera, 2022; Boström, 2015). Da un lato, i contratti e i relativi meccanismi di governance non possono prevedere ogni possibile contingenza, e un'eccessiva enfasi su controllo e monitoraggio può generare costi e rigidità aggiuntivi (Busco et al., 2005; Poppo e Zenger, 2002). Dall'altro lato, gli attori talvolta si comportano come steward motivati dal benessere di lungo periodo dell'impresa più che da interessi personali (Aguilera e Ruiz Castillo, 2025). In tal caso, la governance è radicata nelle relazioni sociali e istituzionali più ampie, dove la cooperazione è sostenuta anche da salvaguardie contrattuali, ma soprattutto dalla fiducia, dalla reciprocità e da norme condivise tra gli attori coinvolti (Aguilera e Ruiz Castillo, 2025; Poppo e Zenger, 2002). Questo riconoscimento ha portato a un orientamento relazionale negli studi sulla governance, sottolineando che un coordinamento e un controllo efficaci spesso emergono da interazioni continue e da aspettative reciproche tra stakeholder, più che da strutture formalizzate (Elkington, 2006; Lee et al., 2020). Il passaggio concettuale – da un orientamento formale a uno relazionale – è stato favorito dall'integrazione della teoria degli stakeholder e di approcci sociologici che evidenziano la dimensione sociale della governance (Bacq e Aguilera, 2022; Poppo e Zenger, 2002). Un'idea guida in questa letteratura è che la fiducia e reciprocità funzionino come "collante sociale" auto-rinforzante che integra – e non sostituisce – i contratti formali (Poppo e Zenger, 2002; Zaheer e Venkatraman, 1995). Questo è particolarmente vero nel perseguimento degli obiettivi di sostenibilità. Infatti, un'eccessiva dipendenza da meccanismi formali di governance può condurre a una conformità meramente simbolica ai requisiti di sostenibilità (Berrone e Gomez-Mejia, 2009). Al contrario, un approccio collaborativo e basato sulla fiducia rappresenta un complemento essenziale alla conformità formale, consentendo di affrontare in modo più efficace le sfide della sostenibilità (Gimenez e Sierra, 2013; Lee et al., 2020). Tali approcci enfatizzano modalità di governance relazionale, nelle quali la responsabilità per gli esiti della sostenibilità è distribuita tra reti di attori che includono organizzazioni non governative, governi e comunità (Albareda e Waddock, 2018; Fougère e Solitander, 2020).

In estrema sintesi, la letteratura sulla governance della sostenibilità – dal punto di vista cronologico – ha compiuto un'evoluzione che l'ha condotta da un orientamento prevalentemente formale a uno maggiormente relazionale. Quest'ultimo supera la visione centrata esclusivamente sulla singola impresa e valorizza la dimensione interattiva delle relazioni tra l'impresa stessa e gli altri attori (ad es. Albareda e Waddock, 2018; Belhadi et al., 2021). In questa prospettiva, le imprese si confrontano con attori pubblici e civili attraverso pratiche di dialogo, cooperazione e processi decisionali condivisi (Scherer e Palazzo, 2011). Tuttavia, tali approcci coesistono con altri modelli che si fondano su logiche gerarchiche o di controllo di mercato. Ne consegue l'esistenza di una pluralità di meccanismi, formali e informali, che rendono complesso il ruolo della governance nella sostenibilità e richiedono un'analisi più approfondita dei diversi strumenti.

3.2. Accountability e sostenibilità: logiche di rendicontazione e di costruzione

Storicamente, la nozione di accountability si fonda sull'idea che alle imprese è richiesto di "rendere conto" ai propri stakeholder – principalmente finanziari, quali investitori e autorità di vigilanza – del modo in cui il valore economico è creato e distribuito (es. Nelson, 1993). Nel tempo, tuttavia, il concetto si è esteso oltre questi confini, riflettendo una crescente consapevolezza del fatto che le imprese sono inserite in sistemi sociali e ambientali più ampi (Roberts, 1991; Shearer, 2002). L'opera pionieristica di Gray et al. (1988) aveva già sottolineato

la necessità di concepire l'accountability come una relazione sociale tra imprese e società, mediando aspettative, valori e impatti attraverso le dimensioni economica, sociale e ambientale.

L'emergere delle preoccupazioni per la sostenibilità e il lancio dell'agenda globale per lo sviluppo sostenibile hanno ulteriormente accelerato questo cambiamento. L'impatto più visibile si è manifestato nell'ambito del corporate reporting. Alle imprese è ora richiesto di dimostrare in che modo creano valore sostenibile e la reportistica finanziaria tradizionale presenta, sotto questo profilo, dei limiti (Unerman et al., 2018). Tale aspettativa ha favorito lo sviluppo di nuovi strumenti di rendicontazione, tra cui il Integrated Reporting, progettato per rafforzare la responsabilità delle imprese riguardo alla varietà di risorse impiegate e per promuovere un pensiero integrato orientato alla creazione di valore sostenibile per gli stakeholder (Busco et al., 2013). Pur oggetto di critiche (es. Brown e Dillard, 2014), iniziative come il reporting integrato incarnano i tentativi in corso di ridefinire il significato e la pratica dell'accountability in linea con una concezione dell'impresa orientata agli stakeholder.

Parallelamente, si sta affermando la consapevolezza che questa concezione allargata di accountability richieda di riconsiderare anche meccanismi interni di governo, misurazione e controllo. Le logiche di accountability devono essere interiorizzate da tutti i dipendenti, i quali dovrebbero sviluppare un senso collettivo di responsabilità per i risultati d'impresa (Busco et al., 2005). In questo modo, forme di accountability interna possono supportare la costruzione di "conti di sostenibilità" che rispondono alle richieste di accountability esterna (Frostenson e Johnstone, 2023). In tale prospettiva, inoltre, è dai processi interni che portano alla costruzione di reportistica per gli stakeholder che dipende il grado di reale integrazione della sostenibilità nei processi decisionali (Adams e McNicholas, 2007) e di dialogo tra "preparatori" e "utilizzatori" (Lai et al., 2018).

Nonostante tali sviluppi, rimangono dubbi circa la capacità degli strumenti attuali di rendere conto della complessità delle interrelazioni che legano le imprese allo sviluppo sostenibile. Alcuni autori hanno proposto di muovere l'attenzione da forme di accountability "basate sull'accounting" (centrate, cioè, su disclosure e misurazione di carattere prevalentemente finanziario) verso modelli di accounting costruiti a partire da specifiche relazioni di accountability (Dillard e Vinnari, 2019). Questa evoluzione riflette un più ampio movimento verso forme dialogiche di accountability (e.g. Bebbington et al., 2007), nelle quali le imprese cercano di interagire con un insieme più ampio di portatori di interesse – tra cui dipendenti, comunità e ambiente naturale – ascoltandone le istanze e rispondendo ad esse (Rinaldi et al., 2014).

In questo contesto, diversi studiosi hanno sostenuto che l'accountability richiede, da un lato, riforme istituzionali e di governance d'impresa, poiché le pratiche di rendicontazione esistenti raramente consentono agli stakeholder di incidere sulle decisioni delle imprese (Cooper e Owen, 2007). Dall'altro, l'accountability pretende che i processi di rendicontazione di sostenibilità e di coinvolgimento degli stakeholder si trasformino in strumenti di dialogo, offrendo agli attori sociali la possibilità di esprimere le proprie prospettive (Bellucci et al., 2019). Più in generale, l'approccio dialogico mira a favorire forme di governance più inclusive (Brown e Dillard, 2015). Questa prospettiva deve manifestarsi non solo nella reportistica, ma anche nelle interazioni quotidiane alla base delle relazioni con gli stakeholder. In questo senso, l'accountability è intrinsecamente relazionale e la sua efficacia dipende dalle micro-interazioni che emergono nei processi di stakeholder engagement (Bianchi et al., 2025).

Le assunzioni tradizionali sull'accountability vengono così rimesse in discussione, sollecitando una riflessione sulla pertinenza delle lenti analitiche attraverso cui essa è stata storicamente osservata, alla luce delle nuove esigenze poste dalla sostenibilità. Ad esempio, la stessa nozione di trasparenza, frequentemente considerata il fondamento dell'accountability, è oggetto di revisione critica. La trasparenza non è più intesa come valore intrinsecamente virtuoso: da un lato, le logiche contabili tradizionali possono indurre individui e imprese a concentrarsi maggiormente su come appaiono, piuttosto che sulle reali conseguenze delle proprie azioni (Roberts, 2009); dall'altro, la trasparenza non è un costrutto stabile o oggettivo, ma una pratica

negoziata che evolve continuamente in relazione a ciò che viene considerato di interesse collettivo, in particolare rispetto a questioni di disuguaglianza sociale e sostenibilità (Quattrone, 2022). Questi dibattiti invitano a re-immaginare la contabilità in modo da includere attori non umani – come la natura (Quattrone, 2022) – e da incorporare le voci di stakeholder emarginati o "silenziosi", in risposta a imperativi sociali emergenti quali l'equità di genere, la diversità e la giustizia climatica (Agyemang, 2024). Senza tale ripensamento, l'accountability rischia di non incarnare il legame tra imprese e società che essa stessa pretende di rappresentare, e di finire, invece, per rafforzare gli squilibri di potere esistenti.

4. Risultati attesi

Come già enunciato, l'obiettivo principale di questo studio è la costruzione di un framework teorico-concettuale che consenta di interpretare e integrare le discipline della governance e dell'accountability nel contesto della sostenibilità d'impresa. L'assunto di fondo è che la governance può svolgere un ruolo cruciale nel migliorare l'accountability delle imprese, garantendo un uso efficace delle risorse d'impresa e promuovendo il raggiungimento degli obiettivi di sostenibilità (Aguilera e Ruiz Castillo, 2025). La governance non può essere ridotta a una scelta binaria tra controllo formale e coordinamento relazionale. Il perseguimento della sostenibilità richiede di ripensare la stessa nozione di azione di governo e i meccanismi organizzativi che la sostengono – come il controllo, la misurazione della performance, la gestione del rischio e la governance della conoscenza (Busco et al., 2005). Da questa prospettiva, l'accountability diventa una lente analitica fondamentale per andare oltre la mera istituzione di meccanismi formali e relazioni, concentrandosi invece su come essi operano, sono monitorati e generano risultati di sostenibilità, rendendo visibili le dinamiche di "costruzione", assunzione di responsabilità e risposta alle istanze degli stakeholder – anche quelli più "silenti" – che determinano l'effettiva qualità delle pratiche adottate.

Attraverso la revisione e la ricomposizione critica delle due aree di ricerca, il lavoro si propone di delineare le dimensioni fondamentali che caratterizzano la governance e l'accountability, in particolare le dimensioni formale e relazionale della governance e le dimensioni di rendicontazione stakeholder-oriented e costruzione interna dell'accountability, alla luce degli obiettivi di sostenibilità. L'integrazione di tali dimensioni concettuali consente di analizzare in modo più coerente come le imprese definiscono, implementano e comunicano la sostenibilità, e di comprendere i meccanismi attraverso cui la governance influenza le pratiche di sostenibilità e, viceversa, come l'accountability contribuisce a plasmare la governance sostenibile. Il risultato atteso è, quindi, un framework concettuale che non solo sistematizzi le interconnessioni tra queste due tradizioni teoriche, ma offra anche una base per costruire un'agenda di ricerca in cui emergano nuove linee di indagine empirica e teorica sul ruolo della governance e dell'accountability nel promuovere la creazione di valore sostenibile.



Figura 1. Integrazione tra governance e accountability per la sostenibilità, fonte: elaborazione degli autori

5. Contributi attesi

Questo lavoro intende offrire tre principali contributi alla letteratura sulla sostenibilità d'impresa. In primo luogo, lo studio ambisce a integrare due tradizioni disciplinari di ricerca sviluppatesi in modo parallelo – quella della governance e quella dell'accountability – per interpretare un fenomeno comune: la sostenibilità. Tale integrazione consente di superare la frammentazione disciplinare che ha a lungo caratterizzato gli studi esistenti, offrendo un quadro concettuale unitario capace di cogliere le interdipendenze tra strutture di governo, processi di responsabilizzazione e obiettivi di sviluppo sostenibile.

In secondo luogo, il lavoro propone un quadro concettuale che identifica le principali dimensioni della governance (formale e relazionale) e dell'accountability (rendicontazione stakeholder-oriented e meccanismi interni di costruzione) al fine di analizzare i punti di contatto e di reciproca influenza. In questo modo, fornisce una struttura analitica utile per organizzare e interpretare i contributi prodotti finora dalla letteratura, oltre che per guidare nuove indagini empiriche.

Infine, il terzo contributo riguarda l'avanzamento della ricerca futura. Partendo dal quadro concettuale proposto, lo studio intende individuare le aree della letteratura ancora poco esplorate o teoricamente deboli, delineando così possibili direzioni di sviluppo. In particolare, sottolinea la necessità di approfondire le modalità attraverso cui i meccanismi di governance e le pratiche di accountability si co-evolvono, si rafforzano o entrano in tensione nel processo di attuazione della sostenibilità.

Parole chiave: Sostenibilità; governance; accountability

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Architetture di Governance per la Sostenibilità: Il ruolo del CEO e dei meccanismi organizzativi

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1. Introduzione

Nel dibattito contemporaneo sulla sostenibilità d'impresa emerge con crescente intensità la necessità di ripensare la funzione della governance aziendale. Le aspettative normative, la crescente attenzione degli investitori, la pressione degli stakeholder e l'evoluzione dei modelli competitivi hanno reso evidente che la sostenibilità non può più essere trattata come un'estensione volontaria delle attività di responsabilità sociale, né come un mero adempimento formale: occuparsi di sostenibilità implica una ridefinizione coerente dei processi decisionali, delle strutture organizzative e dei meccanismi che orientano la strategia (Klettner et al., 2014; Zhu et al., 2025).

La governance è chiamata quindi a svolgere un ruolo diverso rispetto al passato, non limitandosi alla trasparenza o al controllo dei rischi ma richiedendo una capacità di integrare la sostenibilità nella definizione degli obiettivi strategici, nella distribuzione delle responsabilità e nella costruzione di modelli organizzativi coerenti. Si osserva una transizione da modelli di governance of sustainability, focalizzati sulla rendicontazione e sulla gestione dei rischi ESG, verso modelli di governance for sustainability che assumono la sostenibilità come capacità strategica fondamentale e dimensione costitutiva dell'identità aziendale (Lu et al., 2025; Tron et al., 2025).

Nonostante questo sviluppo concettuale, la letteratura mostra ancora limiti rilevanti. Le ricerche sul ruolo del board e quelle sui ruoli manageriali dedicati alla sostenibilità evolvono spesso separatamente, senza una piena comprensione di come diversi meccanismi operino congiuntamente per favorire l'istituzionalizzazione della sostenibilità nei processi decisionali (Coffie et al., 2018; Ebele et al., 2023). Inoltre, il ruolo del CEO è stato frequentemente analizzato attraverso indicatori indiretti – come la dualità o la partecipazione proprietaria – che non riflettono il mandato formale attribuito al CEO in materia di sostenibilità. Si tratta di un punto critico, poiché l'effettiva capacità del CEO di orientare la strategia dipende dalla legittimazione formale della sua autorità, non solo dalla sua posizione strutturale.

Partendo da queste riflessioni, il presente contributo si propone di rispondere alla seguente domanda di ricerca: In che misura la formalizzazione dei ruoli aziendali dedicati alla sostenibilità, come comitati, responsabili e delega al CEO, influenza il livello di implementazione della sostenibilità della governance nelle imprese?

Per rispondere, l'analisi si concentra su tre elementi: la presenza di un comitato per la sostenibilità a livello di consiglio di amministrazione, l'esistenza di un responsabile della sostenibilità o team dedicato e la delega formale al CEO. L'obiettivo è comprendere come questi strumenti influenzino la Governance Sustainability, concetto che identifica la misura in cui la sostenibilità è incorporata nella struttura di governo dell'impresa (Cantele et al., 2024).

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2. Governance sustainability e stewardship theory

La letteratura ha tradizionalmente analizzato la governance come antecedente della performance ESG, indagando se attributi del board, quali diversità di genere (Bear et al., 2010; Yahya, 2025), indipendenza (Hossain & Reaz, 2007; Khan et al., 2013), proprietà del CEO (Ben Fatma & Chouaibi, 2021) o dualità (Rechner & Dalton, 1991; Biswas et al., 2022), influenzino la qualità della disclosure o la performance sociale e ambientale. Sebbene tali variabili abbiano mostrato associazioni rilevanti, esse non colgono pienamente il modo in cui le imprese incorporano la sostenibilità nei loro processi interni.

Per avanzare nella comprensione del fenomeno è necessario assumere una prospettiva diversa: la governance non è solo un antecedente della sostenibilità, ma una sua dimensione costitutiva. In questa cornice, la Governance Sustainability (GS) rappresenta l'insieme di pratiche, procedure, ruoli e meccanismi che integrano etica, strategia sostenibile e trasparenza nei processi decisionali apicali (Cantele et al., 2024). In questa concezione, la GS comprende tre dimensioni: pratiche operative eque, formalizzazione della strategia di sostenibilità e trasparenza nella rendicontazione. Rappresenta quindi un indicatore diretto della maturità organizzativa con cui la sostenibilità è istituzionalizzata nel sistema di governo.

Per interpretare come i meccanismi analizzati contribuiscano a sviluppare tale dimensione, la lente teorica adottata è la stewardship theory. A differenza della teoria dell'agenzia, che considera i dirigenti come soggetti opportunistici da monitorare (Jensen & Meckling, 1976), la stewardship theory assume che i manager possano agire nell'interesse dell'organizzazione quando godono di fiducia, legittimazione e un mandato chiaro (Donaldson & Davis, 1991; Davis et al., 1997). In questa prospettiva, quindi, la capacità dei CEO, del Board o dei Managers di orientare l'impresa verso obiettivi collettivi deriva dalla combinazione di motivazione intrinseca, identificazione con lo scopo organizzativo e chiarezza dei ruoli (Hernandez, 2008; 2012).

La delega formale al CEO rappresenta un esempio emblematico di questa prospettiva: non è meramente un segnale di accentramento del potere ma un meccanismo che chiarisce le competenze decisionali, legittima il ruolo del CEO nella definizione delle priorità di sostenibilità e responsabilizza il vertice nel coordinare le iniziative ESG (French & Raven, 1959; Cannella et al., 2008; Duong et al., 2023).

Questa cornice consente di formulare le ipotesi analizzate:

H1. La presenza di un comitato per la sostenibilità è associata positivamente alla Governance Sustainability.

H2. L'esistenza di un responsabile o team di sostenibilità contribuisce positivamente alla Governance Sustainability.

H3. La delega formale al CEO in materia di sostenibilità è positivamente associata alla Governance Sustainability.

3. Metodologia

L'analisi empirica si fonda sui dati raccolti attraverso una survey e somministrata a un ampio campione di imprese manifatturiere italiane, che ha portato ad avere un campione di 297 imprese rispondenti. Le imprese osservate rappresentano il tessuto tipico dell'industria italiana, caratterizzato da assetti proprietari concentrati, una prevalenza di imprese familiari e una differente maturità nei percorsi legati alla sostenibilità. Il questionario è stato elaborato per intercettare diverse informazioni relative alla struttura organizzativa della governance e, quale variabile dipendente del modello, al livello di implementazione delle pratiche di sostenibilità riconducibili al costrutto di Governance proposto da Cantele et al. (2024), che misura il grado di integrazione della sostenibilità nei processi di governo aziendale, includendo pratiche operative eque, formalizzazione della strategia e trasparenza nella rendicontazione. L'indice deriva dagli

undici item individuati ed è costruito aggregando i pesi normalizzati derivati dal modello PLS-SEM originario, mantenendo la scala di rilevazione a cinque punti.

Le variabili indipendenti introducono tre meccanismi centrali del governo societario, ovvero la presenza di un comitato per la sostenibilità all'interno del Board, l'esistenza di un responsabile o team di sostenibilità e la delega formale al CEO: queste variabili rappresentano diversi modi di istituzionalizzare la sostenibilità, collocandola tanto nella sfera di controllo e supervisione del board quanto in quella esecutiva e operativa. La loro misurazione è diretta e non sovrapposta alla variabile dipendente (in scala), garantendo la possibilità di cogliere gli effetti organizzativi di tali meccanismi.

Sono stati inclusi vari controlli relativi alle caratteristiche delle imprese, tra cui la dimensione (misurata tramite il logaritmo dei ricavi), l'età, l'appartenenza a settori socialmente o ambientalmente sensibili, la natura familiare della proprietà, la quota di donne nel consiglio, la presenza di amministratori indipendenti, la dualità del CEO e la proprietà detenuta dal CEO stesso. La stima dell'impatto delle variabili esplicative è stata condotta mediante modello OLS. Le verifiche diagnostiche mostrano l'assenza di collinearità e non rilevano problemi di eteroschedasticità.

4. Risultati e discussione

Come riportato in tabella 1, i risultati mostrano una relazione positiva tra dimensione aziendale e livello di GS, segnalando che le imprese più grandi tendono ad avere strutture più mature. Le imprese familiari evidenziano una minore formalizzazione delle pratiche di governance della sostenibilità, probabilmente a causa del prevalere di logiche informali e della persistenza di assetti decisionali centrati sulla proprietà. L'appartenenza ai settori socialmente o ambientalmente sensibili mostra invece un effetto positivo, coerente con una maggiore pressione regolatoria e reputazionale.

Ipotesi testate	
Comitato di sostenibilità	0.310
	(0.190)
Manager della sostenibilità	0.909***
	(0.131)
CEO con delega per la sostenibilità	0.404***
	(0.111)
Variabili di controllo	
Essi (Industrie sensibili a tematiche ambietali e sociali)	0.235**
	(0.104)
Dimensioni aziendali	0.504***
	(0.107)
Età azienale	0.0001

	(0.002)
Azienda familiare	-0.280**
	(0.137)
Donne nel board	-0.133
	(0.218)
Consiglieri indipendenti	0.099
	(0.192)
CEO donna	0.148
	(0.156)
CEO socio	-0.036
	(0.142)
Dualità del CEO	0.109
	(0.117)

*Nota: p value: *p<0.1; **p<0.05; ***p<0.01*

Tabella 1. Modello di regressione OLS

Entrando nel merito delle ipotesi, tutte e tre trovano riscontro positivo. La presenza di un comitato per la sostenibilità risulta associata a un maggiore livello di implementazione delle pratiche di governance sostenibile. Sebbene la loro diffusione rimanga limitata, quando presenti tali comitati sembrano svolgere una funzione significativa nel radicare la sostenibilità nel processo deliberativo del consiglio. È un risultato che richiama quanto evidenziato da Klettner et al. (2014), secondo cui la strutturazione dei ruoli all'interno del board contribuisce a stabilizzare l'attenzione verso i temi ambientali e sociali. Un'associazione ancora più marcata emerge per la presenza di un responsabile o team di sostenibilità. Il ruolo di tali figure è centrale: queste professionalità agiscono come traduttori della strategia in processi, coordinano le attività interfunzionali e alimentano la qualità della rendicontazione, contribuendo così a costruire una sostenibilità operativa più solida (Bang & Ramachandran, 2025; Yadav & Jain, 2023). Anche la terza ipotesi è confermata: la delega formale al CEO, infatti, risulta significativamente associata alla Governance Sustainability. Questo risultato è rilevante perché offre la possibilità di andare oltre le tradizionali proxy utilizzate per misurare il potere del CEO. Nel nostro studio la delega rappresenta un atto organizzativo che conferisce al vertice esecutivo un mandato chiaro e legittimato, fondamentale per coordinare e integrare le iniziative legate alla sostenibilità (Shui et al., 2022; Duong et al., 2023). Un aspetto ulteriore che merita attenzione riguarda il modo in cui questi meccanismi possono interagire tra loro. Anche se l'analisi empirica non esplora effetti combinati o moderati, l'osservazione dei coefficienti suggerisce che la presenza congiunta di un comitato e di un responsabile dedicato potrebbe creare un sistema di rinforzo reciproco: il comitato fissa indirizzi e priorità, mentre il responsabile presidia il livello operativo, riducendo il rischio che la sostenibilità si riduca a un esercizio formale: in questo modo la delega al CEO può fungere da ponte tra i due livelli, coordinando il processo complessivo. Questa ipotesi, non testata ma suggerita dai dati, apre spazi per futuri approfondimenti, poiché permette di considerare la

governance non come un insieme di elementi isolati ma come un sistema di meccanismi che, se coerenti, generano un potenziale trasformativo maggiore della somma delle singole parti.

Un ultimo elemento di riflessione riguarda il contesto culturale delle imprese, soprattutto quelle familiari. I risultati mostrano una tendenza a formalizzare meno le strutture di sostenibilità. Tuttavia, la stewardship theory suggerisce che proprio in questi contesti, caratterizzati da forti valori identitari e visione di lungo periodo, la sostenibilità potrebbe trovare terreno fertile. La sfida, quindi, non è soltanto introdurre meccanismi formali ma accompagnarli con una definizione chiara dell'architettura organizzativa capace di connettere sostenibilità e continuità imprenditoriale, mostrando come le scelte sostenibili rafforzino la capacità dell'impresa di prosperare nel tempo.

5. Conclusioni, limiti e linee di ricerca future

La lettura di queste evidenze attraverso la *stewardship theory* consente di coglierne ulteriormente il significato. In questa prospettiva, gli attori che operano per la sostenibilità aziendale non sono mossi esclusivamente da finalità opportunistiche, come ipotizzato dalla teoria dell'agenzia (Jensen & Meckling, 1976), ma possono agire nell'interesse dell'organizzazione quando dispongono della legittimazione necessaria, di un ruolo chiaramente definito e del supporto istituzionale adeguato (Donaldson & Davis, 1991; Davis et al., 1997). La delega al CEO, ad esempio, non è soltanto un trasferimento formale di responsabilità ma un meccanismo che abilita comportamenti orientati al bene collettivo permettendogli di assumere una posizione di guida nella definizione delle priorità di sostenibilità, di mobilitare risorse e coordinare le funzioni interne in modo coerente e favorire l'allineamento tra visione strategica e dimensione operativa. Allo stesso modo, la presenza di un comitato di sostenibilità e di manager o team dedicati crea un contesto che promuove la responsabilizzazione diffusa e l'adozione di pratiche che trascendono l'adempimento formale, mostrando come la sostenibilità possa diventare parte integrante del "modo di decidere" dell'impresa.

L'insieme di tutti questi meccanismi, operando su livelli distinti del sistema di governo, contribuisce alla costruzione di una governance più attenta all'etica, alla trasparenza e alla formalizzazione di ruoli e procedure. L'impatto osservato suggerisce che la sostenibilità non si affermi spontaneamente ma richiede un'infrastruttura organizzativa chiara, in cui la supervisione del board, la professionalizzazione e la leadership esecutiva cooperano in modo complementare.

Alla luce dei risultati emersi si può affermare che la governance della sostenibilità non può essere ridotta a un antecedente della performance ESG, ma rappresenta essa stessa un risultato organizzativo, una capacità che si costruisce attraverso ruoli e meccanismi coerenti.

Sul piano teorico, i risultati offrono un contributo rilevante alla letteratura sulla sostenibilità e sulla corporate governance, sottolineando l'importanza di trattare la governance non solo come struttura di controllo ma come dimensione dinamica e costitutiva dell'integrazione della sostenibilità. La misurazione diretta della delega al CEO amplia inoltre le modalità con cui la ricerca può analizzare la leadership esecutiva, superando le limitazioni delle proxy tradizionali. Infine, la valorizzazione dei ruoli professionali dedicati arricchisce la comprensione del modo in cui le imprese traducono gli impegni strategici in pratiche organizzative.

Dal punto di vista pratico e manageriale, i risultati offrono la possibilità di fare alcune riflessioni: in primis, le pratiche organizzative analizzate non rappresentano semplici dispositivi di conformità ma leve strategiche che migliorano la capacità dell'impresa di orientare e coordinare le sue iniziative. Ad esempio, le imprese familiari, tradizionalmente più orientate a logiche informali, potrebbero trarre beneficio dall'introduzione di ruoli e comitati dedicati, che contribuirebbero ad aumentare la continuità e la trasparenza delle pratiche. Inoltre, l'adozione di strutture di governance più strutturate non solo risponde alle pressioni esterne ma aiuta a costruire un percorso di maturazione interna verso una sostenibilità più coerente.

Sicuramente la ricerca presenta alcuni limiti. Il campione analizzato, pur rappresentativo dell'industria manifatturiera italiana, non consente estensioni automatiche a contesti differenti. Inoltre, la misurazione della delega, basata su informazioni autoriferite, potrebbe essere approfondita tramite ricerche qualitative che esplorino più da vicino i processi decisionali legati alla sua attribuzione.

Tuttavia, questi aspetti aprono la strada a futuri sviluppi di ricerca: in prima battuta, potrebbe essere utile ampliare il campo di analisi a settori e contesti istituzionali differenti, per comprendere, ad esempio, come fattori quali la regolazione, la pressione degli investitori e la cultura nazionale influenzino la configurazione dei meccanismi interni. Approcci longitudinali potrebbero inoltre cogliere l'evoluzione della governance della sostenibilità nel tempo, mettendo in luce come le organizzazioni maturano nella definizione e nell'implementazione delle loro pratiche. Infine, un'attenzione maggiore potrebbe riguardare l'analisi delle interazioni tra board, CEO e responsabili di sostenibilità, per cogliere come si costruisce, si negozia e si consolida la coerenza delle decisioni nel tempo.

Keywords: Governance della sostenibilità; sustainability governance; stewardship theory; CEO delegation; sustainability committee

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Evaluating corporate commitment to ESG: the potential misalignment rating-sentiment

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1. Purpose

Nowadays ESG (environmental, social, governance) is considered an essential framework to pursue the challenge of sustainable development (Bogers et al., 2020; Nirino et al., 2021; Kotsantonis et al., 2016; Sciarelli et al., 2021). Literature acknowledges the importance of effective communication about ESG conduct ESG practices, which can be source of competitive advantage (Bhandari et al., 2022). Indeed, they have a positive impact on brand image and consumer behavior (Lee et al., 2022), attract responsible investors (Eccles and Viviers, 2011; Van Duuren et al., 2016), and improve financial and non-financial results (Friede et al., 2015; Inigo and Albareda, 2019).

The management of ESG performances requires their appropriate evaluation. The current reference point for assessing corporate ESG performance is represented by ESG ratings, consisting of synthetic judgments evaluating firms' environmental, social and governance aspects, e.g., reduction of CO2 emissions, respect for human rights, policies of social inclusion (Avetisyan and Hockerts, 2017; Clementino and Perkins, 2021). These assessments are drawn up by specialized agencies and based on information communicated by firms, in particular, contents of sustainability/CSR reports and corporate websites (Jackson et al., 2020), and from other elements collected by the agencies (company documents, data from supervisory authorities, trade associations, company inspections, interviews with management and workers, etc.), which point out the company's commitment on the ESG spheres (Crace and Gehman, 2023; Jackson et al., 2020).

Extant literature has explored the main drivers of ESG rating. For example, according to the study of Drempetic and colleagues (2020), there is a positive correlation between firm size and ESG score. Also, governance structure is able to affect ESG rating (Gillan et al., 2021); e.g., studies found that this is positively affected by board gender diversity (Endrikat et al., 2021; Disli et al., 2022), and by the existence of CSR committees (Amran et al., 2014; Cucari et al., 2018; Endrikat et al., 2021).

However, the use of ESG ratings has been widely criticized and tackled as controversial. It was pointed out the fact that rankings from different agencies may lead to different conclusions about the same firm (Edmans, 2023; Berg et al., 2022; Chatterji et al., 2016). According to Chatterji and colleagues (2016), among the reasons of such divergencies there are different theorizations about CSR, able to affect numerical evaluations. Berg et al. (2022) go as far to theorize a "rater effect", explaining the differences in the rankings from different providers with three sources of causation: a "scope divergence" (ratings are based on different sets of attributes), "measurement divergence" (use of different indicators to quantify the same attribute), and "weight

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divergence" (different relative importance of attributes). In this contest, the interrelatedness of scope, measurement, and weight divergences creates difficulties in the interpretation of different ESG ratings.

Other critics to ESG ratings are ascribable to their focus on the current status (and then on past performances) rather than on the future potential (Edmans, 2023), up to the progressive promotion of an "ideology of numbers", based on a narrow vision of CSR, and resulting in a regime of normalization for the governance of socio-environmental performance (Chelli and Gendron, 2013). Nevertheless, some scholars lament that ESG rating agencies evaluate corporate practices more than the resulting impacts to the broad society (Crace and Gehman, 2023). Edmans' exhortation "We want great companies, not just companies that are great at ESG" (p. 3) particularly reflects the distortion of a mere instrumental approach to ESG.

An interesting angle to deal with ESG rating can be the literature review of Rindova and colleagues (2018), dealing with organizational rankings in general terms (not specifically considering the ESG sphere). These authors categorize extant research in light of three main deliberate functions of rankings: information intermediaries, means of surveillance and control, creators of comparative orderings.

The first function refers to rankings as information products suitable to reduce firms-stakeholders' asymmetries by favoring the public disclosure of corporate private information, or by enhancing accessibility and intelligibility of public information (Rindova et al., 2018, p. 2180). Such view is somehow questioned in consideration of its scarce utility for well-informed stakeholders (Vidaver-Cohen, 2007), backward orientation and production of low-level and normalized information (Adler and Harzing, 2009).

The rankings' function to ensure firms' surveillance and control sees ranking as disciplining tools, coercing organizations to political and economic interests (Rindova et al., 2018, p. 2175). Even such perspective leads to unintended consequences, such as the "commensuration", i.e., the exasperate need to measure qualitative aspects, and the "reactivity" (Espeland and Sauder, 2007), consisting of the tendency of companies to adapt to the requests of the ranking system in a servile and uncritical manner, even committing crimes (Mishina et al., 2010), due to both simplified cognition and unreflective decision-making (Espeland and Sauder, 2007).

Finally, the comparative orderings' perspective views rankings as representations of organizational status, i.e., the relative actual standing of a certain organization; and reputation, i.e., the organizational quality anticipating future relative performance (Clardy, 2012; Mariconda and Lurati, 2014). In reviewing the comparative orderings' literature stream, Rindova and collegues (2018) call for more research enucleating the reputational component (p. 2185), also highlighting the relevance of rankings directly generated by stakeholders (p. 2186).

In this vein, compounding ESG performance just through ESG ratings seems short-sighted, distortive, and with little usefulness in consideration of long-term value creation (Edmans, 2023). On the contrary, it appears more relevant to explore the main forces shaping the stakeholders' viewpoint about a firm implementing ESG practices. In this regard, stakeholders' perceptions mirrored within the web epitomize current times of technological development and coexistence of online and offline behaviors, the so-called "onlife" (Floridi, 2015), connoted by continuous interactions between human and non-human actors (belonging to the natural and to the machine worlds).

Considering the pitfalls of ESG ratings mentioned above, management research concerning ESG needs to account for the stakeholders' perceptions on the web ecosystem, in turn affecting offline activities and firms' reputation (Besiou et al., 2013; Illia et al., 2017). This figure can be captured by the web sentiment, which indicates the aggregation of positive and/or negative perceptions of corporate practices, resulting from individuals writing and commenting online about a certain firm (Nicolas et al., 2024; Serrano-Guerrero et al., 2015). Specifically, ESG sentiment metrics are derived through natural language processing applied to stakeholder-generated texts, such as social media and online journalistic content (Bharadwaj et al., 2022).

Accordingly, these metrics enrich ESG ratings by capturing how stakeholders interpret potential ESG-related risks and controversies concerning firms (Galletta and Mazzù, 2023).

These elements stress on the reputational features of stakeholder-generated rankings (Rindova et al., 2018), acknowledging reputation as a key asset for firms, suitable to create competitive advantage and stakeholders' trust (Nirino et al., 2021). On the one hand, the web reputation holds commonalities with the offline one (Clardy, 2012; Mariconda and Lurati, 2014); on the other hand, it follows its own rules and is connoted by specific properties: wider scale, technology-driven systematic design, continuous feedback (Dellarocas, 2006). Looking at the challenges of the web, ESG performance is mirrored by the ESG sentiment, an esteem of the web perception of corporate risk of ESG controversies, making firms subjected to negative media exposure (Xue et al., 2023). Therefore, this sentiment represents the stakeholders' "mood" on ESG conducts, both reflecting and socially constructing corporate image and reputation (Bergson, 1988) within technology-aided spaces (Goodings and Tucker, 2014).

This study is part of a broader research project situated within the growing stream of literature assessing corporate ESG commitment and the evolving debate on the accuracy, comparability, and conceptual robustness of ESG ratings, as discussed above. Responding to these concerns, the project investigates alternative or complementary evaluative mechanisms, with particular emphasis on stakeholder-generated metrics such as measures of ESG sentiment.

Specifically, our aim is twofold:

(1) to examine to what extent stakeholder-driven ESG sentiment reflects or diverges from rating-based assessments;

(2) to uncover the causal processes that may explain convergence or misalignment between the two.

2. Methodology

To address the above aims, our starting point draws on results from our prior work (Costanza et al., 2025), which examined the determinants of web-based ESG sentiment toward firms using multivariate mixed statistical modeling (Generalized Additive Mixed Model, or GAMM approach). In that study, we analyzed a panel of the top 113 global firms (from 16 countries) by market capitalization (source: companiesmarketcap.com) and found a negative relationship between firm size and profitability, and a positive relationship between board size and online ESG sentiment. The online ESG sentiment score (the dependent variable) was sourced from the ESGAnalytics® database (with data collected on July 7, 2023) and is referred to as "ESG Analytics" in our model. The dataset also included ESG rating scores provided by Refinitiv Eikon as a mere control variable. Conversely, in the present research we change our angle of observation and focus on the relationships between ESG ratings and ESG sentiment.

So far, given the preliminary stage of our current investigation, we have relied on the same panel of firms and the same ESG Analytics dataset used in our earlier study. Nonetheless, to strengthen the robustness of our analysis, we considered not one but two types of ESG ratings, provided by two leading rating agencies (Refinitiv Eikon and Sustainalytics), within the same time period of ESG sentiment data. We then conducted bivariate analyses aimed at assessing whether, and to what extent, ESG sentiment aligns with formal ESG evaluations. The results revealed a heterogeneous pattern (see Figure 1).

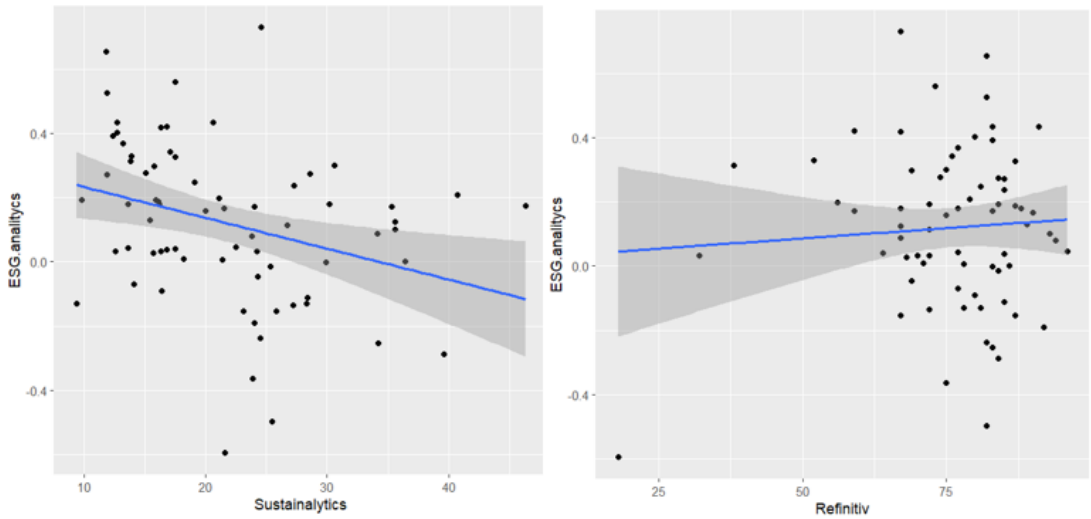


Figure 1. Bivariate relationships between ESG sentiment and two ESG ratings, source: Authors' elaboration

On the left side of Figure 1, it is possible to observe a significant correlation between the Sustainalytics ESG risk rating and ESG sentiment. Indeed, the Pearson coefficient ($r = –0.32$, $p < 0.05$) indicates a negative association, suggesting that higher levels of positive sentiment tend to be related with lower ESG risk scores. On the right side, the analysis based on Refinitiv data shows no statistically significant relationship between the ESG score and sentiment ($r = 0.07$), thus pointing to a substantial divergence between these two evaluative dimensions.

On the one hand, this result reflects methodological and conceptual differences across rating systems. On the other hand, it underscores the need for a qualitative perspective. In this direction, we propose the development of a bidimensional matrix (Figure 2) to categorize companies according to ESG rating and ESG sentiment.

The matrix intersects high/low ESG sentiment with high/low ESG ratings, thereby identifying four analytical configurations that help capture varying degrees of alignment or misalignment between institutional ratings and stakeholder-driven evaluations. It is worth to specify that in the matrix, a firm's ESG rating is classified as "low" whenever at least one of the two ratings considered (Sustainalytics or Refinitiv) places the firm in the lower performance tier. This prudential criterion reflects the heterogeneity identified in the quantitative assessment above and prevents the omission of potential risk signals emerging from a single rating provider.

3. Preliminary Results

The resulting matrix highlights four quadrants, each corresponding to a distinct company cluster, characterized by perceived coherence, hypocrisy, or ambiguity in the relationship between ESG ratings and sentiment. Specifically:

- *Perceived coherence*: This refers to companies exhibiting an alignment between ESG ratings and ESG sentiment. Such firms fall within Quadrant II (high ESG rating-high ESG sentiment) and Quadrant III (low ESG rating-low ESG sentiment).
- *Perceived hypocrisy*: This refers to companies located in Quadrant I (high ESG rating-low ESG sentiment). This cluster likely reflects situations in which ESG sentiment captures contradictions between communicated and actual ESG practices.
- *Perceived ambiguity*: This refers to companies located in Quadrant IV (low ESG rating-high ESG sentiment). This configuration may reflect cases in which ESG ratings appear insufficient to capture actual ESG performance. This misalignment may be driven by factors

related to the company (e.g., lobbying, alternative communication channels) or to stakeholders (e.g., a bottom-up appraisal based on non–company-driven elements).

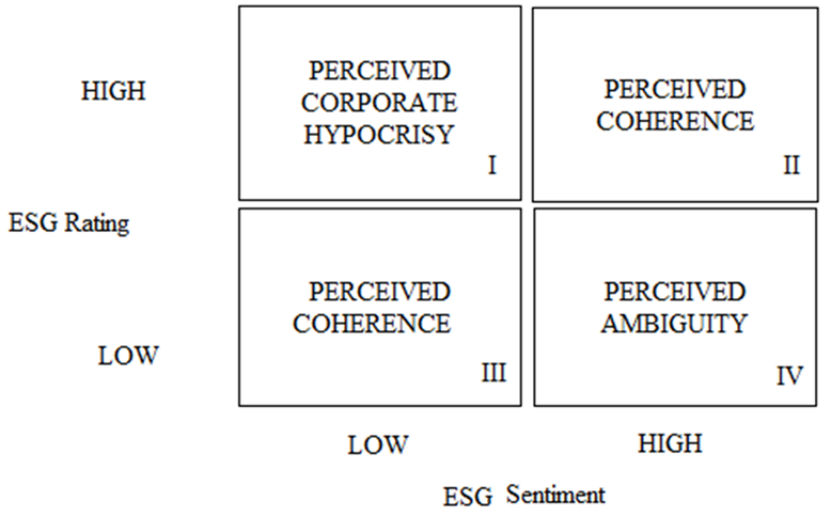


Figure 2. Analytic Matrix ESG rating-ESG sentiment, source: Authors' elaboration

Placing the firms in our panel within the analytical matrix, we identify 81 cases of alignment between ratings and sentiment: 78 falling into Quadrant II (high ESG rating-high ESG sentiment) and 3 into Quadrant III (low ESG rating-low ESG sentiment). Conversely, we observe 32 cases of misalignment between ESG ratings and sentiment. Specifically, 7 cases fall into the "ambiguity" configuration, characterized by high sentiment and low ESG ratings, and 25 cases fall into the "hypocrisy" configuration, characterized instead by high ESG ratings and low sentiment scores.

The next steps in our research involve exploring the causal mechanisms behind the observed alignments and misalignments, and identifying the conditions under which they emerge. Therefore, we will build on the matrix as a starting framework to identify representative cases for each quadrant. Then, for each selected firm, we will conduct an in-depth qualitative analysis based on company-related factors (e.g., narrative styles in ESG disclosure, presence of controversies, sectoral characteristics, communication strategies) and stakeholder-related factors (e.g., social activism, public reactions to specific events). Such investigation will include the examination of ESG reports and corporate communication materials, news and media coverage over the relevant period, the eventual presence of controversies or critical events not fully reflected in the ESG ratings, and the exploration of whether stakeholder sentiment reacts to specific triggers such as scandals, incidents, or other reputational shocks.

4. Contribution

This study is part of a wider research project that examines corporate ESG commitment by investigating alternative or complementary evaluative mechanisms to traditional ratings, with particular emphasis on stakeholder-generated metrics such as ESG sentiment.

Using a panel of global firms, we conducted a bivariate analysis to assess whether ESG sentiment aligns with formal ESG ratings. The observation of heterogeneous patterns across rating systems underscored the need for a qualitative perspective. In this direction, we proposed an original bidimensional matrix that categorizes companies according to ESG ratings and ESG sentiment, and highlights clusters of firms characterized by perceived coherence, hypocrisy, and ambiguity.

With this study, we seek to contribute to the debate on the evaluation of firms' ESG commitment, offering empirical and conceptual insights into how rating systems and stakeholder sentiment may jointly affect the credibility of corporate ESG practices. These findings could be of interest to companies, policy makers, and other stakeholders (e.g., media relations agencies).

The study could also contribute to shedding light on the key dynamics of ESG performance disclosure, highlighting cases of effective ESG communication, corporate hypocrisy, and corporate ambiguity. Accordingly, managers could complement traditional ESG ratings with stakeholder sentiment to identify gaps between communicated and perceived ESG practices, thereby supporting the formulation of more effective ESG communication strategies.

Keywords: ESG commitment; rating; sentiment

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Psychological Ownership for Systemic Sustainability (POSS): An Integrated Theoretical Framework at the Intersection of Sustainability Management, Organizational Behaviour, and Business-Society Fields

Anna Maria Fellegara[1], Riccardo Torelli[2], Monica Veneziani[3]

1. Conceptual development

Contemporary organizations operate within an evolving landscape of stakeholder expectations and regulatory requirements for sustainable business practices. The Business Roundtable's 2019 statement, endorsed by over 180 CEOs, marked a watershed moment in corporate governance philosophy by explicitly rejecting shareholder primacy in favor of stakeholder capitalism (Harrison et al., 2020). This shift reflects broader transformations in capital markets, where Environmental, Social, and Governance (ESG) investments are projected to reach $50 trillion by 2025, driven by frameworks such as the EU's Corporate Sustainability Reporting Directive and IFRS Sustainability Standards (Shmelev & Gilardi, 2025). These developments position sustainability not as peripheral corporate social responsibility but as central to strategic management and competitive positioning. Despite this momentum toward stakeholder-centric business models, empirical evidence reveals a persistent implementation deficit. Recent studies indicate that nearly 50% of organizations identify lack of employee engagement as their primary barrier to achieving sustainability goals (World Economic Forum, 2024). This gap between strategic intent and operational reality suggests fundamental limitations in existing theoretical frameworks, particularly regarding the mechanisms through which sustainability strategies translate into employee behaviors and organizational outcomes.

While strategic management scholarship positions sustainability capabilities as potential sources of competitive advantage (Hart, 1995; Barney, 1991) and stakeholder theory advocates for multi-constituency governance (Freeman, 1984; Bridoux et al., 2021), these perspectives provide limited guidance on operationalization through employee-centered mechanisms. The resource-based view establishes that organizational resources become sources of sustained competitive advantage when they are valuable, rare, inimitable, and non-substitutable (Barney, 1991), and within this framework, sustainability capabilities have been identified as strategically significant resources (Hart, 1995). Dynamic capabilities theory extends this logic by emphasizing organizations' capacity to sense opportunities and threats, seize opportunities, and reconfigure resources to address evolving challenges (Teece et al., 1997). However, these frameworks have predominantly focused on organizational-level resources and capabilities, with limited attention to the psychological and behavioral foundations through which sustainability capabilities are enacted. Systematic reviews underscore this deficit: de Souza Barbosa et al. (2023) found that 87.75% of ESG integration studies rely exclusively on company-level database information, with

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virtually no studies examining impacts from employees' perspectives. This critical gap constrains both theoretical advancement and practical implementation, suggesting that employee-level psychological processes may constitute critical yet undertheorized mechanisms through which sustainability capabilities emerge and are sustained.

This theoretical deficit is particularly evident in recent scholarship on corporate purpose, where strategic importance is increasingly recognized but implementation mechanisms remain unclear. Emerging research positions corporate purpose as a strategic driver rather than peripheral mission statement, with Malnight et al.'s (2019) empirical study identifying purpose as a fourth driver of high growth alongside revenue, industry selection, and mergers and acquisitions. Their analysis demonstrated that purpose-driven companies use organizational purpose to redefine competitive playing fields and expand into ecosystem approaches. However, Rigby et al. (2024) document widespread "purpose-washing," where companies articulate inspiring purpose statements but lack supporting organizational practices and governance structures. This disconnect reveals that while the strategic importance of purpose is increasingly recognized, mechanisms for authentic implementation—particularly how organizations translate purpose statements into everyday practices that meaningfully engage employees and shape their behavior—remain inadequately theorized. Understanding these implementation mechanisms requires attention to the psychological foundations of employee motivation and engagement.

Organizational behavior scholarship provides essential theoretical foundations for understanding these psychological mechanisms. Self-Determination Theory (SDT) identifies three fundamental psychological needs—autonomy, competence, and relatedness—that underpin intrinsic motivation and wellbeing (Deci & Ryan, 1985). Gagné and Deci's (2005) application to work settings established that autonomous motivation (intrinsic plus internalized extrinsic) predicts superior performance and wellbeing compared to controlled motivation, with recent longitudinal evidence demonstrating that organizations promoting high-quality motivation benefit all stakeholders through enhanced organizational health, customer satisfaction, and financial performance (Deci et al., 2017). Complementing SDT, Hackman and Oldham's (1976, 1980) Job Characteristics Model specifies five core job dimensions—skill variety, task identity, task significance, autonomy, and feedback—that produce critical psychological states of experienced meaningfulness, responsibility for outcomes, and knowledge of results. Spreitzer's (1995) psychological empowerment framework further demonstrates that empowered employees, experiencing meaning, competence, self-determination, and impact, exhibit reduced job strain, higher satisfaction, and better performance.

These established theories provide foundational mechanisms for understanding employee motivation and engagement. However, their application to sustainability contexts remains limited. While scholars recognize that sustainability work can provide meaningfulness and purpose, theoretical integration explaining how organizational sustainability strategies shape employee psychological states and subsequent behaviors is underdeveloped. Moreover, the role of governance structures in enabling or constraining these psychological processes has received insufficient attention. This gap is particularly significant given stakeholder theory's emphasis on participatory governance, yet the connection between governance structures and employee psychological mechanisms remains underspecified.

The question of how governance structures shape employee engagement connects directly to ongoing debates within stakeholder theory regarding authentic participation. Stakeholder theory has evolved from Freeman's (1984) original formulation to encompass multiple theoretical perspectives, yet Kujala et al.'s (2022) comprehensive review analyzing 90 articles on stakeholder engagement reveals high fragmentation with 75 different theoretical discussions. Critically, their analysis identified the "dark side" of stakeholder engagement: power asymmetries, exclusion of marginalized voices, and tokenistic participation that creates appearance of engagement without substantive influence. These findings challenge romanticized conceptions of stakeholder engagement and highlight that not all participatory practices produce genuine influence.

Authentic stakeholder engagement, Kujala et al. argue, requires not merely consultation but meaningful participation in decision-making processes that genuinely affects organizational outcomes.

This critique raises fundamental questions about operationalizing stakeholder governance. While normative arguments for stakeholder inclusion are well-established, empirical research documenting effective participatory mechanisms remains limited. Furthermore, the specific case of employees as stakeholders presents unique considerations: employees possess both formal organizational roles and stakeholder interests, creating distinctive opportunities and tensions. The conditions under which employee participation translates into authentic influence, and how such participation shapes employee attitudes and behaviors toward sustainability, represent important yet underexplored questions. These questions become particularly salient when considering the human rights dimensions of stakeholder engagement.

Recent Business & Society scholarship has emphasized human rights as a promising research direction, with implications for understanding employee stakeholder engagement. Schrempf-Stirling et al.'s (2022) analysis connects corporate human rights responsibilities to the UN Guiding Principles on Business and Human Rights (2011), which establish corporate responsibility to respect human rights through due diligence processes addressing impacts throughout value chains. The ILO's Decent Work framework complements this by emphasizing fair wages, secure employment, freedom of association, safe working conditions, and work-life balance as fundamental labor rights. These frameworks position worker wellbeing not merely as instrumental to organizational performance but as intrinsically valuable, raising questions about connections between worker wellbeing, organizational sustainability practices, and broader social outcomes.

Systematic reviews demonstrate connections between worker wellbeing and organizational sustainability. Alonso-Nuez et al. (2022) found that corporate concern for worker wellbeing facilitates organizational adaptation to contemporary challenges, with leadership practices directly affecting organizational health. However, these reviews also identify a critical gap: lack of holistic discourse connecting human resource management, labor wellbeing, and corporate social responsibility. Existing research tends to examine these dimensions in isolation rather than as integrated systems. Moreover, the preventive potential of worker wellbeing—how positive working conditions may prevent exploitation and rights violations—remains theoretically underdeveloped. Caruana et al.'s (2021) analysis of modern slavery in business contexts identifies this as a critical research frontier, noting the field's focus on reactive responses rather than proactive prevention through positive labor practices. Understanding these preventive mechanisms requires attention to how organizational environments shape worker identity and sense of responsibility.

Social Identity Theory provides crucial insights into how organizational environments shape worker identity and behavior. Developed by Tajfel and Turner in the 1970s-1980s, the theory explains how individuals derive self-concept from perceived membership in social groups. Ashforth and Mael's (1989) seminal application to organizational contexts defined organizational identification as "the perception of oneness with or belongingness to the organization," establishing that identification stems from categorization processes, group distinctiveness and prestige, salience of outgroups, and group formation factors. Recent theoretical advances emphasize that identity is dynamic and constructed through ongoing "identity work," multiple and contextually situated, both individual and collective, and shaped by organizational discourses and power relations (Brown, 2022). Ashforth et al.'s (2024) work on place identification demonstrates how physical and social workplace characteristics become incorporated into worker identity, extending traditional Social Identity Theory applications beyond abstract organizational membership to concrete workplace experiences.

For sustainability applications, the Social Identity Model of Pro-Environmental Action (SIMPEA) developed by Fritsche et al. (2018) proposes that pro-environmental behavior is

motivated when environmental threats are perceived, pro-environmental action is identity-congruent, and collective efficacy beliefs are present. Empirical research supports these connections: Shah et al. (2021) demonstrated that when employees identify with organizations engaging in corporate social responsibility, they exhibit more pro-environmental behaviors, amplified by peer advocacy. Norton et al.'s (2023) comprehensive review concludes that green organizational identity is crucial for sustained environmental behaviors, with social identity processes facilitating adoption of environmental values. Critically, their analysis found that collective organizational identity is a stronger predictor of environmental behaviors than individual environmental attitudes, suggesting the primacy of identity-based over attitude-based mechanisms.

Despite these advances, integration between Social Identity Theory and organizational sustainability research remains incomplete. While identity processes clearly influence sustainability behaviors, less is known about how organizations can intentionally shape sustainability-oriented identities through governance practices and workplace design. Furthermore, the relationship between organizational identity and other psychological constructs relevant to sustainability—particularly psychological ownership—has received limited theoretical attention. Yet psychological ownership theory suggests complementary mechanisms through which employees develop feelings of responsibility for organizational outcomes, potentially operating alongside identity processes to shape sustainability behaviors.

Psychological ownership theory offers additional insights into how employees develop feelings of responsibility toward organizational targets. Pierce, Kostova, and Dirks' (2001, 2003) foundational work defined psychological ownership as "the state in which individuals feel as though the target of ownership or a piece of that target is 'theirs.'" This feeling exists independent of legal ownership and applies to both tangible and intangible targets, developing through three routes: controlling the target, coming to know the target intimately, and investing the self in the target. Pierce and Jussila (2010) extended the theory to collective contexts, defining collective psychological ownership (CPO) as "the collectively held sense that this target is collectively 'ours.'" Critically distinct from individual psychological ownership, CPO emerges through three stages: individual psychological integration where objects become part of individuals' extended self; recognition of shared connection where individuals recognize others are also psychologically tied to the object; and interactive dynamics where verbal and nonverbal communication creates consensus transforming the construct from individual to group-level entity.

Recent theoretical advances have identified two distinct pathways from collective psychological ownership with important implications for organizational sustainability (Nijs et al., 2024). Route 1, perceived rights leading to exclusion, operates through the logic "we have the right to determine who can use what is ours," potentially producing negative intergroup outcomes including territorial conflicts. Route 2, perceived responsibilities leading to stewardship, operates through the logic "we are responsible for taking care of what is ours," producing positive prosocial behaviors including caring and responsibility for owned targets. This dual-route model suggests that while psychological ownership can channel toward exclusionary territoriality, it can alternatively channel toward stewardship of social and environmental outcomes. The critical question becomes: which organizational conditions amplify stewardship orientations while minimizing exclusionary tendencies?

Emerging research demonstrates psychological ownership's relevance for environmental stewardship specifically. Preston and Gelman (2020) found that psychological ownership is more powerful than legal ownership for environmental protection, with psychological owners showing greater willingness to protect natural areas, higher opposition to exploitation, and more hours donated to preservation. Li et al.'s (2022) conceptual development of environmental psychological ownership identifies antecedents including pro-environment investment, environmental self-efficacy, and environmental knowledge, with positive prediction of pro-environmental intentions. Wang et al. (2022) demonstrate that organizational psychological

ownership positively influences corporate green operations through social exchange mechanisms: when organizations satisfy employees' ownership motives (efficacy, identity, place), employees reciprocate with beneficial environmental behaviors including waste reduction, environmental management systems implementation, and voluntary environmental initiatives. These findings suggest that psychological ownership toward sustainability outcomes can be cultivated through intentional organizational practices.

However, critical questions remain unaddressed. First, while individual and collective psychological ownership have been separately theorized, their integration within organizational sustainability contexts is underdeveloped. Second, the organizational antecedents of collective psychological ownership toward sustainability remain unclear—specifically, which governance practices and structural arrangements facilitate development of collective ownership feelings toward sustainability outcomes. Third, the relationship between psychological ownership and organizational identity, both theoretically important for sustainability behaviors, has not been systematically integrated. Fourth, while the stewardship route of psychological ownership is theoretically promising, conditions that amplify stewardship while minimizing exclusionary tendencies require specification.

2. Theoretical gaps and research questions

The preceding literature review reveals several interconnected theoretical gaps that constrain understanding of employee-centered sustainability implementation. First, while strategic management theory recognizes sustainability capabilities as sources of competitive advantage and stakeholder theory provides normative arguments for participatory governance, these frameworks have not been integrated with psychological theories explaining how governance structures shape employee motivation and behavior. The psychological mechanisms mediating between organizational conditions and sustainability outcomes remain underspecified. Second, while Social Identity Theory and psychological ownership theory both demonstrate relevance for sustainability contexts, they have developed largely independently. Their integration could provide complementary insights: identity processes explain how employees internalize organizational values while psychological ownership explains how they develop feelings of responsibility. Yet theoretical frameworks integrating these constructs are absent. Third, research on stakeholder engagement has identified the "dark side" of tokenistic participation, yet positive models of authentic engagement remain underdeveloped. Specifically, the organizational practices that transform nominal participation into genuine influence, and how such authentic participation shapes employee psychological states and behaviors, require theoretical elaboration. Fourth, the preventive potential of worker wellbeing for avoiding exploitation and promoting positive sustainability outcomes has been noted but not systematically theorized. Existing frameworks tend toward reactive rather than proactive orientations, missing opportunities to position positive labor practices as foundational to sustainability strategies. Fifth, while corporate purpose has been identified as strategically significant, mechanisms for authentic implementation remain unclear. The gap between purpose statements and organizational realities suggests that theoretical frameworks connecting macro-level purpose to micro-level employee experiences and behaviors are needed.

These gaps converge around a central theoretical deficit: the absence of integrated frameworks explaining how organizational environments—particularly governance structures and participatory practices—shape employee psychological processes that in turn drive sustainability behaviors. Addressing this deficit requires theoretical integration across strategic management, organizational behavior, and Business & Society scholarship. This paper develops the Psychological Ownership for Systemic Sustainability (POSS) Framework to address these theoretical gaps through integration of the literatures reviewed above. The framework is guided by three overarching research questions:

RQ1: How do organizational governance structures and participatory practices shape employees' psychological ownership toward sustainability outcomes?

RQ2: Through what psychological mechanisms does collective psychological ownership toward sustainability translate into proactive socio-environmental behaviors?

RQ3: How can organizations operationalize stakeholder governance principles through employee-centered mechanisms that authentically integrate sustainability into strategic management?

By addressing these questions, the POSS Framework aims to bridge micro-level psychological-behavioural processes with macro-level sustainability outcomes, providing theoretically grounded and empirically testable propositions for authentic sustainability implementation through employee engagement.

3. Methodology

The POSS Framework was developed through an integrative theory-building approach that combines multiple streams of literature traditionally kept separate. The methodology followed an iterative process of literature review, theoretical gap identification, conceptual synthesis, and development of testable propositions.

The first phase involved a focused review of the strategic sustainability management, organizational behavior, and Business & Society literature. This review identified three principal gaps: the lack of attention to employee perspectives in sustainability research, insufficient operationalization of stakeholder governance, and limited integration between individual psychological-behavioural mechanisms and systemic organizational outcomes. The second phase integrated established theories into a coherent framework. Social Identity Theory provides the mechanism through which organizational cultures shape worker identity. Self-Determination Theory explains how organizational practices influence autonomous motivation. Collective psychological ownership theory illustrates how individual ownership feelings aggregate at the group level. Stakeholder theory provides the normative logic for participatory governance. The One Health approach offers a systemic lens for understanding interconnections among human, social, and environmental wellbeing. The third phase developed eight theoretical propositions linking worker wellbeing through psychological ownership to proactive socio-environmental behaviors and One Health outcomes. The propositions specify testable causal relationships and identify mediating mechanisms and moderating variables. Specifically, participatory governance practices moderate the relationship between wellbeing and psychological ownership, while the latter mediates the relationship between organizational conditions and sustainability behaviors. The framework also incorporates feedback loops that reinforce wellbeing. When employees experience that their sustainability behaviors have real impact, this strengthens their psychological ownership and motivation, which in turn contributes to their wellbeing through a sense of meaningfulness and self-efficacy. These positive reinforcement mechanisms distinguish the POSS Framework from linear unidirectional models.

4. First results

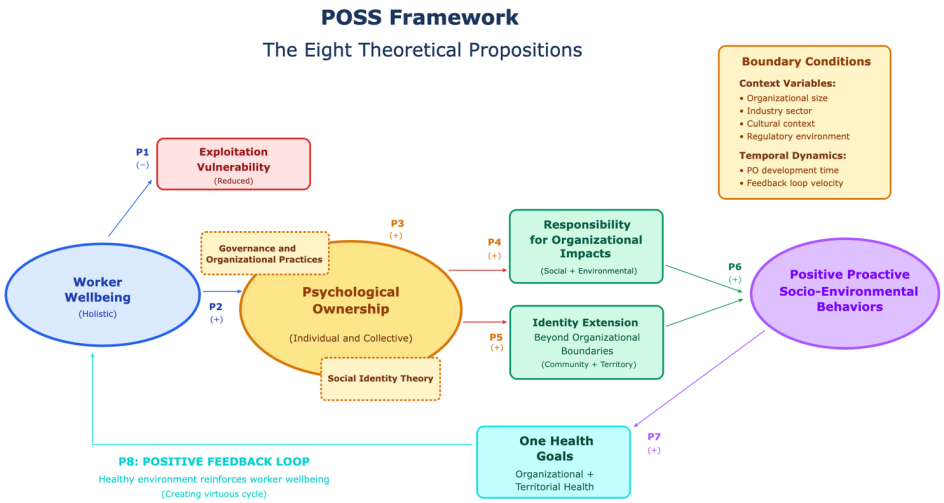


Figure 1. POSS Framework

The research led to the creation of the first draft of the POSS framework (Figure 1) and its eight founding propositions, which are listed below.

Proposition 1: Worker Wellbeing as Foundation

Worker wellbeing, encompassing physical, psychological, social, and economic dimensions, positively influences the development of collective psychological ownership toward organizational sustainability outcomes. This relationship is moderated by governance structures and organizational practices that enable worker participation. Self-determination theory establishes that wellbeing stems from satisfaction of autonomy, competence, and relatedness needs (Deci & Ryan, 1985). Workers experiencing wellbeing possess psychological resources enabling engagement with broader organizational concerns beyond immediate survival or self-protection (Conservation of Resources theory; Hobfoll, 1989). Systematic reviews demonstrate that corporate concern for worker wellbeing facilitates organizational adaptation and generates positive stakeholder impacts (Alonso-Nuez et al., 2022). However, wellbeing alone is insufficient; organizational structures must channel wellbeing into ownership. When participatory governance enables control, knowledge, and investment (the three routes to psychological ownership), wellbeing translates into felt ownership of sustainability outcomes. Wellbeing includes freedom from exploitation, forced labor, and hazardous conditions. Organizations ensuring worker wellbeing create cultures incompatible with modern slavery throughout value chains. This addresses Business & Society scholarship identifying modern slavery as critical corporate responsibility issue (Caruana et al., 2021).

Proposition 2: Social Identity Theory Mechanism

Organizational environments emphasizing sustainability distinctiveness and prestige enhance worker social identification with sustainability goals. This identification process, grounded in Social Identity Theory, mediates the relationship between organizational sustainability commitment and worker attitudes toward environmental and social responsibility. Ashforth and Mael (1989) established that organizational identification stems from distinctiveness, prestige, and group salience. When organizations authentically commit to

sustainability, positioning it as core to organizational identity rather than peripheral add-on, workers incorporate this into self-concept through social identification processes. Meta-analytic evidence demonstrates organizational identification's robust effects on attitudes and behaviors (Lee et al., 2015). For sustainability specifically, the Social Identity Model of Pro-Environmental Action (SIMPEA; Fritsche et al., 2018) shows that pro-environmental behavior increases when it is identity-congruent and collective efficacy exists. Norton et al.'s (2023) review confirms that green organizational identity is the strongest predictor of sustained environmental behaviors, surpassing individual environmental attitudes. The POSS Framework positions SIT as explaining how organizational environments shape worker identity, which then influences receptivity to developing psychological ownership of sustainability outcomes. Organizations with strong sustainability identity create contexts where sustainability ownership becomes psychologically meaningful and self-defining for workers.

Proposition 3: From Identity to Ownership

Social identification with organizational sustainability goals facilitates the development of collective psychological ownership of socio-environmental outcomes through enhanced perceived control, intimate knowledge, and self-investment in sustainability initiatives. This proposition bridges Social Identity Theory and psychological ownership theory. While SIT explains identification WITH the organization and its goals, psychological ownership represents deeper "OURS" relationship with specific targets—in this case, socio-environmental outcomes. Pierce and Jussila's (2010) three-stage emergence model explains this transition: (1) individuals develop psychological connection to sustainability outcomes; (2) they recognize others share this connection; (3) through interaction and communication, collective "OURS" emerges. Social identification provides the foundation—shared organizational identity—upon which collective ownership builds. Participatory governance practices operationalize this by providing the three routes: control through decision-making participation, knowledge through involvement in sustainability initiatives, and investment through time and energy devoted to sustainability goals. Research confirms that control, knowledge, and investment mediate relationships between organizational contexts and ownership development (Giordano et al., 2019).

Proposition 4: Ownership Generates Responsibility

Collective psychological ownership of socio-environmental outcomes activates felt responsibility for organizational impacts on stakeholders, communities, and ecosystems through the responsibility route of psychological ownership. Nijs et al.'s (2024) dual-route model establishes that psychological ownership operates through both rights-based and responsibility-based pathways. The POSS Framework hypothesizes that sustainability-focused organizational contexts amplify the responsibility route: when the target of ownership is socio-environmental outcomes (rather than territorial resources), ownership translates into stewardship rather than exclusion. Hernandez's (2012) stewardship theory defines stewardship as taking responsibility for collectively owned targets, acting in their best interest with long-term orientation toward care and maintenance. Mechanism: perceived group responsibility mediates the relationship between psychological ownership and stewardship behavior. Workers feeling "these outcomes are OURS" perceive responsibility for caring for them: "Taking care of what is 'ours' is taking care of 'ourselves.'" This proposition connects to Business & Society scholarship on corporate responsibility evolution (Carroll, 2021), showing how psychological mechanisms at the worker level can embody corporate responsibility commitments.

Proposition 5: Identity Extension to Broader Systems

Psychological ownership of organizational sustainability outcomes extends workers' identity boundaries to encompass stakeholders, communities, and ecosystems affected by organizational activities, creating expanded moral concern and relational accountability. Belk's (1988) concept of "extended self" establishes that possessions become part of self-concept. When workers develop psychological ownership of sustainability outcomes, their sense of self extends to include those outcomes and the systems they affect. Identity extension represents the psychological mechanism explaining how organization-level concerns become personally meaningful. Recent Social Identity Theory developments emphasize place identification (Ashforth et al., 2024) and identity work (Brown, 2022), showing that identities extend beyond organizational boundaries to include physical spaces, communities, and broader social systems. For sustainability specifically, environmental psychological ownership increases willingness to protect natural systems because they become psychologically integrated into self-concept (Preston & Gelman, 2020). This proposition explains how worker-level psychological processes connect to systemic outcomes: when workers' identities extend to affected stakeholders and ecosystems, they develop moral concern and relational accountability beyond narrow organizational boundaries. This bridges micro-level psychology with macro-level sustainability impacts.

Proposition 6: Proactive Behaviors

Felt responsibility for socio-environmental impacts and identity extension to broader systems motivate positive proactive socio-environmental behaviors, including organizational citizenship behaviors for the environment (OCBE), green innovation, stakeholder engagement, and advocacy for sustainability policies. Robertson and Barling's (2013) definition of OCBE as "individual behavior that is discretionary, not directly or explicitly recognized by the formal reward system, and that in the aggregate benefits the natural environment" establishes that pro-environmental behaviors can be proactive and voluntary. Integrated theoretical models combining Theory of Planned Behavior (Ajzen, 1991) and Norm Activation Model (Stern, 2000) explain up to 77% variance in pro-environmental behavioral intentions (Setiawan et al., 2020). TPB components (attitudes, subjective norms, perceived behavioral control) address self-interested motivations; NAM components (awareness of consequences, ascription of responsibility, personal norms) address pro-social motivations. The POSS Framework proposes that psychological ownership and identity extension create both motivational routes: ownership satisfies self-interested needs (efficacy, identity, place) while simultaneously activating pro-social motivations (responsibility, moral norms). Meta-analytic evidence confirms that organizational identification, green psychological climate, and perceived organizational support predict employee green behaviors (Katz et al., 2022). Psychological empowerment (meaning, competence, self-determination, impact; Spreitzer, 1995) enables proactivity. When workers feel empowered, they engage in proactive green behaviors including idea generation, promotion, and activist behavior for environmental causes (Zafar et al., 2025).

Proposition 7: One Health Outcomes

Proactive socio-environmental behaviors at the organizational level aggregate to contribute to One Health goals—the integrated optimization of human, animal, and ecosystem health—through multiple pathways including reduced environmental pollution, enhanced social wellbeing, sustainable resource management, and health-protective organizational practices. The One Health approach represents "an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals, and ecosystems" (One Health High-Level Expert Panel, 2022). It recognizes close interdependence among human, animal, and environmental health. Recent scholarship demonstrates synergies between One Health and ESG practices in organizational contexts (Oliveira & Gibbs, 2022). Organizations implementing One

Health principles show enhanced pandemic preparedness, improved antimicrobial resistance management, better food safety, more effective environmental protection, and strengthened stakeholder engagement. The POSS Framework proposes multi-level aggregation mechanisms: individual employee green behaviors aggregate to team environmental performance; team performance aggregates to organizational environmental outcomes; organizational practices influence industry standards and supply chain sustainability; sector practices contribute to policy change and societal sustainability (Zacher et al., 2023). This proposition positions organizational-level behaviors within broader systems frameworks, addressing calls for research bridging organizational and societal levels (Kaul et al., 2025).

Proposition 8: Feedback Loop to Wellbeing

Achievement of One Health outcomes and visible organizational sustainability impact creates feedback loops that reinforce worker wellbeing through experienced meaningfulness, collective efficacy, enhanced organizational identification, and satisfaction of self-determination needs, creating a virtuous cycle. Self-determination theory establishes that satisfaction of autonomy, competence, and relatedness needs enhances wellbeing (Deci & Ryan, 1985). When workers see their sustainability efforts producing real outcomes, this satisfies competence needs (efficacy), autonomy needs (self-directed action), and relatedness needs (contribution to collective goals). Research demonstrates bidirectional relationships between employee green behavior and wellbeing (Wang et al., 2021): green behavior enhances self-esteem, provides sense of meaning, aligns with personal values creating satisfaction, and enhances social identity. Positive emotions from sustainability achievement facilitate continued environmental engagement through resource gain spirals (Conservation of Resources theory).

Framework validation will occur through multiple empirical strategies. Quantitative studies can test propositions through structural equation models using multi-source survey data. Qualitative studies can explore the mechanisms through which psychological ownership emerges in specific organizational contexts. Comparative case studies can examine how different governance practices influence the development of collective psychological ownership. Longitudinal studies can trace the temporal evolution of feedback loops among wellbeing, psychological ownership, and sustainability behaviors.

Keywords: Well-being; psychological ownership; systemic sustainability

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The Dynamic Balanced Scorecard for Sustainability in Emerging Sport Organizations: A Systems Thinking Case from an Italian Football Club

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1. Introduction

In recent years, sustainability has moved from a peripheral concern to a strategic mandate in sport management. The UN 2030 Agenda explicitly recognizes the potential of sport to contribute to sustainable development (United Nations, 2015), and scholars increasingly acknowledge that sport organizations generate significant economic, social and environmental impacts that must be governed rather than treated as unintended by-products of competition and entertainment. Yet empirical evidence repeatedly highlights persistent implementation barriers: limited managerial know-how, competing short-term priorities, fragmented accountability structures and a prevalence of narrative or symbolic initiatives over structured performance routines (Cury et al., 2023; McCullough et al., 2016; Schwarz et al., 2019). Sustainability is increasingly demanded, but it remains weakly embedded in the routines guiding planning, resource allocation and performance review, especially outside elite sport.

Within this broader debate, football has become a key laboratory for sustainability. UEFA and national associations have adopted long-term sustainability strategies that frame football as a lever for social and environmental change and call on clubs to align with ESG expectations (FIGC, 2023; UEFA, 2021). Case-based evidence on LaLiga's Social Fair Play programme (Fernández-Villarino, 2021) and on the management company of San Siro stadium during the COVID-19 crisis (Tettamanzi et al., 2024) shows how sustainability principles are gradually translated into governance, risk management and reporting tools, while also revealing tensions between ambitious narratives and everyday operational constraints.

A growing body of work frames sustainability in sport as a multi-dimensional construct encompassing environmental stewardship, social inclusion and economic resilience (Anagnostopoulos et al., 2014; François & Bayle, 2017; Lozano & Barreiro-Gen, 2023). Building on Lindsey's (2008) four forms of sustainability (individual, community, organisational, institutional), recent studies emphasise the need to distinguish short-lived projects from genuine capability-building. For football clubs, this implies moving from "CSR as initiatives" to sustainability as a governance problem: aligning objectives, stakeholders and management control over time. However, research documents both increasing institutional pressure (e.g. league roadmaps, ESG expectations) and persistent implementation gaps. Clubs often adopt selective initiatives while struggling to translate sustainability into targets, metrics and accountability routines(Moon et al., 2022; Nishida et al., 2024) .

Even when sustainability narratives are established, clubs frequently lack feasible performance architectures to integrate ESG goals into decision-making and management control (Agostino & Thomasson, 2025; Gallucci & Tipaldi, 2024). Existing frameworks are often calibrated for well-resourced organizations and focus on external reporting. For smaller and lower-tier clubs, reliant on limited staff, unstable revenues and volunteer work, the burden of

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comprehensive certifications and reporting can be prohibitive, so sustainability risks remaining decoupled from planning and control, especially during transitions from amateur to professional status.

In response, both policymakers and researchers call for integrated management frameworks that bridge the gap between sustainability goals and routine operations. Stakeholder theory is particularly useful here: football clubs operate within ecosystems of passionate fans, sponsors, community groups, local authorities and leagues whose support and legitimacy are crucial (Hautbois & Desbordes, 2023). To maintain stakeholder legitimacy over time, clubs must embed sustainability into strategic planning, risk management and management control systems, not just into external communication. The challenge is one of integration and feasibility: environmental and social initiatives need to be tied to the metrics, incentives and decision cycles that actually guide behavior, while remaining manageable for organizations with limited analytical and administrative capacity.

To address this feasibility challenge, this work applies the Dynamic Balanced Scorecard for Sustainability (DBSCfS) (Bivona & Scirè, 2025) as an integrated, low-overhead performance architecture for emerging football clubs. The DBSCfS links sustainability objectives and KPIs across economic, social, environmental and stakeholder perspectives through explicit causal logic (systems thinking), enabling managers to discuss trade-offs, anticipate delayed effects and progressively align internal monitoring with external expectations (e.g., UEFA/FIGC roadmaps and ESRS/GRI logics) without reproducing their full reporting burden. Within this landscape, emerging football clubs in non-elite leagues represent a critical yet under-explored context. They are strongly embedded in their local communities and often carry explicit social missions, but operate with limited managerial capacity and face intense competitive and financial pressures. For these organizations, there is a lack of integrated, low-overhead performance systems that (i) respect their sustainability ambitions, (ii) remain realistic in terms of data and competences, and (iii) help develop the "managerial intelligences" (analytical, systemic, relational, digital) needed to govern sustainability in practice.

It is precisely this design gap, between high-level sustainability frameworks and the everyday realities of emerging clubs, that the application of the DBSCfS seeks to address. Against this backdrop, the present work-in-progress study applies the DBSCfS to an emerging, community-embedded Italian football club that has recently transitioned from amateur to professional status. By aligning governance, strategy and management accounting around sustainability objectives, the DBSCfS is conceived as an integrated, low-overhead performance architecture tailored to the constraints of non-elite clubs. Conceptually, the study contributes to the literature on sustainability and performance management in sport by proposing and field-testing a systems-thinking, stakeholder-oriented scorecard; methodologically, it illustrates a design-science intervention in an emerging club; and practically, it develops a replicable template for operationalizing sustainability in resource-constrained football organizations. Specifically, we ask how the DBSCfS can (i) mitigate mission drift during organizational transition, (ii) enable governance–strategy–management accounting alignment under resource constraints, and (iii) support the progressive implementation of UEFA/FIGC and ESRS/GRI-oriented sustainability programs at club level.

2. Conceptual framework: the Dynamic Balanced Scorecard for Sustainability in emerging football clubs

The Dynamic Balanced Scorecard for Sustainability (DBSCfS) builds on three main streams of literature: (i) sustainability and performance management in football, (ii) the Balanced Scorecard and its sustainability extensions, and (iii) the Dynamic Performance Management framework and stakeholder-oriented approaches to sustainability in sport. It leverages a systems-

thinking logic to connect strategic resources, performance drivers and sustainability outcomes through explicit cause–effect relationships.

2.1. Sustainability and performance management in football

Recent studies have examined how professional football organisations interpret and operationalise sustainability, often through corporate social responsibility (CSR) initiatives, environmental programmes and emerging ESG frameworks. Systematic and integrative reviews highlight both the breadth of club–community initiatives and persistent strategic and organisational barriers: CSR programmes are frequently driven by marketing and legitimacy concerns, implemented through foundations or community trusts, and only partially integrated into core decision-making and control routines (Nishida et al., 2024; Rith & Spinelli, 2024). Case evidence on Juventus FC further shows how CSR communication differs between sustainability reports and social media, reinforcing the idea that sustainability is often addressed at the level of disclosure rather than embedded in internal control systems (Profumo et al., 2024).

Federation- and league-level strategies build increasing institutional pressure for clubs to align with ESG expectations and formalise their sustainability governance (FIGC, 2023; UEFA, 2021). Empirical work documents how licensing regulations and institutional pressures drive the adoption of sustainability policies and environmental programmes (Adam et al., 2025; Fernández-Villarino, 2021; Kim & Jeong, 2025; Marrucci et al., 2023) and how composite indicators such as the S-Score can be used to assess financial sustainability and resilience (Evans, 2024). At the same time, research on governance and stakeholder relations emphasizes the centrality of fans, sponsors and local communities in co-producing sustainability outcomes, while also documenting heterogeneous and selective implementation (Hernández-Hernández et al., 2023; Kim & Jeong, 2025; Lozano & Barreiro-Gen, 2023; Mura et al., 2024). In the Italian context, studies on reporting practices and bibliometric mappings highlight growing attention to sustainability in football but also fragmented approaches and capability constraints, especially outside the top tier (Agostino & Thomasson, 2025; Gallucci & Tipaldi, 2024; Tettamanzi et al., 2024)Complementary work on compliance shows that even Serie A clubs' organisational models against corporate crimes (e.g. MOG 231/2001) are often opaque, suggesting that formal control systems do not automatically ensure effective governance (Aprile et al., 2025).

Overall, this literature frames sustainability in football as a strategic and governance issue rather than a set of isolated CSR campaigns. However, two gaps remain central to our study. First, most contributions focus on top-tier clubs, mega-events or league-level strategies, while emerging and lower-tier clubs, often operating with limited resources and volunteer staff, receive comparatively less attention (Agostino & Thomasson, 2025; Gallucci & Tipaldi, 2024). Second, existing studies concentrate on external CSR/ESG practices, communication and compliance, with limited attention to the internal performance architectures needed to embed sustainability into planning, budgeting and management control routines. The DBSCfS is designed to address these gaps by offering a sustainability-centric, systems-thinking scorecard tailored to an emerging, community-embedded club.

2.2. Balanced Scorecard and sustainability-oriented extensions

The DBSCfS first builds on the strategy-to-execution logic of the Balanced Scorecard (BSC), which links a concise set of objectives and indicators across multiple perspectives to the organisation's vision and long-term goals (Kaplan, 2009; Kaplan & Norton, 1992, 2007). In its original formulation, the BSC articulates performance through four perspectives—financial, customer, internal processes, and learning and growth—and uses cause–effect chains and strategy maps to align day-to-day actions with strategic priorities.

In the sustainability field, the BSC has been adapted by adding a dedicated sustainability perspective or integrating ESG goals into the traditional four perspectives (Figge et al., 2002; Hansen & Schaltegger, 2016, 2018). These architectures highlight the potential of scorecards to connect sustainability goals with resource allocation, target setting and performance review processes, making sustainability part of mainstream management control. Journeault's (2016) Integrated Scorecard (Figure 1), for instance, explicitly embeds sustainability into a multi-perspective scorecard and links strategic objectives to financial and non-financial indicators in support of corporate sustainability strategies.

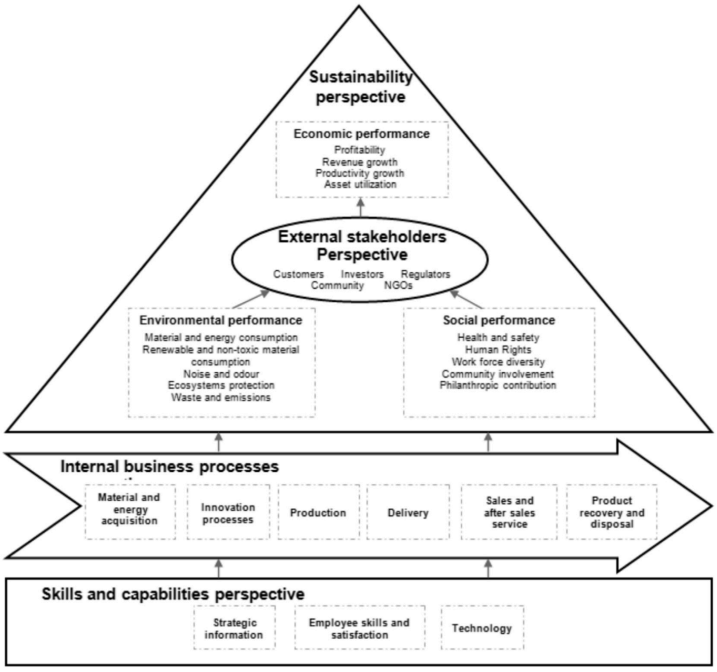


Figure 1. The Integrated Scorecard, a specific sustainability BSC. Source: Journealt (2016, p. 219)

More recent work reviews and refines SBSC architectures, stressing the need to adapt them to organisational contexts and sustainability priorities (Chehimi & Naro, 2024; Heebkhoksung et al., 2023). In sport settings, Balanced Scorecard-inspired models have been used to support strategic alignment and performance management, but typically focus on sporting, financial and customer-related outcomes, treating sustainability as just one dimension and assuming relatively high analytical and administrative capacity (Alnajjar & Suliman, 2023; Dimitropoulos et al., 2017; Lakatos et al., 2019).

The DBSCfS leverages these insights but departs from traditional SBSC approaches in two ways. First, it recenters the scorecard explicitly around sustainability by organizing objectives and indicators into three outcome perspectives—economic, social and environmental—supported by a Stakeholder perspective, rather than treating sustainability as an add-on. Second, it adapts the architecture to the constraints of emerging football clubs by enforcing parsimony (a limited number of KPIs per perspective), "data realism" (priority to data already collected in routine operations) and routine anchoring (linking review cadences to existing planning and budgeting cycles).

2.3. Dynamic Performance Management and the DBSCfS architecture

A further source of added value in the DBSCfS lies in its grounding in Dynamic Performance Management (DPM) (fig. 2), which combines system dynamics with management control to

support strategic learning in complex settings (Barnabè, 2011; Bianchi, 2016; Bianchi et al., 2015; Bianchi & Montemaggiore, 2008).

DPM emphasizes feedback structures, time delays and non-linearities, and uses causal maps and simplified simulation models to explore how policies unfold over time. In the context of sustainability, this dynamic lens helps avoid purely static dashboards by making visible how short-term decisions on, for example, ticket pricing, player recruitment, facility maintenance or community projects generate delayed consequences for revenues, fan loyalty, youth development or environmental impacts.

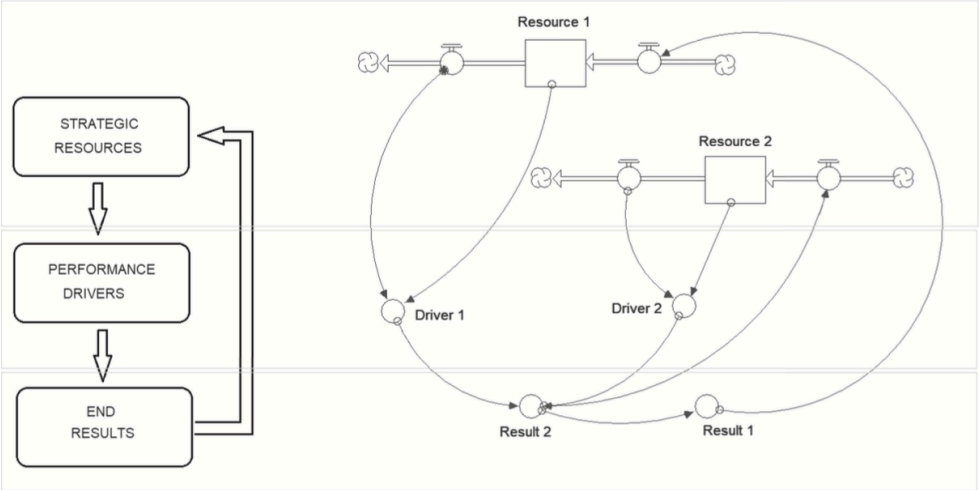


Figure 2. The Dynamic Performance Management framework. Source: Bianchi (2016, p. 73)

The DBSCfS adopts this logic by turning the scorecard into a causal architecture, where KPIs are explicitly linked through cause–effect relationships and feedback structures. By merging the dynamic perspective (Bianchi, 2016; Sterman, 2000) and the sustainability perspective (Chehimi & Naro, 2024; Figge et al., 2002; Journeault, 2016), the DBSCfS (Figure 3) also integrates a stakeholder-oriented view. Sport clubs are embedded in dense stakeholder networks that include fans, sponsors, local communities, municipalities, leagues and media (Freeman, 2010; Hautbois & Desbordes, 2023; Walker & Parent, 2010) and empirical work shows that sustainability in football is co-produced through these relationships (Anagnostopoulos et al., 2014; Kim & Jeong, 2025; Lozano & Barreiro-Gen, 2023).

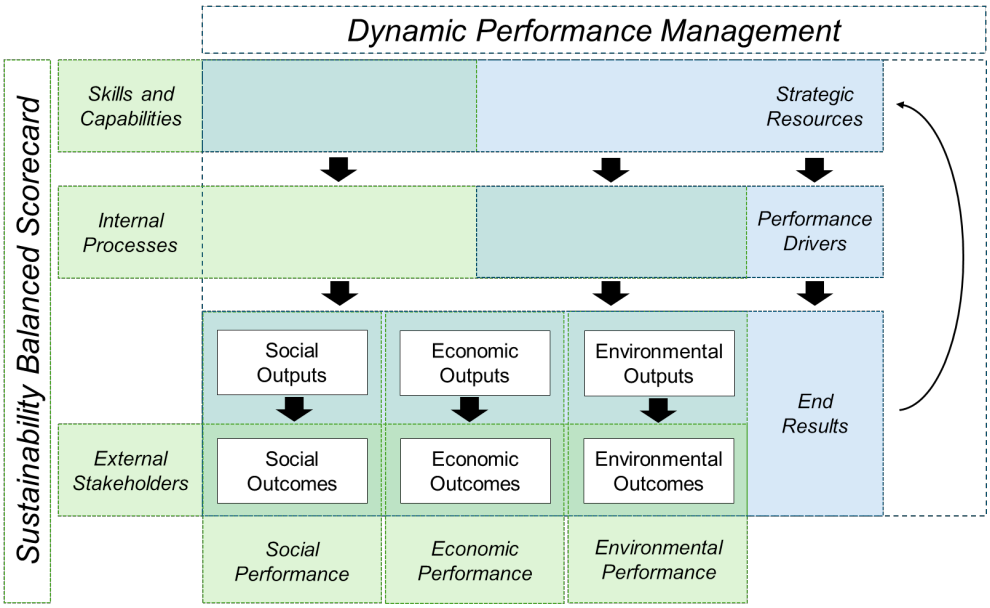


Figure 3. The Dynamic Balanced Scorecard for Sustainability. Source: Bivona & Scirè (2025)

In line with sustainability scorecard architectures and DPM logic, the DBSCfS makes stakeholder engagement explicit through a dedicated Stakeholder perspective, while treating skills/capabilities and internal processes as key enablers of sustainability performance. The DBSCfS is structured around four perspectives: (i) Economic, (ii) Social and (iii) Environmental performance outcomes, supported by (iv) a Stakeholder perspective (fans/community, sponsors and institutional partners). Within each perspective, objectives are linked to a small number of KPIs, targets, owners and review cadences, ensuring that the overall system remains low-overhead and manageable for non-elite clubs. Where possible, indicators are aligned with ESRS/GRI logics and emerging sustainability strategies in football, without reproducing their full complexity.

Available applications suggest that scorecards can support strategic alignment in football but are often calibrated for well-resourced organizations and rarely treat sustainability as the core integrative objective under resource constraints (Alnajjar & Suliman, 2023; Dimitropoulos et al., 2017; Lakatos et al., 2019). The DBSCfS responds to this gap by explicitly treating sustainability as the core integrative principle around which economic, social, environmental and stakeholder dimensions are organised, and by adapting the architecture to the realities of an emerging, community-embedded club. From a governance and learning standpoint, it is designed to cultivate four managerial intelligences—analytical, systemic, relational and digital—required to govern sustainability in emerging sport organizations. In sum, the DBSCfS is conceived as a framework-of-frameworks (Bivona & Scirè, 2025) that translates high-level sustainability principles and sport-specific evidence into a pragmatic, dynamic performance system tailored to the realities of emerging football organizations. This provides the conceptual basis for the design-science case study developed in the following sections.

3. Research design and empirical setting

This work-in-progress study adopts a qualitative, design-science single-case approach. Following design-science principles (Geerts, 2011; Hevner et al., 2004; Van Aken, 2005), we treat the Dynamic Balanced Scorecard for Sustainability (DBSCfS) as a management artifact iteratively designed and evaluated in collaboration with an emerging Italian football club. In line

with these principles, the study focuses on a relevant managerial problem (governing sustainability in an emerging club), develops and refines a solution artifact (the DBSCfS) and generates prescriptive design knowledge on how such an architecture can be implemented under resource constraints. The aim is not only to illustrate the framework, but to explore its practical feasibility through a case study (Hoeber & Shaw, 2017; Skinner et al., 2020; Yin, 2018) and its potential to activate managerial intelligence for sustainability under real-world constraints. The case is selected as a "critical" setting to stress-test feasibility, because organizational transition and resource constraints amplify risks of decoupling and mission drift. While this paper focuses on a single critical case in football, future research will extend the DBSCfS application to other emerging sport organizations (e.g., basketball/volleyball clubs and other sport organizations) to assess the robustness and transferability of the proposed architecture across sport sectors.

3.1. Empirical setting: an emerging community-embedded club

The empirical setting is Siracusa Calcio 1924 S.r.l., a community-embedded football club in Southern Italy that has recently transitioned from an amateur association to a professional limited-liability company and currently competes in Serie C, the third tier of Italian professional football. The club has alternated between professional and amateur tiers, with a recent trajectory marked by financial crisis, relegation, restart as an amateur association and a subsequent climb back through the regional leagues. This path has combined financial fragility, organizational restructuring and strong local support, as the club has remained a symbol of territorial identity and pride.

Today, the organization operates with limited managerial and financial resources but explicit ambitions to stabilize its position, consolidate its professional status and pursue sporting and organizational growth. Recently, the club has also been referred by the FIGC Federal Prosecutor to the National Federal Tribunal for administrative and financial violations related to late payment of players' wages and social-security contributions. This episode illustrates how emerging clubs, even when strongly embedded in their communities, remain exposed to governance and control weaknesses during league transitions and when facing new financial and regulatory challenges. This configuration—non-elite status, deep community embeddedness, transitional governance structure, resource constraints and recent governance tensions—makes Siracusa Calcio a particularly suitable case for stress-testing a sustainability-oriented performance architecture such as the DBSCfS.

3.2. Research phases and data collection

The research design unfolds in three main phases, combining exploratory engagement, structured inquiry and collaborative validation. Data are triangulated across (i) manager interactions, (ii) questionnaire responses and (iii) secondary sources (e.g., public financial and organizational documents and club communications).

Phase 1 – Exploratory engagement and problem validation

An unstructured exploratory meeting with club representatives from the marketing/management area was conducted to (i) understand current governance and planning routines, (ii) assess whether sustainability and community impact are perceived as strategic issues and (iii) verify interest in an integrated performance tool. This conversation confirmed both the strategic importance of community relations and long-term viability, and the absence of a structured system to monitor economic, social, environmental and stakeholder outcomes in an integrated way. On this basis, the DBSCfS was proposed as a potential guidance architecture and the club expressed willingness to engage in the subsequent phases.

Phase 2 – Questionnaire on planning, sustainability and performance monitoring

A short manager-oriented questionnaire (12 questions: nine closed, three open-ended) is administered to key decision-makers. Questions cover: (i) vision and organization of the club; (ii) performance and internal management; (iii) social commitment and territorial relations; and (iv) growth and sustainability perspectives. The questionnaire is designed to be completed in 10–12 minutes, minimizing response burden. Empirically, it provides a structured picture of planning and control practices and the implicit sustainability agenda; analytically, it offers input parameters for calibrating the DBSCfS to perceived priorities, constraints and stakeholder relationships. Closed answers will be summarized descriptively, while open answers will be analyzed through thematic coding to identify perceived priorities, constraints and expected benefits. This build–evaluate cycle is consistent with design-science research in accounting and management control, where artifacts are field-tested through case-based interventions before broader generalization (Geerts, 2011).

Phase 3 – DBSCfS instantiation and feedback session (planned)

Based on insights from Phases 1 and 2, and drawing on secondary sources (public financial data, federation documents, club communications and archival material where available), the research team will develop a first tailored version of the DBSCfS. This prototype will specify objectives, causal links and a concise set of KPIs across the four perspectives (economic, social, environmental, stakeholder), along with suggested targets, responsible roles and review cadences. The framework will be evaluated against feasibility (data availability and workload), clarity (shared understanding of objectives and links) and utility (perceived support to planning and monitoring routines).

A follow-up meeting with club managers is planned to present and discuss the prototype. The session will serve as a feedback and co-design workshop in which participants will be invited to assess the relevance and clarity of objectives and indicators, evaluate the feasibility of data collection, identify misalignments with existing routines and suggest adaptations to enhance usability. This iterative process will allow the DBSCfS to be refined into a locally grounded performance architecture, while generating qualitative evidence on how managers interpret sustainability, negotiate trade-offs and perceive the usefulness of an integrated tool. Where non-public information is used, data will be treated confidentially and reported in aggregated or anonymized form. At the current stage, Phase 1 has been completed, the questionnaire is being finalized, and the design of the DBSCfS prototype and validation workshop constitute the next steps.

4. Expected results and contributions

As this is a work-in-progress study, the empirical analysis is still underway. Nevertheless, the exploratory engagement and the design of the DBSCfS allow us to formulate some expected results and potential contributions at both theoretical and practical levels. In addition to conceptual contributions, we expect to deliver an implementable prototype (KPI set, causal map, ownership and review cadence) and to assess its feasibility with managers.

At the club level, we expect the DBSCfS to make sustainability more operationally visible and governable. By forcing the club to articulate a small set of objectives and KPIs across economic, social, environmental and stakeholder perspectives, the framework is expected to:

- clarify the trade-offs and complementarities between community-oriented initiatives, sporting ambitions and financial viability;

- reduce the current reliance on implicit knowledge and informal planning by introducing explicit targets, responsibilities and monitoring cadences;
- reveal feedback structures (e.g. how investments in youth development, facility management or fan engagement propagate over time into revenues, costs, legitimacy and risk) that are currently not systematically discussed;
- improve feasibility and accountability by linking each KPI to data sources already available at club level (e.g., administrative records, matchday operations, sponsor contracts) and to a lightweight review routine.

Initial insights from the exploratory meeting already suggest a high awareness of the club's social role and a parallel lack of structured tools for monitoring non-sporting outcomes. We therefore anticipate that the DBSCfS will act as a shared representation that helps managers from different areas (sporting, administrative, marketing, community relations) to negotiate priorities, align expectations and build a common language around sustainability. A key expected outcome is a clearer "line of sight" between initiatives, drivers, and outcomes, making sustainability discussable in regular planning and control meetings.

In relation to the three research questions, we expect that:

- regarding mission drift (RQ1), the DBSCfS will help reconnect the club's historic social mission with its current professional structure, by translating broad values (community identity, youth development, territorial embeddedness) into measurable objectives and initiatives;
- in terms of governance–strategy–management accounting alignment (RQ2), the framework will make explicit how sustainability-related choices (e.g. social programs, sponsor selection, facility upgrades) feed into the club's financial and sporting performance, and will highlight where existing accounting routines fail to capture these dynamics;
- with respect to UEFA/FIGC and ESRS/GRI alignment (RQ3), the DBSCfS will provide a lightweight platform that can host indicators and policies derived from these frameworks, without imposing their full reporting burden, thereby supporting progressive readiness for more formal assurance in the medium term. More concretely, we expect to identify a "minimum viable" subset of indicators and routines that can be progressively mapped onto external disclosure logics as capabilities mature.

From a theoretical standpoint, the study aims to contribute in at least three ways. First, it extends the emerging literature on sustainability and performance management in sport by proposing a club-level architecture that explicitly integrates sustainability into a dynamic, multi-perspective scorecard tailored to non-elite organizations. This responds to calls for tools that move beyond CSR talk and reporting towards recurring decision routines under realistic constraints. Second, it enriches the discussion on Balanced Scorecard applications in football by reframing the scorecard as a sustainability-centric, stakeholder-oriented structure, rather than a generic performance dashboard. In doing so, it bridges work on sustainability scorecards, Dynamic Performance Management and stakeholder theory within a single, football-specific framework. Third, by focusing on an emerging, community-embedded club, the study contributes to the still limited evidence on how lower-tier organizations operationalize sustainability, complementing research predominantly centered on elite clubs and major events.

Methodologically, the study illustrates how a design-science case study can be used in sport management and accounting research to co-design and test management control innovations with practitioners. The combination of exploratory interviews, a concise questionnaire and a feedback-oriented workshop is expected to yield rich insights on how club managers perceive sustainability, interpret stakeholder expectations and evaluate the usefulness of integrated performance tools. This, in turn, may inform future comparative designs involving multiple clubs or other sports. Importantly, the evaluation will focus on utility and feasibility (data availability, workload, clarity of causal links, and fit with existing routines), generating transferable design insights. In future work, we plan to replicate and adapt the DBSCfS in additional sport settings, using cross-case comparison to refine the design principles derived from the Siracusa case.

Finally, the project has practical implications for clubs and governing bodies. For clubs, the DBSCfS may serve as a replicable template to structure sustainability efforts without the immediate need for complex certifications or full-scale ESG reporting systems. For federations and leagues, the findings may inform the development of support toolkits that translate high-level strategies into actionable club-level routines, especially for organizations with limited administrative capacity. Overall, the expected contribution is to show that an appropriately calibrated Dynamic Balanced Scorecard for Sustainability can function as an enabling device for the managerial intelligence required to govern sustainability in emerging sport organizations.

Keywords: Sports governance; balanced scorecard; sustainability; systems thinking; stakeholder engagement; management control

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Esplorare le dinamiche di un modello di business born-circular: evidenze da una PMI italiana

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1. Introduzione

L'Economia Circolare (EC) è considerata una delle leve strategiche più importanti per la transizione verso lo sviluppo sostenibile (Bourdin e Jacquet, 2025). Essa rappresenta una soluzione sistemica alle inefficienze generate dal sistema lineare, promuovendo lo sviluppo di un modello rigenerativo focalizzato sull'efficienza delle risorse, la minimizzazione dei rifiuti e i processi produttivi a ciclo chiuso (Upadhyay e Shukla, 2025). In questo contesto, le piccole e medie imprese (PMI) svolgono un ruolo cruciale (Vagnoni et al., 2025) poiché, non solo rappresentano la maggior parte delle imprese nei Paesi dell'Unione Europea (UE), ma sono anche responsabili di gran parte delle emissioni globali di gas serra (OECD, 2024). Attualmente, nel dibattito accademico è possibile identificare due tipi di imprese circolari: le cosiddette imprese "born-circular", cioè imprese che sono state intenzionalmente costruite intorno a principi circolari sin dalla loro nascita, e le cosiddette imprese "growing-circular", cioè imprese consolidate che passano da modelli di business lineari a modelli di business circolari (Zucchella e Urban, 2019).

Nonostante i potenziali benefici, il percorso verso la circolarità per le PMI è spesso caratterizzato da numerosi ostacoli (Rizos et al., 2016). Diversi studi esistenti in letteratura hanno identificato diversi fattori che possono facilitare o ostacolare l'adozione di modelli di business circolari da parte delle PMI. Tra i più importanti, si menzionano: le risorse finanziarie, il capitale tecnologico e umano, le collaborazioni con partner esterni, la pressione e le crescenti aspettative da parte degli stakeholder, le dinamiche di mercato, la cultura organizzativa, il quadro normativo in cui le imprese sono inserite e il supporto governativo (Assmann et al., 2023; Kok et al., 2013; Rizos et al., 2016). Tuttavia, la letteratura esistente si è concentrata prevalentemente su grandi aziende (Bocken et al., 2025; Lepore et al., 2025; Murali et al., 2025) o sulle PMI growing-circular, mentre il contesto delle PMI born-circular è stato ampiamente trascurato (Suchek et al., 2022). Quest'ultime spesso affrontano sfide sostanziali (Ahmadov et al., 2025; Rittershaus et al., 2023) che differiscono da quelle affrontate dalle prime (Cavallo et al., 2021) e che, per questo motivo, necessitano di una maggiore attenzione e di un maggiore approfondimento.

Partendo da questo presupposto, tale ricerca si inserisce in questo filone emergente con l'obiettivo di offrire una comprensione approfondita di come un modello di business born-circular si sviluppi, evolva e si mantenga nel tempo, identificando i fattori che ne sostengono il successo e quelli che ne ostacolano il pieno consolidamento. Pertanto, sono state formulate le seguenti domande di ricerca (RQs):

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RQ1: Come si struttura e si sviluppa il modello di business circolare di una PMI born-circular?

RQ2: Quali sono i fattori chiave che permettono il funzionamento efficace e la crescita dei modelli di business circolari nelle PMI born-circular?

RQ3: Quali ostacoli incontrano le PMI born-circular nel mantenere e consolidare il loro modello di business circolare?

Per rispondere a queste domande, questo studio analizza il caso di GATIM S.r.l., una PMI calabrese attiva nel trattamento degli pneumatici fuori uso. GATIM costituisce un esempio emblematico di impresa born-circular: nasce come modello di business circolare con l'obiettivo preciso di trasformare un rifiuto problematico, lo pneumatico a fine vita, in materiali riciclati ad alta qualità, destinati a una molteplicità di applicazioni industriali.

2. Stato dell'arte

L'attenzione accademica verso l'EC è cresciuta notevolmente negli ultimi anni. I principali contributi (vedi, ad esempio, Blomsma e Brennan, 2017; Geissdoerfer et al., 2017; Kirchherr et al., 2017) considerano l'EC come un cambiamento di paradigma verso un sistema economico rigenerativo che minimizza i rifiuti e ottimizza le risorse attraverso strategie come riutilizzo, riparazione, riproduzione e riciclo. In ambito aziendale, questo cambio di paradigma si traduce nell'adozione da parte delle imprese di modelli di business circolari che vengono adottati per sviluppare modelli di produzione e consumo sostenibile (Hofmann, 2019). A differenza dei modelli lineari, i modelli di business circolari mirano a chiudere i cicli di energia e materiali (Micheaux e Aggeri, 2016) e apportano notevoli vantaggi, tra cui: una riduzione significativa delle emissioni di gas serra, l'abbattimento dei costi operativi e la promozione di modelli di consumo basati sulla sufficienza (Hofmann e Zu Knyphausen-Aufseß, 2022; Mura et al. 2024). Tuttavia, la transizione da sistemi lineari a modelli circolari nelle PMI è influenzata da una combinazione di fattori abilitanti e ostacoli strutturali. Tra i principali driver, le risorse finanziarie rappresentano un fattore cruciale: sia i fondi pubblici (sovvenzioni, contributi, prestiti bancari e governativi), sia il capitale privato facilitano l'adozione di modelli di business circolari (Aranda-Usón et al., 2019; Jakhar et al., 2019; Pan et al., 2015; Ali e Johl, 2023; Kumar et al., 2025). Alle risorse finanziarie, si aggiungono le altre risorse interne, tangibili (tecnologie, impianti, sistemi automatizzati) e intangibili (competenze, reputazione, leadership), che supportano l'implementazione e il consolidamento dei modelli di business circolari (Chaudhuri et al., 2022; Farooque et al., 2022; Koh et al., 2017; Mangla et al., 2018; Bassi e Dias, 2019; Ozkan-Ozen et al., 2020; Chowdhury et al., 2022). Inoltre, anche l'accesso a conoscenze esterne e le reti collaborative con università, centri di ricerca e altre imprese facilitano l'apprendimento organizzativo e l'adozione di strategie circolari (Horbach, 2016; Tessitore et al., 2010). La letteratura esistente dimostra che anche i fattori di mercato e normativi spingono verso la circolarità: l'efficienza delle risorse, la riduzione dei costi e la risposta alla domanda di prodotti sostenibili rappresentano vantaggi competitivi; mentre regolamenti ambientali, politiche pubbliche e pressioni di clienti e partner incentivano l'adozione di pratiche circolari (Kuik et al., 2023; Rizos et al., 2016; Govindan e Hasanagic, 2018; Mehmood et al., 2021; Ranta et al., 2018; Ghisellini et al., 2016; Park et al., 2010; Khan e Haleem, 2021; Luthra e Mangla, 2018). Tra le principali barriere, invece, figurano limiti finanziari, conoscitivi e tecnologici, che ostacolano investimenti in nuove tecnologie, progettazione di prodotti e ristrutturazione della supply chain (Dervojeda et al., 2014; Kok et al., 2013; Rizos et al., 2016; Muller e Tunçer, 2013; Saharan et al., 2024; Takacs et al., 2022; Cantú et al., 2021). Allo stesso modo, fattori culturali, come la resistenza al cambiamento e l'avversione al rischio, riducono l'impegno verso la sostenibilità (Liu e Bai, 2014; Oreg, 2003). Inoltre, inefficienze normative e istituzionali, scarsa domanda di prodotti circolari e complessità logistiche e legali limitano l'adozione di modelli di

business circolari da parte delle PMI (Calogirou et al., 2020; Linder e Williander, 2017; Sarkis et al., 2010; Assmann et al., 2023).

Tuttavia, nonostante numerosi studi abbiano indagato i fattori interni o esterni che facilitano o ostacolano l'adozione di modelli di business circolari da parte dell'imprese, le PMI born-circular rimangono un fenomeno ancora scarsamente esplorato (Suchek et al., 2022). Queste imprese sono particolarmente interessanti perché i loro modelli di business sono progettati attorno ai principi circolari fin dall'inizio, guidati non solo dal perseguimento di obiettivi economici e finanziari, ma anche dall'impegno a implementare pratiche circolari attraverso strategie e approcci innovativi (Zucchella e Urban, 2019). Il loro status di newcomer rafforza la loro credibilità, poiché vengono percepite come parte della soluzione, piuttosto che come contributori di pratiche non sostenibili (Hockerts e Wüstenhagen, 2010). Fin dall'inizio, queste imprese sviluppano reti strette per co-creare soluzioni circolari, fungendo da orchestratori di ecosistemi circolari (Aarikka-Stenroos et al., 2021).

In tale ottica, la Stakeholder Theory (ST), l' Extended Resource-Based View (E-RBV) e la Dynamic Capabilities (DC) Theory offrono strumenti analitici utili per interpretare queste dinamiche, poiché permettono di comprendere come le imprese costruiscano relazioni di valore, accedano a risorse critiche e sviluppino capacità di adattamento necessarie per competere in contesti regolatori e tecnologici in continua evoluzione. Il presente studio applica questo framework teorico integrato per esaminare il caso di GATIM, contribuendo così a colmare un vuoto nella letteratura attraverso un'analisi empirica dettagliata.

3. Metodologia

Per perseguire l'obiettivo della ricerca, il presente lavoro adotta una metodologia di ricerca qualitativa, basata su un caso studio singolo. Il caso studio singolo è ritenuto particolarmente adatto per identificare e analizzare le relazioni tra variabili all'interno di processi complessi, indagando contemporaneamente l'influenza del contesto sociale (Shah e Corley, 2006). Tra le numerose tipologie di caso studio, si è scelto di optare per un approccio descrittivo-esplorativo per analizzare le peculiarità di una PMI circolare e le opportunità e gli ostacoli che incontra nelle sue operazioni (Yin, 1984).

La scelta dell'unità di analisi è ricaduta su GATIM, una PMI calabrese considerata un precursore dell'EC, dal momento che ha messo in pratica principi circolari ancor prima che il concetto trovasse ampia collocazione nel contesto accademico e istituzionale. Inoltre, l'azienda possiede importanti certificazioni ambientali e di qualità (tra cui: ISO 14001, ISO 9001 e IEA), che testimoniano l'impegno concreto nella gestione sostenibile dei processi produttivi. Infine, operando in Calabria, una delle regioni più povere del Mezzogiorno (Eurostat, 2024), ed essendo l'unica impresa locale specializzata nel trattamento degli pneumatici fuori uso e nel riutilizzo della gomma riciclata, GATIM rappresenta un contesto ideale per analizzare i fattori abilitanti e le potenziali barriere all'adozione di pratiche circolari, considerando le specificità territoriali, socio-economiche e istituzionali.

La raccolta dei dati si è articolata in diverse fasi. In primo luogo, sono state condotte interviste semi-strutturate con il CEO, due manager e quattro dipendenti, con l'obiettivo di ricostruire la storia dell'impresa, comprendere il suo modello di business ed esplorare i fattori abilitanti e gli ostacoli che l'impresa incontra nell'implementazione di pratiche circolari. Le interviste sono state condotte separatamente, in italiano, registrate e, successivamente, trascritte e analizzate utilizzando un approccio di codificazione tematica, che ha garantito la validità della ricerca aderendo al rigore metodologico (Kvale, 1995). Per garantire la triangolazione dei dati, le interviste sono state poi integrate con documenti ufficiali disponibili sul sito web dell'azienda e con dati finanziari, ricavati dal database AIDA e dai bilanci aziendali, che hanno permesso di comprendere la solidità economica dell'impresa e la capacità di finanziare progetti di innovazione.

4. Risultati e discussione

I risultati di questo studio mostrano che GATIM rappresenta un esempio significativo di impresa born-circular, in cui sostenibilità e performance economica sono strettamente integrate. Fondata circa venticinque anni fa con l'obiettivo di gestire e trattare pneumatici fuori uso, l'impresa ha da subito adottato processi meccanici per il recupero dei materiali, evitando trattamenti chimici o termici, e producendo granulati di gomma certificati e prodotti finiti derivati dai materiali riciclati. Il modello di business si basa su due principali flussi di ricavo: da un lato, l'azienda opera come soggetto certificato nel sistema nazionale di gestione degli pneumatici fuori uso, ricevendo remunerazioni dai consorzi autorizzati per la raccolta e il trattamento di questi ultimi; dall'altro, commercializza le materie prime secondarie e i prodotti finiti, a livello nazionale e internazionale. Questo duplice approccio mostra come, per GATIM, la sostenibilità non sia solo un imperativo ambientale, ma anche un driver diretto di valore economico e competitività.

Diversi fattori interni ed esterni concorrono allo sviluppo del suo modello di business circolare.

La solidità finanziaria dell'impresa, sostenuta da una gestione prudente e dal reinvestimento dei profitti, permette di finanziare investimenti tecnologici e progetti innovativi senza dipendere eccessivamente dal credito esterno, anche se la complessità burocratica rimane un ostacolo da superare.

Il capitale tecnologico gioca un ruolo centrale: gli investimenti in eco-innovazioni e tecnologie avanzate consentono di trattare gli pneumatici fuori uso con elevata precisione, riducendo scarti e contaminazioni, migliorando l'efficienza dei processi e creando opportunità di mercato innovative. In questo modo, la tecnologia diventa una leva strategica non solo per la qualità dei prodotti, ma anche per la competitività complessiva dell'impresa.

Il capitale umano e la cultura organizzativa si rivelano altrettanto cruciali. La leadership del CEO e del top management, profondamente orientata alla sostenibilità, guida le decisioni strategiche e promuove l'adozione di eco-innovazioni, mentre le competenze operative degli operatori rappresentano un know-how insostituibile per la gestione dei processi. L'investimento nella formazione, nella sicurezza e nel benessere dei dipendenti consolida una cultura condivisa della circolarità, che permea ogni fase della produzione e facilita l'innovazione continua.

Anche le collaborazioni esterne si confermano fondamentali per favorire eco-innovazioni e pratiche circolari. GATIM collabora con consorzi, associazioni di settore, fornitori e università, come dimostrato dalla partnership con l'Università di Granada per lo sviluppo di un calcestruzzo autoriparante. Tuttavia, la scarsità all'interno del territorio di reti consolidate di Open Innovation e di infrastrutture di ricerca e sviluppo (R&S), limita la possibilità di sviluppare eco-innovazioni congiunte, sottolineando l'importanza di ecosistemi dell'innovazione ben strutturati per supportare le PMI circolari. In tali ecosistemi emerge, inoltre, il contributo potenziale degli intermediari dell'innovazione, come gli incubatori di impresa, che collegano i "searchers" (organizzazioni che affrontano una sfida di open innovation) con i "solvers" (individui o entità in grado di fornire soluzioni), nel facilitare il co-sviluppo di eco-innovazioni circolari.

Il contesto istituzionale e regolamentare rappresenta al contempo un vincolo e un'opportunità. Le certificazioni ottenute dall'impresa (ISO 14001, ISO 9001, IEA e Remade in Italy) confermano la capacità di adattarsi alle normative e di trasformarle in vantaggi competitivi, mentre la complessità dei regolamenti e i continui cambiamenti richiedono continui investimenti in certificazioni e strumenti tecnici. I fondi pubblici e gli incentivi regionali rappresentano strumenti strategici per l'innovazione, ma le procedure complesse ne limitano spesso l'efficacia.

Infine, fattori sociali e culturali influenzano lo sviluppo del modello di business circolare. La percezione diffusa di minore qualità dei prodotti riciclati e la limitata consapevolezza sui benefici dell'EC tra clienti e imprenditori locali costituiscono barriere culturali rilevanti. Queste sfide richiedono strategie di educazione del mercato e sensibilizzazione per favorire una più ampia adozione della circolarità.

5. Conclusioni

I risultati di questo studio dimostrano che GATIM, in qualità di PMI born-circular, ha sviluppato un modello di business circolare capace di integrare i principi di sostenibilità ambientale con la creazione di valore economico. Tale modello emerge dall'interazione di molteplici fattori: il capitale finanziario garantisce stabilità operativa e possibilità di investimento; il capitale tecnologico assicura qualità produttiva, efficienza e performance ambientale; le collaborazioni esterne offrono conoscenze complementari e opportunità di sperimentazione. Il capitale umano e una struttura organizzativa orientata alla sostenibilità supportano l'implementazione quotidiana delle pratiche circolari, mentre fattori sociali e culturali, come lo scetticismo verso i prodotti riciclati, condizionano l'accettazione di mercato. Il sostegno governativo aumenta la capacità di innovazione, mentre il quadro normativo rappresenta allo stesso tempo sia un vincolo che un'opportunità, influenzando compliance e pianificazione strategica. Complessivamente, questo caso studio evidenzia come la circolarità, se incorporata fin dall'inizio, possa costituire un modello di business sostenibile e redditizio, capace di generare valore economico e promuovere pratiche di produzione e utilizzo delle risorse più responsabili.

Dal punto di vista teorico, lo studio contribuisce ad ampliare la comprensione delle PMI born-circular, un ambito ancora poco esplorato, identificando i fattori che ne facilitano o ostacolano lo sviluppo e distinguendo chiaramente le imprese born-circular dalle growing-circular. I risultati confermano, coerentemente con la ST, che una PMI born-circular può creare valore sociale e ambientale mantenendo solide performance economiche. In linea con l'E-RBV, invece, lo studio dimostra che il vantaggio competitivo non dipende solo dalle risorse interne, ma anche dall'integrazione strategica di risorse esterne, relazionali e ambientali. Infine, dal punto di vista della DC Theory, lo studio evidenzia l'importanza di riconfigurare costantemente le risorse per rispondere a cambiamenti normativi, variazioni di mercato e sfide ambientali, trasformandole in opportunità di creazione di valore.

Sul piano pratico, i risultati suggeriscono che i manager di una PMI born-circular dovrebbero adottare una gestione finanziaria prudente per facilitare l'accesso al credito, investire in eco-innovazioni per migliorare qualità ed efficienza dei prodotti, e sviluppare collaborazioni esterne per compensare il vincolo imposto dalla disponibilità limitata di risorse interne, facendo leva anche sull'attività svolta dagli intermediari dell'innovazione, così da ridurre i rischi legati a comportamenti opportunistici dei partner. Partendo da questi presupposti, la formazione del personale e l'integrazione delle idee dei dipendenti nei processi di innovazione sono cruciali, così come la capacità di accedere ai finanziamenti pubblici e di riconfigurare rapidamente le risorse in risposta ai cambiamenti normativi. Infine, le imprese dovrebbero promuovere iniziative pubbliche per migliorare la comprensione e l'accettazione dei prodotti circolari tra i consumatori.

Anche i policymaker possono trarre indicazioni importanti dal presente studio. In particolare, questi dovrebbero cercare di ridurre la complessità normativa, semplificare le procedure burocratiche per l'accesso al credito e ai fondi pubblici, investire in infrastrutture per la R&S e favorire ecosistemi collaborativi, ad esempio attraverso la realizzazione di incubatori o la concessione di finanziamenti per progetti di ricerca universitari. Questi suggerimenti potrebbero rilevarsi strategie importanti per favorire la transizione verso modelli di business circolari. Allo stesso modo, incentivi per la formazione dei lavoratori e campagne di sensibilizzazione sul valore dei prodotti circolari possono favorire ulteriormente la consapevolezza pubblica sui benefici delle pratiche circolari.

Il presente studio non è esente da limitazioni. Innanzitutto, prende in considerazione un unico caso, inserito in un contesto territoriale e settoriale specifico, e questo potrebbe limitare la generalizzabilità dei risultati. In secondo luogo, l'approccio qualitativo, basato su dati auto-riportati, può introdurre interpretazioni soggettive e bias di risposta. Infine, l'analisi si concentra principalmente su dinamiche aziendali e regionali, senza esplorare in profondità dimensioni

nazionali o internazionali. Queste limitazioni aprono diverse direzioni per ricerche future, come studi comparativi multi-case tra settori e regioni, analisi quantitative per testare empiricamente i fattori identificati, e indagini longitudinali per comprendere come le PMI born-circular evolvono in risposta a cambiamenti normativi, tecnologici e di mercato.

Parole chiave: Economia circolare; PMI; modelli di business circolari; caso studio

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Value Logics and Collaborative Choices: How Private Firms Engage with Grand Challenges

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1. Introduction

In the current geopolitical landscape stronger partnerships are imperative to address global challenges. This need is emphasized by the European Investment Bank in its Global Impact Report (2025), which highlights the importance of cooperation in establishing sustainable connections for goods, people, and services. Such collaboration promotes sustainability, in fact, Grand Challenges are also partially reflected in the UN Sustainable Development Goals (SDGs) (Brammer et al., 2019). The concept of Grand Challenges (GCs) refers to global issues such as climate change, water scarcity and human rights protection. All these phenomena are characterized by distinctive elements: they are large in scale, complex, intractable, evaluative, uncertain, often consist of diverging and paradoxical interests, needs, and goals of different societal groups. Given these characteristics, GCs can plausibly be addressed only through collaborative action, asking for multi-stakeholder and multisectoral solutions (Brammer et al., 2019; Cloutier et al., 2025; Ferraro et al., 2015; George et al., 2016, 2024). Accordingly, the United Nations recognises cross-sectoral partnerships essential to address GC and particularly those linked to the SDGs (Vogel et al., 2022).

Effectively addressing GCs demands coordinated action at all levels. Public organizations today operate under pressure to optimize resource management, improve outcomes, and control costs. This creates the need for collaboration with private and nonprofit organizations, to achieve public goals (Cabral et al., 2019). The private sector is therefore considered crucial for sustainable development and plays a fundamental role in supporting public-sector efforts (OECD, 2021). Its importance is especially highlighted in SDG 17, that promotes multi-stakeholder partnership to advance the SDGs achievement (Zverev et al., 2023). Private sector actors may contribute to public value creation, sustainability and innovation not only for financial reasons, but also to pursue legitimacy or influence. Partnerships grounded in authentic commitment can generate greater value than traditional governance arrangements (Cabral et al., 2019). This suggests that moral and value-based motivations can be as significant as economic incentives in shaping collaborative responses to societal challenges, particularly within the context of Grand Challenges.

2. Relevance of the problem

Grand Challenges have become a central point of interest in organizational and management studies due to their global and multidimensional nature (Ferraro et al., 2015). Recent organizational literature defines cross-sector partnerships as a key mechanism to tackle these phenomena. Yet, the organizational difficulties they entail are not merely external contingencies but constitute an inherent part of challenges themselves (George et al., 2024).

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In particular, the complexity of Grand Challenges, and the persistent difficulty in effectively addressing them, arises largely from the multitude of actors involved and the interconnected ways in which they interact but also from their plural, value-laden, and deeply moral nature. Collaboration success thus requires alignment among heterogeneous actors (Cloutier et al., 2025; Ferraro et al., 2015; George et al., 2016). Consequently, despite widespread calls for cooperation, collaborative efforts often falter due to tensions stemming from diverging values, priorities, and practices among actors.

Private sector companies are increasingly called upon to engage with GCs, especially within global supply chains and they recognize that acting in isolation is ineffective (Ferraro et al., 2015). However, as Ferraro et al. (2015) observe, organizations themselves face unique internal constraints linked for instance to deep uncertainty regarding both future outcomes and the social recognition of their actions, as well as to the diverse interactions implicating potentially conflicting criteria of worth. Ultimately, the inherent complexity of the system conflicts with the short-term objectives that companies are typically expected to pursue.

This leads to new research opportunities: while literature acknowledges collaboration across sectors is a pivotal aspect of cross-sector partnerships, it offers a limited understanding of how tensions arising from divergent sectoral logics and decision-making approaches could be managed (Vogel et al., 2022). Management research has traditionally emphasized the economic aspects of collaboration, often overlooking the dimension of values and justification. However, approaches grounded solely in economic or technical considerations and assuming that actors are primarily guided by rational self-interest have shown limited effectiveness in addressing Grand Challenges (Cloutier et al., 2025; George et al., 2016). Cloutier et al. (2025) argue that research on these issues cannot be based exclusively on frameworks centred on efficiency or participation as previously suggested by Ferraro et al. (2015). Therefore, an approach that accounts for the plurality of moral perspectives and the diverse justifications that actors bring to collaborative efforts is needed. To this end, Cloutier et al. (2025) propose the Economies of Worth (EoW) framework. This perspective can be considered a suitable lens to examine which orders of worth are prioritized by actors to justify their decision- making in the context of GC.

3. Research objectives and research question

Understanding how to collaborate more effectively is crucial for addressing Grand Challenges. This recognition directly informs the research question, as prior studies have only begun to identify the organizational principles that support successful partnerships and help navigate the managerial tensions they entail (George et al., 2024).

Building on key insights emerging from the literature - namely, the growing engagement of companies in tackling Grand Challenges; the value-based difficulties inherent in cross-sector cooperation; and the recognition that existing collaborative forms (e.g. Public-Private Partnerships, Business–Nonprofit Partnership, Public-Private-People-Policy Partnerships) each entail specific trade-offs with no clear strategy guaranteed to produce effective outcomes (Brammer et al., 2019) - this study, which focuses on private firms perspective as they represent one of the key actors in tackling such challenges, seeks to answer the following research question: How do private firms evaluate different forms of collaboration in response to Grand Challenges, and which value logics or motivations influence their decisions?

More specifically, this study investigates which collaborative instruments private companies consider most appropriate for addressing large social and environmental issues, and which orders of worth are mobilized and come to dominate their collaborative decision-making.

This research offers an original contribution by examining why firms favour specific forms of collaboration. Understanding these motivations is critical, as effective cross-sector partnerships often depend on some degree of value alignment and compromise. Successful collaborations typically evolve through mutual learning and a certain degree of adaptation to the institutional

norms and practices of other sectors (Vogel et al., 2022). Similarly, Ferraro et al. (2015) emphasizes that effective collaboration relies on multivocality that is the capacity to accommodate multiple perspectives and interpretations, enabling actors with different value systems to coordinate without requiring full consensus.

4. Theoretical and methodological framework

Dominant studies on GCs have largely relied on institutional theory, emphasizing the role of norms, rules, and logics in guiding organizational behaviour toward societal concerns (Ferraro et al., 2015). The present research adopts a different theoretical lens by employing the Creating Shared Value (CSV) (Porter and Kramer, 2011) perspective and the Economies of Worth (EoW) framework (Boltanski and Thévenot, 2006). This theoretical shift is motivated by the observation that while CSV posits that firms can simultaneously generate economic value and address societal issues, assuming a win-win scenario, it tends to oversimplify complex social problems and assumes that business and social interests always align (Crane et al., 2014). The EoW framework offers a more nuanced and pluralistic perspective helping to understand how actors justify their actions based on different value orders, and how compromises or conflicts emerge when these justifications collide (Cloutier et al., 2025). This combination allows to understand the interplay between economic incentives and value considerations in cross-sector collaboration. Moreover, by combining EoW and CSV frameworks, this study also moves beyond overly simplified assumptions of collaboration, like those commonly found in stakeholder theory, which tend to presume alignment failing in accounting for tensions and negotiations dynamics at play (Ferraro et al., 2015).

Methodologically, a qualitative, inductive approach is adopted with semi-structured interviews as the primary data source. This allows insights to emerge directly from the raw data rather than being constrained by predefined methodological structures (Thomas, 2006). Given the limited availability of empirical studies, semi-structured interviews will be conducted. This approach facilitates conversational flexibility and mutual engagement, enabling participants to actively shape the dialogue (Yin, 2016). A purposive sample will be drawn up by reviewing the latest sustainability reports of companies listed in the STOXX 50 index. Firms will be selected if they explicitly report engagement in at least one partnership of any kind, targeting a Grand Challenge related to their core business operations. Within each selected company, Sustainability Managers will serve as key informants, given their central role in sustainability strategy and partnership management. Where responsibilities are shared or other relevant actors are indicated, a snowball sampling technique will be applied to include additional participants (Wanner and Miljand, 2025; Yin, 2016).

Data collection is currently ongoing and is expected to include 10–15 interviews. Key aspects to be investigated include organizational motivations for engaging with specific Grand Challenges, dynamics and values underpinning partnerships, expected impacts and objectives, emerging issues in collaboration and their possible causes. The theoretical framework serves as an orienting and interpretive guide rather than a prescriptive model. In this study, conceptual themes are identified inductively from the interviews and subsequently interpreted in light of the different “Worlds of Worth” identified in the EoW framework (i.e. inspired world, domestic world, world of fame, civic world, market world, industrial world) (Cloutier et al., 2025), in order to interpret the underlying meanings and values that shape managers’ collaborative preferences when addressing GCs.

5. Scientific contributions

This study seeks to provide contributions to the literature on Grand Challenges and cross-sector collaboration, advancing both theoretical understanding and practical implications. First,

due to the uncertain and evaluative nature of Grand Challenges it is not possible to determine in advance which forms of collaboration lead to the best outcomes (Brammer et al., 2019; Ferraro et al., 2015). By investigating which tools companies prefer and the reasons behind their choices, this research offers valuable insights into real-world organizational decision-making. Interviewees are expected to reveal practical constraints such as limited time, resources, or institutional support that may hinder the implementation of certain collaborative approaches, providing actionable knowledge for managers seeking to design more feasible and effective interventions. Understanding these motivations is particularly important given the evaluative nature of Grand Challenges, where multiple, often conflicting values coexist, and where economic incentives alone are insufficient to explain organizational behaviour (Cloutier et al., 2025; George et al., 2016). These insights have direct implications for managers and policymakers, helping practitioners anticipate potential sources of tension or alignment when forming cross-sector partnerships.

Additionally, this research offers an integrated view of multiple forms of collaboration within a single comparative framework. Whereas prior research has examined different forms of collaboration in isolation (Vogel et al., 2022), the present study addresses this fragmentation offering a holistic understanding of how different mechanisms contribute to addressing Grand Challenges. Such a comprehensive perspective is valuable for practitioners seeking to select collaborative instruments in ways that maximize social and environmental impact.

Taken together, these contributions advance understanding of how private firms engage with Grand Challenges. By highlighting the interplay between preferred tools, underlying values, and organizational constraints, the study offers actionable insights for managers and policymakers seeking to design value-aligned partnerships, balancing operational efficiency and societal impact, ultimately fostering sustainable value creation across sectors.

6. Expected results

Existing literature highlights the importance of fostering trust and interaction among cross-sector partners, particularly through individuals capable of bridging institutional logics.

These actors who are open-minded and have experience in other sectors are often able to promote mutual understanding (Vogel et al., 2022). While this is certainly a valuable avenue, further progress can be made through the research itself, particularly by conducting empirical investigations to uncover how systemic factors, rather than isolated individuals, can shape effective collaborative initiatives allowing them to move beyond the dominant view that attributes collaboration success to individual visionary agents.

Interviews are expected to reveal value-based compromises to foster alignment across actors. For instance, some firms may assign value to certain forms of collaboration by referring both to operational efficiency (market world) and to the pursuit of the common good (civic world). Such cases would illustrate points of convergence between different moral logics, showing how organizations draw on multiple justifications when making complex decisions. At the same time, constraints such as limited time, resources, or support may hinder engagement in more inclusive collaboration forms. These examples would offer valuable insights into how tensions between values, goals, and organizational constraints influence choices around engagement. More broadly, many firms are likely finding themselves negotiating between conflicting imperatives, such as the aspiration to do good and contribute to social progress versus the pressure to deliver short-term performance results.

These findings aim to contribute to the development of an analytical framework that can be extended to other actors including public institutions and NGOs. By adopting an integrative and comparative perspective this approach would enhance a deeper understanding of what is perceived as relevant, irrelevant, or desirable yet constrained by organizational barriers. These

insights can improve mutual understanding among stakeholders and ultimately foster more effective, value-aligned, and sustainable forms of collaboration in addressing Grand Challenges.

Keywords: Grand challenges; value logics; cross-sector collaboration; corporate decision-making; sustainable value creation; common good

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Assurance ESG e costo del debito: evidenze empiriche sulla credibilità dell'informativa di sostenibilità

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1. Obiettivi e domanda di ricerca

Negli ultimi anni, la crescente rilevanza delle tematiche ambientali, sociali e di governance (ESG) ha trasformato in profondità i sistemi di rendicontazione e controllo aziendale (Hazaea et al., 2022). L'adozione della Corporate Sustainability Reporting Directive (CSRD) (Direttiva UE 2022/2464 recepita con il D.Lgs. 125/2024) ha segnato un punto di svolta nell'evoluzione della disclosure di sostenibilità, imponendo alle aziende obblighi più stringenti in termini di trasparenza, comparabilità e affidabilità delle informazioni non finanziarie. Tale normativa, che sostituisce la precedente Direttiva 2014/95/UE NFRD (recepita in Italia dal D.Lgs. 254/2016), prevede l'estensione progressiva dell'obbligo di rendicontazione e, soprattutto, l'introduzione della revisione obbligatoria dell'informativa di sostenibilità da parte di un soggetto indipendente, dando origine alla nuova figura professionale del revisore della sostenibilità.

In questo quadro regolatorio, l'assurance dei bilanci di sostenibilità assume un ruolo strategico non soltanto come presidio di conformità, ma anche come strumento di legittimazione esterna verso gli stakeholder (Simnett et al., 2007).

Già Kolk & Perego (2010) in uno studio pionieristico su scala internazionale, hanno individuato i principali fattori che spiegano l'adozione dell'assurance dei report di sostenibilità, sottolineando come essa risponda a logiche di visibilità, pressione istituzionale e legittimazione sociale. Questo approccio anticipa la visione moderna dell'assurance come strumento di riduzione del rischio reputazionale, oltre che come segnale di responsabilità e trasparenza verso il mercato.

L'assurance contribuisce infatti ad accrescere la credibilità e l'affidabilità delle informazioni ESG, migliorando la percezione di trasparenza da parte degli stakeholder e potenzialmente incidendo sul rischio finanziario e sul merito creditizio (Casey & Grenier, 2014). L'attenzione verso questi temi è particolarmente rilevante nei settori Energy & Utilities, che, secondo la classificazione GICS (Global Industry Classification Standard), comprendono le imprese energetiche e quelle fornitrici di servizi pubblici essenziali, quali energia elettrica, gas e acqua. Questi settori sono caratterizzati da elevato impatto ambientale, intensità di capitale, alta visibilità pubblica e rilevanza regolatoria, fattori che amplificano l'esigenza di accountability e di assurance (Imperiale et al., 2023). All'interno di tale cornice, si propone di analizzare il legame tra il livello e la qualità dell'assurance dell'informativa di sostenibilità e il costo del debito delle imprese italiane appartenenti ai settori Energy & Utilities. L'obiettivo è comprendere se e in che misura un'assurance volontaria piuttosto che obbligatoria possa favorire una migliore valutazione ESG e un minor costo del capitale di debito, fungendo così da leva di fiducia finanziaria e da strumento di valorizzazione reputazionale verso il mercato e gli stakeholder (Dhaliwal et al., 2011). Il presente contributo intende esplorare il ruolo dell'assurance dell'informativa di sostenibilità come

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determinante del rischio percepito e del merito creditizio aziendale e in particolare, nel settore Energy & Utilities. Lo studio si concentra sugli effetti finanziari, indagando la relazione tra l'assurance ed il costo del debito nel contesto istituzionale italiano.

Questo obiettivo si declina nelle presenti domande:

- RQ1. L'attività di assurance sul bilancio di sostenibilità contribuisce alla riduzione del costo del debito per le imprese?
- RQ2. L'assurance volontaria sul bilancio di sostenibilità è associata a una diminuzione del costo del debito più marcata rispetto all'assurance obbligatoria?

Le risposte a queste domande consentiranno di valutare se il processo di assurance possa essere interpretato come uno "strumento operativo aziendale" in grado di integrare sostenibilità, governance e strategia finanziaria.

L'analisi propone una prospettiva originale, che consente di osservare l'assurance come leva economico-finanziaria, e non solo come adempimento normativo o segnale di responsabilità sociale.

Inoltre, la ricerca valorizza la recente figura del revisore della sostenibilità, destinata a diventare parte integrante dei processi di governance e delle strategie di comunicazione finanziaria. L'obiettivo è comprendere se la qualità e l'esito dell'assurance possano costituire un indicatore anticipatore della solidità finanziaria e reputazionale, con effetti tangibili sul costo del capitale e sull'accesso ai finanziamenti sostenibili.

2. Revisione della letteratura

Sebbene la rendicontazione di sostenibilità sia ormai una prassi diffusa a livello globale, essa non sempre riesce a generare un adeguato livello di fiducia pubblica, a causa di problemi di completezza, coerenza e verificabilità delle informazioni (Fatemi et al., 2018); il tema cruciale è la credibilità delle informazioni contenute nei report di sostenibilità e del ruolo dell'assurance indipendente nel rafforzare la fiducia degli stakeholder nei confronti di tali documenti (García-Sánchez et al., 2023). La crescente eterogeneità nei formati di reporting e nella qualità dei dati forniti ha infatti alimentato dubbi sulla reale affidabilità delle dichiarazioni aziendali in materia ambientale e sociale. In risposta a tale deficit di fiducia, un numero crescente di imprese ha iniziato a corredare i propri report di sostenibilità con dichiarazioni di assurance indipendenti, redatte da revisori contabili o da consulenti specialisti, con l'obiettivo di accrescere la trasparenza e la legittimazione verso gli stakeholder (Gürtürk & Hahn, 2015).

Lo studio di Hodge et al., (2009) si propone dunque di colmare questa lacuna, analizzando sperimentalmente se e in che misura la presenza di un'assurance e il tipo di provider (società di revisione contabile vs. consulente specializzato) influenzino la fiducia degli utenti e le loro percezioni di credibilità rispetto alle informazioni di sostenibilità. I risultati dello studio mostrano che la presenza di un'assurance ha un effetto significativamente positivo sulla percezione di credibilità dei report, sia in termini di dati quantitativi che di dichiarazioni qualitative. Gli utenti attribuiscono maggiore affidabilità e attendibilità alle informazioni quando queste sono accompagnate da una verifica indipendente, rispetto ai report privi di assurance. Per quanto riguarda il tipo di assurance provider, i risultati indicano un effetto marginale ma significativo: i report sono percepiti come più credibili quando l'assurance è fornita da una società di revisione contabile, specialmente se di alto profilo (Big Four). Gli autori interpretano questa interazione come un segnale che gli utenti tendono ad associare maggiore fiducia ai revisori contabili per via della loro reputazione professionale e della familiarità con le formule linguistiche tipiche delle revisioni finanziarie.

Lo studio di Simnett et al., (2007) rappresenta uno dei primi contributi nell'analisi empirica del mercato internazionale dell'assurance volontaria sui report di sostenibilità, ponendosi l'obiettivo di comprendere i fattori che determinano la decisione delle imprese di ricorrere a un soggetto indipendente per la verifica delle informazioni non finanziarie e la scelta del tipo di

assurance provider. Gli autori collocano la loro indagine nel contesto del crescente sviluppo, a partire dai primi anni Duemila, della rendicontazione di sostenibilità come risposta alla maggiore consapevolezza globale sui temi ambientali e sociali, nonché alla percezione che il reporting finanziario tradizionale non fosse più sufficiente a rappresentare in modo completo il valore e la performance aziendale. In tale scenario, la verifica indipendente delle informazioni di sostenibilità assume un ruolo cruciale nel rafforzare la credibilità e la legittimazione delle imprese nei confronti degli stakeholder. I risultati evidenziano che la propensione a richiedere assurance è significativamente più alta per le imprese di maggiori dimensioni, appartenenti a settori ad alta visibilità e impatto ambientale o sociale.

Lo studio di Kolk & Perego (2010) rappresenta uno dei primi tentativi sistematici di analizzare, in chiave comparativa internazionale, i fattori che determinano l'adozione volontaria di dichiarazioni di assurance nei report di sostenibilità. Gli autori collocano la loro ricerca nel contesto dell'espansione delle pratiche di reporting ambientale e sociale e dell'emergere di una crescente richiesta di servizi di assurance non finanziaria. I risultati empirici confermano che la probabilità di adottare una dichiarazione di assurance è più elevata nei Paesi con orientamento stakeholder (code law), dove la responsabilità sociale è parte integrante delle aspettative istituzionali, e nei Paesi con sistemi legali deboli, dove la verifica esterna svolge una funzione sostitutiva rispetto a meccanismi di governance e controllo meno sviluppati.

Questi risultati indicano che la domanda di assurance emerge non solo come risposta a vincoli regolatori o reputazionali, ma anche come riflesso del contesto socio-istituzionale in cui le imprese operano. In uno studio successivo (Perego & Kolk, 2012), si conferma il ruolo delle istituzioni nazionali nella formazione delle pratiche di accountability e si riconosce l'importanza delle capacità gestionali e delle competenze professionali sia delle imprese che dei fornitori di assurance nel modellare la qualità e l'efficacia delle verifiche. Dal punto di vista settoriale, i tassi più elevati di assurance volontaria si riscontrano nei comparti ad alta visibilità o impatto ambientale, come oil & gas, utilities e chimica.

Gli autori mettono in luce i limiti del mercato dell'assurance, ancora frammentato e poco trasparente, e avvertono che la proliferazione di standard e provider eterogenei può compromettere la credibilità delle pratiche di verifica agli occhi degli stakeholder. Nonostante un miglioramento nel tempo, la qualità media delle assurance rimane modesta, suggerendo un rischio di adozione simbolica più che sostanziale, in linea con la logica dei "rational myths" descritta dalla teoria neo-istituzionale.

Al-Shaer & Zaman, (2018) verificano che la presenza di audit committee della sostenibilità tra gli organi societari aumenti la credibilità delle dichiarazioni non finanziarie, evidenziando come caratteristiche quali indipendenza, competenza finanziaria e intensità dell'attività svolta siano positivamente associate alla decisione di ricorrere all'assurance volontaria. I risultati mostrano che tali comitati esercitano un effetto incrementale rispetto agli altri meccanismi di governance, rafforzando la qualità percepita dell'informativa, anche attraverso la scelta di provider di assurance maggiormente qualificati.

Lo studio sperimentale di Reimsbach et al., (2018) dimostra che l'assurance esterna emerge come un fattore determinante: quando le informazioni di sostenibilità sono certificate da un verificatore indipendente, gli investitori attribuiscono maggiore credibilità e rilevanza decisionale a tali dati, valutano più positivamente la performance ESG dell'impresa e manifestano una maggiore propensione all'investimento. L'effetto positivo dell'assurance risulta attenuato nei report integrati, poiché la presenza dell'audit finanziario obbligatorio genera un "bias" cognitivo: gli investitori tendono a estendere la percezione di affidabilità anche alle informazioni ESG non verificate, sopravvalutandone la credibilità.

Di contro, uno studio di Alon & Vidovic, (2015) evidenzia che l'assurance non ha alcun effetto diretto e significativo sulla reputazione, poiché gli stakeholder non sembrano interpretarla come un segnale distintivo di maggiore affidabilità o impegno; è la performance, non l'assurance, a determinare il posizionamento reputazionale in ambito ESG.

Lo studio di Weber et al., (2010) analizza l'integrazione dei criteri di sostenibilità nei processi di credit risk management, dimostrando empiricamente che le performance economiche, ambientali e sociali delle imprese incidono in modo significativo sulla loro affidabilità creditizia. Inoltre, un recente studio di Chen & Wu (2024) ha analizzato le aziende quotate sul mercato di Taiwan e ha evidenziato che il costo del debito per le aziende che rilasciano rapporti di sostenibilità con assurance esterna è inferiore ad altri, il che può essere associato alla riduzione dell'asimmetria informativa tra un'azienda e le sue parti interessate. Tuttavia, viene evidenziato anche che l'assurance, da sola, non è sufficiente a determinare una riduzione del costo del debito. Al contrario, una maggiore copertura mediatica di notizie negative riguardanti la responsabilità sociale tende ad aumentarlo, indicando che tali notizie rappresentano un elemento rilevante nelle valutazioni dei creditori.

Nonostante la crescente letteratura sul legame tra performance ESG, assurance dell'informativa di sostenibilità e costo del capitale di debito, permangono rilevanti aree di incertezza che giustificano ulteriori approfondimenti empirici. Gli studi esistenti forniscono evidenza di un'associazione negativa tra disclosure ESG e costo del debito, attribuendo tale relazione principalmente alla riduzione delle asimmetrie informative e del rischio percepito dai finanziatori. Inoltre, a seguito dell'introduzione della figura del revisore della sostenibilità, emerge l'esigenza di analizzare l'assurance ESG non solo come strumento di compliance normativa o segnale reputazionale, ma come potenziale leva di governance finanziaria capace di incidere in modo misurabile sulle valutazioni del rischio di credito.

In particolare, valutare se e in che misura l'assurance volontaria produca un effetto incrementale rispetto a quella obbligatoria, configurandosi come un segnale di maggiore qualità della governance aziendale e di una maggiore attenzione alle tematiche sulla sostenibilità ambientale e sociale, soprattutto in settori ad alta intensità di capitale e di rischio ambientale e regolatorio, quali Energy & Utilities.

Viene proposta una lettura originale dell'assurance ESG come "strumento manageriale" integrato nei processi decisionali aziendali e nelle relazioni con il mercato del credito. Analizzando un campione di imprese italiane Energy & Utilities nel periodo 2017–2024, lo studio intende colmare il gap esistente attraverso (i) il confronto tra assurance volontaria e obbligatoria in una fase di transizione normativa, (ii) l'introduzione di proxy di qualità e credibilità dell'assurance e (iii) una valutazione dell'impatto dell'assurance sul costo del debito, contribuendo così in modo significativo al dibattito su sostenibilità, governance e mercati finanziari.

3. Metodologia della ricerca

La metodologia adottata nello studio si fonda su un approccio quantitativo finalizzato a indagare la relazione tra il livello di assurance dell'informativa di sostenibilità e il costo del debito delle imprese italiane appartenenti ai settori Energy & Utilities. La scelta di concentrarsi su tali comparti deriva dalle loro caratteristiche peculiari: elevata intensità di capitale, forte esposizione a rischi ambientali e sociali, alta visibilità pubblica e rilevante pressione normativa. Questi elementi rendono le imprese particolarmente sensibili alle dinamiche di disclosure ESG e ne fanno un contesto ideale per analizzare gli effetti dell'assurance sulle valutazioni espresse dal mercato del credito.

La prima domanda di ricerca viene affrontata mediante l'utilizzo del seguente modello panel:

$$COSTODEB_i = \alpha + \beta_1 ASSURANCE_i + \beta_2 ESGRATING_i + \beta_3 CONTROLLI_i + \varepsilon_i$$

L'analisi relativa alla seconda domanda di ricerca viene condotta attraverso l'implementazione del seguente modello panel:

$$COSTODEB_i = \alpha + \beta_1 TYPE\ ASSURANCE_i + \beta_2 ESGRATING_i + \beta_3 CONTROLLI_i + \varepsilon_i$$

Le variabili usate nel modello e le fonti di riferimento sono illustrate nella Tabella 1 che segue.

Categoria	**Variabile**	**Fonte**
Costo del debito	Oneri finanziari / debiti finanziari medi	Bilanci consolidati
Assurance	Si/no (1 se è presente; 0 assente)	Bilanci di sostenibilità / assurance statement
Type Assurance	Tipo di assurance (mandatory = 0; voluntary = 1)	Bilanci di sostenibilità / assurance statement
Rating ESG	Punteggio ESG complessivo e per dimensione (E, S, G)	MSCI / Sustainalytics / Refinitiv
Categoria	**Variabile di controllo**	**Fonte**
ROA	Reddito Operativo / Tot. Assets	Bilanci / Orbis
Leverage	Passivo / Patrimonio netto	Bilanci / Orbis
Size	ln (Revenue)	Bilanci / Orbis
ROE	Utile netto / Patrimonio Netto	Bilanci / Orbis
BigFour	Se una società Big Four revisiona il bilancio la variabile assume valore 1, 0 in caso contrario	Bilanci sostenibilità
Lvl. assurance	Se una società svolge un'assurance reasonable la variabile assume valore 1, 0 in caso contrario	Bilanci sostenibilità
Sustainability Committee	Se la società presenta un comitato di sostenibilità interno la variabile assume valore 1, 0 in caso contrario	Relazione di Corporate governance

Tabella 1. Descrizione delle variabili

Il campione è costituito da imprese italiane appartenenti ai settori Energy & Utilities, identificate secondo la classificazione GICS. Si analizzeranno sia aziende sottoposte all'obbligo sia aziende che diversamente svolgono l'attività di assurance volontariamente. Il periodo di osservazione considerato è 2017–2024, che include la fase di transizione normativa tra la DNF e la CSRD, permettendo di analizzare l'evoluzione della qualità dell'assurance e dei rating ESG nel tempo, e la transizione da volontaria a obbligatoria. L'analisi empirica si basa su dati panel e mira a stimare l'effetto dell'assurance sull'esito di costo oggetto di studio, tenendo conto dell'eterogeneità non osservata a livello di impresa e dei potenziali problemi di endogeneità associati alla decisione di adozione dell'assurance. In via preliminare, al fine di individuare la specificazione più appropriata del modello panel, viene condotto il test di Hausman, che consente di valutare la consistenza dello stimatore a effetti casuali rispetto allo stimatore a effetti fissi. In base ai risultati del test, si seleziona la specificazione ritenuta più idonea a controllare per le caratteristiche non osservabili invarianti nel tempo delle imprese analizzate.

La decisione di adottare l'assurance potrebbe essere influenzata da fattori osservabili e non osservabili che incidono simultaneamente sull'esito di costo, generando potenziali problemi di endogeneità e di auto-selezione. Per affrontare tali criticità, lo studio adotta un insieme di metodologie complementari. In primo luogo, viene implementato un approccio basato su variabili strumentali (Instrumental Variables, IV) al fine di testare e correggere l'eventuale endogeneità della variabile di assurance. La validità degli strumenti utilizzati è verificata attraverso test standard di rilevanza e di esogeneità, garantendo che essi risultino correlati con la decisione di assurance, ma non con il termine di errore dell'equazione di outcome.

In secondo luogo, viene applicata la metodologia del Propensity Score Matching (PSM), con l'obiettivo di ridurre i bias derivanti da auto-selezione. In particolare, le imprese che adottano l'assurance vengono abbinate a imprese non assicurate sulla base di un insieme di caratteristiche osservabili pre-trattamento, consentendo un confronto più appropriato tra gruppo trattato e gruppo di controllo e fornendo un'ulteriore verifica della robustezza dei risultati rispetto a problemi di endogeneità. Al fine di verificare la solidità dei risultati principali, viene condotta un'analisi di robustezza volta a distinguere tra assurance obbligatoria e assurance volontaria. A tal fine, viene stimata una specificazione alternativa che introduce la variabile TypeAssurance, codificata come 0 in presenza di assurance obbligatoria e 1 in caso di assurance volontaria.

L'analisi si articola in due fasi distinte. Nel primo step, il modello è stimato sull'intero campione di imprese, includendo una variabile dicotomica che cattura esclusivamente la presenza o l'assenza dell'assurance. Nel secondo step, l'analisi è limitata al sottocampione delle imprese che adottano l'assurance; all'interno di tale sottocampione viene stimato l'effetto specifico della volontarietà dell'assurance sull'esito di costo. Questa strategia consente di isolare l'impatto marginale dell'assurance volontaria rispetto a quella obbligatoria e di valutare se la natura volontaria dell'assurance produca effetti differenziati in termini di costo, rafforzando così l'interpretazione causale dei risultati empirici.

4. Risultati attesi

Sulla base della letteratura ci si attende che l'assurance dell'informativa di sostenibilità svolga un ruolo significativo nella riduzione del costo del debito per le imprese appartenenti ai settori Energy & Utilities. Tali settori, caratterizzati da forte esposizione a rischi ambientali, sociali e regolatori, rappresentano un contesto nel quale la qualità e l'affidabilità delle informazioni non finanziarie acquisiscono un peso determinante nelle valutazioni effettuate da banche, investitori istituzionali e altri finanziatori. In questo senso, la presenza di un'assurance indipendente può essere interpretata dai creditori come un segnale credibile della solidità del sistema di governance, della trasparenza informativa e dell'impegno dell'impresa verso una gestione responsabile dei rischi ESG.

Il primo risultato atteso riguarda quindi l'associazione negativa tra assurance e costo del debito: le imprese che presentano un report di sostenibilità accompagnato da una verifica esterna dovrebbero beneficiare di condizioni di finanziamento più favorevoli, grazie alla riduzione dell'asimmetria informativa e alla maggiore affidabilità delle metriche ESG comunicate al mercato. Ci si aspetta che tale effetto sia particolarmente evidente nelle imprese con profili di rischio più complessi o operanti in segmenti caratterizzati da maggiore sensibilità ambientale, in cui la qualità dell'informativa può incidere in modo sostanziale sulla percezione del rischio da parte dei finanziatori.

Un secondo risultato atteso concerne la distinzione tra assurance volontaria e assurance obbligatoria. Alla luce dei cambiamenti normativi introdotti dalla CSRD e dal relativo recepimento nazionale, ci si aspetta che l'assurance volontaria produca un effetto più marcato sulla riduzione del costo del debito rispetto all'assurance obbligatoria. L'assurance volontaria, infatti, può essere interpretata come un segnale credibile di impegno strategico verso la sostenibilità, non motivato da mere esigenze di conformità. Tale scelta deliberata suggerisce

all'esterno la presenza di una cultura aziendale orientata alla trasparenza e alla gestione responsabile dei rischi, elementi che possono tradursi in una più favorevole valutazione del merito creditizio. Al contrario, l'assurance obbligatoria potrebbe generare un effetto meno intenso, poiché percepita dai finanziatori come un adempimento di natura formale, volto principalmente a rispondere a prescrizioni regolamentari. In questo caso, il beneficio in termini di costo del debito potrebbe essere più contenuto e maggiormente differenziato in funzione della qualità del provider e della profondità del processo di assurance.

Infine, ci si attende che la relazione tra assurance e costo del debito non sia omogenea tra tutte le imprese del campione, ma vari in funzione di caratteristiche specifiche quali dimensione, leva finanziaria, performance economica e livello di rischio operativo. Le imprese più grandi, esposte a maggiore esposizione pubblica e con una più ampia base di stakeholder, potrebbero mostrare effetti più forti. Al contrario, le imprese più indebitate o caratterizzate da elevata volatilità dei risultati economici potrebbero trarre beneficio dall'assurance, ma in misura più attenuata se il loro profilo finanziario complessivo continua a esporle a rischi significativi.

In sintesi, ci si attende che l'assurance dell'informativa di sostenibilità agisca come una leva di riduzione del rischio percepito e come un indicatore di buona governance, contribuendo a migliorare il merito creditizio delle imprese e a ridurre il costo del debito.

5. Implicazioni teoriche e manageriali

Dal punto di vista teorico, i risultati attesi dello studio contribuiscono ad ampliare il dibattito sul ruolo dell'assurance come meccanismo di governance informativa e come leva per la riduzione del rischio percepito dagli stakeholder finanziari. La letteratura esistente ha ampiamente documentato l'importanza della disclosure ESG nel migliorare la trasparenza e la qualità informativa delle imprese, ma rimangono ancora poco esplorati gli effetti specifici dell'assurance sulla struttura del capitale e, in particolare, sul costo del debito.

L'assurance può essere interpretata come un dispositivo che riduce l'asimmetria informativa tra impresa e finanziatori, aumentando l'affidabilità delle informazioni ESG e migliorando la capacità degli stakeholder di valutare la continuità aziendale, la solidità del modello di business e l'effettiva gestione dei rischi non finanziari. Ne deriva una maggiore connessione tra performance ESG, credibilità della disclosure e outcome finanziari, confermando l'idea che la sostenibilità sia ormai parte integrante delle metriche di valutazione del rischio.

Dal punto di vista manageriale, i risultati attesi potrebbe avere implicazioni rilevanti per la governance aziendale e per la gestione strategica dei rapporti con il sistema finanziario. In primo luogo, le imprese possono considerare l'assurance non come un onere aggiuntivo, ma come un investimento capace di generare ritorni economici tangibili. Inoltre, si rafforzerebbe il dialogo con gli stakeholder finanziari, maggiormente improntato su dinamiche trasparenti e incentrate su rapporti fiduciari che potrebbero migliorare il merito creditizio, facilitando l'accesso ai finanziamenti a condizioni più vantaggiose.

Infine, se l'assurance risultasse effettivamente correlata a un minor costo del debito, ciò avvalorerebbe l'utilità delle recenti riforme introdotte dalla CSRD e dall'evoluzione della revisione della sostenibilità, rafforzando l'idea che una maggiore standardizzazione e qualità dei processi informativi possa produrre benefici concreti non solo a livello sociale, ma anche per il funzionamento dei mercati finanziari. In particolare, anche le imprese che non saranno soggette agli obblighi normativi previsti dalla CSRD potrebbero essere incentivate ad adottare forme volontarie di assurance come strumento strategico per migliorare l'accesso al mercato del credito. Ciò implicherebbe un progressivo rafforzamento dei sistemi di governance aziendale orientati alla sostenibilità e una crescente domanda di competenze specialistiche in ambito ESG, controllo e assurance non finanziaria. La figura del revisore della sostenibilità sarebbe chiamata a svolgere un ruolo sempre più centrale nei processi di certificazione e attestazione della credibilità informativa verso gli stakeholder aziendali.

6. Conclusioni

Il presente studio cerca di comprendere la relazione tra l'assurance dell'informativa di sostenibilità e il costo del debito delle imprese italiane operanti nei settori Energy & Utilities. In un contesto regolatorio in rapida evoluzione, segnato dall'introduzione della CSRD e dalla crescente attenzione dei finanziatori verso i fattori ESG, l'assurance emerge come un elemento potenzialmente decisivo nei processi di valutazione del rischio e nella determinazione delle condizioni di finanziamento. Le riflessioni teoriche elaborate, insieme alle evidenze offerte dalla letteratura internazionale, suggeriscono che un reporting di sostenibilità verificato da un soggetto indipendente possa contribuire a ridurre l'asimmetria informativa e a rafforzare la percezione di affidabilità dell'impresa, con possibili effetti positivi sul merito creditizio e, quindi, sul costo del capitale.

È tuttavia fondamentale sottolineare che la ricerca si trova ancora nella fase di raccolta e sistematizzazione dei dati, e le considerazioni finora esposte devono essere interpretate come risultati attesi, derivanti dall'impostazione teorica e dal modello concettuale adottato. Solo la successiva analisi empirica potrà confermare la solidità delle ipotesi formulate e quantificare con precisione l'effetto dell'assurance, nonché comprenderne le differenze legate al carattere volontario o obbligatorio e alla qualità del provider.

Guardando ai possibili sviluppi, il progresso della ricerca potrà articolarsi lungo diverse direzioni. In primo luogo, il completamento del dataset consentirà di verificare se le imprese che adottano volontariamente l'assurance, anticipando o superando gli obblighi normativi, ottengano un vantaggio più significativo in termini di costo del debito rispetto a quelle che vi ricorrono esclusivamente per conformarsi alle disposizioni imposte. Allo stesso modo, la disponibilità di informazioni più dettagliate sulla tipologia di assurance permetterà di indagare se livelli più elevati di profondità nella verifica, standard internazionali più rigorosi o il coinvolgimento di provider particolarmente qualificati incidano in modo differenziato sulle valutazioni dei finanziatori.

In prospettiva, una volta completata la fase empirica, il lavoro potrà evolvere verso analisi più ampie, includendo altri settori economici o confrontando la realtà italiana con contesti internazionali caratterizzati da diversi assetti normativi e istituzionali. Ciò consentirebbe di verificare la generalizzabilità dei risultati e di comprendere meglio come la sensibilità del mercato finanziario verso l'assurance ESG vari in funzione delle dinamiche di settore o delle strutture dei mercati del credito.

In conclusione, pur non essendo ancora giunta alla fase di validazione empirica, questa ricerca contribuisce a delineare un quadro teorico sul ruolo dell'assurance ESG nei rapporti tra imprese e sistema finanziario.

Parole chiave: Assurance ESG; costo del debito; asimmetria informativa; Corporate Sustainability Reporting Directive (CSRD)

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In the name of sustainability: auditors and the normativity construction

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1. Introduction and conceptual framework

Over the past two decades, sustainability reporting assurance has undergone significant development, yet it continues to be characterised by conceptual, methodological, and institutional fragility. Research has repeatedly highlighted that, unlike financial auditing—supported by decades of professional consolidation—sustainability assurance lacks shared methodological frameworks, consolidated professional boundaries, and homogenous expectations among providers, regulators, and report users. The result is an assurance field marked by persistent ambiguity, uneven practices, and substantial variation in objectives and outcomes.

A first stream of research has long questioned the substantive value of sustainability assurance. Some early studies argued that third-party statements may not add meaningful credibility to sustainability reports, functioning instead as symbolic mechanisms for enhancing legitimacy, reputation, or stakeholder trust without improving underlying performance (Ball et al., 2000; Owen et al., 2000; O'Dwyer & Owen, 2005). Subsequent empirical contributions have reinforced this argument, showing that companies may strategically select assurance providers and scopes that minimise scrutiny while maximising external perception of responsibility (Michelon et al., 2015; Cho et al., 2015). Even when assurance is mandated, providers may adopt narrow or procedural approaches that do not sufficiently reduce information asymmetry or guarantee reporting reliability. At the same time, research has increasingly recognised that sustainability assurance can generate organisational learning and foster more systematic attention to ESG processes. Assurers may stimulate reflection on data governance, internal controls, and cross-functional coordination, thereby supporting organisations in clarifying sustainability priorities (Baudot & Cooper, 2022; Boiral et al., 2020). These studies suggest that assurance's potential value lies not only in external accountability but also in shaping internal practices.

Yet, despite this potential, the field is characterised by methodological fragmentation. Providers—including accounting firms and specialist consultancies—tend to adopt diverse procedures, resulting in inconsistent assurance depth and limited comparability across engagements (Farooq & De Villiers, 2019). Furthermore, most assurance engagements historically rely on limited assurance, which provides weaker evidential guarantees than reasonable assurance and often falls short of addressing stakeholder expectations about the robustness of the disclosed information (Simnett et al., 2009). Recent work (Braam et al., 2025) suggests that limited assurance may not reduce CSR decoupling, raising the question of whether current assurance modalities can effectively respond to the credibility challenges associated with sustainability information. A further set of challenges arises from the intrinsic nature of sustainability information, which often includes qualitative narratives, forward-looking indicators, estimates, or metrics based on assumptions that lack established measurement norms.

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This distinctiveness means that professional judgement plays a greater role than in traditional financial audits, increasing the complexity of assurance work and expanding the interpretive responsibility of auditors (Hickman & Cote, 2019). These limitations explain why sustainability assurance remains a field in which regulation alone cannot stabilise expectations. The introduction of the CSRD strengthens reporting obligations, imposes mandatory assurance, and introduces ESRS. However, organisational practices, professional judgement, and interpretive routines remain essential for transforming legal requirements into workable procedures.

This study adopts the concept of normativity developed by Bebbington et al. (2012), which interprets norms not as static prescriptions derived from regulatory texts, but as social constructions produced through practice. Normativity emerges when certain behaviours, routines, or interpretations become taken for granted and widely accepted within a field. In sustainability assurance, auditors play a critical role in producing such norms: they interpret ambiguous requirements, translate expectations into organisational processes, and help companies navigate complex reporting challenges.

Italy offers a particularly relevant context for examining this dynamic. Unlike most EU countries, Italy introduced mandatory assurance under the first European Directives on sustainability reporting. As a result, Italian auditors have been involved in sustainability assurance for several years, interacting with companies that vary widely in their maturity and organisational readiness. This early experience, combined with the strong guidance provided by national professional bodies (Consob, Assirevi), has contributed to shaping how sustainability assurance is understood and practiced in the Italian context. Understanding how auditors interpret and enact the CSRD within this landscape provides valuable insights into the broader European transition.

This work-in-progress study analyses how Italian auditors perceive and perform sustainability assurance in the context of the CSRD. Through interviews with practitioners and institutional actors, the study investigates the practical challenges they encounter, the interpretive work they undertake, and the ways in which they support firms in operationalising a rapidly evolving regulatory environment.

2. Non-financial reporting in Europe and the normativity landscape

Over the last few years, European institutions' commitment to sustainability has increased, shifting from a "voluntary and non-binding" approach to a legislative and regulatory one. The 2014/95/EU directive represented an important step towards the aim of "binding" companies to ethically virtuous behaviours and practices by requiring them to produce non-financial reports (NFRs) containing social and environmental information. The application of this directive was not uniform because the states differed in their adaptation or omission of its requirements, and because the directive itself came into effect at different times. Findings about this directive's results are contrasting.

Concerning assurance, the directive allowed the states to define whether NFRs should be subject to assurance by an independent third party and whether organisations that do not report adequately will be sanctioned. Owing to this discretionary approach, the member states adopted varying levels of assurance. However, the mandatory reporting assurance in Italy, France, and Spain did not seem to have any significant impact. For example, Gillet-Monjarret (2022) highlighted the different strategies for promoting the implementation of assurance missions aimed at legitimising the providers' new skills. Criticisms have also emerged in analyses of NFR assurance statements, indicating differences in their content, the processes executed, and the concrete implementation of standards (Gurtuk & Hahn, 2016). Recently, Braam et al. (2025) demonstrated that the effectiveness of CSR assurance in reducing CSR decoupling depends on both the assurance level and the type of provider. Specifically, reasonable assurance, when combined with either a broad assurance scope or an assurance provider from the auditing profession, significantly narrows the gap between CSR disclosures and actual performance. In

contrast, limited assurance—regardless of scope or provider—fails to prevent decoupling and mainly serves a symbolic legitimacy purpose. The authors argue that auditors, due to their adherence to professional standards, independence requirements, and reputational incentives, provide more credible assurance results than non-auditing providers. These findings suggest that only comprehensive assurance practices, especially those that go beyond minimum regulatory requirements, can meaningfully improve the credibility and dependability of CSR reports.

In Europe, a further step was the CSRD, which was approved by the EU Parliament in 2022. It aims to amend the previous directive by extending the reporting obligations to all large companies and companies with real estate securities admitted to trading in regulated markets, including small and medium enterprises. Many companies are thus required to provide the information necessary to understand their impact on sustainability issues and how these affect their business. Interestingly, an independent actor's assurance was introduced as a mandatory requirement, initially limited in scope and subsequently reasonable. In particular, the new directive demands a progressive approach to enhancing the assurance level by obligating a limited assurance engagement (Section 60 CSRD).

Moreover, the directive highlights the challenges auditors face. On the one hand, it would help ensure connectivity between the annual and CSR reports, given the (desired) consistency of financial and sustainability information, which is particularly important for sustainability information users. On the other hand, owing to the risk of further concentration of the audit market, there may be concerns about auditors' independence (Section 61 of the CSRD). Finally, the new CSRD requires sustainability reports to be prepared in accordance with the European Sustainability Reporting Standards (ESRS) adopted by the European Commission through delegated acts. Companies were required to apply the standards for the 2024 financial year when preparing their sustainability reports in 2025. However, in 2025, the EU adopted the first "Omnibus I" quick fix to the CSRD, introducing a "stop-the-clock" provision that delays the application of certain sustainability reporting deadlines. In parallel, the Commission proposed broader simplifications, including slimming and clarifying the ESRS, as well as politically debated options to narrow the scope (e.g., potentially to companies with more than 1,000 employees), while maintaining limited assurance in place for the initial phase. Further negotiations on the wider Omnibus package continue into late 2025 (EU 2025).

3. Sustainability reporting assurance and auditors' roles

Until the new EU directive, companies have voluntarily produced sustainability reports and have had complete discretion regarding assuring them. From the late 1990s, the importance of sustainability reporting assurance increased considerably, driven by regulation and standardisation, as well as by greater awareness of its role in a company's business. As revealed by the KPMG report (KPMG, 2024), the rate among the N100 (the largest 100 companies in each of 58 countries analysed) and the G250 (top 250 listed companies worldwide) companies had increased continuously from 2005, reaching 69% among the G250 and 54% among the N100 in 2024. Owing to market development and regulatory frameworks, these percentages are likely to continue to increase in the future. Despite the growing adoption of sustainability reporting assurance, it remains voluntary in several countries, and the market is open to various types of providers competing with one another (Farooq & DeVilliers, 2019). Moreover, the lack of consensus about who should conduct the assurance and how (i.e. the approach) it should be performed pose numerous challenges for the sector, for the providers, and for organisations (O'Dwyer, 2011; Farooq & De Villiers, 2019).

Faced with these challenges, researchers adopted different theoretical approaches to analyse them. These approaches emphasise different conceptions of the underlying motivations (Ramdhony, 2015) and the theoretical perspectives adopted (Farooq & De Villers, 2017; Venter & Van Eck, 2021; Yan et al., 2022). Generally speaking, sustainability assurance strengthens

stakeholder trust by communicating a firm's commitment to sustainability, or fosters a firm's legitimacy by responding to pressures stemming from its context. On the one hand, organisations should consider the interests of many stakeholders, and the assurance of sustainability reporting thus serves as a "signal" to reduce the uncertainty of the disclosed information. In this sense, assurance helps reduce the information asymmetry between firms and their stakeholders (Clarkson et al., 2019; García-Sánchez et al., 2019; Hassan et al., 2020; Lòpez-Santamaria et al., 2021) and it is used as a mechanism to enhance a firm's credibility and reputation (Beets & Souther, 1999; Birkey et al., 2016; Casey & Greiner, 2015; Cheng et al., 2015; Sierra García et al., 2022; Simnet et al., 2009). On the other hand, legitimacy theory explains how assurance is configured as a strategic tool companies can use to legitimise their activities and influence the community's perception of their behaviours (O'Dwyer et al., 2011; Martínez-Ferrero & García-Sánchez, 2017; Hickman & Cote, 2019). In the case of assurance, the acquisition of legitimacy may also put the mechanisms of isomorphism back into play. Particularly interesting for the present study is that changes are often driven by professionals, and "legitimated professional practices" may pressurize organizations to conform, as their staff can draw on networks and professional standards to guide them. Beyond traditional isomorphisms, critical approaches have also emerged over the years because some authors have doubted the ability of assurance to guarantee effective benefits for companies, since it has not been found to be associated with a higher market value for the report-issuing companies (Cho et al., 2014), while some have questioned the higher quality of the information communicated, suggesting, rather, a symbolic use of assurance as a tool to influence stakeholder perception (Michelon et al., 2015).

Therefore, faced with an increasingly complex and fragmented regulatory and political landscape (Silvola & Vinnari, 2021; Sonnerfeldt & Pontoppidan, 2020), the role of auditors in sustainability assurance extends far beyond that of neutral verifiers. One of the central tensions lies in auditors' dual identity as both independent monitors and embedded collaborators. While the traditional approach emphasises objectivity and external scrutiny, recent works suggest that assurance engagements often involve relational, iterative, and dialogic dynamics (Channuntapipat, 2020; Liu et al., 2024). The client–auditor relationship is further complicated by the institutional indeterminacy of sustainability itself. Without a universally accepted auditing framework or agreed-upon metrics, auditors are often required to exercise interpretive judgment, filling gaps between regulatory expectations and practical feasibility. O'Dwyer et al. (2011) and Malsch (2024) illustrated how auditors navigate this space by selectively adopting language and emphasis to meet diverse expectations—whether from clients, regulators, or the broader public.

In this contested space, auditors perform not only technical tasks but also symbolic and strategic functions. Michelon et al. (2019) demonstrate how assurance providers influence the likelihood of sustainability restatements, suggesting a deeper organizational impact than commonly assumed. At the same time, Gaudy and Malsch (2023) highlight how auditors engage in reputational positioning, balancing public claims of societal commitment with market-driven imperatives. Their study of audit firms' branding strategies reveals a deliberate effort to appear aligned with sustainability values while maintaining client-centric flexibility. The sustainability assurance engagement, therefore, becomes both a service and a performance—an arena where professional legitimacy, commercial strategy, and normative aspiration intersect. Power's (2003) foundational critique warned against the "ritualisation" of auditing—where assurance provides legitimacy through appearance rather than substance. In the sustainability field, this critique remains relevant, but its implications are less fixed. The field is still evolving, and the meanings of assurance, credibility, and accountability continue to be shaped. Auditors, in this context, are not just formalizing a pre-existing order; they are actively shaping it through interpretation, boundary-setting, and the daily practice of what is considered assurable.

Against this heterogeneous and unstable backdrop, understanding how the European legislative demands are being enacted in firms' everyday life is a demanding task. A critical entry point to understanding the impact of the CSRD on corporate practices is through the lens of

"normativity", which captures how norms—distinct from legal rules—emerge, stabilize, and influence action in organizational fields. The CSRD, while legally binding, also operates as a normative device by shaping expectations, codifying practices, and embedding institutional logics around sustainability reporting. Drawing on Bebbington et al. (2012), normativity in sustainability reporting should not be understood solely as compliance with legal or technical standards, but as a dynamic construct emerging from the interplay between actors, ideas, and institutional structures. The recent wave of sustainability regulation in the European Union illustrates a process of "normative institutionalization" whereby new reporting practices, initially perceived as external impositions, gradually acquire legitimacy and internal coherence within organizations. Bauernhofer et al. (2025) provide empirical evidence of this dynamic by analyzing how firms respond to CSRD requirements by anticipating them. Organizations are not merely adapting to top-down mandates; they are engaged in processes of meaning-making, internal alignment, and strategic reconfiguration—suggesting that normativity is not only imposed but also enacted and negotiated. This understanding is reinforced by Larrinaga et al. (2020), who emphasize that the institutionalization of sustainability assurance services reflects not only regulatory pressures but also cultural-cognitive processes and professional routines. The assurance process contributes to normativity by reinforcing what is considered credible, material, and legitimate in sustainability reporting.

4. Research Objectives

The study aims to deepen understanding of sustainability auditors' role during a transformative regulatory phase by addressing two interrelated objectives. The first is to explore the practical and interpretive challenges auditors perceive in implementing sustainability assurance under European directives. And the second is to analyse how audit firms adapt organisationally and professionally to provide sustainability assurance at scale. Overall, these allow us to understand how auditors act in practice, and thus to better depict normativity, since information about the practice works better than examining law itself.

These objectives are conveyed through two research questions:

RQ1: What challenges and ambiguities do auditors perceive in the implementation and development of sustainability assurance after the introduction of European directives?

RQ2: What practices do auditors adopt in implementing sustainability assurance, and how do these practices contribute to the construction of normativity within firms?

5. Methodology

This qualitative study is based on 24 semi-structured interviews conducted from June 2023 to March 2025. The sample includes partners, senior managers, ESG specialists from Big Four and smaller audit firms, as well as representatives from the local Chamber of Commerce, the Order of Chartered Accountants, and other national professional organizations.

Northern Italy was chosen because sustainability assurance has been especially important there due to its industrial structure and early implementation of assurance under the first European Directive (Legislative Decree 254/2016). Specifically, interviews examined: perceptions of NFRD and CSRD objectives; the shift from voluntary to mandatory assurance; audit procedures and anticipated changes under ESRS; interactions with companies; challenges related to materiality, data systems, and internal controls; and organizational adjustments within audit firms.

Each interview lasted between 30 and 60 minutes, was recorded with participants' consent, and transcribed. Analysis involved iterative coding and thematic synthesis (O'Dwyer, 2004; Ritchie & Lewis 2003). Themes were refined through multiple rounds of coding by all researchers to ensure consistency.

6. Preliminary findings

A prominent theme emerging from interviews is that firms find it difficult to understand the meaning and implications of sustainability reporting, especially those reporting for the first time. Therefore, auditors may be viewed as interpreters of regulatory ambiguity. Many interviewees noted that companies often viewed sustainability reporting primarily as a communication tool, oriented toward reputation or compliance, rather than as a mechanism for systematically measuring and reporting impacts.

Auditors often found themselves explaining: what sustainability reporting entails under ESRS; how double materiality must be assessed; what constitutes adequate evidence for assurance; how internal controls must be structured to support reliable reporting. Interviewees highlighted that double materiality is one of the most complex areas for companies. Both auditors and institutional representatives described confusion about how to identify which impacts are material and how sustainability topics should connect to financial performance. Auditors often had to help firms navigate the conceptual and procedural parts of this assessment. The interpretive work auditors perform is a crucial mechanism through which companies begin to develop a more structured understanding of sustainability reporting. This supports prior research that emphasises the role of professionals in supporting organisations in contexts of regulatory uncertainty (Sonnerfeldt & Pontoppidan, 2020).

A second key finding concerns auditors' involvement in organizational processes. Many companies lack proper systems for collecting sustainability data, and auditors often become involved in: identifying relevant data sources; evaluating the adequacy of internal controls; explaining what documentation is required; encouraging cross-functional coordination; clarifying the relationship between sustainability and financial information. This is especially clear in medium-sized firms, where sustainability reporting systems are often basic. Auditors' support helps companies create reporting practices that meet regulatory standards, even if firms initially have limited technical knowledge about sustainability reporting. Several interviewees observed that assurance work can drive ongoing organizational change, encouraging firms to examine internal processes, clarify responsibilities, and deepen their understanding of how sustainability issues impact operations and strategy. This aligns with literature indicating that assurance can promote organizational learning (Baudot & Cooper, 2022; Boiral et al., 2020).

A third point relates to changes within audit firms. To address increasing demand, audit firms have expanded their sustainability functions. All participating firms reported establishing dedicated sustainability assurance units, implementing extensive internal training programs, hiring professionals with multidisciplinary backgrounds, and developing internal guidelines aligned with Assirevi documents and European standards. Firms also emphasized that sustainability assurance teams are organizationally separate from financial auditors, although collaboration is expected to grow as reporting standards become more integrated. Several auditors described sustainability assurance as a "new frontier" that requires ongoing professional development, given the evolving regulatory landscape and the complexity of concepts like double materiality and impact assessment.

Overall, across interviews, it becomes evident that auditors influence not only reporting practices but also the evolving expectations of what qualifies as acceptable sustainability disclosures. Through repeated interactions, explanations, and methodological choices, auditors help firms to understand and translate into practices: interpretations of materiality; documentation requirements; data quality thresholds; expectations for internal controls; reporting boundaries and formats. In doing so, auditors participate directly in the construction of normativity, as described by Bebbington et al. (2012). Their practices fill the gaps left by ambiguous regulations and gradually shape consistent routines within organisations.

7. Discussion and expected contributions

The findings highlight that the transition from voluntary to mandatory sustainability assurance involves more than compliance. Auditors' experiences reveal that the CSRD introduces clear regulatory obligations, but significant interpretive work is needed to operationalise them across companies with varying levels of maturity.Auditors serve as intermediaries between regulation and organisational practice, helping firms translate the abstract principles of ESRS into concrete processes. This is especially critical because sustainability reporting differs significantly from financial reporting in its reliance on narratives, estimates, and forward-looking information. The study also shows that assurance providers play a crucial institutional role. Their practices—developed through experience, discussion, and professional guidance—shape emerging norms in the field. As these practices are repeated across engagements, they contribute to stabilising expectations and supporting the institutionalisation of sustainability assurance.

The study deepens the understanding of sustainability assurance by emphasizing the interpretive and developmental roles of auditors, demonstrating how they help shape reporting norms through their practice. Furthermore, by examining Italy's initial experience with mandatory assurance, the study offers insights that predict challenges other EU Member States may face during CSRD implementation. Finally, the findings provide guidance for policymakers, regulators, and standard setters on the challenges auditors face and the support companies require to meet regulatory expectations.

Further analysis will deepen the comparison between audit firm types and explore internal organisational processes in greater detail. The next phase will include triangulation with documentary evidence and additional analysis of interview data to refine theoretical insights on normativity in sustainability assurance.

Keywords: Sustainability assurance; Sustainability reporting European Directives; auditors; normativity; Italy

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La valutazione del rischio strategico d'impresa tra governance, strategia e performance: un framework integrato per l'Enterprise Risk Management sostenibile

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1. Il rischio strategico nella tradizione aziendalistica italiana e internazionale

La nozione di rischio ha assunto, nel corso dell'evoluzione della disciplina economico-aziendale, un rilievo sempre crescente, diventando una componente intrinseca e strutturale della gestione d'impresa. Già nella prospettiva della dottrina italiana, il rischio veniva concepito non solo come minaccia, ma come elemento fisiologico del sistema aziendale, capace di influenzarne gli equilibri e la vitalità. In questo senso, il contributo di Umberto Bertini rappresenta un riferimento fondativo: il rischio è fattore endogeno, strettamente connesso alle scelte di governo, alle condizioni ambientali e ai processi decisionali, la cui anticipazione e gestione costituiscono un prerequisito per la continuità aziendale e per la capacità competitiva (Bertini, 1987). Tale quadro concettuale ha fornito linfa alla successiva formalizzazione dei modelli di Enterprise Risk Management (ERM) (Amoroso e Orlandini, 2024).

Parallelamente, in ambito internazionale, la gestione del rischio ha conosciuto una evoluzione da funzione specialistica, connessa prevalentemente alla dimensione assicurativa o alla finanza, a processo integrato nella governance e nella strategia aziendale. Il COSO Internal Control Framework (1992), il COSO ERM (2004) e, soprattutto, il suo aggiornamento del 2017 hanno ridefinito la natura del Risk Management come processo trasversale, parte integrante del governo d'impresa, capace di influenzare la definizione della strategia, il monitoraggio delle performance e la generazione di valore nel lungo periodo. L'ERM tende così a ricondurre in un unico sistema le diverse categorie di rischio — operativo, finanziario, reputazionale, di compliance e, in modo sempre più evidente, strategico (COSO, 2017).

In questo quadro, il rischio strategico occupa una posizione particolare. Esso deriva dalle scelte di indirizzo, dalle opzioni di posizionamento e dalle decisioni che determinano l'assetto competitivo presente e futuro dell'impresa. La sua natura è bidimensionale: identifica sia le minacce derivanti da strategie non adeguate, sia le opportunità connesse all'incertezza strategica e al cambiamento. Proprio per la sua origine, esso è il rischio più difficile da identificare e valutare, poiché dipende da fattori spesso poco strutturati, qualitativi, non storicizzabili, legati sia alle dinamiche dell'ambiente sia ai processi cognitivi e decisionali del management.

1.1. Le determinanti del rischio strategico

La letteratura individua tre principali determinanti del rischio strategico. La prima determinante è legata all'incertezza del contesto esterno, caratterizzata da complessità, volatilità e discontinuità. Per incertezza ambientale si intendono complessità del mercato, discontinuità tecnologiche, dinamiche competitive imprevedibili, fenomeni esogeni come shock geopolitici,

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crisi sanitarie, cambiamenti normativi o climatici. I principali framework internazionali ne offrono una formalizzazione chiara; per esempio il COSO ERM 2017 definisce il rischio strategico come l'effetto di "changes in the external environment", includendo eventi emergenti, innovazioni tecnologiche, pressioni normative, crisi geopolitiche e fenomeni climatici (COSO, 2017) e la ISO 31000:2018 identifica il rischio come "effetto dell'incertezza sugli obiettivi", enfatizzando la necessità di includere variabili ambientali nella valutazione del rischio (ISO 31000, 2018).

La seconda determinante deriva dalle decisioni strategiche dell'impresa, essendo il rischio strategico radicato nella natura stessa della strategia. Tra le scelte di posizionamento e configurazione strategica troviamo le decisioni relative a diversificazione, innovazione, internazionalizzazione, investimenti, governance e struttura di controllo. La letteratura strategica e di corporate governance riconosce il rischio generato dalle scelte deliberate dal management, ad esempio il COSO ERM 2017 considera il rischio strategico come esito di un possibile "misalignment between chosen strategy and risk appetite". Secondo Porter, la strategia competitiva implica rischi intrinseci legati alla scelta di un posizionamento (Porter 1980; 1985). Mintzberg evidenzia come il fallimento nella formulazione/implementazione della strategia rappresenti una fonte primaria di rischio (Mintzberg , 1994) e Amoroso e Orlandini mostrano come il rischio strategico emerga dalle opzioni di sviluppo, dagli investimenti, dai percorsi di crescita e dalle logiche di posizionamento (Amoroso e Orlandini, 2025).

La terza determinante riguarda la dimensione cognitiva, comportamentale e organizzativa del processo decisionale. Le scelte strategiche non derivano solo dalle informazioni disponibili, ma soprattutto da come esse vengono interpretate, ovvero dai processi cognitivi e decisionali. Rientrano tra questi i bias manageriali, i limiti informativi, la capacità di previsione, la cultura del rischio, la qualità delle informazioni e dei sistemi di accounting a supporto del processo decisionale. Amoroso e Orlandini mettono in relazione il rischio strategico con la capacità degli organi di governance di interpretare il contesto e guidare la strategia. A livello internazionale Kahneman C Tversky (1979) mettono in luce i bias cognitivi che influenzano la percezione del rischio (overconfidence, availability bias, anchoring), March C Shapira (1987) evidenziano come il management sviluppi una "risk perception" distinta dai modelli oggettivi, generando potenziali asimmetrie decisionali; Kaplan C Mikes (2012) sottolineano che lo strategic risk è strettamente dipendente dal "managerial judgment" (Kahneman e Tversky, 2013; Kaplan, and Mikes, 2012; March and Shapira, 1987).

Ne deriva un rischio dalla natura intrinsecamente multidimensionale e sistemica, che richiede strumenti analitici capaci di integrare approcci qualitativi e quantitativi, prospettive interne ed esterne, e soprattutto un forte allineamento con i processi di governance e di definizione della strategia.

1.2. Rischio strategico, governance e sostenibilità

Il rischio strategico è strettamente intrecciato alla governance. Gli organi societari — in particolare il Consiglio di Amministrazione — hanno la responsabilità di definire il risk appetite, valutare la coerenza tra strategia e profilo di rischio, monitorare gli scostamenti e garantire che i sistemi informativi e di controllo forniscano una visione integrata dei rischi materiali. La sostenibilità, intesa come capacità dell'impresa di mantenere un equilibrio duraturo tra performance economiche, sociali e ambientali, richiede una piena integrazione tra ambizione strategica, esposizione al rischio e creazione di valore nel lungo periodo.

Il framework COSO 2017 sottolinea come l'ERM debba essere integrato non solo nei processi operativi, ma anche nella formulazione della strategia e nella definizione degli obiettivi, prevedendo che la valutazione del rischio strategico guidi scelte quali l'allocazione del capitale, la selezione dei progetti di investimento e innovazione, le decisioni di internazionalizzazione e

diversificazione, le politiche di sostenibilità e di transizione green, la definizione delle metriche di performance strategica.

2. Obiettivi

Alla luce di questo quadro concettuale, l'articolo si propone tre principali obiettivi.

Obiettivo 1 — Ricostruire il fondamento teorico del rischio strategico integrando dottrina italiana e framework internazionali

L'intento è evidenziare come la prospettiva sistemica della dottrina economico-aziendale italiana— con particolare riferimento al pensiero di Bertini e ai contributi più recenti (Bertini, 1987; Amoroso e Orlandini, 2024) anticipi e arricchisca le moderne concezioni del rischio strategico presenti nei modelli COSO e ISO. Viene proposta una lettura sinottica che mette in evidenza affinità, divergenze e complementarità.

Obiettivo 2 — Elaborare una definizione integrata di rischio strategico

Una definizione che tenga conto della dimensione strategica (coerenza delle scelte di posizionamento), organizzativa (cultura del rischio, qualità del management), cognitiva (bias, capacità predittive), ambientale (complessità, discontinuità, shock), informativa (ruolo dell'accounting strategico e dell'integrazione dei dati).

Obiettivo 3 — Proporre un framework applicativo per la valutazione del rischio strategico d'impresa

Il contributo dell'articolo mira a colmare un gap metodologico offrendo una mappatura delle fonti del rischio strategico; un modello di valutazione integrata che combina indicatori qualitativi e quantitativi; un processo in cinque fasi che integra governance, strategia e sistema di controllo; linee guida per l'allineamento tra risk appetite, pianificazione strategica e indicatori di performance; un output finale sotto forma di Strategic Risk Dashboard utile al top management e agli organi di governo.

3. Quadro metodologico e framework applicativo

La metodologia si sviluppa attraverso un approccio qualitativo che integra un'analisi della letteratura scientifica internazionale su ERM, rischio strategico, strategic management e corporate governance (COSO, ISO 31000, studi di Mikes, Kaplan, Taleb ecc.), un'analisi della dottrina italiana classica e contemporanea e un'esame dei modelli di governance e dei principi di controllo interno previsti da normative nazionali ed europee (TUF, codice di corporate governance, Modello 231, normative vigilanza Banca d'Italia ecc.).

Il framework proposto deriva da un processo di sintesi critica delle metodologie già esistenti e delle lacune individuate. Si compone di cinque fasi:

- Fase 1 — Identificazione dei driver di rischio strategico: Attraverso strumenti quali SWOT, PESTEL, analisi competitiva e trend analysis.
- Fase 2 — Valutazione qualitativa della rilevanza strategica dei rischi: Con l'utilizzo di matrici di impatto-probabilità, questionari Delphi, interviste ai dirigenti, analisi dei bias cognitivi.
- Fase 3 — Valutazione quantitativa del rischio strategico. Basata su:
  - indicatori di posizionamento competitivo;
  - misurazioni della volatilità dei mercati;
  - simulazioni Monte Carlo applicate a scenari strategici;
  - indicatori economico-finanziari (VaR strategico, sensitività dei flussi di cassa, stress test).
- Fase 4 — Allineamento con governance e risk appetite: Attribuzione dei rischi alle responsabilità dei board committee; definizione dei limiti di tolleranza; integrazione nei KPI e nei KRI (Key Risk Indicators).

- Fase 5 — Costruzione della Strategic Risk Dashboard: Con rappresentazione grafica, sintetica e integrata dei principali rischi strategici, del loro trend e del loro impatto sugli obiettivi aziendali.

Il quadro metodologico prevede la possibilità di applicare il framework a imprese industriali, aziende pubbliche, gruppi multinazionali, PMI innovative.

L'applicazione empirica può essere effettuata mediante casi studio, simulazioni, o analisi dei piani industriali delle aziende quotate.

4. Contributi teorici attesi

Il lavoro contribuisce alla letteratura in almeno quattro direzioni:

- Rielabora il concetto di rischio strategico integrando il pensiero sistemico italiano con i framework internazionali, offrendo una definizione aggiornata e multidimensionale.
- Chiarisce il legame strutturale tra rischio strategico, governance e sostenibilità, mostrando come la strategia sia luogo originario del rischio e come la governance ne debba garantire la gestione integrata.
- Propone un modello concettuale che ricompone in una cornice coerente elementi conoscitivi, decisionali e organizzativi.
- Colma un gap nella letteratura sull'ERM, che spesso trascura o sottostima la dimensione strategica rispetto a quella operativa o finanziaria.

Il framework sviluppato consente alle imprese di dotarsi di un processo strutturato per identificare, valutare e monitorare il rischio strategico; migliorare la qualità delle decisioni strategiche attraverso l'integrazione di informazioni qualiquantitative; rafforzare il ruolo della governance nella definizione del risk appetite e nel monitoraggio dell'esposizione al rischio; integrare maggiormente pianificazione strategica, sistemi di controllo e reporting; rendere più coerenti e trasparenti i processi decisionali, favorendo la creazione di valore sostenibile. L'adozione del modello produce benefici quali migliore allineamento tra strategia e rischi, maggiore resilienza ai cambiamenti ambientali, maggiore credibilità nei confronti degli stakeholder, miglioramento della comunicazione interna e del coordinamento tra funzioni, possibilità di integrare la valutazione del rischio strategico nei reporting ESG e nella rendicontazione non finanziaria. Il modello apre a diverse linee di ricerca ed in particolare a applicazione empirica su campioni ampi di imprese, analisi comparata tra settori, esplorazione del ruolo dell'intelligenza artificiale e dei modelli predittivi nella valutazione del rischio strategico, integrazione del framework nei sistemi di performance management e nelle balanced scorecard evolute.

5. Conclusione

Il contributo proposto intende valorizzare sia l'eredità teorica della disciplina italiana, sia le metodologie più avanzate dell'ERM, per offrire una prospettiva integrata e applicabile sulla valutazione del rischio strategico. In un contesto caratterizzato da crescente incertezza e complessità, la capacità delle imprese di identificare, comprendere e gestire il rischio strategico diventa una leva fondamentale per il successo competitivo, la sostenibilità del business e la qualità della governance.

Parole chiave: Rischio; risk management; strategia; governance; performance

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How and why do football clubs disclose sustainability? A preliminary investigation of leading Italian clubs

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1. Introduction

In recent decades, public concern and awareness regarding organizations' environmental and social impacts have increased significantly (Hoerber, 2025). Consequently, scholars, practitioners, and policymakers have examined the paradigms of sustainability and sustainable development extensively. The discourse on these paradigms originated with the Brundtland Report (1987), which defined sustainable development as the necessity and the ability of meeting present needs without compromising the ability of future generations to do the same. Subsequent initiatives, such as Agenda 21, the Convention on Biological Diversity, the Framework Convention on Climate Change, the Paris Agreement, and the 2030 Agenda, have furthered these efforts. These developments have prompted organizations to enhance their long-term positive impact on society and the environment while minimizing negative management effects (García-Sánchez et al., 2021; Stojanović-Blab and Blab, 2024). Despite this progress, research on sustainability remains fragmented, and sectors such as sports continue to lag behind.

In sport management, sustainability is defined as sports organizations' ability to lower or minimize the negative economic, environmental, and social impacts of their activities while trying to maximize, at the same time, positive outcomes for stakeholders and society (Doustaly and Zembri-Mary, 2024).

Most research on sports sustainability is still focused on the environmental sphere of sustainability (McCullough et al., 2020), neglecting the influence that sports organizations have on the social and economic spheres.

The sports industry faces frequent crises, misconducts, and scandals (e.g., bullying, harassment, alimentary and psychological disorders, etc.). These incidents create unsafe environments for athletes and supporters. They also highlight a need for improved sustainability-oriented regulations at both individual and institutional levels (Breitbarth et al., 2023; Safarpour et al., 2025). Breaking the culture of silence is essential for professional and non-professional sports to achieve full sustainability maturity. Promoting public awareness and openness around such issues is vital (Verschuuren, 2021; Stokowski and Carter, 2025). To help accomplish this, European sports organizations are starting to apply sustainability disclosure regulations. In Europe, these are mainly based on the Non-Financial Reporting Directive[6] (NFRD) and the Corporate Sustainability Reporting Directive (CSRD), which replaced the NFRD in 2024.

The CSRD is a directive issued to transform the sustainability reporting into a real governance opportunity, driving organization in disclosing non-financial information about

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[6] This Directive, enacted in 2017, states that EU public interest entities characterized by a specific size and financial criteria must disclose non-financial information, including diversity data.

environmental and social risks, opportunities, and impacts. This directive is based on comprehensive and detailed reporting requirements, including: 1) the principle of double materiality, 2) the integration of sustainability information into management reports; mandatory external assurance, 3) digital tagging of reported data, and 4) the obligation to report in line with the European Sustainability Reporting Standards (ESRS). These standards "encompass a wide range of environmental, social, and governance issues, including climate change, biodiversity, and human rights" (Raimo et al., 2025, p.5), emerging from the long-lasting debate on the International Sustainability Standards Board (ISSB) and the Global Reporting Initiative (GRI), intended to align EU and global reporting standards (Hummel and Jobst, 2024; Hristov and Searcy, 2025).

Although sustainability communication and disclosure have gained momentum in sport management, attention to the social dimension of sustainability remains limited (Trail and McCullough, 2020; Rith and Spinelli, 2024). To address this gap, the present study analyzes how football clubs approach sustainability disclosure, with a particular focus on the communication of their commitment to the social dimension of sustainability. Accordingly, the research is guided by the following questions: 1) Do major Italian professional football clubs comply with the CSRD and the ESRS? 2) What sustainability-related themes are most frequently disclosed?

In doing so, an inductive thematic analysis (Terry et al., 2017) has been conducted to identify the main themes at the core of the communication material they disclose. The thematic analysis has been conducted on the official documents published by a sample of Italian football clubs. As a result, the analysis of the achieved results will support policymakers and sports managers in strategically approaching sustainability and its disclosure through the institutionalization of specific practices dedicated to boosting social sustainability.

This paper has been organized as follows. The first section is dedicated to defining the theoretical background of the study, while the second section is dedicated to describing the applied methodology. The third and fourth sections are dedicated to the presentation and discussion of the achieved findings. Implications, limitations, and future research close the paper.

2. Theoretical background

2.1. Why a sustainable approach to sport and football management matters?

Currently, the sports industry is a major contributor to socio-economic development, generating several tangible and intangible benefits (Kim and Kim, 2024). These stem mainly from this industry's high economic impact (Tettamanzi et al., 2024); thus, it accounts for $521bn, including material infrastructures, licensed products, services, and events (Deloitte, 2024). Together with the economic impact, this industry also has important positive and negative societal and political outcomes. The positive ones are mainly personal and team success, national pride, international reputation, personal emancipation, social cohesion and inclusion, and gender equality (Ekholm and Dahlstedt, 2022). The negative ones are corruption, doping, alimentary and mental disorders, misconduct, discrimination, exclusion, and political propaganda or boycott (Zare and Géczi, 2024). The existence of these outcomes has led scholars and policymakers to devote growing attention to Corporate Social Responsibility (CSR) and to the way it can better contribute to enhancing the social dimension of sustainability in sport management (Robertson et al., 2025). This is possible by challenging misconduct and inspiring decision-making through the most common principles of business ethics, CSR, and social sustainability. However, the way sports organizations approach ethics, responsibility, and sustainability is often influenced by local and organizational culture (Räsänen, 2023). Together with this, the so-called "culture of silence" (Mitchell, 2012), or the reluctance to speak up and speak out about misconduct and abuses, characterizes the sports industry, and in particular football, hindering their commitment toward the principles of social sustainability. The so-called culture of silence is currently impacting athletes' mental and physical well-being, as well as organizational efficiency within and outside

of sport's specific contexts (Manley et al., 2016). To counteract this situation, institutions and sports organizations should promote the incorporation of sustainability-oriented practices in mainstream sport management strategies (Tettamanzi et al., 2024). This calls for a holistic approach based on the implementation of "green practices, promoting social responsibility, and ensuring financial stability (…) to shape a more sustainable future for the sports industry and the planet as a whole" (Safarpour et al., 2025, p.5).

To build a positive impact on the playground and beyond, as well as to achieve a wide societal involvement in sustainable causes, sports organizations should take a step forward and institutionalize specific and holistic sustainability-oriented programs (Wall-Tweedie and Nguyen, 2018).

2.2. Football clubs' approach to sustainability reporting and disclosure

As stated, the sports industry and the football sector have been increasingly committed to sustainability over time. This has pushed them to rethink their processes and activities, organizing them according to the sustainability paradigm, sustainable development's principles, and ESGs (Agostino and Thomasson, 2025). To support this paradigm shift, the main leagues (e.g., FIFA and UEFA) have issued specific criteria and guidelines to make football practice and infrastructures as sustainable as possible (Konstantopoulos and Manoli, 2024).

The football industry is currently populated by a growing number of clubs that tend to merely reinvest profit or assume losses to finance new player transactions to maximize the possibility of winning the league, more than to maximize profits (Kwon and Kwak, 2022; Agostino and Thomasson, 2024). This makes clubs "more sensitive to financial troubles since unexpected and negative shocks (e.g., injuries to key players, drop-out of key sponsors, relegation, and global catastrophes) would immediately deplete cash" (Tettamanzi et al., 2024, p.261). This challenge mainly affects the smallest ones, which tend to suffer more than larger ones due to their endemic lack of resources, limited expertise, and less organized crisis management (Kwon and Kwak, 2022).

To support sport organizations' transition towards financial sustainability, some regulations have been enacted (Breitbarth et al., 2023). For example, to counteract football clubs' financial misconduct and ensure their economic sustainability, the UEFA (Union of European Football Associations) issued the Financial Fair Play (FFP), a regulation that supports clubs in conducting economic activities properly, ensuring them equal opportunity to win and maintain financial stability. This measure states that "clubs should at least report their financial results as meeting the break-even principle and meeting the accounting standards applicable in the country of the competition" (Yusmita and Hafiz, 2023, p.128). It is worth noting that the FFP is not mandatory; consequently, clubs can decide whether to enact and to what extent to implement it.

Together with the FFP, the Sustainable Finance Disclosure Regulation (SFDR), issued by the EU in 2019 and enacted in 2021, supports clubs in regulating the sustainability of their financial activities.

Apart from the financial sustainability, football clubs are also starting to invest in environmental and social sustainability initiatives, working, for example, to reduce the environmental impact of events in terms of energy and water consumption or waste management. However, the way leagues and clubs address these issues remains fragmented and far from being institutionalized (Daddi et al., 2022).

To date, the growing public pressure is pushing clubs also towards a deeper commitment to social sustainability, which is related to the main "umbrella" dimensions of football equity and inclusion (Teplitz, 2025), and its issues (e.g., gender diversity, assaults and scandals, equity, inclusion, bullying, etc.) (Clarkson and Philippou, 2024). Even though there is growing public interest in football social accountability, not all teams are concretely involved in such initiatives, and, above all, not all teams are open and willing to disclose their social sustainability efforts.

However, some clubs and leagues (e.g., La Liga) are increasingly working on equity and inclusion by implementing community-based initiatives and integrating sustainability into their decision-making process and strategic planning (Chopra et al., 2024).

To support clubs in sustainability disclosure, the EU recently issued "more comprehensive and detailed reporting requirements, such as the principle of double materiality, the integration of sustainability information into management reports, mandatory external assurance, digital tagging of reported data, and, crucially, the obligation to report in line with the European Sustainability Reporting Standards (ESRS)" (Raimo et al., 2025, p.5). The ESRS are based on several environmental, social, and governance issues (e.g., climate change, biodiversity, human rights, etc.), which are also related to the International Sustainability Standards Board (ISSB) and the Global Reporting Initiative (GRI). Even though this makes these standards able to strictly align and interact with European Union and global reporting standards (Raimo et al., 2025), few are the football clubs and leagues that voluntarily enact them.

Apart from the standards mentioned before, to address and disclose social commitment, clubs can count on specific "tools" (e.g., the sustainability report, corporate websites, or social media) to share information about their sustainable initiatives. Moreover, they can voluntarily decide to approach disclosure following specific directives and regulations, such as the Corporate Sustainability Reporting Directive (CSRD) or the Corporate Sustainability Due Diligence Directive (CSDDD), the GRI standards, and the ESGs. In 2022, to further complement these, the EU issued the CSDR, which replaced the NFRD to make sustainable reporting equivalent to financial reporting, being standardized, relevant, and reliable (Croenenberg, 2024). In particular, the clubs that enact CSRD must also respect the ESRS, integrate sustainability information in the management reports, respect the external assurance requirement, and share digital tagging of the reported information (Hummel and Jobst, 2024).

Finally, the CSDDD is intended to promote the integration of responsible and sustainable standards and practices in corporate value chains, enhancing accountability mechanisms to adhere to transparency and reporting standards.

3. Methodology

Research approach and method

This study aims to recognize the main themes at the core of the major Italian football clubs' sustainability disclosure. In doing so, the analysis will be conducted by comparing whether and how the sample clubs, the professional ones that participate in the Italian Premier League (Serie A), approach sustainability reporting and disclosure.

Drawing on the study's purpose, an inductive qualitative thematic analysis (Terry et al., 2017) has been implemented to identify and analyse the recurrent patterns of meaning identified in a specific dataset (Braun and Clarke, 2006). In doing so, a wide range of textual materials (e.g., sustainability reports, news, posts, etc.) has been analysed to identify the themes important in the description of the phenomenon under investigation, which are those that mostly recur in the selected textual resources used by the Italian football clubs to disclose sustainability commitment.

The sample textual resources were analysed by implementing an open-ended iterative search process (Finfgeld-Connett and Johnson 2013), based on: (1) searching, (2) sorting, (3) selecting, (4) acquiring, (5) reading, (6) identifying, and (7) refining.

Searching was conducted by reviewing titles and keyword occurrences to determine whether the documents' content aligns with the main topics of this study. Then, the retrieved texts were sorted and selected for screening to identify the final sample. January 2021 was set as the starting period from which the published textual material would be collected, because it represents the enactment year of some sustainability-oriented regulations (e.g., the SFDR). Other inclusion criteria were the publishing language (Italian) and the authorship (Serie A clubs).

The internal validity of the analysis was ensured by data triangulation, achieved by comparing different sources of data to confirm information gathered through corporate websites and social media. Triangulation is essential to cross-validate the achieved findings, comparing, validating, and corroborating them through multiple data sources (Denzin and Lincoln 2011).

Specific content units (or 'observation' in inferential statistics) were defined, while the sentence was considered the unit of analysis to set the limits on the information to be considered. Two researchers worked independently and checked the texts to correct any eventual coding errors. As stated, to ensure internal validity, data were triangulated (Houghton et al. 2013) to test the observations of the thematic analysis and reduce researchers' subjective influence.

4. Prelimary results

The preliminary analysis of the sample document and online textual resources (e.g., corporate websites and social media articles and posts) has confirmed the results of previous research, according to which the Serie A lags behind the other European major leagues (e.g., La Liga, Premier League, Bundesliga, Ligue 1) (Piedepalumbo et al., 2024). This is because Serie A clubs do not strategically approach sustainability, but rather still consider it as something voluntary and episodic.

The preliminary analysis made it possible to recognize that Italian football clubs have achieved different sustainability levels, characterized by different commitment, initiatives, and tools, as well as different disclosure strategies. It follows that the sustainability maturity level of these clubs ranges from initial to complete; thus, the different stages have been defined as beginner, elementary, satisfactory, and complete (Meza-Ruiz et al., 2017).

It is worth noting that to achieve a complete sustainability maturity, clubs must not only address all three dimensions of sustainability but also use the main tools and measures to operationalize and communicate their social sustainability-oriented effort. Drawing on these considerations, it is possible to classify the 20 analyzed Italian clubs as follows.

Only two clubs (Juventus and A.C. Milan) have reached complete sustainability maturity because, over time, they have enacted initiatives intended to address economic, social, and environmental sustainability. They have also developed and published the corporate Ethics Code, and incorporated their CSR effort into the sustainability strategy, disclosed in the Sustainability Report. In particular, Juventus has approached sustainability and social sustainability disclosure following the European CSRD and the ESRS (European Sustainability Reporting Standards).

A singular situation characterizes a club named Cagliari, which in the past realized and published the sustainability report, while recently has switched to a less complete approach to sustainability disclosure, publishing just the Ethical Code.

Three clubs (Bologna, Roma, Udinese) have demonstrated a satisfactory level of sustainability commitment and disclosure, being involved in the first enactment of the main principles of the UEFA sustainability principles. However, the effort these clubs put into sustainability and social sustainability is still far from being institutionalized.

Most of the major Italian clubs have demonstrated an elementary level of sustainability maturity; thus, these eleven clubs have decided to report their effort in a specific sphere of sustainability through the Ethic Code (Atalanta, Fiorentina, Lazio, Napoli, Pisa, and Verona), or the CSR strategy (Como, Genova, Inter, Parma, and Sassuolo).

Finally, some clubs (Cremonese, Lazio, Lecce, and Torino) have been classified as beginners because they do not approach sustainable initiatives holistically and strategically. Thus, they report just about punctual initiatives pointing to contribute to a specific sustainable and/or responsible project, often ideated and promoted by other organizations (e.g., supporting environmental protection, inclusion, gender diversity, etc.).

These preliminary results, which will be further supported by the results of the thematic analysis, demonstrate that very few of the Italian major clubs have strategically approached

sustainability, doing so at an individual and voluntary level, not following any directive or official guideline.

The two most mature clubs (Juventus and A.C. Milan) are also those with the most formalized business organization, and with a long-lasting effort to address sustainability and social sustainability issues. In particular, Juventus has established a specialized team dedicated to sustainability and strategic planning, as well as a sustainability committee responsible for achieving sustainability KPIs (Key Performance Indicators) and goals. This makes the club a national pioneer in implementing and disclosing social responsibility and sustainability efforts (Profumo et al., 2024). It follows that Juventus' sustainability effort has led the club to achieve the Best Social Performance category and the third best role model of the global sustainability index of sport organisations (Global Sustainability Benchmark in Sports, 2022).

5. Implications and final remarks

The debate around football sustainability has been intensified in recent years, attracting the interest of people, practitioners, and policymakers at a global level (Trail and McCullough, 2020). Thus, growing research has highlighted that "sport and sustainability are increasingly being linked together in efforts to promote environmental stewardship and social responsibility" (Safarpour et al., 2025, p.3). Integrating sustainability into sport management and practice is not only aimed at reducing their environmental impact (e.g., emissions, climate change, natural resource consumption, etc.) but also to inspire and engage communities in socially responsible initiatives.

Drawing on these considerations, this paper investigated the approach of Italian football clubs to the disclosure of sustainability and, in particular, of social sustainability. Even though this represents a preliminary investigation, which will be further exploited by a punctual thematic analysis, it offers an initial snapshot of how the Italian football clubs address sustainability, focusing on their commitment to social sustainability initiatives. In doing so, the achieved results demonstrated that Italian football clubs' commitment towards sustainability is still fragmented. Thus, few clubs have demonstrated a fully mature or strategically oriented approach to it and a focus on socially sustainable initiatives, while most of them are still trying to develop a sustainability-oriented mindset, for example, enhancing their compliance with the main national and international regulations and standards. This also represents a permanent challenge for institutional actors (e.g., the national league, government, etc.), who should be more open and proactively oriented to support clubs, especially the smallest ones, in their ameliorative journey towards complete sustainability maturity (Meza-Ruiz et al., 2017). This opens to interesting implications, which can support managers and policymakers in better addressing 1) the main issues that affect football at the societal level (e.g., education, racism, inclusion, diversity, mental health, medical costs, etc.), and 2) the effects that football can have on the other two spheres of sustainability, the economic and environmental one.

This study does not come with any limitations. Thus, the main ones are related to the preliminary nature of this contribution, which is the first step of a wider and deeper research, and to the low level of generalizability of the achieved findings. This limitation will be addressed by conducting further cross-country comparative analyses.

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Does it Pay to Be Good in Italy? Exploring the Relationship Between ESG Performance and CFP

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1. Introduction

In recent years, the issue of corporate sustainability has become central to scientific and managerial debate, due to the evolution of European regulations, the growing attention of institutional investors, and the systematic inclusion of ESG (Environment, Social, Governance) factors in capital allocation processes.

Despite the spread of ESG metrics, the literature does not converge on the actual impact of sustainability on corporate financial performance.

The most authoritative reviews (Margolis & Walsh, 2003; Friede, Busch & Bassen, 2015) show mixed results: while many research report a positive correlation, there is also evidence of no or negative correlations attributed to the costs of responsible initiatives, the difficulty of measurement, or different time horizons of impact.

This fragmentation points to an open question: to what extent does ESG performance represent a robust determinant of corporate profitability, especially in regulated contexts characterized by high stakeholder pressure, such as Europe.

Furthermore, the most recent literature emphasizes the importance of focusing on the ESG scores of individual companies, rather than composite market indices, to avoid aggregation and mis-measurement problems (Berg, Kolbel & Rigobon, 2022).

In light of these considerations, this study analyzes the relationship between ESG performance and profitability indicators (ROA, ROE, ROI) of companies included in the MIB ESG Index for the period 2021-2025. The objective is to test the hypothesis that better ESG performance is associated with significantly higher financial performance, ceteris paribus, consistent with the view that sustainable practices generate reputational advantages, risk reductions, and more effective stakeholder relationship management (Porter & Kramer, 2006; Luo & Bhattacharya, 2006).

The expected contribution is twofold: on the one hand, the work contributes to the academic debate by providing updated evidence on a market characterized by strong regulatory pressure and significant changes in reporting standards. On the other hand, it addresses one of the most significant methodological issues in ESG studies: the choice of reliable corporate metrics, in this case represented by ESG scores from specialized agencies, avoiding the misuse of composite market indices.

2. Literature Review and Theoretical Framework

2.1. Conceptual evolution: from CSR to ESG

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The scientific debate on corporate social responsibility has its roots in the late 1960s, but it was with the contributions of Carrol (1979) that the concept of Corporate Social Responsibility (CSR) took on a structured and multidimensional form, articulated in economic, legal, and ethical components. In this initial phase, however, CSR remained a predominantly normative construct, lacking systematic mechanisms for assessing its economic effects. In the 1990s, Wood (1991) proposed the Corporate Social Performance (CSP) framework, with the aim of overcoming the vagueness of CSR through the introduction of observable and measurable elements. CSP represents a first attempt to translate social responsibility into verifiable policies, processes, and results.

The next step – decisive for empirical literature – came with the introduction of the ESG paradigm, promoted by the UN in 2005 through Who Cares Wins. ESG differs from both CSR and CSP in its more markedly financial orientation: it has become the tool with which investors assess the risks, opportunities, and management quality of companies.

This transformation has a twofold effect: on the one hand, it creates a common language between management and financial markets; on the other, it introduces the complex issue of measurability, as ESG scores vary significantly depending on the methodologies adopted and the rating agencies (Chatterji et al., 2016; Berg, Kolbel & Rigobon, 2022).

2.2. Empirical evidence on the ESG-CFP relationship

There are numerous studies on the relationship between sustainability and financial performance, covering very different periods, methodologies, and contexts.

One of the most recurrent findings in meta-analyses (Orlitzky, Schmidt & Rynes, 2003; Busch & Bassen, 2015) is the prevalence of a positive association between sustainability initiatives and financial performance, especially in studies that adopt indicators capable of assessing returns in relation to the risk incurred by the company, rather than in purely accounting or absolute terms. However, the most recent literature tends to introduce greater caution.

Studies such as Awaysheh et al. (2020) highlight that a significant portion of empirical analyses produce null or statistically insignificant results, suggesting that the ESG effect is not automatic and that the benefits may depend on contingent factors: sector, internal governance, quality of disclosure, regulatory shocks, or phases of the economic cycle.

There is also evidence of negative relationships, especially in the short term, attributed to the costs of implementing complex environmental or social practices (Baron, Harjoto & Jo, 2011). This perspective, known as the "trade-off view," holds that ESG can temporarily reduce profitability, especially if sustainable initiatives are not integrated into strategic processes or if they respond more to compliance logic than to actual competitive opportunities.

A crucial point concerns measurement.

The study by Berg, Kobel & Rigobon (2022) highlights that convergence between ESG rating agencies is surprisingly low, with correlations often not exceeding 0.6. This methodological divergence has direct consequences on empirical studies, as it can generate different results depending on the agency used, a factor that explains part of the inconsistency observed in the literature.

Furthermore, a growing body of research emphasizes the need to use ESG scores at the company level, rather than market indicators or aggregate indices, to reduce the risk of distortion arising from sector compositions or capitalization-based weightings.

3. Theoretical framework

The interpretation of the possible link between ESG performance and economic and financial results can be understood through a combination of institutional and informational dynamics that influence both corporate behavior and investor perception.

First, Legitimacy Theory offers a relevant interpretative key: according to Suchman (1995), organizations operate within a system of normative and social expectations on which their "license to operate" depends. In contexts such as Europe, characterized by high regulatory pressure on sustainability, companies develop ESG practices to demonstrate compliance with these expectations and preserve their institutional legitimacy.

This process reduces reputational risk, mitigates potential tensions with stakeholders and authorities, and can contribute to more stable economic results in the medium term, reflecting positively on indicators such as ROA and ROE.

At the same time, Signaling Theory (Spence, 1973) helps us understand how ESG scores published by rating agencies serve as signals about the quality of governance, risk management capabilities, and strategic orientation of a company. The literature shows that these signals significantly influence investor behavior, reducing information asymmetries and contributing to lower capital costs (Chatterji et al., 2016; Christensen, Serafeim & Sikochi, 2022).

In markets where sustainability is an integral part of decision-making processes, a high ESG score is interpreted as an indicator of reliability and transparency, with direct implications for the financial valuation of the company.

These two perspectives, institutional and informational, do not operate separately, but reinforce each other: the search for legitimacy drives companies to develop ESG practices, while their structured communication through scores and ratings allows the market to recognize and evaluate these efforts.

Sustainability thus becomes a mechanism through which the company builds credibility externally, improves risk management, and consolidates trust-based relationships with investors. In this sense, ESG is not simply a set of ethical practices, but a strategic device that mediates the relationship between companies, institutions, and the market, measurably influencing their financial performance.

Development of the research hypothesis

The set of dynamics described in the previous paragraph allows us to formulate a clear theoretical rationale for hypothesizing a positive association between ESG performance and economic and financial results.

On the one hand, Legitimacy Theory suggests that companies that adopt practices consistent with institutional and regulatory expectations receive implicit recognition that reduces the risk of sanctions, disputes, regulatory pressure, and reputational damage (Suchman, 1995).

In a context such as Europe, characterized by significant developments in the regulatory framework on sustainability, this legitimacy takes on a particularly important role: companies that demonstrate a credible commitment to ESG are more aligned with the demands for transparency and social responsibility, with positive implications for operational stability and the continuity of economic results.

On the other hand, the signaling mechanisms described by Signaling Theory suggest that ESG scores represent, in the eyes of investors, summary indicators of management quality, the soundness of internal processes, and the company’s ability to anticipate and manage emerging risks (Spence, 1973).

ESG assessments carried out by specialized agencies help to reduce information asymmetries and provide reliable signals on corporate environmental, social, and governance policies, thus influencing both portfolio decisions and the cost of capital (Chatterji et al., 2016; Christensen, Serafeim & Sikochi, 2022).

In this context, companies with high ESG scores are often perceived as less risky and more transparent, with possible positive effects on financial performance.

These two perspectives – institutional and informational – converge in suggesting that sustainability is not just a set of ethical or philanthropic initiatives, but a strategic lever that affects

value creation through risk management, uncertainty reduction, stakeholder relationship strengthening, and corporate reputation improvement.

This implies that, at least in theory, an improvement in ESG performance should be reflected in stronger economic results, especially when considered through operating profitability indicators such as ROA, ROE, and ROI, which are sensitive to the combined effects of management effectiveness, operating efficiency, and credibility with investors.

In light of these considerations, this study formulates the following research hypothesis:

H1: Better ESG performance is associated with significantly higher financial performance. This hypothesis will be tested empirically, using panel data relating to companies belonging to the MIB ESG Index in the period 2021-2025, with the aim of verifying whether the theoretical framework outlined is reflected in the economic and financial results observed in a market particularly sensitive to sustainability issues, such as the Italian market.

4. Data and Sample

The empirical analysis is based on a dataset constructed through several steps that are methodologically consistent with the recommendations of the ESG-CFP literature. Since the MIB ESG Index was introduced in 2021 and is subject to quarterly review, the first step involves constructing the index composition for each quarter, following an approach similar to that adopted in studies requiring dynamic tracking of ESG indices (Derwall et al., 2005; Statman & Glushkov, 2009). This procedure allows us to distinguish between companies with stable presence and companies subject to turnover, reducing the risk of distortions due to transitory effects or idiosyncratic shocks.

The final sample consists exclusively of companies present in all quarters since the creation of the index.

This choice is consistent with the recommendation in ESG literature to limit structural heterogeneity and reduce reverse endogeneity problems attributable to short-term changes in the composition of indices. Companies with a stable presence are, in fact, a more suitable subset for assessing structural and non-episodic relationships between sustainability and economic and financial performance.

Data on the main Corporate Financial Performance (CFP) indicators – ROA, ROE, ROI – are extracted from the AIDA database. The use of annual accounting indicators is well established in ESG-CFP literature, which considers these measures particularly suitable for capturing the operational efficiency and internal profitability of a company, unlike stock returns, which are more sensitive to market dynamics and speculative components (Orlitzky, Schmidt & Rynes, 2003).

The main independent variable is the ESG Score at company level provided by specialized agencies.

This choice is supported by extensive literature that warns of the limitations of using aggregate indices as proxies for corporate sustainability. Relevant studies on the subject show that market-level ESG indices incorporate exogenous components (capitalization, sector structure, weightings) that distort the CSR/ESG measurement of the company (Berg, Kolbel & Rigobon, 2022; Chatterji et al., 2016).

Furthermore, measurement at the company level reduces mis-measurement problems and allows for a more accurate analysis of the relationship between ESG and financial performance, in line with the latest methodologies adopted in empirical studies on sustainability.

To test the research hypothesis, the empirical analysis involves conducting OLS regressions separately for each year within the considered period. This approach is widely used in studies aiming to reduce the influence of intertemporal shocks or unobservable structural changes and allows us to isolate the association between environmental, social and governance (ESG) performance and economic and financial results within each financial year.

This approach does not assume homogeneity of effects over the entire time period.

Using annual regressions also mitigate the risk of confounding factors arising from systemic events, regulatory changes or macroeconomic dynamics that could affect multiple years of observations simultaneously. Therefore, analyzing each year as an independent cross-section avoids the overlap of heterogeneous temporal effects, which is a particularly relevant issue in ESG-CFP studies where the estimated relationship can vary significantly in response to changes in the institutional context (Awaysheh et al., 2020; Eccles, Ioannou & Serafeim, 2014).

At the same time, the separate estimate enables us to observe how the ESG-CFP coefficient evolves over time and verify whether the association is stable, increasing or decreasing, or statistically insignificant in certain years. This temporal perspective is particularly useful during a period characterized by significant regulatory transitions in the field of sustainability.

Overall, the adopted strategy enables a more granular and transparent evaluation of the relationship between the ESG Score and financial performance. It ensures the robustness of the sample definition and aligns with the best methodological practices recommended by contemporary literature, particularly when the aim is to capture year-on-year variations rather than estimate an aggregate average effect.

5. Methodology

The empirical analysis adopted in this study is based on the estimation of a series of independent OLS regressions, conducted separately for each year of the period 2021-2025. This methodological configuration allows for a precise assessment of how the association between ESG performance and economic and financial results varies over time, preventing the estimates from being jointly influenced by macroeconomic shocks, regulatory changes, or heterogeneous market conditions between the years considered, as widely recommended in studies that favor within-year analysis to mitigate unobservable exogenous effects (Petersen, 2009; McWilliams & Siegel, 2000)

The decision not to adopt a traditional panel model stems from two fundamental methodological requirements: (i) to observe the stability or variability of the ESG-CFP coefficient over time, in line with research highlighting how the link between sustainability and performance can change depending on the regulatory context and economic cycle (Awaysheh et al., 2020; Eccles, Ioannou & Serafeim, 2014); (ii) to reduce the possibility that systemic events – such as inflation and regulatory revisions – generate spurious correlations between different years, a risk explicitly reported in the applied econometric literature (Woolridge, 2010).

For each year t, the following cross-section equation is estimated:

$$CFP_i^{(t)} = \alpha_t + \beta_t + ESG_i^{(t)} + \varepsilon_i^{(t)}$$

where $CFP_i^{(t)}$ represents, alternatively, ROA, ROE, or ROI of company i in year t while $ESG_i^{(t)}$ indicates the ESG Score assigned in the same period. The coefficient ßt measures the association between sustainability and financial performance within the year, allowing for a comparable and methodologically transparent analysis of the evolution of the ESG-CFP relationship over time. The use of accounting indicators as measures of Corporate Financial Performance is consistent with established literature, which highlights their ability to represent the operational efficiency and internal profitability of the company, reducing the influence of speculative components typical of market returns (Orlitzky, Schmidt & Rynes, 2003; Margolis & Walsh, 2003).

On this point, numerous studies confirm that ROA and ROE are robust proxies for analyzing the effects of ESG strategies on corporate performance (Waddock & Graves, 1997; Barnett & Salomon, 2012).

The annual regressions are also replicated by progressively including a set of control variables – including company size, financial leverage, and sector – in line with methodological recommendations aimed at reducing the risk of omitted variable bias (Roberts & Whited, 2013). This procedure allows us to isolate the effect associated with ESG scores more accurately, ensuring that the estimates do not reflect persistent structural differences between companies.

This approach is also consistent with the literature on ESG measurement, which points out that, despite their heterogeneity across agencies, company scores are the most appropriate tool for analyzing the ESG-CFP relationship, avoiding the distortions generated by aggregate indices and their weighting by capitalization (Chatterji et al., 2016; Berg, Kolbel & Rigobon, 2022).

Overall, the strategy adopted allows us to explore the ESG-CFP relationship from a comparative time perspective, verifying the robustness and stability of the coefficient ßt throughout the entire period considered and allowing us to interpret any variations in light of regulatory, institutional, and macroeconomic changes that have taken place in the Italian and European context.

6. Implications

The expected results of this study have significant implications at the scientific, managerial, and regulatory levels.

On the scientific side, the study helps to clarify the role of ESG performance as a possible determinant of corporate profitability in a context – that of Italy – characterized by strong regulatory pressure and the growing integration of sustainability factors into investors' decision-making processes.

Empirical evidence supporting a positive relationship would reinforce the idea that sustainability is a strategic lever capable of generating value through better risk management, greater transparency of information, and stronger institutional legitimacy.

From a managerial perspective, the analysis aims to provide useful guidance for listed companies: a stable presence in the MIB ESG Index could be interpreted not only as a reputational signal, but also as an element associated with better economic results in the medium term, encouraging more substantial investments in environmental, social, and governance practices.

Finally, in terms of public policy and regulatory debate, the study aims to contribute to assessing the effectiveness of ESG indices as market tools for promoting the reallocation of capital towards more sustainable companies, offering useful insights for reflecting on the consistency between mandatory disclosure, standardization of metrics, and the overall functioning of financial markets.

Keywords: ESG performance; corporate sustainability; firm-level ESG Analysis

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The integration of sustainability into SME strategy: an Italian case study

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1. Purpose

In the contemporary globalized economy, Environmental, Social and Governance (ESG) issues affect stakeholders' investment choices (Amstrong et al., 2020; Huang et al., 2022; Casciello et al., 2025), creating pressure on companies to commit to a sustainable behaviour (Gray et al., 2006; Paolone et al., 2022). The term ESG first appeared in 2004, in a United Nations (UN) report (Mahmood et al., 2025). In the most used frameworks, pollution, emissions, biodiversity, energy consumption, water usage, and waste management are examples of environmental factors. Social factors include human rights, workforce issues, gender rights, discrimination, and inequality; while governance factors cover the issues concerning management and the board (Loizzo and Schimperna, 2022).

Over the years, many studies investigated i) the effects of incorporating sustainability issues into corporate strategy and behaviour; and ii) why and how to make this inclusion. Focusing on the first perspective, the relationship between corporate sustainability and financial performance is one of the most interesting aspects investigated by researchers. In particular, positive correlation was found by various studies that highlighted how proactive environmental and social policies are often associated with higher financial returns and competitive advantages (Burnett and Hansen, 2008; Erhemjamts et al., 2013; Rodgers et al., 2013; Gallego-Álvarez et al., 2015). Moreover, it should be noted that sustainability can lead to economic benefits thanks to the creation of unforeseen opportunities (Fombrun et al., 2000; Cheng et al., 2014).

Moving to the second point, according to Lozano et al. (2015), the introduction of sustainability considerations into corporate strategies and behaviour relies on many supporting theories, among them the agency theory, the evolutionary theory, the resource-based view (RBV) theory, the stakeholder theory, and the social contract theory. The agency theory describes the agency relationships between the principal, who engage and transfer authority, and the agent, who acts on behalf of the principal (Jensen and Meckling 1976). In this scenario, the introduction of sustainability considerations can help meet the principal's expectations, allowing costs to be reduced and benefits/profits to be increased. The evolutionary theory suggests that the most profitable companies drive the least profitable ones out of the market (Nelson and Winter, 1982). Thus, companies are encouraged to develop medium- to long-term strategies that also consider sustainability to strengthen their market position.

Moving to RBV theory, it considers the company as an entity with interlinked internal resources that provide it with a competitive advantage (Penrose, 1959; Conner and Prahalad, 1996). The selection and development of valuable and proactive internal resources is essential to keep pace with market demands. In this scenario, when internal resources perceive new sustainability-related needs, they become a driver of change in corporate strategy and behaviour. Focusing on the stakeholder theory, companies must meet the needs of many stakeholders

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(Freeman, 1984). For this reason, given that society in general is demanding ever greater attention to environmental and social issues, companies are called upon to make a positive contribution in these areas.

Lastly, according to the social contract theory, companies have an ethical obligation to enhance societal welfare (Coase, 1937; Hasnas, 1998). Therefore, companies have an obligation towards society, including from a sustainability perspective, considering that society itself is ultimately responsible for granting or revoking the "operating licence". Additionally, focusing on how to include and implement sustainability and ESG factors in a company, Eccles et al. (2012) suggested that it should be based on: i) reframing the company's identity; ii) codifying the new identity; and iii) building a supportive organisational culture.

More in detail, the first step – reframing the company's identity – is composed of leadership commitment and external engagement. Through leadership commitment, it is possible to drive the change, while the external engagement strengthens the company's mechanisms of execution, as pressure from stakeholders drives the company to improve its quality constantly. The second step – codifying the new identity – means creating internal support for the new identity through employee engagement and implementation mechanisms. Overall, the codification of a sustainable company's new identity will strengthen (or establish) a culture based on trust, changeability, and innovation. Thus, the final output is an open, supportive corporate culture that embraces change from a sustainability perspective.

In light of the above considerations, our research question is as follows: How does an Italian SME operating in the flour industry integrate sustainability principles into its strategy and behaviour?

2. Design/methodology/approach

To answer our research question, we conducted an exploratory case study on a small and medium-sized Italian enterprise (SME) operating in the flour industry. The Yin's (2014) case study methodology allows us to identify and acknowledge the relationships between variables in complex processes (Shah and Corley, 2006; Lombardi et al., 2019). This methodology is entirely suitable for this research because a case study is functional when "a how or why question is being asked about a contemporary set of events over which the investigator has little or no control" (Yin, 2014, p. 14).

According to Yin's methodology, a research protocol has been designed to ensure reliability. In particular, we defined the people to be interviewed, the average expected length of each interview, and the questions to be asked. Data were collected from semi-structured interviews with the company's board members. We opted for this tool because a semi-structured interview envisages "prepared questioning guided by identified themes in a consistent and systematic manner interposed with probes designed to elicit more elaborate responses" (Qu and Dumay, 2011, p. 246). The interviews have followed a closed-ended multiple-choice questionnaire with some open-ended items.

We analysed the retrieved data following the framework by Lombardi et al. (2019). The choice of this framework depends on its ability to provide an analytical structure that can be transferred to other contexts. Following this framework, we examine the analysed SME (who), the objectives pursued (what), the strategic motivations behind integrating sustainability (why), and the processes implemented to achieve them (how). To achieve investigator triangulation, we discussed the results together. Then, we produced a draft of the results; lastly, we discussed it with the respondents to validate our findings.

3. Findings

The analysed company is an Italian SME operating in the flour milling sector. Particularly, it transforms wheat into flour. Its production activity is located in central Italy, but the company also exports its products to Asia and America (who dimension).

The company is currently in the early stages of its sustainability journey, having integrated this dimension into its mission and strategy in less than three years. More specifically, the company has decided to innovate its internal processes to strengthen transparency, enhance stakeholder engagement, and foster long-term value creation. In addition, it considered it useful to start preparing a non-financial report on a voluntary basis. Even if the company is not legally required to disclose sustainability-related information to the market, it chooses to do so proactively to enhance communication with its stakeholders and demonstrate the positive results achieved beyond its financial performance (what dimension).

The strategic motivations behind integrating sustainability are different. Firstly, in response to the increasingly articulated expectations expressed by its stakeholders, the company initiated a broader process of organisational and managerial innovation. This evolution reflects a shift from a purely economic and financial perspective to a more integrated view of value creation, in which social, relational, and operational aspects are also considered relevant drivers of performance. The firm has therefore revised some of its internal processes, strengthening monitoring and coordination mechanisms. Such actions are consistent with the strategic intent described in the What dimension, where the role of stakeholder pressure and emerging sustainability needs is recognised as a catalyst for change.

In parallel, with the objective of improving communication quality with stakeholders, the company decided to prepare a voluntary non-financial disclosure. Although the analysed SME is not subject to any regulatory obligation regarding sustainability reporting, management acknowledged that providing structured information on non-financial outcomes could enhance transparency, credibility, and dialogue with external audiences. This initiative enables the firm to present the positive non-financial results achieved, which would otherwise remain partially invisible when relying solely on traditional financial documentation. Therefore, the introduction of a voluntary sustainability report represents not only a response to stakeholders' interests but also a strategic tool to convey the broader contribution generated by the company and to strengthen its positioning as a responsible and forward-looking market actor.

Secondly, the CEO considers integrating sustainability as a means of achieving competitive advantage. In a period where most companies in the same sector and of similar size do not integrate sustainability in their core business and practices, immediately meeting the new needs of stakeholders and being proactive could be a key element for business competitiveness (why dimension).

The analysed SME demonstrated a strong sensitivity toward environmental and social issues. Over the past three years, the company has undertaken several investments to integrate sustainability into its operations and governance. First, resources have been allocated to enhance internal processes and infrastructure, including the installation of a 500-kW photovoltaic system designed to reduce the company's reliance on non-renewable energy sources. Secondly, the company has also funded research activities, such as a research grant in the field of sustainability reporting, demonstrating its willingness to develop knowledge and tools that support its transition.

Regarding human capital, the company places particular emphasis on worker well-being, considering it a core element of its ethical and managerial philosophy. Continuous training courses are regularly organised to enhance employees' skills and stimulate engagement in sustainability-related practices. These actions reflect a broader strategic approach that recognises personnel as a fundamental driver of organisational performance and innovation.

Although ESG targets have not yet been fully defined, the company is currently working to establish them. During this transitional phase, performance is monitored through periodic reporting to top management and through internal information systems. In addition, the enterprise holds several product-quality certifications, such as UNI EN ISO 9001:2015, UNI EN ISO 22005,

and IFS (International Featured Standards), which contribute to strengthening market credibility and stakeholder trust, despite the absence of a designated sustainability manager, a role currently assumed directly by the CEO.

Regarding disclosure, since 2024, the company has voluntarily published a sustainability report aligned with the GRI standards, positioning itself among the first firms in its sector to adopt this practice. The process proved challenging, especially in the initial stages, mainly due to difficulties in collecting complete and comparable data. Reporting activities are supported by the CEO through a top-down management approach, and significant economic and professional resources have been devoted to structuring the reporting system as well as to broader ESG projects. Overall, the main limitation identified concerns the reliability and availability of non-financial data necessary for comprehensive disclosure. For the future, the company aims to enhance the process in place to better achieve its strategic objectives by improving its sustainability performance and communication (how dimension).

4. Originality/value

This study makes a valuable contribution to the debate on integrating sustainability into companies' managerial strategies. In particular, our study shows that in order to respond to the ever-increasing and pressing sustainability demands of the market and stakeholders, SMEs are also seeking to adapt their strategies and behaviour. Furthermore, it differs from other studies as it shows some practices that can be implemented by an SME in order to innovate in terms of sustainability. Thus, these findings are valuable for managers, investors, academics, and policymakers, as they help them understand the emerging ESG practices relating to SMEs.

However, it has the following five limitations: i) it relies on a single case study approach; thus, the findings are difficult to generalize; ii) data collection was carried out solely through a questionnaire with a limited number of questions; iii) the limited number of respondents; iv) the focus on a specific sector; and v) the consideration of the only Italian national context. Future research aims to overcome these limitations, considering a broader number of SMEs operating in different sectors and nations to gain a deeper understanding of their specific strategies and approaches. Moreover, future research will focus on trying to understand whether there are any major differences in the introduction of sustainability practices between SMEs and large/listed companies, and if so, what these differences are.

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Auditing in the Age of Climate Risk: A Mixed-Methods Review of Climate-Related Assurance Research

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1. Introduction and background

Over the last two decades, the intersection between climate change and auditing has emerged as a critical research field, reflecting the growing awareness that climate-related risks and sustainability information must be subject to reliable assurance mechanisms. The increasing societal and regulatory demand for transparency and accountability in environmental performance has prompted companies to disclose non-financial and sustainability information that is material to investors, regulators, and other stakeholders.

Furthermore, Climate change is increasingly framed as a source of material financial risk, through both physical and transition channels, which affects firms' cash flows, access to finance and cost of capital. In this context, external assurance on sustainability and climate-related disclosures is expected to enhance the credibility of non-financial reporting, mitigate information asymmetries and reduce the risk of greenwashing in capital markets (Simnett et al., 2009; Perego and Kolk, 2012).

The expansion of sustainability reporting and the diffusion of voluntary assurance engagements have stimulated a growing body of research on the market for sustainability assurance services, the role of different assurance providers (audit firms vs. non-audit specialists) and the quality of assurance statements. Prior studies show that external assurance can strengthen stakeholder confidence and organizational legitimacy, but they also highlight heterogeneous assurance practices, varying levels of assurance and persistent concerns about professionalism, independence and the actual value added of these engagements (Cohen and Simnett, 2015; Farooq and De Villiers, 2017; Boiral et al., 2019). These tensions are particularly salient for climate-related information, where measurement uncertainty is high and the underlying risk exposures are complex, forward-looking and scenario-dependent.

Existing contributions have analysed how external assurance affects the credibility of sustainability reports, how auditing and assurance standards are applied to non-financial information, and how climate-related disclosures contribute to corporate accountability and risk management (Tang and Demeritt, 2018; Li et al., 2019; Dutta and Dutta, 2021). Yet, empirical and conceptual integration is still limited: most studies focus on voluntary assurance practices, on a narrow set of jurisdictions, or on selected industries, while less attention has been devoted to the evolving interplay between climate-related financial risks, regulatory developments and the institutionalization of assurance practices (Farooq and De Villiers, 2017; Hazaea et al., 2021; Zhou, 2022).

Against this background, this paper systematically reviews and maps the scientific production at the intersection of climate change and auditing. The overarching objective is to develop a systematic and integrated overview of the scholarly literature up to the end of 2024, tracing its origins, current configuration, and emerging developments across accounting, auditing,

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finance and sustainability research. In this perspective, the study is guided by two main research questions.

First, we ask how scientific output on climate change and auditing has evolved over time, which scholars, institutions and countries have been most active in this domain, and which contributions have achieved the greatest international visibility in terms of citations (RQ1).

Second, we investigate which core themes and research streams have been explored so far, whether empirical work has predominantly adopted quantitative or qualitative designs, and which avenues appear most promising for future research on climate-related auditing and external assurance (RQ2).

To address these questions, we employ a mixed methods research design (Nicolò et al., 2023; Latella and Veltri, 2024; Marzi et al., 2024; Ferraro et al., 2025), combining quantitative bibliometric techniques (Aria and Cuccurullo, 2017) with qualitative content analysis. This integrated approach enables a broad and systematic mapping of the field and makes it possible to identify the most influential publications, intellectual foundations, research clusters and emerging themes. At the same time, it provides a structured basis for advancing and orienting the scholarly debate on climate change and auditing, responding to recent calls for more structured and interdisciplinary syntheses of the assurance literature, with particular attention to climate related risks, external assurance and the evolving role of auditors and other assurance providers (Cohen and Simnett, 2015; Farooq and De Villiers, 2017).

The evolution of scientific output in this area shows a clear upward trend from 2018 onwards, in parallel with the diffusion of global and regional regulatory frameworks for climate-related reporting, such as the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), the EU Corporate Sustainability Reporting Directive (CSRD) and the International Sustainability Standards Board's IFRS S2 Climate-related Disclosures (TCFD, 2017; Directive (EU) 2022/2464; IFRS Foundation/ISSB, 2023). These initiatives explicitly foreground climate-related financial risks and opportunities and, in the case of the CSRD, progressively introduce mandatory external assurance on sustainability information. Against this backdrop, a comprehensive mapping of the literature on climate change and auditing is timely and necessary to understand how academic research is interpreting, supporting or challenging these regulatory and professional developments. The present study forms part of a work-in-progress project that will subsequently be extended to cover additional years and cross-country comparisons. The findings provide an updated and integrated overview of scholarly work on climate-related auditing and external assurance and offer valuable insights for the design and implementation of more robust assurance practices, standards, and regulatory frameworks. These results contribute to the theoretical advancement of the field by clarifying how auditing and assurance address climate related financial risks, disclosure quality and corporate accountability. They also enhance professional practice by supporting auditors, assurance providers and regulators in strengthening the credibility of climate related reporting.

The originality of this work lies in its methodological approach, which employs a bibliometric lens, complemented by content analysis, to critically examine the literature at the intersection of climate change and auditing. By synthesizing insights across accounting, auditing, sustainability, and climate-finance research, the study bridges the gap between academic debate and professional practice, offering a nuanced understanding of how climate-related auditing and assurance practices are evolving and how they can be effectively designed, contextualized, and implemented across different institutional and regulatory settings.

2. Methodology

The study is based on a three-stage mixed methods research design that combines a Systematic Literature Review (SLR), bibliometric analysis and qualitative content analysis. This protocol is intended to ensure transparency in the identification and selection of the relevant

literature and, at the same time, to provide both a structural and an interpretive understanding of research on climate change and auditing.

In the first stage, a SLR is conducted following the PRISMA framework, which structures the review process into the phases of identification, screening, eligibility and inclusion. The initial corpus of documents is retrieved from the Scopus database based on a structured search string that captures the intersection between climate change, sustainability, auditing and external assurance. Inclusion and exclusion criteria are then applied to select peer reviewed journal articles and reviews that fall within the scope of the study. The resulting set of publications constitutes the analytical foundation for both the bibliometric and the content analysis.

In the second stage, a bibliometric analysis is carried out using the R package Bibliometrix and its Biblioshiny web interface (Aria and Cuccurullo, 2017), which support the management, visualisation and evaluation of large bibliographic datasets. Performance analysis and science mapping techniques are employed to examine the evolution of scientific production, the most productive authors, institutions and countries, and the most influential contributions. Co-authorship, co-citation, bibliographic coupling and keyword co-occurrence analyses are used to reconstruct the intellectual structure of the field and to identify its main thematic clusters, thereby addressing RQ1.

In the third stage, a manual content analysis is performed on a subset of core documents within the main clusters identified by the bibliometric mapping. Using a structured coding scheme, the analysis investigates how climate related auditing and external assurance are conceptualised, which types of climate related risks and disclosures are examined, and which methodological and theoretical approaches are adopted. This qualitative step deepens and contextualises the bibliometric findings, providing richer insights into the substantive content of the literature and contributing to the answer to RQ2.

Our methodological approach is informed by the guidelines of (Zupic and Čater, 2015), (Donthu et al., 2021) and (Mukherjee et al., 2022), as well as by recent applications of scientific mapping techniques in accounting and sustainability research (Nicolò et al., 2023; Ferraro et al., 2025), which emphasise the advantages of combining quantitative and qualitative procedures for achieving a systematic understanding of academic fields. Consistent with this literature, the three-stage protocol adopted in this study is designed to ensure a reliable and reproducible analysis, supported by both statistical and textual evidence.

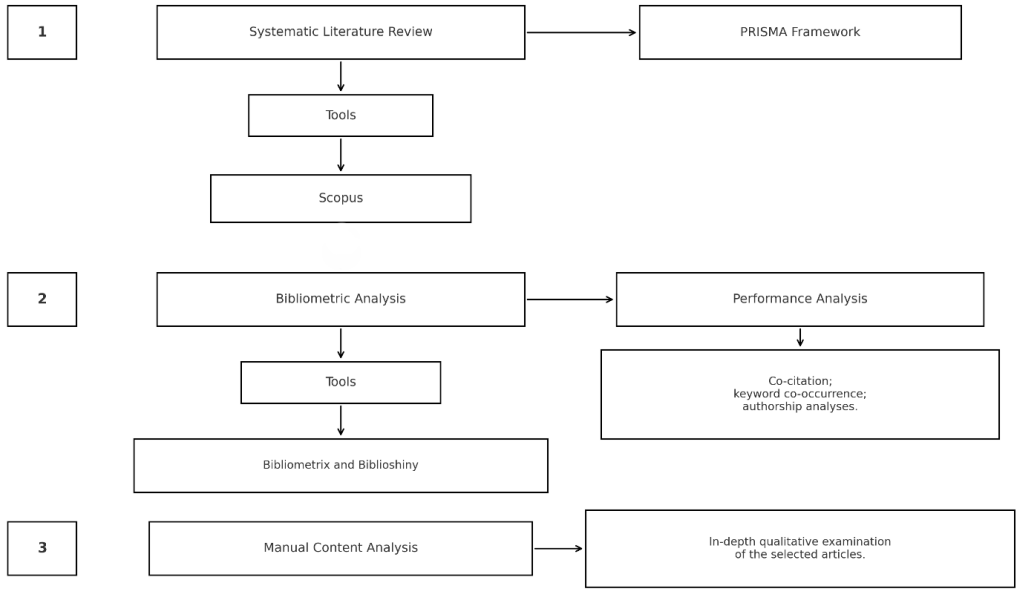


Figure 1. The research protocol

2.1. Data collection

The first step consists of a SLR conducted with reference to the PRISMA guidelines for systematic reviews (Moher et al., 2009; PRISMA Statement, 2020; Page et al., 2021). The search was carried out on the Scopus database, using a structured query that combines climate related terms ("climate change", "carbon", "greenhouse", "sustainability", "environment*") with auditing and assurance related keywords ("audit*", "assur*", "external assurance", "independent assurance").

The time window considered runs from 2000 to 2024 and the search is restricted to subject areas linked to accounting, auditing, business, management and finance. Only peer reviewed journal articles and reviews written in English are retained. After removing duplicates, the records are screened on the basis of titles, abstracts and keywords to exclude documents that do not deal with the intersection between climate (or climate related issues) and auditing or assurance. The remaining papers are read in full to verify their coherence with the research scope and the two RQs. Additional relevant studies are identified through reference list checking and citation tracking. The final set of publications constitutes the corpus used for the subsequent bibliometric and content analyses.

2.2. Bibliometric analysis

In the second step, the selected corpus is examined through a bibliometric analysis, which mainly addresses RQ1. Following the indications of (Zupic and Čater, 2015), (Donthu et al., 2021), (Mukherjee et al., 2022), and recent applications in accounting and sustainability research (Nicolò et al., 2023; Ferraro et al., 2025), we combine performance analysis and science mapping.

The analysis is implemented in R using the Bibliometrix package and the Biblioshiny web interface (Aria and Cuccurullo, 2017). Descriptive indicators such as annual scientific production, average citations per article, most productive authors, institutions and countries, most relevant journals and most cited papers are computed to assess the growth and maturity of the field.

To reconstruct the intellectual and thematic structure of the literature, we then apply document level bibliographic coupling. This technique groups articles that share common references and thus allows us to detect clusters of conceptually related contributions and the main

research streams on climate change and auditing. Where useful, keyword co-occurrence analysis is also employed to explore how climate related risks, assurance practices and auditing concepts are combined in the existing body of work.

2.3. Content analysis

To complement the quantitative mapping and address RQ2, a qualitative content analysis was conducted on a subset of core articles drawn from the main clusters identified in the bibliometric analysis. The selection focused on the most influential (highly cited) and the most recent contributions within each cluster, in order to capture both foundational and emerging perspectives.

Following the qualitative procedures suggested by (Kuckartz, 2014), we developed a coding scheme that combined deductive categories (e.g. types of climate-related risks considered, nature of the audited or assured information, characteristics of the assurance engagement, methodological approaches) with inductive theme development. This allowed us to examine how the literature conceptualises the role of auditing in climate governance, how external assurance practices are designed and justified, and which theoretical and methodological lenses are mobilised.

The integration of SLR, bibliometric techniques and content analysis strengthens the robustness of the findings: quantitative patterns observed in the mapping of the field are contextually interpreted within the broader academic debate, while qualitative insights are grounded in a systematically constructed corpus. The study is a work in progress, and future developments will extend the analysis to additional databases (e.g. Web of Science, WOS) and, where feasible, triangulate bibliometric and content-based evidence with practice-oriented insights, for example through interviews with audit and assurance professionals.

3. Results and discussion

3.1. Descriptive trends

Preliminary bibliometric evidence shows a marked increase in annual scientific production on climate change and auditing from 2018 onwards, in parallel with the introduction of major sustainability reporting frameworks and the growing salience of ESG issues in policy and practice.

Citation patterns indicate that the earliest contributions, published between 2008 and 2013, are predominantly conceptual and normative in nature, laying the foundations for subsequent empirical work. More recent papers have begun to accumulate citations at an increasing rate, signalling the consolidation of the field and its growing visibility in the wider accounting and sustainability literature.

From a geographical perspective, the most prolific countries in terms of publication output include the United Kingdom, Australia and China, alongside other European jurisdictions. These are contexts where non-financial reporting and climate-related disclosure frameworks are either well established or rapidly evolving. Co-authorship and institutional collaboration networks remain largely regionally clustered, with relatively limited cross-regional integration. This suggests significant potential for future comparative and joint research projects that systematically explore differences in institutional settings, regulatory regimes and climate risk exposure.

3.2. Thematic clusters

The document-level bibliographic coupling analysis reveals three main thematic clusters that structure the literature on climate change and auditing.

Cluster 1: Carbon accounting and assurance practices

This cluster gathers studies focusing on auditing and assurance methodologies applied to carbon accounting, greenhouse gas (GHG) emissions verification and broader sustainability assurance engagements. Contributions in this stream examine the quality and scope of assurance, differences between audit firms and specialist assurance providers (e.g., Big Four vs non-Big Four), and the implementation of standards such as ISAE 3000, ISAE 3410 and ISO 14064 in carbon-related engagements. Particular attention is paid to how assurance contributes to the credibility of carbon information and to the mitigation of information asymmetries and greenwashing risks in carbon-intensive sectors.

Cluster 2: Governance, regulation and audit quality

The second cluster explores how governance structures and regulatory developments shape climate-related assurance and audit quality. Studies in this stream analyse the role of boards, audit committees and internal control systems in overseeing climate risk disclosures, as well as the implications of regulatory changes (e.g. mandatory climate-related reporting, stewardship codes, assurance requirements) for auditor independence and professional judgement. This cluster links climate-related assurance to broader discussions on risk management, internal control and the integration of climate considerations into corporate governance frameworks.

Cluster 3: Sustainability reporting, accountability and stakeholders

The third cluster connects auditing and assurance to wider accountability mechanisms, integrated reporting practices and stakeholder engagement. Scholars often draw on legitimacy, stakeholder and institutional perspectives to explain why firms voluntarily seek external assurance on sustainability and climate-related information, and how this process contributes to maintaining or restoring organisational legitimacy. Particular emphasis is placed on the communicative function of assurance statements, stakeholder perceptions of assurance credibility, and the extent to which climate-related auditing can support informed judgement by investors, regulators and civil society.

Taken together, these clusters suggest that climate-related auditing research is organised around the interplay between technical assurance practices, governance and regulation, and broader accountability and stakeholder dynamics.

3.3. Conceptual and methodological observations

Across the three clusters, the preliminary analysis indicates a gradual shift from descriptive and conceptual contributions towards more empirically oriented and methodologically diverse studies. Early work tends to discuss the potential role of auditing and assurance in sustainability and climate governance in mainly normative terms, whereas more recent contributions employ survey-based evidence, archival data, content analysis and experimental designs to investigate audit quality, assurance materiality, user perceptions of credibility and market reactions to climate-related assurance.

At the same time, the field remains fragmented. While accounting and sustainability studies often mobilise well-established theoretical lenses such as legitimacy, stakeholder and institutional theories, audit-oriented research less frequently integrates insights from climate science, environmental governance or risk management. This limits the extent to which climate-related auditing is connected to the underlying physical and transition risks that firms face. The bibliometric mapping also highlights the dominance of Anglo-Saxon and European contexts, with

relatively few studies focusing on developing and emerging economies, despite their high vulnerability to climate change and the growing relevance of climate finance in these regions. Addressing these gaps represents a promising avenue for more interdisciplinary and geographically diversified research.

3.4. Discussion and theoretical implications

The combined bibliometric and content analyses suggest that auditing plays a dual role in the climate change discourse. On the one hand, it operates as a technical mechanism for enhancing the reliability, comparability and transparency of climate-related disclosures. On the other hand, it performs a symbolic function by signalling commitment, reinforcing corporate legitimacy and shaping stakeholder trust in firms' climate strategies.

From a theoretical standpoint, the emerging literature can be read through the lens of legitimacy and accountability perspectives. Climate-related auditing and external assurance are portrayed as mechanisms through which firms respond to institutional and societal pressures, align their reporting practices with evolving expectations and seek to secure or renew their social licence to operate. Nonetheless, the degree to which accountability is effectively enhanced depends on the scope of the engagement, the assurance level and the independence and expertise of the assurance provider. The predominance of limited assurance engagements, and the variability in assurance practices across providers and jurisdictions, indicate that a "credibility gap" may persist.

These preliminary findings are consistent with prior work that calls for more rigorous and harmonised climate-related assurance standards and for clearer guidance on the integration of climate risks into financial and non-financial audits. The growing attention to regulatory initiatives such as the CSRD, the ISSB climate standards and the IAASB's exposure drafts on sustainability assurance points to a transition from predominantly voluntary assurance regimes towards more mandatory and standardised frameworks. This evolution is likely to reshape both assurance practices and academic research agendas, opening up new questions on the effectiveness, costs and unintended consequences of climate-related auditing.

4. Conclusions and future developments

This study offers an initial mapping of the research field at the intersection of climate change and auditing, based on a combination of SLR, bibliometric analysis and qualitative content analysis. The preliminary results point to a rapidly expanding body of literature, characterised by growing conceptual diversification and increasing methodological sophistication. The three main thematic clusters identified in the bibliometric mapping reflect how the academic community is progressively addressing the contribution of auditing and external assurance to climate accountability, transparency and governance.

Our interpretation of these findings is informed by legitimacy and accountability perspectives, which provide a coherent lens for understanding how climate-related auditing and assurance contribute to organisational trust and social licence to operate. The study extends existing reviews on sustainability assurance by focusing specifically on climate-related information and by connecting auditing practices to the broader governance mechanisms and regulatory developments that underpin climate disclosure.

Given its nature, the project has several planned extensions. Future developments will:

- expand the dataset to include publications from 2025 onwards and incorporate additional databases (e.g. Web of Science);
- conduct longitudinal analyses to track the evolution of themes, methods and theoretical approaches over time;

- integrate cross-country comparisons to examine how institutional and regulatory differences shape climate-related auditing and assurance;
- and enrich the content analysis with practitioner perspectives, for instance through semi-structured interviews with auditors and assurance providers, in order to triangulate bibliometric evidence with practice-oriented insights.

The contribution of the final study is twofold. From an academic perspective, it will provide a structured and up-to-date overview of the climate change auditing literature, clarifying its intellectual foundations, mapping its main research streams and highlighting gaps and priorities for further investigation. From a practical perspective, it will inform regulators, standard-setters, audit firms and policymakers about the evolution of climate-related assurance practices and their role in supporting credible and decision-useful climate disclosures.

In conclusion, auditing is increasingly recognised as a key component of climate accountability infrastructures. As sustainability information, and climate-related disclosures in particular, become subject to stricter regulatory oversight and higher stakeholder scrutiny, the audit and assurance function is likely to play a decisive role in ensuring the transparency, reliability and legitimacy of climate-related reporting. This research contributes to that understanding and lays the groundwork for future interdisciplinary and empirically grounded studies on climate change and auditing.

Keywords: Climate change; auditing; content analysis; sustainability assurance

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Rischi e costi delle strategie di fornitura: una revisione bibliometrico-sistematica della letteratura

Simone Camillieri[1]

1. Problema di ricerca

Il crescente livello di instabilità geopolitica ed economica, proprio degli ultimi decenni, ha mostrato la sua rifrazione anche con riguardo ai mercati di fornitura: si è, così, assistito a un ripensamento del ruolo e della rilevanza strategica che il procurement ha all'interno delle imprese (Blome e Schoenherr, 2011; Giunipero et al., 2018). Se, in passato, la funzione acquisti ha ricoperto una veste prevalentemente operativa ed esecutiva – ossia un ruolo limitato principalmente al soddisfacimento dei fabbisogni produttivi e alla negoziazione del loro prezzo di acquisto --, oggi, le imprese iniziano a riconoscerle una valenza strategica a sostegno della flessibilità operativa, della competitività e della capacità di resilienza economica (Nair et. al, 2015).

Un tale avanzamento sul piano teorico, tuttavia, non trova, ad oggi, un riscontro pratico, come si può evidenziare da una prima analisi esplorativa della letteratura; nelle pratiche aziendali, infatti, le decisioni di fornitura continuano ad essere valutate prevalentemente sulla base di metriche di breve periodo fondate su costi diretti e immediatamente rilevabili; siffatta prassi ha, invero, giocato un ruolo preminente nel generare una valutazione distorta delle effettive conseguenze economico-finanziarie indotte dalle strategie di fornitura (Johnson et al., 2013; Giunipero et al., 2018).

L'acme del problema risiede nella difficoltà strutturale che molte imprese incontrano nel rendere visibili, tracciabili e misurabili i fattori di rischio lungo la catena di fornitura e, dunque, tradurli in vere e proprie configurazioni di costo (Ronchi et al., 2012). Sebbene l'affermazione di normative sempre più stringenti in materia di responsabilità sociale e ambientale, molte aziende non dispongono ancora di strumenti adeguati tanto a rilevare con certezza le pratiche dei fornitori, quanto a quantificare in modo sistematico i rischi a esse associati (Villena e Dhanorkar, 2020; Chen, 2022).

A ciò si aggiunga che talune tipologie di rischio – come quelli reputazionali, tecnologici o legati alla perdita di conoscenza interna – sono per loro natura difficilmente esprimibili attraverso metriche quantitative tradizionali. Si tratta, infatti, di rischi caratterizzati da elevata incertezza e da impatti che si distribuiscono nel tempo e su una pluralità di voci reddituali (Reitzig e Wagner, 2010; Hansen et al., 2016; Pattanayak et al., 2019; Dhingra e Krishnan, 2020). Quanto appena delineato provoca, altresì, un disallineamento temporale tra la manifestazione del rischio e quella del costo; viene, quindi, a determinarsi una complessità per ciò che concerne la corretta individuazione del nesso causale che intercorre tra la scelta di fornitura e le conseguenze economiche, operative e strategiche, poiché gli effetti economici tendono a manifestarsi in fasi successive rispetto alle decisioni strategiche che li hanno originati (Larsen et al., 2013; Holweg et al., 2011; Larsen et al., 2013; Waltho et al., 2019; Zhou et al., 2021).

Seppur, a una prima valutazione, talune strategie di fornitura – quali, in particolare, il global sourcing e il low-cost country sourcing – possano apparire vantaggiose in termini di risparmio sui costi diretti di acquisto, tuttavia, come emerge dalla letteratura, ad esse, una volta intervenuto il processo valutativo, possono essere associati una molteplicità di costi nascosti; questi sono

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riconducibili, ad esempio, a ritardi operativi, alle maggiori complessità logistiche, all'intensificazione dei tempi e delle risorse necessarie per l'espletamento di specifiche attività, ai problemi di qualità e alle difficoltà di coordinamento e comunicazione inter-organizzativa, i quali, risultando difficili da rilevare e ricondurre causalmente ai processi di fornitura, vengono spesso assorbiti da centri di costo generali (Weber et al., 2010; Holweg et al., 2011; Min e Kim, 2011; Gray et al., 2020). Siffatte configurazioni di costo, invero, non sembrano dipendere tanto dalla distanza geografica tra azienda acquirente e fornitori, quanto da fattori strutturali legati alla complessità organizzativa, all'introduzione di nuove interfacce di coordinamento e all'allungamento dei flussi informativi (Larsen et al., 2013). Emerge inoltre che, se non coerentemente allineate con gli obiettivi definiti a livello corporate, tali strategie di fornitura tendono ad amplificare la complessità gestionale e a generare inefficienze operativo-strategiche che si traducono in ulteriori configurazioni di costo difficilmente rilevabili e riconducibili ai processi di fornitura (Lin, 2020).

Con riferimento ai costi della qualità, errori di stima dei costi di prevenzione, valutazione, controllo e gestione possono generare rischi non rilevati in fase di pianificazione e programmazione, con effetti rilevanti tanto sul piano operativo quanto su quello strategico (Pattanayak et al., 2019). Inoltre, sebbene i costi di insuccesso della qualità possano essere, almeno in parte, prevenuti tramite attività di prevenzione, monitoraggio e audit, tali pratiche - oltre a rappresentare ulteriori componenti reddituali negative spesso non ricondotte causalmente ai processi di fornitura - non garantiscono di per sé necessariamente la piena accuratezza informativa, potendo risultare affette da asimmetrie e distorsioni sistemiche (Short et al., 2016).

Ulteriori contributi evidenziano come nei modelli di pianificazione e programmazione aziendale non vengano spesso incorporati i costi potenziali derivanti da comportamenti opportunistici di natura sociale o ambientale da parte dei fornitori, con una conseguente sottovalutazione del rischio reputazionale quale componente strutturale del costo complessivo di fornitura (Dhingra e Krishnan, 2020).

Con particolare riferimento alla dimensione ambientale, le decisioni di localizzazione, le attività di trasporto e logistica, nonché le stesse configurazioni delle reti di fornitura generano impatti ambientali rilevanti – tra il 50 e il 70 % delle emissioni industriali è, invero, riconducibile alla supply chain (Waltho et al., 2019, p. 306) - spesso non adeguatamente rilevati nei modelli contabili tradizionali. In tale prospettiva, i rischi ambientali non si configurano più come semplici esternalità, ma assumono la forma di nuovi costi emergenti, destinati ad aumentare di rilevanza con l'adozione di strumenti regolatori quali carbon tax, sistemi cap-and-trade e il Carbon Border Adjustment Mechanism (CBAM) (Waltho et al., 2019; Zhou et al., 2021). La letteratura evidenzia tuttavia come il perseguimento congiunto di obiettivi di efficienza operativa e di sostenibilità ambientale possa generare benefici sinergici e favorire miglioramenti simultanei delle performance ambientali ed economico-operative (Azevedo et al., 2012; Gouda e Seranga, 2018).

Un nodo trasversale a tali evidenze riguarda il ruolo della condivisione dei flussi informativi lungo la catena di fornitura. Il coordinamento tra flussi informativi qualitativi e quantitativi favorisce la riduzione dei rischi e dei costi ambientali e sociali (Khan et al., 2016), mentre l'efficacia della disclosure dipende dall'interazione tra pressioni istituzionali e meccanismi coerenti di controllo e coordinamento inter- e intra-organizzativo (Villena e Dhanorkar, 2020). In assenza di tali meccanismi, la trasparenza informativa tende ad assumere un carattere prevalentemente opportunistico.

A ciò si aggiungono i limiti strutturali dei sistemi di programmazione e controllo, che continuano a privilegiare la riduzione dei costi direttamente rilevabili a discapito della capacità di evitare costi futuri e incerti (Ellram e Tate, 2020). Poiché tali costi non vengono rilevati ex-ante nei sistemi di programmazione, essi restano sistematicamente esclusi dai sistemi di controllo, generando disallineamenti decisionali, conflitti inter-funzionali e comportamenti opportunistici orientati al breve periodo, con conseguente esclusione del costo complessivo di fornitura dai

meccanismi di misurazione, valutazione delle performance e incentivazione aziendale (Murfield et al., 2021).

Sul piano organizzativo, emerge infine come la responsabilità di individuazione e rilevazione dei costi e dei rischi non possa essere attribuita a una singola funzione aziendale. Sebbene il procurement sia direttamente coinvolto nelle attività di selezione, valutazione e monitoraggio dei fornitori (Nair et al., 2015), il suo contributo strategico risulta effettivo solo in presenza di una reale integrazione con i processi di pianificazione e programmazione aziendale. In assenza di tale integrazione, si osserva una marcata disomogeneità nella percezione dei fattori di rischio da parte delle differenti funzioni aziendali (Huq et al., 2020).

Si può, dunque, affermare che, a fronte di una crescente attenzione teorica con riguardo ai temi della rilevazione e gestione dei fattori di rischio lungo la catena di fornitura, permane una significativa carenza di modelli interpretativi e operativi in grado di spiegare in modo sistematico attraverso quali meccanismi tali dimensioni si traducano in configurazioni di costo e come possano essere efficacemente integrate nei processi decisionali e nei sistemi di programmazione e controllo.

In particolare, risulta ancora lontana una visione sistematica delle differenti configurazioni di costo di fornitura, nonché delle loro determinanti che ne spieghino tanto l'insorgenza quanto la manifestazione. In assenza di una chiara comprensione di quali siano i driver sottostanti, risulta, invero, complesso approfondire le logiche di analisi e gestione strategica di suddetti costi. Dalla letteratura esaminata emergono altresì lacune interpretative con riferimento alle dinamiche organizzative, relazionali e comportamentali che influenzano i processi di produzione, interpretazione e utilizzo delle informazioni di costo nei processi di fornitura.

La distanza tra ciò che la letteratura riconosce come significativo e ciò che le imprese riescono effettivamente a rilevare, misurare e governare rappresenta, quindi, il principale nodo focale del presente studio; il fine della ricerca, infatti, volge all'identificazione di un quadro concettuale atto a ricomporre la frammentazione esistente tra rischio, costo e strumenti di pianificazione, programmazione e controllo a supporto della valutazione e del governo delle decisioni strategiche di fornitura.

2. Gli obiettivi e le domande di ricerca

Alla luce delle evidenze emerse da un primo studio esplorativo della letteratura – quali il persistente disallineamento tra la crescente complessità strutturale e relazionale dei processi di fornitura e la capacità delle imprese di rilevare, misurare e governare in modo sistematico i rischi e i costi a essi associati -, il presente studio si propone di sviluppare una ricostruzione integrata dei principali fattori di rischio e delle corrispondenti configurazioni di costo nelle strategie di fornitura. In tale senso, si presterà particolare attenzione proprio a quelle dimensioni operative, organizzative, informative e ambientali che hanno la tendenza a sfuggire ai tradizionali modelli di contabilità direzionale, ancora prevalentemente orientati a configurazioni di costo direttamente osservabili nel breve periodo.

Tuttavia, lo studio non intende limitarsi al tema della rilevazione e misurazione dei costi di fornitura, ma mira altresì ad approfondire le logiche di gestione strategica di tali costi attraverso la ricostruzione delle principali determinanti (cost driver) che ne spiegano l'insorgenza e la manifestazione. Inoltre, lo studio intende indagare le ragioni strutturali, organizzative, sociali e relazionali che rendono complessa l'integrazione dei costi di fornitura nei sistemi di pianificazione, programmazione e controllo e, di conseguenza, ne ostacolano la gestione strategica.

Sulla base di quanto summenzionato, lo studio è, dunque, guidato dalle seguenti domande di ricerca:

RQ1. Quali principali ambiti tematici, configurazioni concettuali e traiettorie evolutive emergono nella letteratura sulla rilevazione, misurazione e gestione dei rischi e dei costi nei processi di fornitura?

RQ2. In che modo la letteratura ha concettualizzato il nesso tra fattori di rischio e configurazioni di costo nei processi di fornitura, e quali determinanti causali, convergenze interpretative, ambiguità concettuali e lacune di ricerca emergono da tale analisi?

RQ3. In che modo i rischi e i costi di fornitura sono stati integrati nei sistemi di pianificazione, programmazione e controllo a supporto delle decisioni strategiche di fornitura, e quali condizioni organizzative, informative e socio-relazionali ne influenzano tanto l'adozione quanto l'efficacia?

3. La metodologia di ricerca

A fronte di un ambito di studio caratterizzato da forte frammentazione teorica e da un'elevata eterogeneità disciplinare, il presente studio adotterà un approccio metodologico di revisione della letteratura di tipo bibliometrico-sistematico (Bibliometric-Systematic Literature Review, o B-SLR) (Marzi et al., 2024). Tale approccio, infatti, appare idoneo a cogliere e, al contempo, combinare le potenzialità caratteristiche dell'analisi bibliometrica – funzionale all'individuazione dei nuclei tematici, delle traiettorie evolutive e delle connessioni concettuali tra i diversi contributi disciplinari (Zupic e Cater, 2015; Donthu et al., 2021) -- con la profondità interpretativa propria della revisione sistematica della letteratura (Tranfield et al., 2003; Durach et al., 2017; Snyder, 2019).

Al fine di garantire coerenza rispetto agli obiettivi di ricerca, nonchè trasparenza e replicabilità, la raccolta degli articoli è stata condotta attraverso un protocollo strutturato, utilizzando il database Scopus, selezionato in quanto quest'ultimo rappresenta una delle principali banche dati bibliografiche a livello internazionale per ampiezza di copertura, qualità delle fonti indicizzate e rilevanza nei campi del management accounting (Tranfield et al., 2003; Snyder, 2019).

La costruzione della stringa di ricerca è stata articolata in due macro-blocchi semantici combinati tramite operatore booleano AND: il primo volto a intercettare le differenti tipologie di costo discusse in letteratura (tra cui, ai meri fini esemplificativi, hidden costs, transaction costs, cost of quality, environmental e sustainability costs), includendo sia formulazioni consolidate sia varianti terminologiche emergenti; il secondo orientato a delimitare il contesto di analisi ai processi di supply chain e procurement (come ad esempio supply chain, sourcing, purchasing, procurement). L'utilizzo del campo TITLE-ABS-KEY ha di fatto consentito di focalizzare la ricerca sugli articoli in cui tali concetti risultano centrali nel contributo scientifico.

L'applicazione della query ha restituito un dataset iniziale di 9.484 contributi, successivamente ridotto a 1.713 mediante criteri preliminari di inclusione ed esclusione (Marzi et al., 2024), quali la limitazione all'area disciplinare Business, Management e Accounting, ai soli articoli pubblicati in lingua inglese su riviste scientifiche, allo stato finale di pubblicazione e al periodo 2010-2025. Si precisa che la delimitazione temporale, fissata al periodo 2010–2025, risponde all'esigenza di focalizzare l'attenzione sulla letteratura più recente e rilevante rispetto alle trasformazioni contemporanee dei processi di procurement e delle relazioni buyer–supplier, caratterizzate da una crescente complessità, dalla diffusione del global sourcing, e più recentemente, dall'emergere di tematiche legate alla sostenibilità.

Al fine di garantire un livello adeguato di qualità scientifica, sono state successivamente considerate esclusivamente riviste classificate nel primo quartile Scimago e con un rating AJG pari o superiore a 2, riducendo il corpus a 570 articoli pubblicati su 32 riviste di riferimento (Marzi et al., 2024). Tuttavia, una fase successiva di screening, basata sulla lettura di titoli, abstract e parole chiave, ha evidenziato la necessità di escludere una quota rilevante di articoli non coerenti con gli obiettivi della ricerca. In particolare, sono stati esclusi contributi caratterizzati da

un'impostazione prevalentemente ingegneristica, focalizzati su modelli di ottimizzazione matematica o approcci quantitativi orientati alla risoluzione di problemi operativi, ma privi di un esplicito collegamento al management accounting. Sono stati altresì esclusi studi che, pur trattando tematiche affini, non affrontavano in modo diretto il problema della concettualizzazione, misurazione e utilizzo delle informazioni di costo nei processi decisionali di procurement e nelle relazioni buyer–supplier.

Il processo di selezione ha condotto a un sottoinsieme di 103 articoli ritenuti maggiormente pertinenti rispetto al dominio di ricerca. Tali contributi sono attualmente oggetto di una fase approfondita di analisi qualitativa, basata sulla lettura integrale dei full paper, finalizzata a definire in modo più rigoroso il dataset finale di ricerca e a ricostruire in maniera sistematica le principali traiettorie evolutive della letteratura.

Una volta definito il dataset finale, l'analisi si articolerà in due momenti complementari. In un primo momento, al fine di intercettare i filoni di ricerca più recenti e le principali configurazioni concettuali emergenti connesse ai rischi e ai costi di fornitura, lo studio si focalizzerà, rispettivamente, sulle tecniche quantitativo-bibliometriche di "bibliographic coupling" e di "co-word analysis" (Donthu et al., 2021). Si deve, tuttavia, sottolineare come nella B-SLR tali analisi non sono, in verità, concepite come sostitutive della revisione sistematica, bensì come suo necessario completamento, in quanto la sola bibliometria consente di descrivere le relazioni quantitative tra i contributi, ma non di interpretarne in profondità i contenuti teorici e i meccanismi causali sottostanti (Zupic e Cater, 2015; Paul e Criado, 2020). Per rispondere a tale esigenza, pertanto, in un secondo momento la revisione sistematica consentirà di analizzare in modo critico i contributi selezionati, mettendo in luce convergenze, ambiguità concettuali, discontinuità teoriche e lacune di ricerca in relazione ai processi di rilevazione, misurazione e gestione dei rischi e dei costi nascosti nelle strategie di fornitura (Tranfield et al., 2003; Durach et al., 2017; Snyder, 2019; Williams et al., 2021).

4. I risultati attesi

Il presente studio intende individuare e mappare i principali cluster teorici e le traiettorie evolutive della ricerca sul tema della rilevazione, misurazione e gestione dei rischi e dei costi nelle strategie di fornitura. Segnatamente, un primo risultato atteso dalla ricerca risiede nello sviluppo di un quadro sistematico e integrato di quali siano i rischi e i costi insiti nei processi di fornitura. In tal senso, lo studio si propone di far emergere uno schema teorico in grado di spiegare le diverse configurazioni di costo di fornitura, con il fine ultimo di ridefinire il concetto di "costo totale di fornitura". Invero, solo rappresentando i diversi rischi e i costi di fornitura all'omogeno valore monetario, le aziende possono essere in grado di confrontare fornitori diversi e valutare, nonché governare, efficacemente le proprie strategie di fornitura attraverso la misurazione e gestione del complessivo costo di fornitura.

Al fine di passare dalla misurazione alla gestione dei costi di fornitura, lo studio mira, inoltre, a far emergere le dinamiche organizzative, operative, informative e relazionali che ruotano intorno ai processi di fornitura, con il fine ultimo di superare la frammentazione concettuale esistente e comprendere le determinanti (cost driver) che spiegano l'insorgenza e la manifestazione di suddetti costi. In tal senso, la presente ricerca – attraverso la ricostruzione dei principali driver di costo - si propone di sviluppare un modello di riferimento in grado di far emergere quali costi siano a reale valore aggiunto (interno/esterno) per l'azienda e quali, invece, risultino a non valore aggiunto come conseguenza di ridondanze o inefficienze.

Lo studio fornirà, altresì, una ricostruzione dei principali aspetti relazionali, comportamentali e sociali che influenzano i processi di produzione, interpretazione e utilizzo delle informazioni di costo nei processi di fornitura e, incidentalmente, condizionano l'efficace rilevazione, misurazione e gestione del costo totale di fornitura. In questo modo sarà possibile sviluppare un quadro concettuale utile a comprendere in che modo, nelle pratiche aziendali, il costo totale di

fornitura possa essere concretamente integrato nei sistemi di pianificazione, programmazione e controllo, al fine di una sua corretta gestione.

5. Le implicazioni teoriche e manageriali

Per quanto attiene più strettamente al piano teorico, la ricerca si propone di offrire un contributo nel campo dell'economia aziendale, attraverso una revisione bibliometrico-sistematica della letteratura in merito alla rilevazione, misurazione e gestione dei fattori di rischio e delle differenti configurazioni di costo riconducibili alle decisioni strategiche di fornitura. In particolare, la B-SLR consentirà di ricostruire in modo integrato lo stato delle conoscenze, chiarendo ciò che la letteratura attualmente conosce – nonché ciò che rimane inesplorato – in relazione alla loro natura, alle cause che li generano, alle modalità di rilevazione adottate e alle pratiche attraverso cui tali dimensioni vengono gestite.

Tale approccio metodologico permetterà inoltre di contribuire alla ridefinizione del concetto di "costo totale di fornitura": componenti finora trattate in modo frammentario e marginale saranno, pertanto, analizzate secondo una prospettiva sistematica.

Infine, il lavoro consentirà di mettere in luce i limiti strutturali dei modelli decisionali e dei sistemi di programmazione e controllo tradizionali, ancora fortemente ancorati a metriche di breve periodo e a configurazioni di costo immediatamente osservabili, offrendo le basi per lo sviluppo di modelli interpretativi più coerenti con la natura socio-tecnica della contabilità direzionale.

Con riguardo, invece, al piano pratico-manageriale, i risultati attesi della ricerca potranno supportare le imprese nella chiara identificazione dei principali fattori di rischio e delle configurazioni di costo nascosto, insite nei processi di fornitura, favorendone – in coerenza con la crescente complessità dei contesti competitivi - l'integrazione nella progettazione di sistemi di pianificazione, valutazione e governo delle strategie di fornitura. Segnatamente, l'individuazione delle principali configurazioni di costo nascosto e delle condizioni che ne ostacolano la rilevazione potrà fornire – attraverso un'integrazione sistematica tra grandezze strategiche, operative, economico-finanziarie e ambientali – indicazioni operative utili tanto al miglioramento dei processi di selezione e valutazione dei fornitori, quanto alla ridefinizione dei sistemi di pianificazione, programmazione e controllo, nonché alla comprensione delle determinanti organizzative e operative che generano costi a non valore aggiunto lungo la catena di fornitura.

Parole chiave: Approvvigionamento; catena di fornitura; costo di fornitura; rischio di fornitura; costi nascosti; Total Cost of Ownership; contabilità direzionale; sostenibilità

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Economia circolare e valorizzazione dei beni comuni: il valore delle al-leanze strategiche nel settore olivicolo-oleario

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1. Introduzione

Il comparto olivicolo-oleario riveste per l'Italia grande rilievo economico. A livello mondiale, l'Italia è il secondo produttore di olio d'oliva, rappresentando circa il 15% della produzione mondiale totale (dopo la Spagna, con una quota dominante del 45%) e il secondo Paese esportatore con il 20% delle esportazioni globali di olio d'oliva (anche in questo caso, dopo la Spagna, le cui esportazioni di olio d'oliva costituiscono un sostanziale 60% del totale mondiale) (Ismea, 2023). Si caratterizza per elevati standard qualitativi (si contano 42 DOP e 8 IGP per gli oli d'oliva; 4 DOP per le olive da tavola) e per una forte tipicità territoriale: si contano oltre 500 cultivar con caratteristiche organolettiche uniche, modellate da clima, suolo e tecniche agronomiche locali.

Nonostante il rilevante valore economico, ambientale, sociale e culturale del settore olivicolo-oleario, le pratiche agricole intensive associate alla produzione di olio di oliva generano considerevoli impatti ambientali: degrado del suolo, impoverimento della materia organica, sfruttamento eccessivo di acqua ed energia, inquinamento e squilibrio ecologico in casi di gestione impropria del suolo e dei ferti-lizzanti, delle acque di vegetazione e delle sanse (Ncube et al., 2024). Inoltre, in questo settore si genera una grande quantità di scarti e residui inevitabili di lavorazione (residui di potatura, fogliame) e sot-toprodotti (sansa, acque di vegetazione e di processo, nocciolino) che generano problematiche ambien-tali e gestionali e comportano elevati costi di stoccaggio e di smaltimento (Kounani et al., 2024).

Aanalogamente a quanto accade per altri settori, anche le aziende del settore oleario sono esortate ad allineare le proprie attività agli obiettivi di sviluppo sostenibile contemplati dalla Strategia europea sull'economia circolare e dal Piano di azione Agenda 2030 per lo Sviluppo Sostenibile delle Nazioni Unite. Questo allineamento richiede il miglioramento della compatibilità ambientale e l'implementazione di strategie e azioni volte a rendere più sostenibili vari aspetti della produzione. L'impatto ambientale dell'industria olivicolo-olearia può essere significativamente ridotto attraverso la transizione verso l'e-conomia circolare. Questo potrebbe tradursi in pratiche più sostenibili, come la gestione efficiente del suolo e delle risorse idriche, il riutilizzo e il riciclo dei residui di potatura, la valorizzazione dei sot-toprodotti della lavorazione delle olive (come il nocciolino e la sansa) convertendoli in prodotti di alto valore, e l'adozione di tecnologie che riducono il consumo energetico.

L'adozione di pratiche di economia circolare nella filiera olivicolo-olearia può risultare complessa per le piccole e medie imprese (Pmi) e richiede l'adozione di un approccio eco-sistemico per affrontare i necessari cambiamenti strutturali e organizzativi della produzione. Esse richiedono investimenti che implicano costi significativi e che sono più sostenibili finanziariamente se realizzati congiuntamente con altre imprese. Le relazioni collaborative interorganizzative tra Pmi, come reti aziendali, consorzi, organizzazioni di produttori e simili,

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possono contribuire a rendere praticabili modelli di business sos-tenibili, favorendo anche la transizione verso un'economia circolare. Esiste una vasta letteratura sul te-ma delle reti strategiche aziendali interorganizzative e sull'importanza che queste forme di aggregazione hanno per le capacità di investimento delle imprese, in particolare delle Pmi. Tradizionalmente, questo modello organizzativo consente alle imprese aggregate e/o in rete di operare nei mercati con la competi-tività di un'impresa medio-grande senza sacrificare la propria autonomia e flessibilità (Pastore et al., 2020; Peterman et al., 2020), di condividere gli investimenti e di frazionare i rischi correlati (Håkansson e Snehota, 1995).

Sulla base di queste premesse, l'obiettivo della ricerca è quello di individuare le caratteristiche dei beni comuni generati da pratiche di economia circolare nell'ambito del settore olivicolo-oleario e di indagare il ruolo della cooperazione interaziendale nel facilitare l'implementazione di pratiche di economia circo-lare sulla scorta dei concetti di "beni comuni" come oggetto (Common-Pool Resources o Commons) e di "comune" come principio per regolarli e governarli, enunciati dalla Premio Nobel per l'economia (2008) Elinor Ostrom. Lo scopo è quello di approfondire in che misura gli accordi cooperativi tra le Pmi del settore olivicolo-oleario, interpretati alla luce della Teoria dei Commons e dell'azione collettiva auto-organizzata e autogovernata di Ostrom, favoriscono una gestione collettiva ed efficiente dei flussi di materiali, dei sottoprodotti e della capacità di carico ambientale nell'ambito dell'economia circolare.

2. Framework teorico e obiettivi

Il tema centrale dello studio della Ostrom «è il modo in cui un gruppo di soggetti economici che si trovano in una situazione di interdipendenza possono auto-organizzarsi per ottenere vantaggi col-lettivi permanenti, pur essendo tentati di sfruttare le risorse gratuitamente, evadere i contributi o co-munque agire in modo opportunistico» (Ostrom, 1990, p.51).

Le riflessioni della Ostrom prendono le mosse, negli anni '60, da un dibattito nelle scienze sociali che cerca di dare una risposta convincente al problema del governo delle risorse naturali comuni (ad esempio, oceani, laghi, foreste, ma anche sistemi di irrigazione, pascoli montani, zone di pesca) per impedire il loro sovrasfruttamento da parte degli individui e, soprattutto, per garantire la loro sos-tenibilità economica nel lungo periodo. All'origine del dibattito vi era l'articolo del biologo ecologista Garrett Hardin, The Tragedy of the Commons (1968), secondo il quale gli individui che utilizzano una risorsa condivisa (i commons, appunto), agendo in modo autonomo e perseguendo il proprio inter-esse, finiscono inevitabilmente per sovrautilizzarla, portandola al deterioramento e, a lungo termine, alla distruzione. Pertanto, l'unico modo per evitare tale tragedia era la privatizzazione della risorsa o la sua proprietà pubblica (Hardin, 1968). La Ostrom ha dimostrato che le comunità, intese come l'insieme di appropriatori e di utilizzatori di spazi o risorse collettive (commons), sono in grado «a certe condizioni», di autogestire sistemi di risorse complessi in modo soddisfacente (ovvero efficiente per se stessi) e sostenibile (per le risorse) anche per periodi molto lunghi (Vollan e Ostrom, 2010). Nel pensiero di Elinor Ostrom, per certe condizioni, si intendono (Tab.1): la conoscenza, la fiducia e la comunicazione tra i componenti di una comunità, ritenuti fondamentali per la buona riuscita dell'autoregolamentazione; l'esistenza di sistemi di regole (c.d. istituzioni) conosciute, accettate e condivise dai membri della comunità e che gli stessi sono in grado di fare rispettare da tutti i compo-nenti del gruppo, applicando sanzioni predefinite a coloro che non le rispettano; la non interferenza di un'autorità esterna, come per esempio lo Stato, che si sovrappone alle persone appropriandosi di scelte che non è in grado né di fare né di far rispettare.

Nell'approccio teorico di Ostrom (1990, 2007), i beni comuni si riferiscono a risorse naturali con-divise (ad esempio i bacini idrografici, boschi, sistemi di irrigazione, ecosistemi marini e costieri, ecc.) o alla proprietà e all'uso del suolo, al patrimonio storico-culturale e ambientale, o a risorse artificiali nella forma di infrastrutture fisiche (ad esempio acquedotti, vie di comunicazione, ecc.) o di risorse immateriali (come la conoscenza pubblica, la scienza aperta, il

libero scambio di idee) all'interno di specifici contesti locali o aree geografiche. L'ampia ricerca empirica e teorica di Ostrom ha dimostrato come i beni comuni possano essere gestiti in modo efficiente dalle comunità locali senza fare rifer-imento ai tradizionali diritti di proprietà, alla gerarchia o all'intervento statale. Gli utilizzatori locali (ap-propriators), avendo una maggiore vicinanza e familiarità con le risorse comuni sfruttate, possono in certe circostanze essere in grado di preservarle, stabilendo regole di gestione flessibili e cambiando tali regole in base alle conoscenze che provengono dal loro utilizzo, anche in condizioni di informazione incompleta riguardante la natura stessa del bene. Inoltre i costi sostenuti dalla comunità, per vigilare sul corretto uso del bene e per punire chi trasgredisce a tali regole, tendono a essere inferiori ai costi della regolamentazione pubblica o privata. Dunque, tali beni comuni possono essere efficacemente governati attraverso l'adozione di protocolli di proprietà comune (accordi diversi dalla proprietà privata o dall'amministrazione statale) fondati su azioni collettive auto-organizzate e auto-governate, in base ai quali si instaura una relazione specifica tra -da un lato- coloro che supervisionano le risorse e contribu-iscono al loro mantenimento, riproduzione e sviluppo e -dall'altro- i loro utilizzatori (Hesse e Ostrom, 2001, p.54).

Ciò considerato la ricerca sostiene, e si propone di dimostrare, che le alleanze strategiche tra Pmi, nella forma di reti di imprese, consorzi, organizzazioni di produttori e simili possono contribuire a ren-dere praticabili modelli di business sostenibili, favorendo anche la transizione verso un'economia cir-colare nell'industria olivicolo-olearia. In particolare, dopo aver individuato le risorse e i beni comuni prodotti nell'ambito di pratiche di economia circolare nel settore olivicolo-oleario, la ricerca intende rispondere alle seguenti domande di ricerca:

RQ1: i beni comuni del settore olivicolo-oleario possono essere qualificati come Common-Pool Resources e governati secondo i principi di progettazione istituzionale individuati da Elinor Ostrom

RQ2: la cooperazione tra Pmi del settore olivicolo-oleario, interpretata alla luce dei principi di governance dei Commons di Elinor Ostrom, contribuisce a facilitare l'implementazione di pratiche di economia circolare.

3. Metodologia

L'approccio metodologico adottato si fonda su una revisione sistematica della letteratura combinata con la somministrazione di un questionario on line ad aziende del settore olivicolo-oleario. Per com-prendere se e come gli accordi cooperativi tra le Pmi del settore olivicolo-oleario possono contribuire ad una efficace gestione dei flussi di materiali e della capacità di carico ambientale (elementi fondamen-tali del modello circolare) nonché alla valorizzazione di residui e sottoprodotti generati dalla produzione olivicolo-olearia garantendo la tutela dei beni comuni, è stata condotta una revisione siste-matica della letteratura (RSL). Inoltre, utili indicazioni sono state ottenute dall'analisi e interpretazione dei risultati di un questionario somministrato a 219 aziende del settore olivicolo-oleario nelle regioni Calabria, Campania, Sicilia, Puglia (dove si rileva una maggiore presenza di olivicoltori e di produttori di olio).

La fase di RSL ha seguito un processo replicabile e trasparente (Tranfield et al., 2003) e ha con-sentito di individuare gli studi esistenti, selezionare e valutare i contributi rilevanti, analizzare e sintetiz-zare i dati, raggiungere conclusioni chiare sugli aspetti noti e d'identificare potenziali gap di ricerca sull'argomento (Denyer e Tranfield, 2009, Kraus et al., 2020). Per condurre l'analisi, sono state seguite le linee guida di Denyer e Tranfield (2009) e il framework PRISMA (Liberati et al., 2009). La raccolta dei documenti è stata effettuata utilizzando i database Scopus e WoS. La seguente stringa di ricerca è stata applicata a titoli, abstract e parole chiave:

("strategic alliance*" OR "collaboration*" OR "joint venture*" OR "aggregation*" OR "coopera-tive*" OR "consortium*" OR "interorganizational" OR "business network*" OR "partnership" OR "industrial symbiosis" OR "resource synergy") AND ("circular econom*" OR "circular bioeconom*" OR "circular bio-econom*" OR "bioeconom*" OR "bio-econom*" OR

"waste" OR "waste valoriza-tion" OR "by-product*" OR "byproduct*" OR "mill wastewater" OR "olive mill wastewater" OR "leaves" OR "pruning" OR "olive cake" OR "olive stone*" OR "pomace*") AND ("agriculture" OR "agri-food" OR "agri-industrial" OR "olive" OR "olive oil" OR "oil mill*" OR "olive mill*" OR "olive industry" OR "olive supply chain" OR "olive farming" OR "olive processing")

Dopo aver ristretto la ricerca agli articoli di riviste peer-reviewed redatti in lingua inglese e classificati nelle categorie "Business", "Management" ed "Economics", sono stati recuperati 94 risultati da Scopus e 33 da WoS, per un totale iniziale di 127 articoli. Dopo la rimozione dei duplicati, il numero è stato ri-dotto a 107. Successivamente, attraverso lo screening di titoli, abstract e parole chiave, sono stati esclusi ulteriori 37 articoli, portando il totale a 70. Lo screening finale dei testi integrali ha determinato l'esclusione di altri 4 documenti. Pertanto, il campione finale è composto da 66 articoli.

Il questionario è stato elaborato e successivamente validato mediante revisione di esperti e test pi-lota (Elangovan e Sundaravel, 2021) nell'ambito di un Progetto PRIN PNRR (bando 2022) in corso di sviluppo (di cui questo contributo è parte integrante) e somministrato tramite il programma LimeSur-vey ad aziende olivicole e a frantoi delle 4 regioni del Sud Italia succitate, con l'obiettivo di raccogliere dati sulle pratiche di gestione dei sottoprodotti di frantoio, di individuare i principali ostacoli e facilita-tori dell'adozione di pratiche di bioeconomia circolare nel settore olivicolo-oleario nonché di compren-dere se le aggregazioni tra le Pmi del settore rappresentano un meccanismo di governance efficace per promuovere l'implementazione di tali pratiche.

L'analisi descrittiva dei risultati della somministrazione del questionario ha consentito di comprendere le pratiche di gestione e valorizzazione di residui e sottoprodotti adottate dagli olivicoltori e dai produttori di olio e, conseguentemente, l'impatto di tali pratiche sulla tutela dei beni comuni.

4. Economia circolare e beni comuni nel settore olivicolo-oleario

L'economia circolare rappresenta una risposta strategica all'esigenza delle Pmi di fronteggiare la transizione verso modelli produttivi sostenibili, che si estende alla gestione e alla conservazione dei beni comuni.

Nel settore olivicolo-oleario i beni comuni si riferiscono, alle risorse naturali (suolo fertile, acqua pulita, biodiversità del paesaggio olivicolo), ai marchi territoriali (DOP/IGP), ma anche agli scarti e ai residui di lavorazione (acque vegetative e di processo, fogliame, residui di potatura) nonché ai sotto-prodotti (sansa, polpa, nocciolino) della filiera[4], che possono essere trasformati in nuove risorse, utili e ad alto valore aggiunto, e possono essere valorizzati in impieghi alternativi, (re-)integrandoli nei cicli produttivi di altre imprese o in processi industriali successivi di altre aziende e settori, in ottica di sim-biosi industriale (Sgambaro et al., 2024).

[4] Le risorse comuni identificano una classe di beni definiti dalle seguenti caratteristiche (Ostrom et al., 1994; Ostrom, 2009): a) la non rivalità nel consumo: il singolo agente può godere della loro esistenza, indipendentemente dall'aver contribuito o meno alla loro creazione e dall'ammontare del suo conferimento: il consumo di questi beni è compatibile, cioè non rivale, con il consumo degli stessi da parte di altri agenti; b) la difficile escludibilità dei potenziali beneficiari: non sussistono restrizioni o limiti che impediscono il pieno godimento di questi beni a tutti. Sotto questo aspetto, l'uso improprio di questi sottoprodotti (per esempio lo sversamento incontrollato delle acque di vegetazione) da parte di un frantoio danneggia la qualità del suolo e dell'acqua per l'intera comunità, riducendone la disponibilità futura (rivalità). Analogamente, è difficile o costoso escludere gli attori (olivicoltori, frantoiani, agricoltori) dall'accesso al suolo e all'acqua che vengono compressi dagli scarichi (difficile escludibilità).

L'attuazione di pratiche di economia circolare rappresenta un'opportunità strategica per il settore olivicolo-oleario per chiudere i cicli delle risorse. Da queste pratiche si possono generare energia, combustibili, biomateriali, concimi e mangimi, composti bioattivi riducendo l'impatto ambientale su suoli e acque (derivante da smaltimenti impropri), migliorando l'efficienza delle risorse e trasformando un problema di gestione e smaltimento (la gestione degli scarti rappresenta una parte significativa dei costi di produzione) in significative opportunità economiche e competitive, creando nuove filiere e valore aggiunto (Donner e Radić, 2021).

Ad esempio, il fogliame e i residui delle potature possono essere valorizzate energeticamente ed essere utilizzate come legna da ardere o per produrre cippato o biochar (carbone vegetale) oppure possono es-sere destinate all'impiego in impianti di conversione energetica. I sottoprodotti come la sansa (tradizionalmente destinata ai sansifici per l'estrazione di olio di sansa) e gli scarti come i noccioli pos-sono essere usati come fertilizzanti e ammendanti per i terreni migliorandone la struttura e la fertilità oppure possono essere trasformati in biomassa per il riscaldamento e in biocarburanti, riducendo il bi-sogno di (e la dipendenza da) combustibili fossili: l'energia prodotta può essere fornita a frantoi e strutture limitrofe che necessitano di calore, in ottica di simbiosi industriale. I residui e i sotto-prodotti della lavorazione sono ricchi di nutrienti (digestato, biomassa di scarto delle olive, sansa) e possono essere compostati o trattati per diventare biocarbone e fertilizzanti naturali (anche da fornire a settori agricoli locali), migliorando la qualità e la fertilità dei suoli e riducendo la dipendenza da fertilizzanti e prodotti chimici di sintesi. Le acque reflue di frantoio opportunamente trattate possono essere riuti-lizzate per l'irrigazione o per scopi industriali secondari, riducendo il prelievo e l'inquinamento idrico e al tempo stesso promuovendo il risparmio idrico nelle regioni con carenza idrica tipiche delle aree oliv-icole. Gli scarti della produzione di olio d'oliva possono essere convertiti in materiali di origine biologi-ca. La biomassa dei noccioli d'oliva, inoltre, è sempre più studiata come fonte per la produzione di bi-oplastiche o materiali compositi. Le industrie focalizzate sul packaging sostenibile possono collaborare con i produttori di olio d'oliva per reperire questi materiali, riducendo la necessità di materie plastiche derivate dal petrolio. Dalle acque vegetative e di processo si estraggono polifenoli e altri composti bio-attivi la cui gestione è complessa ma che sono materie prime pregiate per le industrie farmaceutiche, cosmetiche e nutraceutiche che li utilizzano per le loro proprietà antiossidanti e antimicrobiche. Questi esempi ci dicono come il settore olivicolo-oleario possa beneficiare di modelli circolari che migliorano l'efficienza (nell'uso) delle risorse, riducono l'impatto ambientale (minori volumi di rifiuti prodotti e dei relativi costi di smaltimento), favoriscono l'autosufficienza energetica delle singole imprese locali.

Sotto questo profilo, l'economia circolare offre nuove opportunità per aumentare la competitività delle Pmi olivicolo-oleari e favorisce la sostenibilità della filiera e dei territori di riferimento. Quest'ultima, a sua volta, contribuisce alla tutela, alla conservazione e alla valorizzazione dei beni comuni, garanten-do la resilienza e la competitività dell'intera filiera nel contesto della transizione ecologica globale.

Di fatto, le pratiche di economie circolare consentono di chiudere i cicli delle risorse e dell'ambiente nell'ecosistema agricolo, offrendo al contempo un metodo di smaltimento sostenibile per gli scarti del settore oleario e creando nuove fonti di reddito per i produttori. L'economia circolare emerge dunque come alternativa sistemica, mirata a mantenere prodotti, componenti e materiali al loro massimo valore e utilità tramite pratiche di riuso, riciclo, rigenerazione e valorizzazione. La sua efficacia non dipende solo dall'innovazione tecnologica ma, strategicamente, dalla governance, cioè dalle regole e dai mecca-nismi di gestione che guidano l'azione collettiva.

5. Azione collettiva e autogoverno dei beni comuni

La transizione verso pratiche di economie circolare richiede un approccio sistemico, fondato sulla collaborazione tra olivicoltori, agricoltori, imprese, ricerca e comunità locali. Seguendo

l'approccio di Ostrom, la gestione sostenibile dei beni comuni rappresentati dalle risorse olivicole-olearie e l'innovazione tecnologica e gestionale del settore possono attuarsi efficacemente attraverso istituzioni cooperative, fondate sulla collaborazione e sul coordinamento fra Pmi, che possono sviluppare pratiche operative e regole proprie evitando la "tragedia dei beni comuni" (il degrado per eccessivo sfruttamento). Inoltre, le Pmi aggregate in rapporti cooperativi formali aumentano le opportunità di implementare strategie e pratiche di economia circolare e di simbiosi industriale. Conseguentemente, si aprono nuove opportunità di business, aumento della competitività, guadagni economici, riduzione dei volumi dei rifiuti prodotti e dei relativi costi di gestione e smaltimento e miglioramento delle prestazioni ambientali, sia per le singole imprese che per le aggregazioni di cui esse fanno parte.

Ostrom (1990) ha dimostrato che le comunità locali sono in grado di auto-organizzarsi per gestire i beni comuni in modo efficace e sostenibile attraverso Istituzioni di Azione Collettiva, identificando otto Principi guida, fondamentali per la loro riuscita (Tab.1). Applicati alle aziende olivicolo-olearie locali, significa stabilire regole chiare e condivise su chi appartiene alla comunità produttiva, su chi può accedere alle risorse (oliveti, acqua, marchi territoriali) e su come vengono utilizzate e gestite le risorse comuni, evitando conflitti (le aziende sanno chi ha diritto a cosa), sovrasfruttamento (di suolo, oliveti, risorse idriche, ecc.) e favorendo la sostenibilità ambientale.

Il modello di Ostrom dimostra che l'efficacia delle pratiche di economia circolare nella filiera olivicolo-olearia non è solo una questione di tecnologia ma di anche di istituzioni di autogoverno che garantiscono cooperazione, sostenibilità e competitività lungo tutta la catena del valore. Gli otto principi per la gestione dei beni comuni applicati alle aggregazioni e alle reti di Pmi del settore olivicolo-oleario servono a definire regole condivise, partecipazione attiva e sistemi di monitoraggio che tutelano e valorizzano le risorse collettive per la prosperità del territorio.

Principi Ostrom	Definizione	Applicazione all'economia circolare nelle reti di imprese olivicolo-olearie	Beneficio "circolare" e per i beni comuni
1. Chiara definizione dei confini	Definizione dei confini della coprogettazione, con riferimento all'ampiezza del contesto territoriale interessato (confini geografici), ai soggetti che hanno diritto di utilizzare le risorse collettive e alle modalità d'uso delle stesse (confini sociali), alle problematiche sociali affrontabili con la co-progettazione (confini tematici).	Definire chiaramente i membri legittimati a partecipare (aziende olivicolo-olearie locali, cooperative, consorzi, famiglie di produttori), ad utilizzare e beneficiare dei sottoprodotti (per esempio: un consorzio di frantoi e olivicoltori che conferisce la sansa a un unico biodigestore o impianto di compostaggio). identificare con precisione quali risorse sono incluse e fanno parte del bene comune (oliveti, terreni, frantoi, marchi collettivi, sottoprodotti come sansa e acque di vegetazione).	Riduce i rischi di comportamenti opportunistici (free-riding) e di smaltimento illegale, assicurando che i sottoprodotti rimangono nel ciclo,
2. Congruenza tra le regole di appropriazione e di fornitura e le condizioni locali	Tenuto conto delle specificità economiche e sociali del contesto territoriale, definizione delle regole per regolare interessi non immediatamente convergenti, orientare l'utilizzazione delle risorse e garantire un adeguato accesso ai servizi (appropriazione) e la realizzazione delle necessarie attività di produzione dei servizi (fornitura).	Chiarire le regole di accesso (chi può raccogliere, trasformare o commercializzare l'olio e in quali quantità). Adattare regole di produzione e trasformazione alle specificità territoriali (clima, varietà di olive, tradizioni). Stabilire regole di valorizzazione (per esempio l'uso della sansa per fertilizzanti e bioenergia) di riuso e riciclo adattate al territorio, al tipo di cultivar (ad esempio: compostaggio della sansa, riutilizzo acque reflue in agricoltura), alle tecnologie locali, alla tipologia di rifiuto prevalente e alle esigenze agronomiche del territorio (ad esempio: un sistema di compostaggio efficiente dove l'agricoltura è dominante).	Massimizza l'efficienza e l'accettazione, ad esempio privilegiando il compostaggio in zone ad alta necessità di sostanza organica nel suolo
3.Metodi di decisione collettiva	Definizione di processi decisionali improntati alla collegialità nonché delle politiche di gestione delle risorse e delle attività collettive. I produttori e gli utilizzatori dei servizi realizzati, devono poter contribuire a definire, e all'occorrenza modificare, le regole che orientano la funzionalità complessiva del sistema operativo istituito dalla coprogettazione, adattandole al contesto specifico e ai cambiamenti sistemici	Coinvolgere i produttori e tutte le Pmi nelle scelte su qualità, marketing, gestione delle risorse e innovazione nonché sulle innovazioni circolari (biogas, packaging sostenibile, economia di scarto). Creare consorzi che coinvolgono frantoiani, olivicoltori, aziende nutraceutiche e università locali nella definizione di standard di qualità dei sottoprodotti.	Garantisce che le pratiche di economia circolare (ad esempio la creazione di una bioraffineria) rispondono ad esigenze concrete e sono percepite come eque da tutti i beneficiari.
4. Monitoraggio condiviso	Definizione di sistemi di monitoraggio sulle condizioni d'uso delle risorse collettive e sui comportamenti di coloro che usufruiscono dei servizi collettivi, in modo da garantire comportamenti cooperativi e un mutuo monitoraggio tra i soggetti.	Creare sistemi di controllo condivisi sulla qualità dell'olio, sull'uso sostenibile delle risorse e sul rispetto delle regole di filiera. Creare sistemi di tracciabilità per verificare riduzione rifiuti, efficienza energetica e riuso dei sottoprodotti nonché per monitorare la destinazione finale di sansa e acque di vegetazione, verificando che non vengano smaltite illegalmente ma valorizzate.	Assicura la responsabilità e la qualità dei materiali secondari (ad esempio, certificare il compost da sansa).
5. Sanzioni graduate	Previsione di sanzioni (a seconda della gravità e del contesto della violazione) per coloro che violano le norme operative condivise all'interno di logiche di autogoverno al fine di garantire un credibile impegno del rispetto delle regole da parte degli utilizzatori. Monitoraggio e sanzioni non sono intraprese da autorità esterne ma dai partecipanti stessi.	Premiare i frantoi che aderiscono a standard di economia circolare (ad esempio, con certificazioni di sostenibilità o tariffe di conferimento agevolate). Prevedere penalità proporzionate per chi non rispetta gli standard di qualità, o le regole di marchio collettivo, o le regole ambientali e di sostenibilità (ad esempio: uso improprio di risorse comuni).	Promuove la conformità e la trasformazione del comportamento verso la circolarità.
6. Meccanismi di risoluzione dei conflitti	Le reciproche e intense relazioni sollecitano l'attivazione di meccanismi idonei per trattare in modo rapido i possibili conflitti all'interno del gruppo degli utilizzatori delle risorse o che possono insorgere tra destinatari dei servizi e operatori.	Istituire comitati/tavoli di mediazione interni alla rete per gestire divergenze su investimenti o utilizzo dei sottoprodotti o per risolvere eventuali dispute tra aziende.	
7. Minimo livello di riconoscimento dei diritti di organizzarsi - Riconoscimento da parte di autorità esterne	Utilizzatori e fornitori delle risorse collettive hanno diritto di auto-organizzarsi e di codificare i propri comportamenti cooperativi in vere e proprie istituzioni, che non sono contestabili da autorità governative esterne.	Supporto istituzionale: leggi e politiche che riconoscono e sostengono legalmente i modelli di business circolari, le cooperative di riuso e i partenariati pubblico-privati. Ottenere certificazioni ambientali (ISO 14001, EMAS) e riconoscimento istituzionale per pratiche circolari, così da rafforzarne legittimità e accesso a fondi.	
8. Organizzazioni articolate su più livelli	La dimensione organizzativa della coprogettazione richiama la necessità di sviluppare un sistema di governance policentrico (proporzionate all'ampiezza dei contesti territoriali e alla molteplicità dei temi sociali ed economici affrontati) che comprende soggetti privati e pubblici chiamati a tradurre in scelte e azioni e le soluzioni identificate per la comunità e il territorio di riferimento.	Strutturare la rete e la sua governance su più livelli: cooperative locali, consorzi regionali, associazioni nazionali, fino alle reti europee per l'economia circolare. Frantoio-azienda agricola (micro-ciclo) che riutilizza i residui della potatura; Consorzio di frantoi (meso-ciclo): che gestisce la sansa per energia; Politiche regionali (macro-ciclo), che supportano la ricerca e l'innovazione.	Collegando le azioni locali a quadri istituzionali più ampi, si risolvono problemi di scala e logistici

*Tabella 1. I principi progettuali per governare i beni comuni (*Ostrom, 1990) e applicazione all'economia circolare nel settore olivicolo-oleario. F*onte: Ns adattamento da Ostrom (1990), p.90.*

In accordo con Hess e Ostrom (2007), i beni comuni prodotti collettivamente e con il contributo anche finanziario dei soggetti interessati richiedono costante impegno e forte azione collettiva (Sandler, 1992; Dietz et al., 2003), cooperazione costruttiva delle imprese partner (Marshall, 1927) e solidi meccanismi di autogoverno (Hess e Ostrom, 2007), oltre a un livello elevato di capitale sociale da parte dei soggetti interessati (Koka e Prescott, 2002; Poppo e Zenger, 2002; Sumo et al., 2016), che li spinge a fare cose l'uno per l'altro, reciprocamente (Putnam, 2000).

Applicare i principi di Ostrom alle aggregazioni e alle reti olivicolo-olearie significa costruire un sistema di governance partecipato, che integra sostenibilità ambientale, innovazione circolare e valorizzazione del territorio e garantisce competitività globale. Come rilevato dagli studiosi dell'azione collettiva (Ahrne e Brunsson, 2008; Dietz et al., 2008; Berkowitz e Dumez, 2016; Ahrne et al., 2017) è possibile rinvenire la presenza di queste condizioni nella co-gestione adattiva di beni, servizi e risorse comuni attraverso l'autogoverno e le azioni collettive (Araral, 2014) intraprese nell'ambito degli accordi cooperativi e di partnership strategica tra imprese, siano essi di natura informale, formale, contrattuale o proprietaria.

6. Risultati

Allo stato attuale, l'analisi combinata della RSL e delle risposte ai questionari ha rilevato, da un lato, tipologia e caratteristiche dei beni comuni nel settore olivicolo-oleario e, dall'altro lato, le principali forme di collaborazione adottate a supporto dell'implementazione di pratiche di economia circolare. Tra queste, emerge il modello della rete collaborativa/contratto di rete (Zucchella e Previtali, 2019; Howard et al., 2022), un sistema di cooperazione tra attori che operano nello stesso settore o area geografica, capace di favorire scambi virtuosi di risorse, conoscenze ed expertise. Seguono le collaborazioni tra aziende di settori diversi finalizzate alla simbiosi industriale (Poponi et al., 2023; Kleinpeter et al., 2024), che riducono i costi operativi e a migliorano l'efficacia e l'efficienza dei processi circolari. Risultano inoltre frequentemente coinvolti i settori correlati alla trasformazione dei prodotti agricoli e agroalimentari, come le industrie cosmetica e farmaceutica.

Infine, si rilevano strategiche le partnership pubblico-private (Yin et al., 2024), in cui le istituzioni locali supportano le Pmi nell'adozione di pratiche circolari attraverso assistenza normativa, infrastrutturale e finanziaria.

Nel complesso, i risultati ad oggi disponibili indicano che le forme di rete di organizzazioni come alleanze strategiche, contratti di rete, consorzi, organizzazioni di produttori (tra aziende dello stesso settore, lungo la catena del valore, in partnership con enti pubblici, o basate su caratteristiche tematiche o settoriali) sono un fattore chiave per il successo della transizione verso modelli di produzione circolari nel settore olivicolo-oleario (Velasco-Muñoz et al., 2021) e offrono alle Pmi del settore nuove opportunità per aumentare la propria sostenibilità e competitività.

7. Conclusioni, implicazioni, originalità

Le Pmi del settore olivicolo-oleario stanno diventando centrali nella transizione verso l'economia circolare, e possono rappresentare un esempio replicabile in altri comparti agro-alimentari. Non solo l'olio d'oliva viene valorizzato, ma l'integrazione di sostenibilità ambientale, valorizzazione dei sotto-prodotti in impieghi alternativi, innovazione tecnologica e collaborazione interaziendale e territoriale generano valore economico, sociale e ambientale.

La transizione verso modelli di economia circolare, soprattutto quando supportata da processi di collaborazione tra imprese, istituzioni e attori della catena di fornitura, genera molteplici benefici economici, competitivi, ambientali e sociali ed effetti sistemici positivi.

Tra i vantaggi più frequentemente documentati si annoverano: un uso più efficiente delle risorse naturali; una significativa riduzione dei rifiuti; l'aumento della competitività aziendale; l'emergere di nuove opportunità di business (Ciccullo et al., 2021). La valorizzazione dei sottoprodotti crea nuove fonti di reddito e sostiene l'occupazione locale, anche in comparti innovativi quali la bioenergia, la cosmetica sostenibile o le industrie agroalimentari rigenerative (Donner et al., 2021). Dal punto di vista sociale, la collaborazione tra stakeholder eterogenei promuove l'inclusione sociale, lo sviluppo di competenze condivise e il rafforzamento delle economie locali. Una cooperazione ben strutturata lungo la filiera accresce altresì la trasparenza, migliora la tracciabilità e funge da stimolo per l'innovazione tecnologica attraverso la condivisione della conoscenza (Anugrah et al., 2024).

Nonostante il suo potenziale, sia la letteratura che la verifica empirica, sottolineano come la transizione verso l'economia circolare sostenibile nel settore olivicolo deve superare alcune sfide, in parte connesse alla frammentazione del settore olivicolo, caratterizzato da imprese di ridotte dimensioni. Tra queste, in particolare:

- necessità di politiche di supporto e di incentivi pubblici per promuovere progetti di economia circolare e sostenibilità, per sostenere gli investimenti in tecnologie innovative e per sviluppare infrastrutture adeguate:
- complessità logistiche per il recupero, il trasferimento e la gestione di materiali e sottoprodotti;
- creazione di impianti comuni destinati allo stoccaggio, alla manipolazione o alla trasformazione di residui e sotto-prodotti;
- promozione della ricerca per l'estrazione di composti ad alto valore e diffusione di tecnologie nelle aziende frantoiane, spesso di piccole dimensioni;
- formazione e cambiamento culturale, strutturale, organizzativo e gestionale;
- barriere normative o burocratiche, specialmente nell'ambito della gestione dei rifiuti e della classificazione dei sottoprodotti riutilizzabili;
- mercato ancora poco sviluppato per i sottoprodotti valorizzati;
- difficoltà di coordinamento tra attori eterogenei, i quali spesso presentano obiettivi e capacità divergenti;
- promuovere la collaborazione tra i vari attori della filiera (agricoltori, imprese, ricerca, consumatori, comunità locali) per creare valore condiviso.

Tali sfide fanno emergere con forza la necessità di nuovi modelli organizzativi che consentano agli operatori di collaborare, condividere risorse e competenze, e accedere con maggiore facilità ai mercati e ai finanziamenti pubblici. Un approccio efficace per supportare la crescita e la competitività delle Pmi agricole e olearie, aiutandole a raggiungere performance più elevate, si basa sulle alleanze strategiche tra Pmi.

Implicazioni

L'economia circolare rappresenta un nuovo paradigma per lo sviluppo sostenibile, capace di trasformare i modelli produttivi e di consumo in un'ottica rigenerativa.

Lo sviluppo di questa ricerca potrebbe offrire utili contributi sia alla teoria che alla pratica nel contesto dell'adozione dell'economia circolare nel settore olivicolo-oleario. In primo luogo, lo studio fornisce una comprensione più approfondita di come diverse forme di aggregazione interaziendale, come reti collaborative, alleanze di filiera e simbiosi industriale, possono facilitare l'implementazione di pratiche di economia circolare e, attraverso l'identificazione degli ulteriori settori coinvolti nelle relazioni simbiotiche, evidenzia il potenziale delle collaborazioni intersettoriali per migliorarne la sostenibilità. Da un punto di vista pratico, lo studio suggerisce

che le Pmi del settore olivicolo-oleario possono trarre vantaggio dalle pratiche di economia circolare, impegnandosi in collaborazioni interaziendali e sfruttando i sistemi di gestione della conoscenza.

Tuttavia, ciò richiede un ecosistema abilitante composto da regole chiare, meccanismi di governance efficaci, supporto politico e una volontà condivisa di superare le sfide tecniche e organizzative. I benefici sono significativi, ma devono essere bilanciati da un approccio sistemico e ben gestito ai rischi associati. Sotto questo profilo, i decisori politici e i leader del settore sono incoraggiati a sostenere tali iniziative attraverso la creazione di quadri che facilitino la cooperazione attraverso la condivisione e lo scambio di conoscenze, competenze, risorse, attività, investimenti, pratiche agricole sostenibili.

Lo sviluppo dello studio può avere diverse implicazioni che potrebbero interessare regolatori, professionisti e accademici. La conferma che le aggregazioni e le reti di Pmi migliorano l'implementazione di pratiche di economia circolare può imprimere un rinnovato slancio al modello italiano del contratto di rete. Questo strumento giuridico è stato concepito per favorire forme di cooperazione strutturata tra Pmi che, sulla base di obiettivi condivisi e sfruttando le reciproche complementarietà, realizzano un progetto comune, senza compromettere la propria flessibilità e autonomia giuridica e patrimoniale ma superando efficacemente alcune criticità legate alle loro ridotte dimensioni.

Decisori politici e istituzioni italiane potrebbero progettare incentivi e meccanismi di supporto adeguati per assistere le Pmi, le loro reti e i loro facilitatori (ad esempio, incubatori o associazioni): 1) nell'innovare i propri modelli di business secondo i principi dell'economia circolare e nella direzione di comportamenti più cooperativi, soprattutto in quei contesti in cui la propensione alla cooperazione è minore; 2) nell'identificare nuove aree di collaborazione tra aziende, incoraggiate dalle opportunità derivanti da strategie di bioeconomia circolare e simbiosi industriale; 3) nel promuovere forme di governance collaborativa che possono aumentare gli investimenti e la condivisione dei rischi, semplificando le procedure amministrative e, attraverso scambi interorganizzativi di risorse, aumentare la produttività e la sostenibilità della produzione semplificando l'accesso alle risorse.

Originalità

Lo studio qui presentato ha inteso applicare il concetto di autogoverno dei commons di Elinor Ostrom alle alleanze strategiche tra Pmi, spostando un paradigma nato per la gestione comunitaria di risorse naturali condivise(acqua, foreste, pascoli) verso un ambito socio-economico diverso, quale è la cooperazione tra attori economici privati (alleanze e aggregazioni strategiche) e verso un modello produttivo agricolo-industriale che punta alla sostenibilità e alla cooperazione, trasformando scarti, residui e sottoprodotti dell'olivicoltura in risorse comuni e creando un modello di governance circolare. Nelle aziende olivicole-olearie circolari le risorse comuni sono sottoprodotti e scarti (sanse, acque di vegetazione, potature), che diventano materie prime condivise per biogas, compost, biomateriali, ecc.. Ostrom studiava comunità locali che riuscivano a gestire risorse comuni senza ricorrere né al mercato puro né allo Stato centrale ma mediante regole auto-prodotte, condivise e rispettate dai membri, evitando la "tragedia dei commons". Ciò considerato, in questo studio si intende riconoscere che anche le imprese, come le comunità locali, hanno bisogno di istituzioni auto-organizzate per gestire risorse immateriali comuni (conoscenza, innovazioni, relazioni, reputazione) e che le Pmi del settore olivicolo-oleario, anziché competere in modo isolato, possono creare regole comuni per la raccolta, il trattamento e la redistribuzione dei sottoprodotti, per condividere know-how, coordinare investimenti, rendere praticabili modelli di business sostenibili, modelli di produzione circolari e pratiche di simbiosi industriale. Non si tratta solo di gestire scarti, ma di condividere conoscenza, tecnologie e fiducia. La stessa fiducia tra aziende diventa essa stessa un common da preservare.

Parole chiave: Reti di imprese; alleanze strategiche; economia circolare; settore olivicolo-oleario; commons; azione collettiva auto-organizzata e autogovernata

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Rethinking inventory through a sustainability lens: an Italian perspective

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1. Introduction

In recent years, supply chains have attracted growing interest in academics (Wong et al., 2024). Technological developments, intensification of global competition, market volatility, and increasing attention to environmental, social, and governance (ESG) issues have led to a series of changes in managers' management and decision-making approaches (Lu et al., 2024).

The OECD Supply Chain Resilience Review highlights that, despite the diversification of global trade, import concentration is increasing and relocation could significantly reduce global GDP (OECD, 2025). According to the report, resilience is built by strategically managing risks through agile, adaptable, and internationally coordinated supply chains.

With the consolidation of Industry 4.0, companies have progressively integrated advanced digital technologies that significantly impact the various phases of the supply chain, from procurement planning to product delivery to the customer (Caputo et al., 2025). Digital tools such as blockchain, business intelligence, artificial intelligence, and big data analytics strengthen management's decision-making capabilities, improving control, operational agility, and predictive analytics (Awan et al., 2021; Chae et al., 2014; Sullivan and Fosso, 2024).

Within this context, inventory management is a crucial issue. Hofer et al. (2012) analyzed that lean inventory management improves financial performance by reducing costs. Furthermore, strong governance that is aware of the risks of supply chain disruption, often exacerbated by events such as the COVID-19 pandemic or geopolitical instability, can redesign the global supply chain (Roscoe et al., 2022). In particular, the Russia-Ukraine war has disrupted the supply of key raw materials, including energy and agricultural products (Tollefson, 2022). The conflict has produced significant negative effects on the manufacturing, transport, and agri-food sectors, exacerbating inflationary pressures. This requires a reconfiguration of supply chains and logistics in response to shortages, sanctions, and social dynamics (Bednarski et al., 2025). Finally, data management within inventory plays a key role. Strong mediation of information processed through digital technologies improves the quality of decision-making (Awan et al., 2021).

At the same time, sustainability has become a pillar of supply chain governance. Principles such as the circular economy guide processes toward waste reduction and resource reuse, generating competitive advantages and meeting regulatory and social expectations (Kristoffersen et al., 2021). This push is reinforced by the latest European directives, in particular the Corporate Social Responsibility Directive (CSRD) and the Corporate Sustainability Due Diligence Directive (CSDDD), which are pushing corporate boards to strengthen reporting and control practices throughout the entire sustainable supply chain (Velte, 2025). On the other hand, the "Stop the Clock" directive and recent votes in the European Parliament highlight a trend toward raising the thresholds for the application of regulations. Thus, society finds itself in a rapidly and constantly evolving regulatory environment. In this regard, Nicolo et al. (2025) show that companies

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included in the omnibus package are slightly better prepared in terms of sustainability reporting than those excluded from it.

Several gaps emerge from the literature. First of all, although there are studies that analyze how sustainability practices influence corporate performance (Hofer et al., 2012), there is a lack of clear evidence on how companies' approach to sustainability specifically affects inventory management performance, particularly average days of inventory. Furthermore, empirical analyses of ESG factors that may influence this indicator are limited, with most studies focusing on related aspects, such as transportation, waste management, or reverse logistics, rather than on internal inventory dynamics (Bouchery et al., 2012; Wu et al., 2017). Finally, there is a lack of studies exploring sectoral differences and dynamics in this regard, leaving it unclear whether and how the effect of sustainability on inventory management varies across industries with different operating characteristics.

In the light of the gaps identified, this study aims to empirically analyze the impact of sustainability practices, both in terms of governance structures and sustainability reporting along the supply chain, on the average inventory levels of Italian companies, taking into account sector-specific characteristics. The objective is to assess whether sustainability can be considered a determinant of internal operational performance.

The study is expected to make a twofold contribution. First, it expands the existing literature by integrating the strands of sustainability and inventory management. Second, it provides empirical evidence on the role of sustainable governance and experience in sustainability reporting as possible drivers of operational efficiency, thus providing a basis for the development of more robust theoretical models and the definition of more targeted policy and managerial implications.

This study, adopting the theoretical framework of Resource-based view theory (RBV) formulated by Barney (1991), proposes to empirically analyze how companies' approach to sustainability disclosure affects inventory management, with particular reference to average days of inventory. Furthermore, the analysis aims to explore any sectoral differences and dynamics that exist in this regard.

2. Methodology

This research used a quantitative approach to analyze the sustainability determinants that affect the average inventory levels of companies and to explore the sectoral differences and dynamics that drive them. Specifically, this study uses panel regression analysis to analyze the sustainability factors that influence average inventory levels.

First, a sample of companies was established for analysis. Following (Pizzi et al., 2020), a sample of italian Public Interest Entities (PIEs) was extracted from Bureau Van Dick's AIDA database, a comprehensive data archive that collects financial information on Italian companies. The analysis focuses on the Italian context, chosen in consideration of the significant regulatory transition, which sees the transition from the NFRD to the CSRD and the introduction of the new European Sustainability Reporting Standards (ESRS). Therefore, Italian companies represent a relevant case study for observing both compliance with the new requirements and the ability to adapt organizationally to the new provisions (Nicolo et al., 2025). The sample therefore consists of 178 units of analysis. The time frame analyzed ranges from 2019 to 2023, for a total of five years.

As regards the dependent variable, the average inventory level indicator, expressed in days, was extracted from the AIDA database. It represents the average time that a company holds its stocks before selling them.

The independent variables included governance characteristics, ESG policy, reporting experience, and Global Reporting Initiative (GRI) indicators. For the latter, following Ligorio et al. (2024), a score was calculated by taking the average value of the GRI standard indicators

related to the supply chain, reported by companies in their sustainability reports, and the total number of available supply chain indicators. The reports were downloaded from the companies' websites. The formula is as follows:

$$SC_{score} = \frac{\sum_1^n GRI\ SC\ indicators\ disclosed}{Total\ GRI\ SC\ indicators}$$

Governance characteristics refer to board size, the percentage of women on the board, the percentage of independent directors, and the presence of a sustainability committee, expressed as a binary variable (Beji et al., 2021; Endrikat et al., 2021). These data were extracted from sustainability reports.

ESG policy refers to the presence within a company of a code of conduct for suppliers, aimed at assessing and ensuring compliance with ethical, environmental, and social standards, thereby helping to reduce risks (Li and Lee, 2024). This variable is expressed as a binary variable.

Finally, reporting experience refers to the total number of years that a company has been producing sustainability reports (Caputo et al., 2021).

The model is shown as follows:

$$\text{InventoryAvgit} = \beta 0 + \beta 1\text{SCscoreit} + \beta 2\text{BSit} + \beta 3\text{WBit} + \beta 4\text{IBit} + \beta 5\text{Comit} + \beta 6\text{ESGpolicyit} + \beta 7\text{REit} + \alpha\text{i} + \varepsilon it$$

where:

- $InventoryAvg_{it}$ represents the average inventory indicator, expressed in days;
- $SCscore_{it}$represents the supply chain indicator score;
- BS_{it} represents board size, measured as the total number of board members;
- WB_{it} represents board diversity, measured as the percentage of women and underrepresented groups on the board;
- IB_{it} represents the number of independent administrators on the board;
- Com_{it} reflect the presence of a sustainability committee within the governance structure, where 1 = the company has a sustainable committee, and 0 = it does not;
- $ESGpolicy_{it}$ represents the existence of a code of conduct for suppliers, where 1 = the company has a code of conduct, and 0 = it does not;
- RE_{it} represents the company's experience in sustainability reporting, measured by the number of years of reporting.

For the purposes of an analysis that can guarantee greater accuracy and consistency in estimates, the Hausman test is performed to choose between the application of fixed effects or random effects (Conca et al., 2021). In this way, endogeneity problems are limited.

3. Expected results

Evidence from companies listed on the European market shows that sustainable board governance significantly improves sustainable supply chain reporting (Velte, 2025). Therefore, the study is expected to show how the sustainability variables considered have a significant influence on average inventory levels, suggesting that ESG governance may also play an important role in inventory management. In particular, it is expected that a higher level of supply chain sustainability reporting, measured through the SCscore, will be associated with improved corporate performance (Solano et al., 2023). Companies that invest in sustainability practices tend to improve collaboration with suppliers, transparency of information flows, and the efficiency of logistics processes, with a positive impact on the capacity to plan and reduce unnecessary stock. More transparency in information flows makes demand planning and strategic supplier

management easier, improving alignment between production and sales (Vasista and AlAbdullatif, 2017).

Board characteristics may also be linked to inventory management efficiency. A higher proportion of women on board, as well as a higher proportion of independent administrators, are often associated with greater attention to control, transparency, and sustainability issues, which may be reflected in more careful and disciplined operating practices (Akhter and Hassan, 2024; Arora, 2022). Similarly, the presence of a sustainability committee and the adoption of a formal ESG policy could help to guide the company towards more structured decision-making processes that are consistent with efficiency objectives, promoting a more rational use of resources and a reduction in average inventory (Li and Lee, 2024).

Finally, it is hypothesized that experience in ESG reporting is a further indicator of organizational maturity in monitoring and managing internal performance (Caputo et al., 2021). Companies with a longer history of non-financial reporting tend to develop more advanced control systems, which can translate into more accurate inventory management. Furthermore, this increases the ability to support strategic decisions consistent with efficiency and sustainability objectives (Velte, 2025). In this sense, sustainability is a multidimensional factor, capable of integrating governance, operations, and economic performance in a synergistic approach. Furthermore, integrating ESG practices into decision-making processes can increase a company's responsiveness to market fluctuations and unexpected events, such as supply chain disruptions or regulatory changes.

Overall, the expectation is that greater integration of ESG practices, both in governance and in operational processes, will be associated with lower average inventory levels, suggesting that sustainability can act not only as a reputational leverage but also as an asset capable of creating efficiency and resilience within the supply chain.

4. Implications

Given the results, this study has a multitude of implications for academics, managers, and policymakers, providing numerous insights for both theoretical exploration and the development of more informed practical and policy strategies.

First, from a resource-based view theory perspective, the research contributes to the literature on the role of sustainability in supply chain performance, particularly in terms of average inventory levels. The study highlights that, compared to existing literature which tends to focus on the effects of sustainability mainly in the external stages of the supply chain, such as outbound logistics and waste management, the results indicate that sustainable practices also have a measurable impact on internal inventory management processes.

Furthermore, the research opens the way for further investigation into the mediating role of digital technologies in linking sustainability and inventory management, trying to confirm the RBV assumption that the competitive advantage of companies emerges in the presence of non-imitable resources.

In terms of managerial implications, this study offers several insights into inventory management, verifying how the adoption of sustainable practices impacts supply chain efficiency throughout the various steps of the process. The analysis highlights the intersectoral differences between companies. This strengthens the idea that sectors with long production cycles and a strong dependence on raw materials could benefit from technological investments in inventory planning, management, and traceability, while sectors with high turnover could focus more on advanced collaboration practices with suppliers. Therefore, managers can focus on the characteristics of their own sector rather than resorting to standardized solutions.

In addition, the use of advanced digital tools provides useful guidance to decision-makers for supplier selection, suggesting that ESG practices are not only a reputational issue but can improve delivery reliability and reduce the risk of supply chain disruption.

Finally, the implications of this study are particularly relevant for policymakers. Showing that sustainable practices have a measurable effect on inventory levels, the research provides evidence for developing regulations that encourage efficient and sustainable inventory management. To this end, tax incentives or guidelines could be developed for companies that adopt sustainable inventory management practices. Sectoral differences highlight the need for tailored policies and the creation of sector-specific standards, which allow better comparability between companies and promote transparency.

Furthermore, the results suggest opportunities for the public sector to support digitization initiatives that mediate the relationship between sustainability and inventory management, reducing environmental impact and improving the efficiency of the territorial supply chain.

Keywords: Supply chain; inventory management; greenlogistics; days inventory outstanding; sustainability; SSCM

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Sustainability Assurance and Disclosure Quality in the Italian Agri-Food Sector

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1. Introduction and research objectives

The entry into force of the Corporate Sustainability Reporting Directive (CSRD) in January 2024 marked a turning point in the regulation of sustainability reporting in Europe, significantly broadening the scope of obligated companies and introducing a phased requirement for external assurance, moving from limited to reasonable assurance by 2028. In parallel, the proposals contained in the Omnibus I package (February 2025), aimed at reducing administrative burdens and compliance costs through higher thresholds and greater application flexibility, have generated uncertainty regarding the future depth, comparability, and credibility of ESG disclosures. In this context, sustainability assurance, understood as the independent verification of ESG information by qualified third parties, has assumed a crucial role in reducing information asymmetry, mitigating greenwashing risks, and enhancing the reliability of sustainability reports (Rossi and Tarquinio, 2017; Larrinaga et al., 2020; Borgato and Marchini, 2021; Mio et al., 2024). The Italian agri-food sector provides a particularly compelling context for analysis. It is characterized by high environmental and social materiality (climate change, land and water use, biodiversity, labor conditions along the supply chain) (Briamonte et al., 2024; Cromwell et al., 2025), substantial national economic relevance (significant contribution to GDP and employment) (Fortunati et al., 2020; Betti et al., 2025), and complex supply chains that span from primary production to processing and distribution (Contò et al., 2019). The ownership and governance structures are predominantly composed of family-owned businesses, agricultural cooperatives, and SMEs, embedded within an institutional fabric defined by relational networks, strong regional identities, and a civil law legal tradition (Tarangioli et al., 2024).

Despite the strategic role of the agri-food sector in the green transition, studies specifically focused on assurance of sustainability for Italian agri-food firms remain limited (Betti et al., 2025). For this reason, the present study addresses this gap by examining the relationship between the characteristics of external assurance and the quality of ESG disclosure. More precisely, it examines how assurance level, the use of recognised assurance standards, and the choice of provider are associated with disclosure quality in Italian agri-food companies, distinguishing the effect of the mere publication of a sustainability report from the incremental effect of external assurance, while considering the institutional and regulatory specificities of the Italian context. Accordingly, the research question guiding this study is as follows: How do the various characteristics of sustainability assurance relate to the quality of ESG disclosure in the Italian agri-food sector during the initial implementation phase of the CSRD, and what implications arise for regulatory policy and corporate practice?

2. Theoretical backgroynd and hypothesis development

To address the research question, three complementary theoretical perspectives are employed: Legitimacy Theory (Suchman, 1995), Stakeholder Theory (Freeman, 1984), and Agency Theory (Jensen and Meckling, 1976).

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According to Legitimacy Theory (Suchman, 1995), organizations continuously seek social approval by striving to operate within boundaries deemed acceptable by society. In the field of sustainability, legitimacy pressures stem from regulatory constraints, stakeholder expectations, media scrutiny, and evolving societal norms on environmental and social matters (Cho et al., 2015; Deegan, 2002). Sustainability reporting and its assurance are thus viewed as tools for managing legitimacy (Simnett et al., 2009; Boiral, 2013). Through the publication of ESG information and its independent verification, firms signal their conformity to socially accepted norms and values. In this framework, higher levels of assurance act as stronger signals of commitment and credibility, reducing perceptions of managerial discretion in the selection and presentation of information (Martínez-Ferrero and García-Sánchez, 2017). In the Italian agri-food sector, legitimacy pressures are particularly intense due to its high environmental impact and the strong cultural ties to food quality and origin (Belletti and Marescotti, 2011). This perspective leads to the following hypothesis:

H1: Firms that obtain higher levels of assurance exhibit higher-quality sustainability disclosure.

Stakeholder Theory (Freeman, 1984; Mitchell et al., 1997) shifts the focus from broad societal expectations to the demands of specific stakeholder groups that possess power, legitimacy, and urgency in their claims. Investors, customers, suppliers, workers, local communities, NGOs, and regulators have diverse information needs and may exert varying degrees of pressure on firms to produce reliable and comparable sustainability information (Manetti and Becatti, 2009; Boiral et al., 2020). From this viewpoint, sustainability assurance can be interpreted as a response to the demands of stakeholders seeking credible information (Simnett et al., 2009). The adoption of internationally recognized assurance standards (e.g., ISAE 3000, AA1000AS, ISSA 5000) and the engagement of providers with established reputational capital, such as those belonging to the Big 4, strengthen the signal of reliability to sophisticated stakeholders such as institutional investors, major retailers in the agri-food chain, or certification bodies (Mangieb and Sarr, 2025). In the agri-food sector, the complexity of supply chains increases the demand for verifiable information on environmental and social impacts. Firms may thus employ recognized standards and reputable providers to meet such expectations and differentiate themselves through disclosure quality. This perspective leads to two additional hypotheses:

H2: Firms that adopt internationally recognized assurance standards exhibit higher-quality sustainability disclosure than those using proprietary or non-standardized approaches.

H3: Firms that engage Big 4 assurance providers exhibit higher-quality sustainability disclosure than those relying on other types of providers.

Agency Theory (Jensen and Meckling, 1976; Eisenhardt, 1989) conceptualizes the information problem as a principal–agent relationship between managers (agents) and shareholders or financial stakeholders (principals), highlighting how the former possesses superior information and may have incentives to select, distort, or omit information to maximize their own objectives. From this perspective, sustainability reporting serves as a mechanism to reduce information asymmetry, while external assurance functions as a governance tool that constrains managerial opportunism and enhances the reliability of disclosed information (Simnett et al., 2009). Assurance may also yield economic benefits, such as reduced cost of capital (due to lower information risk), better access to sustainable finance instruments, enhanced reputation, and reduced exposure to regulatory sanctions (Hummel and Schlick, 2016).

In the Italian agri-food sector, the prevalence of family-owned and cooperative firms introduces agency configurations that differ from the classical model, potentially reducing the separation between ownership and management but generating specific accountability needs towards members, shareholders, or local communities (Gasson and Errington, 1993). However, as firm size increases, so does organizational complexity, the distance between owners and managers, and public visibility, thereby raising agency costs and external scrutiny. In such

contexts, assurance may become particularly relevant as both a governance and signaling mechanism (Krasodomska et al., 2025). This leads to the final hypothesis:

H4**:** The relationship between assurance characteristics (level, standard, and provider type) and sustainability disclosure quality is stronger in larger firms, which face higher agency costs and stakeholder scrutiny than smaller firms.

Overall, the three theoretical perspectives converge in suggesting that more "robust" assurance characteristics (greater depth, recognized standards, reputable providers) are associated with higher-quality ESG disclosure. At the same time, they indicate that this relationship is moderated by stakeholder structure, governance features, and firm size within a highly dynamic sectoral and regulatory context such as that of the Italian agri-food industry during the implementation phase of the CSRD.

3. Methodology

3.1. Sample selection and data sources

The empirical analysis employs a cross-sectional design focusing on fiscal year 2024 to examine the relationship between sustainability assurance characteristics and disclosure quality in the Italian agri-food sector. The sample selection process followed a multi-stage approach to identify relevant companies while ensuring data availability and quality. Data were collected from multiple sources between July and October 2025, when complete 2024 reporting information was available.

Financial and structural data were obtained from the AIDA database (Bureau van Dijk), which provides comprehensive information on Italian companies. Sustainability reports were retrieved directly from annual reports and company websites, with particular attention to obtaining the most recent reports corresponding to the 2024 fiscal year. Assurance statements were extracted from these reports, with detailed coding of assurance characteristics including level, standards used, and provider identity.

The study population was defined using NACE Rev. 2 codes corresponding to agri-food activities: 01 (Crop and animal production), 02 (Forestry and logging), 03 (Fishing and aquaculture), 10 (Manufacture of food products), 11 (Manufacture of beverages), 462 (Wholesale of agricultural raw materials), 463 (Wholesale of food and beverages), 4711 (Retail sale in non-specialized stores with food predominating), and 472 (Retail sale of food in specialized stores).

From the initial universe, we applied a structured sequence of screens to derive the analytic sample (see Table 1). First, we retained only entities with active legal status. Second, we restricted the frame to corporations and cooperatives, excluding sole proprietorships and partnerships whose governance structures and reporting practices are not comparable. Third, we imposed a size criterion of at least 1,000 employees to concentrate on organizations with sufficient resources and stakeholder salience to engage meaningfully with sustainability reporting; this threshold also aligns with ongoing Omnibus discussions that envisage higher CSRD applicability parameters. Finally, we verified the availability of complete information for fiscal year 2024. The resulting sample comprises 73 companies, representing the largest enterprises in the Italian agri-food sector.

Selection Criteria	Number of Companies	Reduction
Initial population (agri-food sector)	1,022,410	-
Active legal status	960,820	-61,590
Capital companies and cooperatives	120,288	-840,532
≥1,000 employees	1,101	-119,187
2024 data available	73	-1,028
Final sample	**73**	**-1,022,337**

Table 1. Sample selection process

3.2. Variable construction and coding

The reporting indicator (Report present) equals 1 if a stand-alone sustainability report or an integrated report with identifiable sustainability sections is available, and 0 otherwise. The assurance level (AQ2) is coded from the assurance statement. The standards indicator (AssurStd) equals 1 when the statement explicitly references ISAE 3000 Revised, ISAE 3410 for greenhouse gas assertions, AA1000AS, or ISSA 5000, and 0 otherwise. The provider indicator (ProvBig4) equals 1 for engagements conducted by one of the Big 4 audit firms and 0 for other providers.

The disclosure quality index assigns one point for explicit alignment with at least one recognized reporting standard, one point for the presence of a content index, one point for disclosure of Scope 1 and Scope 2 emissions with at least partial disclosure of Scope 3, and one point for quantitative climate targets. Components are coded as binary indicators to maximize transparency and replicability. A codebook defines each rule and records borderline cases, with traceability links to the underlying document excerpts. Inter-coder agreement is assessed on a subsample using standard reliability procedures in content analysis (Krippendorff, 2018).

Financial controls are derived from the corporate database and harmonized to fiscal year 2024 (or the latest available year when 2024 financial data are not yet reported). Size is proxied by the natural logarithm of total assets (ln_Assets); leverage is measured as total debt over total assets; profitability is captured by return on assets (ROA). All continuous variables are winsorized at conventional percentiles to contain the influence of outliers.

3.3. Dependent variable: Disclosure Quality Index (DQI-4)

The primary dependent variable is a Disclosure Quality Index (DQI-4) constructed specifically for this study. The index follows an additive approach with a 0–4 scale, where one point is awarded for each of the following elements present in a company's sustainability disclosure:

- Alignment with recognized standards: evidence of reporting according to at least one of the following frameworks: Global Reporting Initiative (GRI), International Sustainability Standards Board (ISSB), or European Sustainability Reporting Standards (ESRS).

- Content index: inclusion of a structured index that explicitly links specific disclosures to the corresponding standards or framework requirements.
- Comprehensive emission coverage: disclosure of Scope 1 and Scope 2 greenhouse gas emissions, plus at least partial disclosure of Scope 3 emissions.
- Quantitative climate targets: establishment of specific, measurable climate targets, such as those validated through the Science Based Targets initiative (SBTi) or equivalent credible frameworks.

For companies not publishing a sustainability report (non-reporters), all DQI-4 components are coded as 0. This approach follows Clarkson et al. (2008) in avoiding the selection bias that would result from analyzing only reporting companies, which is particularly important given the early-stage adoption context.

3.4. Independent variables: assurance characteristics

Three primary independent variables capture different dimensions of sustainability assurance:

- AQ2: an ordinal variable measuring the level of assurance obtained: 0 = no assurance; 1 = limited assurance; 2 = reasonable assurance. This coding reflects the hierarchy of assurance engagement depth and resulting confidence levels.
- AssurStd: a dummy variable coded 1 if the assurance engagement references recognized assurance standards (ISAE 3000/3410, AA1000AS, or ISSA 5000), and 0 otherwise. This variable captures the methodological rigor of the assurance process.
- ProvBig4: a dummy variable coded 1 if the assurance provider is one of the Big 4 accounting firms (Deloitte, PwC, EY, or KPMG), and 0 for other providers. This variable test whether provider reputation and resources are associated with disclosure quality.

3.5. Control variables

Several control variables are included to account for alternative explanations and potential confounding factors:

- ln_Assets: natural logarithm of total assets, serving as a proxy for company size. Larger companies typically face greater stakeholder scrutiny and have more resources for sustainability initiatives.
- Leverage: total debt over total assets, controlling for financial structure and potential risk exposure that might influence reporting decisions.
- ROA: return on assets, measuring profitability, which may affect both resources available for sustainability reporting and strategic priorities.
- Report present: dummy variable coded 1 if the company publishes a sustainability report, 0 otherwise. This variable separates the effect of merely reporting from the incremental effect of assurance characteristics.
- Sector fixed effects: dummy variables based on 2-digit NACE codes to control for sector-specific factors that might influence both assurance adoption and disclosure practices.

3.6. Empirical models

The baseline empirical model is specified as follows: $DQI4_i = \alpha + \theta Report_present_i + \beta_1 AQ2_i + \beta_2 AssurStd_i + \beta_3 ProvBig4_i + \gamma_1 ln_A_i + \gamma_2 Leverage_i + \gamma_3 ROA_i + \mu NACE2 + \varepsilon_i$

Where:

- θ captures the marginal effect of publishing a sustainability report, independent of assurance decisions;

- β1, β2, β3 measure the incremental associations of assurance characteristics with disclosure quality;
- μNACE2 represents sector fixed effects that control for unobserved sector-level heterogeneity;
- εi is the error term.

This specification allows us to distinguish between the decision to report (which may reflect basic compliance or initial engagement with sustainability transparency) and the additional effect of assurance characteristics (which may reflect deeper commitment to credibility and stakeholder accountability). To further explore whether firm size conditions these relationships, additional models including interaction terms between assurance variables and ln_Assets are estimated as part of the robustness analysis.

3.7. Estimation strategy and statistical approach

The empirical analysis proceeds in a structured sequence. First, we present descriptive statistics for all variables, including means, standard deviations, and ranges, to characterize the sample and provide context for the multivariate analysis. This descriptive analysis highlights the distribution of disclosure quality, assurance adoption rates, and company characteristics in our sample.

Second, we conduct correlation analysis to examine bivariate relationships between variables and identify potential multicollinearity issues. The correlation matrix provides initial evidence regarding the relationships between assurance characteristics and disclosure quality before controlling for other factors.

Third, we estimate multiple regression models using Ordinary Least Squares (OLS) with robust standard errors (Eicker–Huber–White). The use of robust standard errors addresses potential heteroskedasticity concerns. We estimate three nested models: Model 1 includes only the report dummy and control variables; Model 2 adds the assurance level variable; Model 3 includes all assurance characteristics. This sequential approach allows us to observe how the addition of assurance variables affects model fit and coefficient stability.

Fourth, we perform diagnostic tests to validate model assumptions and ensure result reliability. These include Variance Inflation Factor (VIF) tests to check for multicollinearity, Breusch–Pagan tests for heteroskedasticity, and examination of residual distributions for normality. These diagnostics are reported alongside the main regression results.

3.8. Robustness checks and additional analyses

To assess the robustness of our findings and address potential methodological concerns, we conduct several supplementary analyses that are reported in the Results section:

- Subsample analysis of reporting companies: we re-estimate our models using only the subsample of companies that publish sustainability reports (n = 45). This analysis tests whether the relationships between assurance characteristics and disclosure quality hold within the population of reporting companies, excluding the contrast with non-reporters.
- Inverse Probability Weighting (IPW): to address potential selection bias in the reporting decision, we implement a two-stage approach. First, we estimate a logistic regression model predicting the probability of reporting based on company characteristics (size, sector, profitability). Second, we use the inverse of these predicted probabilities as weights in the main regression analysis. This approach provides evidence on whether selection into reporting affects our estimated relationships.
- Alternative DQI specifications: we test the sensitivity of our results to alternative operationalizations of disclosure quality. Specifically, we estimate models using a modified DQI

that excludes the climate targets component (resulting in a 0–3 scale), examining whether our findings are robust to this measurement variation.

- Winsorization of outliers: we re-estimate models after winsorizing continuous variables at the 1st and 99th percentiles to assess whether extreme values disproportionately influence our results.
- Sector-specific analyses: we explore whether the relationships between assurance and disclosure quality vary across different agri-food subsectors by estimating models with interaction terms between assurance variables and sector dummies.

4. Preliminary results and discussion

Based on completed data collection and preliminary analysis, initial evidence points to the following key results (final statistical validation is in progress).

Primary effect of reporting. The coefficient for Report present (θ) is expected to be positive and highly significant, indicating that the decision to publish a sustainability report is itself associated with a substantial increase in the disclosure quality score.

Incremental effect of assurance level. The coefficient for AQ2 (β1) is expected to be positive and statistically significant, suggesting that moving from no assurance to limited assurance, and from limited to reasonable assurance, is associated with incremental improvements in disclosure quality, holding reporting constant.

Role of standards and providers. The coefficients for AssurStd and ProvBig4 (β2, β3) are expected to display positive but potentially weaker or only marginally significant associations, indicating that, while relevant, the specific standard or provider brand may be secondary to the fundamental decision to obtain a higher level of assurance in this context.

Importance and role of firm size. The control variable for firm size (log assets) is expected to be positively and significantly related to DQI-4, consistent with resource-based and stakeholder pressure arguments. In line with H4, preliminary analyses also explore whether the association between assurance characteristics and disclosure quality is stronger for larger firms, which face higher agency costs and more intense stakeholder scrutiny.

Hypothesized Relationship	**Expected Sign**	**Theoretical Rationale**
H1: Assurance Level → Disclosure Quality	Positive (+)	Legitimacy signaling, deeper verification processes
H2: Use of Standards → Disclosure Quality	Positive (+)	Methodological rigor, professional norms
H3: Big4 Provider → Disclosure Quality	Positive (+)	Reputational capital, technical expertise
H4: Firm Size x Assurance Characteristics → Disclosure Quality	Positive (+)	Higher agency costs and stakeholder scrutiny in larger firms

Table 2. Expected direction of key relationships

4.1. Potential Scientific Value and Contributions

This work-in-progress study is positioned to offer several contributions to academia and practice:

- Theoretical contribution. By testing established theories (Legitimacy, Stakeholder, Agency) in the under-researched context of Italian agri-food, the study may reveal boundary conditions or contextual moderators of these frameworks, particularly concerning the role of family ownership and cooperative governance.
- Empirical contribution. The study provides early, sector-specific evidence on the CSRD's "on-the-ground" implementation, focusing on assurance quality rather than mere adoption. The construction and application of the DQI-4 index offer a replicable tool for assessing the comprehensiveness of ESG disclosure.
- Practical and policy implications. The findings are expected to inform Italian agri-food companies about the potential disclosure benefits associated with different assurance choices. For regulators and standard setters (e.g., CONSOB, EFRAG), the study can shed light on the real-world interplay between reporting mandates and assurance markets. For assurance providers, it highlights the factors that may drive quality differentiation in a specific sector.

4.2. Limitations of research design

Several limitations of the research design should be acknowledged. First, the cross-sectional nature of the analysis limits causal inference; we can identify associations but cannot definitively establish causality between assurance characteristics and disclosure quality. Second, the sample size of 73 companies, while adequate for the planned analyses, limits statistical power for detecting small effects and constrains more complex model specifications (e.g., extensive interaction terms). Third, the DQI-4 measure, while transparent and replicable, represents a relatively narrow operationalization of disclosure quality and may not capture all relevant dimensions of ESG reporting. Fourth, data availability constraints meant that we could only include companies with complete data for 2024, potentially introducing selection bias if data completeness is correlated with disclosure practices.

5. Conclusions and future developments

This research is actively in progress. The data collection and coding phase is complete, and preliminary statistical analyses have been conducted. The immediate next steps involve finalizing the regression diagnostics, completing all planned robustness checks, and deepening the interpretation of results within the Italian institutional context.

The study offers initial empirical evidence on the association between sustainability assurance characteristics and disclosure quality in the Italian agri-food sector during the early CSRD adoption phase. Preliminary findings highlight the fundamental importance of the decision to report, which appears to show the strongest association with disclosure quality. Beyond this basic decision, assurance level emerges as a significant factor, with higher assurance levels corresponding to better disclosure quality. Firm size consistently matters, reflecting both greater stakeholder pressure and higher resource availability, and may also condition the strength of the relationship between assurance characteristics and disclosure outcomes.

The Italian agri-food sector presents a distinctive context where traditional business structures and sector-specific sustainability challenges intersect with evolving regulatory requirements. As sustainability reporting becomes increasingly institutionalized, understanding how different types of organizations respond to assurance incentives will be crucial for developing effective policies and practices.

The findings of this work-in-progress contribute to the growing literature on sustainability assurance by providing sector-specific evidence from an important but understudied context. They also offer practical insights for companies navigating new reporting requirements, for

assurance providers developing service offerings tailored to complex value chains, and for policymakers designing regulatory frameworks that balance simplification with the need for credible, decision-useful ESG information. As CSRD implementation progresses, continued research will be needed to track evolving practices and outcomes in sustainability assurance and disclosure, including longitudinal analyses and designs that more explicitly exploit regulatory shocks such as the Omnibus I package.

Keywords: Sustainability assurance; CSRD; ESRS; ISSA 5000; agri-food sector; disclosure quality; omnibus I

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L'Internal Dealing come meccanismo di segnalazione della governance sostenibile: analisi delle reazioni del mercato

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1. Introduzione

Nel contesto regolamentare italiano, il termine Internal Dealing identifica le operazioni di compravendita sui titoli di una società quotata poste in essere da amministratori, sindaci, dirigenti con responsabilità strategiche e persone a essi collegate. In virtù della posizione di particolare rilievo rivestita tali soggetti, le operazioni di acquisto o vendita sui titoli della società assumono, infatti, un ruolo rilevante per il mercato anche in termini informativi. Per tale ragione, la normativa italiana, in coerenza con l'indirizzo europeo, ha posto in capo a questi soggetti l'obbligo di comunicare al mercato tempestivamente qualsiasi operazione di acquisto/vendita compiuta sui titoli della loro società (art. 114, 7° comma T.U.F. e artt. 152 sexies e seguenti del Regolamento Emittenti Consob 11971/99). L'obbligo di renderle pubbliche sussiste al fine di offrire agli investitori un valore segnaletico circa la percezione che le persone rilevanti hanno sulle prospettive della società e si presume siano operazioni effettuate nel rispetto della normativa vigente e sulla base del set informativo disponibile al mercato. Questo aspetto, a livello nazionale, permette di distinguere tale fattispecie dall'insider trading, invece qualificato come condotta illecita da parte di chi effettua operazioni di acquisto/vendita sui titoli di una società quotata avendo a disposizioni informazioni riservate. Nonostante l'obbligo di disclosure, persiste comunque un certo grado di asimmetria informativa, che suggerisce un possibile contenuto informativo delle operazioni di compravendita condotte dagli insider.

Il potenziale ruolo segnaletico dell'Internal Dealing si inserisce nel dibattito internazionale volto ad esplorare la capacità predittiva delle operazioni di compravendita poste in essere da insider sui rendimenti anomali sia nel breve sia nel medio periodo (Baker et al., 2025). Nel mercato italiano, caratterizzato da strutture proprietarie concentrate, presenza di gruppi familiari e sistemi di governance eterogenei, il contenuto informativo delle operazioni degli insider può risultare particolarmente rilevante. Infatti, in coerenza con la teoria dei mercati efficienti sviluppata da Fama (1970), una forte efficienza dei mercati riflette anche l'informazione privata, rendendo impossibile l'estrazione di extra-profitti attraverso l'uso di informazioni riservate. Pertanto, le evidenze empiriche sui rendimenti anomali associati alle operazioni degli insider costituiscono pertanto test diretti della validità empirica dell'efficienza forte. Se a seguito delle operazioni condotte dagli insider si registrano ritorni superiori alla media, l'ipotesi di mercato efficiente in forma forte risulta smentita.

A tal proposito, lo studio di Bajo e Petracci (2006) mostra come variazioni significative nelle partecipazioni degli insider siano associate a rendimenti anomali positivi nei mesi successivi, con effetti maggiori nel caso degli acquisti rispetto alle vendite. Gli autori evidenziano, inoltre, ritardi nella comunicazione delle operazioni alla Consob, segnalando una discrepanza tra quadro regolamentare e comportamento empirico. In aggiunta, Barucci et al. (2006) analizzando l'attività

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degli insider nel mercato italiano e le strategie di trading immediatamente successive a variazioni di prezzo, evidenziano che gli insider tendono ad acquistare dopo ribassi e a vendere dopo rialzi, suggerendo un utilizzo opportunistico dell'informazione, coerente con strategie di feedback trading, e un ruolo determinante del timing delle comunicazioni. Le analisi del mercato italiano mostrano quindi che, nella pratica, gli insider appaiono in grado di estrarre valore dalle informazioni private prima che tali informazioni siano incorporate nei prezzi, suggerendo l'esistenza di potenziali rischi informativi.

Con l'obiettivo di contribuire e aggiornare il dibattito in materia, il presente studio, attraverso la lente teorica della signaling theory, esplora se e in che modo la disclosure relativa alle operazioni di Internal Dealing sia percepita dal mercato come un segnale delle performance prospettiche della società. Nello specifico, l'assunzione alla base è che le operazioni di Internal Dealing caratterizzate dall'acquisto delle azioni possano dare al mercato un segnale positivo con riferimento alle performance future, mentre operazioni di vendita possano essere percepite come un segnale di sfiducia.

Le caratteristiche istituzionali del contesto italiano rafforzano l'applicazione della signaling theory poiché, in presenza di concentrazione proprietaria e di forte sovrapposizione tra proprietà e controllo, il potenziale segnale emesso dagli insider risulta spesso più credibile. Tale analisi intende, inoltre, leggere il fenomeno in termini di sostenibilità della governance all'interno del paradigma ESG (Mason, 2020). La reazione del mercato può essere, infatti, intesa anche come proxy della credibilità della governance e della buona condotta dei soggetti rilevanti che ricoprono ruoli chiave (Mollet et al., 2013).

2. Letteratura di riferimento

La letteratura specificamente dedicata all'Internal Dealing, come definito da Borsa Italiana, risulta estremamente limitata, in quanto tale denominazione assume un significato tecnico soltanto nel contesto italiano. In Italia, infatti, la disciplina dell'Internal Dealing si è sviluppata con caratteristiche peculiari rispetto alle normative internazionali, dando luogo a una produzione scientifica ristretta, relativamente datata e circoscritta prevalentemente al campo finanziario. Tra i contributi più rilevanti in questo ambito si collocano gli studi di Barucci et al. (2006), Tardivo et al. (2006) e Bajo e Petracci (2006), che forniscono le principali evidenze disponibili circa l'informatività delle operazioni degli insider nel contesto italiano. Barucci et al. (2006) mostrano che gli insider italiani assumono comportamenti sia riconducibili alla tradizionale ipotesi dell'asimmetria informativa, sia a strategie trading discrezionale. Dalla loro analisi emerge che questi tendono a comprare azioni sottovalutate, con basso rapporto market-to-book, ma tendono ad acquistare dopo un rendimento positivo nell'anno precedente, agendo come positive feedback traders. In questo modo sfruttano i movimenti di mercato a breve termine, comprando dopo un calo dei prezzi e vendendo dopo un aumento dei prezzi, seguiti da un parziale price reversal. Il mercato risponde almeno in parte alle loro operazioni, generando ritorni anomali nel breve periodo. Allo stesso modo, lo studio di Tardivo et al. (2006) conferma che le compravendite degli insider italiani risultano profittevoli e che gli operatori sono in grado di ottenere extra-rendimenti, tanto immediatamente quanto nei mesi successivi alla transazione. Attraverso l'impiego dell'event study dal punto di vista metodologico, gli autori riscontrano che il mercato attribuisce un contenuto informativo alle comunicazioni degli insider, in particolare agli acquisti, interpretati come segnali relativamente credibili di sottovalutazione del titolo. A loro volta, Bajo e Petracci (2006) analizzano le variazioni significative della partecipazione detenuta dagli insider, evidenziando che incrementi della quota azionaria sono generalmente seguiti da rendimenti anomali positivi particolarmente concentrati tra il primo e il terzo mese successivo all'operazione, mentre riduzioni della partecipazione tendono ad anticipare rendimenti negativi. Il segnale è più forte quando l'insider detiene già una posizione di controllo superiore al 50 per cento, suggerendo che la discrezionalità e la qualità informativa delle operazioni siano maggiori per insider con

elevato potere di controllo ed elevata influenza nella definizione delle strategie. Nel complesso, le evidenze che emergono dal contesto italiano sono piuttosto consistenti nell'affermare la presenza di abnormal return e di reazioni del mercato collegate a operazioni di compravendita condotte da persone di rilievo nella gestione della società. In particolare, gli acquisti costituiscono il segnale informativo dominante in presenza di asimmetrie informative significative.

A livello internazionale, il dibattito viene portato avanti nell'ambito nei filoni di ricerca più ampi sull'insider trading e sulle operazioni finanziarie, genericamente definite, portate avanti dagli insider. Una recente revisione bibliometrica della letteratura sull'insider trading ha individuato sei principali cluster tematici: : i) efficienza del mercato, contenuto informativo e comportamento degli insider; ii) Corporate Governance, caratteristiche degli insider e pratiche di insider trading; iii) regolamentazione e compliance; iv) fusioni e acquisizioni e altri eventi significativi; v) rendicontazione finanziaria, annunci degli utili e informativa volontaria; vi) comparazioni tra mercati e Paesi (Baker et al., 2025). Cruciale e con una crescita costante è il tema relativo al legame tra insider trading, corporate governance e asimmetria informativa. Nella prospettiva teorica classica, l'ipotesi dell'asimmetria informativa resta dominante; pertanto, la posizione prevalente è quella in base alla quale gli insider negoziano sulla base di informazioni private e il mercato reagisce in modo adattivo, incorporando progressivamente tali informazioni nei prezzi (Doffou, 2007). Tuttavia, modelli più recenti hanno ampliato il quadro interpretativo, considerando motivazioni alternative alle operazioni degli insider, come esigenze di liquidità, cicli di vita patrimoniale, forme alternative di compenso e meccanismi di segnalazione strategica non direttamente collegati all'informazione privilegiata (Baker et al., 2025).

A partire dagli anni Settanta e Ottanta, studi pionieristici come quelli di Seyhun (1986) hanno dimostrato che gli insider sono in grado di conseguire rendimenti anomali sfruttando un vantaggio informativo e che gli acquisti degli insider costituiscono segnali più affidabili delle vendite, poiché meno influenzati da esigenze di diversificazione o liquidità. Dalle loro analisi emerge che i rendimenti anomali sono concentrati nel periodo immediatamente successivo alle operazioni, ma appaiono anche persistenti nel medio termine, soprattutto quando si considerano transazioni di dimensione significativa o condotte da insider di alto livello gerarchico. Tale evidenza è stata confermata, anni dopo, da Gurgul and Majdosz (2007), i quali, studiando il mercato polacco, hanno osservato rendimenti anomali nei giorni precedenti e successivi alla disclosure, mentre le vendite non mostrano particolare contenuto informativo. Inoltre, hanno riscontrato che strategie di imitazione delle operazioni degli insider non replicano sistematicamente gli extraprofitti, suggerendo che parte dell'informazione alla base delle operazioni non risulti trasferibile agli outsider. Questo risultato contrasta con le osservazioni di Lei et al. (2014) sul mercato statunitense, dove gli insider agiscono come value investor nell'indirizzare le decisioni di investimento degli outsider, ottenendo rendimenti anomali significativi in positivo.

Sono state, inoltre, osservate variazioni di prezzo e di volume di scambio economicamente significative, le quali riflettono, rispettivamente, i cambiamenti nelle aspettative di consenso del mercato e i cambiamenti nelle aspettative dei singoli investitori (Ryna, 2005).Tuttavia, le compravendite che generano una risposta significativa nel prezzo non sono necessariamente le stesse che generano grandi movimenti nel volume di scambio, suggerendo che l'impatto sul prezzo e sul volume possono essere indipendenti.

Nei mercati europei anglosassoni, in particolare nel Regno Unito, ricerche successive hanno approfondito il ruolo del contesto informativo dell'impresa. Ryan (2005), ad esempio, mostra che l'impatto delle operazioni dei manager ai livelli più alti è anche funzione della dimensione: in imprese caratterizzate da dimensioni ridotte, bassa copertura analitica e reporting finanziario meno dettagliato, le operazioni dei soggetti di rilievo generano reazioni di prezzo più intense, coerenti con una forte asimmetria informativa. Viceversa, quando il mercato è già ben informato, la reazione tende ad attenuarsi, suggerendo che il contenuto informativo marginale dell'operazione sia inferiore.

Come evidenziato da Baker et al. (2025), negli anni più recenti sono aumentati gli studi di tipo comparativo. Nello specifico, Dardas e Güttler (2011) analizzano otto mercati europei, documentando che effetti significativi a seguito dell'annuncio di operazioni di compravendita portate avanti da soggetti in rilevanti nella metà di essi. In linea con le evidenze già emerse in studi precedenti, gli acquisti costituiscono, anche in questo contesto, il segnale più informativo. Gli autori confermano inoltre la validità dell'insider hierarchy hypothesis, secondo cui la posizione dell'insider - esecutivo o non esecutivo, membro del board o del top management – incida sulla capacità informativa per il mercato.

Sul fronte regolamentare, il recente studio di Cline et al. (2021) fa il punto sullo stato di avanzamento della regolamentazione in materia, sottolineando che la severità delle norme sull'insider trading dipende anche dai valori culturali nazionali, in particolare dal grado di individualismo. Secondo questa prospettiva, è soprattutto l'adozione corretta della regolamentazione a contribuire positivamente allo sviluppo finanziario, suggerendo che la capacità informativa delle operazioni di compravendita condotte dagli insider si inserisce in un quadro più ampio di determinanti istituzionali.

In termini normativi, gli Stati Uniti hanno storicamente sviluppato un quadro particolarmente stringente, basato sulla Rule 10b-5 del Securities Exchange Act del 1934 e sulla Rule 14e-3, che proibisce il trading su tender offer information anche in assenza di violazione di un dovere fiduciario. discute estesamente Il modello statunitense si distingue per la combinazione tra disclosure tempestiva, responsabilità estesa ai "tippee" e severe sanzioni penali e civili Doffou (2003). A livello europeo, la Market Abuse Directive (MAD, 2003) e successivamente il Market Abuse Regulation (MAR, 2016) hanno perseguito un obiettivo di armonizzazione, imponendo requisiti di comunicazione uniformi e ampliando i poteri delle autorità di vigilanza nazionali. Tuttavia, l'impatto delle riforme regolamentari non è stato omogeneo. Pattitoni et al. (2013), concentrandosi sull'Italia, mostrano che gli insider continuano a conseguire rendimenti anomali anche dopo la Direttiva Europea sull'abuso di mercato e che i blackout period autoimposti risultano frequentemente violati, specialmente in prossimità di eventi societari rilevanti.

La letteratura teorica ha inoltre identificato diversi modelli interpretativi utili per comprendere perché e in che misura gli insider riescano a generare rendimenti anomali. Il paradigma dell'asimmetria informativa, sviluppato in parallelo agli studi empirici statunitensi, interpreta gli insider come possessori di un vantaggio informativo strutturale, che utilizzano per operare scelte di timing superiori rispetto agli operatori ordinari. L'approccio agency-based suggerisce invece che l'insider trading possa ridurre o aumentare i conflitti tra manager e azionisti (Padilla, 2002). Per alcuni autori, consentire agli insider di negoziare può favorire l'allineamento degli incentivi e promuovere una maggiore efficienza allocativa, mentre per altri può amplificare i rischi di espropriazione e compromettere la fiducia degli investitori (Enriques et al., 2025). Infine, l'insider hierarchy hypothesis propone che la posizione dell'insider all'interno dell'organizzazione determini il grado di accesso alle informazioni critiche, la credibilità percepita del segnale e la reazione conseguente del mercato. Questa ipotesi è stata confermata sia da studi italiani sia da quelli europei e statunitensi, evidenziando come le operazioni condotte dai top executives abbiano effetti più marcati rispetto a quelli dei membri non esecutivi o degli insider periferici.

Nonostante gli importanti contributi accumulati negli ultimi decenni, emergono tuttavia diversi gap significativi nella letteratura. In primo luogo, gli studi italiani sull'Internal Dealing sono limitati temporalmente e non coprono in maniera sistematica gli effetti delle normative più recenti, in particolare del Regolamento Europeo sull'abuso di mercato. In secondo luogo, nonostante la crescente attenzione ai profili gerarchici degli insider, restano ancora poco esplorate le implicazioni delle dinamiche interne di governance e gli aspetti contestuali che possono contribuire alla capacità informativa. Infine, mancano analisi che permettano di osservare il fenomeno anche in termini di sostenibilità della governance.

3. Metodologia

Il campione oggetto di analisi include le operazioni di Internal Dealing pubblicate sul sito di Borsa Italiana negli ultimi dodici mesi e identificate come l'evento intorno al quale esplorare le reazioni del mercato. La fonte impiegata, che rappresenta il canale istituzionale attraverso cui gli emittenti adempiono agli obblighi di disclosure sulle operazioni di compravendita delle azioni della società che coinvolgono persone rilevanti, consente di disporre di dati omogenei in termini di struttura informativa e tempistica di comunicazione. Dal dataset originario sono state escluse le operazioni riferibili a banche e istituzioni finanziarie, poiché soggette anche a una disciplina specifica che compromette la comparabilità con le altre società quotate.

Per ciascuna operazione sono stati estratte le seguenti informazioni: i) la data in cui è avvenuta l'operazione, la cui pubblicazione deve avvenire entro i 3 giorni successivi; ii) il nominativo dell'insider o persona a lui vicina; iii) il ruolo ricoperto dall'insider; iv) il volume scambiato; v) il valore dell'operazione. Nella costruzione del campione, sono state eliminate le operazioni che presentavano missing data. Invece, in presenza di compravendite ravvicinate, della medesima tipologia (acquisto o vendita), compiute dallo stesso soggetto e comunicate unitariamente (o richiamate nell'annuncio di un'operazione successiva), tali movimenti sono stati ricondotti a un'unica operazione di compravendita assegnata alla prima data utile. Il ricorso a questa aggregazione, coerente con quanto applicato nella letteratura empirica, evita la duplicazione artificiale di segnali informativi e gli associati effetti confondenti nella valutazione dei ritorni anomali. La distinzione tra operazioni singole e multiple, nel modello di valutazione, è stata formalizzata tramite la creazione di una variabile dummy, pari a 0 per le operazioni singole e a 1 per quelle multiple, così da consentirne l'impiego come variabile di controllo nell'analisi. Laddove, invece, nello stesso giorno siano state effettuate operazioni della stessa tipologia ma poste in essere da soggetti distinti, con ruoli e volumi diversi, le operazioni sono state considerate come evento unico nell'event study, al fine di evitare duplicazioni nella misurazione dei rendimenti intorno alla data dell'operazione, e come eventi separati nell'analisi di regressione.

La prima parte dell'analisi, in linea con la letteratura di riferimento (Bajo & Petracci, 2006), si è concretizzata nella conduzione di un event study, per il quale il rendimento atteso per ciascuna società è stato misurato utilizzato il modello tradizionale. Per ogni operazione sono stati acquisiti, tramite la banca dati Orbis, i prezzi giornalieri dei 200 giorni precedenti e successivi alla data dell'operazione, nonché i rendimenti del mercato di riferimento, così da costruire le serie necessarie alla stima dei rendimenti anomali.

$$R_{it}^{*} = \alpha + \beta\, Rm_t + \varepsilon_{it}$$

dove R_{it} indica il rendimento del titolo osservato al tempo t, Rm_t è il rendimento di un indice azionario ponderato al momento, e α, β e ε sono parametri stimati su un periodo di "comportamento normale", il periodo di stima che comprende i rendimenti registrati nei 200 giorni antecedenti la data dell'evento e i 15 giorni successivi.

Gli abnormal return per l'applicazione dell'event study sono stati determinati, per ogni titolo i , come la differenza tra i rendimenti osservati intorno al giorno dell'evento, t = 0 , e il rendimento atteso definito come sopra.

$$AR_{it} = R_{it} - R_{it}^{*}$$

L'abnormal return misura la differenza tra i rendimenti condizionati all'evento e i rendimenti incondizionati attesi all'evento. La somma dei ritorni anomali permette di determinare i Cumulative Abnormal Return (CAR), i quali indicano l'impatto cumulativo di un evento (come un annuncio societario) sui rendimenti anomali (superiori o inferiori alle attese) di un titolo finanziario, aggregando i rendimenti anomali giornalieri su un periodo (finestra d'evento) per

quantificare l'effetto totale dell'evento sul prezzo del titolo nel tempo, aiutando a capire se il mercato ha reagito in modo significativo.

$$\text{CAR} = \sum_{t=ta}^{tb} ARt$$

dove ta e tb rappresentano l'intervallo di osservazione. L'event study è stato condotto attraverso il t-test, volto a testare le seguenti ipotesi:

H0 : non ci sono ritorni anomali all'interno del periodo di osservazione, quindi i CAR = 0.
H1: ci sono ritorni anomali all'interno del periodo di osservazione, quindi i CAR ≠ 0.

Nell'ambito del presente studio, le finestre di osservazione adottate per l'event study sono:
- t=0: il giorno dell'evento
- [-3, 0], [-2, 0], [-1, 0], [0, 1], [0,2], [0,3]: per tenere conto del possibile ritardo nella comunicazione dell'operazione al mercato.
- [-5,0], [0, 5]: per testare le ipotesi su un periodo molto breve, in linea con la letteratura di riferimento.
- [-5, +5], [-10, +10], [-15, +15]: per testare le ipotesi su un periodo medio-lungo.

Non si è ritenuto opportuno allargare la finestra di osservazione oltre i 15 giorni, in quanto nel database sono state osservate diverse operazioni di Internal Dealing a distanza di 15 giorni.

La seconda parte dell'analisi è stata a identificare quali variabili di controllo spiegano meglio la reazione del mercato attraverso un'analisi di regressione cross-sectional, descritta dal seguente modello, nel quale i CAR rappresentano la variabile dipendente. Sono state utilizzate variabili riferite all'operazione (DealVolume, DealValue), alla dimensione dell'azienda (lntotasset), alla performance economico-finanziaria dell'azienda (EBITDA margin, EPS, CF per share, BV per share), al mercato di riferimento (la volatilità degli ultimi 360 giorni).

$$CAR_i = 0 + \beta_1 \text{DealVolume} + \beta_2 \text{DealValue} + \beta_3 \text{lntotasset} + \beta_4 \text{EBITDAmargin} + \beta_5 \text{EPS} + \beta_6 \text{CFpershare} + \beta_7 \text{BVpershare} + \beta_8 360\text{volatility} + \beta_i$$

La scelta delle dimensioni da includere nel modello è coerente con la letteratura di riferimento (Dardas & Guettler, 2011; Tardivo & Bresciani, 2011) e di includere sia elementi specifici dell'operazione, sia elementi strutturali dell'azienda.

Entrambe le analisi sono state condotte differenziando le operazioni di acquisto da quelle di vendita. Questo approccio consente di verificare se, come suggerito dalla letteratura (Bajo & Petracci, 2006), le operazioni di acquisto generino segnali più forti e persistenti rispetto alle vendite, e se l'effetto delle variabili finanziarie e di mercato incida in maniera statisticamente significativa tra le due categorie.

4. Risultati preliminari

Lo studio include 2.728 osservazioni, riferite a 120 operazioni di Internal Dealing messe in atto nell'ultimo anno da parte di soggetti di rilievo afferenti a società quotate. La ripartizione tra operazioni di acquisto e operazioni di vendita presenta le caratteristiche descritte nelle Tabelle 1 e 2.

Operazioni di acquisto	**N**	**Mean**	**Std. Dev.**
AR	1.581	-.0008	.0224
CAR	1.581	-.0092	.0725
DealVolume	1.581	312.395,69	1.884.957,21
DealValue	1.581	359.660,28	1.140.618,64

Tabella 1. Statistiche descrittive operazioni di Internal Dealing basate sull'acquisto di azioni

Operazioni di vendita	**N**	**Mean**	**Std. Dev.**
AR	1.147	.0004	.0191
CAR	1.147	-.0148	.0535
DealVolume	1.147	15.069,37	22.393,03
DealValue	1.147	283.596,1	550.540,83

Tabella 2. Statistiche descrittive operazioni di Internal Dealing basate sulla vendita di azioni

L'analisi condotta mette in luce una serie di evidenze tra le diverse finestre temporali e le due tipologie di operazione. L'analisi basata sul t-test per valutare la significatività dei CAR nelle diverse finestre attorno alla data dell'operazione evidenzia che le operazioni di acquisto e quelle di vendita presentano comportamenti sistematicamente differenti e in contrasto con le evidenze disponibili in letteratura. Infatti, in quasi tutte le finestre temporali analizzate, i risultati indicano che gli acquisti generano CAR mediamente negativi, ma non statisticamente significativi. L'analisi delle operazioni di cessione delle azioni da parte degli insider presenta una fotografia opposta. In quasi tutte le finestre temporali emerge una reazione positiva e statisticamente significativa del mercato. Tale risultato va contro la prospettiva avanzata da alcuni studiosi di insider trading opportunistico, che normalmente produrrebbe CAR negativi per le vendite e CAR positivi per gli acquisti. L'effetto potrebbe, invece, trovare spiegazione nella percezione di irrilevanza informativa delle operazioni di vendita da parte del mercato.

Le tabelle 3 e 4 sintetizzano i principali risultati dell'event study per ciascuna finestra temporale, con riferimento a ciascuna tipologia di operazione.

Event window	**Mean**	**T**	**p-value**
(-15, +15)	-.0092	-5.039	<.001
(-10, +10)	-.0069	-3.343	<.001
(-5;+5)	.0037	-1.516	.065
(-5;+0)	-.0076	-2.407	.008
(-3; 0)	-.0052	-1.513	.066
(-2; 0)	-.0033	-.880	.190
(-1; 0)	-.0022	-.528	.299
0	-.0006	-.122	.451
(0; 1)	-0.0002	-.061	.476
(0; 2)	.0017	.454	.325
(0;3)	.0014	.393	.347
(0;5)	.0007	.205	.419

Tabella 3. Risultati T-Test per Internal Dealing basato sull'acquisto di Azioni (n=1581)

Event window	**Mean**	**T**	**p-value**
(-15, +15)	.0148	9.349	<.001
(-10, +10)	.0165	9.710	<.001
(-5;+5)	.0166	8.610	<.001
(-5;+0)	.0161	7.652	<.001
(-3; 0)	-.0137	6.411	<.001
(-2; 0)	.0132	5.847	<.001
(-1; 0)	0.0092	4.218	<.001
0	0.0100	3.478	<.001
(0; 1)	.0148	5.093	<.001
(0; 2)	.0149	5.101	<.001
(0;3)	.0139	4.796	<.001
(0;5)	.0161	5.542	<.001

Tabella 4. Risultati T-Test per Internal Dealing basato sulla vendita di azioni (n=1147)

Risultati contrastanti tra l'acquisto e la vendita delle azioni emergono anche dall'analisi di regressione. Con riferimento agli acquisti, nessuna variabile di controllo risulta statisticamente significativa nella spiegazione dei CAR, sia in generale, sia con riferimento a specifiche finestre temporali (0; -3,0; 0,+3; -5,0; 0,5; -5,+5; -10;+10; -15,+15).

Al contrario, nell'ambito delle vendite, l'analisi di regressione mostra un elevato potere esplicativo e statisticamente significativo (p<.001) di tutte le variabili di controllo relative alla performance finanziaria dell'azienda e alla volatilità del mercato di riferimento.

Le figure 1 e 2 sintetizzano i risultati dell'analisi di regressione.

Coefficients[a,b]

Model		t	Sig.
	(Constant)	.153	.878
	DealVolume (overall)	1.035	.301
	DealValue (overall)	-.003	.998
	EBITDA Margin_2024	1.217	.224
	EPS	-1.836	.066
	CF_per_share	.578	.563
	BV_per_share	1.396	.163
	Price_volatility_360days	-1.864	.063
	LogNetAsset	-.160	.873

a. DealType = Acquisto

b. Dependent Variable: CAR

Figura 1. Risultati regressione per Internal Dealing basato sull'acquisto di azioni

Coefficients[a,b]

Model		t	Sig.
1	(Constant)	3.754	<.001
	DealVolume (overall)	2.717	.007
	DealValue (overall)	-.161	.872
	EBITDA Margin_2024	4.667	<.001
	EPS	-7.759	<.001
	CF_per_share	6.572	<.001
	BV_per_share	2.024	.043
	Price_volatility_360days	10.782	<.001
	LogNetAsset	-7.527	<.001

a. DealType = Cessione

b. Dependent Variable: CAR

Figura 2. Risultati regressione per Internal Dealing basato sulla vendita di azioni

5. Conclusioni

In conclusione, i risultati mostrano un'evidente asimmetria tra acquisti e vendite. In particolare, gli acquisti non generano reazioni significative, in contrasto con la letteratura, mentre le vendite producono CAR positivi e statisticamente rilevanti in quasi tutte le finestre temporali. I risultati suggeriscono, quindi, che il mercato interpreta le vendite come segnali deboli o non informativi, sollevando interrogativi sulla capacità segnaletica dell'Internal Dealing e sul suo ruolo nella governance sostenibile.

Dal punto di vista teorico, questo dibattito assume rilevanza nell'ambito della signaling theory, la quale offre un quadro concettuale per analizzare situazioni in cui individui informati (signalers) trasmettono informazioni private a soggetti meno informati (receivers) attraverso azioni osservabili e costose (Connelly et al., 2025). Con riferimento alle operazioni di Internal Dealing, l'azione osservabile coincide con l'acquisto o la vendita di strumenti finanziari dell'emittente, mentre il costo del segnale deriva dall'impiego di risorse finanziarie e

dall'aumento del rischio idiosincratico dell'investitore interno. Gli acquisti da parte di azionisti di controllo o dirigenti con responsabilità strategiche sono difficili da imitare in assenza di informazione positiva, e pertanto il mercato li interpreta come segnali robusti sulla qualità attesa dell'impresa. Le vendite, al contrario, presentano motivazioni più eterogenee, riducendone la capacità segnaletica. La signaling theory consente inoltre di chiarire i meccanismi attraverso cui la regolamentazione può amplificare o attenuare il contenuto informativo delle operazioni. Se gli obblighi di disclosure sono tempestivi e uniformi, l'azione osservabile del signaler giunge rapidamente al mercato. Tuttavia, ritardi nella comunicazione possono permettere agli insider di estrarre maggiori benefici dall'asimmetria informativa, riducendo la capacità del mercato di distinguere segnali informativi da segnali opportunistici. Come dimostrato da Barucci et al. (2006), gli insider delle società italiane sfruttano strategicamente la tempistica della disclosure, effettuando acquisti immediatamente comunicati, mentre ritardano le vendite laddove possibile. Tali dinamiche riducono la trasparenza effettiva e creano condizioni prossime a un equilibrio di pooling, nel quale segnali informativi e non informativi diventano più difficili da distinguere.

Tuttavia, nell'epoca contemporanea, le reazioni del mercato richiedono di adottare anche la lente della sostenibilità, con un focus sulla governance, quale proxy della credibilità dell'azienda e della buona condotta dei soggetti rilevanti che ricoprono ruoli chiave.

Parole chiave: Internal Dealing; event study; signalling theory

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Rating ESG di cantiere: benefici, criticità e costi dei cantieri sostenibili

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1. Introduzione

Considerati i notevoli impatti di natura ambientale, sociale ed economica (ESG), associati alla costruzione e alla manutenzione delle infrastrutture, un approccio sostenibile alla loro progettazione appare essenziale per facilitare il raggiungimento degli Obiettivi di Sviluppo Sostenibile fissati dalle Nazioni Unite (Navarro et al., 2019). Secondo alcuni autori, la sostenibilità è diventata la questione più importante per il settore edile nel XXI secolo (Dobson et al., 2013). Con l'aumento del livello di consapevolezza dell'opinione pubblica e delle misure normative, gli stakeholders del settore richiedono strumenti che possano essere di supporto nella valutazione delle opzioni di investimento, al fine di identificare alternative sostenibili e implicazioni finanziarie della loro inclusione nel ciclo di vita dell'investimento (Goh & Yang, 2014). In forza delle suddette esigenze, il D.Lgs. 36/2023 introduce esplicitamente l'obbligo per le stazioni appaltanti di includere nel processo valutativo anche criteri legati alla prassi ESG. Inoltre, nel febbraio 2025, l'Ente Italiano di Normazione (UNI), in collaborazione con l'Associazione Infrastrutture Sostenibili (AIS), ha emanato una Prassi di Riferimento volta ad individuare strategie, indicatori, e buone pratiche al fine di valutare la sostenibilità dei cantieri delle infrastrutture. L'attenzione rivolta alla sostenibilità degli appaltatori è incentrata su un sistema di rating strutturato, basato su 32 indicatori che coprono aspetti ambientali, economici e sociali. Studi precedenti hanno messo in evidenza il bisogno di identificare e di misurare gli aspetti di costo legati alle dimensioni ESG lungo tutto il processo di costruzione delle infrastrutture, compresa la fase ancestrale di progettazione (Goh & Yang, 2014; Navabakhsh & Tamiz, 2013). Kim & Chang (2022), sul tema, hanno segnalato che la necessità di dover disporre di una metodologia chiara per la definizione di un rating ESG per le opere edili. Allo stesso tempo però, altri autori si sono adoperati per la possibile individuazione di un set di criteri e di strategie volti alla determinazione del rating ESG del settore edile, specificatamente del sottosettore dedicato all'edilizia abitativa (Battisti, 2023). L'Introduzione dell'UNI/PdR 172:2025, consente di usufruire di una metodologia condivisa per la determinazione del rating di sostenibilità di cantiere sia in fase di progettazione che in fase di realizzazione.

La Prassi di Riferimento declina la sostenibilità del cantiere sotto i tre pilastri portanti dell'ESG: dal punto di vista economico, puntando l'attenzione su un uso sapiente delle risorse, al fine di incentivare, il più possibile, il riutilizzo delle materie prime e le logiche di economia circolare; dal punto di vista ambientale, mirando alla minimizzazione degli impatti di cantiere, attraverso il contenimento delle emissioni di CO2 e degli agenti inquinanti, prevedendo, inoltre, un corretto trattamento e/o smaltimento dei residui di lavorazione; dal punto di vista sociale,

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mettendo al centro, sin da subito, la comunità che interagirà con il cantiere e, soprattutto, con l'opera finale che il cantiere è chiamato a realizzare.

La sostenibilità di cantiere viene, quindi, valutata in due fasi ben distinte quella di progettazione e quella di realizzazione.

In questo lavoro verrà approfondita la determinazione del rating di cantiere in fase progettuale, attraverso un caso di studio che analizza modalità e criticità di attribuzione del rating ESG di cantiere in fase di progettazione.

Il lavoro quindi, oltre ad evidenziare il parziale superamento del gap della letteratura, relativo all'assenza di un'unanime metodologia di valutazione delle performance ESG dei cantieri italiani, colmato con la recentissima introduzione dell'UNI/PdR 172:2025, mette in luce le best practices, le modalità che consentono la determinazione del rating ESG di cantiere in fase progettuale e le principali criticità ancora presenti per una consistente diffusione di questa prassi.

Quanto rilevato in questa fase, ci consente di formulare le seguenti domande di ricerca.

RQ1: Quali sono i benefici attesi dalla progettazione sostenibile del cantiere?

RQ2: Quali sono le criticità riscontrate nell'applicazione di tale metodologia di rating?

RQ3: Quali sono le principali componenti di costo che un appaltatore dovrà sostenere in fase di realizzazione per rendere il cantiere sostenibile e meritevole di un rating ESG elevato?

RQ4: Quanto è diffuso il rating ESG di cantiere. Il calcolo del rating avviene esclusivamente sulla base di quanto previsto dall'UNI/PdR 172:2025?

Il presente lavoro è ad oggi "in progress". È stata già condotta l'analisi della letteratura, la redazione del questionario alla base delle interviste e condotta un'intervista con la referente del rating di cantiere della società scelta come caso studio. Nel successivo full paper sarà possibile integrare il lavoro con ulteriori evidenze sottoforma di approfondimenti ed interviste per presentarlo nella sua forma definitiva.

L'obiettivo del presente lavoro è comprendere l'effettiva diffusione del rating di sostenibilità di cantiere in fase progettuale e di valutarne le criticità e i benefici collegati alla sua determinazione. Inoltre, la ricerca, si propone di indagare la componente onerosa, e quindi relativa ai costi, legata all'effettiva realizzazione di un cantiere sostenibile.

2. Letteratura

La sostenibilità (ESG), intesa come propensione alle best practice ambientali (E), sociali (S) e economiche (G), rappresenta ormai un elemento fondamentale di molti settori economici per i suoi importanti impatti su persone ed organizzazioni. Studi recenti evidenziano che i fattori ESG incidono positivamente sul valore aziendale, e ancora che i tre pilastri di sostenibilità possono essere implementati quali strategie volte alla prevenzione dei fattori di rischio e possono fungere da vantaggio competitivo, nonché da strategie di successo sostenibile (Chang & Lee, 2022; Deng & Cheng, 2019; Xie et al., 2019). La letteratura esistente identifica, quale fondamento teorico, alla base della sostenibilità, la teoria degli stakeholder (De Matteis et al., 2025; Li et al.,2021; Peng & Isa, 2020). La teoria degli stakeholder, quale pilastro dell'odierna dottrina, prevede che l'azienda, oltre al perseguimento degli obiettivi degli azionisti, deve soffermarsi sulla creazione di valore per tutti gli stakeholders che influenzano o che sono influenzati dall'azienda, quali portatori di interessi (Freeman, 1984, 2010). La letteratura, quindi, amplifica l'importanza degli ESG, sorretti dal framework teorico della Stakeholder theory. Secondo Moats & DeNicola (2021) e Rose (2020), gli ESG influenzano il comportamento delle aziende e la loro capacità di creare valore a lungo termine per gli stakeholder. Secondo Wang (2024), la teoria degli stakeholder suggerisce che, a cospetto di solide performance ESG, le aziende possono ottenere il consenso degli stakeholder interni ed esterni, per i quali viene, inoltre, prevista la soddisfazione delle proprie esigenze. Inoltre, secondo Signori et al. (2021), la maggiore attenzione alle tematiche ESG nelle aziende, sottolineata dalla diffusione, in molti settori, dei rating di sostenibilità, è associata ad un maggior valore aggiunto creato per la collettività, nella prospettiva della Stakeholder theory.

Tale maggior valore è ascrivibile alla performance ESG, la quale conduce alla crescita aziendale di lungo periodo derivante da minori costi espliciti, maggiore efficienza operativa e benefici reputazionali e competitivi (Daugaard & Ding, 2022). In letteratura innumerevoli sono gli studi che si sono occupati di analizzare la relazione esistente tra i fattori ESG e i diversi driver di valore aziendale, spesso in specifici settori di attività. Si pensi alla relazione studiata tra i fattori ESG e la sempre più ascendente intelligenza artificiale (Bifulco et al., 2025; Sætra, 2023; Macpherson et al., 2021;) e ancora la presenza dei fattori ESG in settori di attività, quali il settore finanziario (Chaudhry et al., 2025; Mandas et al., 2023; Bătae, 2020), il settore dell'energia rinnovabile (Parashar et al., 2025; Kandpal et al., 2024; Lu & Li, 2024), il settore dell'industria chimica (Ren et al., 2024; Tutko,2023), il settore delle Pubbliche Amministrazioni (Besenyei, 2024), il settore edile (Liu et al., 2021; Li et al., 2018; Xue et al., 2018; Hojjati et al., 2017). Proprio con riferimento al settore edile, Dubey et al. (2023) rilevano che la sostenibilità nell'ambito delle costruzioni assume sempre più importanza, in quanto la progettazione e la contestuale realizzazione di edifici ed infrastrutture generano ingenti impatti sull'ambiente e sulle società. Secondo Xue et al. (2018), lo sviluppo di infrastrutture attira in misura sempre maggiore l'attenzione degli stakeholders, quali il legislatore, studiosi di differenti materie e cittadini. La letteratura, in tal senso, attribuisce un ruolo cruciale al coordinamento e all'efficace collaborazione dei principali stakeholders per lo sviluppo di infrastrutture sostenibili (Liu et al., 2021; Li et al., 2018; Berawi, 2016). Dunque, come sostenuto da Hosny et al. (2022), la sostenibilità rappresenta uno degli aspetti più significativi nello sviluppo delle infrastrutture. Le costruzioni nell'ambito dei trasporti sono importanti per la circolazione sia delle merci che dei passeggeri. Ulteriori infrastrutture, come quelle energetiche e le telecomunicazioni, sono legate agli sforzi di modernizzazione, volti ad aumentare la capacità del settore produttivo. Inoltre, le componenti accessorie di alloggi e strutture abitative, come la fornitura di acqua potabile e servizi igienico-sanitari, sono orientate all'accrescimento del livello di benessere della comunità (Vitri & Herman, 2019). Secondo Liu et al. (2021), la sostenibilità dell'infrastruttura conferisce la possibilità di assicurare le proprietà di sicurezza, validità e durabilità della stessa nel lungo periodo. Rispetto alla costruzione di edifici, le iniziative atte alla progettazione e realizzazione di infrastrutture richiedono una pianificazione più complessa, investimenti finanziari più elevati, un maggiore impegno tecnico e differenti tipologie di risorse (Hosny et al., 2022). La letteratura concorda sulla centralità della tematica sostenibile nella fase ancestrale di progettazione di opere infrastrutturali, soprattutto in considerazione del suo impatto lungo tutto il processo di costruzione e sull'utilizzo dell'output finale (Xue et al., 2018). Precedenti studi hanno messo in luce l'esigenza di sistemi di rating ESG integrati, nel settore delle costruzioni e delle infrastrutture (Dubey et al., 2023; Hosny et al., 2022). Come sostenuto da Berardi (2012), il settore delle costruzioni rimane estraneo rispetto alla misurazione delle performance e, nonostante diversi studi abbiano proposto metodologie diverse all'attribuzione di un rating di sostenibilità, il loro utilizzo risulta scarsamente diffuso nella prassi. I sistemi di rating di sostenibilità sono stati interessati da un'importante evoluzione, da indicatori singoli a indicatori complessi e multidimensionali (Sanad et al., 2025). Secondo gli autori, parte della letteratura si è concentrata su indicatori di sviluppo sostenibile, focalizzando la ricerca sul soddisfacimento dei bisogni odierni senza compromettere la possibilità di soddisfare quelli futuri (Hosny et al., 2022; Xue et al., 2018). AbouHamad & Abu-Hamd (2019) analizzano la performance ESG attraverso l'approccio basato sugli aspetti economici alla sostenibilità, utilizzando il Life Cycle Cost Assessment (LCCA), attraverso la valutazione dei costi relativi a sistemi di costruzione alternativi. Liu et al. (2021) mettono in comparazione la metodologia basata sulla teoria Triple Bottom Line (TBL) con il framework POP (Product, Organization, Process), ponendo l'attenzione sulla mancanza di una valutazione multidisciplinare integrata. Ulteriori indicatori, quali l'Envision Rating System (ERS) e l'Infrastructure Sustainability Council of Australia (ISCA) framework includono criteri più ampi di misurazione della sostenibilità, ma riportano lacune in termini di capacità di ottimizzazione (Sanad et al., 2025; ISI (Institute for Sustainable Infrastructure), 2018).

Alla luce di tali considerazioni, si rileva un'elevata frammentazione della letteratura sulla misurazione della performance di sostenibilità nella progettazione e realizzazione di infrastrutture, nonché l'esigenza di uno strumento di rating multidisciplinare. A tal proposito, l'Ente Italiano di Normazione (UNI), in collaborazione con l'Associazione Italiana per la Sostenibilità delle Infrastrutture (AIS) ha pubblicato la prassi di riferimento UNI/PdR 172:2025 orientata a definire le strategie e gli indicatori qualitativi e quantitativi utili alla valutazione della sostenibilità del cantiere di un'opera infrastrutturale, sia nella fase progettuale che in quella realizzativa. Tale processo valutativo si articola nell'esame delle strategie atte a perseguire quattro obiettivi: (i) contenimento delle emissioni di CO2, (ii) tutela e salvaguardia degli elementi naturali e storici, (iii) riuso e riciclo e (iv) riduzione degli impatti sulla comunità, sull'ambiente sociale e sull'ambiente esterno. Attraverso l'attribuzione di un punteggio alle strategie prescelte per ottemperare agli obiettivi prefissati, ponderato in relazione ad una scala di priorità. La Prassi di Riferimento conduce al computo di un rating di sostenibilità che tenga conto delle dimensioni E, S e G, sia in fase progettuale che realizzativa, nonché gli approcci digitali afferenti ad entrambe. Tale sistema di valutazione delle performance di sostenibilità risponde alle esigenze di uno strumento comprensivo delle dimensioni ESG, come emerso dalla corrente letteratura.

3. Metodologia

Il presente lavoro adotta un approccio metodologico di tipo ibrido suddiviso in tre fasi comprensive dello studio della letteratura, dell'analisi di casi studio e di un questionario. La prima fase di studio della letteratura fornisce il fondamento teorico alla presente ricerca. La metodologia del caso studio, sviluppato nella seconda fase, è generalmente utilizzata per comprendere le possibili relazioni che emergono all'interno di processi complessi (Shah e Corley, 2006). Tale approccio è stato ampiamente utilizzato nell'analisi di progetti di costruzione e infrastrutturali e viene solitamente impiegato per esaminare eventi reali contemporanei e per investigare un fenomeno nel suo contesto specifico quando le relazioni tra il fenomeno stesso e il contesto non risultano chiaramente definite (Taylor et al., 2011; Scapens, 2004). Inoltre, il caso di studio rappresenta il metodo di ricerca privilegiato per rispondere alle domande "come" e "perché" (Yin, 2018). Al fine di garantire la generalizzazione dei risultati della ricerca sono analizzati due distinti casi con ad oggetto attori di rilievo internazionale nel campo della progettazione e monitoraggio delle iniziative infrastrutturali, di cui nel lavoro corrente è presentato il risultato delle prime evidenze emerse. L'utilizzo di interviste semi-strutturate consente di approfondire gli aspetti specifici che emergono nel corso del dialogo con i soggetti intervistati il cui scopo è raccogliere valutazioni e osservazioni non emerse nella fase di progettazione e che potranno incidere in modo determinante sullo sviluppo successivo del progetto (Adams, 2015).

L'ultima fase della metodologia si sviluppa attraverso un questionario con domande chiuse a risposta multipla sottoposto alle società facenti parte dell'OICE [4], associazione delle organizzazioni di ingegneria, di architettura e di consulenza tecnico economica, direttamente coinvolte nella gestione di progetti infrastrutturali di rilievo. L'implementazione di tale metodologia strutturata è ampiamente diffusa nella ricerca sulla gestione delle infrastrutture e costruzioni, nonché tra i ricercatori autorevoli del settore (Babatunde e Perera, 2017). Inoltre, al fine di carpire ulteriori elementi di carattere qualitativo, le società sottoposte al questionario sono incoraggiate a fornire ulteriori punti di vista ed elementi sotto forma di risposte aperte. I risultati del questionario sono analizzati utilizzando la Principal Component Analysis (PCA), quale metodo statistico multivariato che combina le informazioni provenienti da diverse variabili osservate sugli stessi soggetti in un numero inferiore di variabili. Tale metodologia costituisce un

[4] L'OICE è l'associazione di categoria, aderente a Confindustria, che rappresenta le società italiane operanti nei settori dell'ingegneria, dell'architettura e della consulenza tecnico-economica.

metodo efficace e versatile per estrarre le informazioni essenziali da complessi set di dati multivariati (Greenacre et al., 2022). Nel presente studio, l'analisi PCA è utilizzata per valutare le criticità e i benefici attesi riconducibili all'implementazione di un sistema di misurazione delle performance di sostenibilità, nonché per valutare le principali componenti di costo afferenti all'utilizzo di rating ESG.

4. Prime evidenze empiriche

Il primo caso di studio ha ad oggetto le attività di progettazione sostenibile e rating di sostenibilità svolte da una società di ingegneria da considerarsi tra le eccellenze italiane in ambito di opere infrastrutturali. Nello specifico, l'attività peculiare verte sulle attività di programmazione, progettazione, realizzazione, verifica e avviamento operativo delle opere, con un forte ruolo nei sistemi ferroviari e nelle opere civili nazionali e internazionali, nonché nella mobilità integrata. Al momento si ritiene di tenere riservata l'identità della società attenzionata, che comunque rappresenta un pioniere della misurazione della performance sostenibile dei cantieri infrastrutturali.

L'analisi condotta è incentrata, oltre che sull'analisi di documentazione fornita dall'azienda sulla base di accordi di riservatezza, dalla realizzazione di un caso studio relativo all'attribuzione del rating di cantiere in fase di progettazione in base alla metodologia proposta dalla Pdr Uni 72:2025.

È stata condotta un'intervista basata su domande aperte a due dirigenti della divisione preposta all'attribuzione del punteggio di sostenibilità ambientale, sociale ed economica dei cantieri infrastrutturali in fase progettuale. La qualifica ricoperta dai soggetti intervistati consente di disporre di un set informativo realmente rappresentativo delle pratiche di settore, volte alla misurazione della sostenibilità di cantiere. Tuttavia, le informazioni di cui si dispone non sono sufficienti, allo stato attuale, per la completa trattazione degli obiettivi del lavoro. Per questo motivo, saranno condotte ulteriori interviste e saranno esaminati ulteriori documenti già richiesti alla società, al fine di predisporre le adeguate analisi finali per rispondere alle domande di ricerca del lavoro. Inoltre, si prevede un ulteriore caso di studio al fine di rilevare rigorose evidenze metodologiche ed empiriche da una base informativa maggiormente articolata.

Le informazioni di cui si dispone, consentono di porre l'attenzione su tre macro-temi fondamentali legati alla sostenibilità di cantiere in fase di progettazione, ossia: le metodologie di calcolo del rating di sostenibilità ESG dei cantieri in fase di progettazione e i relativi benefici e aspetti critici; la componente dei costi legata alla determinazione del rating di sostenibilità ESG dei cantieri in fase di progettazione; la propensione degli appaltatori all'adozione del rating di sostenibilità ESG in fase di realizzazione

Con riferimento alla domanda di ricerca RQ1: "Quali sono i benefici attesi dalla progettazione sostenibile del cantiere?", in primo luogo, dall'intervista condotta è stato possibile rilevare come la fase di progettazione e la fase di realizzazione dei cantieri di opere infrastrutturali siano nettamente distinte tra loro. In particolare, nel caso di determinazione del rating di sostenibilità ESG dei cantieri, la fase di progettazione non è in grado di cogliere alcun aspetto della successiva fase di realizzazione ma questa fase è fondamentale per assicurare la successiva sostenibilità del Cantiere.

In particolare, i benefici di una progettazione redatta in ottica di sostenibilità sono da ricercarsi in un forte stimolo alla sostenibilità per tutti gli operatori coinvolti nel processo di realizzazione dell'infrastruttura ed in particolare, nell'orientamento dell'appaltatore, quando diverso dal progettista, alla realizzazione di concrete pratiche di sostenibilità già previste fin dall'impostazione iniziale del progetto.

Inoltre, l'attività di analisi sin ora condotta permette di desumere che la sostenibilità di cantiere in fase progettuale conduca le società, che ne fanno adozione, a godere di numerosi benefici. Infatti, le società del settore infrastrutturale attente alle pratiche e alle metodologie

sostenibili possono ricavare innumerevoli benefici reputazionali, nonché, essere in grado di generare benefici ambientali e benefici sociali, con particolare riferimento a quelli relativi al personale e alla sicurezza. Le prime evidenze empiriche segnalano l'importanza dell'attribuzione di un rating ESG per rafforzare l'impegno alla sostenibilità dei cantieri da parte di società di progettazione e degli appaltatori.

Con riferimento alla domanda di ricerca RQ2 "Quali sono le criticità riscontrate nell'applicazione di tale metodologia di rating?", dalle interviste preliminari condotte si evince che è "relativo" parlare di criticità legate alla valutazione del cantiere sostenibile in fase di progettazione. Tale prima evidenza, secondo quanto affermato dagli intervistati, deriverebbe dalla facoltà prevista, per le società del settore, di adottare quanto previsto dalla UNI/PdR 172:2025 e, di conseguenza, dai 32 indicatori da essa previsti per valutare lo stato degli obiettivi sostenibili. Gli intervistati affermano che le eventuali difficoltà che potrebbero emergere dall'applicazione della misurazione delle performance di sostenibilità mediante la PdR in oggetto, riguarderebbero unicamente il reperimento delle informazioni necessarie per calcolare gli indicatori scelti. Quanto affermato deriva principalmente dalla stessa Prassi di Riferimento, in quanto per ciascun obiettivo è sufficiente adottare almeno uno dei 32 indicatori disponibili, ne consegue che la complessità varia in funzione della tipologia di indicatore selezionato e non degli obiettivi in sé. Inoltre, è stato possibile evincere che le criticità si concentrano, perlopiù, sugli indicatori quantitativi, i quali si fondano su dati precisi e modalità di calcolo definite, mentre le metriche di matrice qualitativa sono caratterizzate da una maggiore flessibilità imputabile alla discrezionalità nel processo di valutazione.

Alla luce di ciò, si evince che le criticità riscontrate in fase progettuale del cantiere sostenibile sono riconducibili all'accessibilità e alla disponibilità dei dati necessari alla stima del rating ESG, in quanto le difficoltà riguarderanno poi l'effettiva capacità di applicare in concreto nel cantiere quanto teoricamente previsto in fase di progettazione. Nondimeno, si ritiene che la progettazione sostenibile debba essere sufficientemente sfidante per stimolare gli appaltatori a comportamenti sostenibili, ma non tale da essere irraggiungibile o troppo onerosa per essere intrapresa.

Con riferimento alla domanda di ricerca Rq3: "Quali sono le principali componenti di costo che un appaltatore dovrà sostenere in fase di realizzazione per rendere il cantiere sostenibile e meritevole di un rating ESG elevato?", le prime evidenze empiriche indicano che la componente onerosa risulta più attenuata in fase progettuale rispetto alla fase realizzativa. Il rating ESG in fase progettuale può essere facilmente introdotto dalle società di progettazione, in quanto l'applicazione della UNI/PdR 172:2025 non genera aggravi di costi. Si ritiene che le informazioni a disposizione di una società di progettazione siano "sufficienti" a redigere una progettazione sostenibile senza sostenere costi aggiuntivi.

Sul punto si specifica che in sede di interviste preliminari, gli intervistati hanno affermato che la componente di costo legata alla valutazione della sostenibilità di cantiere è notevolmente inferiore rispetto alla fase di realizzazione. Gli intervistati, inoltre, hanno affermato che per loro, allo stato, non è possibile esprimersi circa la quantificazione della componente onerosa legata alla fase di realizzazione. Inoltre, sempre a parere degli intervistati, il costo della sostenibilità, in fase di realizzazione, è legato alle fasi tecniche di cantierizzazione, soprattutto nelle fasi di approvvigionamento e di smaltimento dei materiali.

Con riferimento alla domanda di ricerca Rq4: "Quanto è diffuso il rating ESG di cantiere. Il calcolo del rating avviene esclusivamente sulla base di quanto previsto dall'UNI/PdR 172:2025?" non ci sono ancora elementi sufficienti per rispondere a tale domanda. Una survey tra gli operatori di settore ed in particolare rivolta alle principali società di ingegneria e progettazione associate all'OICE che conta in Italia più di 350 società fra società di ingegneria, architettura, studi professionali, società di consulenza e imprese strutturate potrebbe permettere di comprendere quanto è diffusa questa prassi ed assicurarne ulteriore diffusione.

5. Conclusioni

Alla luce di quanto esposto, si ritiene che il presente lavoro, al momento ancora sotto forma di extended abstract, opportunamente integrato con il secondo caso di studio e con i risultati attesi dal questionario sottoposto a società attive nel settore della progettazione socie dell'OICE, possa offrire importanti evidenze metodologiche e teoriche agli attori interessati.

Ulteriori considerazioni sulla sostenibilità del cantiere in fase di realizzazione consentiranno di beneficiare di una visione integrata dell'oggetto e di adottare approcci univoci alle performance ESG. Inoltre, il lavoro sarà in grado di favorire la diffusione di questa prassi presso le società di ingegneria e le imprese di costruzioni facendo cogliere i benefici ottenibili dalla progettazione e realizzazione di cantieri sostenibili, nonché di individuare i costi necessari per la performance ESG affinché gli stessi possano essere recepiti nei bandi di gara e dare luogo a punteggi premiali. Si ritiene infatti che solo il riconoscimento dei costi della sostenibilità, come già in passato avvenuto per i costi della sicurezza, possa assicurare una buona diffusione delle prassi di sostenibilità sui cantieri.

Appare doveroso sottolineare i limiti del presente studio. Primo tra tutti, il ricorso ad interviste semi-strutturate, nonostante queste lascino spazio alla soggettività dell'operatore intervistato, carpendo ulteriori nozioni non espressamente menzionate nelle domande poste, le stesse implicano il rischio di una ristretta rilevanza empirica. I rischi legati alla scarsa generalizzabilità dei risultati sono parzialmente mitigati dalla metodologia utilizzata, dunque da differenti casi studio e da un questionario sottoposto alle società dell'associazione di categoria OICE. Invero, la selezione non volontaria del campione di ricerca ne assicura la rappresentatività e la dimensione consistente dello stesso risulta sufficiente a supportare analisi statistiche robuste.

Dallo studio della letteratura corrente emergono potenziali linee di ricerca future, orientate ad approfondire la sostenibilità di cantiere nella fase realizzativa, aspetto che, nel presente lavoro, è stato considerato solo parzialmente e sulla base delle informazioni fornite volontariamente dai soggetti coinvolti. L'attenzione rivolta a tale fase consentirà agli studiosi e agli operatori del settore di ottenere una completa comprensione delle determinanti della performance di sostenibilità lungo tutta la vita del cantiere infrastrutturale, incoraggiando il perseguimento di approcci integrati alle tematiche ESG.

Parole chiave: Cantieri infrastrutturali; sostenibilità; rating ESG; stakeholder theory; costi e benefici

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How Organizational Intelligence Within Corporate Governance Shapes Overbidding in Acquisitions

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1. Introduction

Strategic expansion through mergers and acquisitions (M&A) represents one of the most consequential decisions firms undertake, yet it is also among the most exposed to managerial biases and valuation uncertainty. Empirical research highlights that acquisition outcomes are highly sensitive to information asymmetries, incentive structures, and the mechanisms that shape managerial judgment during deal evaluation. For example, compensation-related incentives have been shown to influence executives' propensity to engage in value-reducing transactions (Grinstein and Hribar 2004), while ownership concentration can amplify or mitigate these distortions depending on the governance environment (Bhaumik and Selarka, 2012). Evidence also indicates that competitive processes do not automatically discipline bidding behavior and may instead intensify escalation dynamics (Boone and Mulherin, 2008). Against this backdrop, our study seeks to explore whether, and to what extent, the organizational intelligence embodied in the board of directors can help mitigate managerial overpayment in acquisitions, thereby contributing to firms' sustainable competitiveness.

Indeed, the board integrates human, intellectual, and relational capital that shapes decision quality and supports financial sustainability. Prior research documents that board characteristics influence reporting quality and the integrity of firm-level information (Aifuwa and Embele 2019; Alves 2023) as well as firms' financing conditions (Anderson et al., 2004). Yet, despite the growing recognition of the board's monitoring function, relatively little is known about how board-level capabilities affect bidding discipline in M&A transactions. This represents a notable gap, especially in light of recent contributions showing that more accurate information environments improve deal pricing (Hashim et al. 2024). From this perspective, this paper aims to assess whether stronger board monitoring reduces the likelihood of excessive bidding, as more independent, competent, and structurally robust boards are better able to perform monitoring and advisory functions over executives.

The study advances current research by bridging insights from corporate governance and M&A literature and by linking them to a growing body of work that examines how internal decision structures shape strategic outcomes. Preliminary findings indicate that board independence is positively associated with overbidding, suggesting that formal governance attributes may not necessarily translate into effective monitoring and that a more fine-grained approach to board characteristics and country-level institutional specificities may help shed further light on this phenomenon. Our work thus contributes to the existing literature by questioning the assumption that formal board independence automatically leads to more effective monitoring of strategic decisions such as acquisition pricing.

2. Literature review and hypotheses development

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2.1. Overbidding and agency problem

Overbidding in mergers and acquisitions refers to the situation in which acquiring firms offer a purchase price that substantially exceeds the economically justified valuation of the target, potentially harming shareholder wealth. The literature identifies several determinants of this behavior, ranging from managerial misjudgments to inadequate governance systems and biased decision-making processes (Hashim et al., 2024).

A central theoretical strand links overbidding to auction dynamics, particularly the Winner's Curse. In competitive bidding environments, where firms hold similar information sets, the bidder offering the highest price is likely to overpay relative to the target's true economic value, ultimately turning the "winner" into a "loser" as post-acquisition returns fail to materialize (Bartov et al., 2020). This risk intensifies under conditions of uncertainty, increasing the likelihood that firms will submit inflated bids (Boone and Mulherin, 2008).

Another factor that may influence incentives to overbid concerns accounting rules. In the early 2000s, regulatory changes in the accounting treatment of goodwill altered managerial incentives. The shift from systematic amortization to annual impairment testing led some managers to perceive that higher acquisition prices, and thus higher goodwill, would not immediately erode earnings. Although initially seen as an opportunity to justify higher bids, subsequent evidence demonstrated that excessive goodwill does not necessarily translate into sustainable value and may exert negative pressures on stock performance over time (Boone and Mulherin, 2008).

Beyond market dynamics and accounting incentives, behavioral finance provides an additional explanatory framework centered on managerial overconfidence. This cognitive bias leads decision-makers to overestimate their competencies and the likelihood of achieving successful outcomes (Lin et al., 2020). Overconfident managers are prone to overstate expected synergies, underestimate risks, and endorse overly optimistic valuations of the target firm. Roll's (1986) Hubris Hypothesis formalizes this intuition, suggesting that managerial arrogance can drive acquisitions that are not justified by fundamentals. Empirical evidence shows that deals influenced by managerial overconfidence tend to exhibit poorer medium- and long-term performance, with substantial value destruction for acquiring-firm shareholders, thus hindering firms' financial sustainability. The negative effects of overconfidence are particularly pronounced in weak governance environments, where monitoring mechanisms lack the strength to curtail impulsive or biased managerial decisions (Twardawski and Kind, 2023).

In this respect, it has been observed that the effectiveness of corporate governance plays a crucial role in constraining such behavior, regardless of whether overbidding stems from market dynamics, accounting incentives, or managerial biases. Accordingly, a prominent body of work attributes overbidding to agency conflicts arising from the misalignment between managers and shareholders. Managers may pursue acquisitions not to maximize shareholder value, but to obtain private benefits such as enhanced prestige, visibility, bargaining power, or the opportunity to expand the firm under their supervision (Hashim et al., 2024). Compensation schemes may further reinforce these incentives, as executives can receive bonuses contingent on deal completion or post-acquisition performance, regardless of long-term value creation (Grinstein and Hribar, 2004). These dynamics become particularly problematic when governance mechanisms fail to effectively monitor or constrain managerial behavior, enabling opportunistic bidding strategies. In some cases, managers may escalate bids to prevent competitors from acquiring the target, even when such strategies are not supported by economic fundamentals, behaviors consistent with the entrenchment hypothesis, prompting executives to primarily preserve or strengthen their position within the firm (De Bodt et al., 2018).

2.2. Corporate governance mechanisms and executive discretion

From an agency theory perspective, prior studies consistently emphasize how the board of directors serves as a central mechanism for shaping managerial conduct so that it converges with shareholder objectives (Alfraih, 2016; Alzeban, 2020; Jensen, 1993). Within this framework, an effective board plays a key role in scrutinizing and constraining executives through its oversight responsibilities (Alzoubi, 2014). In this context, it has also been noted that the presence of blockholders modifies the principal-agent relationship by influencing monitoring incentives and managerial discretion (Bhaumik and Selarka, 2012).

In addition, the resource-based view outlines how diversity in a firm's human capital can drive competitive advantage, leading to increased profitability, productivity and innovation (Nerdrum and Erikson, 2001), thus emphasizing how the integration of directors' diverse capabilities and skills can contribute to effective decision-making (van Knippenberg et al., 2020; Dezsö and Ross, 2012), as they enhance a firm's knowledge base and knowledge-sharing practices. The combined effects of these attributes can play a central role in nurturing human capital (Smriti and Das, 2022). In line with this view, internal corporate governance characteristics may substantially influence managerial overbidding.

The role of board size

Although a larger board is often expected to broaden the expertise available to the firm, the empirical literature offers mixed evidence on its actual impact (Wellalage et al., 2012). Board size may affect managerial effectiveness in opposing ways: while an increase in the number of directors may dilute efficiency due to greater organizational complexity, it may simultaneously enhance decision-making by incorporating a wider set of competencies. A stream of studies contends that expanding the board can hamper its functioning, as coordination becomes more demanding, decision processes lengthen, and the board's advisory capacity weakens (Tampakoudis et al., 2018), also undermining the monitoring role of outside directors (Jensen, 1993; Tochia and Calabrò, 2016). Nevertheless, an opposing body of research highlights the potential benefits of larger boards, outlining that a greater number of directors can introduce a wider set of viewpoints and strengthen supervisory capacity thanks to more diverse backgrounds and expertise (Zheng and Tsai, 2019). Our first hypothesis follows:

H1: The board size negatively affects the acquirer's propensity to overbid in acquisition deals

The role of independent directors

Among the attributes that characterize board members, the independence of directors is widely regarded as one of the most influential. From an agency theory perspective, outside independent directors are expected to act as more effective monitors of managerial opportunism (Fama and Jensen, 1983), as their autonomy enhances their ability to carry out oversight responsibilities compared to insiders, who are generally less inclined to challenge executive decisions (Alves, 2023). While internal directors may have incentives to withhold unfavorable information for personal benefit (Aifuwa and Embele, 2019), independent directors are motivated to encourage more transparent financial reporting to strengthen the firm's overall information environment (Goh et al., 2016). Their desire to cultivate and maintain a reputation as competent decision controllers further increases their willingness to question the CEO and to exercise rigorous monitoring, helping them protect themselves from reputational consequences associated with poor-quality oversight (Carcello et al., 2002; Fama and Jensen, 1983). Thus, we hypothesize that:

H2: Board independence negatively affects the acquirer's propensity to overbid in acquisition deals

The role of female directors

A more gender-diverse board is associated with strengthened monitoring and advisory capacities (Groening, 2019), as well as with richer cultural integration, broader cognitive frames, and enhanced legitimacy of corporate actions (Hillman et al., 2007), ultimately supporting more informed and effective decision processes (Loukil et al., 2019). Prior research further indicates that female directors tend to adopt a more diligent oversight style, showing stricter monitoring, higher meeting attendance, and greater collegiality, which collectively help mitigate agency-related concerns (Birindelli et al., 2020). Their atypical career trajectories, together with higher educational attainment and advanced training (Hillman et al., 2007), managerial competencies, and stronger long-term and stakeholder-oriented perspectives (Sarkar and Selarka, 2021), have also been linked to enhanced strategic judgment (Loukil et al., 2019). We hence hypothesize the following:

H3: Board gender diversity negatively affects the acquirer's propensity to overbid in acquisition deals

The role of board committees

Prior research highlights that board committees constitute an important governance mechanism, as they enhance the board's ability to monitor managerial actions (Anderson et al., 2004; Hadani et al., 2011; Safari et al., 2021). Their monitoring capacity stems from the specific responsibilities delegated to them. These committees operate independently of the full board, holding separate meetings guided by their own agendas and formal charters (Reeb and Upadhyay, 2010). Since board committees tend to be composed of a majority of independent directors (Klein, 1998), they may further strengthen the board's monitoring capacity and influence managerial decision-making, thereby shaping the relationship between board independence and organizational outcomes. Accordingly, when board structure is examined through the lens of the presence of board committees, the traditional arguments regarding advantages of larger versus smaller boards may require reconsideration. Building on this perspective, the present study revisits the link between board architecture and managerial overbidding, explicitly accounting for the number of committees, some of which are mandated by regulatory bodies and national stock exchanges. Based on the above, we hypothesize that:

H4: The number of board committees negatively affects the acquirer's propensity to overbid in acquisition deals

The role of controlling shareholders

Due to their greater ability to oversee managers, the presence of controlling shareholders may help alleviate the traditional agency conflict (Bhaumik and Selarka, 2012; Chen et al., 2009; Zou et al., 2008). Nevertheless, they may simultaneously advance objectives that diverge from those of minority owners, thereby giving rise to principal-principal conflicts (Peng et al., 2011; Wang and Shailer, 2015). Furthermore, large shareholders typically hold a significant portion of their personal wealth in a single firm, which is found to prompt risk-averse behavior (Bodnaruk et al., 2008; Dyck and Zingales, 2004), and to hinder their propensity to engage in acquisition activities. In this perspective, M&A potential benefits and losses are evaluated carefully (Worek, 2017) to limit exposure to uncertainty, which in turn reduces their likelihood of pursuing M&A deals.

In addition, firms with highly concentrated voting rights may approach acquisitions differently due to financing constraints: blockholders' preference for debt financing (Ellul, 2008) and cash payments to avoid diluting voting power (Faccio and Masulis, 2005) may attenuate overbidding propensity. We therefore hypothesize that:

H5: Concentrated ownership negatively affects the acquirer's propensity to overbid in acquisition deals

3. Methodology

3.1. Sample selection

The hypotheses were tested on a final sample of 47 acquisition transactions. This study represents the first stage of an ongoing research project.

Given the exploratory nature of the study and the data-intensive research design, in this initial phase, we identified a starting sample of 100 acquisitions from the Zephyr database, selected prior to the analysis of outcome variables and intended solely as a basis for data construction. The sample selection was based on the following eligibility criteria. First, only transactions classified as "completed" by the database were included. Second, we focused on acquisitions accounted for in accordance with IFRS 3 and involving IFRS-adopter acquirors and target firms to ensure consistency of accounting standards. We then excluded transactions that did not result in a full change of control. Due to data availability requirements, transactions lacking information on deal value, net equity, and post-acquisition total assets were excluded. This sequential screening process resulted in a final sample of 47 acquisitions.

Firm-level data were retrieved from different sources. In particular, data on acquisitions were gathered from Zephyr, financial data from Orbis, while corporate governance data were manually collected from companies' annual financial reports or corporate governance reports.

3.2. Variables and measures

Dependent variable. Overbidding was measured as the ratio between goodwill and post-acquisition total assets of the target company.

Independent variables. Before delving into the description of our independent variables and their measurements, it is worth noting that all variables are lagged by one year prior to the acquisition, to ensure that data are not influenced by the transaction and avoid endogeneity issues. Board Size reflects the number of directors sitting on the board in the year prior to the transaction. Independent Directors was computed as the ratio between the number of independent directors and the total number of directors appointed to the board in the year prior to the transaction. Female Directors captures the proportion of female directors, calculated as the number of women on the board divided by the total board size in the year prior to the transaction.

Committees measures the number of board committees. Ownership stake measures the percentage of shares held by the largest shareholder.

3.3. Model specification

To test our hypotheses, we estimated a multiple linear regression model. To assess potential multicollinearity concerns, we computed Variance Inflation Factors (VIFs). All VIF values fall well below the conventional threshold of 5, with the highest equal to 2.35.

The following model was estimated:

$$Overbidding_{i,t} = \alpha + \beta_1 Boardsize_{i,t-1} + \beta_2 IndependentDirectors_{i,t-1} + \beta_3 FemaleDirectors_{i,t-1} + \beta_4 Committees_{i,t-1} + \beta_5 OwnershipStake_{i,t-1} + \beta_6 Size_{i,t-1} + \beta_7 Leverage_{i,t-1} + \beta_8 ROA_{i,t-1}$$

Additionally, as a robustness check, we re-estimated the main specification separately for smaller and larger firms, based on total assets. While the reduced sample size limits statistical power, the direction of the estimated effects is consistent with the baseline model.

4. Results

Table 1 provides descriptive statistics. The mean value of overbidding amounts to 0.1, which indicates that, on average, the goodwill recognized in the post-acquisition balance sheet represents 10% of the acquirer's total assets. This suggests that the transactions were priced at a relatively high premium, consistent with prior evidence linking substantial goodwill to more aggressive bidding strategies. Concerning the independent variables, it is worth noticing that the minimum value of independent and female directors, as well as board committees, is 0, which can be ascribed to the heterogeneity of the sample: since the acquisitions were carried out by firms operating in different countries, they are subject to diverse corporate governance regulations and listing requirements, some of which do not mandate the presence of independent directors, gender diversity, or board committees. Interestingly, most acquirers feature the presence of a blockholder, reflecting a relatively concentrated ownership structure.

	Mean	Median	Minimum	Maximum	SD	Skewness	Kurtosis
Overbidding	0.10	-0.25	-1.53	4.83	1.32	2.13	4.53
Board Size	10.00	10.00	1.00	15.00	3.54	-0.28	-0.45
Independent Directors	0.31	0.33	0.00	0.90	0.21	0.82	1.61
Female Directors	0.18	0.17	0.00	0.57	0.14	0.70	0.26
Board Committees	3.37	3.00	0.00	7.00	1.50	0.29	0.42
Ownership Stake	51.98	49.55	4.60	100.00	31.17	0.26	-1.02
Size	13.10	13.27	8.31	17.05	1.87	-0.45	0.03
Leverage	9.88	4.16	0.03	81.86	8.75	0.93	3.29
ROA	5.46	3.87	-17.95	37.07	16.42	2.90	8.42

Table 1. Descriptive statistics

Table 2 displays the correlation between our variables, showing a significant positive relationship between overbidding and ROA (0.355 at the 5% level).

	1	2	3	4	5	6	7	8	9
Overbidding	1								
Board Size	-0.177	1							
Independent Directors	0.163	0.121							
Female Directors	-0.003	0.258*	-0.049	1					
Board Committees	0.139	0.145	0.060	0.183	1				
Ownership Stake	-0.051	-0.315*	-0.081	-0.094	-0.182	1			
Size	-0.234	0.036	-0.157	-0.049	0.187	0.308*	1		
Leverage	-0.266*	0.045*	-0.149	-0.102	0.156	0.077	0.362**	1	
ROA	0.335**	-0.195	-0.298**	0.088	0.004	-0.079	-0.239	-0.261*	1

Table 2. Correlation matrix

Table 3 reports the regression results.

	Only Controls	Full Model
Constant	1.055 (1.406)	-1.702 (1.356)
Board Size		0.0115 (0.055)
Independent Directors		1.691 (0.843)*

Female Directors		0.021 (1.179)
Committees		0.154 (0.119)
Ownership Stake		0.002 (0.005)
Size	-0.080 (0.107)	0.032 (0.104)
Leverage	-0.012 (0.012)	-0.048 (0.028)
ROA	0.040 (0.022)*	0.046 (0.022)**
R^2	0.16	0.36

Table 3. Regression results

Contrary to our expectations, the hypothesis of a negative association between the board size and overbidding (H1) is rejected. Referring to H2 on the negative effect of board independence on overbidding, the findings contradict our predictions, showing a positive and statistically significant relationship with the independent variable (β=1.691; p-value<0.1). Results on the negative correlation between female directors (H3), board committees (H4) and controlling shareholders (H5) do not confirm our hypotheses. Considering our control variables, ROA is positively and significantly associated with overbidding, suggesting that the greater availability of internal resources can facilitate more aggressive bidding strategies. At the same time, strong prior performance may reinforce managerial overconfidence, leading executives to overestimate expected synergies from acquisitions.

5. Discussion and conclusions

Despite the well-known disruptive effects of acquisition overpayment, harming companies' financial performance and position and endangering their financial sustainability (Feng et al. 2016), relatively few studies explore the relationship between internal corporate governance mechanisms and overbidding.

In this context, our exploratory analysis provides preliminary insight into the interaction between the board of directors' characteristics and acquisition overpayment, overall showing that the oversight role of the board does not prevent managerial overbidding and outlining that, contrary to theoretical predictions, formal board and ownership attributes do not appear to constrain executives' bidding behavior in this setting.

Specifically, both the agency theory and the resource-based view predict that larger and diversified boards act as more effective monitors of the executives (Zheng and Tsai, 2019), also offering sounder advice (Alfraih, 2016; Alzeban, 2020; Jensen, 1993). By contrast, this study shows a different picture, indicating that the board characteristics and the ownership stake apparently do not limit executives' excessive bid premium in M&A deals. This seems to be particularly interesting when considering the multi-country nature of our sample, with companies operating in different institutional and cultural settings. In particular, our results align with a nascent line of inquiry, suggesting that the effectiveness of board monitoring mechanisms cannot be fully understood without accounting for the context in which boards operate (Miska et al., 2018).

On the one hand, the directors' appointment may be subject to different regulations, such as for gender quotas or independent directors, which may not be required in all countries. On the other hand, national culture may play a significant role in shaping directors' selection processes (Li et al., 2021; Slater, 2008), with cultural dimensions such as power distance, collectivism, or uncertainty avoidance affecting expectations about board members' roles, behavioral norms, and the extent to which they are expected to challenge top management (Li and Harrison, 2008).

In particular, an intriguing finding that emerges from this study is the positive association between overbidding and the board's independence, as this may indicate that beyond the potential

influence exerted by outside directors due to formal independence criteria, their actual role depends on both the adopted notion of independence and on context-specific characteristics. Indeed, legal independence prerequisites may be decoupled from substantive independence, as directors' actual monitoring effectiveness can be constrained by institutional norms, appointment processes, and relational dynamics within the boardroom (Crespí-Cladera and Pascual-Fuster, 2014; Marra, 2021).

Taken together, these counterintuitive results suggest that analyses of the role played by directors' characteristics in shaping board effectiveness may benefit from a more nuanced approach that considers the different national settings in which boards operate.

We thus contribute to the ongoing debate on how governance factors affect executives' conduct by suggesting that directors' attributes should be investigated by adopting a fine-grained analytical lens, as the effectiveness of the board scrutiny may depend on characteristics beyond formal prerequisites required by regulations (Amin et al., 2024). For instance, the positive impact of women on boards may be shaped by national cultural traits that influence expectations about gender, hierarchy, and conformity, potentially constraining their ability to exercise independent judgment and challenge dominant coalitions and qualifying them as grey directors (Licht et al., 2005).

Our results also align with prior studies positing that board independence can effectively contribute to a firm's outcomes when true detachment from managerial interests occur, as formal criteria per se are insufficient to ensure directors' autonomy (Johnson et al., 2013; Marra, 2021; Moscariello et al., 2019).

This study is, of course, a work in progress. Accordingly, we aim to further advance our understanding of the phenomenon under investigation through several complementary avenues. First, we plan to expand the sample size by including a broader set of acquisition transactions, moving beyond this initial exploratory subset in order to strengthen the statistical power of the analysis and further assess the robustness of our findings. Second, since overbidding was measured using an accounting-based proxy, we plan to conduct a robustness check relying on market-based measures. Third, we intend to incorporate country-level characteristics, including both cultural dimensions and institutional features into the analysis. Finally, we will undertake an additional robustness test using a composite corporate governance index, responding to calls for examining the concurrent role of multiple governance mechanisms. Such an approach acknowledges that governance practices may reinforce one another, while analyses focused on isolated mechanisms risk overlooking the interaction effects among different governance dimensions (Aguilera et al., 2012; Schnyder, 2012).

Keywords: Overbidding; M&A; corporate governance; board of directors

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Intelligenza Artificiale ed efficienza aziendale: il caso del Consorzio Industriale del Lazio

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1. Introduzione e rassegna della letteratura

I consorzi industriali sono enti pubblici economici, nonché uno strumento politico strategico, che favorisce lo sviluppo industriale attraverso la fornitura di servizi, il consolidamento dell'atmosfera industriale, delle infrastrutture e della logistica, ecc. (De Giorgi, 2007; Massarutto et al., 2019, L. 317/1991). Tra le attività principali vi sono la gestione di aree industriali, tramite servizi e assegnazione delle aree, e l'attrazione degli investimenti (Turina et al., 2011). Tali funzioni si collocano in un contesto reso ancora più competitivo dalla globalizzazione, in cui i territori sono chiamati a concorrere per mantenere e attrarre imprese nei propri confini (Pacetti, 2006). La formalizzazione della loro natura giuridica di Ente Pubblico Economico (Legge 5 ottobre 1991, n. 317) ha accentuato la necessità di adeguarsi al mondo produttivo ed ha accresciuto l'esigenza di un utilizzo delle risorse volto ad ottenere il massimo risultato con il minore impiego di ricchezza (Buccellato, 1983). In considerazione di ciò, i loro compiti sono stati ampliati e comprendono: i) l'erogazione di servizi primari; ii) l'innovazione tecnologica; iii) le reti informatiche polifunzionali, indispensabili per rendere le aziende competitive sui mercati internazionali. Pertanto, ciascun consorzio ha assunto nuovi ruoli e responsabilità, ponendosi al diretto servizio degli operatori economici insediati nelle proprie aree. In tal modo, hanno ricoperto il ruolo di attori cruciali per il progresso economico e sociale del territorio di competenza (https://www.ficei.it/notizie-ficei/). Tale funzione si colloca proprio in un contesto di forte competizione dei territori. Questi ultimi, infatti, competono affinché vengano considerati come la sede più appropriata per l'insediamento di attività produttive, risultando "vincenti" nella comparazione con altre aree nella misura in cui sono in grado di favorire il successo delle imprese collocate entro i propri confini (Pacetti, 2006). Alcuni strumenti possono rendere più o meno attrattivi determinati territori, come accaduto nel secondo dopo guerra con l'istituzione della Cassa per il Mezzogiorno nel Meridione, o più recentemente con l'istituzione delle Zone Economiche Speciali (ZES) (Lepore, 2012; Lepore e Spirito, 2017; Ferrara et al., 2022).

A questo si affiancano nuove sfide e opportunità derivanti dalle nuove tecnologie con impatti diretti sui processi aziendali (Trequattrini et al., 2021; Lombardi et al., 2022; Russo et al., 2023); tra le più dirompenti vi è l'intelligenza artificiale (IA) (Lombardi et al., 2021; Trequattrini e Schimperna, 2023). L'implementazione di quest'ultima in azienda è un utile strumento per migliorare la qualità e l'efficienza dei processi aziendali (Gravila et al., 2025; Scarton et al., 2025; Kumar e Shrivastava, 2025). La sua diffusione è cresciuta grazie all'avvento dei Big Data, degli

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algoritmi avanzati e al miglioramento della potenza di calcolo e della capacità di archiviazione, con un profondo impatto sul processo decisionale umano (Duan et al., 2019). Per Boden (2019) l'IA è definibile come l'abilità di un computer a svolgere funzioni e ragionamenti tipici della mente umana. Dunque, l'obiettivo dell'IA sarebbe quello di imitare, quanto più possibile, per mezzo di macchine normalmente elettroniche, l'attività mentale umana (Penrose, 1989). È possibile distinguere differenti tipologie di IA: le opere artificiali che eseguono operazioni al posto delle persone e gli intelletti sintetici che sembrano destinati a sostituire gli esseri umani nell'assumere decisioni di carattere ristretto o di natura generale (Kaplan, 2016). In questo contesto, si vanno a delineare tre spazi decisionali: nel primo, le scelte dipenderanno dalle capacità di processare grandi quantità di dati, di gestire relazioni complesse tra dati, di considerare molte variabili, di effettuare analisi coerenti, oggettive, precise e accurate. Questo ambito sarà presumibilmente occupato dagli intelletti sintetici. Nel secondo, saranno predominanti le caratteristiche che favoriscono i punti di forza degli esseri umani. Pertanto, tale spazio resterà di competenza degli uomini. Nel terzo, saranno presenti caratteristiche miste, permettendo la compresenza di macchine ed esseri umani (Trequattrini e Schimperna, 2023).

In questa prospettiva, le imprese stanno impiegando l'IA per prendere decisioni più veloci, soprattutto nei contesti complessi (Edwards et al., 2000; Wilson e Daugherty, 2018; Kumar e Shrivastava, 2025). La sua implementazione permette, infatti, lo svolgimento di compiti per raggiungere obiettivi specifici, come l'analisi dei dati, la previsione dei prezzi, l'ottimizzazione dei processi, la gestione dei rischi e l'identificazione delle tendenze (Kumar et al., 2025). Può, altresì, supportare l'identificazione di nuove opportunità di mercato, il miglioramento della produttività e della soddisfazione dei clienti, permettendo di migliorare il vantaggio competitivo (Musa et al., 2025). Può essere, infine, impiegata per semplificare le operazioni quotidiane, come la gestione della produzione, la gestione dei magazzini, la gestione dei fornitori e la gestione della manutenzione (Trequattini e Schimperna, 2023; Rad et al., 2025). In taluni casi può essere affiancata a tecnologie geo-spaziali per il miglioramento della gestione dell'intera supply chain (Andrei e Scarlat, 2024).

In questo scenario di forte competitività e di rapida e profonda trasformazione, i consorzi industriali possono assumere il ruolo di attori chiave nella competizione dei territori, in una posizione ideale per sperimentare modelli di gestione dei processi basati sui dati, fondati sulla condivisione delle conoscenze, sulla cooperazione istituzionale, sull'intelligence geospaziale e sull'uso delle nuove tecnologie nella definizione dei processi aziendali.

Pertanto, l'obiettivo del presente studio è valutare se e in che modo le nuove tecnologie abilitanti supportano i consorzi e le parti interessate nel processo di insediamento industriale, contribuendo ad una più efficiente allocazione delle risorse territoriali e migliorando i processi decisionali. In tale prospettiva, la ricerca esamina come la disponibilità e l'uso dei dati geospaziali affiancata dalle nuove tecnologie abilitanti, tra cui l'IA, possano influire sulla qualità dei processi decisionali, sull'attrazione degli investimenti e sulla gestione delle aree industriali. In tale prospettiva, i consorzi, originariamente concepiti per fornire alle aree produttive infrastrutture e servizi essenziali, si sono evoluti fino a diventare facilitatori strategici dello sviluppo locale (Turina et al., 2011). Essi assistono nella creazione di imprese, sostengono la riqualificazione di aree abbandonate e collaborano con le autorità pubbliche per definire strategie di sviluppo in linea con le esigenze locali. Questa evoluzione li avvicina alla logica dei distretti industriali e dei sistemi produttivi locali (Varaldo, 2006; Lombardi, 2015), in quanto promuovono il coordinamento territoriale, il capitale relazionale e l'incontro tra domanda e offerta per le aree industriali. Più che semplici gestori di spazi, i consorzi agiscono ora come mediatori di conoscenza, contribuendo a costruire reti collaborative e catene del valore all'interno dei loro territori. Questo nuovo ruolo richiede la capacità di raccogliere, elaborare e interpretare dati territoriali ed economici complessi, aprendo così la strada all'adozione di strumenti digitali di supporto decisionale.

I consorzi sono spesso considerati attori amministrativi o infrastrutturali (De Giorgi, 2007), piuttosto che analizzati come enti strategici in grado di mediare la conoscenza, promuovere l'innovazione e adottare tecnologie digitali a supporto dell'attrazione di investimenti. Sebbene in letteratura siano presenti alcuni studi preliminari sul ruolo dei consorzi industriali e sulla digitalizzazione dei processi decisionali territoriali, il loro ruolo in questo contesto rimane in gran parte inesplorato. Inoltre, le ricerche sulle tecnologie si concentrano principalmente sulle istituzioni pubbliche o sulle grandi infrastrutture urbane, trascurando le dinamiche operative degli attori intermediari come i consorzi industriali. Alla luce del gap evidenziato, le domande di ricerca (RQ) sono le seguenti:

RQ1: "Come può essere implementata l'intelligenza artificiale per migliorare l'attrazione degli investimenti?"

RQ2: "Come può migliorare l'efficienza aziendale attraverso l'uso dell'intelligenza artificiale?"

2. Disegno della ricerca

Per colmare tale gap in letteratura e rispondere alle domande di ricerca, è stato adottato un approccio di ricerca qualitativo basato su un caso studio rilevante (Yin, 2014). La metodologia del caso studio è considerata efficace quando la ricerca affronta domande relative al "come" o al "perché" di eventi contemporanei sui quali il ricercatore ha un controllo limitato (Yin, 2014). Nel caso in esame, l'obiettivo è comprendere in che modo i dati georeferenziati e gli strumenti di IA influenzano i processi decisionali relativi all'allocazione delle aree industriali e perché i consorzi adottano o resistono a tali tecnologie nelle loro pratiche quotidiane. Questa metodologia consente una comprensione approfondita delle dinamiche istituzionali, organizzative e tecnologiche che modellano l'evoluzione dei consorzi industriali.

Nel particolare, il presente studio prende in esame il caso del "Consorzio Industriale del Lazio", ente che coordina lo sviluppo delle aree industriali in diverse province dell'Italia centrale. In particolare, sono state condotte interviste semi-strutturate su un arco temporale di un anno che hanno offerto una prospettiva completa sull'uso degli strumenti digitali e dei dati spaziali per la pianificazione delle aree industriali e il supporto all'insediamento delle aziende. Le interviste mirano a raccogliere percezioni, esperienze e valutazioni sull'efficacia della georeferenziazione e di altri strumenti digitali nei processi decisionali e operativi. Tali informazioni sono state integrate con quelle rinvenibili sul sito ufficiale del Consorzio e sui documenti pubblici del Consorzio (es. Statuto). In tal modo è stato possibile comprendere come il Consorzio utilizza dati geospaziali e l'IA nelle proprie attività tipiche, se tali strumenti migliorano l'efficienza dei suoi processi e, infine, come questo plasmi il ruolo attuale del Consorzio.

Le informazioni sono state analizzate attraverso un'analisi tematica, per identificare il modello utilizzato, questioni critiche ed opportunità emergenti. Al fine di assicurare robustezza e credibilità delle informazioni e dei dati, è stato implementato il seguente protocollo (Yin, 2014):

1) presentazione del caso (focus sulla realtà oggetto d'indagine);
2) procedure di raccolta dei dati e delle interviste (procedure per la protezione della privacy, identificazione delle probabili fonti di dati, presentazione dei contatti sul campo);
3) raccolta dei dati (struttura delle domande e raccolta delle evidenze);
4) presentazione dei risultati.

3. Il caso del Consorzio Industriale del Lazio: risultati e discussione

Sistematizzando le informazioni ricevute durante le interviste, dalla visione del processo, dalle informazioni sul sito ufficiale del Consorzio e dalla documentazione pubblica ufficiale dell'ente, è stato possibile delineare i risultati preliminari del caso studio.

Il Consorzio Industriale del Lazio è un ente pubblico-privato che coordina lo sviluppo delle aree industriali in diverse province dell'Italia centrale. È nato dalla fusione di cinque enti industriali presenti sul territorio della Regione Lazio (ASI Frosinone, Cosilam, Consorzio Roma-Latina, Consorzio di Rieti e Consorzio del Sud Pontino) ed oggi è il più grande d'Italia. I pilastri su cui si basa sono lo sviluppo, l'attrazione di investimenti e l'occupazione. In particolare, tra i compiti emergono:

- l'attuazione di specifiche azioni per la ricerca di investitori sia nazionali che esteri, promuovendo anche a livello internazionale opportunità di investimento nell'economia del territorio e ricercando la valorizzazione delle realtà produttive, anche di piccola e media impresa;
- la promozione e la gestione di progetti strategici di innovazione industriale, focalizzandosi sulla riqualificazione delle aree industriali dismesse, la logistica e la valorizzazione dell'ambiente;
- la realizzazione di opere per la fornitura di servizi necessari all'insediamento, allo sviluppo, alla riqualificazione ed alla riconversione delle imprese, oltre che sostenendo la diffusione di reti di telecomunicazione e di servizi telematici alle imprese insediate in queste aree (https://www.consorziolazio.it/il-consorzio/chi-siamo.html).

Inoltre, come da Statuto, si occupa anche della "predisposizione di una mappatura analitica delle aree disponibili, comprensiva delle informazioni necessarie alle imprese ai fini delle valutazioni sulla realizzazione degli insediamenti produttivi" (art.3, comma 3 Statuto del Consorzio Industriale del Lazio). L'ente oggetto d'indagine svolge, come tutti i consorzi industriali, principalmente attività riconducibili a i) gestione delle aree industriali e ii) attrazione degli investimenti. I risultati dimostrano che il Consorzio ha recentemente implementato l'IA per migliorare l'efficienza aziendale e portando al contempo un miglioramento nel processo di attrazione degli investimenti. Il sistema è articolato nelle seguenti fasi: i) mappatura; ii) schede; iii) IA; iv) dialogo IA-investitori; v) soluzioni. In tale processo gli investitori hanno un primo contatto direttamente con l'IA che risponderà alle loro richieste specifiche, restituendo il numero identificativo dei lotti adatti a disposizione del Consorzio. Successivamente, potranno negoziare direttamente quei lotti con l'ufficio commerciale dell'Ente. Tale modello comporta vantaggi significativi per entrambi gli attori coinvolti. Gli investitori riducono i tempi di ricerca e trattativa, evitando contatti inutili e un impiego eccessivo di risorse. Dal lato del Consorzio, il sistema consente di concentrare tempo e risorse su un numero contingentato di opportunità, negoziando in modo mirato con gli interlocutori effettivamente interessati. Questo, in linea con la dottrina (Edwards et al., 2000; Wilson e Daugherty, 2018; Kumar e Shrivastava, 2025), ha portato ad una migliore efficienza aziendale, riducendo il tempo impiegato in modo superfluo dagli uffici commerciali, ma anche ad una maggiore attrazione degli investimenti, grazie al raggiungimento di zero costi e zero burocrazia per gli investitori. In tal modo, gli investitori saranno incentivati a investire nei territori gestiti dal consorzio esaminato, anziché intraprendere l'intero iter procedurale previsto per altri territori. Inoltre, tale risultato è molto rilevante trattandosi di un ente pubblico economico, in cui gli aspetti legati all'efficienza sono più che mai centrali, e nel quale, pertanto, l'uso delle risorse dovrebbe essere sempre volto ad ottenere il massimo risultato con il minore impiego di ricchezza (Buccellato, 1983).

Questo porta un'evoluzione nel ruolo del Consorzio, passando da un ente la cui attività tipica era la gestione delle aree industriali, ad uno in cui il peso maggiore è quello dell'attività di attrazione degli investimenti. Tale trasformazione risulta cruciale, data la crescente competizione dei territori attraverso le politiche di attrazione, come quelle degli incentivi ZES e quelle legate alla burocrazia (all'aumentare della burocrazia aumentano i costi) (Lepore e Spirito, 2017; Ferrara et al., 2022). Quanto implementato dal Consorzio rappresenta uno strumento in grado di aumentare l'attrattività dei territori, snellendo i processi, migliorando al contempo l'efficienza aziendale e rafforzando il ruolo del Consorzio come fonte di attrazione d'investimenti. Inoltre, il modello creato dall'Ente permette la compresenza decisionale integrata di uomini e macchine,

nel quale i due attori si supportano l'un l'altro, evitando che le macchine possano prendere il sopravvento sugli umani (Trequattrini e Schimperna, 2023).

4. Conclusioni: originalità, implicazioni manageriali e limiti

Il presente lavoro risponde a diverse call, tra cui quella del XLI Convegno AIDEA. Lo studio colmando un rilevante gap in letteratura, propone avanzamenti negli studi sul ruolo attuale dei consorzi industriali (Buccellato, 1983; De Giorgi, 2007; Massarutto et al., 2019) e su come l'IA stia plasmando i processi decisionali e impatti sull'efficienza aziendale (Edwards et al., 2000; Wilson e Daugherty, 2018; Trequattrini e Schimperna, 2023; Kumar e Shrivastava, 2025).

I risultati della ricerca potrebbero avere implicazioni pratiche notevoli per i manager e i decision-makers politici: da un lato, mostrano come il ruolo dei consorzi industriali stia evolvendo da gestore di aree industriali a fonte di attrazione degli investimenti; dall'altro, rivelano come è possibile ottimizzare i processi aziendali attraverso le nuove tecnologie.

Questo contributo non è esente da limiti. I principali derivano dall'uso di un caso di studio singolo che riduce la generalizzabilità dei risultati e l'impiego di un metodo esclusivamente qualitativo. Tale approccio è stato necessario essendo all'inizio del fenomeno di integrazione dell'IA nei processi del Consorzio. Quando sarà passato maggior tempo dall'introduzione di tale strumento e/o altre realtà avranno adottato approcci simili, sarà possibile estendere la ricerca attraverso analisi quantitative e comparative.

Parole chiave: Consorzio industriale; efficienza; IA; attrazione degli investimenti; competizione dei territori

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Track 4: IL RUOLO DELLE INTELLIGENZE ARTIFICIALI NELLE IMPRESE INTERNAZIONALI TRA GLOBALIZZAZIONE E PROTEZIONISMO

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Data-Driven Leadership e Strategic Intelligence: una prospettiva comparata sull'impatto dei dati nei processi decisionali in contesti globali frammentati

Francesco Della Rocca[1], Virginia Zambrano[2]

1. Introduzione

La crescente pervasività dei dati e delle tecnologie intelligenti ha trasformato radicalmente le modalità di governo e di decisione pubblica. La ricerca si propone di indagare, in una prospettiva comparata tra Unione Europea, Stati Uniti e Cina, come la *data-driven leadership* e la *strategic intelligence* influenzino i processi decisionali, la cultura organizzativa e la capacità di innovazione nelle amministrazioni pubbliche. Tale obiettivo si colloca all'interno di un quadro geopolitico e normativo frammentato, nel quale la sovranità sul dato è divenuta un elemento cardine della competitività economica e della legittimazione istituzionale. Come ha osservato Galetta (2019), il diritto contemporaneo non può più ignorare la natura algoritmica dei processi decisionali, poiché la traslazione di funzioni pubbliche verso sistemi automatizzati impone di ridefinire le categorie di legalità, responsabilità e trasparenza. L'ipotesi di fondo è che la capacità delle istituzioni di governare il dato determini, oggi, non solo la qualità della decisione amministrativa, ma la stessa effettività dei diritti fondamentali nella sfera digitale.

L'approccio metodologico integra l'analisi giuridico-normativa con la prospettiva manageriale, seguendo una logica qualitativa e comparativa. L'indagine parte da un esame sistematico delle principali fonti europee — il Regolamento (UE) 2016/679 (GDPR), il Codice dell'Amministrazione Digitale (d.lgs. n. 82/2005), la Direttiva (UE) 2022/2555 "NIS2", il Data Governance Act (Reg. UE 2022/868) e il recente Regolamento (UE) 2024/1689 sull'Intelligenza Artificiale — e le mette in relazione con i modelli statunitensi di *self-regulation* (CCPA 2018, CPRA 2020) e con la legislazione cinese, imperniata sulla *Data Security Law* e sulla *Personal Information Protection Law* (2021). Questa comparazione è accompagnata da una riflessione sulle trasformazioni organizzative e cognitive che derivano dall'adozione di sistemi decisionali basati sui dati, attraverso l'analisi di casi nei settori della sanità, della giustizia e della difesa, ambiti in cui la digitalizzazione incide direttamente sulla legittimazione e sulla fiducia del cittadino. Il metodo assume, in tal senso, un carattere interdisciplinare: la triangolazione tra fonti normative, letteratura scientifica e prassi istituzionali permette di osservare l'interazione tra cultura del dato, processi decisionali e capacità amministrativa. Dall'analisi emergono risultati coerenti e al tempo stesso differenziati. L'Unione Europea si distingue per una visione antropocentrica della tecnologia, in cui la protezione del dato costituisce una proiezione del diritto alla dignità personale, fondamento della cittadinanza digitale. Tuttavia, come osserva Esposito (2022), il modello europeo soffre di una "asimmetria di attuazione": pur definendo un quadro normativo avanzato, esso fatica a tradursi in pratiche organizzative realmente evidence-based. Gli Stati Uniti, al contrario, presentano un ecosistema innovativo più dinamico ma privo di una tutela organica, dove la *data economy* si sviluppa in chiave di mercato, con scarso coordinamento tra i livelli federali. La Cina rappresenta infine un paradigma alternativo, in cui la governance dei dati

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è funzionale alla sovranità tecnologica e alla pianificazione politica, riducendo lo spazio della responsabilità individuale. La comparazione conferma dunque che la *leadership data-driven* non è un modello universalmente esportabile, ma dipende dal contesto normativo e culturale entro cui si inserisce. Il lavoro mette in luce come la governance del dato, per produrre valore pubblico, debba fondarsi su una leadership capace di integrare il vincolo giuridico con la logica manageriale. Adinolfi (2018) ha mostrato come la leadership efficace, nei contesti complessi, non derivi dall'autorità formale ma dalla capacità di orientare processi di apprendimento collettivo. Applicata alla sfera digitale, tale visione implica un approccio riflessivo: il leader data-driven deve saper mediare tra etica e innovazione, promuovendo una cultura organizzativa che valorizzi il dato come bene comune e non come mero strumento di efficienza. Campo, Martella e Ciccarese (2018) sottolineano che l'algoritmo non è neutrale, ma riflette i valori e le asimmetrie del contesto sociale in cui viene progettato; pertanto, il diritto deve vigilare affinché la tecnologia resti subordinata alla finalità pubblica e al principio di legalità. In questa prospettiva, la *strategic intelligence* diventa un elemento di connessione tra conoscenza e potere decisionale: una funzione organizzativa che consente di trasformare i dati in insight, e gli insight in politiche pubbliche informate, tracciabili e responsabili.

Sul piano pragmatico, la ricerca propone un modello operativo per la pubblica amministrazione fondato su tre assi: la maturità digitale, la capacità di lettura del contesto e l'allineamento tra regolazione e innovazione. Le amministrazioni con alti livelli di *data maturity* mostrano, come evidenzia The European House – Ambrosetti & Salesforce (2023), una maggiore capacità di anticipare i rischi e di adattarsi a crisi sistemiche, poiché integrano la gestione dei dati nei processi decisionali quotidiani. Tuttavia, l'Italia e molti Paesi europei presentano ancora un deficit di competenze digitali e una scarsa cultura del dato, che ostacolano la traduzione dei principi di trasparenza e *accountability* in pratiche di governo del rischio. Gli obiettivi della ricerca sono dunque doppi: da un lato, individuare le condizioni giuridiche e organizzative che favoriscono la leadership data-driven; dall'altro, delineare strumenti di policy per rafforzare la *strategic intelligence* come capacità istituzionale, non solo come funzione tecnica. La sfida è rendere il diritto e la gestione pubblica complementari, superando la dicotomia tra controllo e innovazione. L'analisi riconosce anche i limiti del proprio impianto. La natura qualitativa dello studio e la disomogeneità dei dati comparati rendono difficile una validazione empirica generalizzabile. Inoltre, la comparazione tra modelli giuridici profondamente diversi, soprattutto nel caso della Cina, comporta un rischio di relativismo metodologico. Tuttavia, tali limiti rappresentano anche un'opportunità: la mancanza di indicatori uniformi di *digital accountability* sollecita nuove ricerche empiriche orientate alla misurazione del grado di maturità data-driven delle amministrazioni pubbliche, attraverso metriche condivise e replicabili. In questa direzione, la ricerca auspica lo sviluppo di osservatori interuniversitari e strumenti di valutazione che integrino indicatori normativi, tecnologici e culturali, favorendo una governance multilivello dei dati pubblici. L'originalità del lavoro risiede nella prospettiva ibrida che unisce diritto, management e analisi comparata. Superando la tradizionale separazione tra norma e organizzazione, la ricerca sostiene che la leadership data-driven costituisce una forma emergente di potere pubblico, in cui la capacità di gestire il dato diventa condizione di legittimità e di efficacia dell'azione amministrativa. Ambrosini e Bresciani (2020) hanno dimostrato come la cultura organizzativa sia il vero fattore abilitante della trasformazione digitale: la leadership, in questo senso, è il vettore attraverso cui i principi giuridici – legalità, trasparenza, proporzionalità – si traducono in processi operativi e decisioni responsabili. Il contributo scientifico è dunque duplice: da un lato, propone una rilettura del diritto amministrativo alla luce delle sfide algoritmiche; dall'altro, individua nella *strategic intelligence* una leva manageriale per la costruzione di amministrazioni resilienti e orientate all'apprendimento. Il dato, da strumento tecnico, diventa così infrastruttura cognitiva del potere pubblico.

In una prospettiva più ampia, la ricerca invita a ripensare la relazione tra sapere e decisione, tra informazione e legittimazione democratica. L'emergere di una leadership fondata sul dato non

è solo una questione di efficienza, ma di giustizia cognitiva: la trasparenza, l'inclusione e la capacità di spiegare le scelte diventano nuovi parametri della legalità amministrativa. La trasformazione digitale, per essere coerente con i valori costituzionali europei, deve tradursi in un diritto capace di orientare la tecnologia e non di inseguirla. È in questa direzione che la data-driven leadership assume un significato politico oltre che gestionale: essa rappresenta la possibilità di costruire un'amministrazione pubblica realmente intelligente, in cui il dato non sostituisce la deliberazione, ma la rafforza attraverso la conoscenza.

Parole chiave: Leadership data-driven; governance dei dati; intelligenza strategica; accountability digitale; pubblica amministrazione; comparazione UE-USA-Cina

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Strategie di offshoring e disponibilità a pagare dei consumatori europei per gli autoveicoli elettrici cinesi: un modello concettuale

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1. Inquadramento concettuale

Le strategie di offshoring delle case automobilistiche cinesi per entrare nel mercato europeo devono essere comprese all'interno di un più ampio contesto di trasformazione industriale globale. Il settore automobilistico è infatti ridefinito da tre dinamiche concomitanti: l'accelerazione della decarbonizzazione, la digitalizzazione dei veicoli e l'ascesa di nuovi attori globali che mettono in discussione il primato dei costruttori tradizionali (Holweg, Luo & Oliver, 2009; Carboni, 2023). Tra questi nuovi concorrenti, la Cina è emersa non solo come il più grande mercato automobilistico mondiale, ma anche come leader nella mobilità elettrica, sostenuta da ingenti investimenti e da catene del valore fortemente integrate (Santelli, 2024). Questo cambiamento genera al tempo stesso opportunità e barriere per i marchi cinesi in cerca di legittimazione in Europa, un mercato a lungo dominato dalle case automobilistiche tedesche, francesi e italiane.

La letteratura sull'immagine del Paese (country image, CI) mostra come le percezioni dei consumatori nei confronti dei marchi siano fortemente influenzate dalla CI, che funge da scorciatoia cognitiva nel plasmare le aspettative in termini di qualità, affidabilità e valore simbolico (Schooler, 1965; Han, 1989; Verlegh & Steenkamp, 1999). Nel caso della Cina, l'indicatore di Paese d'origine (country of origin, COO) risulta ambivalente. Da un lato, la Cina è associata a capacità tecnologiche avanzate nel settore dei veicoli elettrici (EV). Dall'altro, l'origine cinese è generalmente legata a standard qualitativi percepiti come inferiori, a un minore capitale simbolico e a una forma di dipendenza geopolitica. Questa duplicità rende il COO non un semplice fattore di sfondo, ma una variabile centrale nel determinare l'accettazione da parte dei consumatori europei.

Un secondo filone di studi enfatizza il ruolo della qualità percepita del prodotto (perceived product quality, PPQ) nella formazione delle decisioni di acquisto. La disponibilità a pagare (willingness to pay, WTP) dei consumatori è strettamente connessa alla loro valutazione della qualità del prodotto, in particolare nei beni ad alto coinvolgimento come le automobili (Peterson & Jolibert, 1995). Immagini-paese negative possono pertanto ridurre la WTP in modo indiretto, abbassando la qualità percepita e indebolendo la fiducia. Allo stesso tempo, segnali positivi quali la sostenibilità o il radicamento locale possono mitigare tali effetti, evidenziando l'importanza di variabili moderatrici e mediatrici nella relazione tra COO e WTP (Miller et al., 2027).

Due moderatori contestuali appaiono particolarmente rilevanti. In primo luogo, la natura del prodotto, se il veicolo è elettrico o dotato di motore a combustione interna, può modificare l'impatto del COO sulla qualità percepita. Dato il ruolo di leadership globale della Cina nella tecnologia EV, i modelli elettrici possono rafforzare la qualità percepita nonostante le associazioni negative legate al COO. In secondo luogo, strategie di offshoring "upward", come la

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localizzazione della produzione in economie avanzate, fungono da amplificatori di credibilità, riducendo la distanza simbolica e rafforzando il legame tra COO e qualità (Dunning, 2001; Pavlínek, 2018). Nel loro complesso, questi moderatori mostrano come le percezioni legate al COO non rappresentino passività fisse, ma segnali malleabili che possono essere ridefiniti attraverso le scelte strategiche delle imprese.

Infine, variabili a livello individuale quali l'efficacia percepita del consumatore (perceived consumer effectiveness, PCE) e la preoccupazione ambientale (environmental concern, EC) arricchiscono ulteriormente l'analisi. La ricerca evidenzia che i consumatori che percepiscono le proprie scelte come capaci di incidere sugli esiti ambientali, e coloro che manifestano una maggiore attenzione alla sostenibilità, risultano più propensi a sostenere prodotti ecologici di alta qualità, mostrando una WTP più elevata (Sweeney & Soutar, 2001; Arsyistawa & Hartono, 2022; Falchi, Grolleau & Mzoughi, 2022). Queste costruzioni concettuali legano le trasformazioni industriali a livello macro (transizione verde, strategie di offshoring) ai processi decisionali a livello micro del consumatore, fungendo da ponte tra prospettive istituzionali e individuali.

In sintesi, questo studio si colloca all'intersezione tra immagine del Paese, qualità percepita del prodotto e disponibilità a pagare, considerando al contempo moderatori strategici (orientamento elettrico, localizzazione produttiva) e moderatori individuali (efficacia del consumatore, preoccupazione ambientale). L'originalità dell'approccio risiede nella sua integrazione multilivello: esso mostra come i bias reputazionali associati al COO interagiscano con fattori tecnologici, strategici e individuali nel plasmare l'accettazione dei costruttori automobilistici cinesi in Europa.

2. Obiettivo e metodologia

L'obiettivo centrale di questo contributo è esplorare come i consumatori europei percepiscano l'ingresso delle case automobilistiche cinesi nei loro mercati e in che modo tali percezioni influenzino la loro disponibilità a pagare (willingness to pay, WTP). A differenza dei contributi empirici che testano specifiche relazioni mediante dati quantitativi, questo lavoro si colloca esplicitamente come paper concettuale. Il suo scopo è intrecciare gli apporti della letteratura in un quadro coerente e sviluppare ipotesi in grado di orientare future ricerche empiriche.

Il punto di partenza è il ben noto Country-of-Origin Effect (COO). Decenni di studi hanno mostrato come l'immagine di un Paese operi come un potente euristico nei processi decisionali di consumo, influenzando il modo in cui i prodotti vengono valutati in termini di qualità, affidabilità e valore simbolico (Schooler, 1965; Han, 1989; Verlegh & Steenkamp, 1999). Nel caso della Cina, l'indicatore di Paese d'origine è particolarmente ambivalente: da un lato, è associato a una leadership globale nella tecnologia dei veicoli elettrici e a un forte dinamismo industriale; dall'altro, porta con sé stereotipi legati a standard qualitativi inferiori e a una condizione di dipendenza geopolitica (Diamantopoulos et al., 2017). Questa dualità rende il COO non una semplice condizione di sfondo, ma un determinante della legittimità e dell'accettazione sul mercato. All'interno di questa cornice più ampia, l'articolo avanza sei ipotesi. Le prime due articolano i canali diretti e indiretti attraverso cui un'immagine-paese negativa influenza la disponibilità a pagare. Da un lato, percezioni sfavorevoli del COO sono attese ridurre direttamente la propensione dei consumatori a pagare un premio di prezzo (H1). Dall'altro, l'immagine-paese esercita un effetto indiretto tramite la qualità percepita del prodotto (perceived product quality, PPQ): quando il COO è negativo, le valutazioni di qualità tendono a peggiorare e questo, a sua volta, deprime la WTP (H2). Queste ipotesi evidenziano il ruolo centrale della reputazione nel plasmare le dimensioni sia simboliche sia economiche del comportamento di consumo.

Il framework riconosce inoltre che gli effetti del COO non sono statici, ma possono essere riformulati alla luce di moderatori contestuali. Due fattori appaiono particolarmente rilevanti. In primo luogo, la natura stessa del prodotto conta: quando l'auto è elettrica anziché con motore a

combustione interna, l'associazione con la riconosciuta expertise tecnologica della Cina negli EV può attenuare lo stigma legato al COO ed elevare le percezioni di qualità (H3). In secondo luogo, le scelte strategiche relative alla localizzazione produttiva, che definiamo offshoring "upward", possono funzionare come segnali di credibilità. Localizzando la produzione in economie avanzate, le case automobilistiche cinesi possono beneficiare del capitale reputazionale di tali contesti, riducendo la distanza simbolica e rafforzando la qualità percepita (H4).

Al di là di queste condizioni macro, il modello integra disposizioni a livello micro del consumatore. Anche quando la qualità viene riconosciuta, la misura in cui essa si traduce in disponibilità a pagare dipende da credenze e valori individuali. I consumatori che percepiscono le proprie scelte come in grado di contribuire a miglioramenti ambientali sono più inclini a premiare i prodotti di alta qualità con una WTP più elevata (H5). Analogamente, coloro che manifestano una più forte preoccupazione ecologica sono attesi attribuire maggiore valore ai veicoli sostenibili, amplificando il nesso tra PPQ e WTP (H6). In questo senso, i moderatori a livello del consumatore costituiscono un ponte cruciale tra dinamiche industriali e processi decisionali individuali.

Da un punto di vista metodologico, il contributo di questo articolo non risiede nella raccolta di nuovi dati, bensì nella sua integrazione concettuale. Combinando la ricerca sul COO con gli apporti relativi a qualità percepita, disponibilità a pagare e psicologia ambientale, lo studio propone un framework al contempo teoricamente solido e di rilevanza pratica. Le sei ipotesi traducono costrutti astratti in proposizioni verificabili, offrendo una road map per future indagini empiriche che potranno avvalersi di dati survey, modelli di regressione o modelli ad equazioni strutturali per validare le relazioni qui delineate.

In sintesi, l'impianto metodologico sottolinea l'originalità di questo lavoro come contributo concettuale. Esso collega segnali reputazionali (immagine del Paese), risposte strategiche (orientamento elettrico, localizzazione) e fattori a livello del consumatore (efficacia percepita, preoccupazione ambientale) in un modello multilivello. In tal modo, offre una spiegazione strutturata di come le case automobilistiche cinesi possano superare lo stigma legato al COO e costruire legittimità in Europa, predisponendo al contempo il terreno per una futura validazione empirica.

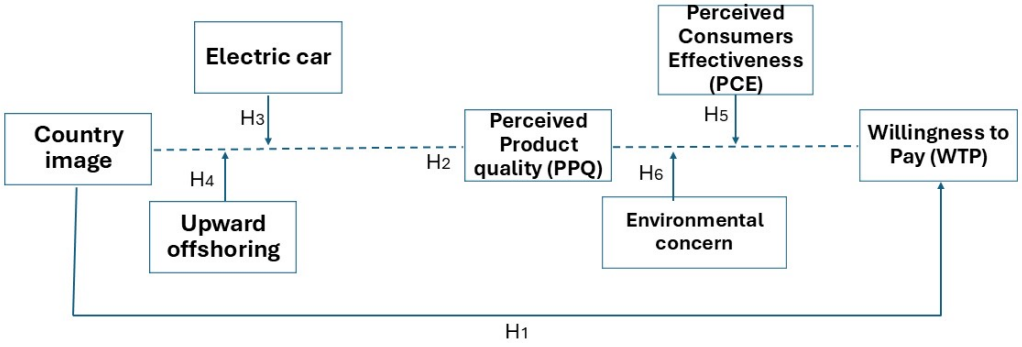


Figura 1. Framework Concettuale proposto

3. Risultati

Poiché questo contributo si configura come un paper concettuale, i risultati non consistono in evidenze empiriche, bensì nelle dinamiche attese che emergono dal framework teorico. L'obiettivo è illustrare come possa articolarsi l'interazione tra immagine del Paese (country image, CI), qualità percepita del prodotto (perceived product quality, PPQ) e disponibilità a pagare (willingness to pay, WTP), e come tali relazioni siano plasmate da moderatori tecnologici, strategici e a livello individuale.

Una prima evidenza riguarda l'impatto diretto dell'immagine del Paese. In linea con H1, una CI negativa è attesa ridurre la WTP. Ciò riflette la perdurante rilevanza degli stereotipi legati al Paese d'origine (COO): quando il Paese d'origine è percepito come meno affidabile, i consumatori esitano a riconoscere un premium price, indipendentemente dagli attributi funzionali del prodotto. Nel caso delle case automobilistiche cinesi, questa passività si manifesta in uno svantaggio strutturale nel competere in mercati in cui i marchi europei o giapponesi godono di un forte capitale reputazionale.

La seconda evidenza sottolinea il ruolo mediatore della qualità del prodotto. Come proposto in H2, percezioni negative del COO tendono a indebolire le valutazioni di qualità, il che a sua volta riduce la WTP. Questo meccanismo mette in luce la centralità della PPQ come ponte tra segnali reputazionali ed esiti economici. Anche qualora i consumatori non colleghino consapevolmente il COO alla loro sensibilità al prezzo, i giudizi di qualità fungono da canale attraverso cui il COO influisce sulla WTP. In tal senso, il COO non incide soltanto sulle associazioni simboliche, ma vincola direttamente il valore che i consumatori sono disposti ad attribuire a un prodotto.

Il framework suggerisce inoltre che lo stigma associato al COO non sia immutabile. H3 postula che l'impatto negativo della CI sulla PPQ possa essere attenuato nel caso dei veicoli elettrici. Qui la categoria di prodotto diventa cruciale: la riconosciuta leadership della Cina nella tecnologia EV e nell'innovazione legata alle batterie fornisce un contrappeso positivo allo scetticismo verso il COO. Quando il prodotto incorpora un expertise tecnologica allineata con le priorità europee di decarbonizzazione, le percezioni di qualità possono migliorare, neutralizzando almeno in parte lo stigma legato al COO. In modo analogo, H4 evidenzia il ruolo delle strategie di offshoring "upward", come la localizzazione produttiva in economie avanzate. Radicando le attività in contesti caratterizzati da forte legittimità industriale, le case automobilistiche cinesi possono inviare segnali di credibilità, ridurre la distanza simbolica e allinearsi alle aspettative dei consumatori in termini di qualità. Entrambe le ipotesi mettono in rilievo come il COO non rappresenti una passività deterministica, bensì una percezione malleabile, sensibile alle scelte tecnologiche e strategiche delle imprese.

Un ulteriore livello dei risultati attesi riguarda la traduzione delle percezioni di qualità nella disponibilità a pagare. Come suggerito da H5 e H6, tale traduzione non è uniforme, ma dipende da disposizioni individuali. L'efficacia percepita del consumatore (perceived consumer effectiveness, PCE) modera il legame PPQ-WTP plasmando il modo in cui i consumatori interpretano il significato delle proprie scelte. Coloro che ritengono che le proprie decisioni di acquisto possano contribuire positivamente agli esiti ambientali sono più inclini a premiare la qualità percepita con una maggiore disponibilità a pagare. In modo analogo, la preoccupazione ambientale (environmental concern, EC) rafforza questo nesso: i consumatori con forti valori ecologici tendono ad attribuire maggiore importanza ai veicoli sostenibili, risultando più disposti a pagare per prodotti percepiti come ambientalmente responsabili. Questi moderatori a livello individuale mostrano che il COO e le percezioni di qualità vengono filtrati attraverso i sistemi di valori dei consumatori, generando risposte eterogenee tra differenti segmenti di mercato.

Complessivamente, questi risultati concettuali offrono una spiegazione multilivello di come le case automobilistiche cinesi possano essere accolte in Europa. A livello macro, il COO agisce come baseline reputazionale che condiziona l'accettazione. A livello meso, leve strategiche quali il posizionamento sugli EV e la localizzazione produttiva offrono percorsi per ridefinire gli effetti del COO. A livello micro, credenze e valori individuali determinano il modo in cui le percezioni di qualità si traducono in comportamenti economici come la WTP.

In sintesi, il framework non pretende di presentare evidenze testate, ma di articolare esiti plausibili e teoricamente fondati. Mostra come il successo delle case automobilistiche cinesi in Europa dipenderà dalla loro capacità di gestire lo stigma reputazionale, mettere in risalto la leadership tecnologica, radicarsi strategicamente nei contesti locali e risuonare con i valori dei consumatori legati alla sostenibilità e alla responsabilità individuale. Queste intuizioni

predispongono il terreno per future ricerche empiriche, necessarie per validare, affinare o mettere in discussione le sei ipotesi avanzate in questo studio.

4. Limiti della ricerca ed implicazioni

In quanto paper concettuale, questo studio presenta una serie di limiti che devono essere riconosciuti. Il limite più evidente è l'assenza di una verifica empirica: le sei ipotesi qui proposte restano proposizioni teoriche, non ancora supportate da evidenze statistiche. Ricerche future dovranno validare il framework attraverso studi basati su survey, disegni sperimentali o modelli ad equazioni strutturali, al fine di valutare la forza e la robustezza delle relazioni ipotizzate.

Un secondo limite riguarda la specificità di contesto degli effetti legati al Paese d'origine (COO). Le percezioni delle case automobilistiche cinesi possono variare in modo significativo tra i diversi paesi europei, riflettendo tradizioni culturali, climi politici e politiche industriali nazionali. Il framework fornisce dunque una road map concettuale generale, ma il suo potere predittivo è verosimilmente destinato a variare in funzione delle condizioni locali. Infine, il COO e le percezioni di sostenibilità sono costrutti dinamici: con l'espansione della produzione delle imprese cinesi in Europa, il miglioramento degli standard qualitativi o l'adattamento delle strategie di comunicazione, le percezioni dei consumatori possono mutare, richiedendo studi longitudinali per cogliere tali evoluzioni.

Nonostante questi confini, il framework offre diverse implicazioni manageriali rilevanti. In primo luogo, esso sottolinea come l'immagine del Paese rimanga un fattore decisivo per l'accettazione da parte dei consumatori. I manager delle case automobilistiche cinesi devono riconoscere che il COO non è neutrale e che stereotipi negativi possono deprimere direttamente la disponibilità a pagare. Al tempo stesso, il modello mostra che tale stigma può essere gestito. Il posizionamento nel segmento dei veicoli elettrici consente alle imprese di valorizzare la riconosciuta leadership della Cina nella tecnologia EV, riformulando in chiave positiva le percezioni dei consumatori. Analogamente, l'adozione di strategie di offshoring "upward", ad esempio tramite la localizzazione produttiva nei mercati europei, può rafforzare la credibilità, ridurre la distanza simbolica e allineare il brand con ecosistemi industriali considerati affidabili.

In secondo luogo, il framework enfatizza l'importanza della qualità percepita del prodotto come driver centrale della disponibilità a pagare. Le strategie di comunicazione dovrebbero pertanto andare oltre l'enfasi sulla competitività di prezzo, concentrandosi invece su affidabilità, sicurezza e prestazioni tecnologiche. Investimenti in trasparenza e verificabilità, in particolare rispetto alle dichiarazioni in materia di sostenibilità, risultano altrettanto cruciali per costruire fiducia tra i consumatori europei.

In terzo luogo, l'analisi evidenzia che le risposte dei consumatori sono eterogenee. Moderatori a livello individuale, come l'efficacia percepita del consumatore e la preoccupazione ambientale, plasmano il modo in cui le percezioni di qualità si traducono in comportamenti economici. Per i manager, ciò implica la necessità di strategie di marketing segmentate, rivolte a gruppi di consumatori caratterizzati da forti valori ecologici e da un marcato senso di responsabilità personale. Un branding narrativo che sottolinei il ruolo del consumatore nella transizione ecologica ("la tua scelta conta") può risultare particolarmente efficace in questi segmenti.

Infine, i risultati presentano implicazioni anche per i decisori pubblici. Se l'accettazione da parte dei consumatori dipende dall'interazione tra stigma legato al COO, posizionamento tecnologico e localizzazione produttiva, le politiche industriali che incentivano investimenti sostenibili e sostengono l'occupazione locale possono svolgere un ruolo decisivo nel legittimare i nuovi entranti stranieri. Tali politiche non solo favoriscono la competitività, ma allineano l'accettazione di mercato con più ampi obiettivi sociali, quali la decarbonizzazione e la resilienza economica.

In conclusione, pur essendo limitato dalla propria natura concettuale, lo studio offre indicazioni operative per manager e policy maker. Per i manager, il percorso verso il successo in Europa consiste nel combinare leadership tecnologica, radicamento locale e narrazioni incentrate sulla sostenibilità. Per i ricercatori, il framework fornisce una base per future indagini empiriche che potranno affinare o mettere in discussione le proposizioni qui avanzate, contribuendo così ad arricchire sia il dibattito accademico sia la pratica manageriale.

5. Originalità

Questo articolo offre un contributo originale riformulando il Country-of-Origin Effect nel contesto dell'espansione delle case automobilistiche cinesi in Europa. Piuttosto che trattare l'immagine del Paese come un elemento passivo e fisso, lo studio la concettualizza come un fattore dinamico, il cui impatto sull'accettazione da parte dei consumatori può essere mediato e moderato da una molteplicità di condizioni. Collegando l'immagine del Paese in modo diretto e indiretto alla disponibilità a pagare, attraverso il ruolo della qualità percepita del prodotto, il framework mette in luce le dimensioni reputazionali, tecnologiche e individuali che plasmano il comportamento di consumo.

Il contributo risiede nella proposta di un modello multilivello che combina segnali a livello macro, scelte strategiche d'impresa e valori a livello del consumatore. In tal modo, l'articolo non solo arricchisce la letteratura sul COO, ma fornisce anche un'agenda strutturata per future ricerche empiriche sulla legittimazione e l'accettazione dei brand dei Paesi emergenti nelle economie avanzate.

Parole chiave: Country Image; offshoring; electric vehicles; perceived product quality; willingness to pay

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Strategic routes and geopolitical risks in the Arctic: a perspective from corporate responsibility and intercultural governance

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1. Introduction

In the space of a few decades, the Arctic has gone from being a geographical periphery to becoming a strategic space of primary importance, where global interests, environmental challenges and rich cultural diversity converge. The acceleration of ice melt has transformed a once inaccessible area into a hub for trade, energy and military projection. Emerging maritime routes, together with the opening of mineral and energy deposits, have turned the Arctic into a territory of opportunity, but also of vulnerability and contention. In this context, geopolitics, corporate responsibility and intercultural governance converge as fundamental axes of analysis.

The reconfiguration of the Arctic reflects Agnew's (1994) thesis that geopolitics is not limited to territorial control but also involves the discursive production of spaces of power. The Arctic, therefore, is not only a melting physical frontier, but also a discursive scenario in which states project sovereignty, companies seek legitimacy and local communities claim recognition.

The growing interest of powers such as Russia, China, and the United States has placed the region at the epicentre of a new multipolar order, a laboratory in which the balance between climate cooperation and energy competition is measured. As a result, companies operating in this space face a dual challenge: seizing logistical and economic opportunities while responding ethically and responsibly to intensifying political and environmental tensions.

The expansion of northern sea routes—particularly the Northeast Passage, the Northwest Passage and the Central Arctic Route—symbolises this paradigm shift. These routes promise to reduce distances between Asia and Europe by up to 40%, but their opening has triggered a silent race for control of polar corridors and infrastructure. As Lasserre and Têtu (2020) observe, the melting of the ice has transformed the Arctic into a new logistical frontier where economics, climate and geopolitics intersect.

This paper aims to develop geopolitical risk analysis capabilities applied to the Arctic, understanding how companies can anticipate and mitigate the effects of sanctions, trade wars and political instability. However, the analysis is not limited to the strategic level: it also aims to integrate an ethical and cultural perspective, in line with the corporate social responsibility (CSR)

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formulated by Carroll (1991), according to which corporate sustainability depends on the balance between economic, legal, ethical and philanthropic responsibilities.

From this perspective, the concept of 'social licence to operate', developed by authors such as Wilson and Stammler (2016), takes on a particular significance in the Arctic: the legitimacy of a company is measured not only by its compliance with the law, but also by its ability to generate trust among indigenous peoples and local institutions.

Interculturality, in turn, becomes a key component of the analysis. Authors such as Hofstede (2001) have shown that cultural differences profoundly influence organisational relationships and global risk management. Applied to the Arctic, this implies that sustainability cannot be achieved without a dialogue between corporate rationality and the community values of peoples such as the Inuit, Sámi and Chukchi.

For this reason, the work combines three analytical dimensions:

Geopolitics: how global tensions are redefining control of routes and international cooperation.

Corporate responsibility: how companies respond to the ethical, legal and cultural challenges of the Arctic environment.

Intercultural skills: how the inclusion of local knowledge and ethical training strengthen stability and sustainability.

Ultimately, the central question driving this research is:

How can businesses develop a culture of geopolitical analysis and intercultural responsibility that will ensure their sustainability in an increasingly competitive and unstable Arctic?

2. The new Arctic routes: strategic logistics in a context of global fragmentation

Throughout geological history, the Earth's climate has undergone significant changes. According to the Gautier et al., (2009), over the last 800,000 years, the Earth has undergone multiple glacial cycles, including eight major glacial periods and their respective interglacial periods, processes closely linked to fluctuations in mean sea level. However, since the mid-20th century, the pace and magnitude of climate change have reached unprecedented levels in instrumental records.

We are currently in an interglacial period, commonly referred to as the Holocene, characterised by a sustained and accelerating increase in global average temperatures (Bardan, 2025). The report by Bardan (2025) confirms 2024 warmest year on record, continuing a trend of global warming', 2024 was the warmest year since systematic records began (1880), with an increase of 1.28 °C compared to the 1951–1980 average, surpassing the previous record set in 2023. The year-on-year increase of 0.10 °C intensified glacier retreat and contributed to sea level rise. Furthermore, compared to the average temperatures of the pre-industrial period (1850–1900), it is estimated that in 2024 the global temperature was 1.47 °C higher (Bardan, 2025).

Analysis shows unexpected amount of sea level rise in 2024, highlighting that global average sea level rose faster than expected in 2024, reaching 0.59 cm. This value exceeds the initial projection of 0.43 cm by 0.16 cm and is mainly attributed to the thermal expansion of the oceans induced by anthropogenic global warming. The result has fuelled growing concern in the scientific community.

Over the past four decades, the Arctic has warmed at more than twice the global average rate, leading to an accelerated reduction in sea ice. The minimum extent has decreased by about 40%, from 7 to 4.3 million km². In addition, Arctic sea ice is declining at a rate of 13% per decade. According to the National Snow and Ice Data Centre (2025), between 1979 and 2025, the total ice extent decreased from 15.4 to 13.1 million km²: a loss of 2.3 million km², or 15.5%.

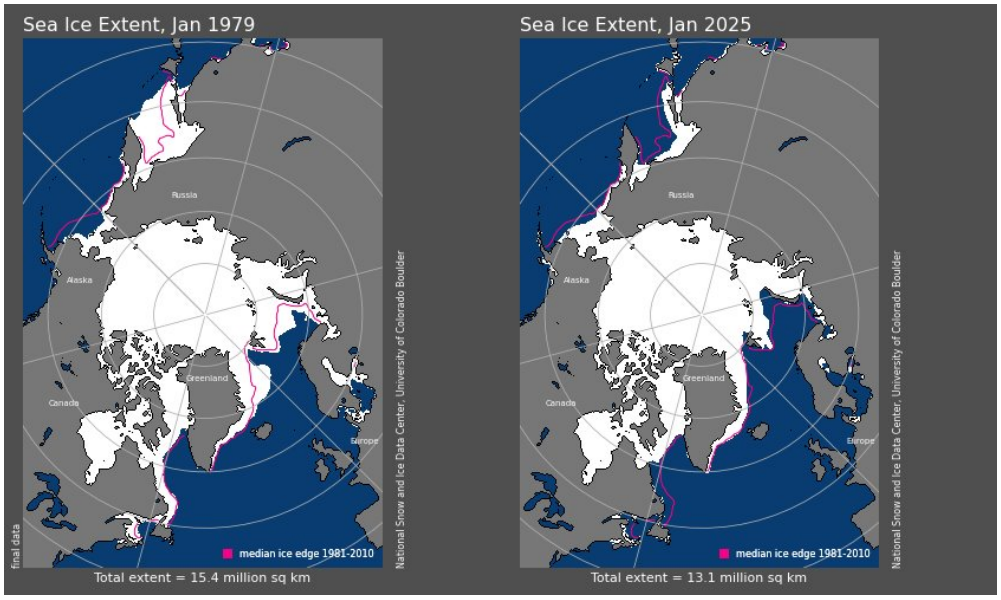


Figure 1. Evolution of Arctic ice melt from 1979 to 2025. Source: National Snow and Ice Data Centre

It is estimated that the Arctic could connect up to 75% of the world's population, highlighting its importance in global trade (Department of the U.S. Navy, 2021). The progressive melting of the Arctic Ocean has made possible what until recently seemed a pipe dream: sailing for months through the ice to connect Asia and Europe in record time. These polar routes—the Northeast Passage (Russia), the Northwest Passage (Canada) and the Central Route (high seas)—have become the new frontier of global trade, a space where logistical innovation, economic diplomacy and geopolitical rivalry converge.

The operability of the routes varies according to seasonality and is mainly determined by the presence and thickness of sea ice. When the thickness exceeds 10 metres, even the latest generation of icebreakers are unable to break through, forcing routes to remain closed or diverted. During the summer months, from late June to September, navigation conditions improve significantly, especially along the eastern and western routes. Nevertheless, the central route continues to have limitations, as it requires constant assistance from icebreakers, significantly increasing the logistical costs associated with transporting goods.

In addition, the Arctic has gained increasing strategic importance, driven by its wealth of natural resources. The U.S. Geological Survey (2008) study, 'Circum-Arctic resource appraisal: estimates of undiscovered oil and gas north of the Arctic Circle', estimates that approximately 22% of the world's undiscovered but technically recoverable gas and oil reserves are located within the Arctic Circle. Of this total, over 80% is believed to be in the ocean subsoil, mainly in areas under the sovereignty of the Russian Federation. In addition to hydrocarbons, the Arctic is home to a significant concentration of strategic mineral resources. Previous studies have identified large deposits of metals such as gold, platinum, nickel and rare earth elements, increasing the economic and geopolitical interest in the region (Linholt, 2006). These materials are essential for the technology, energy and defence industries, reinforcing their strategic importance in terms of control and exploitation.

In particular, the melting of the ice has opened up access to vast natural resources: it is estimated that the region contains 13% of the world's undiscovered oil and 30% of its undiscovered natural gas, both of which are essential for global energy and the functioning of industries and transport systems. In addition, the Arctic is rich in strategic minerals such as gold, nickel, cobalt and copper, which are essential for the production of batteries, electronic components and advanced technologies. Added to this are the reserves of fresh water stored in

glaciers and polar ice caps, an increasingly precious resource in light of the global water crisis. Finally, Arctic waters are home to abundant fish stocks—cod, salmon and shellfish—which support the food industry and local economies in several circumpolar countries. Progressive melting, combined with technological advances in exploration and extraction in extreme environments, has facilitated operational access to these resources. As a result, the Arctic has become an area of global competition, in which not only Arctic coastal states—especially Russia—but also extra-regional powers such as China and the United States aim to expand their influence and access to these riches.

According to Linholt's (2006) analysis, in terms of hydrocarbon production, the main extraction centres are concentrated in Alaska and Russia, which account for approximately 10.5% and 25.5% of global oil and gas production, respectively. Russia, in particular, has intensified exploration activities in key areas such as the Barents Sea, where reserves of up to 32,000 billion cubic metres of gas and natural are estimated to exist. Despite the challenges associated with exploiting these resources, the region's economic potential continues to be a key driver of territorial claims and state investment. This interest is intensifying with the melting of the ice, which has not only facilitated physical access to previously inaccessible deposits, but has also opened up new opportunities for maritime connectivity.

2.1. The Northeast Passage: Russian control and strategic dependence

The Northern Sea Route (NSR), which runs along the northern coast of Russia, reduces the distance between Shanghai and Rotterdam by almost 40%. It is the shortest and, to date, the most explored route, stretching from the Bering Strait to the North Sea. Over 90% of the journey made by container ships along this route takes place in waters under Russian jurisdiction. This is largely due to the fact that Russia has the largest concentration of the Arctic's coastal population, which has led to the development of significant port infrastructure in the main settlements on the northern coast.

Another determining factor in the proliferation of ports in the Russian Arctic region is the relative thinness of the ice for a significant part of the year. This condition is influenced by the country's hydrography: most of the rivers in northern Russia originate in the south and flow into the Arctic Ocean, helping to reduce ice formation in these areas. In contrast, in Canada, rivers tend to originate and flow within the northern regions or towards the west—particularly in Alaska—limiting this effect. These geographical and climatic conditions give the Russian route a higher level of security and efficiency in logistics operations and delivery times. Its logistical potential is indisputable, but geopolitical control is total: Moscow requires transit permits and supervises navigation using fleets of nuclear icebreakers.



Figure 2. Arktika, the world's most powerful Russian nuclear icebreaker. Source: U.S. Naval Institute

After the 2022 sanctions, Russia used this route as an instrument of economic power, redirecting traffic to non-Western partners, particularly China. According to Zreik and Derendiaeva (2025), Sino-Russian cooperation around the so-called Polar Silk Road constitutes a strategy of resilience vis-à-vis the Western-dominated maritime order. However, this alliance poses an ethical and operational dilemma for European companies: participating in NSR-related projects means exposing themselves to sanctions or compromising their international reputation.

For companies wishing to operate in this context, the challenge is to maintain strategic neutrality and diversify their logistical alliances. Porter and Kramer's (2011) perspective on shared value is relevant here: companies that integrate social and political interests into their strategy build sustainable competitive advantages even in highly uncertain contexts.



Figure 3: The Northern Sea Route: from strategies to realities. Source: Arctic Portal

2.2. The Northwest Passage: Canadian opportunities and sovereignty dilemmas

The Northwest Passage (NWP) stretches from the Bering Strait to Baffin Bay, crossing the territorial boundaries of Alaska (United States), Yukon, Northwest Territories and Nunavut (Canada) until it reaches the waters of Greenland (Denmark). It crosses the Canadian Arctic Archipelago and has emerged as an alternative to the Russian route. Although it offers a relatively more neutral route, it faces technical obstacles—persistent ice, poor infrastructure—and political obstacles: Canada considers the passage under its sovereignty, while the United States and the European Union define it as an international route.

This tension reinforces what Toal and Tuathail (1996) define as critical geopolitics, in which discourses of power materialise in selectively interpreted maps and boundaries. Businesses, caught between sovereign narratives, must act with legal and diplomatic caution. Furthermore, the route crosses Inuit territories, where consultation and consent processes are legally mandatory. Ignoring them would imply not only regulatory non-compliance, but also a serious reputational risk. The Canadian experience shows that companies that collaborate with indigenous governments achieve greater operational stability. Community inclusion is not an obstacle, but rather a preventive governance strategy, consistent with Sen (1999) idea of collective capabilities as the foundation of justice and development.

2.3. The Central Arctic Route: global promise, regulatory vacuum

The Central Route crosses international waters and is the shortest route between Asia and Europe. As the ice recedes, its navigability increases; however, the absence of a regulatory authority creates legal uncertainty. In this scenario, international maritime law—in particular the United Nations Convention on the Law of the Sea (UNCLOS)—constitutes the main framework, although its interpretation varies according to state interests. The absence of a common legal regime requires companies to adopt voluntary self-regulation and multi-level compliance mechanisms, anticipating possible disputes. As Fraser (2009) argues, global justice requires the simultaneous recognition of the dimensions of redistribution, representation and recognition. Transposed to the Arctic context, this means that commercial decisions must consider the balance between profitability, sovereignty and cultural legitimacy.

The three routes share one characteristic: dependence on an unstable international context. International fragmentation—with sanctions, military tensions and economic rivalries—forces companies to redefine the concept of security. In the Arctic, caution is a form of strategy. Organisations that incorporate geopolitical analysis, intercultural sensitivity and ethical commitment into their planning not only reduce risk but also contribute to the stability of the system.

The sustainability of the Arctic will therefore depend on the ability of economic actors to transform competition into cooperation. Such cooperation, however, must be based on business ethics and respect for the peoples who have inhabited the region for millennia.

3. Sanctions, trade wars and instability: the new geopolitical chessboard of the Arctic

The Arctic has become a context in which the dynamics of international trade are intertwined with political tensions, economic sanctions and territorial disputes. The region exemplifies what Agnew (2009) calls the 'rebirth of the geography of power', in which states are once again using natural spaces as instruments of geopolitical influence.

The war in Ukraine and the sanctions imposed on Russia since 2022 have reconfigured cooperation in the Arctic. The Arctic Council, historically a symbol of dialogue, has suspended its joint operations and Western-participated energy projects have been frozen. This rift marks the transition from 'cooperative geopolitics' to 'competitive geopolitics', in which alliances are defined by ideological affinities rather than scientific or environmental interests. The sanctions against Russia have hit liquefied natural gas (LNG) and maritime transport projects on the Yamal

Peninsula hard. Companies such as TotalEnergies and Shell have withdrawn, while China National Petroleum Corporation (CNPC) and COSCO Shipping have taken their place. This shift has strengthened the Sino-Russian axis, promoting the Polar Silk Road as an alternative to Western-dominated routes.

From a business perspective, sanctions produce what Porter (1991) would call an 'environment of distorted competition': market rules are subordinated to geopolitical alignments. Companies no longer compete solely on efficiency, but also on legitimacy and reputation. Operating in sanctioned territories can entail financial, reputational and even criminal risks. In this new arena, companies must develop political risk analysis capabilities: monitoring the impact of sanctions, mapping networks of actors and anticipating possible diplomatic breakdowns. This approach is consistent with the idea of Toal and Tuathail (1996) that geopolitics is not only the politics of states, but also the daily practice of institutions, companies and communities that build and negotiate power.

3.1. The trade war: fragmentation of the economic order

The rivalry between the United States and China has intensified global fragmentation, with direct effects also in the Arctic. As Zreik and Derendiaeva (2025) argue, the Polar Silk Road is both an economic initiative and an instrument of alternative diplomacy, designed to secure Chinese influence in a historically Westernised space . This competition transfers trade wars to extreme latitudes: subsidies, technological control and sustainability standards become instruments of power.

European and North American companies must navigate between two blocs that impose divergent regulations. On the one hand, the West demands environmental transparency and respect for human rights; on the other, Eurasia offers economic incentives and regulatory flexibility. In this dilemma, corporate responsibility becomes a moral compass. Following Carroll (1991) CSR pyramid, corporate sustainability involves balancing economic, legal and ethical dimensions. In the Arctic, this means that a company cannot be profitable at the expense of legitimacy, nor can it operate with only apparent neutrality in the face of regulatory violations.

3.2. Militarisation and structural risk

Economic instability is compounded by the progressive militarisation of the Arctic. NATO is increasing its presence in Norway, Iceland and Finland; Russia has reopened bases on the Kola Peninsula, while the US military presence in the Arctic is concentrated in Alaska and Greenland. Alaska is a key element in the US Arctic defence architecture: here, the country maintains a dense network of military infrastructure—air bases, radar stations and anti-missile systems—which ensures permanent surveillance of Arctic airspace and a rapid response capability to emerging threats.

A representative example of this strategy materialised in September 2024 with the deployment of over a hundred US soldiers, equipped with HIMARS rocket systems, on the island of Shemya, located at the western end of the Aleutian archipelago, approximately 1,930 km south-west of Anchorage. The operation was in response to increased joint military exercises between Russia and China in the North Pacific and Arctic regions, particularly near the coast of Alaska. At that time, eight Russian military aircraft and four naval units, including two submarines, were recorded operating near US airspace and maritime territory. The deployment was part of a larger force projection operation called Ocean-24, which also included the dispatch of a guided missile destroyer and a Coast Guard vessel. These manoeuvres reinforce the idea that the Arctic has ceased to be a passive surveillance zone and has become an active arena for strategic competition.

At the opposite end of the Arctic, the Pituffik Space Base in Greenland (formerly known as Thule Air Base) is the northernmost installation of the US Department of Defence. Located

approximately 1,210 km north of the Arctic Circle and 1,524 km from the North Pole, Pituffik plays a central role in aerospace and missile defence operations. The base houses high-precision radar systems integrated into the ballistic missile early warning system, enabling the detection and tracking of intercontinental launches. In addition, its strategic location facilitates the monitoring of satellites in polar orbits, contributing significantly to the United States' space situational awareness.

Strategic interest in Pituffik has resurfaced in relation to the development of hypersonic missiles by powers such as Russia and China. These weapons, capable of moving at extreme speeds and at low altitudes, pose a considerable technical challenge to current defence systems. According to military analyst and retired officer Troy J. Bouffard, there is currently no fully effective system for neutralising such threats. Consequently, the US strategy is based on deterrence and immediate response capability, further reinforcing the geopolitical value of installations such as Pituffik (Olmo, 2025). Finally, Greenland's geographical position—offering a direct route between Eurasia and North America—confirms its strategic importance, as was already the case during the Cold War. In this context, the administration of US President Donald Trump has once again emphasised the security of the island, questioning Denmark's ability to guarantee it and describing it as critical to US national defence.



Figure 4. Pituffik Space Base. Strategic operations and missile defence in the Arctic. U.S. Department of Defence

The growing militarisation of the Arctic has intensified the geostrategic rivalry between the United States, Russia and China, transforming the region into a theatre of multidimensional competition. Russia has consolidated a significant military presence through the reactivation of former Soviet bases and the expansion of the Northern Fleet, the most powerful component of its navy. These installations incorporate advanced air defence systems, port infrastructure for nuclear submarines and logistical capabilities that strengthen Russia's power projection in the Arctic. Russia's strategy aims not only to strengthen national defence on its northern flank, but also to secure its economic future by attracting foreign investment in strategic sectors such as energy and Arctic logistics (Chan, 2025).

China, although not an Arctic state, describes itself as a 'near-Arctic state' and has increased its involvement in the region through investments in energy infrastructure and the promotion of its Polar Silk Road initiative. This strategy is part of its global economic expansion policy and is accompanied by growing military and technological cooperation with Russia. The organisation of joint military exercises and participation in Arctic development projects reveal a strategic alliance that introduces new challenges for the United States and its Western allies.

In this scenario, even in the absence of open conflict, the region has become a theatre of symbolic deterrence. This creates an indirect operational risk for businesses: route disruptions, increased maritime insurance premiums, cargo surveillance and access control. In the words of Lasserre and Têtu (2020, p.20), "the Arctic has become a securitised space, where logistics is subordinate to politics" and Corporate sustainability therefore requires the integration of security analysis and diplomacy into strategic planning.

The context outlined above therefore requires the development of corporate geopolitical intelligence. It is not enough to react to sanctions or tensions: they must be anticipated. This involves training teams specialised in international risk, monitoring political indicators and maintaining institutional relations with governments and multilateral bodies. Sen's (1999) capability theory offers a useful conceptual basis: organisations, like individuals, must expand their capacity for rational choice in conditions of uncertainty. It follows that true corporate competitiveness lies in flexibility, knowledge and ethics in dealing with change. In short, sanctions and trade wars have shown that the Arctic is no longer an 'empty space' but a field of power. Companies that understand this change will be able to act prudently and responsibly, avoiding the opportunistic logic that has historically characterised extractive economies.

4. Corporate responsibility in the face of geopolitical risk: from opportunism to ethical governance

The transformation of the Arctic into a global logistics hub has tested the traditional limits of corporate responsibility. Operating in an environment where climate, politics, and culture are constantly changing requires a comprehensive corporate ethic that balances profitability and legitimacy.

Companies operating in geostrategic territories cannot be considered neutral entities. As Fraser (2009) suggests, economic institutions participate in the production and distribution of justice. In the Arctic, every corporate decision—a chosen route, a signed alliance, a built port—has ethical and geopolitical implications. The notion of 'business as a political actor' derives from the field of business ethics, in which authors such as Scherer and Palazzo (2011) argue that global corporations should assume responsibilities typically held by states in contexts of weak governance. From this perspective, corporate action in the Arctic is not limited to compliance with the law but includes the promotion of stability and intercultural respect.

The concept of social licence to operate (SLTO) summarises the transition from mere legal compliance to social legitimacy. According to Wilson and Stammler (2016), this licence is built on the consent and trust of local communities. In regions such as the Arctic, where identity and territory are inseparable, SLTO is more fragile and more valuable than any contract. Companies that do not recognise indigenous actors tend to encounter boycotts or blockades. Conversely, those that develop mechanisms for ongoing dialogue, based on transparency and reciprocity, strengthen their reputation and resilience. This is where Carroll's (1991) idea takes shape: corporate ethics as a strategic obligation, not as a moral ornament.

In this context, the new Arctic reality requires the concept of compliance to be extended beyond the legal perimeter. Companies must create systems of geopolitical compliance that consider sanctions, alliances, human rights policies and international commitments. This approach is linked to Matten and Crane's (2005) theory of the 'global corporate citizen', according to which corporations assume civic duties in the absence of effective state governance.

Compliance must also be intercultural: codes of conduct must be adapted to local norms and values, avoiding the imposition of external views. In this sense, the work of Geert Hofstede (2001) is crucial: understanding the cultural dimensions of power, communication and cooperation reduces strategic errors and improves negotiation.

In the Arctic, sustainability depends on the ability of public, private and indigenous actors to co-govern the territory. This model echoes Sen's (1999) idea of freedom as collective agency: development is only sustainable when decisions are shared and participatory. Cooperative governance involves moving from the discourse of 'social responsibility' to the practice of ethical co-responsibility. This includes indigenous participation in decision-making processes, co-financing of sustainable infrastructure and transparency in the distribution of benefits; the legitimacy of the Arctic's future will not be decided in international forums, but in the daily relationship between businesses and communities.

In contexts of high media and environmental exposure, ethical reputation is a survival asset. Porter and Kramer's (2011) theory of shared value states that the creation of economic value must be accompanied by the creation of social value. In the Arctic, this implies transparency of information, local cooperation and public accountability. Responsible businesses do not aim to operate with a 'permit', but with trust. Transparency, ethics and cultural respect are the new foundations of competitiveness in fragile territories. Contemporary justice requires balancing three principles—redistribution, recognition and representation—which, in the Arctic, translate into development, respect and inclusion.

5. Local governance and indigenous inclusion: key factors for business stability in the Arctic

The Arctic is not an empty territory or a frontier without history. It is home to communities that have inhabited, interpreted and governed the ice for millennia. The peoples who live in the region—such as the Inuit, Sámi, Chukchi, Athabaska, Aleuts and Nenets—not only possess ecological knowledge, but also legitimate political structures that shape the governance of the North. Business sustainability in the Arctic depends largely on companies' ability to recognise, integrate and cooperate with these institutions. Effective justice requires a combination of economic redistribution, cultural recognition and political representation. In the Arctic, this means that development must be participatory, intercultural and fair.

Economic, political and environmental transformations have had profound effects on the social and cultural structures of indigenous peoples. Among the most significant consequences are the loss of ancestral territories, forced displacement to urban centres, the migration of younger generations and the deterioration of the physical and mental health of communities (Inuit Circumpolar Council, 2020). These peoples maintain a close relationship—both spiritual and functional—with the natural environment. Their lifestyles, based on hunting, fishing, gathering, and the intergenerational transmission of traditional knowledge, depend directly on the stability of the Arctic ecosystem. Therefore, any significant alteration of the environment—such as ice retreat, changes in animal migration routes, or habitat contamination—poses a direct threat to the culture, livelihoods, and well-being of these communities.

Indigenous knowledge, known as Indigenous and Local Knowledge (ILK), is a key tool for climate risk management. Inuit observation systems, based on ice and wind patterns, enable environmental changes to be detected with a precision that complements modern science. The SmartICE project, developed in Canada, exemplifies how cooperation between science and traditional knowledge can improve maritime safety and reduce emissions. According to the International Work Group for Indigenous Affairs (IWGIA, 2024), such forms of collaboration show that 'sustainability can only be achieved through an alliance between local knowledge and technology'. From a business perspective, integrating indigenous knowledge is not merely an act of cultural courtesy, but rather a strategy of environmental intelligence. The experience of the

peoples of the North offers operational information on routes, seasons, wildlife and climatic conditions that no satellite database can replace.

However, the advancement of mining projects, military infrastructure and the expansion of maritime trade have contributed to the fragmentation of indigenous territories and the imposition of foreign ways of life, triggering processes of forced sedentarisation, loss of autonomy and cultural erosion. A worrying example is the progressive decline of Inuktitut, the indigenous language spoken by the Inuit in Canada, which is not only a vehicle of communication but also a structure of thought linked to the Arctic worldview. Its decline is accompanied by the disappearance of traditional rituals and customs, collective hunting practices and ways of transmitting ancestral knowledge. This not only weakens the cultural fabric but also deepens structural inequalities and reinforces dynamics of social marginalisation. Geographical isolation, reduced access to adequate basic services and the absence of intercultural public policies exacerbate these processes, affecting young people and the elderly, who have higher rates of depression, suicide and chronic diseases associated with the sudden change in traditional lifestyles (Hansen, 2016). Faced with this scenario, it will be necessary to adopt an approach that recognises the collective rights of indigenous peoples over their territories, cultures and ways of life, integrating them as central actors in policies on the future of the Arctic.

Despite the historical and contemporary challenges, they face, indigenous peoples have made significant advances in political representation and legal recognition. In the Canadian Arctic, for example, the creation of the territory of Nunavut in 1999 established a form of Inuit self-government, recognising territorial rights and decision-making capacity. In Scandinavia, the Sámi Parliaments in Norway, Sweden and Finland are consultative and representative bodies that influence language, cultural and territorial policies. These examples show that indigenous governance is not a utopia, but an expanding institutional reality.

At the international level, the indigenous peoples of the Arctic have gained formal representation, particularly in the Arctic Council, the main intergovernmental forum for regional cooperation. Within this structure, six indigenous organisations enjoy 'Permanent Participant' status, which gives them the right to participate in discussions on an equal footing with member states, although without voting rights. These include the Inuit Circumpolar Council, the Sami Council, RAIPON (Association of Indigenous Peoples of the North, Siberia and the Far East of Russia) and other key representatives. This institutionalised presence constitutes an unprecedented recognition of the fundamental role of indigenous communities in shaping regional policies on the environment, sustainable development, culture and security.

Although implementation is still uneven and faces structural resistance, these advances represent significant steps towards more inclusive, intercultural and equitable Arctic governance. These institutional models have been reinforced by international h l instruments that consolidate legal protection and recognition of collective rights. United Nations (2007) provides a fundamental regulatory framework, establishing the right to self-determination, control over territories and the maintenance of their own political, legal, social and cultural institutions. Similarly, Convention No. 169 of the International Labour Organisation (ILO) on Indigenous and Tribal Peoples, 1989 (Office of the United Nations High Commissioner for Human Rights, 1989), one of the most important legally binding instruments in this area, establishes the obligation of States to consult indigenous peoples whenever legislative or administrative measures that may directly affect them are envisaged. The Convention also guarantees rights to ancestral lands, work, health, education and the protection of traditional institutions.

For businesses, this represents a radical change: local actors are no longer 'beneficiaries' of economic activities, but political partners. This idea is in line with the theory of the 'global civic enterprise' proposed by Matten and Crane (2005), according to which corporations must take on a civic role and respect the democratic structures of the contexts in which they operate. In practice, this implies that corporate decisions must include processes of free, prior and informed

consultation (FPIC), as well as the inclusion of indigenous representatives in environmental and social governance mechanisms.

The principle of inclusion cannot be separated from that of distributive justice. As Sen (1999) warns, real development is measured by the capabilities that expand people's freedom. It follows that indigenous participation in business projects must be accompanied by tangible benefits: employment, education, health and infrastructure. Impact Benefit Agreements (IBAs) in Canada are examples of good practice, as they guarantee local participation in revenues and decision-making processes. This model translates Carroll's CSR into concrete redistribution policies. Conversely, when companies impose projects without consent or without fair distribution, people respond with civil resistance or international boycotts. In the Arctic—where reputation is as important as profitability—inclusion ceases to be an ethical gesture and becomes a tool for political and corporate stability.

Companies that succeed in intercultural territories develop what Hofstede (2001) defines as institutionalised cultural competence: the ability to recognise symbolic hierarchies and communication norms. In practice, this means establishing cultural liaison teams, adapting negotiation strategies and respecting the timings and protocols of local communities. Cultural diplomacy, applied to the corporate sphere, allows the company to position itself as a player in cooperation rather than as an external agent. In this way, dialogue becomes a tool for risk mitigation and trust building.

6. Intercultural skills and risk analysis: keys to the future of business in the Arctic

The future of the Arctic will require not only advanced technology, but also cultural intelligence and geopolitical foresight. Intercultural skills are the set of cognitive, affective and behavioural abilities necessary to interact effectively with different cultures. According to Hofstede (2001), sensitivity to local values determines the success or failure of cooperation. Companies that intend to operate sustainably will need to build teams capable of interpreting cultural contexts, managing political risks and making ethically informed decisions. These skills will enable companies to understand how international changes affect their operations. According to Agnew (2009), global power is no longer exercised solely by states, but also by economic actors who 'territorialise their strategies'. In the Arctic, this territorialisation requires ethical sensitivity: a company lacking geopolitical prudence can become hostage to tensions between powers. Developing such intelligence involves integrating political analysis, corporate diplomacy and local knowledge. This multidimensional view is associated with Porter and Kramer's (2011) approach to shared value, according to which sustainable competitiveness emerges when the company contributes to social well-being.

In the Arctic, where corporate decisions affect millennia-old ways of life, cultural empathy is not optional. Understanding traditional calendars, subsistence practices and community authority structures prevents conflicts and strengthens shared governance. The development of such skills must be incorporated into corporate training programmes: workshops on intercultural dialogue, alliances with Arctic universities and exchange programmes with community leaders. Geopolitical and cultural risk management therefore requires an ethic of knowledge. Global justice demands transparency in the production and use of information; in the corporate sphere, this means sharing environmental data, recognising indigenous authorship and accounting for impactful decisions. Businesses must become learning organisations, capable of adapting through critical reflection and the inclusion of different perspectives. This ethical learning strengthens reputation and builds trust in markets and communities.

The Arctic of the future will be a space where business survival will depend on cooperation. Intercultural governance, respect for human rights and economic diplomacy are not abstract ideals, but strategies for resilience. The balance between power and responsibility will be the

determining factor in the Arctic's future; in this sense, businesses must see themselves as co-responsible actors in a global sustainability project.

7. Conclusions

The Arctic has become an emblematic reflection of 21st-century tensions: the progressive melting of ice, the opening of new trade routes, pressure on ecosystems and the need for intercultural skills outline a scenario in which climatic, economic and social challenges are intertwined. This work has shown that sustainability in the North does not depend exclusively on technological progress or the volume of investment, but—above all—on political intelligence, cultural sensitivity and shared responsibility among the actors involved.

Companies operating, or intending to operate, in this region must understand that geopolitical risk management is not a peripheral function, but the core of any sustainable strategy. In the new global paradigm, competitiveness will be measured by the ability to simultaneously generate economic and social value, in harmony with local contexts and fragile ecosystems.

In this context, intercultural skills should not be seen as a complement, but as a fundamental condition for any development initiative. Far from being an obstacle, the indigenous communities of the Arctic are strategic allies, with deep knowledge of the territory, socio-cultural legitimacy and invaluable experience in climate adaptation and sustainability. Integrating them is not only a matter of justice, but also of effectiveness.

Corporate responsibility must therefore evolve towards a form of ethical diplomacy: companies that are able to balance power and prudence will not only ensure their own economic sustainability, but will also actively contribute to regional stability and, ultimately, global peace.

The following recommendations emerge from the analysis:

- Integrate geopolitical analysis into corporate strategic planning, especially in highly sensitive regions such as the Arctic.
- Strengthen ethical and intercultural compliance by incorporating principles of justice, equity and recognition of collective rights.
- Promote tripartite alliances (state-business-community) that favour shared governance models, with joint responsibility and ongoing dialogue.
- Integrate indigenous knowledge into environmental management, logistics and territorial planning processes.
- Promote intercultural education within organisations, from senior management to operational levels.
- Adopt information transparency as an operating principle and tool for social legitimacy.

In short, the Arctic is shaping up to be the great moral laboratory of contemporary capitalism. Companies that act with strategic intelligence, sound ethics and human sensitivity will not only prosper, but also build the conditions for lasting success.

Keywords: Polar shipping routes; geopolitics; international governance; corporate responsibility; intercultural competences; indigenous peoples

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The Polar Silk Road and international governance of the Arctic: geopolitics, indigenous participation and intercultural skills

Francesco Maria Autolino[1], Forster Ampadu[2], Luisa Fernanda Rodríguez Hevia[3]

1. Introduction

The Arctic has ceased to be a remote space and has become a crucial hub in the international system. The accelerated retreat of the ice cap has opened up navigation possibilities that seemed impracticable just three decades ago. This physical transformation has triggered far-reaching political and economic change. In a context marked by rivalry between powers—both Arctic and non-Arctic states—the region has become a laboratory where strategic interests, natural resources, commercial expectations and indigenous communities with a millennial presence converge.

Against this rapidly evolving backdrop, the Polar Silk Road, the Arctic dimension of China's Belt and Road Initiative (BRI) (World Economic Forum, 2023), is emerging. Since the publication of its Arctic Policy Strategy in 2018, Beijing has reinforced its intention to participate in the development of new northern sea routes, as well as energy and scientific projects (State Council of the People's Republic of China, 2018). The seasonal decline in ice has given rise to potential corridors such as the Northeast Passage, controlled by Russia, and the Central Arctic Route, access to which will depend on the evolution of international law and multilateral cooperation. The Chinese vision presents these routes as shorter alternatives between Asia and Europe, with the potential to reduce time, costs and dependence on traditional bottlenecks such as the Suez Canal (Lassere & Faury, 2020).

However, these logistical opportunities are linked to a tense political context. Russia, which has the world's longest Arctic coastline, has established itself as China's privileged partner in the region. Energy and maritime cooperation between the two countries has intensified since Western sanctions were imposed on Moscow in 2014 (Alexeeva , et al,m 2018)) and, more forcefully, since 2022. Cooperation around the Polar Silk Road is not only driven by economic reasons, but also as a response to an international order that both powers perceive as dominated by the West. For Moscow, China has become a key partner in supporting the Yamal projects and keeping the Arctic corridor active. For Beijing, Russia offers political access, port infrastructure and nuclear icebreakers that facilitate entry into an environment to which it does not belong geographically.

At the same time, the Arctic has gained renewed geopolitical importance. The United States, Canada, the Nordic countries and NATO are watching with concern the reversal of the cooperative dynamics that had characterised the Arctic Council for two decades. The deterioration of relations with Russia has paralysed part of the regional governance mechanisms, while military presence and competition for scientific and technological access are increasing. According to

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(Rahbek-Clemmensen & Thomasen, 2020), the region symbolises the transition from an order based on cooperation to one driven by strategic mistrust .

However, the Arctic is not just a place of rivalry between major powers. It is also a territory inhabited by indigenous groups who have their own systems of knowledge, governance structures and ways of relating to the environment that predate the presence of modern states. From this perspective, any discussion of trade routes, resources or infrastructure must incorporate an intercultural and ethical perspective. The effective participation of indigenous peoples in decision-making processes must be a requirement, but also a practical necessity to ensure sustainability and legitimacy. Documents such as the Circumpolar Inuit Protocols for Equitable and Ethical Engagement (Inuit Circumpolar Council, 2022) and the Ethical Guidelines for Research Involving the Sámi People in Finland (University of Oulu, 2024) establish clear principles of consultation, consent, recognition of Indigenous Knowledge and respectful cooperation. Their relevance is central to any actor aspiring to operate in the region, including Chinese, European and multinational companies.

This chapter is part of an effort to understand the relationship between geopolitical transformations in the Arctic and the intercultural skills necessary for responsible governance. The overall objective is to analyse the Polar Silk Road as a key element of China's advance in the Arctic and, at the same time, to highlight the importance of integrating indigenous peoples into decision-making processes that affect their territories.

From an interdisciplinary perspective, the chapter articulates two complementary dimensions: on the one hand, the strategic logic that has driven China to become involved in the region; on the other, the fundamental role of cultural intelligence in the interaction between businesses, governments and local communities . The central premise is that there can be no sustainable development in the Arctic if decisions are taken without the full participation of its ancestral inhabitants. Understanding indigenous values, norms, hierarchies, expectations and ways of life should not be considered a cultural addition, but rather a structural condition for avoiding conflicts, planning errors and irreversible environmental and social damage.

In this sense, the chapter offers a critical reading that connects geopolitics, trade and ethics. The Polar Silk Road cannot be interpreted solely as a logistical project, just as intercultural skills cannot be reduced to mere 'soft skills'. The Arctic is evolving into a space where global and local decisions intertwine, and where businesses and states must learn to operate in complex multicultural contexts.

2. The Polar Silk Road

The Polar Silk Road is the Arctic dimension of the Belt and Road Initiative (World Economic Forum, 2023), launched by China in 2013 with the aim of strengthening global connectivity through land and sea corridors. The inclusion of the Arctic in this strategy represents a significant change in the economic and geopolitical architecture promoted by Beijing. As indicated, since the Chinese government defined its Arctic policy in 2018, the country has sought to position itself as a central player in the exploitation of new maritime routes emerging due to seasonal ice melt, as well as in the development of infrastructure and energy projects in the region.

The Chinese vision is based on a strategic premise: the Arctic offers shorter routes between Asia and Europe. Shipping between Shanghai and Rotterdam can be reduced by about 30% by using the Northeast Passage along the Russian coast (Lasserre & Faury, 2020). This means shorter transit times, lower fuel costs and reduced congestion in traditional corridors such as the Suez Canal. Furthermore, volatility in the Middle East and risks to shipping in the Red Sea have increased global interest in polar alternatives. For Beijing, a country heavily dependent on maritime trade, diversifying routes strengthens economic security and mitigates vulnerability to geostrategic bottlenecks.

The Polar Silk Road is mainly based on cooperation with Russia, which exercises legal and military control over the Northern Sea Route (NSR).

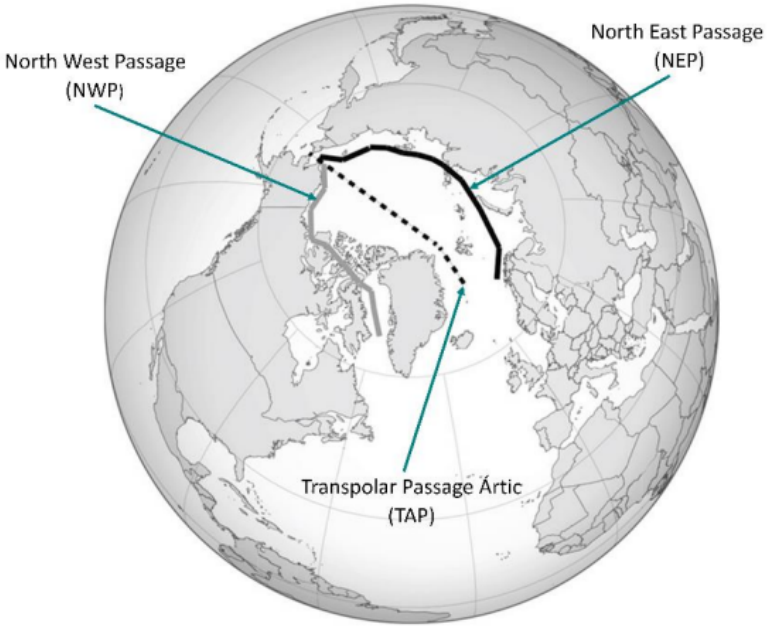


Figure 1. Arctic Marine Shipping Assessment (AMSA): Updated Recommendations (2021)

This collaboration is not only driven by logistical objectives, but also by political and energy interests. Russia has the longest Arctic coastline and a port infrastructure that, although limited, far exceeds that of other circumpolar states. Following Western sanctions imposed on Moscow, China has emerged as the most important financial, technological and commercial partner for Russian projects.

One of the most emblematic cases is Yamal LNG, located on the Yamal Peninsula. The project, led by PAO Novatek—Russia's largest natural gas producer—involves Chinese participation through the Silk Road Fund and the China National Petroleum Corporation (CNPC). In addition, the state-owned company COSCO Shipping has been instrumental in opening summer routes through the NSR, consolidating a trade flow that seemed unlikely a decade ago. China has also invested in icebreaker fleets and polar scientific capabilities, notably with the Xue Long 2, the first domestically built icebreaker. These investments pursue a dual objective: to ensure a Chinese presence in the Arctic and to improve operational capabilities in coastal areas subject to extreme conditions.



Figure 2. Xue Long 2, China's first domestically built icebreaker. Source: Cruise Mapper (2022)

The shared Sino-Russian vision for the Arctic is part of what (Alexeeva, et. al., 2018) call a 'strategy of geo-economic resilience'. In this logic, the Polar Silk Road compensates for restrictions on traditional routes and allows for the projection of influence in a space where the United States and the European Union have historically been dominant. Nevertheless, this collaboration operates in a delicate balance. China maintains global interests that require a certain stability in relations with the West, while Russia seeks economic support without relinquishing control over its Arctic areas. Cooperation is advancing, but Moscow retains a sovereigntist approach that limits Beijing's operational autonomy.

From a legal perspective, the Northeast Passage integrated into the Polar Silk Road is heavily regulated by Russia. The country requires transit permits, fees for icebreaker escort and strict navigation supervision. This regulatory framework is consistent with the broad interpretation of Article 234 of the United Nations Convention on the Law of the Sea, relating to the protection of the environment in ice-covered areas. For international companies, this regime generates additional costs and direct dependence on the Kremlin's decisions (Byers, 2019).

Outside the Sino-Russian axis, the vision of the Polar Silk Road extends to areas such as infrastructure, scientific research and sustainable development. The Chinese government, through its Arctic strategy, has insisted that its presence in the Arctic is 'peaceful, cooperative and respectful of the international order (State Council of the People’s Republic of China, 2018). Beijing has strengthened ties with the Nordic countries through investments in ports, scientific projects and research stations.

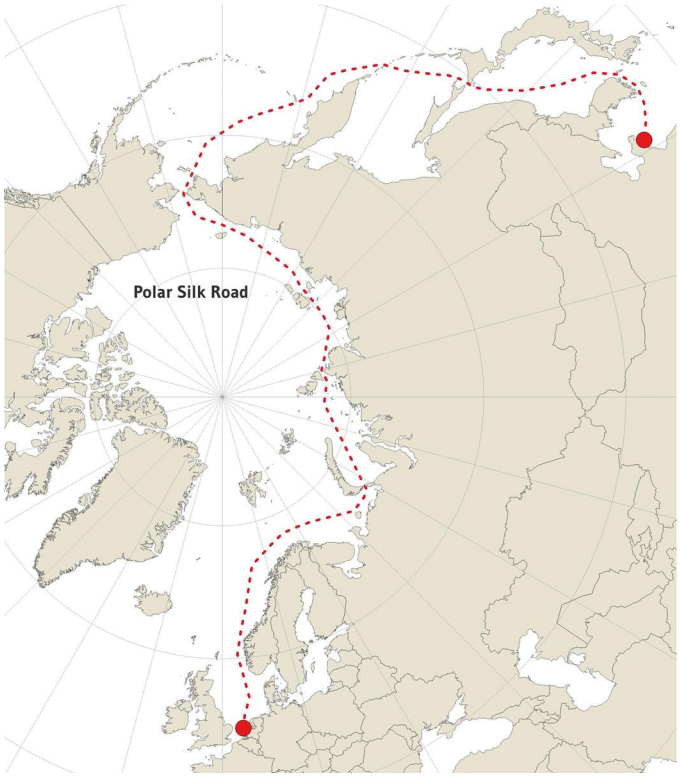


Figure 3. Polar Silk Road. Source: Arctic Centre, University of Lapland

In addition to the political dimension, there is also an environmental aspect. The feasibility of the Polar Silk Road depends on the evolution of ice melt: although the summer period extends the navigation window, conditions remain unpredictable. The risk of sudden ice formation, the lack of ports of refuge and the absence of SAR (Search and Rescue) infrastructure over long stretches of the Arctic pose significant challenges. This vulnerability requires public and private actors to integrate climate risk analysis into their decisions. In addition, increased traffic could amplify environmental impacts such as noise pollution, the risk of spills, or the alteration of marine mammal migration routes (Arctic Monitoring and Assessment Programme, 2021).

Therefore, the Polar Silk Road must be understood within the broader context of global governance in crisis. The international order is undergoing a process of fragmentation, in which supply chains seek resilience and powers reconfigure their alliances. The Arctic dimension of the BRI is a long-term strategic gamble that combines economic, energy, scientific and geopolitical interests. However, its implementation requires a delicate balance: China must project power without triggering disproportionate reactions; Russia seeks capital without ceding sovereignty; and Arctic and non-Arctic states attempt to preserve a stable and sustainable system of governance.

3. China’s geopolitical role in the Arctic

China's presence in the Arctic is one of the most significant geopolitical developments of the last two decades. Although it has no territory in the region, the country has managed to establish itself as an influential player through a combination of diplomacy, science, strategic investment and bilateral cooperation. In its Arctic policy strategy, the State Council of the People’s Republic of China (2018) defines itself as an Arctic-state, a formulation that reflects its intention to actively participate in shaping the future governance of a space that has become central to international trade, energy and security. This self-definition is a political gesture aimed at legitimising its

involvement in an environment traditionally controlled by the eight member states of the Arctic Council.

From a strategic perspective, China's focus on the Arctic responds to four main motivations: the opening of shorter sea routes to Europe; access to critical natural resources; strengthening its status as a scientific and technological power; and diversifying its national security architecture. The reduction in summer ice opens up opportunities for maritime transport, but also for the exploitation of hydrocarbons, minerals and fish resources, all of which are essential for the global economy and for the energy transition that China intends to lead.

In this geostrategic context, relations with Russia take on fundamental importance. Moscow, which controls most of the navigable Arctic coastline, is an indispensable partner for any country wishing to operate along the Northeast Passage. Energy cooperation at Yamal LNG and the large-scale liquified natural gas (LNG) project located on the Yamal Peninsula, Russia, participation in port infrastructure and growing commercial interdependence following European and North American sanctions have strengthened a relationship that, while pragmatic, has profound geopolitical implications. Russia brings experience, military infrastructure and territorial control, while China offers financing, technology and a stable market for Russian energy exports. This convergence of interests represents an axis of strategic convenience rather than an ideological alliance; however, its effects on the regional balance cannot be underestimated.

Despite this cooperation, China must act cautiously so as not to trigger mistrust among the Western Arctic states. Its growing presence has raised concerns about possible latent geopolitical ambitions. (Sørensen & Klimenko, 2018), in Emerging Chinese–Nordic Arctic relations, note that China's economic expansion could translate into disproportionate political influence, especially in vulnerable areas such as Greenland, where Beijing has attempted to invest in airports, mining and other strategically important infrastructure. Denmark, the United States and NATO have responded by tightening control over projects involving Chinese companies in Arctic territories, particularly those with military security implications. This vigilance has increased since 2019, when Washington made it a priority to prevent China from acquiring critical assets in Greenland.

At the same time, the United States has adopted a more assertive stance towards Chinese activity in the Arctic, linking it to the global rivalry between the two powers. The US Department of Defence's (2024) Report on Arctic identifies the region as an area where China is attempting to extend its influence through economic, scientific and diplomatic means. China's presence in polar research, for example, has gone from being considered scientific cooperation to being interpreted as a potential vehicle for strategic projection. The establishment of observation stations, participation in scientific expeditions and the expansion of icebreaker fleets are being watched with increasing attention, as they could have dual applications. At the same time, China argues that its scientific interest is legitimate and necessary to understand the global effects of climate change, a phenomenon that affects both the Arctic and ecosystems and societies in more southern latitudes.

Strategic tension around the Arctic is amplified by the deterioration of relations between Russia and the West. The partial suspension of the Arctic Council's operations after Russia's invasion of Ukraine in 2022 has weakened one of the main pillars of regional cooperative governance. In this vacuum, China has sought to project itself as a player willing to maintain scientific and economic cooperation, thereby reinforcing its narrative of responsible power. However, its proximity to Moscow raises doubts about its ability to act as a neutral intermediary.

Another key element of China's geopolitical role in the Arctic concerns its economic strategy. The inclusion of the Polar Silk Road in the BRI responds to a logic of diversification: China is seeking new trade routes that reduce its dependence on the Strait of Malacca and the Suez Canal, two vulnerable points in its global logistics architecture. At the same time, Chinese investments in Arctic mining and energy aim to secure the supply of strategic minerals needed for technological transition, including nickel, rare earths and cobalt. The combination of climate

risks, economic opportunities and political tensions transforms the Arctic into a space where economic decisions take on an immediate geopolitical character.

Finally, China also uses scientific diplomacy as a tool of influence. Polar research is one area where the country is attempting to project an image of itself as a constructive actor. The China–Iceland Arctic Science Observatory and participation in the global Arctic observation programme are examples of efforts to join international scientific cooperation networks (Bertelsen & Gallucci, 2016). While this 'soft' diplomacy helps to strengthen China's global reputation, it also allows it to expand its knowledge of the Arctic environment, improve its management capabilities in extreme conditions and support a narrative of 'legitimate participation'. Beijing believes that the Arctic will become a key space for the global economy of the future and for the reconfiguration of the international order. However, its progress is conditioned by factors beyond its direct control: rivalry between major powers, the fragility of the Arctic governance regime, and the growing need to integrate indigenous peoples as essential actors in any project aspiring to sustainability.

4. The importance of promoting intercultural skills in the Arctic

The Arctic is not only a geographical and geopolitical space, but also a complex socio-cultural fabric in which indigenous peoples with different values, languages, knowledge systems and community structures coexist. Inuit, Sámi, Chukchi, Nenets, Yupik and other communities make up a region characterised by deep historical continuity and ways of life that are intimately connected to the natural environment.

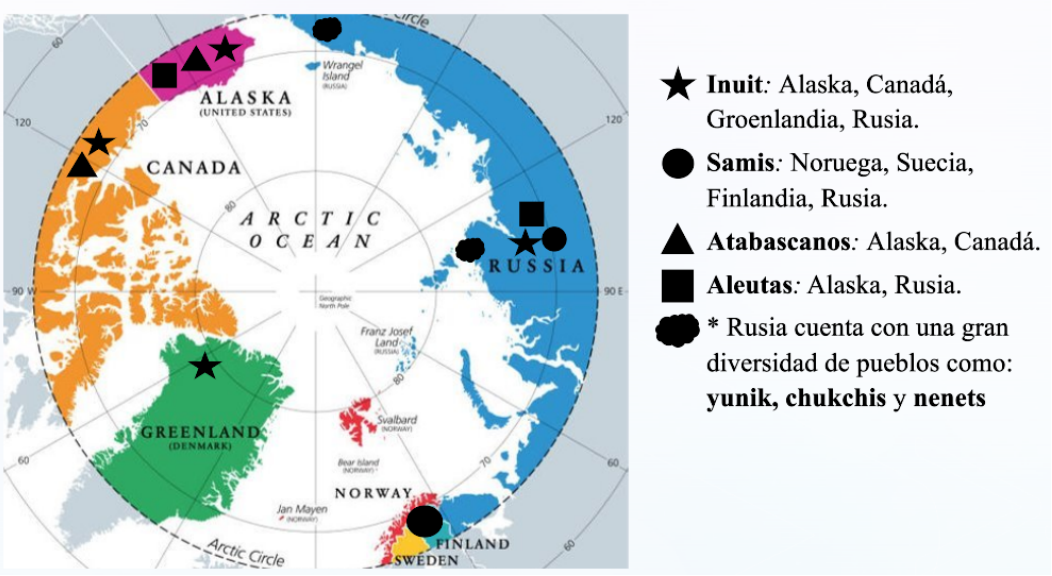


Figure 4. Indigenous communities in the Arctic

In this context, intercultural skills are not just a set of desirable professional abilities, but a structural requirement for ensuring respectful relationships, sustainable operations and legitimate decision-making processes. For international companies, governments and multilateral organisations, working in the Arctic involves interacting with knowledge systems that differ from Western ones and, above all, recognising the legitimate authority that indigenous peoples exercise over their territories, ways of life and development priorities (Inuit Circumpolar Council, 2022).

From an academic perspective, according to Deardorff (2006), intercultural competencies can be defined as cognitive, emotional and behavioural skills that enable a person to interact effectively and respectfully with individuals from different cultures. In the Arctic, these skills

take on a specific meaning, as cultural differences are not accidental but structural. Unlike multicultural urban contexts, relations with indigenous peoples in the Arctic involve recognition of their own legal systems, traditional forms of leadership, community values centred on reciprocity, and strategies for relating to the environment based on generations of observation and practice. Deardorff's model of intercultural competence proposes a combination of attitudes (respect, openness, curiosity), knowledge (deep understanding of the cultures involved) and skills (communication, active listening, adaptation). This approach conceives intercultural competence as a cyclical and dynamic process, particularly useful in contexts where relationships must be built with time, trust and continuous dialogue. Furthermore, (Earley & Ang, 2003)'s notion of cultural intelligence (CQ) offers a complementary understanding: the ability to interpret cultural behaviours and adjust one's actions according to the context. CQ includes cognitive, motivational and behavioural dimensions that enable organisations to navigate complex situations with cultural sensitivity.

Hall's (1976) classic approach to high- and low-context cultures offers further interpretative tools. Many indigenous Arctic cultures can be considered high context, where communication is based on implicit elements, silence, observation and reading the environment. In contrast, many international companies operate in low-context communication frameworks, which are more direct and explicit. This difference can lead to misunderstandings if not addressed with adequate training (Hall, 1976). The research of Triandis (1995) and Hofstede (2001) on individualism, collectivism and power distance is also relevant. Indigenous Arctic societies tend to favour consensus and community cohesion over individual interests . Decision-making processes are based on extensive consultation and the search for balance with the environment. For companies accustomed to hierarchical dynamics, accelerated timelines and linear planning, such practices may appear slow, even though they respond to forms of governance that have ensured community survival and well-being for centuries.

The convergence of these interdisciplinary theories allows us to understand why intercultural skills are essential in the Arctic. By way of example, it should be remembered that a significant part of the main regional economic activities cross indigenous territories: mining projects, port infrastructure, scientific stations, shipping routes and maritime expeditions. All these activities affect resources such as traditional hunting, animal migration routes and the cultural integrity of communities that depend on the environment for food security and identity continuity. For this reason, any project that ignores the intercultural dimension risks failure, generating conflict or being perceived as a contemporary form of colonialism (Wilson & Stammler, 2016).

Recent years have seen numerous examples of companies and governments making mistakes due to a lack of cultural sensitivity. Gaps in consultation processes, ignorance of Indigenous Knowledge, underestimation of community leaders or failure to recognise territorial rights have led to tensions that compromise the feasibility of projects. Conversely, initiatives that have genuinely integrated Indigenous peoples have demonstrated greater stability and lower reputational risks. The co-production of knowledge between scientific knowledge and forms of indigenous knowledge, as recommended by the Inuit Circumpolar Council Protocols (2022), is one of the most relevant practices in this area. This methodology not only combines scientific data and traditional knowledge accumulated over generations, but also recognises the epistemic legitimacy of both systems, promoting more integrated and sustainable decisions.

In this perspective, international organisations such as the United Nations, the International Labour Organisation and the Arctic Council emphasise the need to ensure prior, free and informed consultation processes, as established by the United Nations Declaration on the Rights of Indigenous Peoples (United Nations, 2007). These regulatory frameworks have promoted a gradual transformation in the way businesses and states approach indigenous peoples. Beyond mere legal compliance, the development of intercultural competence requires open-mindedness, institutional humility and a willingness to redistribute power in decision-making processes.

Therefore, cultural intelligence should not be understood as a one-way tool aimed exclusively at non-indigenous businesses or governments. It also requires recognising that local communities have the capacity to adapt to different external actors and to build forms of cooperation based on reciprocity and respect. Intercultural interaction in the Arctic is, therefore, a two-way process in which both parties contribute to the creation of more inclusive governance frameworks. This process must be based on intercultural skills that build trust, on cooperation supported by culturally sensitive communication, on corporate and economic relations, and on the influence of international public opinion.

This approach is particularly relevant for understanding the dynamics between China and the indigenous peoples of the Arctic. As Beijing increases its economic, energy and scientific presence, it becomes essential to build deep intercultural relationships. Chinese companies tend to operate in cultural contexts characterised by hierarchical structures and collective values, which can facilitate certain aspects of working with indigenous communities, but can also generate tensions if consultation is interpreted as a mere administrative formality. Intercultural dialogue requires real commitment, adequate time and a willingness to integrate different perspectives into the design and implementation of initiatives.

Intercultural skills are therefore an essential pillar of contemporary Arctic governance. Their relevance transcends effective communication: they are part of a broader ethical framework aimed at ensuring respect, sustainability, reciprocity and justice. The socio-cultural complexity of the region requires that every external actor develop a deep understanding of local dynamics, recognising that the survival and prosperity of indigenous communities are intimately linked to ecological balance and political self-determination.

4.1. Indigenous frameworks for legitimate Arctic governance

The integration of indigenous peoples into decision-making processes is a fundamental element in ensuring legitimate and sustainable governance of the Arctic. Beyond institutional rhetoric, indigenous participation requires real mechanisms for consultation, consensus, recognition of Indigenous Knowledge and equitable distribution of power. The United Nations Declaration on the Rights of Indigenous Peoples establishes clear principles in this regard, in particular the right to free, prior and informed consent (FPIC), an international standard that requires states, companies and organisations to ensure transparent and respectful processes before undertaking any activity that directly affects indigenous peoples or their territories.

The importance of this principle is reflected in the practices derived from protocols and guidelines published by indigenous communities and peoples in the Arctic. These include the Ethical Guidelines for Research Involving the Sámi People in Finland (2024) and the Circumpolar Inuit Protocols for Equitable and Ethical Engagement (2022), whose communities are represented in the Arctic Council by the Saami Council and the Inuit Circumpolar Council.

The Ethical Guidelines for Research Involving the Sámi People in Finland, published by the University of Oulu, are the first interdisciplinary guidelines specifically for research with the Sámi people in Finland. They were developed after several years of joint work between the Sámi Parliament, Finnish universities and Sámi communities, and apply to any discipline that investigates Sámi people, communities, territory or society in Finland. The guidelines also state that they can be used throughout Sápmi. Their main objective is to create culturally safe research environments, recognising Sámi self-determination, the collective nature of knowledge, the centrality of Sámi languages and the need to obtain free, prior and informed consent that is not merely formal. They emphasise shared responsibility throughout the entire research cycle (co-design, data collection, interpretation and dissemination), the return of results to communities in useful formats, and responsible governance of data and materials in order to avoid the misappropriation of indigenous knowledge.



Figure 5. Sámi indigenous community. Source: Artic Portal (2024)

The Circumpolar Inuit Protocols for Equitable and Ethical Engagement, developed by the Inuit Circumpolar Council, offer one of the most robust frameworks for operating ethically in the Arctic. Protocol 1, 'Nothing About Us Without Us', stipulates that no research, economic project or public decision can be developed without the active participation of the Inuit; this implies sharing decision-making processes from the earliest stages and recognising communities as political actors with veto power. Indigenous Knowledge occupies a central position: it is understood as a complete epistemic system, based on multigenerational observations of ecosystems, climate and animal life, which must be recognised as such and not automatically subordinated to Western science. From this perspective, the Arctic can only be understood holistically, considering the interdependencies between ice, wildlife, food security and hunting practices, which makes such knowledge an indispensable input for integrated decisions.

The protocols also develop concrete principles of good governance and relations with Inuit communities. Protocol 3, 'Practice Good Governance', requires transparency, accountability and meaningful participation in all phases of projects, obliging companies and external actors—including Chinese companies interested in energy investments or logisti s—to adapt hierarchical models to contexts where community consensus is essential. Protocol 4, 'Communicate with Intent', emphasises the importance of clear, continuous and culturally relevant intercultural communication, while Protocol 5 insists on accountability through consistent actions and tangible benefits. Protocol 6 calls for lasting, non-transactional partnerships with power and benefit sharing; Protocols 7 and 8 address community control of data and adequate funding to ensure truly equitable indigenous participation, avoiding extractive practices in both Arctic research and governance.

The Ethical Guidelines for Research Involving the Sámi People in Finland and the Circumpolar Inuit Protocols for Equitable and Ethical Engagement share a common basis: they recognise indigenous peoples as political subjects with the right to self-determination and control

over how knowledge about them is produced. Both documents insist on early community participation, assessment of benefits and risks, respect for indigenous knowledge, and the obligation to return results in useful forms. In both cases, the guidelines are developed through lengthy co-design processes with indigenous communities and academics and aim at 'culturally safe' working environments, where Indigenous Knowledge is recognised as a valid system in its own right, not simply as a complement to Western science.

Taken together, these principles provide a solid framework for understanding decision-making processes in the Arctic. This is not just a matter of cultural aspects, but of justice, self-determination and democratic governance in a territory whose ancestral inhabitants have historically been marginalised. In the era of the Polar Silk Road, in which extra-regional actors are seeking to expand their presence, the full adoption of these protocols and guidelines is essential to avoid past mistakes and build a sustainable future for all the peoples of the Arctic.

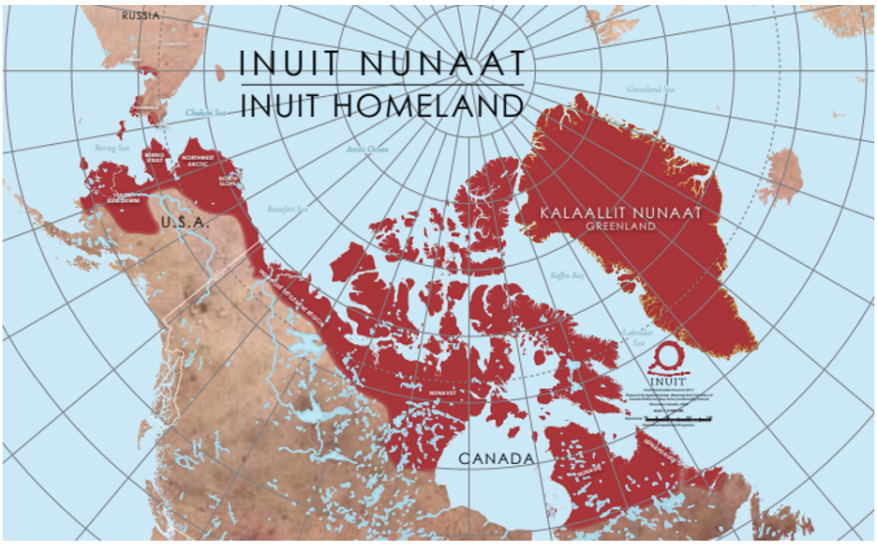


Figure 6. Map of Inuit Nunaat. Source: Inuit Circumpolar Council (2022)

4.2. Intercultural skills for inclusive governance

Intercultural skills, as analysed above, enable external actors to interact with the indigenous peoples of the Arctic in a respectful and effective manner. In the context of governance, these skills take on political significance as they aim to build institutions capable of fairly integrating indigenous voices into regulatory, negotiation and planning processes. Contemporary Arctic institutions, such as the Arctic Council, have recognised since the 1990s that indigenous participation cannot be symbolic. The status of Permanent Participants, granted to organisations such as the Inuit Circumpolar Council or the Saami Council, reflects this commitment, although gaps remain that require attention.

In this context, the framework of the 'Six Intercultural Competencies' is useful in helping to define more precisely the skills needed to move towards inclusive governance:

- Historical and political literacy
- Epistemic humility and plural integration of knowledge
- Relational responsibility and long-term commitment
- Communicative and linguistic adaptability
- Co-management and design of shared governance models
- Recognition and implementation of indigenous autonomy

Historical and political literacy is an essential starting point. Any actor operating in the Arctic must understand the processes of colonisation, territorial disputes, overlapping legal frameworks and the specific trajectories of each indigenous people. Without this understanding, even proposals presented as innovative risk reproducing colonial logic.

Epistemic humility and the plural integration of knowledge require recognition that Indigenous Knowledge is a complete system of knowledge, with its own methods and temporalities. Its incorporation cannot be reduced to a symbolic gesture. It is fundamental in a context where melting ice and climate change are altering ice patterns, wildlife routes and socio-ecological dynamics—processes that communities know first-hand.

Relational responsibility and long-term commitment remind us that participation is not achieved through one-off consultations. Communities value continuous presence, trust-building and reciprocity. This implies accompanying processes before, during and after decisions are made, taking responsibility for the effects of the measures adopted.

Communicative and linguistic adaptability requires adapting communication methods to local rhythms and realities. Legitimacy within communities is held not only by formal leaders, but also by elders, experienced hunters, older women and knowledge keepers. Furthermore, meetings must be organised according to climatic cycles, hunting seasons and family dynamics, and not on the basis of external calendars that rarely fit in with everyday life in the Arctic.

Co-management and the design of shared governance models transfer these skills to the institutional and organisational level. States and international bodies need regulatory frameworks that recognise indigenous rights, priorities and forms of knowledge. Free, prior and informed consent (FPIC) must be a non-negotiable principle for any economic, scientific or infrastructure initiative. At the same time, companies must review their internal structures, form intercultural teams, include indigenous advisors and adapt their communication methods. The tensions that Chinese, European and North American companies frequently encounter in the Arctic highlight the limitations of conventional corporate approaches when they are not adapted to local decision-making systems.

Recognising and implementing indigenous autonomy means moving towards real forms of self-government. This means guaranteeing territorial rights, ensuring binding participation in state institutions and incorporating Indigenous Knowledge into strategic decisions. Some Nordic countries have made progress, but significant gaps remain. In Canada and the United States, relations between federal governments and indigenous peoples remain marked by historical and administrative inequalities that require sustained reconciliation processes.

The application of these six competencies is necessary at the institutional, organisational and community levels. At the institutional level, they guide the development of regulatory frameworks that avoid the reproduction of colonial inequalities. At the organisational level, they help transform corporate and scientific practices to align them with principles of respect, co-management and relational accountability. At the community level, they strengthen direct interaction between external actors and indigenous peoples, recognising diverse leadership and respecting local rhythms.

A particular challenge arises with China's growing presence in commercial and scientific activities in the Arctic. Although its diplomacy presents itself as cooperative, Chinese state-owned enterprises often operate with hierarchical structures and limited participation processes, which can generate friction with the principles of Arctic community governance. In this context, intercultural skills serve as a tool for harmonising economic interests and local values. Similarly, Arctic states need to strengthen their own intercultural capacity: advances in self-government in some Nordic countries do not eliminate persistent gaps in land rights, representation and recognition of Indigenous Knowledge in decision-making processes.

Inclusive governance is, ultimately, an evolving process. There are no universal solutions for all Arctic regions, as each community has its own history and priorities. Intercultural skills should not be understood as a list of technical abilities, but rather as a way of working that combines

sensitivity, ethics and continuous learning. At a time when the Polar Silk Road is gaining relevance in the region, such skills are no longer a complement: they are becoming a prerequisite for ensuring sustainability, legitimacy and equity.

5. Conclusions

The Arctic is going through a decisive phase in which global transformations and deeply interconnected local processes are converging. The gradual opening of maritime routes increased geopolitical competition between major powers and the intensification of energy, scientific and logistical projects have transformed the region into a central arena of international politics. In this scenario, the Polar Silk Road emerges as one of the most significant developments of the 21st century: it represents both a strategic gamble by China to diversify trade routes and secure energy resources, and a reflection of the new multipolar order taking shape.

However, the future of the Arctic will not depend solely on the geo-economic interests of China, Russia, the United States or the Nordic countries. It will depend above all on the collective ability to establish governance that recognises the legitimacy and centrality of indigenous peoples, the true ancestral inhabitants of the region. Such governance must be ethical, inclusive and respectful of international law, in particular the frameworks established by the United Nations Declaration on the Rights of Indigenous Peoples and essential documents such as the Circumpolar Inuit Protocols for Equitable and Ethical Engagement.

Research shows that maritime routes, energy projects and scientific cooperation cannot be separated from the cultural, social and spiritual dimensions that define life in the Arctic. Indigenous knowledge is not a complement to science, but a comprehensive knowledge system that provides an understanding of the interrelationships between climate, animals, ecosystems and human well-being. Its integration into decision-making processes improves the quality of assessments, reduces risks and contributes to long-term sustainability.

From this perspective, intercultural skills should not be seen as ancillary abilities, but as structural elements of any project that aspires to operate in the contemporary Arctic. International companies must assume that trust, transparency and communication adapted to the cultural context are indispensable requirements. Inclusive governance means abandoning extractive or vertical approaches and moving towards models based on dialogue, respect and the co-production of knowledge. The Inuit, Sámi, Nenets and Chukchi communities, among others, are not mere 'stakeholders', but holders of collective rights and custodians of territories whose ecological integrity sustains life itself in the Arctic.

Furthermore, the geopolitical dimension cannot be ignored. The Polar Silk Road provides a lens through which to interpret the tensions between cooperation and competition in the international system. The Sino-Russian alliance along the Northeast Passage, the reactions of the Nordic countries, the US strategy towards the region and the growing militarisation show that the Arctic is no longer an isolated space. What happens there will affect global security, supply chains and international governance.

Faced with such complexity, the challenge is twofold: on the one hand, to manage competition between powers without compromising regional stability; on the other, to ensure that economic development does not come at the expense of the self-determination of indigenous peoples or the ecological balance of the Arctic. Intercultural skills, far from being a purely theoretical resource, are the bridge that allows these two objectives to be articulated.

In conclusion, the Arctic has become one of the most strategic regions in the world, but also a space where our capacity for coexistence, justice and sustainability is being tested. The Polar Silk Road symbolises the opportunities and risks of the 21st century. In this scenario, ethical and intercultural governance is not only desirable but essential. In a territory where local decisions have global effects and where indigenous knowledge is crucial to understanding the climate, the future of the Arctic will depend on the ability of all actors—states, businesses and international

organisations—to respect cultural diversity, recognise indigenous authority and build institutions that reflect the complexity of a world undergoing profound change.

Keywords: Polar silk road, arctic geopolitics, international governance, indigenous peoples, intercultural skills

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Track 5: INNOVAZIONE, GOVERNANCE E SOSTENIBILITÀ NELLA FINANZA DEI MERCATI, INTERMEDIARI E IMPRESE

Who Gets Accused? Using LLM to Predict Climate-Washing from Sustainability Reports

Olga Bogachek, Massimiliano Bonacchi, Luca Menicacci, Paolo Perego, Francesco Reggiani

Chi è pronto per l'Euro Digitale? Il ruolo dell'alfabetizzazione finanziaria e della fiducia nell'innovazione finanziaria

Elvira Anna Graziano, Gerardo Petroccione, Carlo Drago

Exploring the Intersection of Environmental Sustainability and FinTech: Patterns, Developments, and Knowledge Gaps

Francesco Minnetti, Loris Di Nallo, Alberto Manzari, Anna Maria Calce

Who Gets Accused? Using LLM to Predict Climate-Washing from Sustainability Reports

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1. Introduction

Greenwashing — the act of making misleading environmental claims in corporate disclosures — poses material risks to investors, regulators, and capital markets. The societal and financial stakes of greenwashing are high. As ESG-themed investment has grown to encompass trillions of dollars of assets, the gap between disclosed environmental commitments and actual corporate performance has attracted increasing regulatory scrutiny and, crucially, formal legal action. Sato et al. (2024) document a noticeable drop in abnormal stock returns at lawsuit filing, rising to 1.50% following unfavourable court decisions. Overall these figures underscore the materiality of the phenomenon for financial economists and practitioners alike.

Yet ex-ante empirical detection remains methodologically underdeveloped. ESG ratings disagree substantially across providers, assurance coverage is uneven, and text-based detection approaches have largely relied on ad-hoc keyword dictionaries that are neither theory-grounded nor externally validated. The result is a literature that describes greenwashing richly but predicts it poorly.

This study addresses this gap and asks whether greenwashing risk can be identified before enforcement occurs, using only the text of firms' sustainability reports. We propose a structured, theory-anchored workflow that uses a large language model (LLM)- based approach to evaluate firm sustainability reports against an established greenwashing typology. We build on Lyon and Maxwell's (2011) theoretical typology to construct a theory-grounded LLM-based greenwashing risk measure, which we relate to observed climate-washing litigation outcomes. We then test whether these scores carry forward-looking information by linking them to confirmed litigation outcomes: formal accusations recorded in the Sabin Center for Climate Change Law's Climate Case database. We contribute to the growing literature by linking text-based greenwashing risk measure against climate-washing litigation outcomes rather than against investor perceptions, media coverage, or ESG rating disagreements.

The contribution is threefold. Methodologically, we develop and illustrate a feasible, transparent, and replicable LLM workflow grounded in established theory. Substantively, we provide initial evidence that ex-ante detection is possible from disclosures alone. Conceptually, we bridge finance, law, and disclosure research by anchoring a text-based measure to real enforcement: a move that addresses the field's well-documented fragmentation across management, environmental science, and securities law.

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Our theoretical anchor is the greenwashing typology developed by Lyon and Maxwell (2011, 2015) extended into integrated framework by Nemes et al. (2022), which formalizes the mechanisms through which firms mislead stakeholders about their environmental credentials. These mechanisms, which include selective disclosure, vague claims, and strategic omission of negative information, are conceived as deliberate, systematic rhetorical choices rather than opportunistic errors. Crucially, they map naturally onto linguistic features that LLMs are well-positioned to detect: those associated with ambiguity, imbalance, and limited verifiability.

Marquis and Toffel (2016) provide the strategic-disclosure logic: firms selectively disclose positives and omit negatives to conform to stakeholder norms, a behaviour visible in overly positive tone and reduced textual balance. Delmas and Burbano (2011) complement this by documenting the demand-side pressures (from capital markets, regulators, and individual managerial incentives) that make greenwashing rational even for financially robust firms. Together, these perspectives motivate hypotheses spanning AI-based indicators, textual features, institutional context, and firm characteristics."

We test a set of high-level hypotheses linking the likelihood of external allegations related to environmental communication to multiple firm-level dimensions. First, we examine whether AI-based indicators derived from sustainability disclosures capture signals associated with such allegations. Second, we analyze whether linguistic characteristics of disclosures—such as tone and complexity—are systematically related to increased scrutiny. Third, we consider the role of industry affiliation and regulatory context in shaping exposure to allegations. Finally, we investigate whether underlying firm fundamentals are associated with variation in allegation risk.

While mandatory ESG disclosure regimes (e.g., the EU's CSRD and the forthcoming Green Claims Directive) make omission harder, standardisation may incentivise more creative linguistic strategies that escape keyword-based detection. This reinforces the case for a semantically rich, context-sensitive analytical method.

The study draws on several primary sources. First, we identify accused firms using the Sabin Center Climate Litigation Database, a widely used and continuously updated compilation of climate-related legal cases. We algorithmically flag greenwashing cases by parsing case summaries for keywords indicative of potentially misleading environmental communication.

This screening process yields a sample of accused corporate entities across multiple jurisdictions and sectors. Cases arise under a variety of legal instruments. The economic and policy relevance of these cases is is underscored by enforcement actions against major asset managers and industrial firms, which demonstrates that greenwashing accusations carry material financial and reputational consequences.

Second, we construct a matched sample of non-accused firms to serve as a benchmark, aligning firms along key observable characteristics such as industry, geography, time, and size. This matching approach is designed to ensure comparability while mitigating confounding differences between accused and non-accused firms. The resulting panel covers multiple firms observed over several years, depending on the availability of sustainability disclosures.

Third, for each firm-year, we collect corporate sustainability or integrated reports, supplemented where necessary by relevant ESG-related sections of annual reports. These textual data are combined with firm-level financial information obtained from a standard commercial database. To reduce the influence of extreme observations, continuous financial variables are treated using standard winsorization procedures.

Methodologically, the study's primary contribution lies in the development of a theory-grounded, AI-assisted measurement approach to greenwashing risk. Specifically, we design a structured prompting architecture that operationalizes the dimensions of an established greenwashing framework through a sequence of explicit evaluative queries. This design embeds theoretical constructs directly into the LLM's reasoning process, enhancing interpretability and ensuring conceptual alignment between measurement and theory. The approach further emphasizes transparency and replicability by standardizing prompts and outputs across model

iterations, allowing consistent application across firms and reporting contexts. Beyond simple text classification, the method is designed to capture patterns of omission, exaggeration, and inconsistency in disclosures, translating qualitative assessments into a structured risk signal.

To complement the LLM-based measure, we consider a set of conventional textual and firm-level characteristics that are commonly used in disclosure research. These include broad linguistic characteristics of sustainability reporting, such as tone and readability, alongside firm attributes that may shape both disclosure incentives and exposure to scrutiny. We also incorporate dimensions related to industry affiliation, scale, and reporting environment in order to separate the informational role of the proposed measure from more standard correlates of allegation risk.

Empirically, the analysis is designed to preserve temporality by relating disclosure characteristics observed in one period to subsequent allegations. To improve comparability, accused firms are evaluated against a matched benchmark sample of non-accused firms with similar observable characteristics. This allows the empirical design to focus less on unconditional differences between firms and more on whether the proposed text-based measure captures variation that remains informative once basic differences in firm profile and disclosure context are taken into account.

The empirical strategy proceeds in several stages. A first set of specifications examines whether conventional textual indicators alone are associated with subsequent accusations. A second layer adds firm-level and contextual controls, reflecting the idea that greenwashing risk may arise not only from how firms write, but also from the incentives, visibility, and institutional settings under which they report. A final set of models introduces the LLM-based measure in order to assess whether a theory-informed semantic indicator captures aspects of disclosure risk not fully reflected in more traditional text-based proxies. In this sense, the objective is not simply to compare prediction across models, but to examine whether different measurement approaches appear to capture distinct layers of disclosure behaviour.

At a descriptive level, the data already suggest meaningful heterogeneity in both reporting style and the LLM-derived assessment of disclosure risk. This is important because it indicates that the proposed workflow does not merely reproduce uniform scores across reports, but instead differentiates across firms and reporting contexts in a way that is potentially useful for empirical analysis. More broadly, the design allows us to explore whether accusations are associated with simple rhetorical features, with deeper semantic patterns emphasized by theory, or with some combination of the two.

The early evidence obtained in our study is encouraging, though necessarily preliminary. Broadly, the results suggest that conventional textual variables capture some features of disclosure style, but that a theory-informed LLM-based measure may provide an additional and potentially distinct signal. This is consistent with the idea that aggregate textual proxies, while informative, may not fully reflect the more nuanced patterns of omission, imbalance, or selective emphasis that greenwashing theory highlights. At the same time, the analysis also indicates that allegation risk is unlikely to be explained by text alone, and instead appears to reflect an interaction between disclosure content, firm characteristics, and external scrutiny.

Taken together, these patterns support the feasibility of the proposed empirical approach. Rather than treating greenwashing as a purely conceptual construct or relying exclusively on broad textual heuristics, the framework illustrates how theory-grounded LLM outputs can be incorporated into a more traditional empirical design and examined alongside established controls. For the purposes of this study, the contribution is therefore less about claiming a definitive predictive model and more about showing that a structured, semantically rich measure of disclosure risk can be meaningfully brought into the empirical study of greenwashing.

As an additional credibility check, the empirical design can be supplemented with standard robustness and comparability tests. In particular, balance diagnostics on the matched sample help assess whether accused and benchmark firms are broadly similar along key observable dimensions prior to estimation. Sensitivity analyses can further examine whether the main

patterns are robust to alternative matching choices, variable definitions, and model specifications. More generally, the framework allows for checks using different subsets of controls, alternative text measures, and variations in the construction of the LLM-based indicator. Taken together, these steps help ensure that any emerging associations are not driven by a particular modeling choice or sample composition.

Several preliminary observations emerge from the analysis. First, the association between firm characteristics and accusation risk s broadly consistent with the view that greenwashing may reflect strategic communication incentives. This is consistent with the selective-disclosure logic of Marquis and Toffel (2016) and the capital-market-pressure mechanisms identified by Delmas and Burbano (2011).

The analysis also suggests that theory-informed LLM-based measures may capture aspects of disclosure not fully reflected in conventional textual proxies. While these traditional proxies reflect aggregate sentiment, the LLM-based measure is designed to engage with the underlying semantic content of disclosures, in line with theory-informed dimensions of communication. This suggests that such approaches may be better suited to identifying more nuanced patterns in reporting that are not fully captured by conventional text-based metrics.

The study is subject to several limitations that warrant caution in interpretation and point to avenues for future research. First, the analysis is based on a relatively limited sample of litigation-confirmed cases, and should therefore be viewed as preliminary, feasibility-stage evidence rather than a definitive benchmark. Second, the use of litigation outcomes as a proxy for greenwashing introduces potential noise, as such cases are unevenly distributed across jurisdictions and do not necessarily reflect final determinations of misconduct. Finally, as with any LLM-based approach, results may be sensitive to model specification and prompt design, highlighting the need for further validation and robustness analysis in future work.

In summary, this study provides initial evidence that greenwashing risk is detectable ex-ante in the text of sustainability reports using a structured, theory-grounded LLM workflow. Building on existing greenwashing typology, we propose a workflow to derive a LLM-based risk measure that helps relate formal climate-washing accusations in a litigation-observed matched sample. The measure appears to capture information not fully reflected in standard textual and firm-level indicators..

The methodological implications are practical and immediate. Regulators, ESG rating agencies, and institutional investors can, in principle, deploy structured LLM scoring as an early-warning tool, flagging disclosures for targeted review before enforcement actions materialise. The approach is scalable to large report corpora, language-agnostic in principle, and interpretable at the dimension level: the approach also has the potential to support more interpretable assessments by linking outputs to theory-informed disclosure dimensions. Future research could extend the analysis to broader samples, alternative outcomes, and different regulatory settings, while also exploring ways to strengthen the robustness, interpretability, and portability of LLM-based measures.

Keywords: Greenwashing; ESG; sustainability; generative AI

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Chi è pronto per l'Euro Digitale? Il ruolo dell'alfabetizzazione finanziaria e della fiducia nell'innovazione finanziaria

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1. Introduzione

La digitalizzazione sta modificando profondamente i sistemi finanziari, influenzando l'accesso e l'utilizzo degli strumenti di pagamento (Kamuangu, 2024). Questo processo si inserisce in un contesto in cui sostenibilità, innovazione e transizione digitale rappresentano priorità strategiche per governi e istituzioni (Gupta et al., 2023; Shalaby, 2024). Le tecnologie emergenti — dall'intelligenza artificiale alla blockchain — costituiscono leve cruciali per migliorare efficienza, trasparenza e inclusione (Hajian et al., 2025; Chin et al., 2022; Bresciani et al., 2021), ma la loro efficacia dipende dalle capacità cognitive e organizzative dei soggetti coinvolti (Martínez-Peláez et al., 2023; Di Vaio et al., 2024). Nel settore finanziario, il dibattito sulle Central Bank Digital Currencies (CBDC) e, in particolare, sull'Euro Digitale, ha rilanciato il tema della preparazione degli utenti (Cotugno et al., 2024). L'Euro Digitale rappresenta non solo un'innovazione tecnologica, ma un cambiamento sistemico che richiede nuove forme di literacy, fiducia e comprensione del rischio (Graziano et al., 2025; Boakye-Adjei et al., 2023). Nonostante la crescente produzione scientifica, persistono lacune conoscitive: molte ricerche analizzano singolarmente literacy finanziaria (Lusardi & Mitchell, 2014), fiducia digitale (Belanche et al., 2022) o preoccupazioni sulla privacy (Acquisti et al., 2015), senza approfondire come tali elementi interagiscano come capacità integrate (Xiao & Porto, 2017; Koskelainen et al., 2023). Inoltre, l'eterogeneità degli utenti è spesso sottovalutata, benché evidenze recenti mostrino differenze significative legate a età, conoscenze digitali e fiducia istituzionale (Zaimovic et al., 2025; Graziano et al., 2023). Alla luce di ciò, lo studio affronta tre domande di ricerca:

- RQ1: come conoscenza finanziaria, privacy, fiducia digitale ed entusiasmo tecnologico influenzano l'atteggiamento verso l'Euro Digitale?
- RQ2: quali profili di utenti emergono dall'interazione di tali elementi?
- RQ3: quali implicazioni derivano per la progettazione di politiche inclusive in ambito digitale?

Il contributo è organizzato come segue. Il quadro teorico di riferimento è presentato nel paragrafo 2. Il paragrafo 3 e il paragrafo 4 sono dedicati alla metodologia d'indagine, ai risultati e alla discussione di questi ultimi. Il paragrafo 5 contiene le conclusioni e le implicazioni della ricerca, mentre limiti e futuri sviluppi sono oggetto del paragrafo 6.

2. Quadro teorico

2.1. Literacy finanziaria e adozione di innovazioni

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La letteratura ha dimostrato ripetutamente che l'alfabetizzazione finanziaria influenza decisioni economiche, gestione del rischio e uso di strumenti innovativi (Lusardi & Mitchell, 2011; Cole et al., 2014). Nel framework TAM, una financial literacy più elevata aumenta percezione di utilità e facilità d'uso (Davis, 1989); nella teoria della diffusione (Rogers, 2003) la conoscenza rappresenta la base dell'adozione. Evidenze empiriche mostrano che utenti più alfabetizzati adottano più facilmente strumenti di pagamento digitali (Long et al., 2023; Strønen et al., 2019) e sono più inclini a considerare positivamente le CBDC (Solberg Söilen & Benhayoun, 2022; Palanisamy et al., 2025). In Italia, un elevato livello di alfabetizzazione finanziaria è correlato con maggiore utilizzo di pagamenti digitali (Banca d'Italia, 2022) e percezione positiva dell'Euro Digitale (Ferilli et al., 2024).

2.2. Privacy e adozione dei pagamenti digitali

La privacy rappresenta uno dei principali ostacoli all'adozione delle CBDC (Salmony, 2023). Gli utenti temono sorveglianza, perdita di anonimato e uso improprio dei dati (Acquisti & Grossklags, 2005; Acquisti et al., 2015). Il fenomeno rientra nel "privacy–innovation paradox" (Keith et al., 2013). Anche dal punto di vista comportamentale, la paura della gestione incerta dei dati si lega all'avversione all'ambiguità (Ellsberg, 1961). Recenti ricerche sull'e-CNY mostrano che la privacy riduce sia la fiducia sia l'efficacia delle variabili TAM (Tronnier & Qiu, 2024). L'ECB (2023) ha riconosciuto la privacy come tema centrale per l'Euro Digitale, evidenziando la necessità di trasparenza e limiti chiari alla tracciabilità.

2.3. Fiducia digitale ed entusiasmo tecnologico

La fiducia digitale facilita percezioni di utilità e controllo (Venkatesh et al., 2003), riduce percezione del rischio e sostiene l'adozione (Belanche et al., 2022). L'entusiasmo tecnologico aggiunge una dimensione affettiva: la letteratura mostra che atteggiamenti positivi verso l'innovazione amplificano l'effetto della literacy sulla propensione all'adozione (Xiao & Porto, 2017; Amin et al., 2025). L'Euro Digitale richiede dunque di considerare non solo competenze oggettive, ma anche orientamenti emotivi legati all'uso della tecnologia.

3. Metodologia

Lo studio adotta un approccio quantitativo esplorativo volto a identificare come caratteristiche sociodemografiche, competenze finanziarie, atteggiamenti digitali e preoccupazioni sulla privacy si combinino nel determinare diversi profili di predisposizione verso l'Euro Digitale. L'approccio, coerentemente con studi precedenti che analizzano fenomeni complessi caratterizzati da molte variabili qualitative (Greenacre & Blasius, 2006), integra due tecniche complementari. La Multiple Correspondence Analysis (MCA) viene usata per:

- sintetizzare le relazioni tra variabili categoriali,
- proiettare individui e categorie in uno spazio fattoriale a bassa dimensionalità,
- identificare pattern latenti,
- ridurre ridondanze prima della cluster analysis.

La tecnica è ampiamente utilizzata nelle scienze sociali per raggruppamenti data-driven (Greenacre & Blasius, 2006).

La Cluster analysis si applica per classificare gli individui in gruppi omogenei, basati sulle componenti MCA.

La raccolta dati è stata effettuata tramite Computer-Assisted Web Interviewing (CAWI) tra maggio e ottobre 2024. Il questionario online è stato distribuito attraverso le piattaforme di social network. Il metodo CAWI è stato scelto per intercettare un bacino ampio e diversificato di utenti, con particolare attenzione a fasce giovani e digitalmente attive. Il campione finale è composto da

502 partecipanti che hanno totalmente completato il questionario. Il questionario include 38 item, organizzati in cinque sezioni:

1. Dati sociodemografici: età, genere, area geografica, stato civile, istruzione, occupazione, reddito.
2. Alfabetizzazione finanziaria: domande standard sulla comprensione di interesse semplice, interesse composto, inflazione, diversificazione (Lusardi & Mitchell, 2014).
3. Comportamenti di pagamento: utilizzo di contanti, carte, mobile payment, app bancarie (Graziano et al., 2024).
4. Euro Digitale: conoscenza percepita, interesse, fiducia, benefici e rischi percepiti, timori sulla privacy (adattamento degli autori su Tronnier e Kakkar, 2022).
5. Frodi finanziarie: esperienza diretta, consapevolezza, percezione di vulnerabilità (adattamento degli autori su Shree et al., 2021; Brands and Van Doorn, 2022 ed Engle et al., 2025).

3.1. Preparazione dei dati e codifica

Poiché molte variabili erano categoriche (es. età, livello di istruzione, risposte "vero/falso/non so"), è stato necessario:

- uniformare formati e categorie;
- ricodificare variabili ordinarie (es. reddito) in classi omogenee;
- trattare la modalità "non so" come categoria informativa e non come mancante (cfr. Golman et al., 2017).

Non sono stati rilevati missing rilevanti, poiché la piattaforma CAWI impediva la consegna del questionario senza risposta.

3.2. Analisi empirica

Sono state incluse nel modello MCA tutte le variabili sociodemografiche, le variabili di financial literacy finanziaria, le percezioni sull'Euro digitale e le relative preoccupazioni sulla privacy. Dalla MCA sono state estratte dieci dimensioni, ordinate per varianza spiegata. Le cinque dimensioni selezionate - determinate tramite analisi screenplot - spiegano la quota più significativa dell'informazione. Tali dimensioni sono state usate come input della cluster analysis (Figura 1).

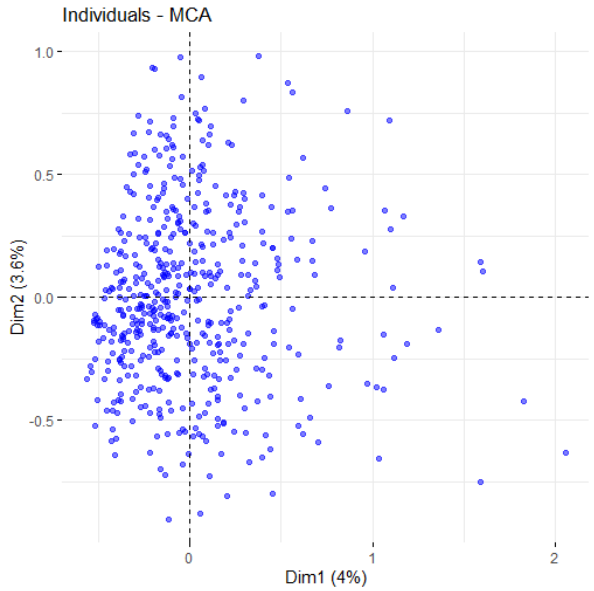


Figura 1. Estrazione dimensioni rilevanti attraverso MCA

Per una migliore leggibilità, la Figura 2 sintetizza visivamente le fasi del processo empirico adottato. Ciascuna fase si basa sulla precedente, contribuendo a garantire un'identificazione robusta dei cluster.

Questo approccio integrato ha permesso di identificare pattern latenti complessi rendendo possibile la derivazione di profili socio-cognitivi distinti.

La seconda fase prevede la classificazione degli individui in gruppi omogenei attraverso l'applicazione della cluster analysis. Seguendo il criterio di Elbow (Humaira & Rasyidah, 2020), che analizza la riduzione del within-cluster sum of squares in funzione del numero di cluster, e il criterio di Silhouette (Rousseeuw, 1987), che misura coesione interna e separazione tra cluster, sono stati individuati tre cluster come soluzione ottimale, offrendo un buon compromesso tra semplicità della struttura e capacità discriminante. Per garantire robustezza, sono stati applicati il K-means clustering e il clustering gerarchico (metodo Ward). L'uso congiunto dei due metodi permette di verificare la stabilità della classificazione (fpc; mclust in R). Per valutare la qualità dei cluster sono stati utilizzati:

- Silhouette average width;
- Indice di Dunn;
- Indice di Calinski–Harabasz (Caliński & Harabasz, 1974);
- Adjusted Rand Index (ARI) per confrontare le soluzioni K-means e Ward;
- Between-cluster vs total sum of squares ratio.

L' ARI elevato conferma che entrambe le tecniche convergono su strutture di clustering molto simili. Una volta assegnati i cluster, è stata condotta un'analisi descrittiva approfondita:

- incroci con variabili sociodemografiche,
- distribuzione delle conoscenze finanziarie,
- differenze nei comportamenti di pagamento,
- atteggiamenti verso l'Euro Digitale,
- livelli di preoccupazione privacy.

Le differenze tra cluster sono state visualizzate tramite:

- bar chart comparativi,
- grafici delle dimensioni MCA,

- convex hull plot per rappresentare la separazione tra gruppi.

Questa fase fornisce la base interpretativa per la descrizione dei profili.

L'elaborazione statistica è stata condotta utilizzando R 4.x, con i pacchetti FactoMineR e factoextra per la Multiple Correspondence Analysis, cluster, fpc e mclust per i modelli di clustering e le validazioni di robustezza, e ggplot2 per la rappresentazione grafica dei risultati.



Figura 2. Flowchart della Metodologia di Clustering

4. Risultati e discussione

I risultati dell'analisi condotta, mettono in luce tre interessanti profili socio-cognitivi. Il primo profilo è rappresentato dai "Giovani Professionisti Digitalmente Avanzati" (55,8%). Questo gruppo ha un'età media compresa tra i 26–35 anni ed elevato livello di istruzione. Essi sono finanziariamente molto alfabetizzati (Lusardi & Mitchell, 2014) con grande fiducia nel progresso digitale (Belanche et al., 2022). Rispetto all'Euro digitale, mostrano un forte entusiasmo pur consapevoli dei rischi legati alla privacy (Krishna et al., 2023). Questo cluster ha caratteristiche da early adopters, coerenti con la diffusione dell'innovazione (Rogers, 2003) e con il ruolo dei segmenti digitalmente competenti nel favorire transizioni tecnologiche (Kraus et al., 2023). Quello dei "Professionisti Affermati" rappresenta il secondo profilo emerso dall'analisi (29,5%). Con un'età media tra 36–45 anni e nonostante un alto livello di istruzione – il 61% dichiara di aver conseguito un master – e una buona alfabetizzazione finanziaria, essi mostrano un atteggiamento prudente verso l'Euro digitale, in quanto molto preoccupati delle ricadute in termini di privacy (Acquisti et al., 2015). Questo gruppo combina maturità finanziaria e moderazione tecnologica, coerente con quanto osservato in popolazioni con elevata competenza, ma bassa propensione al rischio digitale (Golman et al., 2017). Infine, l'analisi rileva il profilo dei "Giovani in Apprendimento" (14,7%). Essi sono tipicamente studenti a basso reddito e hanno mediamente tra i 18 e i 25 anni. È un gruppo che mostra molta incertezza nelle risposte – molto

spesso dichiara di non sapere. Coerentemente con la rilevazione dell'OECD (2025), sono finanziariamente poco alfabetizzati. La scarsa conoscenza finanziaria si riflette in un tiepido interesse nei confronti del tema dell'Euro digitale e una grande preoccupazione circa le ricadute sulla privacy. Questo profilo riflette dinamiche già osservate tra giovani a rischio di esclusione finanziaria nonostante familiarità digitale (Buenestado-Fernández et al., 2023).

La segmentazione emersa suggerisce che l'utente non è un soggetto omogeneo, ma presenta capability differenti (Martínez-Peláez et al., 2023), che influenzano accettazione, percezione del rischio e apertura all'innovazione. I risultati confermano che:

- l'alfabetizzazione finanziaria rappresenta un fattore abilitante, ma non sufficiente (Lusardi & Mitchell, 2014);
- la fiducia digitale e l'entusiasmo tecnologico amplificano l'intenzione di adozione dell'Euro digitale, in linea con i modelli TAM e UTAUT (Davis, 1989; Venkatesh et al., 2003);
- la privacy rappresenta un ostacolo trasversale, come mostrato nella letteratura sulle CBDC (Salmony, 2023; Tronnier & Qiu, 2024).

5. Conclusioni

Il presente studio ha esplorato il ruolo congiunto della conoscenza finanziaria, della fiducia digitale, dell'entusiasmo tecnologico e delle preoccupazioni sulla privacy nell'influenzare l'accettazione dell'Euro Digitale tra gli utenti italiani. Attraverso un approccio metodologico basato su Multiple Correspondence Analysis e Cluster Analysis, sono stati identificati tre profili distinti — Professionisti Affermati, Giovani in Apprendimento e Giovani Professionisti Digitalmente Avanzati — che rappresentano modalità differenziate di relazione con l'innovazione monetaria. Un primo elemento cruciale che emerge è che l'adozione dell'Euro Digitale non può essere interpretata attraverso un'unica variabile isolata. Al contrario, il processo risulta dall'interazione complessa di fattori cognitivi, comportamentali, emotivi e percettivi. La conoscenza finanziaria, pur essendo un fattore facilitante, non si traduce automaticamente in disponibilità a adottare strumenti innovativi, come l'Euro digitale. In linea con la letteratura (Lusardi & Mitchell, 2014; Koskelainen et al., 2023), i nostri risultati mostrano che la literacy deve essere accompagnata da adeguate competenze digitali e da un orientamento positivo verso la tecnologia perché favorisca realmente l'accettazione di una CBDC. La fiducia digitale e l'entusiasmo verso l'innovazione costituiscono, infatti, elementi catalizzatori. Gli individui del cluster dei Giovani Professionisti Digitalmente Avanzati, dotati di un'elevata combinazione di literacy finanziaria, familiarità tecnologica e apertura emotiva verso il cambiamento, manifestano i livelli più alti di predisposizione verso l'Euro Digitale. Questo gruppo incarna in modo emblematico il concetto di "dual literacy" (Xiao & Porto, 2017), in cui competenze finanziarie e competenze digitali non operano come fattori separati, ma come risorse complementari che, integrate, potenziano la capacità degli individui di trarre vantaggio dalle innovazioni emergenti. All'opposto, il cluster dei Giovani in Apprendimento presenta un quadro particolarmente rilevante dal punto di vista delle politiche pubbliche. Nonostante la familiarità tecnologica tipica delle generazioni più giovani, la scarsa alfabetizzazione finanziaria, l'incertezza decisionale e le elevate preoccupazioni sulla privacy rendono questo gruppo vulnerabile. In assenza di interventi formativi mirati, esiste il rischio che l'Euro Digitale — e più in generale la trasformazione digitale dei servizi finanziari — accentui divari informativi e capacità diseguali, contribuendo a forme di esclusione finanziaria silenziosa. Tale evidenza conferma quanto rilevato da studi sull'inclusione digitale dei giovani (Buenestado-Fernández et al., 2023). Un aspetto trasversale di particolare rilevanza riguarda il tema della privacy. In coerenza con il crescente dibattito accademico e istituzionale (Acquisti et al., 2015; Salmony, 2023; Tronnier & Qiu, 2024), i nostri risultati indicano che le preoccupazioni legate alla riservatezza dei dati, alla tracciabilità delle transazioni e ai potenziali utilizzi impropri delle informazioni sono diffuse in tutti e tre i cluster, con intensità differenti ma costanti. Ciò significa che la privacy rappresenta una barriera strutturale

all'adozione dell'Euro Digitale, non un problema circoscritto a gruppi specifici. Per questo motivo, la costruzione della fiducia istituzionale e la trasparenza nella governance dei dati costituiranno elementi determinanti per la legittimazione sociale della CBDC europea.

Si ritiene che il contributo del presente lavoro possa essere molteplice. Innanzitutto, il contributo più rilevante di questo studio consiste nell'evidenziare che l'accettazione dell'Euro Digitale è un processo eminentemente "capability-based". Non dipende solo dalla disponibilità di strumenti tecnologici o dalla loro diffusione sociale, ma dalla capacità degli individui di comprenderli, integrarli nei propri comportamenti finanziari e valutarne rischi e benefici. La prospettiva delle capability consente di leggere anche le differenze demografiche non come semplici variabili statistiche, ma come indicatori di risorse (cognitive, emotive, sociali) disponibili in misura diversa nella popolazione.

Un secondo contributo riguarda la segmentazione emersa: i tre cluster individuati offrono un quadro concreto e operativo per politiche pubbliche, banche centrali e operatori finanziari. La presenza di profili chiaramente differenziati implica che strategie "one-size-fits-all" sarebbero inefficaci e potenzialmente controproducenti. Invece, risulta necessario sviluppare:

- percorsi educativi specifici per fasce con bassa literacy finanziaria;
- linee di comunicazione dedicate agli utenti tecnologicamente avanzati;
- strumenti di tutela avanzata della privacy per consolidare la fiducia;
- interfacce digitali più inclusive, intuitive e accessibili.

Un terzo contributo ha natura metodologica: l'utilizzo congiunto di MCA e cluster analysis si è dimostrato efficace per analizzare pattern complessi in presenza di un elevato numero di variabili categoriali. Questo approccio può essere applicato ad altri contesti dell'economia digitale, dalla fintech adoption alla valutazione del rischio digitale, rafforzando il ruolo delle tecniche esplorative nella ricerca empirica. Infine, sul piano macro, lo studio suggerisce che la trasformazione digitale dei sistemi di pagamento europei richiede non solo infrastrutture tecnologiche robuste, ma anche la costruzione di un ecosistema culturale e cognitivo in cui gli utenti possano esercitare pienamente la propria autonomia finanziaria. L'Euro Digitale rappresenta un'opportunità significativa per rafforzare inclusione, sicurezza e innovazione, ma il successo dell'iniziativa dipenderà dalla capacità delle istituzioni di riconoscere e valorizzare la diversità delle capacità individuali. Solo attraverso un approccio differenziato, trasparente e orientato alla tutela degli utenti sarà possibile raggiungere una diffusione realmente sostenibile e socialmente equa.

6. Limiti e ricerche future

Come in ogni studio empirico basato su questionari e tecniche esplorative, anche questa ricerca presenta una serie di limiti che è importante riconoscere per interpretare correttamente i risultati e delineare possibili sviluppi futuri. Il primo limite riguarda il campionamento. L'utilizzo di un questionario CAWI diffuso attraverso social network ha permesso di raggiungere rapidamente un numero significativo di partecipanti, ma comporta l'assenza di una vera rappresentatività statistica rispetto alla popolazione italiana. È probabile, infatti, che individui meno digitalizzati, appartenenti a fasce d'età più avanzate o con minori risorse economiche e tecnologiche, siano sottorappresentati.

Il design CAWI tende infatti a intercettare principalmente utenti con una maggiore esposizione digitale e familiarità tecnologica; di conseguenza, le strutture di cluster individuate riflettono probabilmente percezioni più avanzate rispetto alla media della popolazione. Studi futuri dovrebbero controllare tale bias adottando strategie di campionamento stratificato o ponderazioni ex-post, così da garantire una rappresentatività più solida dei segmenti meno digitalizzati.

Inoltre, la partecipazione volontaria può aver favorito le risposte di persone già interessate ai temi della finanza digitale, introducendo un possibile bias di autoselezione che tende a sovrastimare la familiarità con strumenti digitali o l'interesse per l'Euro Digitale.

A ciò si aggiungono le limitazioni tipiche dei dati basati su autovalutazione. Le risposte fornite dai partecipanti possono essere influenzate da percezioni soggettive, interpretazioni diverse delle domande o dalla tendenza a dare risposte socialmente desiderabili. Tale dinamica può essere particolarmente rilevante nelle sezioni dedicate alla financial literacy, dove gli individui tendono talvolta a sovrastimare il proprio livello di competenza. Un ulteriore limite riguarda la natura trasversale del dataset: le informazioni raccolte riflettono un singolo momento nel tempo, mentre atteggiamenti e opinioni nei confronti dell'Euro Digitale possono evolversi rapidamente, soprattutto in un contesto tecnologico e regolamentare in forte trasformazione. Questa mancanza di longitudinalità rende difficile valutare come la familiarità con il tema, le campagne istituzionali o l'evoluzione delle tecnologie digitali possano modificare nel tempo le percezioni degli utenti.

Dal punto di vista analitico, occorre considerare anche le implicazioni derivanti dall'uso della Multiple Correspondence Analysis e della cluster analysis. La MCA, pur essendo una tecnica potente per sintetizzare relazioni tra variabili categoriali, implica inevitabilmente una riduzione della complessità originaria dei dati e può generare componenti talvolta difficili da interpretare. La cluster analysis, dal canto suo, offre una classificazione utile e leggibile dei diversi profili di utenti, ma resta pur sempre un metodo esplorativo, potenzialmente sensibile alle scelte effettuate in fase di modellazione, come il numero di cluster o il tipo di algoritmo. Anche se sono stati adottati diversi criteri di validazione per garantire la robustezza dei risultati, una certa dose di arbitrarietà è inevitabile. Un ulteriore limite concettuale riguarda l'assenza nel modello di costrutti psicologici che la letteratura considera sempre più determinanti nell'adozione di tecnologie digitali. Variabili come la fiducia istituzionale, l'avversione al rischio, la propensione all'innovazione o l'ansia tecnologica potrebbero contribuire in modo significativo a spiegare le differenze tra i profili individuati. Inoltre, il questionario rileva principalmente intenzioni e percezioni, ma non comportamenti effettivi. La distanza tra intenzioni dichiarate e comportamenti reali — ben documentata nelle scienze comportamentali — suggerisce prudenza nell'interpretare i risultati come pienamente predittivi dell'utilizzo futuro dell'Euro Digitale. Va considerato anche che il concetto stesso di Euro Digitale è ancora in fase di definizione. Le opinioni raccolte riflettono quindi un contesto caratterizzato da informazioni parziali, aspettative non consolidate e un certo grado di incertezza. Questo scenario può aver influito sulla stabilità delle risposte, generando variazioni dovute più alla percezione del nuovo che a una reale comprensione del progetto.

Alla luce di questi limiti, emergono numerose possibilità per ricerche future. Un primo filone consiste nell'impiego di campioni più ampi e statisticamente rappresentativi, che consentano di confrontare in modo più preciso atteggiamenti e competenze tra fasce diverse della popolazione italiana. Un secondo filone riguarda invece gli studi longitudinali, particolarmente utili per monitorare come la diffusione di informazioni e la progressiva definizione dell'Euro Digitale possano influenzare la fiducia, la privacy percepita e la predisposizione all'adozione nel corso del tempo. Un'altra direzione promettente è l'integrazione tra dati dichiarati e dati comportamentali reali, provenienti ad esempio dall'uso effettivo di strumenti di pagamento digitali o da sistemi di tracciamento anonimo dell'interazione con app bancarie. Tali dati permetterebbero di superare il limite dell'autovalutazione e ampliare la capacità predittiva dei modelli. Allo stesso tempo, studi sperimentali o quasi-sperimentali potrebbero contribuire a valutare come differenti modalità di comunicazione istituzionale — soprattutto in relazione alla privacy — influenzino la fiducia dei cittadini e la disponibilità a adottare una CBDC. Ricerche future potrebbero inoltre approfondire l'evoluzione del rapporto tra tecnologia, fiducia e inclusione finanziaria, integrando costrutti psicologici e socioculturali, oggi solo parzialmente considerati. Una prospettiva comparativa

internazionale potrebbe infine arricchire ulteriormente il quadro, confrontando il caso italiano con altri Paesi impegnati nello sviluppo di valute digitali delle banche centrali.

In conclusione, questi limiti non riducono la rilevanza dello studio, ma ne definiscono il perimetro e offrono una base solida per sviluppare analisi più ampie e approfondite. L'introduzione dell'Euro Digitale rappresenta un passaggio cruciale nella trasformazione del sistema dei pagamenti europeo, e comprenderne le determinanti sociali, cognitive e culturali richiederà un impegno di ricerca continuativo, multidisciplinare e sensibile alle rapide evoluzioni del contesto tecnologico e normativo.

Keywords: Euro digitale; financial innovation; CBDC; financial literacy; multiple correspondence analysis; cluster analysis

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Exploring the Intersection of Environmental Sustainability and FinTech: Patterns, Developments, and Knowledge Gaps

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1. Introduction

The convergence of green issues and FinTech represents one of the most dynamic and transformative areas of contemporary business and financial research. As global economies grapple with intensifying climate change demands and rising environmental risks (Saviano et al., 2024), the need for innovative technologica financial mechanisms has become pivotal (Kou & Lu, 2025; Salem & Shahimi, 2025), impacting risk assessment, investment platforms, resource allocation processes, and banking system behaviours (Drago et al., 2025). The intersection of these two trajectories, environmental sustainability on the one hand and FinTech innovation on the other, has spurred a growing body of academic research exploring the various drivers linking these two themes. Despite this, the field remains fragmented, theoretically underdeveloped, and empirically uneven.

The analysis, made using a systematic literature review (SLR), reveals a field marked by rapid acceleration, notable geographical variation, thematic heterogeneity, and a lack of consolidated theoretical anchors. Research on environmental sustainability and FinTech has grown considerably since 2018, with publication rates increasing sharply during and after the pandemic, reflecting a heightened global interest in digital tools that support climate resilience, sustainable investments, and low-carbon transitions. Growing academic interest is certainly also linked to broader economic and regulatory developments, including the rise of green taxonomies, the expansion of climate-related financial disclosures such as Corporate Social Responsibility Directive (CSRD), and the maturation of technological infrastructures capable of providing real-time environmental data, automating risk assessments, and facilitating decentralized validation mechanisms.

2. Methodology and data

This study conducts a SLR to examine how environmental sustainability and FinTech are jointly conceptualized, operationalized, and empirically investigated within the academic domain. The protocol is based on established guidelines for rigorous evidence synthesis (Kraus et al., 2020; Massaro et al., 2016; Petticrew & Roberts, 2006; Tranfield et al., 2003), in order to ensure that each step of the research is transparent, replicable, and robust. According to these methodological standards, we have developed a bibliometric and content analysis aiming to carry out detailed mapping of intellectual structures, thematic convergences, and conceptual trajectories

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within the selected body of literature (Lombardi & Secundo, 2021; Kessler, 1963; Waltman et al., 2010; Van Eck & Waltman, 2009; 2010; 2017).

In order to develop a comprehensive and representative dataset, relevant studies answering our research questions about how environmental or green objectives and FinTech mechanisms intersect within business research were systematically identified, collected, and examined. The search strategy followed a multi-database approach, with Scopus, Web of Science, PubMed, and Google Scholar, which covered a wide range of peer-reviewed contributions across the fields of business, management, economics, and sustainability-related areas. This multi-source design assured high sensitivity and specificity in the identification of major academic outputs published between 2000 and 2026-a timespan sufficiently broad to include both foundational research and the most recent conceptual and technological developments.

The search query applied, TITLE-ABS-KEY ("environmental" OR "green" AND "fintech") AND (LIMIT-TO (SRCTYPE, "j")) AND (LIMIT-TO (SUBJAREA, "BUSI")) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (LANGUAGE, "English")), was replicated conceptually in the other databases to ensure consistency in scope and terminological precision. So, the dataset underlying this study comprises English-language, peer-reviewed journal articles that focus on the intersection between environmental or green dimensions and FinTech, specifically within the Business, Management, and Accounting subject areas.

The initial retrieval produced 168 journal articles, which were subsequently organized into a structured dataset and subjected to a rigorous multi-stage screening process reflecting the methodological guidance of seminal SLR frameworks. Duplicates, non-academic materials, conceptually irrelevant publications, and non-English outputs were removed. After applying the inclusion and exclusion criteria aligned with the review's purpose, 113 scientific articles remained as the final validated sample for analysis.

Following dataset consolidation, we have conducted an extensive bibliometric analysis using VOSviewer software, which enabled the visualization and interpretation of keyword co-occurrence networks, citation structures, and thematic clusters. This approach enabled us to detect dominant conceptual groupings, underlying intellectual linkages, and evolving research fronts within the Environmental FinTech domain. Keyword co-occurrence mapping highlighted the frequency and relational intensity of core constructs, while citation analyses provided insights into influential authors, seminal works, and the propagation of knowledge across disciplines. Thematic clustering, in turn, exposed how environmental concerns, such as carbon reduction, green financing mechanisms, climate-related risk analytics, and sustainable investment behaviors, are embedded within FinTech-oriented business research.

Overall, by applying a structured protocol rooted in systematic review methodology (Kraus et al., 2020; Massaro et al., 2016; Petticrew & Roberts, 2006; Tranfield et al., 2003) and leveraging advanced bibliometric tools (Lombardi & Secundo, 2021; Kessler, 1963; Waltman et al., 2010; Van Eck & Waltman, 2009; 2010; 2017), the study provides a detailed and methodologically rigorous assessment of how the academic community conceptualizes and investigates the intersection of environmental sustainability and FinTech. The resulting synthesis not only maps the intellectual structure of the field but also identifies conceptual ambiguities, methodological gaps, and future research opportunities, contributing to a more coherent and integrative understanding of Environmental FinTech within business scholarship.

Briefly, in order to generate a clearer understanding of the emerging domain highlighted, using a rigorous analysis methodology, this research aims to identify patterns and potential future developments.

3. Results

Starting from the geographical perspective, the empirical analysis of the dataset highlights significant contributions from Asia, particularly China and East Asian economies, where robust

digital ecosystems coexist with ambitious state-led sustainability programs. In Europe, academic production reflects the region's advanced regulatory frameworks for sustainable finance and digital innovation. In contrast, the United States tends to emphasize technological development and market-driven innovation, with a particular focus on blockchain-based solutions, climate analytics, and digital environmental monitoring systems. Emerging economies, such as India, Indonesia, and Malaysia, are also contributing to research focused on sustainable digital lending, financial inclusion, and grassroots financing for renewable energy. This geographical dispersion highlights both the global relevance of environmental FinTech and its contextual dependence on development, as adoption patterns are closely linked to regulatory frameworks, technological infrastructure, market maturity, and societal needs.

Beyond the geographic patterns emerging from the dataset, a deeper understanding of how environmental sustainability and FinTech interact requires examining the intellectual dynamics that shape the development of this research field. It does not appear a single e unique trend of research. Instead, results reflect a complex interplay between institutional incentives, market demand, technological capabilities, and evolving societal expectations. As the literature in the dataset reveals, the emergence of the relationship between green issues and FinTech has unfolded through multiple trajectories that often intersect but rarely overlap fully, resulting in a heterogeneous body of knowledge characterised by diverse conceptual motivations and methodological orientations.

One of the most relevant dynamics concerns how different financial systems have integrated digital technologies into their environmental strategies. In some contexts, FinTech appears primarily as a mechanism to enhance the efficiency of traditional financial institutions by offering new tools for environmental risk assessment, cleaner reporting infrastructures, or automated compliance with sustainability regulations. In other contexts, FinTech operates as a disruptive force capable of reshaping how environmental value is produced, exchanged, or verified, leading to the development of novel financial instruments, such as tokenissed carbon credits, decentralized renewable-energy marketplaces, and blockchain-enabled sustainability certifications. This divergent evidence suggests that there is no single approach to the relationship between FinTech and the environmental theme, but rather different practices, whose meaning evolves based on institutional priorities, technological maturity, and specific environmental challenges.

In this sense, the analysis of the paper reveals an increasing interest in how environmental sustainability is embedded not only in financial decision-making but also in the broader architecture of digital ecosystems. Several studies examine how application programming interfaces (APIs), artificial intelligence algorithms, distributed ledgers, and big data infrastructures interact to generate new forms of environmental intelligence. These systems help better understand how climate impacts economic and financial activities, how sustainable the supply chain is, and how "green" investment portfolios are. While the technology used varies from study to study, a common element is the use of real-time data in environmental-related financial processes. This data-driven focus on sustainability signals a significant shift in finance: environmental information is no longer considered a secondary consideration, but a fundamental component of assessing risks, determining asset values, and complying with regulations.

Another closely related issue concerns the growing attention paid to green FinTech users. Several studies within the dataset highlight how digital interfaces influence individuals' environmental awareness, investment choices, and consumption patterns. Environmental FinTech applications increasingly leverage gamification strategies, behavioral nudges, and visual analytics to encourage greener habits or stimulate participation in low-carbon investment schemes. These contributions help broaden the understanding of sustainability-oriented financial innovation beyond institutional and technological mechanisms, positioning end-users as active participants in shaping environmental outcomes. Yet, despite this growing attention, this part of literature remains relatively underexplored. This means that future research directions could also consider

topics related to psychology, behavioral economics, and human-computer interaction in order to better understand how digital environments can effectively guide users towards environmentally responsible financial behavior.

However, the literature review also highlights a body of research highlighting potential problems in the interconnection of FinTech and green sustainability. In particular, it reveals tensions between the promise of digital sustainability and the risks or unintended consequences associated with digital financial systems, particularly pollution. Several studies raise concerns about the ecological footprint of financial technologies themselves, particularly those relying on energy-intensive infrastructures, such as some blockchain architectures. Others highlight the emergence of new vulnerabilities, including cybersecurity risks, algorithmic opacity, and data privacy challenges, which could undermine environmental governance if left unaddressed. Thus, these issues underscore the need for a more nuanced perspective on the relationship between FinTech and the environment, recognizing not only its potential to support sustainability goals but also the material and systemic risks associated with the increasing digitalization of finance. Therefore, future research may require a more critical assessment of the trade-offs, environmental externalities, and structural imbalances introduced by technological innovations in the financial field.

Another important insight from the analysis of the dataset is that green financial innovations are evolutionary. Green FinTech is not a separate category of technologies, but a constantly evolving set, influenced by experimental rules, market reactions, and new technologies.

Initially, studies focused on specific instruments, such as carbon footprint calculators or apps for financing small renewable energy projects. Instead, today academic papers take a broader view and analyse how digital infrastructures, institutions, and climate governance systems interact. This evolution demonstrates that environmental sustainability depends not only on the design of individual technologies, but also on coordination between various actors: regulators, investors, technology providers, and civil society. With the increasingly close integration of the digital and environmental transitions, this coordination becomes pivotal.

However, the literature highlights that such coordination is still uneven and often hindered by incompatible standards, fragmented regulations, and divergent interests.

Another relevant topic concerns the impact on capital. Several articles analyse how digital platforms facilitate access to green investment opportunities for retail investors, for example, through robo-advisory systems that integrate sustainability preferences. Others examine the potential of decentralized finance to democratize environmental investments, reduce transaction costs, and improve transparency in capital allocation to low-carbon projects. This line of research opens the debate on the potential utility of green FinTech in mobilizing private capital for climate change mitigation and adaptation, particularly in regions where traditional financial institutions face structural constraints or lack the necessary incentives to engage in green finance. On the other hand, the contributions of the dataset also highlight that the transformative potential of these innovations remains contingent on regulatory clarity, market conditions, and the credibility of environmental claims, factors that vary from market to market.

A final area of research focuses on how digitalization is changing the knowledge base of sustainable finance. The new opportunities offered by green FinTech allow many more stakeholders, such as technology companies, data providers, and even individual users, to contribute to sustainability assessments and environmental decisions.

This makes the process more transparent and collaborative, but it also raises questions about who is responsible, the quality of the data, and how to govern these systems. In this sense, the topic of data becomes very important. Research has begun to study these changes, but more in-depth analyses are needed to understand how distributed digital intelligence influences environmental policies, market regulation, and the role of institutions.

Then, focusing on the journals, it emerges that the journals represented in the dataset span sustainability research, digital innovation, financial economics, business strategy, and

information systems. This variety underscores the interdisciplinary nature of the field but also reveals the absence of a single, well-defined research strand. Articles discussing environmental FinTech appear in venues dedicated to environmental management, sustainable finance, emerging technologies, and digital transformation, suggesting the simultaneous presence of multiple epistemic communities contributing to the discourse. Thus, it emerges that the research patterns in the field are numerous. While this interdisciplinary reach enriches the field, it also contributes to conceptual fragmentation, as studies often employ incompatible definitions of green FinTech, divergent environmental indicators, or widely varying technological and analytical frameworks.

After identifying the most important clusters of interest, a co-occurrence analysis of keywords was conducted. The results reveal a conceptual framework centered on sustainability, green finance, FinTech innovation, blockchain, artificial intelligence, carbon finance, climate risk, digital transformation, renewable energy, and financial inclusion. From these recurring terms, it can be deduced that the intellectual architecture of the sector is composed of four main thematic clusters. The first reflects work on green finance and environmental impact assessment, where FinTech is positioned as a tool to improve measurement accuracy, enhance environmental disclosures, and enable more transparent climate sustainability reporting. From this perspective, technologies such as artificial intelligence and machine learning are being mobilized to process large volumes of environmental data, generate automated sustainability assessments, or detect greenwashing risks. The second thematic stream focuses on digital technologies that underpin sustainable finance infrastructures, particularly blockchain systems, digital identities, and distributed ledgers, which enable the decentralised verification of environmental claims, the issuance of green tokens, and the traceability of renewable energy certificates. These studies often conceptualize FinTech not merely as a financial innovation but as a technological substrate capable of transforming the governance of environmental assets. The third thematic group is focused on sustainable digital business models and financial inclusion, with a special emphasis on how mobile-based platforms, digital credit scoring mechanisms, crowdfunding mechanisms, and embedded finance solutions provide a vehicle for the expansion of green microloans, enabling small-scale renewable energy investments, or underserved populations' access to environmental finance products. This study typically situates green FinTech in broader development trajectories and explores how digital tools can overcome financing constraints that limit the diffusion of sustainable technologies in emerging economies. The fourth conceptual cluster brings together governance, regulation, and public policy, reflecting a growing interest in how regulatory frameworks shape the adoption and implementation of green FinTech solutions. In this respect, studies are casting light on regulatory gaps, digital compliance mechanisms, standard-setting processes, as well as on emergent forms of RegTech that can support environmental governance.

Across this dataset, several overarching patterns are evident. First, there is a consensus that FinTech should operate as a key enabler of sustainability, capable of solving longstanding inefficiencies in environmental data transparency, investment mobilization, and risk measurement. Digital technologies are often put forward as a solution to information asymmetry, investor confidence, automated carbon accounting processes, and scalable technologies for environmental monitoring. These arguments find resonance in the studies suggesting that FinTech can democratize access to sustainability-oriented financial products and induce behavioral changes among consumers by offering real-time tracking of carbon footprint or incentivizing green spending with apps. However, beyond these optimistic narratives, the evidence supporting FinTech's environmental effectiveness remains limited, inconsistent, and methodologically heterogeneous. Few studies, other than making normative claims about technology potential, provide an empirical assessment of actual environmental outcomes, creating a research gap between theoretical expectations and measurable environmental impacts.

The results also show heterogeneity in terms of methodologies. Qualitative case studies or conceptual models, as well as econometric or quantitative approaches, are used, for example, to assess the relationship between digital adoption and green credit allocation, environmental

performance metrics, or investment behavior. Other studies, however, use simulation models, experimental designs, or pilot implementations to illustrate potential technological applications. The lack of standardized environmental performance metrics leads to difficulties in comparing results across studies or in establishing cumulative evidence. This challenge parallels those observed in the sustainability literature more generally, where inconsistent methodologies and heterogeneous indicators prevent clear causal attributions.

Another critical dimension underlying the evolution of environmental FinTech is regulation. Strong, sustainable finance rules-for example, in the European Union-correlate with advanced FinTech-enabled sustainability initiatives, such as digital compliance solutions for green bond reporting, digital taxonomies, and automated sustainability screening tools. In contrast, regions with rapidly advancing digital infrastructures, such as China, are prone to develop more aggressively in areas like blockchain-based environmental monitoring or AI-driven climate analytics. But regulatory asymmetries also create barriers to scalability and cross-border integration. In fact, many studies call for harmonized global standards, improved digital governance mechanisms, and more transparency on what constitutes environmentally sustainable FinTech activities. Without such alignment, inconsistencies in measurement, disclosure requirements, and technological protocols may erode trust and hinder the adoption of green financial technologies.

The results from the dataset analysis, therefore, highlight gaps in the existing literature that hinder the sector's development, such as the lack of unified conceptual definitions. The limited empirical evidence on environmental outcomes further limits the ability to assess whether FinTech actually improves sustainable performance or simply replicates existing financial models through new tools. Furthermore, the geographical concentration of research can lead to knowledge imbalances, with an underrepresentation of regions that could benefit most from green FinTech solutions but lack the necessary infrastructure.

The potential risks associated with FinTech adoption in environmental domains remain not sufficiently addressed. Issues such as cybersecurity vulnerabilities, data privacy concerns, algorithmic biases, and digital divides can undermine both technological reliability and environmental effectiveness. Yet, these interdependencies have received minimal scholarly attention, suggesting the need for new conceptual and empirical models.

4. Conclusions

The findings of the SLR outline a field in its early but rapidly accelerating stage of development. The intersection of environmental sustainability and FinTech holds potential ability to advance climate mitigation, environmental stewardship, and sustainable development in general. Yet realizing this potential will require a more coherent theoretical foundation, harmonized measurement frameworks, robust empirical evaluations, and deeper interdisciplinary integration. In fact, results show potential and risk related to the interconnection between green themes and FinTeck, such as pollution related to intensive usage of energy. Scholars, policymakers, and practitioners will have to work toward greater clarity of conceptual boundaries, alignment of regulatory frameworks, and evidence-based assessments for the responsible and effective development of green FinTech ecosystems.

Briefly, this extended abstract provides an integrative, comprehensive, and critical synthesis of such emerging dynamics, providing a baseline for future researches.

Parole chiave: Green FinTech; environmental sustainability; sustainable finance; systematic literature review

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Track 6: INTELLIGENZE AMMINISTRATIVO-CONTABILI NELLA STORIA: RESPONSABILITÀ, SOSTENIBILITÀ E BENE COMUNE

Beyond Institutional Support: Relational Accountability and the Networks Behind the Unexpected Development of the Insurance System in Trieste
Eleonora Masiero, Loredana Panariti, Karen McBride

United we stand: managerial, sustainability and accounting implications regarding the merge of the "Santa Croce" hospital of Mondovì during the 16th century
Andrea Fontanella, Taras Tarasenka, Daniela Preite, Elio Borgonovi

Accounting for Displacement: Governing Smyrna Refugees in Colonial Malta (1919–1922)
Alberto Caratozzolo, Ivan Paul Grixti, Carmelo Marisca, Nicola Rappazzo

Accounting for Fairness: A Genealogical Analysis of the Monte di Pietà of Naples
Antonio D'Alessio

Beyond Institutional Support: Relational Accountability and the Networks Behind the Unexpected Development of the Insurance System in Trieste

Eleonora Masiero[1], Loredana Panariti[2], Karen McBride[3]

1. Purpose

The development and expansion of an insurance sector can be explored and explained adopting different perspectives. With respect to Trieste, it has been claimed that the fast and successful expansion of the insurance sector was due to the willingness and institutional support of the Hapsburg crown.

With the aim of making Trieste the insurance centre for the Habsburg territories, since the beginning of the 18th century, the Habsburg dynasty strengthened the port of Trieste's economic expansion by privileging the city with the status of a free port (in 1719, Charles VI had privileged Trieste and Rijeka with a free port) and by introducing privileges and practices favouring merchants.

However, while historical facts demonstrate the positive expansion of Trieste's insurance firms, both at the local level and in the global market, during the 18th century a possible positive expansion in the insurance sector was not to be given for granted by the experts and the observer of the time.

In fact, at the end of the 18th century, several criticalities seemed to prevent the development of this sector. Among the main criticalities: Trieste did not have a great tradition of financial and insurance activities; Trieste did not have a strong tradition of financial and insurance activities; there were no insurance or security brokers in the city; the city suffered from a constant shortage of circulating money; it lacked the rules and channels necessary for international payments. Last, but not least, despite being the most important port of the Austro-Hungarian Empire, Trieste suffered from its proximity to Venice, which remained the most prominent port on the Adriatic Sea. (Panariti, 2003).

All in all, Trieste did not have a tradition of financial and insurance activities, but after a few decades, many insurance companies successfully operated in Trieste, offering a wide range of services to an international cohort of users. Besides, during the 19th century, Trieste became one of the most prominent insurance centres in Central-Eastern Europe and by the Mediterranean Sea.

In fact, during the nineteenth century, Trieste became one of the most crucial insurance centres in Central-Eastern Europe and the Mediterranean. After establishing insurance firms in Vienna, Pest, and Prague; Trieste insurance companies surpassed the territory of the Habsburg Empire, with a web of insurance branches located in every major city of the Italian peninsula, of the Mittleuropean and Eastern European cities and Levante. The most critical companies reached the territories of Africa, Asia and the Americas (Panariti, 2011). The insurance companies that

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contributed to the supremacy of Trieste were Assicurazioni Generali (1831) and Riunione Adriatica di Sicurtà (1838), and the first section of Austrian Lloyd (1836), which at the time was an information agency serving the insurance companies of Trieste.

2. Study design/methodology /approach

Given these barriers to introducing and expanding the insurance sector, it may be asked what the reason behind the successful expansion of Trieste's insurance firms was.

To respond to this question, initially researchers collect and rely on primary and secondary sources to shed light on the set of privileges that supported the initial development of the insurance sector and, at the same time, to highlight the barriers to its effective implementation.

Later systematic archival research was conducted to collect and reconstruct the information pertaining the establishment of each insurance company operating in the city of Trieste between the 18th and 19th century.

To reconstruct the birth and development of the Trieste insurance system between the 18th and 19th centuries, the researchers used sources retained in the State Archives of Trieste (Intendenza Commerciale, 1748-1776, Deputazione di Borsa, 1755-1921, Cesareo Regio Governo 1776-1809) and the Finanz und Hofkammerarchiv of Wien (Kommerz, Litorale (1749-1813).

The Intendenza Commerciale was founded in 1731 and strengthened its powers during the Theresian period[4]. The Intendenza Commerciale had the objective of encouraging traffic between the German and Italian lands, especially with regards to the maritime trade of the hinterland, through the two free ports of Trieste and Fiume. The documents preserved in the fund Deputazione di Borsa represent a source for researching the economic situation in Trieste. From this documentation relationships between the Trieste merchant class and the central power emerge, and the regions with which they had trade and commerce. In contrast, the Cesareo Regio Governo in Trieste, which had been instituted to succeed the Intendenza Commerciale, had very broad competencies and directive and supervisory powers over trade, navigation, the application of maritime laws and seafaring. Both magistracies then reported to the courtly dicastery of Vienna on which they depended. The juxtaposition of the Trieste and Viennese documentation has made it possible to obtain a precise and articulated picture of the path that led to the birth of the first insurance companies and the distinct characteristics that allowed their development. Along with the archival documentation, contemporary publications dealing with the subject matter of the research were used. One of the first writings on insurance, was published in Trieste in 1797: "Riflessioni sulle assicurazioni marittime e loro progressi in Trieste", written by Samuele Vital. This document, although not particularly innovative, is of interest because it identifies the role played by social capital, consisting of cultural knowledge and training for those who worked in the insurance industry. The Collection of observations on marine insurance, on insuring against fire, river and air damage, and those on life insurance (Morpurgo, 1830), show us how the creator of Assicurazioni Generali determined and developed a new type of insurance company that would emerge from the narrow confines of maritime insurance to offer multiple services in the international arena.

[4] Maria Theresa of Austria, ruler of the Habsburg Monarchy, reigned from 1740 to 1780 and from 1765 in co-regency with her son Joseph II, who became ruler after her death. Joseph II's reign lasted only until 1790, when he was succeeded by his brother Leopold II, whose reign was even shorter and ended in 1792. His son Franz II, on the other hand, was sovereign until 1835, going through the difficult Napoleonic years. To oppose French hegemony in Europe, he assumed the title of hereditary Emperor of Austria in 1804, while he carried the title of Emperor of the Holy Roman Empire until 1806.

Accordingly, the collection of information has had as an object the mapping of the management background and relations. Hence, in this phase the exploration moves to unveiling actions and personal relationship of the most prominent figures leading the insurance sector in Trieste. The aim this second analytical phase is to shed light on the informal networks and personal relationship behind the development of the insurance system.

In this regards, collaborative networks, primarily based on informal coordination practices, are processes of mutual evolution, growing trust and interdependence among actors relying on direct personal relations (Larson, 1992; Rossignoli e Ricciardi, 2015). Collaborative network's actors are self-regulated, and identify themselves with shared interests and aspirations, or work toward solving common issues (Rossignoli e Ricciardi, 2015). Actors participating in these flat organisations are regarded as equals even if considerable differences in the degree of power may exist (Samlinger, 1993). Nevertheless, are the ethical values of mutual respect and trust among the people involved, that make collaboration within these networks effective and distinguish them from other hierarchical organised and institutionalised forms (Thompson, 2003). Among the ethical values, while reputation encourages the collaborative networks to behave altruistically, also independently from the probability of reciprocation, trust is a key factor enabling a stable social relationship based on reciprocal collaboration (Rossignoli e Ricciardi, 2015).

For this paper we may define these collaborative networks as informal systems of accountability. In fact, like all other types of social practices, collaborative networks take place and interact within formal, institutionalised systems of accountability. Accordingly, informal systems of accountability embrace all the forms of account that spring from the participation in the social world (Willmott, 1996). In this regard, a framework of accountability results from the institutional setting, the set of norms, the culture within a specific time and place (Willmott 1996). Trust, which necessitates relational thinking (Cremer, Snyder and Dewitte 2001) is a social phenomenon that requests a response regarding an accountability relation unrelated to the usual hierarchical forms (Jonsson 1996; Roberts 1991, 1996). When the level of trust is high, the informal accountability system is privileged, while the community members perceive the formal, sophisticated controls as unnecessary (Panozzo 2008). Bringing the concept of trust within the accountability relationship implies that, accountability involves "identity building in a social context" where the group rely upon and adheres to a set of norms and practices that serve a "coordinating purpose" (Jonsson 1996, 103-115). Accordingly, the shared identity, reinforced by the participant's behaviour, shapes the accountability system and its notion (Panozzo 1996; Selznick 1957). In other words, trust implies establishing some characteristics of the accountability relation. Jonsson's (1996, 103) words: "Leaving something of value in the hands of others, both imply risk-taking but trust also exposes relationships to the whim of those who rely on each other". However, trust may take various forms: resulting from the institutional, legal systems in place; or being based on calculative and rational choices; or deriving from relational interactions and shared identities (Hyndman and McConville, 2018).

3. Findings

Researchers argue that while the central institutions' actions commenced the insurance sector, its successful growth and, most importantly the overcome of barriers was mainly due to the development of an informal relational accountability systems based on the reciprocal collaborative network of international merchants and directors.

More specifically, findings shows that the actions enacted by the central government (e.g. set of privileges, controls and norms) were the necessary, but not sufficient condition, to bust the insurance system.

Instead, the informal, relational accountability system effectively supported the successful development of the insurance sector through the growth of collaboration among the merchants and collaborative networks of managers living and operating in Trieste. These managerial figures

and merchants found their anchor of collaboration, by gathering around the Stock Exchange of Trieste, and trusting the informal system of accountability they had created over time.

In doing so the network of merchants overcame the specific interests of each ethnic community and group and exploited the specific international connection while developing tight contacts based on a sense of belonging and reciprocal trust.

In fact, the merchants working in Trieste were part of different groups and ethnical communities (with different cultures, beliefs, and international connections) operating as "collaborative networks" primarily based on informal coordination practices, with a strong interdependence among the people relying on direct personal relationships (Larson, 1992; Rossignoli & Ricciardi, 2015). The network of collaboration, grounded on reciprocal, trust, was based not only on belonging to a specific community or an ethnic group, but on the shared identity and consequent collaboration among the different communities and groups living and working in the city of Trieste and having invested in homes in the city. In this regard, members of the collaborative networks identified with their shared interests and aspirations towards these common purposes (Rossignoli and Ricciardi 2015; Samlinger 1993). Accordingly, this trust reputation encouraged the collaborative networks to behave with reciprocity (Rossignoli and Ricciardi 2015).

4. Originality/value

The paper contributes to previous historical studies investigating the insurance sector (Denzel, 2022; Kingston, 2014; Panariti, 2011; Piluso, 2012; Plasschaert, 2021; Pons et al., 2020; Schisani & Ragozini, 2023) in several ways.

First, this work provides a detailed reconstruction of the dynamics enabling the development of the marine insurance sector between the 18th century and the 19th century, filling a gap in the literature. The paper does this by illustrating how the successful growth of the insurance sector in Trieste was mainly due to the development of informal accountability systems based on the reciprocal trust shared within and among collaborative, cosmopolitan networks of merchants, thus overcoming factors (e.g. the lack of liquidity) that might otherwise have impeded the sector's expansion, while supporting the achievement of otherwise unattainable results.

Second, by exploring historically the evolution of the introduction and expansion of the insurance sector in Trieste, this paper expands the scholarly understanding of the dynamics of informal systems of accountability (Boland & Schultze, 1996; Masiero, 2020; Panozzo, 1996; Roberts, 1996; Selznick, 1957; Willmott, 1996). The historical research reveals how relationships of trust and profound connections among collaborative networks (Rossignoli & Ricciardi, 2015; Samlinger, 1993; Thompson, 2003) of merchants were essential for developing an informal accountability system to boost Trieste's insurance system.

Finally, what emerges from this paper is the historically enabling role of collaborative networks and trust in supporting informal accountability mechanisms, thus bypassing the need for a higher degree of control than formal, hierarchical accountability systems should have implied.

Keywords: Insurance companies; accountability; networks; business history; eighteen-century

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United we stand: managerial, sustainability and accounting implications regarding the merge of the "Santa Croce" hospital of Mondovì during the 16th century

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1. Introduction

The problem of cost-efficiency and the quality of healthcare is a major issue of many healthcare systems in the world, especially those which rely on public healthcare (Graham et al., 1998; Weatherly et al., 2009; Owen et al., 2012). Different countries adopted different strategies to overcome this challenge, such as managerialisation (Borgonovi 2008, 2013; Anselmi, 2014), pay-for-performance regarding particular health issues (Petersen et al., 2006), and deincentivisation practices (Ries, 2012; Mozaffarian et al., 2018). All of these practices can be considered from a general perspective, because they impact the whole healthcare system, without excluding any healthcare organisation operating within it. However, trying to achieve the result of quality healthcare, thus effective and efficient (Orlandini & Amelio, 2022), can also be pursued by acting at the organisational level, thus intervening on those dynamics and structures which constitute the healthcare organisations themselves, such as organisational structure, organisational behaviour, relationships, technologies, production and management cycles, management of human resources and their learning and updating processes. In some cases, aiming to improve the overall quality of the healthcare system and the local health services delivery, it can happen that a hospital can merge with another or into a new one.

Hospital mergers are a practice widely used by healthcare organisations in modern healthcare systems, especially in the last few decades in Europe and the USA (Vogt & Town, 2006; Gaynor et al., 2012; Greaney, 2018). Mergers can be defined as a combination of previously independent hospitals, formed by either the dissolution of one hospital and its absorption by another, or the creation of a new hospital from the dissolution of all participating hospitals (American Hospital Association, 1992; Alexander et al., 1996). Thus, the practice of mergers regards whole healthcare organisations, deeply impacting them, and cannot be considered just arrangements for some functions or contracts. Hospital mergers can be explained by many reasons. First, they should increase sustainability (Cerezo-Espinosa De Los Monteros et al., 2021); second, they should optimise internal processes and practices on both the medical and the managerial perspectives (Zuckerman & Weeks, 1979; Beaulieu et al., 2020); third, they should decrease, by realising multihospital systems (Bogue et al., 1995), costs (Dranove & Shanley, 1995; Connor et al., 1997),

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improve productivity (Ferrier & Valdmanis, 2004), quality (Beaulieu et al., 2020; Mariani et al., 2022), and the overall performance (Harris et al., 2000).

Hospital mergers can be differentiated into two major typologies, which are vertical and horizontal. Vertical merger is an arrangement whereby the new health care organisation offers a broad range of patient care and support services and is thus oriented towards cost reduction through the optimisation of processes (Conrad & Dowling, 1990); horizontal mergers are more oriented towards the realisation of economies of scale and the increasing of market power (Conrad & Shortell, 1996), thus are logics which are more present in private healthcare system models than in public health.

According to Harris (2000), the performance of a merged hospital can be measured by using technical efficiency as an indicator. Thus, it appears hospital mergers are one of the strategies which can be used to increase the overall performance and sustainability of hospitals and healthcare systems, such as digitalisation (Fontanella et al., 2024A), improvement of available technologies (Wu et al., 2012) and organisational structures (Taylor et al., 2015).

Shifting the attention to the past, healthcare and hospitals were not related to particular healthcare systems but often managed by the Church (Wolper & Peña, 2011) and charities (Baskerville & Servalli, 2016). Analysing the Medieval and Renaissance periods, charities played a crucial role in helping local governments in managing health issues and emergencies (Black, 2004; Servalli, 2013). Following Manetti et al. (2017), charity organisations helped Florence in managing the sanitary emergency caused by the plague. In this situation, the Confraternita of Misericordia took into account the complex situation, also providing health services. The role of Confraternities was pivotal in the social environment of Medieval and Renaissance societies, because they filled the gap between the civil and religious authorities, also providing many services which both the Church and the local government were unable to provide or provided in a non-optimal way (Black, 2003; Esposito, 2019). Among the services offered by Confraternities, there was also healthcare, which was delivered in hospitals and other facilities under the Confraternities' property (Flynn, 1989; Black, 2004). In the field of accounting history, many scholars have investigated the implications and the relationships which created between Confraternities, hospitals and civil and spiritual authorities. Manetti et al. (2017) proposed the role of the Confraternita of Misericordia in the management of the plague in Florence; Lazzini & Nicoliello (2021) investigated the Galliera Hospital and its dynamics under Foucault's governmentality lenses; Miley & Read (2016) proposed accounting as a tool to overcome stigma, and Baskerville & Servalli (2016) proposed a special issue about this topics, stimulating the production of many contributions. However, although the accounting history scientific literature provides many interesting and intriguing contributions about the multitude of facts and implications regarding hospitals, the organisations which manage them, and the role accounting has in these contexts, to the best of our knowledge, there are no contributions which analyse from the accounting perspective a hospital merger in the past. Aiming to fill this gap in the literature, this paper proposes the Santa Croce Hospital of Mondovì merger. Although there is no documentation about the original realisation of the infrastructure, nor the reasons why it was realised, the Santa Croce Hospital was the hospital of the Piazza district and it was owned and it was under the responsibility of the Santa Croce Confraternity, founded in 1319 (Billò, 2006). A few years later, in 1340, it obtained Pope Benedict XII's protection through a bulla, providing one of the first official evidence about the formal existence of Santa Croce as a hospital.

In the context of Mondovì, the Santa Croce was just the last hospital built, and it was the third in the Piazza district, following the realisation of Sant'Antonio Hospital and San Domenico Hospital, owned and managed by other Confraternities. In fact, there were already three other hospitals, divided into the other districts of the town, managed by other Confraternities and strictly linked with the Church. In the district of Breo, down Piazza's hill, the Confraternity of Disciplinanti Bianchi di Santo Stefano owned and managed the Breo's Hospital, which, in 1601, divided itself into two organisations: one was still the Breo's Hospital and the other, the new one,

was Piandellavalle Hospital, voted to Holy Mary of the Pilone. In the Carassone district, the Confraternity of Sant'Antonio Abate managed the homonymous hospital. Considering the small dimensions of Mondovì, especially during the historical period analysed, it is interesting to identify so many hospitals and, consequently, the interaction between so many different Confraternities, obviously disciplined and regulated by the Church.

The year 1547 is the year of interest for this research because the Santa Croce Hospital, which already had absorbed two minor hospitals (San Giovanni and San Francesco) in 1437 by order of bishop Alberto Gutturaio, merged with Sant'Antonio Hospital, San Domenico Hospital and the Confraternities of Porta di Vasco, Porta di Vico and Roata Damascena. According to the local authority, the operation was justified by efficiency and cost reduction. From the logistic and organisational perspective, although after the merger the Santa Croce Hospital assisted also the patients who were managed by previous hospitals, the location of the main building remained the classic one until the final merger of 1743, which made the Santa Croce Hospital commissioning the realisation of a new building in Piazza district, that will be known as the Major Hospital of Mondovì and which will host all the structures, departments and activities of Santa Croce Hospital, definitely transferred from its historical site. From the accounting perspective merger of 1547 is interesting because it highlights the control that both the local and the spiritual authorities exercised on the financial flows of hospitals, even if they were managed by charity Confraternities, which suggests the social importance of hospitals and healthcare even in Medieval and Renaissance (Auerswald, 2009). Furthermore, this fact highlighted the importance of financial sustainability (Munro, 2003; Johnson, 2017) in those historical periods, many centuries before the actual healthcare dimension, in which financial sustainability is one of the major issues (Birch et al., 2015; Lee et al., 2023; Fontanella et al., 2024B) for healthcare system, especially those oriented towards public health models. This led to the elaboration of the following research questions.

- RQ1: Had the merger actually reduced costs, and how did it make it possible?
- RQ2: Had the merger actually increased efficiency in the management of financing flows, and how did it make it possible?

The research team expects a positive answer to both the research questions, supposing the element which helped in decreasing costs is the increased efficiency in the use of new infrastructure and know-how sharing. Regarding RQ2, the research team supposes that the merger decreased the number of organisations operating in the territory, without deleting them as entities. This could have led people not to stop their donations (one of the most important financing sources), but to concentrate them into only one big organisation, increasing the overall capital available and increasing, as a consequence, the efficiency of the financing process itself.

Starting from this evidence and by answering to the research questions, this paper contributes to the scientific literature not only by closing the literature gap previously identified, but also by providing an accounting analysis of the merger of Santa Croce Hospital of 1547, which analyses the previous situation and the new organisational structure of the hospital, highlighting with accounting data the reasons which led to the operation and, by analysing the years following the merger, if the expected results have been achieved. In doing this, the paper is an element of originality. Furthermore, this paper enriches the accounting history scientific literature about charity organisations and hospitals during the Medieval and the Renaissance periods. Finally, this paper aims to contribute to the open debate about hospital mergers for cost reduction (Dranove & Shanley, 1995; Harrison, 2011; Schmitt, 2017) by proposing the first accounting historical research which proposes the logic through which cost-effective choices were made, considering that hospitals were managed and conceived in a completely different way than nowadays. In doing this, the case of Santa Croce Hospital seems to forecast the future, showing that public interest was a major concern even in a society in which these topics were barely considered and there were no evolved public apparatuses designed to pursue it. Finally, the solution of hospital merger justified by economic and accounting reasons can be seen as a sort of application of accounting

genius oriented towards the improvement of the quality of a service which is crucial for the well-being and the protection of life of the whole community.

The realisation of this paper relies on both primary and secondary sources. Primary sources were retrieved by performing archival research in the State Archive of Cuneo, in which the whole documentation of Santa Croce Hospital is kept. Documents analysed were of a different nature. In the first instance, accounting documents such as balance sheets were considered of crucial importance and were deeply analysed. Second, other kinds of documents, such as relations, declarations, circulars and epistolary exchanges, were considered, aiming to complete or specify accounting information already retrieved. The consultation and analysis of those documents was fundamental because they provided the reasons, the problems and the negotiations which led to choosing the Santa Croce Hospital as the new sanitary hub for the Piazza district. Moreover, because of the merger, consulting those non-accounting or economic documents permitted to highlight the position of the Church and the local authority, and that of the different Confraternities interested in the organisational operation. Regarding Confraternities, it was interesting to understand the new configuration in the merged hospital and the new destination of the old sanitary buildings obtained after the merger and the end of their use as healthcare facilities. Secondary sources are composed of an analysis of the scientific literature that helps frame the topic of the research in a faithful historical context, analysing both the role of Confraternities in society and their relationships with the Church and civil authorities. Furthermore, part of the secondary sources consists of specific productions regarding charity organisations in Mondovì, including particular information about the history and major events of local hospitals, as well as the history of every hospital in Mondovì, including those that merged into the Santa Croce Hospital throughout history. This was helpful not only for increasing the accuracy of the narration and the description of the organisations and the facts, especially from a historical perspective, but also because, thanks to some charts, it was possible to identify the strategic advantage that the position of the Santa Croce Hospital gave to the organisation, undoubtedly influencing the choice when the merger process was about of being designed and applied.

Keywords: Hospital; merger; social value; accounting history; healthcare management

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Accounting for Displacement: Governing Smyrna Refugees in Colonial Malta (1919–1922)

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1. Introduction

In September 1922, the recapture of Smyrna by Turkish nationalist forces and the devastating fire that followed precipitated one of the most dramatic episodes of displacement in the eastern Mediterranean. The destruction of the city's Greek, Armenian, and European quarters transformed a long-standing commercial and cosmopolitan centre into a scene of panic, death, and forced displacement. As thousands of civilians crowded the waterfront in search of escape, Allied naval forces stationed in the harbour became the last possible channel of rescue. Among those evacuated were not only Greek and Armenian refugees, but also individuals connected to the British Empire through passports, descent, or legal status. A number of them, though culturally and linguistically integrated into the Levantine world of Smyrna, were transported to Malta.

The arrival of Smyrna refugees in Malta must be understood within a broader Mediterranean and imperial context. Malta occupied a strategic location within British imperial infrastructure and had long served as a military, naval, medical, and logistical hub. During the First World War it was widely described as the "nurse of the Mediterranean," a phrase that reflected both its military centrality and its imagined humanitarian usefulness. Yet by 1922 the island was no longer governed through a simple colonial chain of command. The constitutional reforms introduced in 1921 had established a limited form of self-government under a diarchic system that divided responsibility between imperial and local authorities. Certain matters remained reserved to the colonial government, while others were devolved to Maltese ministers. This institutional arrangement created uncertainty over fiscal responsibility, especially in moments of emergency.

The Smyrna refugee crisis therefore posed not only a humanitarian challenge but also an administrative and accounting problem. Who was responsible for receiving, housing, feeding, and possibly repatriating the refugees? Which categories of displaced persons were to be treated as a legitimate charge on local funds, and which were to be referred back to imperial authorities? How were donations to be allocated? These were not secondary issues that followed relief efforts; they were constitutive of them. The refugee emergency was organised through financial distinctions, bureaucratic procedures, and classificatory practices that transformed mobile and complex lives into categories legible to government (Mignolo, 2011; Stoler, 2008).

This paper argues that accounting was central to that process. It did not merely document costs after decisions had already been taken. Rather, accounting provided the language, categories, and calculative rationality through which the crisis was interpreted and governed. The

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archival material reveals repeated efforts to separate refugees by birthplace, nationality, ancestry, and entitlement "to facilitate accounting." It also shows that standards of food provision, accommodation, labour obligations, and fund allocation were closely tied to these distinctions. Refugees thus emerged not simply as vulnerable persons in need of assistance, but as differentiated units of fiscal responsibility.

This argument matters for at least three reasons. First, it extends the literature on accounting for refugees by locating refugee governance within a colonial maritime setting rather than within the contemporary nation-state alone. Recent studies have shown that accounting plays an important role in rendering migrants visible, countable, governable, and often suspect. Yet historical cases remain comparatively underdeveloped, especially where imperial structures, overlapping jurisdictions, and layered forms of belonging complicate the operation of public authority (D'Cruz, 2014; Pianezzi et al., 2022; Quayle and Haque, 2023). Malta provides a particularly revealing site because it combined strategic insularity, partial self-government, and deep entanglement with British imperial and Mediterranean political dynamics.

Second, the case allows us to reconsider the relationship between accounting and bureaucracy. Max Weber's reflections on rational-legal authority and bureaucracy remain highly relevant in explaining how administration translates social complexity into formal categories. However, the Maltese material also shows the limits of bureaucratic rationality when confronted with hybrid identities. Many of the refugees evacuated from Smyrna were British by nationality, Maltese by family origin, and Greek by language and social world. Such layered identities did not fit neatly within administrative grids. Accounting therefore became a means not only of order but also of exclusion, reducing ambiguity by attaching costs and obligations to fixed labels (Weber, 2019; Beetham, 1991; Du Gay, 2000).

Third, the paper contributes to postcolonial accounting scholarship by showing how classification, costing, and administrative fragmentation were implicated in the politics of empire. Malta in the early 1920s was also marked by ideological struggles involving British imperial loyalty, local constitutional claims, and the influence of Italian irredentism. Refugee management was not insulated from these tensions. Decisions about who should be supported, under what terms, and at whose expense reflected deeper anxieties about allegiance, belonging, and political legitimacy (Funnell and Chwastiak, 2015; Cobbin and Burrows, 2018).

2. Theoretical framework

This study is positioned at the intersection of three strands of literature: accounting for refugees, Weberian bureaucracy, and critical-postcolonial accounting history. Taken together, these perspectives make it possible to interpret the Maltese response to the Smyrna crisis not as a merely technical exercise in relief administration but as a politically charged process of classification, calculation, and selective responsibility.

A first point of departure is the emerging literature on accounting for refugees. This body of work has shown that accounting is deeply implicated in the governance of forced displacement. Refugees are made knowable to institutions through acts of naming, counting, documenting, and costing. These practices do more than describe a population; they help produce it administratively. Categories of vulnerability, dependency, entitlement, and risk are stabilised through forms, registers, budgets, and statistics. In this sense, accounting contributes to defining who is visible to the state, who qualifies for care, and who remains outside the legitimate frame of obligation (D'Cruz, 2014; Pianezzi et al., 2022; Quayle and Haque, 2023).

These studies are especially useful because they shift attention from accounting as a neutral reporting tool to accounting as an active participant in statecraft. The present paper extends that insight historically. In Malta during the Smyrna crisis, accounting practices were not ancillary to humanitarian relief; they structured the very possibility of relief by linking assistance to categories

of origin and cost liability. The question was never only how many refugees had arrived, but who among them could be considered a proper charge on public or imperial resources.

A second and closely related perspective comes from Max Weber's analysis of rational-legal authority and bureaucracy. Weber's account of bureaucracy emphasises hierarchy, written documentation, formal rules, specialisation, and impersonal decision-making. Bureaucracy is powerful precisely because it renders administration calculable, predictable, and ostensibly objective. It replaces personalised judgment with procedures, classifications, and records. In its ideal form, this generates efficiency and regularity. Yet Weber also warns of the restrictive and depersonalising tendencies of this rational order. The bureaucratic apparatus can trap actors within what later commentators famously described as an "iron cage," where human complexity is subordinated to administratively manageable categories (Weber, 2019; Beetham, 1991; Du Gay, 2000).

The Maltese response to the Smyrna refugees illustrates this dynamic with particular clarity. Faced with a sudden emergency and uncertain lines of authority, officials sought to reduce complexity through categories that could assign responsibility. The distinction between British-born, Maltese-born, and alien refugees was not simply descriptive. It served to determine who should be maintained at local expense, who should be charged to imperial funds, and who fell outside the primary circle of obligation. The instruction to separate refugees "to facilitate accounting" captures bureaucracy in Weber's sense: an effort to transform a politically and emotionally complex human situation into a rationalised administrative order.

At the same time, Weber alone is not sufficient. His framework helps explain the formal logic of the administrative response, but it does not fully capture the colonial and political asymmetries within which that logic operated. For that reason, the analysis is also informed by critical and postcolonial accounting scholarship. This literature has shown that accounting in imperial and wartime settings cannot be understood as merely technical or neutral. Rather, it has historically been implicated in conquest, extraction, control, and the normalisation of unequal relations (Funnell, 2006; Chwastiak and Lehman, 2008; Funnell and Chwastiak, 2015).

These insights are particularly important for understanding the Maltese case. The crisis was not managed by a unitary humanitarian authority but within a colonial system marked by divided sovereignty, political suspicion, and unequal access to recognition. In such settings, accounting practices can help transform coercive or exclusionary decisions into apparently neutral administrative routines. They also provide one of the principal means through which political tensions are displaced into the language of procedure, budget, and competence.

This postcolonial sensitivity also requires attention to the archive itself. Colonial archives should be read not simply as repositories of facts but as sites where imperial common sense was produced and preserved. They reveal what institutions considered important to know, measure, and record (Stoler, 2008). Spivak's reflections on subalternity are equally relevant: the absence of direct refugee voices is not a minor empirical inconvenience but part of the problem. The refugees appear in the archive primarily as entries, categories, liabilities, and administrative cases. Their speech is mediated or absent (Spivak, 2023).

Accounting records are particularly significant in this respect. Ledgers, manifests, and telegrams might appear dry and impersonal, yet they are saturated with assumptions about value, entitlement, and obligation. They encode distinctions between those who are a "proper charge" and those who are not; they specify acceptable standards of maintenance; and they connect identity to expenditure. Such records do not narrate refugee suffering directly, but they shape the institutional conditions under which suffering is recognised, ignored, or minimised. In that sense, accounting serves as a framing device that organises visibility, support, and administrative silence (Sargiacomo, 2011).

The Maltese case also benefits from insights drawn from Mediterranean studies and scholarship on islands as sites of border management and imperial experimentation. Islands often serve as laboratories of governance precisely because their boundaries can be more tightly

controlled while their strategic significance magnifies administrative decisions. Malta's insular geography, military role, and constitutional ambiguity made it especially suited to a mode of refugee administration in which bodies, funds, and jurisdictions were all subject to close scrutiny. The island was both a place of refuge and a filtering station, a humanitarian threshold and an accounting checkpoint.

This broader perspective helps illuminate an important feature of the case: the mismatch between the refugees' lived identities and the administrative categories available to the state. Many of those arriving from Smyrna embodied layered affiliations that complicated simple classification. They might hold British papers, descend from Maltese families long settled in the Levant, speak Greek, and be perceived locally as culturally foreign. Bureaucratic rationality did not eliminate this complexity so much as contain it through categories that attached responsibility to birthplace, ancestry, and legal form. Accounting thus became a tool for stabilising ambiguity in ways that often disadvantaged the refugees themselves.

The notion of ad personam cost accounting is useful here as an analytical concept. It refers to a mode of fiscal reasoning in which the cost of care is attached to the personal legal and administrative status of each refugee rather than to the collective reality of displacement. This is not a formal accounting term used by the actors themselves, but it captures the logic visible in the archival material. Costs were not simply calculated for a refugee population as such. They were disaggregated and redistributed according to origin, nationality, or classificatory entitlement. Such a system reveals how accounting can individualise administrative burden while depoliticising the broader structures that produce vulnerability.

In sum, the theoretical framework allows the paper to move beyond a descriptive history of refugee relief. Weber helps explain how classification and documentation made the crisis governable in formal terms. Accounting for refugees shows how counting and costing shape the field of humanitarian obligation. Postcolonial and archival perspectives reveal how these processes were embedded in imperial hierarchies, institutional silences, and contested politics of belonging. Together, these approaches support the central claim of the paper: in colonial Malta, accounting was not merely a record of refugee management but one of its principal technologies.

3. Methodology

The paper adopts a qualitative historical methodology grounded in interpretive, discursive, and archival analysis. Its purpose is not only to reconstruct the management of the Smyrna refugee crisis in Malta but also to examine how accounting practices framed that management and participated in the production of administrative distinctions. The approach is therefore historical in source base, interpretive in orientation, and critical in analytical intent.

The empirical material is drawn primarily from the National Archives of Malta and from parliamentary documents relating to the crisis. The key sources include official telegrams exchanged between Maltese ministers and colonial authorities; relief fund ledgers that record receipts, allocations, and reimbursements; ship manifests listing the refugees who disembarked in Malta; and memoranda on the condition of affairs in Smyrna tabled before the Legislative Assembly. Together, these documents offer a rich evidential basis for examining both the language and the calculations through which the refugee emergency was governed.

Particular importance attaches to the telegram of 7 November 1922 signed by the Head of Ministry, Joseph Howard. This document sets out an official policy framework for handling the refugees and makes explicit reference to distinctions drawn in order to facilitate accounting. It also prescribes standards of maintenance and labour expectations. Relief fund ledgers are equally significant because they show how receipts and expenditures were separated by category, making visible the material consequences of administrative classification. The ship manifests, meanwhile, reveal how officials labelled refugees on arrival, while parliamentary papers provide broader political context and help trace how the issue was represented in public debate.

The analysis proceeds in two complementary ways. First, it employs critical discourse analysis to examine the language of official documents. Particular attention is paid to recurring phrases such as “proper charge”, “foreign-born”, “British subject”, and references to the “Poor House” standard. These expressions are treated not as neutral administrative vocabulary but as indicators of the categories and moral assumptions through which the crisis was framed. Second, the study follows Stoler’s suggestion of reading “along the archival grain”. Rather than treating the archive as transparent evidence, the paper reads documents as artefacts of administrative reason (Stoler, 2008).

This interpretive stance is especially necessary because direct refugee voices are largely absent from the material. The archive preserves the perspective of the state more readily than that of the displaced. Refugees appear in the documents primarily as counted bodies, legal statuses, and financial cases. Their experiences must therefore be reconstructed indirectly through traces such as maintenance arrangements, rations, labour requirements, and classificatory distinctions. Following postcolonial approaches to subaltern silence, the paper does not treat this absence as accidental. It is bound up with the very nature of the accounting records under examination (Spivak, 2023; Thomason, 2011).

The concept of ad personam cost accounting, used throughout the analysis, is therefore an interpretive device that synthesises what emerges from the sources. It captures a fiscal logic in which responsibility is assigned to individuals according to origin and status rather than addressed collectively as a humanitarian question. This concept helps reveal how accounting categories operated as politically loaded constructs even when presented in technical form.

Although the Maltese case is historically specific, the methodology has wider relevance. It shows how accounting historians can analyse archival traces of displacement in situations where direct testimony is limited and where the main surviving records are administrative. Such an approach is particularly useful for colonial and maritime settings, where the management of mobility often depended on institutions of classification, cost allocation, and jurisdictional negotiation (Servalli et al., 2024).

4. Findings and discussion

The archival evidence reveals that accounting was deeply embedded in the Maltese response to the Smyrna refugee crisis. Four interrelated findings emerge from the material. First, accounting categories structured access to aid and thereby operated as mechanisms of inclusion and exclusion. Second, the administration developed what can be interpreted as an ad personam system of cost allocation that redistributed responsibility according to personal status rather than collective need. Third, budgeting and provisioning took disciplinary form through the imposition of standardised diets and labour expectations. Fourth, accounting became intertwined with broader political tensions concerning imperial authority, local self-government, and contested identities.

A first finding is that the categorisation of refugees was central to the administration of relief. The documents repeatedly distinguish among British subjects, Maltese by birth or parentage, and aliens. These labels might appear to perform a simple descriptive function, but in practice they determined access to material support. Housing, food, maintenance, and possible reimbursement all depended on how an individual was classified. In this respect, classification was not a neutral prelude to action. It was itself a governing act. By sorting displaced persons into legally and politically significant groups, the state transformed an emergency of mass displacement into a manageable series of differentiated cases.

This point is analytically important because it shows that the administration’s response was not driven solely by humanitarian need. Need was filtered through classificatory schemes that linked recognition to cost liability. A refugee’s claim on support depended not merely on vulnerability but on their fit with available categories of responsibility. Those who could be

presented as properly chargeable to local or imperial funds were more legible to the system than those whose identity was ambiguous. The case therefore confirms that accounting can operate as a mechanism of economic and administrative selection rather than as a neutral background to relief (Chwastiak and Lehman, 2008).

The evidence also reveals how such categories were shaped by colonial anxieties about belonging. Many refugees possessed connections to Malta but had been born and raised abroad. They might have been descendants of Maltese emigrants settled in Smyrna for generations, yet still be treated as culturally external or administratively marginal. Their legal relationship to the British Empire did not eliminate the ambiguity attached to their social identity. Classification thus worked not only as a fiscal tool but as a mechanism through which the state translated uncertain belonging into differentiated entitlement. From a Weberian perspective, this reflects the drive of bureaucracy to stabilise complexity through formal categories. Yet the Maltese case also shows the violence embedded in that process.

A second major finding concerns the way costs were allocated. Rather than treating the refugee emergency as a single collective expenditure requiring joint public responsibility, the authorities sought to disaggregate costs according to each refugee's status. This logic is visible in correspondence over which categories of refugees should be borne by local funds, which should be charged to imperial authorities, and which should be excluded from the central streams of support. The relief fund records reinforce this picture by showing differentiated allocations and the separation of donations according to the intended beneficiaries.

This is what the paper conceptualises as ad personam cost accounting. The term captures a mode of reasoning in which financial responsibility attaches not to the event of displacement as such but to the legal and administrative identity of each person displaced. Care is thereby fragmented into discrete fiscal cases. The result is a system in which humanitarian obligation is mediated by bureaucratic distinctions and intergovernmental negotiation. This finding is particularly significant in the Maltese constitutional context. The diarchic system introduced in 1921 had already divided authority between local and imperial institutions. The refugee crisis exposed how fragile and contested that division remained. Accounting became one of the main instruments through which these disputes were managed.

The material on donations is especially revealing. Appeals directed at "All British" support were reserved for certain categories of refugees, rather than for the displaced population as a whole. Such earmarking demonstrates that accounting distinctions were reproduced even in the distribution of charitable aid. Donations did not necessarily soften the classificatory logic of the system; in some respects, they reinforced it. Relief thus became segmented not only by state finance but also by philanthropic channels aligned with identity categories.

A third finding concerns the disciplinary dimensions of refugee maintenance. The archival material shows that relief was not conceived as an open-ended humanitarian duty. It was calibrated through standards of minimum subsistence and linked to expectations of conduct. The directive that refugee diets should conform to those of the Poor House is especially important in this regard. On the surface, the instruction appears as a budgeting measure: an attempt to control expenditure by adopting an already established maintenance standard. Yet its meaning is broader. To align refugee provisioning with the Poor House was to place the displaced within a moral and institutional framework associated with dependency, destitution, and disciplinary oversight.

The symbolic force of the Poor House reference should not be underestimated. It effectively reframed the refugees not as victims of a violent geopolitical rupture but as subjects to be maintained under the lowest acceptable standard consistent with public order. In this sense, accounting intersected with what might be called a moral economy of relief. Cost control was intertwined with assumptions about deservingness, dependence, and the dangers of excessive generosity. The labour expectations recorded in the material reinforce this interpretation. Refugees were required, or at least expected, to contribute through maintenance work in exchange

for their upkeep. This arrangement narrowed the space of humanitarian care by recoding it as an exchange (Sargiacomo et al., 2014).

A fourth finding is that accounting practices were entangled with wider political tensions concerning identity and loyalty. Malta in the early 1920s was not a politically neutral receiving station. The island was marked by the tensions of diarchic constitutionalism, by local contestation over the scope of self-government, and by the influence of Italian cultural and political currents. In such a context, refugee management could not be detached from broader anxieties about allegiance and legitimacy. The refugees arriving from Smyrna posed a particular challenge because many embodied hybrid identities that unsettled simple distinctions. Some held British nationality, some had Maltese ancestry, and many were culturally Hellenised.

Accounting became one of the means by which this ambiguity was handled. By translating identity into categories of cost, the administration could avoid confronting its full social and political complexity. A person's place within the relief system depended on formal designations that appeared objective even when they were saturated with political judgment. Parliamentary material concerning conditions in Smyrna and the possibility of return further underscores this point. Financial concerns were used to support caution regarding repatriation and longer-term support. Cost projections and liability arguments helped frame decisions that were not merely economic but also strategic and political. In other words, accounting served as both a practical and rhetorical resource. It organised expenditure while also legitimising the terms on which the crisis would be interpreted (Cobbin and Burrows, 2018).

A final point deserves emphasis. The refugees themselves are largely absent as speaking subjects in the archival record. We learn about them through categories, allocations, standards, and administrative concerns. This absence is not simply a limitation of the sources; it is part of the finding. The very records that made the crisis governable also contributed to rendering refugee experience administratively mute. Yet the archive is not entirely silent. Through the insistence on classification, the disputes over charges, the use of minimum dietary standards, and the requirement of labour, we can infer the institutional pressures placed upon the refugees. Reading accounting documents critically therefore makes it possible to reconstruct part of the social reality they helped produce (Stoler, 2008; Spivak, 2023).

This is where accounting history can contribute meaningfully to refugee studies. Historical accounting records are often among the few surviving traces of how displaced populations were handled by states and empires. If read narrowly, they appear as dry administrative remnants. If read critically, they reveal the material and symbolic organisation of care, neglect, and exclusion. The Maltese case shows that such records can illuminate not only costs but the politics of human worth embedded in systems of classification and relief.

5. Conclusion

This paper has examined the role of accounting in the management of the Smyrna refugee crisis in colonial Malta. It has argued that accounting was not merely a secondary instrument used to register expenditure after humanitarian decisions had been made. Rather, it was one of the principal means through which the crisis was rendered governable. By classifying refugees, allocating costs, standardising maintenance, and fragmenting responsibility across authorities, accounting helped determine who counted as a legitimate object of care and under what conditions.

The Maltese case makes three contributions. First, it contributes to the literature on accounting for refugees by offering a historical analysis rooted in a colonial and maritime setting. This widens the geographical and temporal scope of the field and shows that many issues associated with contemporary refugee governance, such as counting, categorisation, and differentiated entitlement, have deeper historical precedents. Second, the paper contributes to accounting history by showing how archival accounting records can be used to reconstruct refugee

governance even where direct testimonies are largely absent. Third, it adds to postcolonial studies of accounting by demonstrating how fiscal rationality was intertwined with imperial politics, contested sovereignty, and unstable identities.

The findings also illuminate the strengths and limits of Weberian analysis. Weber's account of bureaucracy is highly useful for understanding the administration's reliance on written rules, formal categories, and impersonal decision-making. However, the Maltese material shows that bureaucratic rationality was never simply neutral. It operated within a colonial field structured by unequal recognition and political suspicion. The categories through which order was achieved were themselves shaped by imperial assumptions about who belonged, who should pay, and who could be excluded without scandal (Weber, 2019; Funnell and Chwastiak, 2015).

The notion of ad personam cost accounting developed in this paper helps capture that process. It shows how responsibility for relief could be individualised and redistributed according to legal status and ancestry, thereby obscuring the collective humanitarian nature of the crisis. The displaced were not primarily treated as a community in need, but as a series of differentiated fiscal claims.

At the same time, the paper has limitations. The archival base is rich in administrative evidence but poor in direct refugee testimony. This makes it difficult to reconstruct fully the lived experience of those who passed through Malta. The analysis must therefore remain attentive to mediation and silence. In addition, Malta's constitutional and geopolitical specificities mean that the case cannot be generalised without caution. Its value lies less in statistical representativeness than in analytical depth.

Future research could fruitfully proceed in at least three directions. Comparative studies might examine whether similar accounting logics were at work in other Mediterranean islands or colonial ports dealing with refugee movements in the interwar period. Additional work might also bring in newspapers, memoirs, family records, or oral histories where available, in order to recover more of the social worlds obscured by official documentation. Finally, contemporary scholars of migration governance may find in historical cases like this one a reminder that the calculative management of displacement is not a recent development but a long-standing feature of state and imperial responses to mobility.

Seen from Malta, the Smyrna crisis reveals a broader truth about accounting. In moments of emergency, accounting does not simply follow politics and administration. It helps make them possible. It translates uncertainty into categories, vulnerability into charges, and human movement into the terms of responsibility and refusal. In colonial settings especially, those translations could carry profound consequences for who was sheltered, who was disciplined, and who remained at the margins of recognition.

Keywords: Accounting for war; accounting for refugees; smyrna crisis; colonial governance; Malta; Mediterranean

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Accounting for Fairness: A Genealogical Analysis of the Monte di Pietà of Naples

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1. Introduction

Accounting research increasingly views accounting as a social practice that shapes organizational and human behavior, rather than a purely technical activity (Carnegie et al., 2020; Gomes et al., 2008; Hopwood, 1983; Hopwood e Miller, 1994; Napier, 1989). Hopwood (1983) argued that accounting must be studied within its social and institutional contexts, as it does not merely record reality but also contributes to creating it. This insight supports subsequent calls for historically grounded analyses that examine how accounting practices acquire meaning within specific places, institutions, and cultural settings (Carnegie, 2014).

This study follows this perspective by examining the Monte di Pietà of Naples, a charitable credit institution founded in 1539. Historical accounting research often focuses on localized settings because accounting practices are shaped by the political, social, and moral climate in which they operate. Sixteenth-century Naples—a major European capital under Spanish rule and a densely populated commercial hub—provides a particularly rich context. Issues of credit and usury were not only economic matters, but also public concerns linked to morality, religious teaching, and civic stability.

The Monte di Pietà was established by Neapolitan nobles and religious leaders inspired by Franciscan ideals of just lending. Its mission was to offer fair, non-usurious credit to the poor, backed by pledges. To achieve this, the institution relied on a structured system of offices and an extensive set of accounting records—journals, ledgers, pledge registers, and periodic balances. These tools were designed to support proportionality in lending, transparency in operations, and accountability to the community.

Examining the Monte's accounting system therefore offers insight into how accounting functioned as a civic practice, shaped by the broader cultural expectations of early modern Naples. In this context, fairness (aequitas) was a widely shared principle that guided economic and social life: it reflected classical ideas of proportional justice, Franciscan critiques of usury, and, later, the Neapolitan tradition of Economia Civile, which framed economic activity as grounded in reciprocity and the common good.

Against this background, the present study adopts fairness as its guiding theoretical framework and uses archival materials to explore how the Monte's accounting practices supported equitable credit relations. By focusing on place, culture, and institutional design, the paper aims to illuminate the ways accounting shaped legitimacy, trust, and social balance in early modern Naples.

2. Theoretical background

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2.1. The Intellectual Roots of Fairness: From Classical Thought to the Neapolitan Enlightenment

The conceptual lens of fairness adopted in this study draws on a set of intellectual traditions that, although historically distinct, provide a meaningful cultural backdrop for understanding charitable credit institutions such as the Monte di Pietà di Napoli. The starting point is Aristotle's notion of epieikeia, a corrective form of justice that restores proportional balance when general rules fail to capture the complexity of concrete situations (Aristotle, 2000). This idea was taken up and adapted within medieval scholastic thought, where theologians—including Aquinas—developed principles of proportional exchange, the just price, and the moral evaluation of contracts, shaping European reflections on economic justice for centuries (Aquinas, 1948; Langholm, 1998). From the late Middle Ages onward, Franciscan thinkers transformed these abstract principles into institutional practice through their critique of usury and their promotion of transparent, pledge-backed credit to safeguard the poor and preserve civic harmony (Todeschini, 2023). Their ideas directly informed the establishment and governance of the Monti di Pietà across the Italian peninsula (Menning, 1993).

While this broader Mediterranean tradition illuminates the moral vocabulary surrounding fairness, the Neapolitan Enlightenment is particularly relevant for the present study because the case examined is located in Naples. In the eighteenth century, authors such as Antonio Genovesi, Filangieri, and Galiani articulated a distinctive vision of economic life as a form of civil cooperation grounded in trust, reciprocity, and public happiness (Bruni e Zamagni, 2007; Robertson, 2005). Although chronologically distant from the sixteenth-century Monte, this intellectual climate reflects enduring Neapolitan expectations about how economic institutions should contribute to social equilibrium and collective welfare (Genovesi, 1765/2013). For this reason, the Neapolitan Enlightenment is not invoked as the culmination of a linear genealogy, but as a cultural frame that helps interpret the meanings attributed locally to fairness, proportionality, and accountability. Taken together, these traditions support the use of fairness as an interpretive framework for analyzing how the Monte di Pietà di Napoli structured its procedures, valuations, and accounting practices within a civic understanding of economic justice.

2.2. Accounting studies on Monti di Pietà

Over the past two decades, accounting history has broadened its scope to include everyday contexts and the practices of religious, charitable, and other non-profit institutions (Carnegie e Napier, 2012; see also Hopwood, 1994; Jeacle, 2012). This expansion reflects a growing recognition that accounting is deeply implicated in the social, moral, and organizational arrangements of institutions outside the corporate sphere. Within this line of inquiry, a significant body of work has examined how accounting practices in Italian charitable and religious settings have shaped institutional legitimacy, internal control, and public trust.

Orelli et al. (2013) provide a detailed reconstruction of the emergence of accounting as a mechanism of governance in the Monte di Pietà of Bologna, demonstrating how bookkeeping procedures reinforced managerial oversight and operational reliability. Similarly, Del Sordo, Fornasari, and Orelli (2019), studying the Monte di Pietà of Ravenna, show that accounting acted as a disciplinary and organizational device, especially in the aftermath of fraud. Their Foucauldian interpretation positions accounting as a technology of order—one that reconstituted stability and continuity within the charity. More recently, Nicoliello e Aliabadi (2022) examined the Congrega of Apostolic Charity of Brescia (1860–1886), illustrating how accounting routines evolved in response to broader social and political transformations and became vehicles for institutionalizing new rules and expectations.

Taken together, these contributions indicate that accounting in charitable institutions cannot be reduced to a neutral administrative technique. Rather, it operates as a regulative practice that

mediates between institutional values, social expectations, and governance imperatives. Within this historiographical trajectory, the case of the Monte di Pietà of Naples adds a further layer of insight: its accounting arrangements—designed to ensure proportionality, transparency, and structured control—offer a lens through which to explore how early modern financial institutions sought to cultivate fairness and sustain public confidence. This study engages with that tradition by examining how accounting practices were constructed and mobilized within the Neapolitan context, without presuming any predetermined normative function, but recognising their embeddedness in the cultural and institutional fabric of the sixteenth century.

3. Research methodology

The term "new accounting history" (Miller et al., 1991) has been used to describe an interdisciplinary approach to historical accounting research aimed at investigating the social, political, and ethical processes that have shaped the evolution of accounting practices over time (Bertalan e Napier, 2013). As Carnegie and Napier (1996, p. 31) note, this perspective takes form in critical and interpretive histories "firmly grounded in the archive," in which accounting records are examined not as mere administrative documents but as cultural and institutional artefacts that reveal the rationalities, values, and conflicts underpinning systems of recording.

The methodology adopted in this study aligns closely with this tradition. It combines a narrative approach (Previts et al., 1990) with an interpretive perspective (Parker, 2015), applied to the analysis of original archival documents from the Monte di Pietà of Naples, now preserved at the Fondazione Banco di Napoli. Archival investigation enables direct observation of the institution's accounting practices, valuation rules, and control mechanisms between the sixteenth and seventeenth centuries, attending both to formal procedures and to the moral and relational logics embedded within them.

Following Zan (2004), historical sources are used not as mere illustrative material but as theoretical building blocks, allowing interpretive hypotheses to be tested against evidence of practice. In this sense, the research does not aim to reconstruct a linear chronology but to develop a genealogy of accounting equity, illustrating how the language of ledgers and financial statements can be read as a device for social and moral balance. The methodology therefore rests on the interplay between archival analysis, contextual interpretation, and theoretical reflection, situating the study within a broader body of work that understands accounting history as a form of critical engagement with the present (history of the present, Foucault, 1977; Hoskin e Macve, 1986).

To translate the theoretical conception of fairness—understood as corrective justice and practical balance—into an operational framework for archival analysis, this study adopts a multidimensional approach grounded in Organizational Justice Theory (Greenberg, 1990; Colquitt, 2001). While these constructs are developed within modern management literature, they are employed here as a heuristic framework to organize and interpret historical evidence. This approach avoids anachronism by distinguishing between the analytical categories (derived from modern theory) and the normative content (derived from the historical context).

In this study, modern dimensions of organizational justice serve as lenses to detect how the Monte di Pietà operationalized centuries-old concepts of proportional justice, public trust, and civil cooperation. The analysis is structured around four key dimensions:

- Procedural Fairness: Drawing on Leventhal's (1980) criteria of consistency, accuracy, and correctability, this dimension examines accounting as a mechanism of governance. In the context of the Monte, it refers to transparency, redundancy, and the collegial verification of records. These were not merely bureaucratic routines, but structural safeguards designed to ensure the impartiality of the institution and maintain the "public faith" (fede pubblica) essential to the Neapolitan civil economy (Genovesi, 1765).

- Distributive Fairness: Rooted in the Aristotelian principle of geometric proportion and modern equity theory (Adams, 1965), this dimension focuses on the allocation of resources. It is reflected in the appraisal of pledges and the granting of loans, where fairness is achieved not by equality of outcome, but by a balanced ratio between the value of the collateral, the need of the borrower, and the financial sustainability of the institution.
- Interactional Fairness: Based on Bies and Moag's (1986) concept of interactional justice, this dimension concerns the interpersonal treatment of stakeholders. It captures the extent to which the Monte recognized debtors not as passive beneficiaries of charity but as moral agents deserving of dignity. This aligns with the Neapolitan Enlightenment's emphasis on reciprocity and fratellanza (brotherhood) as the basis of economic exchange (Bruni & Zamagni, 2007).
- Substantive Fairness: Extending beyond formal procedures, this dimension addresses the material outcomes of justice, specifically regarding restitution. It is empirically analyzed through the management of the "soprappiù" (the surplus generated from auctioned pledges). The return of this surplus to the debtor embodies a concrete form of corrective justice (Aristotle, Nicomachean Ethics, V), ensuring that the institution restores the economic equilibrium and does not profit unjustly from the misfortune of the poor.

Together, these four dimensions form the conceptual structure of the analytical model. By applying this framework, the archival investigation can interpret the accounting practices of the Monte di Pietà not merely as technical routines, but as historical artifacts of proportional and civic regulation. This allows the study to explore how abstract principles of fairness were embedded in the daily operational logic of the institution, fostering a social order grounded in trust.

4. Expected contribution

Drawing on Foucault's notion of a "history of the present" (1977, 1979) and following recent methodological reflections (McBride et al., 2025), this study employs historical analysis not to reconstruct the past as a linear progression, but to critically illuminate the present. Examining the accounting practices of the Monte di Pietà of Naples reveals how accounting operated as a site where civic and moral values were translated into technical form and invites reflection on how those values—once central—have been gradually reframed or marginalised within contemporary accounting discourse.

Rather than treating the Monte's accounting as an "early" or "primitive" stage in the evolution toward modern banking, the study adopts a genealogical approach that interprets the institution as an alternative rationality of accounting. This rationality emerged from specific social and moral conditions: the struggle against usury, concerns for equitable economic relations, and expectations of public accountability in the management of resources. A genealogical perspective makes it possible to identify discontinuities (shifts between different logics of reporting), contestation (tensions between collective interests and administrative power), and contingency (the non-inevitability of prevailing accounting forms).

This approach also avoids reproducing dominant narratives—those that read the history of accounting solely through modern categories such as efficiency, control, and performance. Instead, it foregrounds practices grounded in equity, justice, and reciprocity, core principles of the Italian Economia Civile tradition. From this perspective, the Monte's accounting system is not a deficient precursor to contemporary practices but a plausible alternative model of accountability, one in which rendering account was inseparable from fairness understood as a higher form of justice.

Finally, this genealogical analysis offers insights for the present. By recovering historical forms of fairness embedded in the accounting of the Monti di Pietà, the study contributes to imagining alternative accounting perspectives—ones potentially better equipped to address

current crises of trust, sustainability, and institutional legitimacy. In this way, the past becomes a resource for rethinking what accounting could be, rather than merely a record of what it has been.

Keywords: Accounting history; fairness; organizational justice; charitable institutions

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Track 7: INTELLIGENZE ARTIFICIALI PER LA GESTIONE DELLE PERSONE E LA SOSTENIBILITÀ ORGANIZZATIVA

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Beyond the hype: employees' real feelings about Artificial Intelligence at work. Preliminary Evidence from an Italian SME

Filomena Pagnozzi[1], Gilda Antonelli[2]

1. Introduction

In recent years, Artificial Intelligence (AI) has evolved from an experimental technology to an everyday presence in the workplace. It is no longer merely a technical tool, but a pervasive and transformative force that is reshaping how organizations operate, make decisions, and define the meaning of human work. Across sectors, algorithms now assist people in performance evaluation, personnel selection, task planning, and the management of production flows (Meijerink et al., 2021; Davenport & Ronanki, 2018).

While large corporations have been early adopters of AI, small and medium-sized enterprises (SMEs) have experienced a slower diffusion of these technologies. Nevertheless, recent studies show that AI can play a transformative role in SMEs, providing access to advanced analytical and operational capabilities that were once available only to larger firms (Rajaram & Tinguely, 2024). This gap, however, continues to widen as large organizations leverage AI to enhance efficiency and competitiveness, leaving smaller firms—particularly in Italy—at risk of falling behind (European Investment Bank, 2022). Italian SMEs, as defined by the National Institute of Statistics, are firms with fewer than 250 employees, forming the backbone of the national economy. With more than four million enterprises—the highest concentration among EU Member States—they employ around 13 million people and generate over 65% of the country's added value, as well as more than half of its total exports (OECD, 2024). Despite their centrality, many SMEs still face challenges in adopting AI due to limited financial resources, infrastructural constraints, and uneven levels of digital literacy (OECD, 2024). To address this gap, the European Commission has launched the AI Innovation Package, which provides funding, access to high-performance computing, and programs to develop AI-related competencies aligned with European standards. Yet, technological investment alone is not sufficient: successful AI integration also depends on understanding the human and organizational dynamics that shape how employees perceive and engage with intelligent systems (Serpa et al., 2022).

From this perspective, AI should not be viewed solely as a technical innovation but as part of a broader sociotechnical system. According to Sociotechnical Systems Theory (Trist & Bamforth, 1951), every organization comprises two interdependent subsystems: a technical one (machines, tools, algorithms, and workflows) and a social one (people, culture, and relationships). The introduction of new technologies can disrupt this balance, triggering psychological and relational adjustments that shape acceptance, trust, and meaning at work (Spagnoli et al., 2020). When the equilibrium between these systems is not maintained, tensions may arise in the form of resistance, anxiety, or perceived loss of control (Singh et al., 2012).

However, while AI offers significant benefits in terms of efficiency and productivity, employees' perceptions of these technologies remain a relatively underexplored domain.

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Individuals respond to AI not only as users but as social actors who interpret, embrace, or resist automation depending on their experiences, values, and interpersonal relationships (Glikson & Woolley, 2020). Understanding these perceptions is essential, as the success of AI adoption depends not only on technical accuracy but also on trust, sense of control, and social integration that workers maintain in the face of technological change (Lee & See, 2004; Zerilli et al., 2019).

This issue is particularly relevant in SMEs, where decision-making processes are less formalized, interpersonal ties are stronger, and human capital remains the main driver of innovation (Unioncamere, 2024). In these contexts, the introduction of AI tools can generate deep ambivalences—enthusiasm for learning and simplification coexisting with fears of substitution, unfairness, and loss of social cohesion (Tarafdar et al., 2019; He et al., 2022). As highlighted by Davenport and Ronanki (2018), AI implementation requires an incremental, human-centered strategy that enhances human capabilities rather than replacing them. Likewise, Serpa et al. (2022) emphasize that digital transformation is successful only when supported by a digital culture founded on openness, transparency, and value alignment.

The present study is part of a broader research project aimed at exploring and measuring the psychological and social reactions of employees toward the adoption of AI technologies in organizations. In this specific case, the focus is on a medium-sized enterprise operating in the construction and engineering sector. At this stage, the research takes the form of a quantitative and exploratory work in progress, based on a survey designed to capture employees' perceptions across three key dimensions: automation and personal control; algorithmic fairness and trust, and communication and collaboration.

In the next phase, the study will be extended through qualitative interviews and further survey waves to deepen the understanding of how employees negotiate trust, professional identity, and belonging within an increasingly hybrid work environment, where humans and algorithms co- produce organizational value (Arcidiacono et al., 2025).

2. Theoretical background

The integration of AI in organizational contexts raises critical questions about how employees perceive and adapt to technological transformation. Beyond operational efficiency, AI profoundly affects the psychological and social dimensions of work—shaping employees' sense of control, fairness, and relational connectedness (Glikson & Woolley, 2020).

The Sociotechnical Systems Theory (STS) (Trist & Bamforth, 1951) provides a foundational lens for understanding these dynamics. According to STS, every organization operates through the interdependence of technical and social subsystems. Sustainable performance emerges only when both systems are jointly optimized. When new technologies such as AI are introduced, this balance may be disrupted, affecting employees' perceived autonomy, meaning, and control over their work (Singh et al., 2012). Employees must navigate a psychological transition, not just a technological change—redefining their professional roles and sense of agency. If this transition is not supported, AI adoption can result in stress, disengagement, and resistance (Tarafdar et al., 2019; Spagnoli et al., 2020). The sociotechnical approach thus emphasizes the need for human-centered AI integration, where organizations design technological change processes that respect human values, promote trust, and reinforce collaboration (Arcidiacono et al., 2025; Davenport & Ronanki, 2018).

Building on this perspective, three key dimensions have emerged as central for understanding employees' perceptions of AI in the workplace:

- Automation and control

AI can function both as a source of empowerment and of threat. On the one hand, it can relieve employees from repetitive or low-value tasks, thereby improving precision and enabling them to focus on more meaningful or creative work (Parasuraman & Riley, 1997). On the other hand, it may reduce discretion and perceived autonomy, undermining employees' sense of control

and relevance (Tarafdar et al., 2019). Previous studies have shown that perceived loss of control and fear of technological substitution can lead to anxiety, technostress, and resistance to automation (Spagnoli et al., 2020). This tension reflects the sociotechnical principle that effective technology adoption requires preserving the social equilibrium—that is, employees' sense of agency and identity within the technical system (Trist & Bamforth, 1951).

- Algorithmic fairness and trust

The second dimension concerns perceptions of justice and transparency in AI-supported decision- making. Trust in AI systems depends on employees' understanding of how algorithms function and on their belief that outcomes are impartial and fair (Lee & See, 2004; Zerilli et al., 2019). When AI processes appear opaque or dehumanized, employees may develop concerns about injustice and loss of procedural fairness (Longoni et al., 2019; Tursunbayeva & Chalutz-Ben Gal, 2024). Conversely, high levels of algorithmic transparency foster what Hancock et al. (2011) describe as trust calibration—a realistic balance between confidence and critical vigilance. From a sociotechnical perspective, fairness is crucial for maintaining legitimacy and trust within the human–machine system.

- Communication and collaboration

The third dimension concerns the impact of AI on interpersonal dynamics and team collaboration. Intelligent technologies can enhance cooperation by improving data sharing and coordination across tasks and teams (Jarrahi, 2018; Seeber et al., 2020). Yet, when communication becomes mediated or substituted by AI systems, relational distance and reduced psychological safety may emerge—undermining the open dialogue and mutual trust essential to collective learning (Edmondson, 1999). In SMEs, where informal interactions and relational cohesion are key elements of organizational culture, such disruptions can be particularly sensitive. Thus, AI should be implemented as a collaborative partner, rather than a replacement, reinforcing human connection rather than eroding it.

3. Methodology

This study adopts a quantitative–exploratory work-in-progress design (Creswell & Creswell, 2017), as part of a broader research project investigating the psychological and social perceptions of employees regarding the introduction of Artificial Intelligence (AI) in organizational contexts. The research adopts a sociotechnical perspective, examining how technological systems interact with social structures, values, and behaviors within a real-world company setting.

3.1. Case study context

The empirical investigation was conducted within a medium-sized Italian enterprise operating in the construction and engineering sector, located in central Italy. The organization, founded in the 1980s, is recognized for its strong tradition of innovation and its multidisciplinary integration of expertise across energy, construction, and infrastructure projects.

Over the years, the company has developed a corporate culture deeply oriented toward research, sustainability, and the enhancement of human capital, promoting a business model that values synergy between technology and specialized competences.

Although the company remains anonymous for confidentiality reasons, it represents a notable example of a technically complex SME currently undergoing digital transformation and gradually adopting AI tools for operational management and strategic planning. Such a context provides an ideal setting for examining the social and psychological dimensions of AI introduction in an SME environment, where interpersonal relations and tacit knowledge play a crucial role (OECD, 2024; Serpa et al., 2022).

3.2. Survey design

An online survey was distributed using Survey Monkey to all 201 employees of the organization. At the time of analysis, 58 respondents completed the questionnaire, representing a response rate of approximately 28.9%.

The instrument consisted of two main sections:

- Socio-demographic and professional information, collecting data on age, gender, education level, contractual type, tenure, and professional role (administrative employee, technical/engineering, manual worker, manager/supervisor, external consultant, intern).
- AI perception items, evaluated on a 7-point Likert scale (1 = strongly disagree; 7 = strongly agree). This section aimed to assess attitudes, beliefs, and emotional responses toward the adoption of AI in the workplace.

The survey was designed as part of a broader process of scale development and validation, aimed at constructing a reliable instrument to measure employees' perceptions of AI.

This specific case study served as an opportunity to test and refine the scale within a real organizational setting, observing how items performed empirically, and which dimensions emerged most clearly among workers. Rather than focusing on statistical generalization, this phase seeks to identify emerging perceptual patterns and assess the construct validity and internal coherence of the proposed dimensions (Creswell & Plano Clark, 2017).

3.3. Measures

The questionnaire items were grouped into two broad interpretative categories, inspired by prior research on human–AI interaction, technology acceptance, and technostress (Parasuraman & Riley, 1997; Glikson & Woolley, 2020; Tarafdar et al., 2019):

- AI Positive perception: capturing perceptions of usefulness, collaboration, and learning opportunities.

Example items include: "AI helps me focus on more meaningful tasks by automating routine activities" and "The introduction of new technologies stimulates my professional growth." These items align conceptually with constructs such as perceived usefulness and technology-enabled learning (Davis, 1985; Venkatesh & Bala, 2008).

- AI Negative perceptions: capturing perceptions of threat, distrust, and discomfort toward automation.

Example items include: "I fear that automation may make my role less relevant" and "I feel under pressure when I think about competing with AI systems." These items reflect technostress, loss of autonomy, and automation anxiety (Tarafdar et al., 2019; Spagnoli et al., 2020).

Internal consistency analyses (Cronbach's α) and descriptive statistics are being used to assess the reliability and preliminary construct validity of the two dimensions. This process contributes to the progressive validation of the scale, which will later be tested on a broader sample.

4. Preliminary results and discussion

Preliminary results provide an overview of the sample's demographic composition, including gender, age group, organizational role, educational level, and job tenure. Regarding gender, most respondents were male (69.0%), while female employees accounted for 31.0% of the sample (Table 1).

Gender	Frequency	Percentage	Valid %	Cumulative %
Male	40	69.0	69.0	69.0
Female	18	31.0	31.0	100.0
Total	58	100.0	100.0	

Table 1. Gender of the sample

This distribution reflects a workforce predominantly composed of men, which is consistent with the characteristics of the organizational and industrial context under investigation.

In terms of age, the respondent population can be described as predominantly young to middle- aged: 27.6% of participants were between 20 and 30 years old, 22.4% between 31 and 40, 24.1% between 41 and 50, and 19.0% between 51 and 60, while only 6.9% were over 60 years old (Table 2).

Age class	Frequency	Percentage	Valid %	Cumulative %
20–30	16	27.6	27.6	27.6
31–40	13	22.4	22.4	50.0
41–50	14	24.1	24.1	74.1
51–60	11	19.0	19.0	93.1
60+	4	6.9	6.9	100.0
Total	58	100.0	100.0	

Table 2. Age classes of the sample

Overall, more than three-quarters of the sample (74.1%) were under 50, indicating a workforce primarily in the central phase of their professional careers. This age profile may have implications for attitudes toward technological innovation, as younger and mid-career employees are often more open and adaptable to technological change compared to older cohorts (Venkatesh et al., 2003; Parasuraman & Colby, 2015).

Regarding educational level, most respondents held a high school diploma (55.2%), while 27.6% had obtained a Master's degree, and 6.9% a Bachelor's degree. A smaller proportion, 5.2%, reported having completed middle school, and an additional 5.2% indicated they had completed a PhD, a master's program, or another postgraduate specialization (Table 3).

Educational Level	Frequency	Percentage	Valid %	Cumulative %
Lower secondary school diploma	3	5.2	5.2	5.2
Upper secondary school diploma (high school)	32	55.2	55.2	60.3
Doctorate, Master's, or Postgraduate Specialization	3	5.2	5.2	65.5
Master's Degree	16	27.6	27.6	93.1
Bachelor's Degree	4	6.9	6.9	100.0
Total	58	100.0	100.0	100.0

Table 3. Education level of the sample

This educational distribution reflects the mixed composition of the company's workforce, encompassing both technical–operational and professional–managerial roles. Higher educational attainment has been linked to greater confidence and readiness in engaging with emerging technologies, including AI (Ezer et al., 2009; Marler & Boudreau, 2017).

As for professional role, the data reveals a prevalence of participants occupying technical or managerial positions.

Specifically, 20.7% identified as managers, 19.0% as technicians, and 15.5% as administrative employees. These were followed by blue-collar workers (13.8%), supervisors (8.6%), professionals or consultants (3.4%), and interns (1.7%). 15.5% of participants did not indicate their job position (Table 4).

Professional Role	Frequency	Percentage	Valid %	Cumulative %

Administrative employee	9	15.5	15.5	15.5
Manager	12	20.7	20.7	36.2
Supervisor / Coordinator	5	8.6	8.6	44.8
Blue-collar worker	9	15.5	15.5	60.3
Professional / Consultant	2	3.4	3.4	63.8
Technician / Engineer	11	19.0	19.0	82.8
Not specified	9	15.5	15.5	98.3
Intern	1	1.7	1.7	100.0
Total	58	100.0	100.0	100.0

Table 4. Professional role of the sample

This distribution suggests a heterogeneous sample composition, with a significant presence of qualified profiles and technical–managerial roles. However, it is plausible that the lower representation of blue-collar workers and lower-qualified personnel may reflect the greater difficulty of engaging these groups in survey participation—a common phenomenon in organizational research, where availability and familiarity with online survey tools tend to vary depending on employees' role and professional background (Dillman et al., 2014).

Finally, regarding job tenure, 41.4% of respondents had been working in their current position for more than ten years, 22.4% for four to ten years, 19.0% for one to three years, and 17.2% for less than one year (Table 5).

Job Tenure	Frequency	Percentage	Valid %	Cumulative %
Less than 1 year	10	17.2	17.2	17.2
1–3 years	11	19.0	19.0	36.2
4–10 years	13	22.4	22.4	58.6
More than 10 years	24	41.4	41.4	100.0
Total	58	100.0	100.0	100.0

Table 5. Job tenure of the sample

These findings indicate a stable and experienced workforce, with a substantial proportion of long- serving employees, alongside a smaller group of younger workers who have joined the organization more recently.

To explore employees' perceptions of artificial intelligence (AI) within the organization, two composite indices were computed.

The AI Negative Perception scale (9 items) captured attitudes of distrust, perceived threat, and discomfort toward AI, while the AI Positive Perception scale (6 items) assessed perceived benefits of usefulness, learning, and collaboration.

Both scales demonstrated satisfactory internal reliability ($\alpha = .84$ and $\alpha = .79$, respectively), consistent with prior studies showing that employees' responses to AI tend to cluster into two main attitudinal domains—empowerment and technostress (Parasuraman & Riley, 1997; Tarafdar et al., 2019; Spagnoli et al., 2020).

Descriptive statistics indicated that employees expressed an overall moderately positive attitude toward AI ($M = 4.87$, $SD = 0.76$), while concerns and negative perceptions were present but less pronounced ($M = 3.66$, $SD = 0.75$). This pattern aligns with prior research suggesting that, although employees acknowledge AI's potential to enhance efficiency, collaboration, and learning (Jarrahi, 2018; Davenport & Ronanki, 2018), residual apprehensions remain regarding fairness, transparency, and social cohesion (Longoni et al., 2019; Zerilli et al., 2019).

From a sociotechnical perspective (Trist & Bamforth, 1951; Pasmore, 1988), these mixed perceptions reflect the ongoing negotiation between the technical and social subsystems of organizational life, where feelings of control loss and relational distance may coexist with optimism toward technological innovation. The findings suggest that AI is perceived as a useful yet ambivalent innovation—one that simultaneously challenges and enriches the meaning of work.

4.1. Theoretical and practical implications

From a theoretical perspective, this study contributes to extending the Sociotechnical Systems Theory (Trist & Bamforth, 1951) to the context of small and medium-sized enterprises (SMEs). The findings reveal that the interaction between the technical and social subsystems—core to STS—remains both fragile and essential within organizations characterized by dense interpersonal networks. The coexistence of enthusiasm and apprehension toward AI suggests that technological adoption represents not merely a structural or operational shift but a deep socio-psychological transition (Bridges, 2009; Singh et al., 2012).

Employees interpret AI not only as a productivity-enhancing tool but as a transformative agent that challenges professional identity, control, and fairness. This confirms that effective AI integration depends on the ability to manage both the situational change (the implementation of new systems) and the psychological transition through which individuals make sense of it.

By situating AI adoption within this socio-technical and psychological framework, the study underscores that organizational success emerges from the joint optimization of the technological and human systems (Pasmore, 1988; Serpa et al., 2022). The evidence from the SME case supports the idea that sustainable digital transformation cannot occur without reinforcing the cultural and relational dimensions that sustain trust, collaboration, and meaning at work.

Moreover, the findings highlight the critical role of organizational culture as a mediating force in socio-technical adaptation (Pescatore et al., 2022). A strong digital culture—defined by openness, learning orientation, and value alignment—acts as an enabling condition for employees to embrace AI constructively rather than resist it (Pagnozzi et al., 2025; Serpa et al., 2022). As prior research shows, technological change becomes a true catalyst for innovation only when accompanied by a parallel evolution of mindset, leadership, and cultural readiness (He et al., 2022).

From this view, the transition to AI-enhanced work systems is as much a cultural process as it is a technical one: it requires rethinking not only workflows but also shared beliefs about autonomy, responsibility, and the role of technology in organizational life.

From a managerial perspective, these insights suggest that leaders play a decisive role in shaping how AI is perceived and integrated. Transparent communication, participatory design, and inclusive training initiatives can help build psychological safety and trust, mitigating fears of obsolescence and unfairness (Edmondson, 1999; Lee & See, 2004; Zerilli et al., 2019).

Particular attention should be given to supporting employees through the transition phase, providing both technical upskilling and emotional scaffolding to help them adapt to new hybrid human–machine environments. This is especially critical in SMEs, where cultural cohesion and informal networks are strong drivers of innovation but can also amplify collective resistance if the change is perceived as externally imposed.

Practically, organizations seeking to integrate AI successfully should: foster a digital culture that values transparency, continuous learning, and human–machine collaboration; encourage co-design processes, involving employees early in the conception and deployment of AI tools; invest in digital literacy and reskilling programs, reducing asymmetries in competence and confidence; promote awareness and education about both the opportunities and the risks associated with AI technologies, ensuring that employees develop informed and responsible engagement with these

tools; and cultivate adaptive leadership, capable of guiding cultural transformation and managing ambiguity in complex systems.

Ultimately, this study reaffirms that the success of AI-driven transformation depends not solely on algorithmic precision or data sophistication, but on the organization's capacity to cultivate a culture that supports adaptation, trust, and shared meaning.

AI thus emerges not only as a technological innovation but more as a socio-cultural phenomenon—one that reshapes how people understand work, value human contribution, and envision the future of organizations.

5. Conclusion and future directions

As AI quietly changes the way people work, this study offers an early view of how employees, especially in SMEs, interpret and adapt to this transformation. For many workers, AI is becoming part of their everyday environment, supporting tasks, improving efficiency, and creating new opportunities for collaboration. In this SME, survey results showed that employees—above all those in technical and managerial roles—generally perceive AI not as an intruder, but as a new coworker: useful, sometimes difficult to understand, yet increasingly integrated into daily routines. This contributes to a form of pragmatic acceptance, where technology is welcomed as long as it helps people perform their jobs better and does not threaten their sense of purpose or autonomy.

Yet, some tensions remain. Several respondents expressed concerns about fairness, control, and the future meaning of human work in an increasingly automated environment. These mixed feelings suggest that, although AI has become a pervasive presence in both private and professional life, true innovation does not depend only on technological progress. Rather, it begins with the emotional, social, and cultural dimensions that shape how people experience and make real sense of technological change.

Future developments of this research will include qualitative interviews with employees and managers to deepen understanding of the meanings and emotions associated with AI in everyday work practices; and a second wave of survey dissemination to broaden the sample and verify whether the emerging patterns hold across different departments and organizational roles.

By integrating quantitative and qualitative insights, the project aims to contribute to the growing field of Human-AI interaction in organizations, offering an empirically grounded reflection on how Italian SMEs can manage the social side of digital transformation — fostering trust, equity, and collaboration between humans and intelligent systems.

Keywords: Artificial intelligence; SMEs; employee perception; socio-technical system theory

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L'evoluzione epistemica delle organizzazioni pubbliche. Il cambiamento dei processi di decision making attraverso l'intelligenza artificiale

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1. Introduzione e obiettivi

La progressiva introduzione dell'Intelligenza Artificiale (IA) nel settore pubblico ha suscitato un diffuso – ma cauto - ottimismo circa il suo potenziale nel migliorare i processi decisionali (Oryshchuk e Minenko, 2024). Ciononostante, questa prospettiva prevalentemente strumentale tende a trascurare una trasformazione più profonda che essa sta innescando all'interno delle organizzazioni, ovvero una ridefinizione del modo in cui la conoscenza viene creata, interpretata e impiegata nei processi decisionali organizzativi (Bolton *et al.,* 2021; Leoni *et al.,* 2024). Le organizzazioni pubbliche, oggi, si avviano ad essere concepite come organizzazioni epistemiche, ossia configurazioni il cui funzionamento dipende dalla continua produzione e dallo scambio di conoscenza (Knorr Cetina, 2007; Patriotta, 2020). Qui, legittimità e autorità non derivano unicamente dal verticalismo gerarchico, bensì dalla capacità di generare e sostenere pratiche epistemiche orizzontali.

L'emergere dell'IA, pertanto, non si limita a modificare la prassi burocratica, ma trasforma i meccanismi epistemici attraverso i quali le organizzazioni definiscono i propri problemi, percepiscono l'informazione e il suo flusso, e legittimano le proprie decisioni. In questo processo, l'IA partecipa concretamente ai processi epistemici influenzando le modalità di raccolta di dati e conoscenza, individuando poi dei pattern e stabilizzando le relative interpretazioni.

Sebbene numerosi studi abbiano analizzato l'adozione dell'IA sotto le lenti di governance e automazione (Camilleri, 2024), minore attenzione è stata prestata al modo in cui essa stia modificando processi di apprendimento e di condivisione della conoscenza nelle organizzazioni pubbliche, particolarmente in condizioni di incertezza (Albous e Alboloushi, 2025). Invero, l'IA viene spesso considerata un'innovazione tecnica, mentre più raramente viene interpretata come un'infrastruttura cognitiva che plasma la comprensione istituzionale della complessità e la capacità di svolgere lavoro epistemico (Larsen, 2021). Ciò si riscontra particolarmente nel momento in cui le organizzazioni pubbliche devono affrontare sfide che richiedono non solo decisioni più rapide, ma anche forme di ragionamento più intelligenti, riflessive e reattive, capaci di coniugare giudizio umano e inferenza algoritmica.

Lo studio proposto si propone di esaminare come l'IA venga impiegata nei processi di generazione della conoscenza e di ragionamento interpretativo all'interno delle amministrazioni, e in quali condizioni organizzative e istituzionali tali applicazioni risultino possibili o, al contrario, limitate. Tale prospettiva supera la classica dicotomia tra controllo tecnico e burocrazia, indagando come l'IA interagisca con le dimensioni epistemiche e cognitive del decision-making

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pubblico e contribuisca così alla costruzione di un'amministrazione intesa come organizzazione epistemica dinamica, nella quale la conoscenza costituisce il nucleo stesso della governance. In questa prospettiva olistica, l'IA si riconfigura non più come uno strumento di automazione, bensì come un vero e proprio agente cognitivo (Capolupo, 2024) capace di amplificare, e talvolta riorientare, i processi di costruzione della conoscenza collettiva. Gli algoritmi non si limitano a estrarre correlazioni dai dati, ma introducono nuovi modi di interpretare la realtà, fondati su logiche probabilistiche e su inferenze generative che, pur distanti dal giudizio umano, contribuiscono a espandere i confini epistemici delle istituzioni. L'IA opererebbe come una tecnologia della conoscenza, ridefinendo i confini tra sapere tacito e sapere esplicito (Capolupo, 2025), e sollecitando le organizzazioni pubbliche a sviluppare competenze metacognitive in grado di comprendere, interpretare e governare le inferenze algoritmiche. Al contempo, introdurre tali tecnologie richiede una riflessione sulla razionalità amministrativa: l'azione pubblica non è più il risultato esclusivo di procedure formali e di gerarchie normative, ma emerge da un'interazione continua tra sistemi umani e non umani, in cui la responsabilità decisionale si distribuisce lungo catene sociotecniche complesse (Capolupo *et al.,* 2025)

Le organizzazioni pubbliche, da sistemi chiusi e procedurali, sono chiamate a divenire sistemi adattivi complessi, capaci di apprendere in modo iterativo attraverso feedback, sperimentazione e riflessione collettiva. Invero, l'IA può fungere da catalizzatore per processi di apprendimento organizzativo "di secondo ordine" (Argyris e Schön, 1996), in cui non si tratta soltanto di correggere errori operativi, ma di ridefinire continuamente i paradigmi interpretativi e le routine cognitive con cui l'amministrazione legge e governa la realtà. Nel settore pubblico, essa rappresenta un passaggio paradigmatico dalla logica burocratica della standardizzazione alla logica epistemica della scoperta. *Inter alia,* sfida non è più soltanto tecnologica, bensì conoscitiva e culturale: consiste nel costruire amministrazioni capaci di apprendere, riflettere e decidere insieme alle macchine, mantenendo al contempo salda la dimensione etica e deliberativa del giudizio umano.

2. Metodologia della ricerca

Viene proposta una meta-sintesi qualitativa della letteratura scientifica recente sull'interfaccia tra pubblica amministrazione e IA (Walsh e Downe, 2005). L'approccio consente di integrare i risultati di diversi studi, facendo emergere gli elementi interpretativi e concettuali che delineano il processo di produzione della conoscenza e le dinamiche epistemiche nel settore pubblico in conseguenza dell'introduzione dell'IA. La ricerca segue un protocollo multi-step per la meta-sintesi qualitativa, in linea con Noah (2017) e Weinberger (2022).

Due domande di ricerca guidano l'indagine, delimitandone di fatto i confini cognitivi:

RQ1. Quali meccanismi facilitano la generazione di conoscenza, il riconoscimento di pattern e il potenziamento dei processi interpretativi tramite l'IA nella pubblica amministrazione?

RQ2. In quali condizioni organizzative e/o istituzionali tali funzioni basate sulla conoscenza possono prosperare o, viceversa, stagnare?

La revisione include studi peer-reviewed pubblicati tra il 2003 e oggi. I criteri di inclusione prevedono che i lavori analizzino l'applicazione dell'IA o di sistemi algoritmici nel settore pubblico in relazione a conoscenza, apprendimento organizzativo, supporto decisionale, scoperta o innovazione nelle politiche; vengono esclusi invece gli studi puramente tecnici privi di implicazioni organizzative. La raccolta del materiale viene effettuata mediante una ricerca strutturata nel database Scopus, il cui prompt viene di seguito riportato:

TITLE-ABS-KEY (("artificial intelligence" OR AI OR "machine learning" OR "generative AI" OR chatbot OR "algorithmic system*")*

AND ("knowledge sharing" OR "knowledge management" OR "organizational learning" OR "knowledge transfer" OR "knowledge creation" OR "epistemic organization" OR "epistemic community" OR "knowledge governance")*
AND ("public administration" OR "public sector" OR "government organization" OR "public institution*" OR "public policy" OR "e-government" OR "digital government")).*

Risultati preliminari (riportati nella Figura 1 e nella Tabella 1) mostrano una crescita costante della produzione scientifica, con un incremento marcato a partire dal 2017 e un salto quantitativo significativo nel periodo 2021–2026. La maggioranza dei contributi risulta composta da conference papers (43) e conference reviews (16), seguiti da articoli scientifici (34), capitoli di libro (9) e monografie (4).

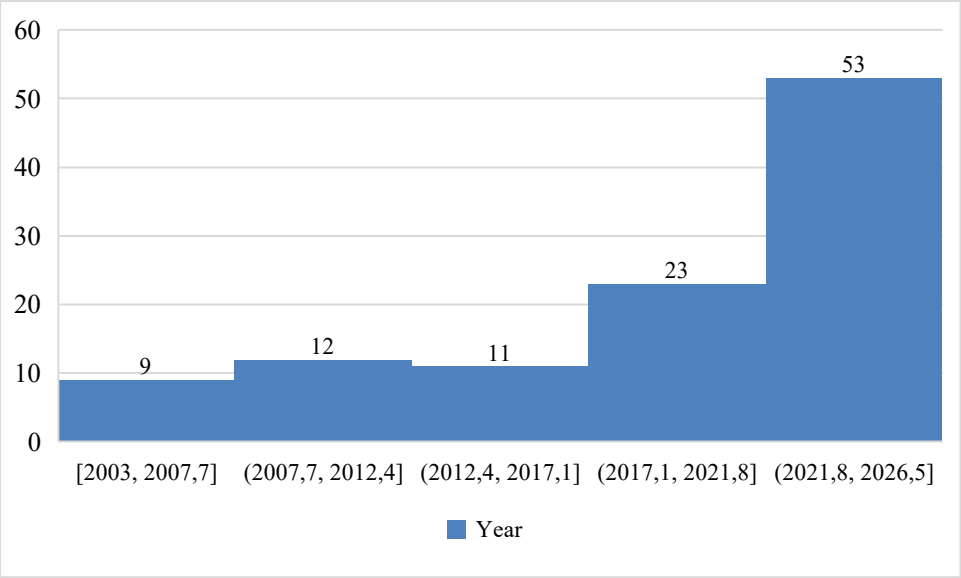


Figura 1. Trend evolutivo preliminare della metasintesi

Tipologia di contributo	**n.di contributi**
Articolo	34
Volume	4
Contributo in volume	9
Conference paper	43
Conference review	16
Ritirato	1
Revisionato	1
Valore finale	108

Tabella 1. Distribuzione preliminare dei contributo

Per l'analisi, viene adottato un approccio interpretativo-computazionale misto. Il corpus di 108 articoli è ordinato mediante mappatura lessicale al fine di individuare concetti ricorrenti e il loro grado di rilevanza rispetto alle domande di ricerca. L'analisi tematica impiegata consente di integrare risultati provenienti da ambiti eterogenei — studi organizzativi, ricerca sulla governance e sistemi informativi — fornendo strumenti per identificare pattern di ragionamento ricorrenti, meccanismi abilitanti e barriere contestuali. La meta-sintesi qualitativa, quindi, si limitata ad

aggregare dati, ma consente di sviluppare un quadro interpretativo che descrive come l'IA stia ridefinendo i processi di apprendimento collettivo e di pensiero nelle organizzazioni pubbliche.

3. Risultati preliminari

I risultati indicano che l'IA funge da strumento interpretativo e generativo di conoscenza, più che da supporto decisionale. Tre meccanismi principali (RQ1) emergono dalla letteratura. Il primo è quello di potenziare la capacità cognitiva organizzativa, consentendo di individuare correlazioni e pattern sottostanti e di tradurre l'informazione in ipotesi utili ai processi decisionali pubblici. Il secondo, prevede di favorire la costruzione di senso, grazie a sistemi esplicabili e interattivi che promuovono un dialogo tra esperienza umana e inferenza algoritmica, consentendo agli amministratori di co-costruire significati e mettere in discussione le assunzioni implicite nei dati. Il terzo e ultimo, di agire come infrastruttura di apprendimento, abilitando processi istituzionali adattivi fondati su cicli di feedback, aggiornamenti continui dei modelli e revisioni basate sull'errore.

Il quadro emerso suggerirebbe che l'IA sia in grado trasformare l'amministrazione pubblica da un apparato regolato da norme a un sistema collettivo di pensiero esplorativo, riflessivo e adattivo (Babšek et al., 2025). L'effettiva realizzazione di tali capacità cognitive dipende tuttavia da specifiche condizioni organizzative e istituzionali (RQ2): governance trasparenti e partecipative, leadership sperimentale, cultura del dibattito rigoroso e disponibilità di risorse infrastrutturali e competenze tecniche adeguate. Viceversa, rigidità gerarchiche, mentalità tecnocratiche e un eccesso di controllo regolatorio ostacolano i processi di apprendimento, confinando l'IA a funzioni procedurali o predittive. L'analisi mostra dunque che il contributo cognitivo dell'IA alle organizzazioni pubbliche costituisca la risultante di una trasformazione organizzativa fondata sull'allineamento coerente tra tre caratteristiche e/o condizioni strutturali: giudizio umano, apprendimento istituzionale e ragionamento algoritmico (Mainardi, 2025; Tangi et al., 2025).

4. Discussioni e implicazioni

Lo studio intende contribuire all'odierno dibattito su IA e governance pubblica, proponendo una visione a suo modo alternativa per il futuro delle organizzazioni pubbliche in quanto organizzazioni epistemiche. Il potenziale dell'IA non risiede soltanto nell'efficienza o nell'automazione, ma anche nella capacità di abilitare processi di scoperta e apprendimento, a condizione che essa operi entro contesti istituzionali adeguati.

Sotto il profilo teorico, la ricerca arricchisce la letteratura integrando filoni tradizionalmente distinti, quali apprendimento organizzativo, decision-making e forme di governance pubblica, in un quadro complesso che concettualizza l'IA come agente cognitivo nei processi istituzionali. La meta-sintesi pone l'enfasi su come gli algoritmi non si limitino ad ampliare la capacità analitica, ma partecipino attivamente alla costruzione di senso attraverso interazione, feedback e traduzione interpretativa. Ciò invita a riconsiderare le ipotesi classiche di razionalità amministrativa: il processo decisionale non è più vincolato alle sole menti umane o alle tradizioni istituzionali, ma viene co-prodotto da combinazioni uomo-macchina. Ne deriva un passaggio da una concezione statica di mera adozione tecnologica a una visione relazionale della base di conoscenza organizzativa, in cui IA, infrastrutture dati e competenze professionali costituiscono sistemi di scoperta in continua evoluzione.

Dal punto di vista pratico, i risultati offrono indicazioni utili a dirigenti pubblici e policy maker interessati a progettare sistemi di IA capaci di potenziare la riflessività e la capacità di apprendimento delle istituzioni. È fondamentale promuovere architetture di governance equilibrate tra trasparenza e controllo, laboratori interdisciplinari per l'analisi dei dati, programmi di leadership e formazione che incoraggino il dialogo e la sperimentazione, oltre a una regolazione

flessibile che permetta sperimentazioni adattive. Infine, si sottolinea la necessità di investire in interdisciplinarità e alfabetizzazione ai dati, per favorire la collaborazione tra funzionari pubblici, esperti tecnici e cittadini (Romeo et al., 2025). Laddove tali elementi convergono, l'IA si configura non come infrastruttura di automazione, bensì come infrastruttura generativa di apprendimento per le istituzioni pubbliche.

In ultima analisi, lo studio fornisce solide basi concettuali ed empiriche per reinterpretare le organizzazioni pubbliche come sistemi cognitivi capaci di riflessione e adattamento continui, nei quali gli algoritmi diventano co-creatori di conoscenza e strumenti di una governance che integra, piuttosto che sostituire, il giudizio umano e la saggezza collettiva.

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The Value of Gender Board Diversity in SMEs: Human Capital Investment and Sustainability

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1. Introduction

This research proposal aims to present a thorough overview of the connection between gender diversity on boards and the performance of small and medium-sized enterprises (SMEs), with a specific focus on the impact of human capital investment. The objective is to critically examine how current academic research approaches the link between board gender diversity and SME performance, while identifying unresolved questions and opportunities for further inquiry. Special attention will be given to understanding the contextual factors and practical conditions that allow gender-diverse boards to foster sustainable, long-term growth—seeking not only theoretical insights but real-world relevance for businesses and society.

Research on gender diversity in corporate governance shows enhanced cooperation, task execution, and innovation capabilities (Ferrary and Déo, 2023). At the board level, enterprises generally experience performance enhancements only upon achieving a critical mass threshold (Jayaraman et al., 2025; Baghdadi et al., 2023). While these trends are predominantly positive, research also identifies instances where gender diversity does not enhance performance and may even correlate with neutral or adverse outcomes. Some studies report non-significant or adverse relationships, especially in innovative SMEs and sectors marked by rapid growth or high risk-taking (Adeoye et al., 2023; Radziwon and Vanhaverbeke, 2024; Schifilliti and La Rocca, 2024; Khan et al., 2024b). For instance, data from 2,264 Italian innovative SMEs indicates a negative link between female board presence and financial performance (Schifilliti and La Rocca, 2024, p. 474). The connection between board gender diversity and SME performance has become a central topic in organizational research, particularly as SMEs undergo digital transformation, adopt smart working, and strive for organizational well-being (Morrone et al., 2022; Schifilliti and La Rocca, 2024). Several studies emphasize that the positive impact of board gender diversity on performance is significantly influenced by the level of HR investment (Adiazmil et al., 2024; Boopathi, 2024; Qiao et al., 2024). SMEs that dedicate more resources to personnel costs and human capital development see improvements in innovation, productivity, and employee well-being (Ferrary and Déo, 2023; Capozza and Divella, 2024; Gaio et al., 2024; Alodat and Hao, 2025; Joo et al., 2023). Conversely, in SMEs with low HR investment, the effect of board diversity is reduced or even negative. The growing digitalization of SMEs has underscored the importance of inclusive governance and HR strategies. Gender-diverse boards are more proficient in navigating technological transformations, promoting sustainable innovation, and boosting employee engagement, particularly when supported by effective human resource practices (Del Mar Fuentes-Fuentes et al., 2023; Capozza and Divella, 2024; Gerged et al., 2023; Tajeddini et al., 2023). In the current context, sustainability is no longer an accessory aspect but a strategic

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driver that affects competitiveness, market access, value creation, and organizational well-being (Ahmad et al., 2023; Omowole et al., 2024). For SMEs, the integration of sustainable practices necessitates prioritizing human capital and board composition, which are pivotal in fostering enduring and sustainable performance (Ahmad et al., 2023; Kutaula et al., 2025). This study conceptualizes sustainability through an integrated Environmental, Social, and Governance (ESG) framework. For SMEs, sustainability is defined as the organization's capacity to cultivate long-term organizational practices that enhance internal well-being, uphold social responsibility, and ensure transparent decision-making processes, all of which are supported by investments in human capital (Ahmad et al., 2023; Shalhoob and Hussainey, 2022). While there are numerous conceptual definitions and measurement methodologies, the importance of gender diversity is supported by a range of theoretical perspectives. The table 1 provides a summary of these perspectives, detailing their fundamental principles, original contributors, and significant applications in the context of board diversity value.

Theory	**Description**	**Original Author(s)**	**Key Authors Who Extended the Theory**
Resource-Based View	Firm resources, encompassing a diverse range of human capital, are essential for attaining a competitive advantage and superior performance.	Jay Barney (1991), Wernerfelt (1984)	Khan et al., 2024a; Ozdemir et al., 2023
Agency Theory	Board diversity can enhance oversight and mitigate agency issues by incorporating diverse perspectives and supervisory approaches.	Jensen and Meckling (1976), Fama and Jensen (1983)	Fayyaz et al., 2023; Zattoni et al., 2023; Lu et al., 2022
Social Role and Expectation States theories	Gender roles and societal expectations influence behavior and impact board dynamics and decision-making.	Alice Eagly (1987)	Khatri, 2023; Issa and Bensalem, 2023
Stakeholder Theory	Organizations must evaluate and align the interests of all stakeholders, not just shareholders, to attain sustained success and legitimacy.	R. Edward Freeman (1984)	Heubeck, 2024; Ozdemir et al., 2023; Lu et al., 2022
Signalling Theory	Board diversity communicates to external entities, such as investors and stakeholders, that the firm prioritizes inclusivity, ethical standards, and progressive governance, thereby enhancing its reputation and fostering trust.	Michael Spence (1973)	Lu et al., 2022
Resource Dependence Theory	Board diversity grants access to a wider range of resources, expertise, and external networks, thereby enhancing	Pfeffer and Salancik (1978)	Islam et al., 2022; Lu et al., 2022

	decision-making and organizational adaptability.		
Human Capital Theory	The incorporation of diverse perspectives expands the collective repository of knowledge, proficiencies, and experiences, thereby augmenting both problem-solving capabilities and innovation processes.	Gary Becker (1964)	Heubeck, 2024; Lu et al., 2022
Social Identity Theory	Group members categorize themselves and others into social groups (e.g., according to gender), thereby influencing group dynamics and patterns of inclusion or exclusion.	Henri Tajfel and John Turner (1979)	Zattoni et al., 2023; Lu et al., 2022
Token Theory	When minority representation is minimal, individuals are perceived as "tokens," resulting in marginalization and restricted influence unless a sufficient critical mass is attained.	Rosabeth Moss Kanter (1977a)	Yadav and Prashar, 2023; Lu et al., 2022
Critical Mass Theory	A minimum threshold of minority representation (e.g., women) is required to impact board decisions and prevent tokenism.	Rosabeth Moss Kanter (1977b)	Khatri, 2023; Yadav and Prashar, 2023; Issa, 2023
Complexity Theory	Board diversity interacts with various board and business characteristics in complex ways, influencing performance in nonlinear and context-dependent manners.	W. Ross Ashby (1956)	Pandey et al., 2023
Upper Echelons Theory	The backgrounds of top managers, including gender, influence strategic decision-making and organizational performance.	Hambrick and Mason (1984)	Heubeck, 2024; Khatri, 2023; Issa and Bensalem, 2023
Stakeholder/Institutional	Organizations are affected by both stakeholder interests and institutional pressures (such as norms and regulations), which influence board composition and governance practices.	Freeman (1984), DiMaggio and Powell (1983)	Ozdemir et al., 2023; Naveed et al., 2023

Table 1. Theories on Gender Board Diversity

In our study, our theoretical perspective is grounded in three prominent frameworks from the literature on gender board diversity: the Resource-Based View (RBV), Agency Theory and the

Social Role and Expectation States theories, as these approaches provide a robust lens to examine the specific variables of interest in our analysis.

From the RBV, gender diversity is regarded as a strategic and distinctive organizational asset that enhances the company's knowledge base and problem-solving capabilities (KS, 2024). Boards with gender diversity benefit from a wider array of cognitive inputs, diverse professional networks, and a broader spectrum of viewpoints, which can improve strategic decision-making – which is especially beneficial for complex challenges like sustainability and climate change – and strengthen competitive edge (Fouad et al., 2023; Ferrary and Déo, 2023; Gaio et al., 2024). This approach argues that diversity is most valuable when it permeates not only the boardroom but also managerial and operational levels, where day-to-day decisions and collaborative processes occur (Ouni et al., 2022; Saeed et al., 2024; Del Mar Fuentes-Fuentes et al., 2023; Laique et al., 2023; Khan et al., 2024a; Ozdemir et al., 2023). This diversity also improves innovation and long-term performance, particularly when leveraged through HR strategies such as environmental management training (Khan et al., 2025). In SMEs, where resources are often limited, gender diversity can be a critical differentiator of sustainable growth and adaptability (Khan et al., 2025; Naveed et al., 2021).

While the RBV highlights diversity as an internal resource that enhances value, Agency Theory concentrates on the governance roles of diverse boards, particularly in terms of oversight and managerial accountability (Adeusi et al., 2024). Agency Theory offers a complementary perspective by underscoring governance and monitoring functions. Gender diversity can reduce agency conflicts between owners and managers by strengthening oversight and improving accountability (Amin et al., 2024; Kalia, 2025). Research has demonstrated that women in directorial roles are frequently associated with enhanced monitoring practices, increased focus on transparency, and more detailed assessments of managerial decisions (Kalia, 2025; Baghdadi et al., 2023; Ouni et al., 2022; Laique et al., 2023). In SMEs, where governance structures may be less formalized, gender-diverse boards can play a key role in aligning management actions with stakeholder interests and promoting responsible and sustainable practices (Zhu et al., 2022; Abed et al., 2025).

In addition to structural and economic factors, behavioral and sociological perspectives illuminate the impact of gender diversity on organizational performance and outcomes.

Social Role and Expectation States theories propose that women frequently introduce leadership styles characterized by relational, cooperative, and stakeholder-focused approaches, which can significantly influence corporate priorities, particularly in areas such as sustainability, employee welfare, and socially responsible strategies (Khatri, 2023; Issa and Bensalem, 2023).

Expectation States Theory posits that even a single woman can influence outcomes in areas typically associated with feminine characteristics, such as social interaction (Khatri, 2023; Del Mar Fuentes-Fuentes et al., 2023). Despite the advancements in current research, several limitations persist, notably the lack of a comprehensive theoretical framework and difficulties in establishing a precise definition.

Various theoretical frameworks link gender diversity on corporate boards to sustainability outcomes, particularly within the three dimensions of ESG criteria (EmadEldeen et al., 2025; Khalid et al., 2025). Table 2 outlines the primary theories associated with sustainability, as well as the key authors who have made recent contributions to this field.

Theory	**Core Idea and Link to Sustainability**	**Citations**
Critical Mass Theory	A threshold, typically 30% or a minimum of three women, is required for gender diversity to exert a meaningful influence on sustainability outcomes.	Khatri, 2023; Yadav and Prashar, 2023; Amorelli and García-Sánchez, 2021

Resource Dependence Theory	Female directors contribute distinctive resources and networks, thereby strengthening sustainability and fostering innovation.	EmadEldeen et al., 2025; Konadu et al., 2022
Signalling Theory	The inclusion of women indicates a company's dedication to social ideals and sustainability to stakeholders.	Fernández-Méndez et al., 2025
Social Role Theory	Women are conditioned to exhibit greater compassion and ethical awareness, resulting in an enhanced emphasis on sustainability and social responsibility in boardroom decisions.	Khatri, 2023; Nadeem et al., 2020; Lin et al., 2022
Stakeholder Theory	Gender-diverse boards are more attuned to stakeholder needs, improving sustainability and ESG performance.	EmadEldeen et al., 2025; Konadu et al., 2022
Upper Echelons Theory	Board members' demographic characteristics (e.g., gender) shape strategic choices, including sustainability initiatives.	Khatri, 2023; Nadeem et al., 2020; Lin et al., 2022

Table 2. Theories Linking Gender Board Diversity and Sustainability

While theoretical models do not always align with empirical data, the evidence on gender diversity's impact is intricate, non-linear, and highly context-specific. Empirical findings vary and show non-linear patterns. Positive impacts are frequently noted at the middle-management and operational levels, but in more traditional or male-dominated settings, the effect may be weaker or even absent (Schifilliti and La Rocca, 2024; Bogdan et al., 2023; García-Meca and Santana-Martín, 2023; Hemmert et al., 2024; Marquez-Cardenas et al., 2022; Tran et al., 2023; Zahoor et al., 2024; Jayaraman et al., 2025).

Overall, the literature indicates that board gender diversity can serve as a strategic asset for SMEs, particularly when coupled with substantial investment in human capital, linking to the dimension "Social" of ESG criteria. Theories such as the RBV and upper echelons theory suggest that diverse boards contribute to superior decision-making and innovation potential (Del Mar Fuentes-Fuentes et al., 2023; Ferrary and Déo, 2023; Capozza and Divella, 2024; Gaio et al., 2024; Alodat and Hao, 2025; Joo et al., 2023). Despite advancements, there remain critical gaps in comprehending how HR investment magnifies these effects and the impact of digitalization for SMEs.

According to Schifilliti and La Rocca (2024), concerning Italian SMEs suggest that the inclusion of women on corporate boards is correlated with the development of more inclusive corporate cultures, an enhanced focus on human resource development, and the adoption of improved sustainability-oriented organizational practices.

However, these effects are not consistent and are influenced by contextual aspects such as the number of women on the board, their active participation in strategic decision-making, and the overarching organizational culture in which they function.

Most evidence on gender diversity and governance is drawn from large corporations; research specifically targeting SMEs is comparatively limited (Schifilliti and La Rocca, 2024; Boffa et al., 2023). This gap suggests the need to understand how gender-diverse boards influence financial performance in smaller firms, particularly during sustainability transitions, such as circular economy, sustainable business models and ESG governance transitions. (Ahmadov et al., 2025, Bargavi et al., 2025; Caputo et al., 2024).

Emerging literature suggests that the impact of board gender diversity on performance is moderated by the degree of investment in human capital (Adeoye et al., 2023; Zayed et al., 2022; Schifilliti and La Rocca, 2024). SMEs allocating greater resources to personnel development, training, and organizational well-being are better able to translate the cognitive and relational advantages of board diversity into strategic outcomes (Zayed et al., 2022). Conversely, when HR investment is low, the positive effects of gender diversity may be weakened or may not emerge at all. This highlights the importance of considering internal resource allocation as a mechanism that enables gender diversity to enhance firm financial performance and sustainability.

Table 3 outlines the impact of women on boards in Italian SMEs, with a focus on areas such as inclusivity and diversity, human resource policies, internal sustainability and financial performance.

Impact Area	**Effect of Women on Boards**	**Citations**
Inclusivity and Diversity	Strongly positive with critical mass	Cambrea et al., 2023; De Masi et al., 2021; García-Sánchez et al., 2024; Boffa et al., 2023
HR Policies	Enhanced focus, especially as chair	Furlotti et al., 2019; Cambrea et al., 2023
Internal Sustainability	Improved ESG and ethical performance	Provasi and Harasheh, 2021; Cambrea et al., 2023; De Masi et al., 2021; Romano et al., 2020
Financial Performance	Mixed or neutral in SMEs; sometimes negative in innovative/high-growth sectors	Provasi and Harasheh, 2021; Schifilliti and La Rocca, 2024

Table 3. Board Gender Diversity and Human Resources

To the best of our knowledge, our literature search in databases such as Scopus and Web of Science reveals that only a limited number of studies on Italian SMEs have empirically examined the relationship between board gender diversity and firm performance while incorporating dimensions of human capital investment (Morrone et al., 2022; Schifilliti and La Rocca, 2024; Baghdadi et al., 2023; Naciti et al., 2025; Bedeir, 2024). Existing research has predominantly concentrated on financial indicators such as profitability and efficiency (Morrone et al., 2022), the performance of innovative SMEs in growth-oriented sectors (Schifilliti and La Rocca, 2024), and managerial ability alongside human capital development (Baghdadi et al., 2023). While some studies have explored issues of wage equity and female leadership within European SMEs (Naciti et al., 2025), and others have investigated executive remuneration and accounting conservatism (Bedeir, 2024), there is a lack of empirical studies that explicitly connect board gender diversity to personnel costs as a proxy for HR policies, particularly within the context of Italian SMEs and across regional variations.

This study is currently under development, and the results will be discussed in future work. According to Schifilliti and La Rocca (2024), firm performance is explained through the share of women on the board alongside a standard set of control variables. In our study, we extend this model by incorporating the numerical variable *Personnel Costs*, sourced from the AIDA database (Computerized Analysis of Italian Firms), to capture the extent of investment in human capital. This approach will be further developed and refined in future research endeavors, wherein additional specifications and robustness analyses will be conducted to more accurately assess the moderating role of personnel expenditure. While the original study concentrated exclusively on Italian innovative SMEs—a category established by the Italian government in 2015 to promote

technological development and growth, characterized by mandatory criteria such as R&D expenditures, qualified personnel, and ownership of patents or registered software—it reported a negative and significant effect of female presence on financial performance (ROA), particularly in high-growth sectors. These findings may be influenced by the highly innovation-oriented nature of the sample, where strategic and technical priorities may overshadow the benefits of inclusive governance practices.

Although there is an increasing body of studies on board gender diversity in various domains, substantial gaps remain about such research in Italian SMEs considering human capital investment. The theory and empirical research methods of this field must also be greatly expanded.

The present study proposes to expand the empirical scope in two keyways. First, rather than restricting the sample to innovative SMEs, the analysis now includes the broader universe of Italian SMEs. Second, the temporal range is extended to cover the years 2022 to 2024. This expanded empirical setting enables an assessment of whether the negative effect of board gender diversity on ROA, measured as the ratio between EBIT and total assets, commonly used as an indicator of operating profitability according to Krstić et al. (2023), observed in innovative SMEs appear to be specific to environments with rapid growth and intense innovation, but it remains to be seen whether a similar trend is also present across Italy's broader SME sector.

The dataset employed in this study is obtained from AIDA, which provides standardized and comparable accounting data and firm characteristics at the SME level. The variable "Personnel Costs" has been included to capture the moderating effect of human capital investment, acting as an indicator of the firm's commitment to developing its workforce by covering expenses such as salaries, social security contributions, and other employee-related costs. This measure reflects the amount of resources allocated to human capital and allows analysis of how female board representation influences HR investment strategies in driving performance outcomes. The purpose of this study is to examine the influence of board gender diversity on SME performance, with a specific focus on how this interplay is affected by the extent of human capital investment.

Specifically, we investigate whether the presence of women on the board contributes more positively to firm performance in SMEs that allocate greater resources to personnel development and organizational well-being. Furthermore, this study lays the conceptual groundwork for future empirical research. In subsequent work, we will conduct a quantitative analysis using firm-level data to test this moderating effect more rigorously and to determine whether the performance outcomes of gender board diversity vary across different levels of human capital investment within Italian SMEs.

The following main research question was posed:

RQ1**:** *What is the impact of board gender diversity on SME performance when considering different levels of human capital investment?*

The moderating RQ1 will be tested by estimating an analysis that includes an interaction term between the share of women on the board (GBDR) and Personnel Costs:

$$ROA_{it} = \beta_0 + \beta_1 GBDR_{it} + \beta_2 PersonnelCosts_{it} + \beta_3 (GBDR_{it} * PersonnelCosts_{it}) + X_{it\gamma} + \alpha_i + \delta_t + \varepsilon_{it}$$

where X_{it} is a vector of firm controls (size, leverage, industry dummies, age, R&D intensity, etc.), α_i are firm fixed effects, and δ_t are year fixed effects.

In addition to the moderating model described above, we develop and include in the analysis a new incidence proxy—defined as the ratio between the Gender Board Diversity Rate (GBDR) and Personnel Costs—and introduce it explicitly as an additional independent predictor in the regression model. This incidence proxy is operationalized as*:*

$$IncidenceProxy_{it} \frac{GBDR_{it}}{PersonnelCosts_{it}}$$

The incidence proxy is included as a direct explanatory variable in the ROA regression to capture the strategic alignment between gender-inclusive governance and HR investment intensity (i.e., whether diversity in decision-making is matched by concrete investment in human capital). By entering the ratio as an independent predictor, the model can evaluate whether firms that simultaneously exhibit higher board gender diversity and stronger personnel expenditure perform differently from those without such alignment.

Consequently, the extended specification estimated to assess the predictive role of the incidence proxy is:

$$ROA_{it} = \beta_0 + \beta_1 GBDR_{it} + \beta_2 PersonnelCosts_{it} + \beta_3 IncidenceProxy_{it} + X_{it\gamma} + \alpha_i + \delta_t + \varepsilon_{it}$$

This approach permits two complementary tests: (i) the moderation test (interaction term) that examines whether Personnel Costs change the marginal effect of GBDR on ROA, and (ii) the direct predictive test provided by the incidence proxy to measure whether the *alignment* between governance diversity and HR investment correlates with ROA above and beyond the main effects and interaction.

Robustness checks will include alternative operationalizations of personnel investment (e.g., Personnel Costs scaled by total assets or by sales), alternative performance measures (e.g., Tobin's Q, Return on Sales), and sub-sample analyses by industry, firm size, and family vs. non-family ownership. Endogeneity concerns will be addressed through lagged independent variables, firm fixed effects, and where possible instrumental variable approaches inspired by prior literature.

This research proposal aims to investigate the specific circumstances under which board gender diversity contributes to improved financial performance, human resource strategies, and sustainable outcomes in SMEs. The proposed framework is structured to show that the relationship between board gender diversity and SME financial performance is affected by the level of investment in human capital.

The theoretical foundation argues that merely appointing women to boards does not consistently translate into better financial outcomes unless accompanied by strategic resource allocation (Schifilliti and La Rocca, 2024; Adeoye et al., 2023; Zayed et al., 2022). The research indicates that the beneficial effects of gender diversity are enhanced in SMEs that significantly allocate resources to human expenses. From the Resource-Based View (RBV), which regards diverse human capital as a crucial resource for competitive advantage (Barney, 1991; Wernerfelt, 1984), gender diversity is a strategic asset that enriches the knowledge base of SMEs (Khan et al., 2024a; Ozdemir et al., 2023; KS, 2024). The model aims to demonstrate that allocating resources to employee development, technical proficiency, and organizational well-being (Personnel Costs) is crucial, as this investment cultivates the environment necessary to effectively leverage diverse inputs, thereby strengthening the competitive edge and enabling sustainable growth.

The analysis, built on Agency Theory (Jensen and Meckling, 1976; Fama and Jensen, 1983), examines how substantial Human Capital Investment promotes improved governance and oversight. Gender diversity on boards can help reduce agency conflicts between owners and managers by improving oversight and strengthening accountability frameworks (Fayyaz et al., 2023; Zattoni et al., 2023; Adeusi et al., 2024). The model proposed in this research seeks to demonstrate that substantial investment in human capital allows gender-diverse boards to more effectively engage in strategic decision-making and monitoring, ensuring management actions align with stakeholder interests and promote responsible, sustainable business practices (Zhu et al., 2022; Abed et al., 2025). These behavioral theories suggest that women often introduce leadership styles characterized by relational, cooperative, and stakeholder-focused approaches (Khatri, 2023; Issa and Bensalem, 2023). The analysis is designed to examine if substantial

Personnel Costs act as the necessary infrastructure (e.g., resources, training) that allows these diversity-driven strategies to translate into tangible organizational resilience and internal sustainability results. The research introduces and tests a novel incidence proxy (Gender Board Diversity Rate / Personnel Costs).

The data proposes to measure the strategic alignment between gender-diverse governance on boards and the extent of strategic investment in human resources. Incorporating this ratio as a direct explanatory variable enables the model to evaluate whether organizations exhibiting both enhanced board gender diversity and increased personnel investment vary in performance from those without such alignment.The use of both a moderation test (through an interaction term) and a direct predictive test (via the incidence proxy) seeks to clarify if the value generated by gender diversity on boards primarily depends on substantial investment in human capital, thereby implying that HR practices act as key enablers of sustainable financial performance in SMEs.

This chapter demonstrates that the benefits of board gender diversity are influenced by the extent of internal human capital investment, offering a refined understanding of how gender-inclusive governance impacts economic performance (Adeoye et al., 2023; Zayed et al., 2022). This perspective is particularly relevant to Italian SMEs (Schifilliti and La Rocca, 2024; Boffa et al., 2023; Morrone et al., 2022), where limited financial resources and cultural factors may reduce the effectiveness of diversity initiatives unless supported by adequate investment in employee development and organizational capabilities.

The expected findings of this study may offer relevant implications for policymakers, stakeholders, and managers. This research explores how the influence of board gender diversity on the performance of SMEs varies with the degree of investment in human capital, aiming to contribute to the continuing debate on how governance structure and HR strategies together affect SMEs' financial outcomes (Capozza and Divella, 2024; Kutaula et al., 2025; Schifilliti and La Rocca, 2024). From a managerial viewpoint, the research emphasizes that appointing women to boards should move beyond symbolic or compliance-based actions (Martínez-García et al., 2021; Wang et al., 2024). Instead, gender diversity must be integrated within a broader strategic framework that focuses on developing human capital, retaining talent, and fostering collaborative organizational practices (Uthman, 2024). SMEs that align inclusive governance with substantial HR investment may be better equipped to innovate, adapt to technological change, and promote sustainable growth (Al Malki, 2023). Additionally, the study offers evidence-based guidance for public institutions seeking to support SMEs in sustainability transitions, highlighting the importance of internal organizational conditions that generate value.

Keywords: Board gender diversity; SMEs performance; human capital investment; sustainability; corporate governance

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Exploring risks of human-centered artificial intelligence in human resource management

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1. Introduction

The increasing diffusion of Artificial Intelligence (AI) systems is radically transforming Human Resource Management (HRM), redefining processes, roles, and decision-making practices (Vrontis et al., 2022, Gupta, 2024, Fenwick et al., 2024). Predictive algorithms, intelligent platforms, and behavioral analytics systems are becoming integral components of key HR practices (Al-Shammari et al., 2024, Alsaif and Sabih Aksoy, 2023), such as recruitment and selection (Gupta and Mishra, 2023, Mori et al., 2025), performance management (Nyathani, 2023), personalized training and development (Huang et al., 2023), and well-being management (Sadeghi, 2024). While these technologies promise efficiency, accuracy, and predictive capabilities, their adoption also introduces new and complex ethical, social, organizational, and technical issues (Shaw et al., 2019, Rane et al., 2024, Kumar and Kumar, 2024). The use of AI systems in HRM carries the potential for algorithmic discrimination (Köchling and Wehner, 2020), reduced transparency in decision-making processes (Rodgers et al., 2023), and diminished employee autonomy and trust (Bankins, 2021).

AI, understood as a set of systems capable of learning, adapting, and making data-driven decisions (Kumari et al., 2024), includes discriminative models, which classify or predict outcomes, and generative models, which create new data or content (Jaakkola and Haussler, 1998, Jebara, 2012). While their application in HRM has enhanced corporate capacity to manage large volumes of information and optimize complex processes, this has also introduced additional forms of risk (Budhwar et al., 2022). Predictive models, for instance, may reproduce or amplify biases present in historical data (Sarstedt and Danks, 2022); evaluation algorithms can reduce human complexity to numerical parameters (Raschka, 2018); and automated decisions may undermine the relational dimension of people management (Raisch and Krakowski, 2021, Parker and Grote, 2022).

To address these challenges, Shneiderman (2020), Ozmen Garibay et al. (2023), Schmager et al. (2025) have proposed a conceptual shift toward Human-Centered Artificial Intelligence (HCAI). This approach aims to develop AI systems capable of collaborating with humans, enhancing their cognitive and decision-making abilities, while ensuring that human oversight remains central. HCAI is grounded in the need to design technologies that are ethical, transparent, and controllable. In the HRM context, this entails creating systems that respect employees' dignity and rights, ensure fairness, and contribute to organizational well-being, while preventing automated decisions from producing distortive or unjust outcomes (Bankins et al., 2022, Folger and Cropanzano, 1998). Given that the concept of HCAI has been articulated explicitly only in recent years, a substantial portion of the existing literature refers to these principles implicitly. In many studies, the term "AI" is used in form, while in substance it denotes intelligent systems that are designed to be ethically grounded, transparent, controllable, and respectful of human values.

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Recognizing this conceptual continuity is essential for interpreting prior research and situating it within the emerging HCAI discourse. However, even systems designed to be "human-centered" are not without risks. Their effectiveness and reliability depend on the context in which they are implemented, the skills of those who use them, and the values shaping organizational culture (Jiang et al., 2025, Becker and Smidt, 2016).

To understand the complexity of risks associated with the application of HCAI in HRM processes, the socio-materiality paradigm (Orlikowski, 2010, Orlikowski and Scott, 2008) may provide a significant theoretical contribution. From this perspective, humans and technologies constitute an integrated system in which the meaning and value of technology emerge from the relationships it establishes with people and the social context. Within this view, the risks of HCAI could not stem solely from technical or algorithmic limitations, but primarily from socio-organizational interactions that shape its use. Studying these dynamics, therefore, entails examining how human, structural, and technological factors intertwine to generate or amplify ethical, managerial, and trust-related challenges.

The analysis of risks associated with HCAI in HRM seems to represent a research topic of growing relevance for both academia and practice. Research to date has primarily focused on the benefits of AI in terms of efficiency, accuracy, and predictive capability (Zong and Guan, 2025, Adekunle et al., 2021, Paramesha et al., 2024), while paying less attention to the unintended consequences that may arise when these tools are integrated into processes directly affecting people. For HR professionals, this topic is of strategic importance in ensuring the fairness, transparency, and sustainability of the HCAI systems they implement.

Given these considerations, this study seeks to address this research gap by examining the HCAI-related challenges within HR practices. The central research question driving this research work is: What are the main risks arising from HCAI applications in the HR practices most covered in literature? The objective is to provide an integrated and systematic view of the risks associated with the adoption of HCAI systems in HRM.

To achieve this goal, the study adopts a mixed-methods approach, combining a Systematic Literature Review (SLR) (Tranfield et al., 2003) and the Gioia method (Gioia et al., 2013). In line with Mori et al. (2025), Barghini and Bonti (2024), Al-Shammari et al. (2024), Alsaif and Sabih Aksoy (2023), the SLR was employed for data collection to ensure a rigorous and transparent empirical foundation. Subsequently, the Gioia method was applied to analyze the 60 selected articles inductively, allowing the main conceptual categories of risk to emerge. This methodological integration combines scientific rigor with interpretive depth, providing a robust and comprehensive framework for understanding the critical issues associated with HCAI in HRM.

Preliminary results suggest the presence of 3 main types of HCAI-related risks in HRM: machine-related risks, human-related risks, and context-related risks. These categories allow for the identification of the primary sources of vulnerability in HCAI systems, highlighting that risks are not confined to the technical level but arise from the interaction between machines, humans, and the organizational context.

This study, still in progress, aims to contribute to the research field by providing a conceptual model of HCAI-related risks in HRM and by opening new avenues for research on HCAI in organizational contexts. From a practical perspective, the research seeks to support HR managers in designing and implementing intelligent systems that are genuinely human-centered, promoting a balance between technological innovation, fairness, and well-being. In the long term, understanding and managing HCAI risks consciously could prove essential not only to protect people but also to build an HCAI system in HRM grounded in trust, transparency, and accountability.

2. Methodology

This study adopts a mixed-method approach that combines a Systematic Literature Review (SLR) (Tranfield et al., 2003) and the Gioia method (Gioia et al., 2013) to ensure both rigor and depth in the research process. The SLR was employed for data collection, providing a transparent, replicable, and comprehensive overview of existing knowledge in the field of HRM. The SLR is widely regarded as one of the most rigorous methods for synthesizing and critically appraising academic literature (Mulrow, 1994). Subsequently, the Gioia method was applied for data analysis, enabling the development of grounded theoretical insights through structured qualitative coding (Miles and Huberman, 1994, Strauss and Corbin, 1990).

Integrating these two approaches allows for a robust synthesis of prior research while fostering the emergence of novel conceptual understanding, thereby enhancing both the validity and originality of the findings.

2.1. Data collection

The initial phase focused on the systematic collection of relevant articles that would inform the subsequent analysis and discussion of the phenomenon under investigation. The search occurred on 28/10/2025 and the research query performed on Scopus® and Web of Science. Consistently with previous literature, the authors searched the following keywords in the title, abstract, and keywords of papers:

"("*risk" OR "challenge") AND ("AI" OR "artificial intelligence") AND ("HR" OR "human resource")*"

Notably, the authors deliberately adopted the broader term "AI" rather than "HCAI" in the search strategy. This choice was intended to ensure a wider coverage of relevant contributions and to avoid the premature exclusion of studies that, although not explicitly labeled as HCAI, are clearly aligned with its underlying principles.

The authors included only those journal articles that have been written in English, published until 28/10/2025, and included in the subject area "Business and Management". The authors obtained 205 documents from Scopus® and 46 from Web of Science.

In the second step, the authors removed 17 overlapping articles and defined the inclusion/exclusion criteria. They decided to focus their review on the influential business journals that were catalogued by the Chartered Association of Business Schools (CABS, 2024) in the most relevant fields for their research. The selected fields were in detail: General Management, Ethics, Gender and Social Responsibility ("ETHICS-CSRMAN"), Human Resource Management and Employment Studies ("HRM&EMP"), Organizational Studies ("ORG STUD"), Psychology (Organizational) ("PSYCH (WOPOB)"), Social Sciences ("SOC SCI"), and Strategy ("STRAT"). There were therefore 96 papers left in the sample. Then, by reading their title, abstract, and full text, the authors excluded those papers not related to the relationship between HCAI and HRM in terms of research topic, scope, and focus (substantive relevance criterion). Accordingly, papers that were not substantively aligned with a human-centered perspective were excluded through a manual, content-based analysis of the retrieved documents. This approach enabled a more nuanced, rigorous, and conceptually grounded selection process. Thus, a final sample of 60 relevant articles was obtained. Figure 1 describes the steps followed.

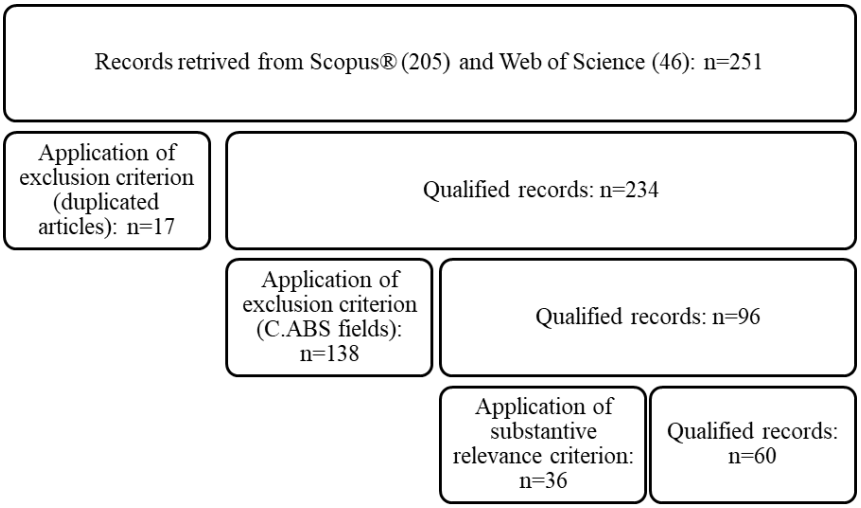


Figure 1. Flowchart of the literature search process

2.2. Data analysis

To develop a deep understanding of the challenges related to HCAI applications in HRM, the authors decided to approach the document analysis and study by adopting a qualitative approach. Their investigation focused on identifying and analyzing risks characterizing an HCAI system employed in HR practices.

The accepted documents (60) were analyzed using inductive open coding (Miles and Huberman, 1994, Strauss and Corbin, 1990), supported by Excel software. The structure proposed by Gioia et al. (2013) was followed for coding. The first-order codes were identified from the texts of the papers. Then, based on the theoretical background of the researchers, grounded first-order codes were progressively aggregated into more abstract second-order themes and overarching conceptual dimensions. This inductive coding process was carried out through triangulation among the three of us and involved several iterative rounds of coding.

Initially, the authors conducted open coding of the transcripts to identify instances related to the dimensions related to HCAI risks in HRM. These initial first-order categories and their associated second-order concepts formed a preliminary data structure. Subsequently, they reviewed this preliminary data structure and re-examined the extrapolated material to critically assess and refine the emerging codes. This collective process led to the removal of some codes, the merging of others, and the creation of new codes. The iterative cycles of coding and discussion continued until theoretical saturation was reached – that is, until no new conceptual insights emerged – resulting in a finalized data structure.

The coding process was complex and required several critical judgment calls. One key challenge was defining what constitutes a HCAI risk and its specific characteristics. To address this, a detailed review of the codes is still under way to ensure that only risks explicitly and unambiguously linked to HCAI applications in HRM are retained. As a result, some quotes initially coded under this category have been reassessed and subsequently removed when they did not meet this criterion.

Second, throughout the labeling and categorization process, the authors have to make several interpretive decisions concerning the assignment of first-order codes to second-order themes, as well as the definition and naming of second-order themes and overarching aggregate dimensions.

Finally, the authors have to determine appropriate cutoff points for including categories. As a guiding principle, they aim for their first-order categories to reflect the perspectives arising from all the accepted documents. Specifically, they are considering those codes that are consistent with

the research scope, closely aligned with a second-order category, contributing additional nuance without compromising the coherence of the data structure.

The coding results are still being refined to ensure the inclusion of concrete examples for discussion. The final coding scheme is therefore developed inductively, grounded in the data, and informed by their triangulated judgments.

In conclusion, 28 first-order codes, 11 second-order codes, and 3 aggregate dimensions have been preliminary identified. Table 1 presents a visualization of the preliminary data structure.

First-Order categories (28)	***Second-Order themes (11)***	***Aggregates dimensions (3)***
Representation risks	Input-related risks	Machine-related risks
Measurement risks		
Functional risks		
Selection risks	Data collection-related risks	
Omission risks		
Allocation risks	Algorithm-related risks	
Correlation risks		
Data optimization risks		
Emerging distortion risks	Process-related risks	
Reiteration risks		
Redesign risks	Structural and operational risks	Human-related risks
Over-reliance risks		
Cognitive-and-emotional overload risks	Person-related risks	
De-skilling risks		
Unprofessionalism risks		
Misinformation-and-manipulation risks		
Losing-humanity risks	Action-related risks	
Misbehave risks		
Cultural-resistance risks	Historic-cultural risks	Context-related risks
Technological-gap risks		
Regulatory-change risks	Institutional risks	
Regulatory-divergence risks		
Liability-attribution risks		
Technological lock-in risks		
Reputational risks		
Rising-inequalities risks	Sustainability risks	
Misalignment-with-CSR risks		
Environmental risks		

Table 1. Preliminary output of data analysis

3. Preliminary results

At this preliminary stage, the study has identified 3 overarching aggregates dimensions of the HCAI-related risks in HRM: machine-related risks, human-related risks, context-related risks. These are conceptually aligned with the framework on AI biases proposed by Schwartz et al. (2022). The first aspect concerns the technical risks intrinsic to HCAI systems, the second is about the risks associated with the human-machine relationship from a human perspective, and the last one involves risks arising from the specific historical, cultural, legislative, social, and environmental context in which an organization operates. Although here these are presented individually, they seem typically to coexist and be strongly interrelated. In addition, these dimensions seem to reflect a multi-layered perspective, capturing the interplay between contextual, human, and technological factors within AI applications in HRM.

The framework in Table 1 does not conceptualize these risks as being caused by the absence of a human-centered design, nor does it suggest that they are specific to poorly designed or purely automation-oriented AI systems. Rather, the risks identified should be understood as risks that may persist, and in some cases emerge, even when AI systems are intentionally designed and implemented according to human-centered principles. In this sense, the framework explicitly advances the argument that HCAI is still risky. Human-centered design reduces, but does not eliminate, the potential for unintended, harmful, or socially problematic outcomes in HRM. This seems therefore to highlight how ethical, transparent, and controllable intelligent systems can generate new forms of vulnerability in organizational practices, power relations, and institutional contexts. By adopting this perspective, the framework shifts the focus from a normative assumption that human-centeredness guarantees safety, toward a more critical understanding of HCAI as an ongoing socio-organizational accomplishment that requires continuous governance, monitoring, and reflexive oversight.

Please, note. As this study is still a work in progress, the authors are continuing to refine the description and analysis of the codes, as well as the conceptual development of the findings. These sections will be fully elaborated in the final version of the manuscript.

4. Conclusion

The expected outcomes of this study aim to provide a comprehensive and systematic understanding of the risks associated with the application of HCAI systems in HRM. This may contribute to the development of an integrated conceptual framework linking technological, human, and contextual dimensions. The research is expected to highlight that these risks could not primarily stem from the intrinsic limitations of technology. They rather could from the socio-organizational interactions that shape its use, thereby confirming the relevance of the socio-materiality paradigm (Orlikowski, 2010) for interpreting human-machine integration in complex organizational contexts. From this perspective, HCAI systems should not be understood as autonomous or neutral entities, but as co-constituted elements within HR practices.

From a theoretical perspective, the study aims to contribute to the advancement of the literature on HCAI in HRM by proposing an interpretive model of risks grounded in a socio-material reading of human-technology interactions. This approach enables a deeper understanding of phenomena related to HCAI, moving beyond technocentric or purely normative perspectives. It intends to emphasize the relational and organizational dynamics that mediate the extent to which AI can be genuinely human-centered.

From a practical perspective, the findings may provide actionable guidance for HR professionals and policymakers involved in the implementation of intelligent systems within HRM. Mapping the main risks associated with HCAI can support system design and promote the development of interdisciplinary competencies for the informed and responsible use of AI. In this regard, the study aims to foster a balance between technological innovation and the human dimension of work, contributing to the creation of organizational ecosystems that are more ethical, inclusive, and resilient.

However, the study may suffer certain limitations. The analysis is based on an SLR and qualitative theoretical development. While the adopted approach provides interpretive depth, it does not allow for direct empirical validation of the identified categories.

Future research might expand and validate the proposed model through empirical analyses, comparative case studies, or longitudinal investigations. It may also be important to further explore the variables that influence the perception and management of risks arising from the use of AI.

Keywords: Human-centered artificial intelligence; risk management; human resource management

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Sustainable employability as a decision-based capability in SMEs confronting systemic disruptions

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1. Objectives and relevance

Contemporary SMEs operate in a context characterized by systemic disruptions: geopolitical instability, fragmented value chains, evolving and contested trajectories of deglobalization, the pervasiveness of AI and digital platforms, demographic aging, and escalating environmental risks (Baldwin et al., 2024; Balsa-Barreiro et al., 2020; Paul, 2023; Volpi, 2024). Supply chain restructuring and near/reshoring efforts further increase volatility and reshape competitive strategies and labor markets (H.-M. Kim et al., 2020; Thakur-Weigold & Miroudot, 2024), particularly in manufacturing, where skill shortages, volatile career expectations, and growing pressures on productivity, compliance, and sustainability coexist and reinforce one another (Pencarelli et al., 2021; Prasanna et al., 2019). Recent debates on responsible and sustainable innovation, stakeholder-centered value creation, and local development show that SMEs face both heightened vulnerability, due to limited resources and exposure to global shocks—and new opportunities rooted in local embeddedness, networks for sustainable innovation, and "made in local" positioning (Giampaoli et al., 2025; Kramer & Porter, 2011; Moore & Manring, 2009; Voegtlin & Scherer, 2017) Smith, 2023). Within this scenario, the competitiveness of SMEs depends not only on technological upgrading and digitalization but also on their ability to align innovation with environmental and social commitments through responsible governance models and non-disruptive, value-driven innovation paths (Anadon et al., 2016; W. C. Kim & Mauborgne, 2019).

This paper addresses a specific aspect of this challenge: how SMEs conceive and implement sustainability as a people-related organizational capability that structurally connects work organization, skill development, well-being, and outcomes. We argue that sustainability becomes effective when embedded in coherent decision-making systems—rather than in isolated initiatives—capable of supporting workers' sustainable employability, stabilizing work processes, and enabling responsible innovation grounded in everyday organizational routines. These conditions call for SMEs not only to innovate technologically, but to develop new coherent forms of organizational intelligences — decision architectures that enable workers to remain valuable over time and organizations to innovate responsibly.

2. Theoretical framework

Our framework connects three related strands of literature.

First, research on sustainable employability conceptualizes the long-term capacity of workers to remain productive, healthy, and valuable under changing conditions, highlighting the interdependence between health, competence development, and meaningful work (Fleuren et al., 2020; Guest, 2017; van der Klink et al., 2016). Sustainable employability thus extends

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employability studies by introducing an individual and collective dimension: individuals' capability to work sustainably depends on the organizational and institutional contexts that support learning, well-being, and fairness over time (De Vos et al., 2020).

Second, scholarship on social sustainability and sustainable HRM underscores that organizational contributions to human well-being and dignity require more than fragmented welfare or training programs. Social sustainability is achieved through coherent systems of practices that enhance employee participation, equity, and long-term employability, linking individual flourishing to organizational resilience (Kramar, 2014; Macke & Genari, 2019).

Taken together, these two strands show that sustainable employability can be interpreted as the people-related expression of social sustainability: while social sustainability articulates the broader organizational commitment to participation, equity, and well-being, sustainable employability translates these principles into the concrete capacity of workers to remain valuable and healthy over time. We therefore conceptualize sustainable employability as the mechanism through which the social dimension of sustainability becomes actionable and measurable within firms. In this sense, sustainable employability serves as the micro–meso bridge through which social sustainability becomes an operational, measurable organizational capability.

Building on these elements, we propose a decision-centered perspective that positions sustainable employability and responsible innovation not as a program or initiative, but as an emergent property of managerial choices architecture with a clear internal logic. Drawing on configuration theory and the concept of HRM system strength (Becker & Gerhart, 1996; Bowen & Ostroff, 2004; Delery & Doty, 1996), we contend that internal social sustainability—and, by extension, sustainable employability—emerges when managerial decisions show coherence across four interconnected dimensions:

- Content, referring to the integration of health, safety, learning, participation, and performance goals;
- Ownership, indicating the straightforward assignment of responsibilities at different hierarchical and functional levels;
- Timing, involving steady yet flexible rhythms of implementation, review, and feedback; and
- Linkage, referring to the presence of credible yet straightforward indicators that connect people-related outcomes to operational and strategic objectives.

Rather than relying on value-driven orientations or declarative commitments, it is this structure of decisions—their coherence, continuity, and traceability—that determines whether sustainability becomes a lasting organizational capability rather than just a symbolic discourse.

Research questions

In light of this framework, the study addresses one question:

RQ1: Can sustainable employability—as an internally grounded form of social sustainability—serve as a viable response to skill shortages, retention issues, and the sustainability challenge of manufacturing SMEs?

3. Methodology

The empirical analysis is based on an interpretive multiple-case study of seven Italian SMEs participating in a national research project on social sustainability, health, and safety. The cases, mainly in manufacturing and related sectors, were selected through purposeful criterion-based and maximum variation sampling to capture heterogeneity in size, sector, ownership structure, and exposure to supply-chain and labour-market pressures.

The dataset comprises 48 complete interview transcripts with owners, top managers, HR professionals, and operational leaders, complemented by thematic summaries organized around

key analytical dimensions, including organizational identity, work organization, health and safety practices, competence development, welfare, involvement, external training networks, and labor market conditions. The analysis followed the procedures outlined by Miles, Huberman, and Saldaña (2020), combining inductive thematic coding with cross-case comparison.

Particular attention was given to how interviewees defined "sustainability," how decisions and responsibilities were described, which practices became routine over time, and how external partners (schools, ITS, universities, local institutions) were engaged. Consistent with the decision-centered perspective, the coding focused not only on the presence of practices but on the underlying decision structures—what is decided, by whom, when, and how these decisions are monitored or revised. Variations in emphasis across cases are viewed as empirical signals of what actors consider necessary to share about their strategies, while avoiding simplistic assumptions that the absence of explicit mention necessarily implies the absence of the phenomenon.

4. Results

The findings portray sustainable employability primarily as an operational, decision-driven capability. Across the cases, managers describe sustainability not as a standalone initiative but as "a way of working and deciding" embedded in routine choices about people and operations, maintaining people's well-being, product and process reliability, regulatory compliance, and economic viability. When present, this capability is activated through everyday decisions about organizing work, managing risks, and supporting and engaging employees, rather than in separate CSR programs.

First, in areas where internal social sustainability effectively translates into sustainable employability, we observe short, recurring organizational rituals—daily briefings, toolbox talks on safety, structured onboarding and on-the-job training, regular cross-functional reviews—anchored to clearly defined roles and minimal indicators. These routines make expectations visible, reduce uncertainty, and link individual efforts to collective outcomes; they also turn relational norms such as respect and listening into observable, responsible behaviours, enabling mutual accountability and smoother coordination.

Second, additional patterns indicate that sustainable employability remains partial, as several practices have not yet been approached or implemented in a planned and systematic manner. In these cases, sustainability is selectively emphasized, mainly highlighting environmental efficiency, technical standards, and formal certifications, compliance, with less focus on skill development, participation, or career trajectories. In such situations, technological or compliance investments and formal standards show limited performance impact because they focus primarily on skills, workload, and employees' attachment to the company.

Third, across all cases, we observe recurring vulnerabilities: difficulties in attracting and retaining essential talent; "capex without adoption" (where technology upgrades outpace routines and skills); overload of coordinating roles during organizational changes; and promising practices that fail to consolidate due to dependency on specific key individuals. These vulnerabilities highlight that sustainable employability emerges only when decisions are consistent across time, actors, and systems, rather than episodic or personality-driven.

Finally, a crucial enabling factor common across all firms—especially relevant to RQ1—is the robustness and permeability of the labor market and training. SMEs that collaborate continuously with vocational schools, ITS institutes, universities, and training providers benefit from a steady flow of technical talent, alleviated skill shortages, and clearer internal growth paths. Conversely, firms with weak or non-existent external training networks face heightened recruitment difficulties and higher turnover risks, and capability erosion over time. This external ecosystem serves as a vital supplement to internal decision-making, helping develop sustainable employability as a stable organizational capacity rather than a reactive response to labour shortages.

5. Discussion

Viewed through a decision-centered perspective, the findings indicate that the SMEs best equipped to handle systemic disruptions are those that do not merely adopt sustainability practices but progressively align decision-making across the four outlined dimensions. This involves integrating content related to safety, health, learning, and involvement rather than treating them as separate or secondary elements; clarifying ownership of decisions involving people instead of centralizing or hiding responsibilities; supporting timing with short but consistent routines that help set clear expectations; and ensuring connections through a small set of indicators and transparent feedback processes. When these elements work together, sustainable employability becomes a stable organizational capability rather than just a sum of disconnected practices.

Adopting a broader system perspective, the evidence also shows that SMEs tend to approach sustainability in a fragmented way, with emphasis skewed toward environmental efficiency, certifications, or compliance, while only partially addressing the social dimension. Where skill development, participation, workload management, and career opportunities are not integrated, sustainability remains procedural rather than transformative. By contrast, the strongest configurations are those in which safety, skill development, daily work organization, and employee involvement are viewed as interconnected and mutually reinforcing components of the same decision system. This systemic approach enables consistent routines, minimizes uncertainty, and creates conditions for workers to stay healthy, productive, and motivated over time.

A second insight emerging from the cases is that SMEs rarely succeed on their own. The internal sustainability of work and skills depends on the presence of stable external ecosystems—training institutions, sectoral funds, territorial partnerships, and vocational networks—that support firms in developing and renewing capabilities. The analysis shows that the labor market–training link acts as a critical enabling condition: firms embedded in strong vocational and territorial training networks are better able to attract the skills they need, organize onboarding processes, and sustain learning over time. Where such ecosystems are weak or absent, even promising internal routines risk becoming fragile or overly dependent on specific individuals, and difficult to scale or maintain.

Taken together, these findings suggest that sustainable employability reflects not only a people capability but an emerging form of organizational intelligence, in which decisions about skills, workload, and safety are integrated rather than siloed.

The link to the sustainable employability literature becomes clear. What differentiates robust, institutionalized forms of sustainable employability from more fragile or sporadic ones is the combination of (1) coherent internal decision-making frameworks and (2) external institutional arrangements that support them. Sustainable employability thus results not only from consistent managerial decisions but also from their alignment with broader training and labor-market ecosystems, allowing SMEs to build adaptive capacity rooted in people, learning, and daily work processes.

6. Value and implications

The study highlights three main contributions. Theoretically, it integrates sustainable HRM, social sustainability, and sustainable employability by advancing a decision-centered perspective on how people-related capabilities develop in SMEs. This perspective demonstrates that coherence in managerial decisions across content, ownership, timing, and linkage serves as the core mechanism through which internal social sustainability becomes operational and measurable, thereby enabling sustainable employability and, in turn, supporting forms of responsible innovation rooted in everyday work processes.

From a managerial perspective, the study offers a practical framework for action. Practices aimed at developing sustainable employability should be designed and evaluated with respect to the decisions made, who is responsible for them, when those decisions are implemented, and how outcomes are monitored and communicated. This approach promotes alignment and transparency in HRM choices and reduces the risk of fragmented or sporadic initiatives that fail to consolidate as stable capabilities.

For policymakers and intermediary institutions, the findings highlight the strategic value of robust territorial training and innovation ecosystems as capability infrastructures. Consistent collaboration with vocational schools, ITS institutes, universities, training organizations, and sectoral funds is vital to skill development, attraction, and retention, especially for SMEs in manufacturing sectors exposed to vulnerability. Strengthening these ecosystems is therefore crucial for supporting the long-term adaptability and competitiveness of manufacturing SMEs facing systemic disruptions, while also mitigating recruitment bottlenecks and capability erosion.

7. Conclusion

In a time when SMEs face overlapping economic, technological, and social challenges, sustainability cannot be viewed as isolated projects or compliance-oriented efforts. It must be understood as a pattern of interdependent decisions that connect people, work, and innovation. By conceptualizing sustainable employability as an internally grounded, decision-based organizational capability, this study shows how sustainability moves beyond rhetoric and becomes a lever for resilience, skill renewal, and responsible transformation.

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Human Uniqueness in the Age of AI: Toward Sustainable Human Flourishing in Organizations

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1. Introduction

The goal of this long abstract is to introduce a multi-year empirical research about the role of human work in organizations where tasks and activities are increasingly and significantly reshaped by advanced AI tools and agents. We are not going to focus on specific hypotheses or conceptual models, but on the general conceptual framework, rationale and motivations that inspire this project.

Artificial Intelligence has become profoundly integrated into the contemporary world of work, reshaping not only how tasks are performed but also work environments are structured and how work itself is experienced and understood by employees (Soulami et al, 2024). The growing presence of advanced AI systems has breathed new life into the long-standing debates about technological substitution, deskilling, and the future of human labor (Sarala et al, 2025).

The real challenge, however, may not lie in the act of predicting how many jobs will soon become obsolete or face a radical transformative change. Indeed, this study proposes a shift in focus: from a discourse centered on replacement and efficiency to one more concerned with the underlying conditions that will allow humans to flourish and generate value in workplaces and organizations in which advanced AI tools and agents will be increasingly capable and pervasive. Rather than asking which tasks humans will retain in AI-intensive workplaces, our project asks under which organizational conditions human individuality itself can become a source of irreplaceable value.

Our general thesis is that realizing such conditions will depend on rethinking jobs and organizational arrangements so that the "individual uniqueness" of humans will become the main (or even the only) way through which they will be able to maintain a key role in AI-centered economic systems. As mentioned, our emphasis is on uniqueness and individuality. Only what is "unique" is, by definition, unreplaceable. And what is truly unique, in humans, is the fact that we are single "individuals" (while we share many traits, we are never identical to one another) who are able and willing to cooperate towards shared purposes while, at the same time, preserving our individuality. As (and to the extent that) AI agents become more capable and cheaper over time, the areas in which humans may provide valuable contributions may recede significantly in most, if not all, industries and activities. If that's the case, it does not seem too farfetched to hypothesize that only the uncovering our human "individual uniqueness" may provide value that not even extremely capable AI agents could replace. It is worth emphasizing that by human uniqueness we do not simply refer to isolated traits such as creativity or personality, but to an emergent configuration of meaning, agency, and contribution that unfolds in interaction with organizational and technological contexts.

Obviously, we cannot be sure about the future evolutionary trajectory of AI technology. It may be the case that the upper limit of LLM's capabilities will soon be reached (Zhou et al., 2024). If that's the case, it is quite likely that humans will nonetheless maintain significant relevance in the organizational world. In our research project, we do not make assumptions or

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predictions on future developments of AI. Even in its current state, it seems clear that this technology has already the potential for decreasing the economic value of human work in many, if not most, activities and industries. Indeed, AI adoption is accelerating quickly (Felten et al, 2025). However, it is also plausible (as many key experts suggest being the most likely scenario) that such limit is distant, and that we may expect, in the not-so-distant future, AI agents that will be orders of magnitude more capable than the current versions. Either way, the concern with the future of the interaction between human workers and advanced AI is still relevant, but it appears to be even more urgent in the latter scenario, which is, for obvious reasons, the most uncertain and problematic.

The key question, of course, is what we really mean by "individual uniqueness". In other words, we need to ask what are the conditions by which organizations may find economically sound reasons to employ humans in a world populated by machines that are cheaper, more efficient, more effective, more creative than most human employees. In this scenario, the existence of valuable "individual uniqueness" should be considered, at the same time, axiomatic (that is, a premise that we postulate as true, without being able to prove it) but also derivative: in other words, a possible but not guaranteed "outcome" that will depend on how we rethink, reconceptualize, redesign work vis a vis highly capable AI agents. Thus, the general aim of our study is to contribute to such effort.

It is possible to hypothesize at least some general directions that such rethinking may need to take in order to maintain human relevance in the workplace. Broadly speaking, our current intuition is that context (industry, tasks, culture, legal frameworks etc.) may play a role. But we also believe that specific organizational work arrangements may play an even more important role. For example, it seems plausible that, in some if not most contexts, the value of human uniqueness may emerge more significantly not by segregating human-only tasks from AI-only tasks, but by developing jobs centered on a synergistic cooperation between humans and AI agents (Przegalińska et al., 2025). Indeed, recent literature on human–AI collaboration (e.g., Jarrahi, 2018; Seeber et al., 2020) suggests that the relationship between humans and AI is shifting from "users and tools" to "partners and collaborators." Recent versions of AIs have the unprecedented ability to acts not only as passive instruments but also, and more significantly, as active counterparts that, in and through dialogue, shape, respond to, and even inspire human action. That, of course, may have relevant implications for how human work could be and / or should be organized vis-à-vis such technology.

Thus, our aim is to explore how organizations could create work environments in which individuals, rather than being marginalized by the advent of advanced technologies, can express abilities that reveal what is most distinctive about them: the combination of experiences, values, aspirations, sensibilities, and interpretive skills, and how this expression can foster sustainable and meaningful forms of employment.

While the current literature offers examples of AI adoption and implementation in the workplace in relation to psychological effects such as automation anxiety, less attention has been given to the subtle human dimensions that make people irreplaceable resources, resulting in a gap that requires further exploration and study (Bankins & Formosa, 2023). The rationale of this research revolves around the fact that social sustainability in the age of AI depends not only on technological adaptation but also on the capacity of organizations to recognize and nurture the uniqueness of each individual. When people see themselves as valuable contributors, work acquires deeper meaning and generates reciprocal benefits for both the person and the organization (Michaelson et al., 2023).

2. Theoretical background

Classic organizational theories often conceived work as designed from the top down: tasks were assigned, roles defined, and workers were expected to adapt. More recent perspectives, such

as job crafting (Wrzesniewski & Dutton, 2001), conceptualize job design as a dynamic process, where bottom-up proactive processes integrate with top-down coordination and control needs, in which individuals continuously reshape their jobs to align them with their strengths, interests, and meaning. Within this view, work is co-authored, not imposed.

In the context of AI-intensive workplaces, we argue that this perspective gains renewed relevance. As machines take over routine and, increasingly, even non-routine functions, human contribution depends on how individuals redefine and personalize their work so that it becomes more coherent with their own unique abilities (Babashahi et al., 2024). However, such potential abilities are not always obvious, not even to the subjects themselves, as they need to be not only nurtured, developed and facilitated, but also discovered. A job design logic that emphasizes these elements by combining the need for coordination and control (via some form of top-down planning and oversight) with a significant, non-residual emphasis on self-determination (such as job crafting) seems to be a plausible path to discovering unique, valuable, unreplaceable human abilities. We could roughly distinguish three "phases" of such discovery process. In the exploration phase, individuals search for new ways to develop skills, capabilities, and resources, as well as to reinterpret their work demands, to find new interests and orientations, and to uncover their natural talents and predispositions. The experimentation phase involves testing these possibilities in practice: an action that requires organizational climates where initiative and trial are encouraged rather than sanctioned, and "good mistakes" are tolerated because they are seen as the necessary investment for innovation, at any scale. Finally, the expression phase translates the insights and competencies developed through exploration and experimentation into tangible adjustments to one's job: new activities, challenges, or relationships that better reflect the individual's distinctive potential.

Overall, it is worth noting that the capacity for human flourishing within technologically dense environments is not only a matter of individual well-being; it is also a foundation of social sustainability. Work that allows people to feel recognized, autonomous, and authentic, contributes to psychological resilience, community cohesion, and long-term organizational viability (Ho & Chan, 2022). In this sense, human uniqueness functions as both a moral and a practical axis for the social sustainability of technological evolution: it links personal fulfilment with systemic balance.

Building on these premises, the aim of the study is to explore the conditions that enable human uniqueness to flourish in AI-intensive organizational contexts and to understand how its expression contributes to socially and economically sustainable outcomes for individuals and organizations.

3. Methodological framework

From a methodological standpoint, the first step of our research, which is what we are presenting in this long abstract, is an exploratory one. We will adopt a qualitative research design based on in-depth interviews that will help shedding light on meanings and subjective interpretations of the protagonists rather than testing predetermined hypotheses (Lee & Lings, 2008). Later, based on the outcomes of this phase, we plan on formulating hypothesis to be tested through quantitative methods.

Consistent with the exploratory nature of the first phase of this research, the analysis will follow a thematic interpretive strategy (Braun & Clarke, 2006), which enables the identification of recurring patterns and tensions in participants' accounts while preserving the richness and nuance of individual narratives. This method provides an adaptable yet systematic analytical framework that allows a reflection on how people perceive and make sense of their job roles, identities, and relationships with technology without imposing pre-established theoretical categories (Nowell et al.,2017). Building on this methodological orientation, this study aims to explore the following questions:

- How do employees describe and make sense of their collaboration with AI systems in their daily work practices?
- How do individuals reshape and reinterpret their tasks or roles to make room for their distinctive abilities when interacting with AI?
- Which set of characteristics stand out when the individual feels that their contribution is "unique" during their work?

3.1. Partecipants

Participants will be selected through purposive sampling, ensuring that all respondents have direct experience working with or alongside AI-based systems in their professional activities. The inclusion criteria are:

- current or recent employment in organizations that use AI or algorithmic technologies
- familiarity with everyday work interactions where technology influences task execution or decision-making processes
- willingness to reflect on and discuss their personal experiences of work, change, and self-expression

No restriction will be imposed regarding age, gender, ethnicity, job position, or hierarchical level, since diversity of background and perspectives represent important factors that can only contribute to the enrichment of how uniqueness is enacted across various roles and settings.

The number of participants will not be predetermined, and interviews will continue until thematic saturation is reached. Each participant will receive detailed information about the study's purpose, procedures, and the voluntary nature of participation. Informed consent will be obtained before data collection, and participants will retain the right to withdraw at any point without giving any explanation.

All data will be treated with the utmost confidentiality. Identifying information will be removed, and pseudonyms will be used in any dissemination of findings. The study complies with ethical principles of respect, anonymity, and transparency in qualitative research. In addition, given the reflective and potential personal nature of the topic, particular attention will be focused on researcher reflexivity: acknowledging that interpretation may be inevitably shaped by the researcher's perspective and background.

3.2. Data collection

Data will be gathered through the use of semi-structured qualitative interviews aimed at investigating how participants experience, interpret, and express their sense of uniqueness while working in environments where artificial intelligence plays a significant role. This method has been selected for its balanced structure and openness. It provides a clear and direct connection with the research questions while also granting participant freedom to articulate their point of view and experiences.

Interviews will be conducted individually, either face-to-face or online (via video call), depending on participants' preference and logistic availability. Each conversation is expected to last approximately 30-45 minutes. Prior to each interview, participants will receive a short briefing outlining the aims of the study, the voluntary nature of participation, and their right to withdraw at any time. Informed consent will be obtained before starting the interview, and, with participants' permission, all sessions will be audio-recorded to ensure accurate transcription and data analysis.

Following data collection, all interviews will be transcribed verbatim and anonymized to ensure confidentiality. Transcripts will be securely stored and subsequently analyzed following the principles of thematic analysis (Braun & Clarke, 2006). As previously mentioned, data

collection will continue until additional interviews no longer yield substantially new insight, signaling that thematic saturation has been reached.

4. Expected results

While our methodological posture, in this exploratory stage, does not require, or even allow clear expectations about the research outcomes, we can certainly envision some possibilities. We expect, for example, to find a variety of situations in which the interaction between AI and human workers may unfold in significantly different ways.

In some cases, we may observe workers that do not feel that their interaction with AI has changed, in any meaningful way, their capacity to explore, experiment and express their individualities and unique talents and abilities. We also expect to find a variety of antecedents and contextual factors that may help explain these circumstances, including organizational (constraints, incentives, nature of tasks etc) and personal factors (subjective attitudes and goals, personality traits, experiences, etc).

In other cases, we may observe the opposite situation, where the interaction with AI opens, for the individual, a new pathway of potential self-expression, self-determination and, in some cases, even an actual process of self-discovery and self-development, at least in relation to some work tasks and activities. Again, we expect that a variety of contingent organizational and subjective factors may be correlated with the occurrence of this different kind of scenario.

Naturally, we may also find situations where such difference is blurry, context-dependent, time-dependent, or even situations that are completely different from the two "types" that we just described and may lead to a more fine-grained typification of work situations.

We also expect, and this is a central element in our framework, that differences in how "interaction with AI" is actually manifested in the daily reality of work may be highly consequential. These differences may include how the interaction is carried out, the goals it serves, the "division of labor" between human and AI, the kind of "dialogue" that occurs (or lack thereof), and the degree of autonomy the individuals exert when shaping such interaction, and more. Such factors may play a significant or even crucial role in creating the "right" (or "wrong") "conditions" leading to different types and degrees of valorization (or, marginalization) of individual unique abilities.

5. Expected Theoretical and Practical Contributions

This study aims to contribute to the fields of organizational behavior and human resource management by addressing a still underexplored question: how human uniqueness can be recognized, sustained, and valued in work environments increasingly shaped by advanced AIs. Although research on AI has expanded rapidly, the human dimension, particularly the ways in which individuals preserve meaning, agency, and distinctiveness, remains largely neglected. By exploring these dynamics qualitatively (and, in subsequent phases, quantitively), this project tries to bring its contribution in starting to fill this gap, offering an interpretive perspective of how humans experience and express individuality and uniqueness in AI-mediated workplaces, and which contextual factors might support or hinder its flourishing.

In this scenario, this proposed research tries to enrich existing theories of work design and employee motivation by suggesting that human uniqueness should be understood not just as an individual and given trait, but as an emergent condition that can sprout from the interlaced interaction between the individual, the organization, and the technology.

A further theoretical contribution lies in the attempt this study makes in conceptually locating human uniqueness and value within the broader framework of the interconnection between social and economic sustainability. This research assumes that valuing human individuality is not only a moral imperative, but it can also represent a strategic source of adaptability, innovation, and

long-term organizational health. In this sense, this study may substantially infer that social sustainability, defined by a meaningful, autonomous, and dignified work, could co-exist with, and even reinforce, economic sustainability.

A further dimension of relevance can be seen in the implications this research may bring to organizations, managers, and human resources practitioners. In particular, we believe the findings may help companies understand how to create and set those favorable conditions that allow employees' uniqueness to emerge and translate into value, both in terms of well-being and performance.

By highlighting the importance of environments that support autonomy, learning and psychological safety, the research might encourage leaders to design workplaces where exploration, experimentation, and self-expression are not penalized but actively encouraged. In such contexts, employees are likely to experience greater engagement, intrinsic motivation, and sense of purpose: all factors that available scientific literature consistently associates with lower turnover, reduced absenteeism, and higher productivity.

Moreover, the study may also provide HR departments with the starting conceptual tools to rethink professional development and management practices in workplaces where AI-human interaction is intense. Rather than focusing exclusively on standardization or task optimization, organizations could benefit from identifying and cultivating employees' distinctive capabilities, their unique capital, as a source of innovation and competitive resources.

More broadly, the project might help decision-makers reflect on how the integration of intelligent technologies can be aligned with human-centered values, fostering sustainable forms of organizational growth. Recognizing and nurturing human uniqueness is not merely an ethical choice; it could become a key driver for long-term resilience, adaptability, and organizational learning in the digital era.

6. Limitations

Given the novelty of the topic explored, this research faces a number of limitations that define both its scope and its potential for further development. These limitations do not undermine the value of the project but rather highlight the challenges inherent in studying a new and rapidly evolving field such as human–AI collaboration and the expression of human uniqueness in work contexts.

Concepts such as human uniqueness, individual value, and flourishing are inherently difficult to operationalize. This creates interpretative richness but also ambiguity, as definitions may vary and overlap with neighboring constructs such as creativity, identity, or meaning at work.

Methodologically, the qualitative and exploratory nature of the first phase of the research highlights the interpretive dimension of the results, which may limit their applicability to broader populations or cultural contexts. The same applies to the diversity of work environments considered: findings will reflect experiences situated within specific organizational and technological settings, while other contexts may reveal alternative dynamics.

Recognizing these limitations provides a necessary frame of humility and positions this inquiry as an initial step toward a deeper, cumulative understanding of human uniqueness in the age of AI.

7. Final remarks

This study tries to position itself as an initial attempt to lay a foundational stone for a different way of thinking about the human-AI dynamic in the workplace. In a scholarly and public debate often polarized between dystopian fears of replacement and utopian salvation, this research aims to pave a third path: one of synergistic change, collaboration and mutual enhancement.

The project aspires to give its contribution to this reframing by implying that coexistence of humans and intelligent technologies need not be defined by competition or substitution but can instead become a space for co-evolution and a conceptual space to uncover dormant resources and potential. Within this view, the sustainability that organizations pursue cannot be reduced to mere economic performance, but it must also address the social and human dimension that make work meaningful and sustainable. If future research continues to build upon this perspective, the discourse on AI and work may gradually shift from one of survival to one of sustainable coexistence, where technological progress and human flourishing evolve together rather than apart.

Keywords: Artificial intelligence; human valorization; social sustainability; job design; human-AI collaboration

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Distributed Trust and the Organizational Governance of AI in HRM

Giorgia Moretti[1]

1. Introduction

Artificial Intelligence has become a central infrastructural component of contemporary Human Resource Management (HRM), reshaping not only operational processes but also the epistemic foundations of decision-making in organisations. What was once a domain grounded in professional judgment, contextual interpretation and direct interpersonal communication is now supported by automated systems capable of processing large volumes of data and generating structured indications in a matter of seconds (Kadirov et al., 2024; Tamilselvan et al., 2025). This transformation has unfolded gradually, driven by the expansion of digital applications in HR, the availability of machine learning and generative AI tools (Aguinis et al., 2024; Alborè et al., 2025), and the pressure on organisations to manage growing workloads efficiently.

The increasing presence of AI in HRM processes introduces potential benefits, such as reduced screening time and more consistent evaluations (Kadirov et al., 2024; Tamilselvan et al., 2025). Recruitment represents a paradigmatic example of these transformations, as automated tools increasingly contribute to decisions about access to employment opportunities, raising questions that go beyond technical performance and extend to issues of transparency, fairness, accountability and the broader legitimacy of decision-making processes (Alborè et al., 2025; Mujtaba, 2025). HR professionals, who remain responsible for final decisions, must determine not only whether the system performs adequately but also how to interpret its outputs, how to integrate them with their own judgments, and how to respond when system suggestions diverge from human assessment. These challenges are made more complex by the fact that AI tools utilized in HRM are often purchased from external vendors (Radonjić et al., 2022), meaning that those who use them are not the same individuals who developed them. The result is a layered form of dependency that influences how trust develops and how decisions are made.

Rather than treating AI as a neutral decision support tool, this study approaches AI-supported HRM as an organisational reconfiguration of judgement and responsibility. As algorithmic outputs gain authority in recruitment and evaluation processes, organisations must renegotiate who is accountable, how decisions are justified, and what counts as legitimate evidence In this sense, the adoption of AI represents not only a technological change, but a socio-technical reordering of roles, interpretive work, and governance routines - where trust becomes distributed across people, artefacts, and institutions.

Against this backdrop, this study develops a conceptual framework for understanding distributed trust in AI-supported HRM. The work is grounded in a systematic literature review (SLR) covering the period 2015-2025 and seeks to integrate insights from HRM, information systems, organisational studies, computer science, law and ethics. The goal is to examine how trust is constructed in contexts where multiple actors interact: the system itself, the vendor who designed it, the HR professionals who use it, the organisation that hosts it, and the regulatory environment that defines boundaries and responsibilities. This study identifies a structural decoupling between informational control and formal accountability in AI-supported HRM, particularly in vendor-mediated configurations, and examines how this condition reshapes the organisational construction of trust. This decoupling represents the core condition under which

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distributed trust emerges as an organisational accomplishment rather than an individual disposition.

The following sections develop the conceptual grounding of distributed trust, outline the review design, present preliminary interpretive insights, and clarify the theoretical contribution of the study.

2. Conceptual Development

To understand the impact of AI, trust must first be grounded within the traditional HRM context. Historically, HRM decision-making is rooted in professional judgment, contextual interpretation, and direct interpersonal communication. In functions like recruitment, trust has traditionally relied on holistic assessments where HR professionals interpret career trajectories and 'cultural fit' through tacit and subjective expertise. The introduction of AI reconfigures this landscape, transforming trust from a centralized interpersonal reliance into a layered, distributed form of dependency where the locus of responsibility is fragmented across multiple actors and technical artifacts. Trust has long been recognised as an important element in the adoption of new technologies. Much of the literature on trust in AI focuses on individual users and examines how system characteristics-such as transparency, explainability, accuracy and fairness-shape perceptions and willingness to rely on automated outputs. These contributions highlight important issues, yet they often narrow the focus to the relationship between a single user and a technical artefact. In recruitment, however, this relationship is part of a broader configuration in which additional actors and expectations come into play. Recruitment decisions, for example, typically rely on holistic assessments that incorporate both quantitative and qualitative information. HR professionals interpret career trajectories, evaluate motivation, identify transferable skills and reflect on cultural fit. These activities involve forms of judgment that are contextual, interpretive and often tacit.

When AI tools enter the picture, they interact with this interpretive work in various ways. Some tools act as filters, selecting candidates based on specific criteria. Others analyse text or digital traces to identify patterns (Chowdhury et al., 2022). Still others generate ranked lists or scores intended to support decision-making. Each of these functions influences how HR professionals structure their work and how they understand the meaning of system outputs.

A key observation emerging from the literature is that trust is not solely a function of system transparency. While transparency can help users understand what the system does, it often relies on forms of explanation that are difficult for non-technical users to interpret (Radonjić et al., 2022). Technical documentation, model descriptions or algorithmic explanations may convey information about how the system works, but they do not necessarily clarify how outputs should be used in practice. HR professionals frequently assess the reliability of a tool based not on its internal logic but on how stable and interpretable its behaviour appears in the context of real tasks.

The literature also shows that trust depends heavily on the relationship between organisations and vendors. In many cases, vendors determine what information is available to users. They control documentation, update schedules, training materials and access to system logs. HR professionals often rely on the vendor to describe system capabilities, limitations and error patterns. This dependency introduces a relational dimension to trust, shaped by the vendor's responsiveness, communication style and willingness to share meaningful information rather than generic reassurance. Several studies point out that HR professionals tend to feel more confident when they can ask questions, receive clear explanations, and observe that the vendor acknowledges system limitations without minimising them.

Another dimension concerns organisational structures. Trust does not emerge solely from individual perceptions but is shaped by how organisations incorporate AI tools into their workflows. Governance practices, documentation routines, spaces for discussion and opportunities for oversight play a significant role (Alborè et al., 2025; Al-Alawi et al., 2024;

Madanchian, 2025; Taslim et al., 2025). For example, when organisations create regular forums where HR professionals discuss ambiguous cases, compare interpretations or reflect on unexpected outputs, users tend to develop a more balanced and informed relationship with AI tools. Conversely, when systems are introduced without structured support, staff may feel isolated in their attempts to interpret outputs, which can undermine trust. Regulation forms a further layer in this configuration. The GDPR and the AI Act introduce requirements for transparency, human oversight, documentation and risk management, particularly for high-risk applications such as hiring, promotion or performance evaluation (Alborè et al., 2025; Madanchian, 2025; Sandeep et al., 2025). These obligations influence how organisations structure their processes and how responsibilities are allocated. They also shape expectations: when regulatory duties are clear and translated into practical routines, users tend to see the system as embedded in a controlled environment. When duties remain abstract, the uncertainty can affect trust. This distributed nature of trust aligns with socio-technical perspectives (Fenwick et al., 2024; Uren et al., 2022) that emphasise how technology adoption depends on the alignment of multiple components rather than on isolated factors. The concept of distributed trust therefore offers a useful framework for describing how confidence in AI develops across different stages of adoption, shaped by relationships, routines and expectations that extend beyond the system itself.

This distributed configuration, however, does not merely raise the risk of organisational responsibility gaps; it structurally decouples decision authority, informational control, and formal accountability. When algorithmic systems are developed externally, operated internally, and regulated institutionally, no single actor fully controls the epistemic infrastructure underpinning HR decision-making. Responsibility becomes simultaneously present and diffused. In such arrangements, accountability is not simply clarified through governance routines, but continuously renegotiated across organisational boundaries, generating zones of indeterminacy in which authority and answerability no longer coincide. The proposed framework moves beyond a descriptive list to show how each dimension actively constitutes distributed trust. System characteristics (transparency, fairness) serve as the epistemic foundation, providing the justifications needed for HR professionals to validate decisions. Vendor relationships manage information asymmetry in B2B contexts, where trust is a function of the provider's responsiveness and willingness to disclose system limitations. Organisational practices act as social stabilizers, creating collective routines and forums that transform individual suspicion into informed adoption. Finally, regulatory frameworks (e.g., EU AI Act, GDPR) provide systemic legitimacy, translating abstract ethical imperatives into verifiable organisational duties.

3. Methodological approach

The study is grounded in a Systematic Literature Review (SLR) covering the period 2015–2025. Following PRISMA 2020 guidelines, searches were conducted in April 2025 across Scopus and Web of Science using combinations of the following keywords: artificial intelligence, machine learning, human resource management, trust, transparency, explainability, bias, fairness, privacy, governance and accountability. The search initially identified 752 records (Scopus = 542; Web of Science = 210). After removing 87 duplicates, 665 unique articles were screened based on titles and abstracts. Studies were retained for full-text assessment if they addressed at least one of the following criteria:

- the adoption or evaluation of AI tools in HRM processes
- trust in algorithmic decision-making relevant to HR contexts
- organisational or regulatory aspects affecting AI-supported decisions

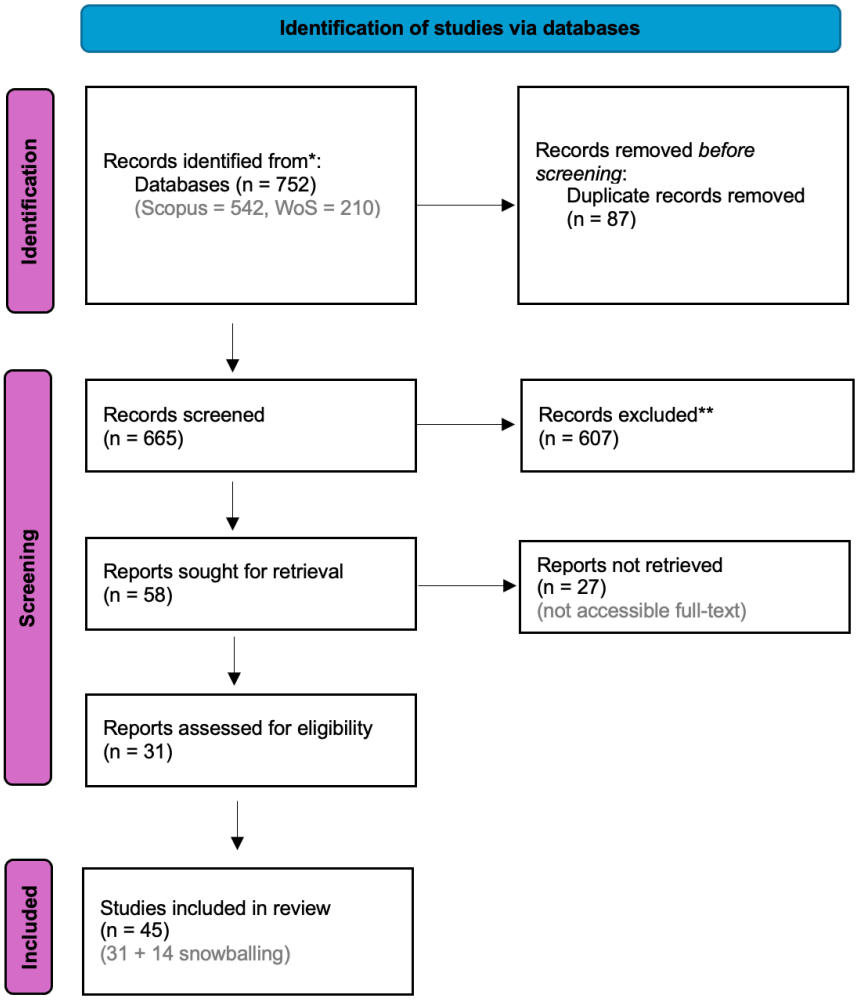


Figure 1. PRISMA 2020 flow diagram illustrating the study identification, screening, eligibility, and inclusion process

Following title and abstract screening, 58 articles were selected for full-text retrieval. Of these, 27 were excluded due to lack of full-text access, resulting in 31 studies assessed for eligibility. An additional 14 relevant contributions were identified through backward and forward snowballing, bringing the total number of included studies to 45.

To ensure methodological robustness, a quality assessment was conducted using the Mixed Methods Appraisal Tool (MMAT, 2018). Only empirical studies scoring above 2 were retained for in-depth analysis. The final analytical corpus therefore consists of 33 empirical studies, complemented by conceptual and regulatory contributions used to contextualize findings.

The dataset reflects the interdisciplinary nature of the field, including qualitative interview-based studies, survey research, experimental designs simulating recruitment decisions, technical analyses of AI system performance, conceptual governance papers, and legal analyses addressing GDPR and the EU AI Act.

To synthesise the material, an abductive thematic analysis was conducted. Initial coding identified recurring themes such as transparency concerns, interpretive challenges, vendor-client dynamics, accountability distribution, governance practices, and regulatory translation. Through iterative comparison and clustering, these codes were organised into four analytical dimensions: system attributes, relational dynamics, organisational practices, and regulatory structures.

Given the rapid evolution of AI adoption in HRM, the SLR is complemented by a planned qualitative phase involving semi-structured interviews with HR professionals and AI vendors. These interviews aim to refine and validate the emerging framework by exploring dimensions of trust that remain underrepresented in academic literature, particularly in B2B communication practices and internal organisational sense-making processes.

4. Preliminary Results

The preliminary results of the Systematic Literature Review (SLR) provide insight into how trust is constructed in the context of AI-supported HRM and where the literature leaves unanswered questions. Gaps in one area can affect perceptions in others, underscoring the need for a framework that captures this distributed nature.

The findings suggest that this socio-technical configuration operates across three interconnected layers: (i) system attributes, (ii) relational dynamics in vendor-client settings, and (iii) organisational and regulatory contexts. Importantly, weaknesses in any single layer tend to spill over into the others, amplifying uncertainty and complicating the practical legitimacy of AI-supported decisions. At the system level, transparency emerges as the most frequently discussed dimension, yet its organisational value appears limited when transparency is framed primarily as technical disclosure. Several studies suggest that HR professionals often struggle to translate model descriptions into actionable understanding, which shifts the burden of interpretation onto users and increases dependence on vendor mediation. Similarly, accuracy and reliability are rarely treated as stable properties: performance is shaped by local norms, task definitions, and organisational expectations, meaning that what counts as "good performance" may vary across contexts. Fairness is also highly salient in the literature, but it is not reducible to technical bias mitigation; rather, it becomes a contested organisational issue when HR teams lack the data access, expertise, or authority to independently evaluate models and must rely on vendor cooperation.

Relational dynamics are therefore central. The vendor-client relationship structures information asymmetries around training data, updates, auditability, and the practical meaning of model outputs. Trust tends to be more grounded where vendors provide accessible documentation, respond to questions with specificity, and acknowledge limitations without resorting to generic reassurance. Conversely, opaque communication practices can stabilise neither expectations nor accountability, leaving HR professionals uncertain about how to justify decisions and how to respond to errors. In this context, accountability is not simply "assigned" but negotiated: the literature shows that responsibility for harms or mistakes often remains ambiguous at the boundary between organisational decision-making and vendor-controlled infrastructures.

Finally, contextual layers shape whether trust can be institutionalised. Organisational governance routines - such as documentation practices, periodic review meetings, and spaces for collective interpretation - appear crucial in turning individual uncertainty into shared sensemaking and controllable oversight. However, the review also reveals a striking gap between the normative emphasis on human-in-the-loop (HITL) and its empirical operationalisation. While oversight is widely endorsed, it is rarely translated into concrete practices, raising the risk that "human oversight" functions as a symbolic safeguard that stabilizes legitimacy discursively without materially redistributing control. In such cases, human involvement may absorb responsibility while leaving underlying algorithmic authority largely intact. Regulation (GDPR and the EU AI Act) interacts with these dynamics by setting requirements for transparency, oversight, and risk management, yet organisations differ in how they translate legal obligations into everyday routines. This variability contributes to uneven conditions for trust across settings. This configuration produces a paradox of control. Organisations remain formally accountable for HR decisions, yet they increasingly depend on algorithmic infrastructures whose internal logics may remain partially opaque. The more organisations rely on AI systems to enhance rationality and

consistency, the more they confront epistemic opacity that complicates justification, contestability, and responsibility attribution.

Together, these findings indicate that trust in AI-supported HRM is less an individual disposition toward technology and more a fragile organisational accomplishment, continuously negotiated across socio-technical and inter-organisational boundaries.

5. Discussion and implications for Organisational research

The objective of this study is to analytically clarify how trust is constructed, stabilised, and contested within AI-supported HRM. Rather than proposing a prescriptive model, the framework contributes by examining the organisational conditions under which algorithmic authority becomes legitimate, the ways in which information asymmetries between vendors and organisations shape accountability arrangements, and how governance routines transform individual uncertainty into collective oversight. Particular attention is given to the translation of regulatory requirements into everyday organisational practices, highlighting how formal obligations are interpreted, enacted, and sometimes reconfigured within local contexts. In doing so, the study contributes to understanding AI adoption not as a purely technological upgrade, but as an organisational process through which responsibility, interpretive work, and decision legitimacy are continuously renegotiated.

The framework is intended to be descriptive rather than prescriptive. It does not impose a single model but offers a way for organisations to reflect on their own practices and adapt them as needed. By focusing on the process through which trust develops, it supports decisions that are informed, transparent and responsive to context.

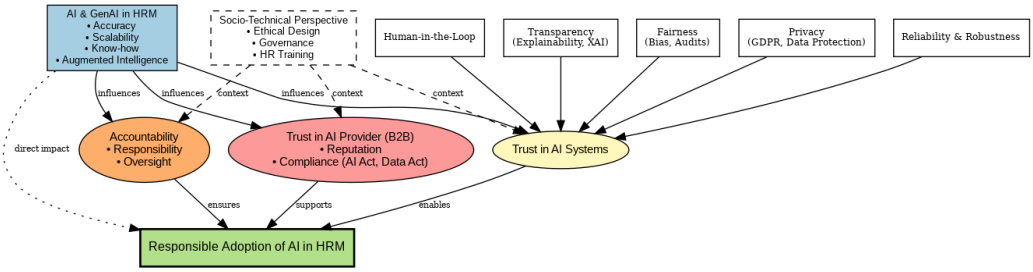


Figure 2. Conceptual Framework developed in this study

Towards an Operational Understanding of Distributed Trust

The review indicates that trust in AI-supported HRM takes shape through a series of interactions that begin before the system is implemented and continue as users gain experience. It is therefore helpful to describe these interactions in a narrative way, emphasising how different elements become relevant at different stages.

A first moment concerns the initial contact between the organisation and the vendor. At this stage, the organisation seeks to understand what the system does, what assumptions it makes and what information will be available for oversight. The quality of the vendor's communication plays a central role. Clear explanations, accessible documentation and openness about limitations help establish a shared understanding of the system's capabilities (Radonjić et al., 2022). When communication is limited or difficult to interpret, uncertainty can influence later stages of adoption. As the system is introduced into the workflow, internal exchanges become important. HR professionals interpret outputs in light of their own knowledge and compare impressions with colleagues. These conversations help users develop a sense of how the system behaves in real cases. When organisations create opportunities for these exchanges, users tend to develop more

realistic expectations. Without such support, AI outputs may be interpreted in isolation, potentially limiting users' ability to integrate them with their own assessments.

Over time, users develop interpretive familiarity. They recognise typical patterns, understand when an output appears unusual and learn how to contextualise system suggestions (Gonzalez et al., 2022). This form of learning does not require technical expertise but benefits from clear documentation and training that focuses on practical examples (Aguinis et al., 2024). Interpretive familiarity supports balanced reliance on AI tools, reducing the risk of both overreliance and undue skepticism. As users gain experience, governance routines naturally develop. Issues such as how to document decisions, how to manage discrepancies between human and system judgments and how to escalate uncertain cases become part of ongoing practice. Even simple routines, such as periodic check-ins or shared logs of difficult cases, help create continuity and support consistent decision-making.

Regulation interacts with these stages by providing boundaries and expectations. When regulatory duties-such as documentation or oversight requirements-are translated into concrete activities, they support a more structured approach to adoption. When they remain abstract, they may introduce uncertainty rather than clarity.

Overall, these dynamics form the basis of an operational understanding of distributed trust.

Trust does not reside in a single actor or artefact. It emerges from a combination of communication, interpretation, governance and regulatory alignment (Fenwick et al., 2024; Uren and Edwards, 2022). The framework provides an analytical lens for examining how these elements interact and become stabilised in practice. The transition to AI-supported HRM can lead to the development of what Roumbanis (2025) describes as 'meta-algorithmic judgment'. At the initial stage (contact), trust is shaped by the vendor's transparency in managing information asymmetry. During implementation (workflow), trust becomes a collective organisational property through shared discussion and routine-building. In the maturity stage, HR professionals develop interpretive familiarity, allowing them to not only rely on but also critically contest and override algorithmic outputs when necessary (Aguinis et al., 2024; Roumbanis, 2025). Thus, distributed trust is the mechanism that enables this higher-level human oversight.

The contribution of this work lies in reframing trust in AI-supported HRM beyond a micro-level focus on technology acceptance and individual perceptions. Rather than treating trust as a psychological disposition toward an artefact, the study conceptualises trust as an organisational alignment process through which judgement, responsibility, and legitimacy are redistributed across actors, technical systems, vendor infrastructures, and regulatory expectations.

From an organisational perspective, distributed trust can be interpreted as an ongoing sensemaking process through which actors attempt to stabilize legitimacy under conditions of technological mediation and epistemic uncertainty. Rather than emerging automatically from system features, trust is enacted through interpretive work, boundary-spanning coordination, and the continuous alignment of governance practices with institutional expectations.

By foregrounding distributed trust, the study highlights the organisational mediation of algorithmic authority: organisations must determine how algorithmic outputs are interpreted, contested, and incorporated into decision routines, and how accountability is negotiated when key information remains controlled by external providers. In doing so, the framework bridges the gap between socio-technical adoption dynamics and the institutional requirements emerging from GDPR and the EU AI Act, particularly in high-risk domains such as recruitment and selection.

Empirically, the review identifies a persistent discrepancy between the normative emphasis on human oversight and the limited evidence of how oversight is operationalised in practice. This gap provides a clear agenda for future research on interpretive work, internal governance routines, and vendor-client arrangements that shape whether “oversight” becomes substantive or merely symbolic. Future research may build on these insights through qualitative interviews with HR professionals and AI vendors, aimed at refining the framework and capturing organisational practices that remain underrepresented in the current literature.

Building on these insights, the framework invites organisations to examine how oversight and accountability become organisationally visible and discussable through structured routines. Rather than offering a universal solution, the intention is to open an analytical space in which organisations can interrogate how responsibility is enacted and how algorithmic authority is stabilized in practice.

Illustrative analytical questions for organisational reflection

Rather than offering a prescriptive checklist, the framework can be used to stimulate organisational reflection around key tensions that characterise AI-supported HRM. For instance, organisations may ask:

- Where does epistemic control reside in our AI-supported processes, and who has access to relevant system information?
- How are discrepancies between human judgment and algorithmic outputs discussed and documented?
- In what ways does human oversight substantively redistribute decision authority, rather than symbolically absorb responsibility?

These questions do not constitute a model to be adopted, but an analytical device to make visible how distributed trust is enacted, stabilised, or destabilised in practice.

Taken together, these findings suggest that trust in AI-supported HRM should not be understood as a property of technology or individual cognition, but as an emergent organisational condition shaped by the alignment (or misalignment) of epistemic control, decision authority, and accountability structures. In this sense, distributed trust provides a lens to analyse how organisations stabilise legitimacy under conditions of technological opacity and inter-organisational dependency in AI-enabled HRM.

Keywords: Distributed trust; artificial intelligence; human resource management; organisational governance; accountability; human oversight

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AI and Performance Management: A Work-in-Progress Review

Martina Mori[1]

1. Introduction

Performance management has long been recognised as a multi-layered process closely connected to strategic HRM (Den Hartog et al., 2004). It encompasses an integrated set of activities through which managers and employees jointly define expectations, monitor progress, discuss results, and allocate rewards, with the overarching aim of supporting individual performance and, ultimately, organisational success (DeNisi & Murphy, 2017).

The growing diffusion of artificial intelligence (AI) systems—ranging from predictive analytics to automated feedback tools—has begun to reshape this process. AI-enabled applications in the broader HRM promise greater accuracy, timeliness, and data richness, but they also raise fundamental questions about transparency, fairness, and responsible use (Bankins, 2021; Vrontis et al., 2022). Despite the rapid evolution of AI applications in HRM and in the context of performance management, existing research remains fragmented and dispersed across different disciplinary domains, making it difficult to develop a coherent understanding of how AI is transforming employee performance management.

To address this gap, the present study aims to conduct a systematic literature review to classify, synthesise, and critically assess the state of research on AI-enabled performance management. This article is therefore a work in progress and presents preliminary findings.

2. Research protocol

In line with recent systematic reviews in HRM and AI (Jatobá et al., 2023; Kaushal et al., 2021; Malik et al., 2023; Pereira et al., 2023), this study adopted a classifying literature review approach (Kunisch et al., 2022) to map existing knowledge on AI within employee performance management. The review follows the Scientific Procedures and Rationales for Systematic Literature Reviews (SPAR-4-SLR, Paul et al., 2021), a protocol increasingly used in social sciences (Palumbo et al., 2023). Ensuring methodological transparency and replicability was a core priority. SPAR-4-SLR was thus followed, combining its steps with the practical guidelines developed by Simsek et al. (2021). These two approaches are complementary and together strengthen the overall robustness of the review. After defining the research question, the boundary conditions of the review were outlined. Building on prior analyses of AI in HRM (Kaushal et al., 2021) and related works (Qamar & Samad, 2021; Sharma & Chillakuri, 2022; Sokolov & Zavyalova, 2021), a comprehensive search involved two major databases: (1) the Web of Science (WoS) Social Science Citation Index and (2) Scopus. To ensure quality and relevance (Le Brocq et al., 2022; Sokolov & Zavyalova, 2021), the 2021 Academic Journal Guide (CABS, 2021) was adopted to focus the search on selected management subcategories. An iterative keyword strategy was developed, drawing on prior work on AI-enabled HRM and performance management (Meijerink et al., 2021). The final WoS search string was cross-validated in Scopus. The initial search returned 1,019 articles after duplicate removal. A three-step set of exclusion criteria was applied (Palumbo et al., 2023): Off-topic (studies unrelated to employee performance

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management); Off-scope (articles addressing organisational or managerial issues without an explicit link between AI and performance management); and Off-focus (works on adjacent HR domains, e.g., recruitment, learning and development) unless they provided relevant and transferable insights. For example, studies on digital learning as a driver of performance (e.g., Nguar & Appolloni, 2025) were excluded because they did not explicitly address AI-enabled performance management.

A two-stage screening process was conducted (Simsek et al., 2021): first, title and abstract screening, then, full-text assessment to confirm relevance and quality. The final dataset included 127 articles.

Following Paul et al. (2021) and Simsek et al. (2021), the analysis extracted and analysed key themes from the selected studies. Articles were coded iteratively and clustered into thematic categories representing the main perspectives and patterns emerging from the literature. The final step concerned reporting the review's consolidated findings, highlighting existing gaps, and outlining directions for future research on AI-enabled performance management.

3. Preliminary findings

Our preliminary findings show that AI-enabled performance management is emerging along three main lines: (1) the design of new tools and measurement systems; (2) the motivational and well- being implications of AI-mediated evaluation, and (3) employee perceptions of fairness and justice in algorithmic performance decisions. A set of recent reviews and position papers further outlines a research agenda for responsible, practice-informed AI in HRM.

3.1. AI-enabled tools and measurement systems in performance management

A first group of contributions focuses on how AI reshapes the infrastructure of performance management through new tools, data sources, and measurement approaches.

Gu et al. (2025) analyse the introduction of an algorithmic supervisor, a data-driven system that monitors service employees, provides real-time feedback, and contributes to performance evaluation. They find that algorithmic supervision improves service quality (higher customer satisfaction) but reduces service quantity (fewer customers served), revealing a clear trade-off between quality and throughput. The study also uncovers gender effects: while men initially outperform women, after the introduction of the algorithmic supervisor, female employees achieve higher levels of both quantity and quality. These findings illustrate how AI-based monitoring tools can simultaneously enhance performance on some dimensions, reshape productivity profiles, and alter performance dynamics across employees.

Other contributions focus on the measurement architecture underpinning performance management. Beckman and Sharif (2025) proposed a method to analyse employee performance by applying temporal mining to large-scale network data on task collaborations. Conceptualising employees as nodes and collaborative tasks as links, they use mathematically validated algorithms to track performance patterns over time, thereby demonstrating how networked work structures and performance trajectories can be evaluated with greater granularity. Similarly, Nesterak et al. (2025) proposed the Workplace Performance Measurement (WPM) method, which combines process mining and machine learning to monitor work execution. Unlike traditional work measurement techniques that focus on task duration and frequency, WPM integrates data on workers' activities, physiological indicators, and tool use, enabling continuous, automated analysis of errors, irregularities, and opportunities for improvement in production processes. These studies point to the growing use of AI and advanced analytics to create high-resolution, continuous performance measurement systems that operate in the background of everyday work. At a more synthetic level, Pereira et al. (2023) map how different AI techniques—such as neural networks, machine learning, fuzzy logic, and other soft computing approaches—have been

applied to performance management and appraisal across multiple levels of analysis. Their review identifies themes related to job performance, engagement, satisfaction, and extra-role behaviour, showing that AI has been used to model links between job satisfaction and performance, enhance knowledge management systems, support problem solving in teams, and connect performance management with cognitive and emotional outcomes such as creativity and well-being. Overall, this work suggests that AI can help address long-standing concerns about validity, reliability, and transparency in appraisal, for instance, by detecting behavioural patterns, predicting turnover or low performance, and reducing delays and inefficiencies through advanced analytics.

Further empirical research illustrates how AI is embedded within talent management and performance systems. Tatiparti et al. (2025) examine AI support in preselection, organisational culture, interviews, and workload reduction, and find that AI-enabled talent management practices are positively associated with employee performance in medium-sized firms. Karina et al. (2025), in turn, identify three key factors for successfully integrating big data analytics into performance management systems: robust organisational data management capabilities, qualified human resources to interpret and use the analytics, and decision-making processes that effectively incorporate analytic insights.

Taken together, these studies show that a pipeline of AI-based tools and methods exists to reconfigure performance management. At the same time, they converge on the idea that the value of these systems depends on clear implementation criteria, governance mechanisms, and explicit design choices regarding trade-offs (e.g., quality vs. quantity), distributional effects (e.g., gender dynamics), and alignment with organisational goals.

3.2. Motivational and well-being implications of AI-mediated performance management

A second set of studies highlights that AI in performance management not only affect "objective" performance outcomes, but also employees' motivational states, autonomy perceptions, and psychological well-being, often drawing on self-determination and self-regulation theories.

Edwards et al. (2024) examine the motivational consequences of algorithmic HR systems that both collect performance metrics and make decisions based on them. They distinguish between the automated monitoring and metricization of performance and the automated decision-making built on these metrics. Building on self-determination theory (SDT), they argue that such systems are likely to elicit extrinsic motivation, especially when employees perceive them as instruments of control. The study introduces the notion of metricized behaviour prioritisation: employees focus their efforts on those dimensions captured by the metrics, potentially neglecting unmeasured but important aspects of performance. Empirical findings show that when employees attribute controlling intent to algorithmic systems, they report stronger extrinsic motivation, greater prioritisation of metricised tasks, and increased emotional exhaustion. Conversely, when systems are interpreted as developmental tools that support feedback and growth, intrinsic motivation is more likely, emotional exhaustion is lower, and employees are less prone to neglect unmeasured performance dimensions. This underscores the central role of employee sensemaking in shaping motivational outcomes.

Brown et al. (2025) revisit the job characteristics model through the lens of SDT in the context of algorithmic performance management. They show that while AI can augment non-routine work, the opacity of algorithmic evaluations may foster scepticism, distrust, and concealment behaviours, even among high performers. Their study highlights real-time automated feedback as a key intervention: by increasing knowledge of results and reducing surprise in final evaluations, real-time feedback enhances the perceived trustworthiness of algorithmic ratings and supports intrinsic motivation. However, trust declines when feedback diverges from expectations, even if the evaluation is more favourable than anticipated, suggesting that alignment and transparency matter more than valence alone. The authors conclude that

algorithmic management contributes positively to motivation and trust when it is implemented in ways that reinforce autonomy, competence, and relatedness, but can undermine these outcomes when transparency and alignment are lacking.

Tang et al. (2023) introduce a complementary perspective based on self-regulation theory, proposing a dual-path model of employees' dependence on intelligent machines. Dependence can reduce discrepancies—by helping to achieve goals more effectively and improving performance—or increase discrepancies, by threatening employees' sense of competence and self-esteem. Empirical evidence supports both: intelligent machines enhance perceived goal progress but can also trigger self-esteem threats that reduce performance. The moderating role of core self-evaluations (CSE) is especially significant. Although CSE usually predicts positive self-regulation, in this context, high CSE may intensify the negative pathway by heightening employees' sensitivity to the gap between their desired self-image and their actual reliance on machines.

Across these studies, AI-enabled performance management emerges as a psychologically consequential infrastructure: depending on how systems are designed, communicated, and interpreted, they can either support autonomous motivation, engagement, and reduced exhaustion or trigger controlled motivation, identity threats, and burnout.

3.3. Motivational and well-being implications of AI-mediated performance management

A third cluster of contributions focuses on employee perceptions, particularly regarding fairness, justice, and cognitive biases in AI-assisted performance judgments.

Carter and Liu (2025) investigate how AI interacts with anchoring and adjustment biases in performance appraisal. Their experiments show that performance ratings are sensitive to both the anchor level (high vs low) and the source of the recommendation (human vs AI). AI-generated anchors have a greater influence on supervisors' ratings than human anchors, indicating that the perceived objectivity and reliability of AI strengthen its anchoring effect. As a result, evaluations may reflect not only observed behaviour but also the interaction between algorithmic suggestions and human judgment, raising concerns about how AI can inadvertently magnify cognitive biases rather than eliminate them.

Majrashi (2025) examines employees' perceptions of the fairness of predictive features used in AI models for job performance assessment. The study finds that features are generally perceived by employees as fair when they are clearly linked to job performance and improve predictive accuracy—such as technology attitudes, job–role fit, tenure, and work experience. By contrast, demographic variables (gender, marital status, number of children) are widely seen as unfair because of their weak connection to performance and their implications for privacy and discrimination risks. The study also underscores an important conceptual distinction between predictive algorithms and decision-making algorithms: even when predictions appear accurate and fair, the organisational processes that translate predictions into decisions can still lead to unfair outcomes. This suggests that fairness needs to be assessed not only at the model and feature levels but also at the decision workflow level.

Focusing on the broader consequences of algorithmic justice, Jabagi et al. (2025) analyse how perceptions of algorithmic fairness shape job satisfaction and perceived organisational support among gig workers. Using survey data from Uber drivers, they distinguish between algorithmic matching decisions (task allocation) and performance evaluation decisions. Perceived fairness in both domains is positively associated with job satisfaction and perceived organisational support, but fairness in performance evaluation decisions has a more substantial impact than fairness in matching. The study shows that workers are particularly sensitive to the fairness of algorithmic evaluative judgments and that transparency and procedural justice in these decisions are crucial for sustaining positive attitudes and well-being.

Collectively, these studies reinforce the idea that what AI does in performance management cannot be separated from how employees perceive it. Perceptions of fairness, the salience of cognitive biases, and the perceived legitimacy of predictive features all play a central role in determining whether AI-based performance systems are accepted, trusted, and experienced as just.

3.4. Motivational and well-being implications of AI-mediated performance management

Alongside empirical studies, several recent reviews and position papers offer higher-level reflections on AI in HRM, including performance management, and stress the need for responsible governance and practice-driven research.

Nyberg et al. (2025) provide a practice-oriented review of generative AI in HRM, based on a Summit that brought together scholars and senior business leaders. Adapting Posthuma et al.'s (2013) taxonomy of HR practices, they cover six functional domains, including performance management. For performance management, discussions centre on four themes: GenAI as potentially transformative; adoption challenges; the risks of misuse and the importance of maintaining a human-in-the-loop; and the need for experimentation with multi-criteria evaluation (accuracy, validity, bias, ethicality). A key message is the call for use-inspired research that bridges academic rigour with pressing practical challenges, positioning scholars as active contributors to the design and governance of GenAI-enabled HR systems. In this regard, Budhwar et al. (2023) focus specifically on large language models such as ChatGPT, identifying performance management as a domain where such tools could significantly reshape evaluative work. They argue that ChatGPT can support raters by synthesising large volumes of qualitative and quantitative information, potentially clarifying links between individual performance data and organisational outcomes. At the same time, they caution that poor data quality, uncritical reliance on AI outputs, and insufficient training for raters can undermine rather than enhance appraisal practices, reinforcing the need for strong governance, oversight, and capability-building. Together with other reviews, such as Pereira et al. (2023), these contributions underscore that AI-enabled performance management remains an emerging field, marked by both optimism about efficiency and analytical sophistication and concern about ethics, fairness, and well-being. They converge on the idea that future work should move beyond purely technical solutions to consider design principles, governance structures, and participatory processes that ensure AI systems genuinely support responsible, human-centred performance management.

4. Discussion: expected contributions

This work-in-progress review aims to develop an integrative conceptual framework that organises existing knowledge on AI-enabled performance management across three emerging dimensions: (1) measurement systems and analytical tools, (2) motivational and well-being mechanisms, and (3) fairness perceptions and cognitive responses to algorithmic decisions. By synthesising heterogeneous contributions scattered across HRM, organisational behaviour, information systems, and algorithmic management, the review seeks to clarify the contours of this evolving field and to articulate the socio-technical nature of AI-mediated performance management.

The ongoing analysis is expected to produce a refined thematic classification, highlight cross- cutting mechanisms that have not yet been systematically theorised, and identify under-explored areas where future research could meaningfully advance conceptual development—particularly with respect to employee sensemaking processes, governance and design principles for algorithmic evaluation, and the interplay between human and machine judgement.

The final version of the study will present a consolidated framework and a practice-oriented research agenda outlining how AI can be embedded responsibly into performance management systems.

4.1. Expected Theoretical Directions

First, early evidence indicates that AI-enabled tools may do more than automate performance measurement. They appear to influence which dimensions of performance become salient (e.g., metricized behaviours, Edwards et al., 2024), how goals are prioritised, and how employees organise their work around algorithmic cues. If confirmed by further analysis, this would imply a shift from a traditional, human-driven evaluative process to a hybrid socio-technical architecture in which algorithms and humans jointly participate in sensemaking and decision-making.

Second, a recurring pattern across the studies reviewed concerns the psychological consequences of algorithmic evaluation (Brown et al., 2025; Tang et al., 2023). Drawing on SDT and self- regulation frameworks, preliminary findings suggest that employees' interpretations of algorithmic tools—supportive versus controlling—may shape whether AI fosters intrinsic motivation and competence or triggers controlled motivation, depletion, and identity threat. Should these trends hold across a broader body of evidence, AI-enabled performance management may need to be theorised not only as an information-processing system but also as a motivational and interpretive context.

Third, studies on anchoring, feature legitimacy, and algorithmic justice consistently highlight that employees evaluate AI-based systems through a fairness lens. Early indications suggest that fairness perceptions vary across types of algorithmic decisions (e.g., matching versus evaluation) and depend heavily on the perceived legitimacy of predictive features and transparency of decision workflows. These insights point toward the potential value of integrating organisational justice theory with research on algorithmic management. Rather than eliminating bias, AI appears to reconfigure its sources—a direction that future theorising will need to interrogate further.

While the above expected directions resonate with classic socio-technical perspectives, our preliminary analysis suggests that AI-enabled systems may not simply fit within existing frameworks. AI systems appear to amplify and transform the interaction between technological and social components, particularly through their capacity to autonomously generate, interpret, and act on data. This suggests the need to revisit and extend socio-technical assumptions in the context of AI-enabled performance management.

Overall, these expected contributions provide a preliminary roadmap for the conceptual development of AI-enabled performance management. As the analysis progresses, these emerging patterns will need to be refined, validated, or revised in light of additional evidence.

Keywords: Performance management; AI-enabled HR; literature review

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Sfide di sostenibilità organizzativa e logiche di employer branding nell'era dell'IA: l'esperienza della Regione Marche

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1. Introduzione e contesto della ricerca

Negli ultimi anni, la Pubblica Amministrazione è attraversata da una crescente difficoltà nel mantenere la propria attrattività come datore di lavoro, in particolare nei confronti delle generazioni più giovani e dei profili ad alta qualificazione. In questo quadro, il tema dell'employer branding pubblico emerge come una leva centrale per comprendere come le amministrazioni possano comunicare la propria identità, i propri valori e l'impatto sociale del lavoro pubblico. La cosiddetta "quarta rivoluzione industriale" rappresenta una sfida per i consolidati modelli organizzativi e decisionali, imponendo una riflessione critica sulle modalità con cui la Pubblica Amministrazione (PA) attrae, seleziona, forma e trattiene il capitale umano.

Jakobsen et al. (2023) sottolineano come le amministrazioni pubbliche stiano affrontando una doppia sfida: da un lato, la difficoltà di reperire competenze tecniche e digitali adeguate; dall'altro, l'urgenza di mantenere sostenibilità organizzativa in un contesto di crescente disaffezione e turnover. In Italia, come in numerosi Paesi europei, il settore pubblico si confronta con quella che la letteratura internazionale definisce una human capital crisis (Jakobsen et al., 2023): un insieme di dinamiche strutturali caratterizzate dall'invecchiamento della forza lavoro, da tassi limitati di ricambio generazionale e da una ridotta capacità di attrarre nuove competenze, in particolare tra le generazioni più giovani. Nel contesto italiano, il Rapporto FPA–Indeed (2024) evidenzia come la Pubblica Amministrazione soffra di un problema strutturale di comunicazione e posizionamento, che incide negativamente sulla sua capacità di attrarre le giovani generazioni. Solo il 16% dei giovani tra i 18 e i 34 anni considera infatti un impiego pubblico come una scelta auspicabile, segnalando una difficoltà diffusa nel percepire la PA come un contesto lavorativo attrattivo, dinamico e innovativo. Tra coloro che partecipano ai concorsi, inoltre, una quota significativa rinuncia durante l'iter selettivo o abbandona nei primi mesi di lavoro. Le principali barriere percepite riguardano la scarsa trasparenza delle procedure, la lentezza dei processi di selezione e la limitata percezione di opportunità di crescita professionale. A ciò si aggiunge l'utilizzo, nei bandi di concorso, di un linguaggio spesso tecnico e impersonale, che fatica a valorizzare l'identità delle amministrazioni e a comunicare il significato e le finalità sociali del lavoro pubblico.

La sostenibilità organizzativa può essere intesa, in primo luogo, come la capacità delle amministrazioni di garantire condizioni durature di benessere alle persone che vi operano.

Rogers et al. (2012) affermano, infatti, che «la sostenibilità sociale implica la soddisfazione dei bisogni degli esseri umani», introducendo una visione del benessere come costrutto multidimensionale che non può essere ridotto a condizioni astratte o uniformi.

In un'ottica più ampia, questa impostazione consente di leggere la sostenibilità organizzativa come la capacità dell'ente pubblico di mantenere nel tempo un equilibrio tra innovazione

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tecnologica, sviluppo delle competenze e benessere delle persone che compongono l'organizzazione. Tale equilibrio diventa particolarmente rilevante nel caso delle nuove generazioni che si affacciano al lavoro pubblico. Inoltre, capire perché i giovani siano meno attratti di un tempo o abbandonino l'ente precocemente, richiede di considerare anche il ruolo della fiducia istituzionale (Grimmelikhuijsen et al., 2013). La decisione di entrare o restare nella PA è strettamente legata alla convinzione che l'organizzazione sia in grado di ascoltare, riconoscere la diversità valoriale delle nuove generazioni e offrire opportunità di crescita coerenti con le loro aspettative. In questo senso, sostenibilità, benessere e fiducia si intrecciano per spiegare non solo l'attrattività della PA, ma anche la sua capacità di trattenere i giovani talenti.

Nel contesto emergente entro cui le amministrazioni pubbliche stanno ridefinendo strategie e modelli organizzativi si colloca un crescente interesse verso i processi di digitalizzazione e, più recentemente, verso le potenzialità offerte dall'intelligenza artificiale (IA) nei processi di gestione delle risorse umane.

In questo studio, tematiche e dinamiche appena descritte sono approfondite con specifico riferimento alla Regione Marche, attualmente interessata dal progressivo potenziamento di strumenti digitali nonché dalla valutazione di possibili applicazioni dell'IA a supporto dei processi di acquisizione del personale[3].

A partire dall'analisi delle attuali criticità riscontrate nei processi di selezione e inserimento di personale, la ricerca, nel suo disegno complessivo, si propone di esplorare come l'adozione di logiche di employer branding, supportate da un utilizzo mirato di strumenti e applicazioni di IA, possa migliorare l'efficacia dei processi di selezione e inserimento, in particolare la capacità di attrarre e trattenere giovani talenti, rafforzando con il tempo un'immagine dell'ente regionale come datore di lavoro innovativo, sostenibile e orientato alle nuove generazioni.

Nella fase embrionale della ricerca l'obiettivo è quello di incrociare il punto di vista dell'ente e quello dei candidati, analizzando le dinamiche di attrazione e abbandono che caratterizzano i concorsi pubblici, per comprendere quali fattori incidano sulle scelte individuali.

2. Obiettivi della ricerca

Nel quadro della trasformazione digitale e dell'evoluzione delle intelligenze artificiali nei processi HR pubblici, la capacità delle amministrazioni di attrarre e trattenere talenti, in particolare giovani, rappresenta una dimensione cruciale della sostenibilità organizzativa.

Parallelamente, la letteratura recente sul public employer branding sottolinea come la percezione dell'attrattività della PA dipenda sempre più dalla capacità di comunicare in modo autentico i propri valori, l'impatto sociale del lavoro e le reali opportunità di crescita professionale (Leijerholt et al., 2022; Ritz et al., 2022; Keppeler & Papenfuß, 2021).

Questi elementi contribuiscono a definire il contesto all'interno del quale si colloca il presente studio.

Il complessivo disegno della ricerca si propone due obiettivi principali, entrambi declinati con riferimento al contesto della Regione Marche:

- Analizzare i fattori che influenzano la partecipazione, la non partecipazione e l'abbandono nei concorsi pubblici banditi nel triennio 2022-24.
- Indagare le motivazioni del turnover giovanile entro il primo anno dall'assunzione.

[3] Lo studio è condotto nell'ambito di un progetto di ricerca condiviso tra Regione Marche e Dipartimento di Management dell'Università Politecnica delle Marche, nell'ambito del Programma «Dottorati InPA» del Dipartimento della Funzione Pubblica. L'autrice, nella sua duplice veste di dottoranda e di titolare di contratto di apprendistato presso la Regione Marche, beneficia del suo status di osservatore partecipante lungo l'intero progetto.

Con riferimento al primo asse di ricerca, l'analisi si concentrerà sull'intero percorso che conduce un candidato dal momento dell'iscrizione al concorso fino all'eventuale assunzione. Verranno quindi osservate in modo integrato le diverse fasi (iscrizione, partecipazione effettiva alle prove, collocazione in graduatoria e accettazione dell'incarico) con l'obiettivo di comprendere come e perché, lungo questo percorso, emergano specifici punti di caduta. L'interesse è rivolto in particolare a identificare se vi siano fasce generazionali più o meno inclini a partecipare o a confermare la propria candidatura nelle fasi successive, e quali elementi possano incidere sulle loro decisioni. Tra questi, particolare attenzione sarà dedicata alla qualità e al linguaggio della comunicazione dei bandi, al grado di chiarezza con cui vengono presentate mansioni e prospettive del ruolo, alla percezione di significato e impatto dell'impiego pubblico, nonché alla complessità delle prove e ai tempi delle procedure.

Il secondo asse di ricerca riguarda, invece, ciò che accade dopo l'ingresso in servizio. L'obiettivo è approfondire se, e in quale misura, il turnover nel primo anno sia attribuibile a un disallineamento tra le aspettative maturate durante la fase concorsuale e l'effettiva esperienza lavorativa. In questa prospettiva, verrà esplorato il ruolo del contesto organizzativo: la qualità del supporto ricevuto dai neoassunti, la percezione di contribuire a un impatto sociale reale e riconosciuto, la possibilità di intravedere percorsi di crescita e sviluppo professionale, la coerenza tra cultura interna e valori che i giovani portano con sé. Analizzare tali dinamiche consente di interrogarsi su come questi fattori, intrecciandosi, possano incidere sulla decisione di lasciare il posto nei primi mesi e, più in generale, sulla sostenibilità organizzativa dell'ente.

3. Quadro teorico

L'attrattività del lavoro pubblico rappresenta un tema emergente nella letteratura internazionale. La rassegna sistematica di Jakobsen et al. (2023) evidenzia come l'interesse accademico sul public sector attraction sia cresciuto a partire dagli anni 2000, in parallelo con le crescenti difficoltà di reclutamento, in particolare nei Paesi dell'Europa settentrionale e nel mondo anglosassone. Gli studi si concentrano prevalentemente sulla fase di attraction, mentre risultano ancora limitate le evidenze relative a selezione, onboarding e retention, suggerendo la necessità di adottare una prospettiva di ciclo di vita e approcci integrati e data-driven.

Tra i principali filoni di ricerca, la Public Service Motivation (PSM) occupa un ruolo centrale nell'analisi dell'attrattività del lavoro pubblico. La letteratura più recente sottolinea come la PSM sia un costrutto dinamico, influenzato da pratiche organizzative, percezioni di impatto sociale e stili di leadership. In particolare, la sostenibilità organizzativa e il supporto percepito possono rafforzare la PSM (Crucke et al., 2022), mentre differenti stili di leadership incidono significativamente su soddisfazione, commitment e intenzione di permanenza nel settore pubblico (Hameduddin & Engbers, 2022).

La Public Service Motivation (PSM) rappresenta uno dei pilastri della ricerca sull'amministrazione pubblica sin dalla sua formalizzazione a metà degli anni '90. Perry (1996) la definisce come una predisposizione individuale a rispondere a motivazioni radicate nelle istituzioni e nelle missioni del settore pubblico, riconducibili a un orientamento prosociale che si contrappone alle spiegazioni utilitaristiche del comportamento umano proprie del public choice (Perry & Wise, 1990).

Il modello originario di Perry (1996) individua quattro dimensioni chiave della PSM: attrazione verso la partecipazione al processo politico, impegno per l'interesse pubblico, compassione e disponibilità al sacrificio personale. Tali dimensioni risultano fortemente influenzate dal contesto organizzativo: ambienti caratterizzati da equità, coerenza valoriale e leadership credibile tendono a rafforzare la PSM, mentre disfunzioni e incoerenze organizzative possono progressivamente eroderla (Hinna, 2009).

La letteratura evidenzia in modo convergente che livelli elevati di PSM si associano a migliori performance, maggiore soddisfazione lavorativa, minori intenzioni di turnover e più forte

commitment organizzativo, oltre a una maggiore propensione ai comportamenti di cittadinanza organizzativa. Studi empirici mostrano inoltre che la PSM favorisce la percezione di significatività del lavoro e la stabilità nel tempo (Vandenabeele, 2008). Tuttavia, emergono differenze rilevanti tra contesti nazionali, con livelli mediamente più elevati nei Paesi nordici e anglosassoni rispetto all'Europa mediterranea, inclusa l'Italia, a conferma del ruolo dei fattori culturali e istituzionali (Hinna, 2009).

I contributi più recenti confermano che la PSM non è una caratteristica innata e immutabile, ma un costrutto sensibile alla qualità dell'ambiente lavorativo e delle pratiche gestionali.

Crucke et al. (2022) dimostrano che la sostenibilità organizzativa, attraverso equità interna, supporto percepito e senso di impatto sociale, rafforza la PSM e riduce turnover e insoddisfazione.

Hameduddin & Engbers (2022) evidenziano che diversi stili di leadership influenzano in maniera significativa la PSM, con effetti su performance e intenzione di rimanere.

Un secondo filone di studi rilevante per comprendere l'attrattività del lavoro pubblico riguarda le differenze generazionali nei valori lavorativi. La letteratura internazionale ha evidenziato come i lavoratori appartenenti alle generazioni Y (Millennials) e Z presentino aspettative e orientamenti valoriali differenti rispetto ai Baby Boomers e alla Generazione X (Hansen & Leuty, 2012; Bencsik et al., 2016). Le nuove generazioni attribuiscono maggiore importanza ad aspetti quali autonomia, apprendimento continuo, flessibilità, equilibrio tra vita privata e lavoro e senso di scopo sociale del proprio ruolo. Di conseguenza, tendono a privilegiare contesti professionali inclusivi, dinamici e coerenti con i propri principi etici, più che stabilità, status o percorsi di carriera lineari. Questo scarto valoriale, se non adeguatamente compreso e gestito, può generare un disallineamento tra aspettative e realtà organizzativa, traducendosi in una percezione della PA come rigida, gerarchica e poco meritocratica. Tale percezione contribuisce a spiegare sia la minore propensione dei giovani ad intraprendere un percorso lavorativo nel settore pubblico, sia fenomeni di turnover precoce e perdita di fiducia verso la PA come datore di lavoro. Per quanto di nostra conoscenza, la letteratura riferita al contesto pubblico italiano non offre contributi sistematici che approfondiscano in modo specifico le differenze generazionali nei valori lavorativi e il loro impatto sull'attrattività della PA. Ciò evidenzia un gap rilevante nella letteratura, che la ricerca in corso può contribuire a ridurre.

Un terzo filone è quello dedicato al public employer branding, che analizza come le amministrazioni costruiscono e comunicano la propria identità di datori di lavoro. Gli studi contemporanei evidenziano come l'attrattività del settore pubblico dipenda in misura crescente dalla capacità delle amministrazioni di presentarsi come organizzazioni moderne, inclusive e orientate al valore pubblico.

Leijerholt et al. (2022) dimostrano che pratiche di comunicazione interna coerenti, leadership credibili e processi organizzativi trasparenti rafforzano l'identità interna e la percezione di attrattività dell'ente. La qualità della comunicazione interna, spesso trascurata nella PA, emerge come un fattore decisivo per la costruzione di un brand pubblico forte.

Ritz et al. (2022) evidenziano che l'attrattività comparata di enti pubblici, privati e nonprofit dipende non solo dagli incentivi economici, ma soprattutto dal valore pubblico percepito, dalle opportunità di contribuire alla collettività e dalla credibilità dell'ente nel mantenere le proprie promesse verso i dipendenti.

Keppeler & Papenfuß (2021), attraverso esperimenti sui social media rivolti a potenziali futuri dipendenti pubblici, mostrano che messaggi chiari, personalizzati e orientati all'impatto sociale aumentano significativamente l'intenzione dei giovani a candidarsi, sottolineando come la PA debba ripensare linguaggi e canali di comunicazione se vuole risultare competitiva rispetto agli altri settori.

Nel loro complesso, questi studi convergono su un punto centrale: il settore pubblico non può più limitarsi a procedure standardizzate di reclutamento, ma deve elaborare strategie mirate di employer branding, focalizzate sulla narrazione del proprio contributo alla società, sulla trasparenza dei processi e sulla valorizzazione delle opportunità di sviluppo professionale. Ciò è

particolarmente rilevante per i giovani laureati, che tendono a scegliere contesti lavorativi percepiti come coerenti con i propri valori e capaci di offrire percorsi di crescita significativi.

Negli ultimi anni, diversi contributi nel campo dell'HRM digitale (Keppeler, 2023) hanno evidenziato come l'introduzione dell'intelligenza artificiale nei processi di gestione delle persone stia trasformando, in modo graduale, anche le pratiche di selezione nel settore pubblico. In generale, l'IA viene considerata una tecnologia potenzialmente utile per supportare attività quali l'analisi strutturata dei curricula, l'identificazione di pattern nei fabbisogni professionali e, più in prospettiva, la personalizzazione dei percorsi formativi. Tuttavia, la letteratura che esplora in modo sistematico queste applicazioni nella PA è ancora emergente.

Alcuni studi iniziano a mostrare come l'integrazione tra strumenti di IA e strategie di employer branding possa contribuire a migliorare la qualità della comunicazione verso i candidati, rendendo il processo più trasparente e coerente con un'immagine organizzativa orientata all'innovazione. In questa direzione, Strohmeier (2022) sottolinea il potenziale degli strumenti di smart e-data-driven recruitment nel rendere più efficiente la gestione delle candidature e nel migliorare l'esperienza dei candidati, riducendo al contempo alcune forme di opacità tipiche dei sistemi tradizionali.

Parallelamente, Benabou et al. (2024) richiamano l'attenzione sulla necessità di adottare un approccio di responsible AI, particolarmente rilevante per il settore pubblico, in cui trasparenza, equità e accountability rappresentano requisiti imprescindibili. L'adozione di algoritmi nei processi HR richiede quindi un bilanciamento tra automazione e supervisione umana, affinché gli strumenti tecnologici non generino bias o discriminazioni, ma fungano da supporto alle decisioni e non da sostituti del giudizio professionale.

Nel complesso, la letteratura disponibile indica con chiarezza che l'IA può rappresentare una leva utile per innovare le pratiche di reclutamento della PA solo se integrata in un framework etico, regolato e coerente con una visione centrata sulla persona.

4. Metodologia

In questa fase embrionale la ricerca adotta un approccio esplorativo, volto a indagare in profondità le dinamiche di attrazione, partecipazione e abbandono nei concorsi pubblici. La scelta di concentrare l'analisi sui concorsi banditi dalla Regione Marche nel triennio 2022–2024 risponde a motivazioni sia scientifiche sia contestuali.

In primo luogo, il ruolo di osservatore partecipante svolto dall'autrice, non solo consente un accesso diretto a dati amministrativi dettagliati e affidabili, ma, attraverso la quotidiana partecipazione ai processi organizzativi, consente di sviluppare una progressiva maggiore consapevolezza delle criticità operative che caratterizzano le pratiche di reclutamento e selezione dell'ente.

In secondo luogo, il focus sui concorsi regionali riflette un interesse concreto e crescente dell'amministrazione stessa verso il tema dell'attrattività e della retention del personale, criticità che si sono accentuate negli ultimi anni e che riguardano in particolare le fasce più giovani e qualificate della forza lavoro. Infine, la scelta di circoscrivere l'analisi al triennio 2022–2024 ha consentito di utilizzare le informazioni più recenti, complete e strutturate attualmente disponibili, rendendo possibile un confronto tra le diverse fasi del processo concorsuale, dalla fase di iscrizione fino all'eventuale abbandono entro il primo anno, offrendo una base empirica solida per comprendere le criticità dell'attrazione e della retention nel contesto regionale.

Il complessivo disegno della ricerca nel suo sviluppo prevede l'integrazione di approcci sia quantitativi che qualitativi.

Nella fase iniziale, l'analisi ha natura quantitativa e attinge prevalentemente al dataset della Regione Marche, relativo ai concorsi delle categorie C e D banditi nel triennio 2022–2024. Attraverso l'impiego di statistiche descrittive, il lavoro produce una prima fotografia del fenomeno, ricostruendo i livelli di iscrizione ai concorsi, le effettive partecipazioni alle prove e le

successive accettazioni dell'incarico. L'esame dei dati permette, inoltre, di osservare come si distribuiscano i candidati in base all'età, al titolo di studio e alla fascia generazionale, nonché di rilevare le proporzioni di abbandono entro il primo anno di servizio.

Una prima esplorazione dei pattern ricorrenti (es. maggiore rinuncia fra i più giovani), risulta utile a orientare le fasi successive, nelle quali si prevede di integrare i risultati prodotti nella prima fase attraverso la somministrazione di:

- interviste semi-strutturate a coloro che hanno lasciato l'incarico entro il primo anno;
- questionari esplorativi per rilevare percezioni di disallineamento, motivazioni alla candidatura e rappresentazioni del lavoro pubblico.

La natura qualitativa dell'indagine sarà essenziale per collegare i dati oggettivi di partecipazione/abbandono con i vissuti soggettivi dei giovani candidati.

Il disegno complessivo della ricerca include anche una analisi testuale (NLP, Natural Language Processing) dei testi dei bandi, volta a esaminare: il linguaggio utilizzato, i segnali valoriali esplicitati o impliciti, la presenza/assenza di elementi di public employer branding, la coerenza tra messaggi, valori e aspettative dei giovani.

L'obiettivo metodologico è costruire un quadro integrato che colleghi i dati oggettivi (partecipazione, turnover) con le dimensioni percettive (motivazioni, rappresentazioni del lavoro pubblico).

5. Raccolta e analisi dei dati

La raccolta e l'analisi dei dati si fondano sull'evidenza che il tema dell'attrattività dei concorsi pubblici e dell'abbandono precoce rappresenta una priorità concreta per la Regione Marche, sia sul piano organizzativo sia su quello strategico. Di conseguenza, il disegno di ricerca adotta un criterio logico-sequenziale che parte dall'analisi dei dati amministrativi per poi approfondire le cause sottostanti attraverso strumenti qualitativi.

In una prima fase, l'analisi quantitativa si concentra sui dati relativi ai concorsi banditi nel triennio 2022–2024, con l'obiettivo di ricostruire le diverse tappe del percorso dei candidati: iscrizione al concorso, partecipazione effettiva alle prove, assunzione o eventuale rinuncia all'assunzione, eventuale abbandono entro il primo anno di servizio. Questa sequenza analitica consente di individuare con precisione i punti di caduta del processo di attrazione, mettendo in evidenza dove e in quale misura si manifestino le principali criticità.

Per i concorsi più recenti, in particolare quelli banditi nel 2024, l'analisi dell'abbandono entro il primo anno non è ancora possibile, rendendo necessario un approccio temporale differenziato che tenga conto dello stato di avanzamento dei percorsi di assunzione.

I risultati quantitativi ottenuti costituiscono la base per la successiva fase, che sarà condotta utilizzando un approccio qualitativo. L'integrazione avverrà attraverso la realizzazione di interviste rivolte a due gruppi specifici di soggetti: i vincitori che non hanno accettato l'incarico e coloro che hanno lasciato il lavoro entro il primo anno dall'assunzione. Data la numerosità contenuta dei casi e la loro rilevanza per l'ente, l'obiettivo è intervistare l'intera popolazione dei soggetti individuabili, compatibilmente con la loro reperibilità.

La fase qualitativa è finalizzata a indagare in profondità le motivazioni che hanno indotto i candidati a rinunciare all'assunzione o ad abbandonare precocemente il lavoro, esplorando aspetti quali le aspettative maturate durante la fase concorsuale, la percezione dell'esperienza lavorativa iniziale, il contesto organizzativo e la coerenza tra valori individuali e valori percepiti dell'ente. In questo modo, l'integrazione tra dati quantitativi e qualitativi consentirà di collegare evidenze oggettive e vissuti soggettivi, rafforzando la comprensione delle dinamiche di attrattività e retention.

Per coerenza rispetto all'obiettivo di indagare l'attrattività della PA tra i giovani e i profili più qualificati, l'analisi ha selezionato solo i concorsi delle categorie C e D, in quanto: richiedono il possesso del diploma (C) o della laurea (D), livelli di istruzione maggiormente rappresentati

nelle fasce generazionali più giovani; presentano un tasso di partecipazione giovanile più elevato rispetto alle categorie A e B, storicamente popolate da profili meno istruiti e meno inclini al turnover e, inoltre, possono essere considerate categorie "strategiche" per comprendere il disallineamento tra aspettative e realtà lavorativa, poiché coinvolgono candidati altamente qualificati e potenzialmente attratti anche dal settore privato.

Il dataset regionale utilizzato contiene un insieme articolato di informazioni che permette di seguire l'intero percorso dei candidati: dai dati anagrafici e formativi (come età, genere e titolo di studio) alle diverse fasi del processo concorsuale, dall'iscrizione alle prove fino alla graduatoria finale e alla decisione di accettare o rifiutare l'incarico. A un anno dall'assunzione, il dataset restituisce inoltre il quadro aggiornato della situazione occupazionale dei vincitori, distinguendo tra chi è rimasto in servizio, chi ha rassegnato le dimissioni e chi non è mai stato effettivamente preso in servizio.

Queste informazioni consentono di analizzare in modo integrato il ciclo di ingresso nella PA regionale, mettendo in evidenza sia i fattori che possono ostacolare la partecipazione effettiva dopo l'iscrizione, sia le ragioni che inducono alcuni vincitori a non assumere l'incarico o ad abbandonarlo nei primi mesi. Attraverso la combinazione delle variabili sociodemografiche con gli esiti delle diverse fasi del processo concorsuale, sarà possibile ricostruire tendenze e comportamenti tipici delle varie generazioni, valutare in quale misura alcune categorie risultino maggiormente soggette a rinuncia o turnover e identificare pattern differenziati legati, ad esempio, al livello di competenze digitali o al titolo di studio. L'analisi dei tassi di conversione tra iscritti, partecipanti e assunti, così come delle dinamiche di abbandono entro il primo anno, permetterà infine di ottenere un quadro dettagliato delle criticità strutturali e dei punti di forza che caratterizzano l'ingresso nella PA.

6. Risultati attesi

In questa fase iniziale della ricerca, i risultati attesi riguardano principalmente l'identificazione delle tendenze relative alla partecipazione ai concorsi e ai fenomeni di rinuncia o abbandono precoce nel contesto della Regione Marche. Ci si attende, in particolare, di ricavare evidenze circa un'eventuale minore propensione delle fasce più giovani della popolazione a partecipare effettivamente alle prove e alla presa di servizio. L'analisi dei dati disponibili dovrebbe inoltre consentire di ricostruire tempi e modalità del turnover entro il primo anno, offrendo una prima base empirica per interpretare il possibile disallineamento tra le aspettative dei candidati e la realtà organizzativa sperimentata dopo l'ingresso in servizio.

Questi risultati preliminari costituiranno il punto di partenza per le successive fasi della ricerca nelle quali, grazie al ricorso ad analisi qualitative, sarà possibile indagare le motivazioni delle scelte dei candidati e dei neo-assunti, nonché evidenziare differenze generazionali nei valori lavorativi e nell'approccio al lavoro pubblico.

In una fase successiva sarà possibile replicare l'indagine presso altre Regioni e procedere con analisi comparative, al fine di verificare la sussistenza di criticità analoghe o, al contrario, di differenze significative legate a variabili quali dimensione dell'ente, collocazione territoriale o condizione di Regione a statuto ordinario o a statuto speciale.

Si ritiene che la ricerca possa offrire un contributo su più livelli:

- Sul piano teorico, potrà arricchire la letteratura su public sector attraction, integrando le prospettive di sostenibilità organizzativa e filoni studi sulla diffusione dell'AI nel settore pubblico regionale. Un ulteriore contributo teorico è individuabile nell' irrobustimento delle evidenze empiriche, ancora limitate nel contesto della Pubblica Amministrazione italiana.
- Sul piano operativo-manageriale**,** la ricerca potrà offrire indicazioni concrete alla Regione Marche, al fine di sviluppare azioni di miglioramento del processo di acquisizione e, più in generale, alle amministrazioni regionali che, nell'esercizio della propria autonomia organizzativa, possono intervenire su specifici ambiti critici: la revisione dei linguaggi e dei contenuti dei bandi

di concorso; la progettazione di percorsi di onboarding capaci di ridurre il disallineamento tra aspettative dei neoassunti e realtà organizzativa, lo sviluppo di strumenti di monitoraggio e dashboard predittive finalizzate a presidiare in modo proattivo il rischio di rinuncia o abbandono.

Parole chiave: Pubblica amministrazione; sostenibilità organizzativa; employer branding; giovani talenti; attrattività

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Addressing Gender Bias in AI Business Implementation: A Latent Dirichlet Allocation-Based Analysis

Francesca Valentina Giglio Moro[1], Carlo Drago[2]

1. Introduction

The present study aims to define the literature approach to gender bias through a bibliometric dataset regarding the evidence of the research results on this social and moral topic affecting society in different areas and levels (see Aria & Cuccurullo, 2017; Drago et al., 2023).

AI gender bias is part of gender studies. It confirms Paoloni and Demartini's (2016) two studies that underlined the role of women in organizations and the debate relating to women's ability to promote knowledge in organizations.

The research questions to be answered concern the existence of gender bias, the level of AI technology at which it is present, and its impact on the enterprise's tools and values.

For the first research question, Friedman and Nissenbaum (1996), in their analysis, have suggested the meaning of the bias term and consider bias as a "slant." This word is neutral without a negative or positive sense, and according to the authors, the quality of technology in use could be defined on social matters through the moral meaning associated with the term bias. In this connotation, bias identifies discrimination towards people or clusters of individuals as "systematical" and "unfair" according to unjustified criteria (Friedman & Nissenbaum, 1996).

According to Gross (2023), biases cover different areas: demographic, cultural, linguistic, temporal, confirmation-based, ideological, or political. Friedman and Nissenbaum (1996) have identified three kinds of bias: pre-existing, technical, and emerged bias.

In order to answer the second research question, the former stage consists of clarifying AI technologies since AI bias involves different types of bias and dimension – i.e., bias management (Bernagozzi et al., 2021).

The study conducted by Corea (2019) counts two categories of AI according to the author's AI Knowledge Map (AIKM):

- AI paradigms (X-axis);
- AI problem domains (Y-axis).

The first group of AI technologies includes six paradigms (O'Connor & Liu, 2024). Corea (2019) classifies these paradigms, including "logic-based tools, knowledge-based tools, probabilistic methods, machine learning, embodied intelligence, and search and optimization," under three primary approaches: symbolic, subsymbolic, and statistical.

The second group comprises: reasoning, knowledge, planning, communication, and perception.

According to the Corea (2019) maps, the AI technology types appear at the intersection of the points on the two axes.

Once the categories of AI technologies have been identified, the study aims to underline the existence of gender bias correlated to the "technologies in use," which indicates the influence of contextual factors between humans and technology (O'Connor & Liu, 2023).

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The subsisting relationship between AI algorithms and gender bias is a reflection of the biases present (i) in the training data and (ii) in the algorithms themselves (Gross, 2023).

Even though algorithms are considered more impartial in decision-making processes (Guitiérezz, 2021), according to an article by UN Women, the United Nations entity dedicated to gender equality and the empowerment of women (2024), AI replicates gender inequality in our society, and the evidence is present in the AI training data.

The Berkeley Hass Center for Equity, Gender, and Leadership's study analyzed the same results, which confirms the embedded bias in AI technologies due to human actions in terms of selection and collection of the data to insert in the datasets and the human decision-making process relating to the chosen datasets and rules to enter into the algorithm's learning path.

In addition, the AI teams in charge of developing and improving AI systems show a lower percentage of women presence (22 percent during 2021), and most of them work at low levels, according to Berkely's research.

The cited study discovered 44 percent gender bias by analyzing 133 AI applications in different industries.

The framework designed by O'Connor and Liu (2023) in their research on gender bias in AI systems has developed in two ways: the direction of gender bias—perpetuation and mitigation—and the AI data source—image and text.

Several studies show evidence of AI gender bias based on machine learning that involves text and image data source dimensions (Buolamwini & Gebru, 2018; Dastin, 2022) and, according to the AI Knowledge Map (Corea, 2019), regarding the statistical AI paradigms across the perception domain. In particular, the technologies identified are Natural Language Processing (NLP) and Computer Vision.

Analyzing NLP technologies, particularly machine translation (Corea, 2019), has shown the presence of gender bias.

Finally, for the third question, the study has analyzed the impact of AI gender bias applications in the organization's processes. Famous research from the Federal University of Rio Grande do Sul in Brazil (Prates et al., 2020) discovered gender bias using Google Translate. After the publication of this study, Google had to reveal the possibility of encountering gender bias and, in 2021, implemented the 'Translated Wikipedia Biographies' dataset (Stella, 2021) to quantify the distortions and reduce the bias by 67 percent.

Large Language Models (LLMs) are included in the generative AI as NLP technologies, "pre-trained and trained" on massive text data, and the learning process is "unsupervised or self-supervised" and is considered biased by default (Bender et al., 2021; Ferrara, 2023; Ray, 2023).

The UNESCO analysis (2024) on generative AI reports the existence of regressive gender stereotypes in LLM. Glosh and Caliskan (2023) show how ChatGPT reveals gender bias in assigning job positions and actions to a specific gender.

The studies in LLM technologies attest to gender discrimination in the hiring and education fields (Singh & Ramakrishnan, 2023) and recruiting processes (Dastin J., 2022); finally, Boulamwini and Gebru's (2018) study on computer vision technologies compared three facial recognition applications held by Microsoft, IBM, and Megvii. All three tools have shown gender bias, resulting in less accurate female recognition and an increase in error percentage for darker-skinned females.

2. Data and Methodology

The methodology used in this work is Latent Dirichlet Allocation (LDA), a topic modeling technique helpful in extracting relevant content from the bibliometric data in this literature (see also Drago and Giglio Moro, 2025; Drago, 2024).

In this way, we want to explore more where enterprises must develop resilience, analyze changes, and structure the correct strategies through a new approach (see also Cosentino and Paoloni, 2021).

We considered as Scopus query this one:

"gender discrimination" OR "gender-based discrimination" OR "sex discrimination" OR "gender prejudice" OR "gender bias" OR "sex bias" OR "gender-based bias" OR "sex-based bias" OR "gender inequality" OR "gender inequity" OR "gender-based inequality" OR "gender gap" OR "gender disparity" OR "gender imbalance" OR "algorithmic bias" AND "algorithmic hiring" OR "algorithm-based hiring" OR "AI hiring" OR "AI-driven hiring" OR "AI-based hiring" OR "AI-assisted hiring" OR "algorithmic recruitment" OR "algorithm-based recruitment" OR "AI-driven recruitment" OR "machine learning recruitment" OR "machine learning-based recruitment" OR "automated hiring" OR "automated recruitment" OR "data-driven hiring" OR data-driven AND recruitment.

We have considered just works that meet the criteria to be relevant for the study we are conducting (Odun et al., 2024). The query was performed the day 16/1/2025.

The classical pre-processing techniques was applied considering also different sensitivity checks to compare the different results using different pre-processing techniques (different stemming techniques). In this respect the different words were reduced to considering their specific root forms (stems) allowing for a simplification of the text and a reduction of the dimensionality (the result of the word cloud on word pre-processed in this way are in Figure 2).

3. Results

3.1. LDA analysis

In figure 1 we have found the different recurrent terms in the analysis. Considering a different type of stemming to improve the results.

hiring	algorithmic	bias	artificial	gender	recruitment	fairness	data	intelligence
30	29	28	24	22	21	20	19	17
human	study	performance	potential	process	paper	systems	digital	research
16	16	13	12	11	10	9	9	9
analysis	practices							
9	9							

Figure 1. Frequencies by term identified in the literature

In Figure 2 we can observe the relevant themes in the literature, and in particular we can observe that bias and gender are very relevant concepts which seems relevant and ubiquitous in literature as algorithmic bias, discrimination and fairness. The context is the recruitment bias and at the same time the different AI hiring practices which can be biased. Another relevant element is the importance of the ethics, governance and the regulation.

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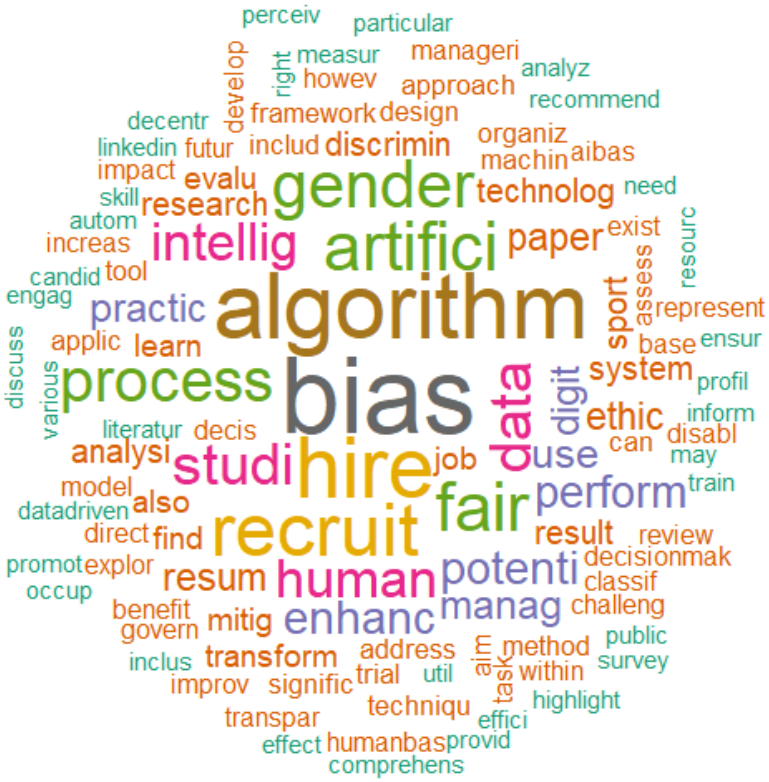


Figure 2. Word cloud depicting the different recurring terms in the literature identified

Then we have considered LDA analysis in which we extracted the top 10 terms for each topic LDA (Figure 3).

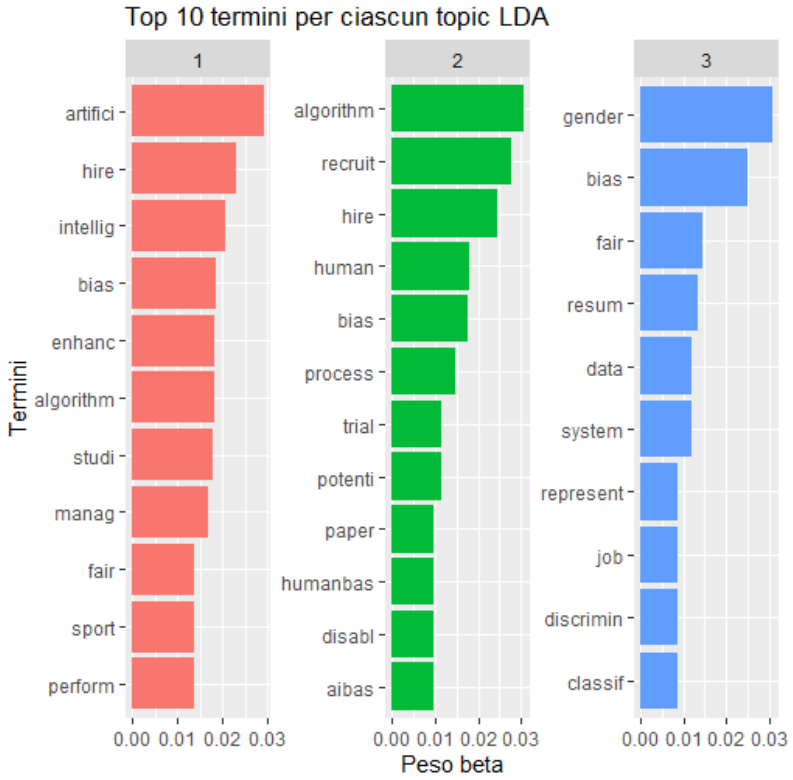


Figure 3. Top 10 terms for each topic LDA

In the first topic, it is possible to observe that the features terms like "artifici" (likely artificial), "hire", "intellig" (likely "intelligence"), "bias", "enhance" (likely "enhancement"), "algorithm", "studi" (likely "studies"), "manag" (likely "management"), "fair", and "perform". Overall these terms consider the theme in literature focusing the use of the artificial intelligence algorithms in the context of hiring.

In this way the different algorithms can have different results, performances and also be more or less "efficient" in the hiring process. On the other side the relevant problem is the "bias" and "fair" which show how in literature there is a relevant attention toward not only the advantages of the use of ai but also on the risks associated on hiring. The second topic contains terms including "algorithm," "recruit," "hire," "human," "bias," "process," "trial," "potenti" (likely "potential"), "paper," "humanbas" (likely "human-based"), and "disabil" (likely "disability").The mention in the terms of "humanbas", but also "disabil" implicate that as topic centers the comparison and also the integration betwenn human and AI in recruitment. In this way the comparison and the analysis is now on human biases versus the algorithmic biases. AI, in this respect, can have a positive or a negative result on the traditional human-based recruitment processes, analyzing more in detail the "fairness" for candidates with disabilities.

The third topic emphasizes terms like "gender," "bias," "fair," "resum" (likely "resume"), "data," "system," "represent," "job," "discrimin" (likely "discrimination"), and "classif" (likely "classification"). This topic address in this way critical issue related gender bias discrimination in AI recruitment. In this respect the word "resum" it is very important: the literature in this way suggests a relevant focus on how the resume-screeing algorithm can reflect and assume biases which are present in historical data. Term like "represent", "system" but also "classif" can indicate a relevant in literature around fairness in representation of the woman, thedata-driven algorithmic discrimination, but also ethical concerns regarding automated classification systems in job

candidate evaluations. In this sense, it is important to consider a relevant trend in literature on how mitigate and deeply understand the biases with aim to promote an equitable recruitment.

3.2. Business Impact

The results observed in paragraph 3.1 are the core data in order to proceed with a deeper analysis in the business implications due to the exploit of the AI and the management of the gender bias.

The starting point is linked to the strategic level in the companies which decide to adopt AI technologies.

The introducing of AI is a top management decision due to a time reducing, cost saving and more profitability could have different spillovers in the business functions and processes.

The Human Resources (HR) department though the AI tools is able to defy new processes related to the following areas:

- Hiring
- Employees evaluations
- Employees training

In recruitment practices has been underlined, in several studies, the presence of the gender bias (Andrews, & Bucher 2022; Drago et al. 2025), for instance, in the CV screenings, in the assignment of scores to the universities attended by women candidates and to pre-hire tests made by NLP systems (Albaroudi et al., 2024).

For the employee's evaluations, the AI tools, according to Koskinen and Sandberg (2017), provide gender based performance and wage disparities. In addition, for the employees training, the use of AI, can reduce the gender bias through the adoption of clear and objective criteria or could expand it (Albaroudi et al., 2024).

The HR department has a crucial role in the gender bis mitigation with the aim to reduce the employment gap between men and women that, according to the European Institute for Gender Equality Report on the Gender Equality Index 2024, has an estimate economic cost of Eur 370 billion per year.

The middle management in different departments, with the diffusion of generative AI in tools in the organizations have to control and manage the algorithms and the data adopted in the business solutions in order to avoid the gender bias, in addition, have to monitor the availability of the new technologies for the women who don't belong to the IT functions.

The last and major fundamental implications of the AI adoption correlated to the gender bias issue is the change and the improve of the business culture and value.

The ethic and values systems in the organizations are the basic aspects who can reflect all the company's business and beliefs.The crucial role of the gender bias mitigation is the ground of a innovative business with a powerful competitive advantage in order to attract the better employees, clients and suppliers reducing the internal and external conflicts.

4. Conclusions

This work aims to show the analysis in order to evidence the existence of the AI gender bias and his diffusion not only in visual systems but, in addition, in LLM technologies including generative AI.

The objective of this study is to underline how challenging is the path in order to obtain more equality systems. This difficult way is signed by a cultural changing and a major control on the data enclosed in the algorithms. In the Results paragraph of LDA analysis the word "algorithm" is present into the two first topic and linked into the third. As suggest by Cowgill & Tucker (2020), the biased algorithms are divided in two categories each one based on different causes:

Biased algorithmic predictions:

- Unrepresentative training samples: the algorithms could be manipulated by the creators by a statistical discriminations using base assumptions unrepresentative of the environment in which the data are included;
- Mislabeling outcomes in training Sample: the biased evaluation could be produced by humans beliefs and statistical reasons;
- Biased programmers: software engineers are more white, male with high education and salary according to the Bureau of Labor Statistics in 2018 and their approach could be translated into the algorithms, in fact, the biases in the translation tools against women and racial minorities are present in a lot of applications;
- Algorithmic feedback loops: the data can be biased by the feedback loop and the use of algorithmic labels affects the future datasets.

Biased algorithmic objectives:

- Race and gender specific thresholds: the question is linked to the technology fairness and the demographic data that can raise the diversity;
- Spillovers: where appear urgent to create a gender targeting to avoid the discrimination;
- Explore and exploit: it is relevant to create rules that manage the exploring of new and long term exploitation.
- Increasing value or lower costs: the use of algorithms can reduce the price and, contemporary, increase the surplus in transactions. For instance, in candidate selection the use of AI can generate inequality when the firms have not selected their preferences and have distinguishes the adoption of AI for the different candidates.

The existence of gender bias in AI is supported by several studies and in the literature are presents articles who show the impact and the breadth of this issue. Typically, this discrimination is associated with the "men fields" that include job, hobby, competence and so on.

This is the result of the cultural feelings and beliefs but the introducing of the ethical aspects in AI could mitigate the gender bias through the identification of the discriminations in the algorithms, in the choices made by the software engineers in order to naturalize and equalize or soften the biases (O'Connor & Liu, 2024).

Keywords: Artificial Intelligence; biases; AI bias; Latent Dirichlet Allocation (LDA); topic modeling

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Beyond the Concert Hall: Spatial Deconstruction as a Mechanism for Cultural Engagement

Benedetta Lui[1], Chiara Paolino[2]

1. Introduction

This chapter explores the role of space deconstruction as a mechanism for democratizing access to culture, fostering collaboration and exchange between stakeholders and communities and opening new meanings and significance in co-designing and participate cultural experiences.

Building on literature rooted in organizational spaces (Lefebvre; 1991) and stakeholder management (Mainardes et al., 2012; Snis et al., 2021), the research investigates how classical music is redefined when performed outside traditional, institutionalized venues and relocated into unconventional spaces such as public parks, libraries, or peripheral neighborhoods. In doing so, this study highlights how space deconstruction activates processes of participation enhancement, cultural legitimacy reframing, and collaboration building, ultimately shaping a new mechanism of space re-signification for all the actors involved. This study draws on theories of organizational space, such as the practices of appropriation, reappropriation, and dis-appropriation as central to how individuals and groups continuously produce and transform space (Beyes & Holt, 2020; Cnossen & Bencherki, 2019). Especially it focuses on spaces as a place of experience, where meanings and practices' renegotiation can occur (Beyes, 2009; Ratner, 2020)

Extant research in this field has highlighted how new ways to activate spaces might produce new discourses, practices, both subverting and consolidating existing logics and assumptions (Aliberti & Paolino, 2024). However, the processes through which, from space deconstruction, space re-signification can occur and make space itself available to new patterns of action and experience have not yet been investigated. This is particularly true, when spaces are the place of experience of multi-stakeholders and multi-faceted issues (Kuismin et al., 2024) : diverse interests and practices animating such spaces can compete or overlap to defined unexpected ways through which space can be renewed and can renew shared meanings (Cnossen & Stephenson, 2022).

The empirical context of this study is an Italian music organization, anonymized as the "Orchestra" devoted to the democratic and open dissemination of high-quality classical music, and its ecosystem of stakeholders. Data were collected through 22 in-depth interviews with audience members, partners, and organizational staff, field observations, research notes and archival data.

This setting is particularly suitable and meaningful for the research purpose, since cultural organizations must negotiate competing and overlapping expectations when redefining their spaces: cultural spaces are places of aesthetic, artistic, economic, educational, political and social interests (De Molli et al., 2020), where artistic intervention have the potential to illustrate unexplored patterns of interaction and work among its stakeholders (Michels & Steyaert, 2017; Holm & Beyes, 2022).

The findings highlight how the deconstruction of traditional concert spaces generate new mechanisms through which the space of cultural production is re-signified and re-enacted. This re-signification illustrates in the findings how the space for classical music production can be

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renamed, relabeled, and re-reexperienced as a space to break away from traditions, to build unity, to conceive the periphery as central in music production and dissemination. Furthermore, the findings shed light on the mechanisms that shape this opportunity to generate and attribute to meanings to a space, illustrating how stakeholders enact new practices of identity negotiation, of collaboration enlargement, of enhancement of music accessibility for all. By staging performances in unconventional venues, the Orchestra, its audience, partners and stakeholders engage in a form of work, where spaces are strategically deconstructed and reassembled to challenge established field structures, foster new audiences, and reshape the cultural field itself.

This study contributes to extant research by illustrating a process model explaining how space re-signification occurs and it is tied to space deconstruction. In such a way, extant knowledge is advanced by clarifying what kind of meaning making processes characterize re-signification (Balogun et al., 2015; Bartunek & Balogun, 2022). In addition, the processes through which stakeholders, with diverse interests and backgrounds converge on re-signification are identified, contribute to illustrate the activities multi-party individuals engage in, when a complex issue of meaning negotiation is at stake. Finally, this study contributes by pinpointing how diverse stakeholders create spaces of encounter where extant logics meet new perspectives, generating collaborative opportunities.

From a management and policy standpoint, implications can be drawn about how space deconstruction broadens access, dismantling the perception of classical cultural genres as an elitist practice and reconfiguring its cultural boundaries. Second, it fosters stronger community belonging by embedding performances in familiar and everyday territories, where repeated interactions strengthen ties between the institution and local residents. By situating music in accessible contexts, outside established concert halls but within lived urban landscapes, the Orchestra create new spaces for dialogue, allowing heterogeneous actors to align around shared cultural experiences.

Deconstructing traditional cultural spaces enables organizations to renegotiate legitimacy, expand participation, and act as mediators between institutional traditions and community needs. In this sense, space becomes both a medium and an outcome of stakeholder engagement: it is appropriated, reappropriated, and transformed through cultural practice, producing new forms of inclusion and collaborative governance.

2. Theoretical background

2.1. Organizational Spatiality in Cultural Contexts

Organizational spaces are defined as "the actual places organizations occupy, such as buildings, office spaces, and factory floors, which represent and embody organizations in the eyes of their stakeholders, be they external (e.g., shareholders or customers) or internal (e.g., employees)" (De Vaujany & Vaast, 2014).

In organization studies, space has progressively moved from being conceived as a static container of activities to being understood as a dynamic and constitutive element of organizing. Earlier managerial and architectural approaches treated space as a neutral backdrop, an objective arrangement of offices, stages, or venues.

The "spatial turn" in the social sciences has challenged this view, showing that space is continuously produced through social practices, power relations, and symbolic interpretations (Lefebvre, 1991; Taylor & Spicer, 2007; Dale & Burrell, 2008).

In this sense, space is something organizations do, not merely something they occupy.

Henri Lefebvre's (1991) triad of spatial practice, representations of space, and spaces of representation remains a foundational analytical lens. It highlights the interplay between how space is physically arranged, conceptually imagined by planners and managers, and emotionally lived by individuals. Within organizations, this triad reveals tensions between designed and experienced space, where everyday appropriation can transform official spatial orders.

Subsequent studies (e.g., de Vaujany et al., 2019) emphasize the performative and political nature of such transformations: spatial configurations materialize hierarchies, enable or restrict participation, and influence how legitimacy is enacted.

From a processual perspective, organizational space is relational, emergent, and contested (Feddersen et al., 2023). It connects people, artefacts, and meanings and is continuously re-made through movement and interactions: a "performative assemblage of subjects, objects, affects, discourses and practices" (Kuismin et al., 2024).

Decisions about where and how to locate activities are thus never neutral but convey ideological and cultural orientations.

Institutional logics become embodied in spatial arrangements, at the conceived, perceived, and lived layers of space, constituting what Preminger and Drori (2017) call spatialized logics.

Through this lens, space is not only a material dimension but also a symbolic and discursive one that shapes how institutional orders are enacted.

Within this framework, unstructured or deconstructed spaces represent a particular form of organizational spatiality that intentionally departs from institutionalized arrangements. Such spaces emerge when organizations relocate their activities beyond formal venues, transforming spatial conventions into arenas for experimentation, inclusion, and relational engagement (Beyes & Holt, 2020). They can be understood as deinstitutionalized organizational spaces, where the absence of formal architecture allows new forms of interaction and meaning making to arise (Bartunek & Balogun, 2022; Cnossen & Stephenson, 2022).

Spatial deconstruction thus becomes a form of "institutional work" which enables field transformation and emergence (Lawrence & Suddaby, 2011; Aliberti & Paolino, 2024): organizations manipulate spatial configurations to challenge established field logics and reconfigure legitimacy. By moving artistic and cultural practices away from "authorized" sites of performance, they open up alternative spaces that mediate between institutional and community domains, fostering new modes of participation and stakeholder engagement (de Vaujany et al., 2019).

In cultural institutions, these dynamics become particularly salient. Concert halls, museums, and theaters are spatial embodiments of cultural legitimacy, often reinforcing boundaries between artists and audiences. When such institutions relocate artistic practices into public or unconventional venues, they engage in a deliberate reframing of organizational space.

Spatial experimentation becomes both a symbolic and practical strategy to democratize access, foster community engagement, and renegotiate the organization's role within the cultural field. Understanding space as an active organizational construct thus provides a crucial lens for analyzing stakeholder engagement in contemporary cultural management.

2.2. Stakeholder engagement in cultural organizations

Stakeholder engagement has become a central concept in the study of cultural and creative organizations, reflecting a broader shift from top-down cultural production to participatory and relational models of value creation (Elsorady, 2018; Bashir & Sawhney, 2021; Snis et al., 2021 Moving beyond instrumental or managerial interpretations, engagement is increasingly conceived as a relational and participatory practice through which diverse actors - artists, audiences, partners, and local institutions- co-construct cultural meaning and organizational identity (Freeman, 2010; Giorgino, 2016). In the cultural field, engagement thus extends beyond transactional exchanges to include affective, symbolic, and spatial dimensions of participation, rooted in reciprocity and dialogue.

Following the contribution of Bonet and Donato (2011), the 2008 financial crisis revealed the limitations of hierarchical governance models and underscored the need for participatory and transparent decision-making processes. Engaging heterogeneous stakeholders becomes a strategic and ethical imperative, fostering institutional resilience and social relevance. Empirical studies

have further shown that participatory arts and heritage projects operate as arenas of co-creation, where community members move from passive consumers to active contributors (Carey & Sutton, 2004; Aas et al., 2005).

Recent work situates these dynamics within the spatial turn of organizational studies: engagement unfolds through spatial and relational practices that enable interaction and shared authorship (de Molli & Vecco, 2021). Festivals, open performances, and community events act as spaces, where artistic, aesthetic, social, and institutional logics converge (Lampel & Meyer, 2008; De Molli et al., 2020; Chang, 2020). In this sense, stakeholder engagement is not a procedural or managerial task, but a generative process through which cultural organizations negotiate legitimacy, foster inclusion, and co-create value. By establishing temporary arenas, such as festivals, open performances, and community events, these organizations enable heterogeneous actors to interact and collaboratively redefine what counts as legitimate cultural participation. Engagement thus unfolds as a spatial and relational practice that binds artistic creation to social dialogue and institutional transformation.

Building on these premises, this study brings together two complementary streams of literature: the spatial turn in organizational studies and the relational turn in stakeholder theory. While the former highlights how space constitutes a dynamic and contested element of organizing, the latter emphasizes the co-production of value and legitimacy through participatory and dialogic practices. Yet, research has rarely examined how spatial configurations themselves function as mechanisms of stakeholder engagement, particularly within the cultural field.

In this study, space is not treated as a neutral backdrop for participation but as an active organizational medium through which relationships are shaped, meanings negotiated, and boundaries redefined. By focusing on the deconstruction of traditional cultural venues and the relocation of artistic practices into unconventional spaces, the paper explores how spatial reconfiguration enables organizations to foster inclusion, renegotiate legitimacy, and mediate among heterogeneous stakeholders. In doing so, it seeks to illuminate the generative interplay between space, participation, and institutional transformation in contemporary cultural organizations.

3. Methodology

3.1. Research context

The empirical setting of the present study is an Italian innovative music organization, (anonymized by the authors as the 'Orchestra') founded in 2018 as a project-based, flexible orchestra, recognized as an "instrumental ensemble" by the Italian Ministry of Culture's General Direction of Performing Arts, with the mission of spreading the value of music by fostering artistic innovation and intergenerational collaboration, pursuing a non-traditional way of making music.

This setting was selected due to its peculiar organizational model, mission and structure: the formation of the ensemble is newly composed each time to fit the characteristics of the project, depending on the specialization of the musicians as related to the specific format and program of the event. To achieve the highest artistic excellence, the Artistic Director of the Orchestra chooses the suitable musicians for the occasion from a rich and diversified set of professionals, which brings together established first-chair musicians, active in the most relevant Italian and international orchestras, alongside excellent emerging talents. Mixing different levels of expertise, backgrounds and specializations, this organization represents a flexible, innovative and creative context for expert musicians to play in, as well as a prestigious stage, rich of opportunities, for young professionals. In addition, the Orchestra holds a strong territorial presence thanks to repeated participations in many relevant festivals and projects around Italy.

Besides its artistic excellence, this music organization was selected as a remarkable empirical setting to shed light on the topics of space deconstruction as a mechanism for leveraging

stakeholder engagement due to its strong social outreach dimension. Indeed, the Orchestra pursues an innovative approach with the public, who is meaningfully engaged in every activity of the orchestra. Prioritizing an open and democratic dialogue with audiences, the Orchestra organizes programs specifically dedicated to the active involvement of diverse publics and communities, playing in the public parks and libraries, especially in the cities' neighborhoods and in the peripheral and liminal metropolitan areas.

It is precisely in the context of the 2025 edition of the Orchestra Summer Festival that the data for this study was collected. Yearly since 2021, the Festival is set in non-conventional venues, usually public spaces, each year in a different district of an Italian city with the aim of reaching each time a new community, of activating various and less-centered areas of the city, and of engaging multiple stakeholders. In its conception, organization, planning, and implementation, the Summer Festival involves other music and cultural organizations of the territory, creating a strong and capillary connection with the district's community.

The festival lasts for a few days, when the Orchestra spreads the beauty of music through concerts, open rehearsals, readings, and lectures, inhabiting the spaces of the neighborhoods with the belief that music and culture in general have the power to make them centers of participation and social enrichment. By transforming everyday places in unusual stages, the Summer Festival strives for bringing people of all ages closer to classical music, meant as a driver of social cohesion and development. The festival was organized thanks to a wide network of partners: public, private, and non-profit entities that inhabit the district daily or that bring a specific and enriching contribution on its cultural proposal.

About the Festival, The Orchestra's President, said: "Now in its fifth year, the project has become a well-established initiative for our city, and citizens have embraced our mission: bringing musical culture in all its forms to the public, as both a tool for knowledge and a source of enjoyment. The success of previous editions, together with the enthusiasm of our local partners, encourages us to do even more in the future."

3.2. Data collection

The qualitative research conducted for the present study was performed through a four-source data collection, including semi-structured interviews, field observations, and archival data, and related research notes. Interviews were transcribed accounting for 120 pages. During and after field observation, meeting and informal discussions, two of the authors took research notes (accounting for 8 pages), 15 pictures and 8 videos.

Semi-structured interviews: After defining the research goals of the study, an interview protocol was developed to build the semi-structured interviews to be conducted during the Orchestra's Summer Festival. When considering the process to build the protocol, a predetermined set of open-ended questions was defined, to allow new queries to emerge from the natural dialogue between the interviewer and the interviewee (DiCicco-Bloom & Crabtree, 2006).

The interview protocol was composed by six open-ended questions revolving around the following topics: clarifying the identity and the relationship that each interviewee had with the Orchestra; exploring the cultural significance - the set of historical, social, aesthetic, and symbolic values that make a place or practice meaningful for individuals and communities (Smith, 2006; Jouan & Hallot, 2024) - to understand how different actors perceive the music organization's role, identity, and social value; investigating the perception of inclusion within the cultural proposals of the festival; inquiring about how the unconventional space was impacting the interviewees' cultural experience while listening to the concerts; clarifying the boundaries between the communities involved, the Orchestra and its stakeholders (the business partners and the local institutions).

This approach was adopted to facilitating the induction of lived experiences and subjective meanings through a flexible, yet focused structure. 22 interviews with members of the audience,

the Orchestra's staff and Board and its stakeholders were collected, both in person and online, between June and August 2025, during the concerts of the festival and during a visit to the Orchestra's headquarters. Table 1 illustrates the features of the interviewee in terms of functions, gender, and their role for the festival.

ID	Function	Gender	Role
Audience			
1	Audience #1	M	Actor and employee of a theatre
2	Audience #2	F	Student of a Master course promoted by one of The Orchestra's partners
3	Audience #3	M	Student of a Master course promoted by one of The Orchestra's partners
4	Audience #4	M	Music amateur, friends with one of The Orchestra's musicians
5	Audience #5	M	Music amateur
6	Audience #6	F	Music amateur
Partners			
7	Business partner #1	M	Content Director for a business partner
8	Cultural administrator	M	President of the Cultural Commission of a partner (territorial public body)
9	Business partner #2	M	CEO, Artistic and Technical Director of a business partner
10	Business partner #3	F	PR manager, employee of one of The Orchestra's partners
11	Business partner #4	F	Communication specialist and employee of a firm that collaborates with The Orchestra
The Orchestra's staff			
12	Staff #1	M	Founder and president
13	Staff #2	M	Artistic director
14	Staff#3	F	Head of production
15	Staff #4	F	Head of organization
16	Staff#5	F	Junior production assistant
17	Staff#6	F	Head of media and communication
18	Staff#7	F	The Orchestra's musician (soprano)
19	Staff#8	M	The Orchestra's musician (pianist)
20	Staff#9	M	The Orchestra's musician (cellist)
21	Staff#10	M	The Orchestra's musician (cellist)

22	Staff#11	F	The Orchestra's musician (cellist)

Table 1. Dataset of the interviewees

Field observations: the dataset of the study included repeated field observations carried out by the first author at the Festival venues and Orchestra headquarters. When at the festival, the author arrived one hour before each concert, stayed during the concert, and another hour after that while the staff was dismantling the setting for the concert, allowing the "unconventional space" created for the performance to return to its "everyday appearance". Interactions and discourses among individuals, spaces and humans, spaces and artistic performance and performers, were at the center of the observation, together with features of the spaces themselves and all the processes surrounding them. Field observation was also carried out, while visiting the offices of the Orchestra's staff. Overall, field observation amounts to 15 hours. The Orchestra staff were aware of the presence of the author on the site of a concert, while other actors could have interacted with them by chance (i.e., sporadic meetings with passengers at the venue). If interviews were carried out on the site of the concert, the interviewee was always made aware of the research goal, process, responsibility, and all the steps for guaranteeing anonymity, confidentiality and opportunity to withdraw were granted, as for all the other interviews.

Archival data: the overall dataset was corroborated through the collection of archival data, including online and print national and international articles, magazines, social media content (posts and stories), and audiovisual materials.

Research notes: research notes were taken (and eventually transcribed) by one of the authors during field observations, specifically on three concerts in summer 2025, where notes were taken before, during and after the concerts; notes were also taken after each interview the sample described above.

3.3. Data analysis

The data collected from all sources, interviews, field observations, archival data, and notes, were treated as a single, integrated dataset. To investigate the process through which the redefinition of space, labelled by the authors 're-signification of space', unfolds, a qualitative analysis was conducted by adopting the Gioia methodology (Gioia et al., 2013), using a bottom-up, inductive and interpretative approach that allowed process theorizing (Yanow & Schwartz-Shea, 2014; Rouse et al., 2025).

This structured data-to-theory approach allows researchers to remain grounded in participants' voices while progressively building conceptual frameworks that are both empirically faithful and theoretically robust, according to the authors of this specific coding process, engaging in a continuous exchange between the themes and the guiding theories, so as to arrive at more abstract concepts and their relationships (Langley et al., 2013). In the present study, the analytical focus was intentionally focused on data exemplars, that were represented by quotes from the interviews, without additional elaboration. This choice allowed to preserve proximity to participants' voices, while still engaging in a structured abstraction process represented by first and second-order themes. This approach was chosen because it captures the experiences, subjectivities, and meanings of the actors involved, while also enabling the identification of broader theoretical patterns in the process of space re-signification.

The analysis followed three iterative steps, where the different sub-dimensions of the codes and the codes themselves unveiled progressively.

First step: in the initial phase of the analysis, an open coding of all the interviews' transcripts, field notes from the researchers, and archival materials , was conducted, remaining close to the participants' words and meanings. At this stage, field observations were particularly helpful in clarifying roles, feelings of inclusion, and the expectations of the various actors involved. This

phase allowed the researchers to clarify and cluster the recurrent themes emerging from the interviews (Braun & Clarke, 2012), producing a large number of first-order codes, which were mapped into different areas according to the questions of the interview protocols.

Second step: the second stage focused on identifying second-order themes, the three mechanisms emerging from the grouping of the first-order codes: 'negotiating identity', 'broadening access' and 'building collaboration'. At this stage, to classify the codes from smaller data units, interviews were attentively matched with research notes and archival data from the music concerts, to ensure a consistent interpretation of the findings.

Third step: the final stage involved moving from descriptive coding to theoretical abstraction, through the investigation of the relationship between the mechanisms emerged in in relation to the research question of the study. The iterative analytical process sought to reach a level of theoretical integration where the relationships among key mechanisms activated could be clearly articulated and visually mapped. The three mechanisms were further integrated into a process model (Rouse et al., 2025) illustrating how spatial deconstruction operates as a trigger for the re-signification of space that represents the interpretive outcome of the process (see Figure 1).

To enhance the robustness of the findings, methodological triangulation was adopted (Denzin, 2012), integrating evidence from interviews, providing individual perspectives and personal narratives; from field observations, offering insights into behaviors, interactions, and atmospheres during the Festival and within The Orchestra's headquarters; from archival data, supplying contextual information on The Orchestra's positioning and audience engagement strategies. This multi-source approach enabled a comprehensive understanding of how spatial practices, organizational processes, and stakeholder interactions converge in giving new meanings to a cultural space which is unconventional and de-structured.

4. Findings

This research investigates how the deconstruction of space operates as a mechanism for fostering stakeholder engagement through the experimentation and re-signification of spatial meanings. The findings reveal that spatial re-signification, that is, the process through which a venue is endowed with new meanings and identities, is triggered by the deconstruction of space, giving rise to three interrelated mechanisms: negotiating identity, broadening access, and building collaboration (Figure 1).



Figure 1. The process of space re-signification

Through spatial re-signification, the organization bridges diverse interests and needs, creating shared arenas where artistic, social, and institutional purposes converge to generate cultural value.

The following sections unpack this process by analyzing each of the three mechanisms in turn: first, identity negotiation; second, broadening access; and third, building collaboration.

4.1. Negotiating identity

Spatial deconstruction functions as a trigger that unleashes the first mechanism in the process: Orchestra's identity negotiation.

By organizing and participating in concerts, talks, and immersive experiences held in unconventional spaces, the various stakeholders engage in a continuous process of renegotiating the Orchestra's identity and its cultural positioning. Rather than imposing cultural offerings from above, this process is characterized by dialogue, reciprocity, and co-creation, through which diverse actors collectively shape the meanings, purposes, and values of the organization. In this sense, spatial deconstruction enables a negotiation of identity from a fixed attribute into an evolving and relational construct.

The sub-mechanism through which this negotiation unfolds, activated by spatial deconstruction, are summarized in Table 2.

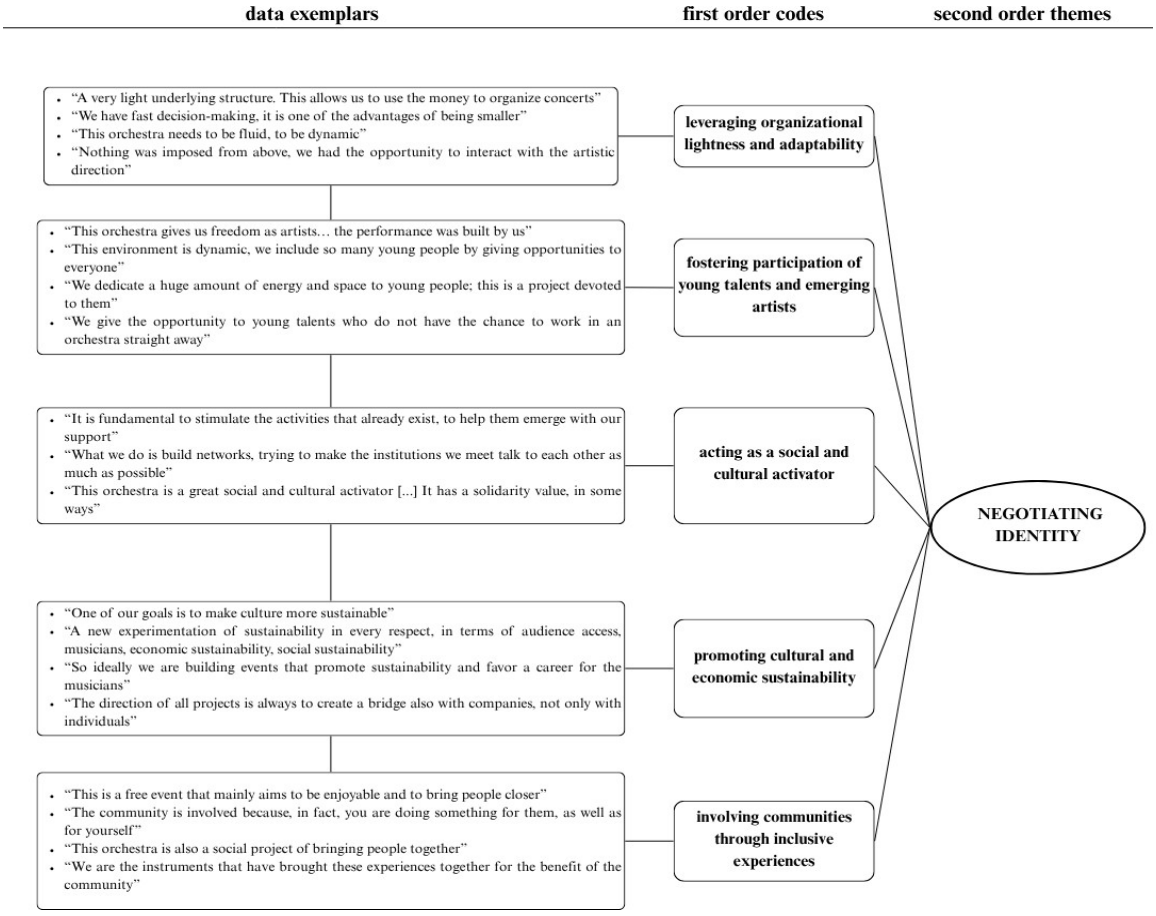


Table 2. Negotiating identity

The organization operates through a lean and adaptive structure, which allows rapid decision-making, creativity, and shared participation among members. This openness fosters collaboration, reflexivity, and responsiveness to contextual needs: We have fast decision-making; it is one of the advantages of being smaller. (Staff #3)

Such participatory dynamics extend to artistic and strategic decisions, which are discussed collaboratively among team members, musicians, and external stakeholders. Rather than following a top-down model, programming and artistic direction emerge through processes of dialogue and co-creation: Nothing was imposed from above; we had the opportunity to interact with the artistic direction. (Staff #8)

Identity negotiation is also enacted through support for emerging musicians, whose integration into professional contexts reinforces the organization's role as an enabler of talent and cultural renewal. By connecting young performers with established artists, mentoring relationships are created that expand both artistic and social capital: We dedicate a huge amount of energy and space to young people; this is a project devoted to them. (Staff #2)

At the same time, the organization acts as a social and cultural activator, fostering inclusive cultural experiences that combine artistic excellence with social awareness: This orchestra is a great social and cultural activator [...] It has a solidarity value, in some ways. (Staff #7)

This mediating role is sustained by a flexible and network-oriented model that encourages collaboration among institutions, partners, and community actors. Initiatives are designed to facilitate dialogue, strengthen territorial networks, and promote shared responsibility for cultural creation: What we do is build networks, trying to make the institutions we meet talk to each other as much as possible. (Staff #4)

Finally, this process of identity negotiation is closely tied to the sustainability of cultural engagement. By avoiding the fixed costs of traditional venues, resources are reallocated to increase accessibility and inclusion, while fostering emotional and social connections with communities. This is a peculiar and unusual identity trait of the music organization, affecting with this feature also its partners, musicians, members of the audience and communities.

A new experimentation of sustainability in every respect, in terms of audience access, musicians, economic sustainability, social sustainability. (Staff #8)

The community is involved because, in fact, you are doing something for them, as well as for yourself. (Staff #6)

Through these intertwined practices, spatial deconstruction enables a continuous redefinition of the Orchestra's identity, organizational, cultural, and social, anchored in openness, collaboration, and relational engagement.

4.2. Broadening access

Spatial deconstruction triggers a second mechanism in the process of re-signifying space: broadening access. As summarized in Table 3, the coding identifies a set of interrelated practices and expectations through which stakeholders experience and enact increased access when concerts are moved outside conventional venues. When those events unfold in unconventional and everyday spaces, they challenge existing hierarchies of participation and open new pathways for inclusion.

By expanding the spatial and symbolic boundaries of cultural experiences, stakeholders collectively contribute to making artistic practices more accessible, participatory, and socially embedded.

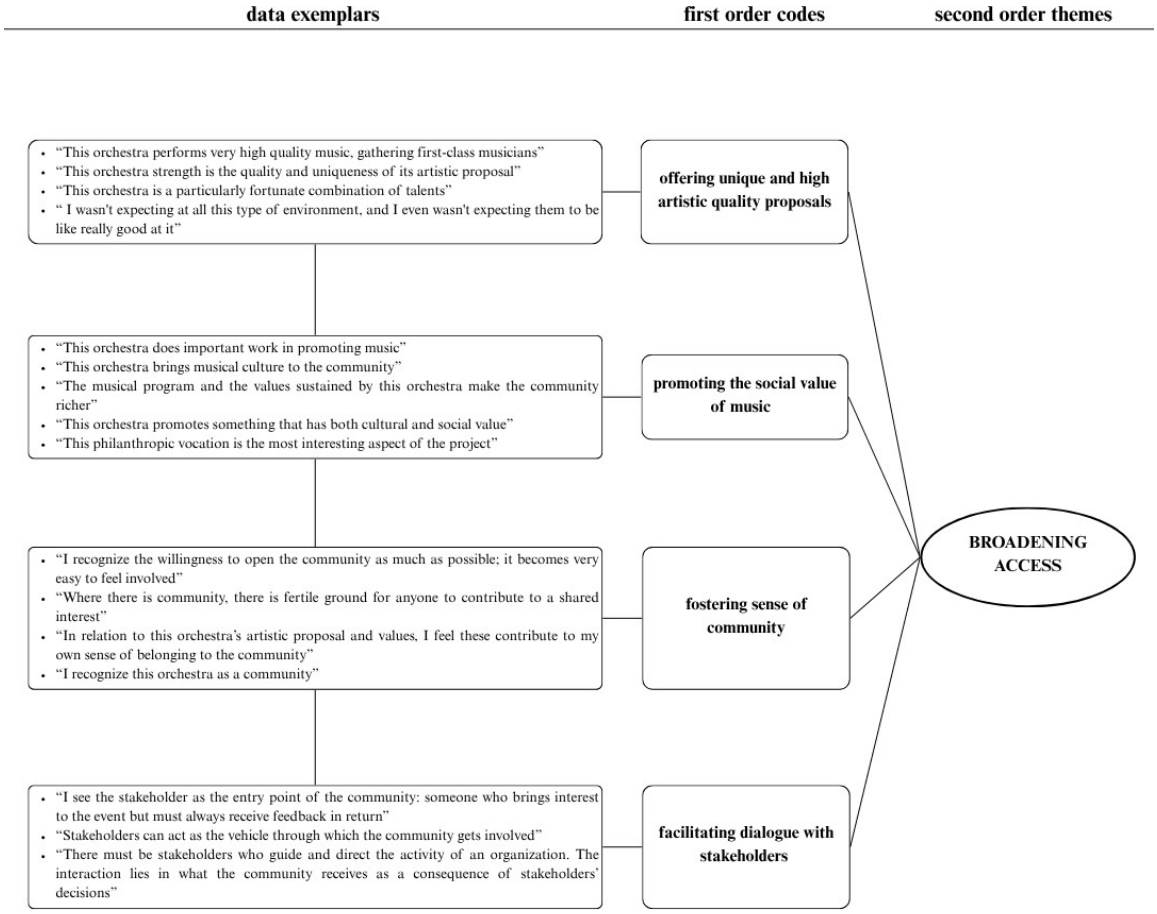


Table 3. Broadening access

This mechanism captures how the relocation of cultural practices into non-traditional spaces transforms both the nature of participation and the relationships among actors. Spaces that depart from institutionalized ones, invite new audiences, partners, and community members to take part in meaning-making, creating shared arenas for dialogue, experimentation, and co-creation of high-quality cultural proposals.

The Orchestra's strength is the quality of its artistic proposal. (Audience #2)

High artistic quality remains a central driver of engagement: participants recognize that excellence and accessibility can be mutually reinforcing. At the same time, reconfiguring spatial boundaries allow culture to move closer to communities.

This orchestra's strength is the uniqueness of its proposal. (Audience #4)

The Orchestra brings musical culture to the community. (Audience #6)

Broadening access also entails social value and community empowerment. Events in familiar places are perceived as catalysts for local enrichment:

The Orchestra promotes something that has both cultural and social value. (Audience #1) The musical program and the values sustained by The Orchestra, in my opinion,

make the community richer. (Audience #5)

Access thus extends beyond physical or economic inclusion to encompass participatory engagement: stakeholders co-design programs, influence cultural directions, and develop a sense of belonging.

In relation to The Orchestra's artistic proposal and values, I feel these contribute to my own sense of belonging to the community. (Audience #3)

Finally, spatial deconstruction facilitates relational access via partnerships: institutions, businesses, and community groups act as mediating channels that connect diverse publics and sustain participation, democratizing roles and distributing agency.

Stakeholders can act as the vehicle through which the community gets involved. (Audience #4)

4.3. Building collaboration

Spatial deconstruction also activates a mechanism of building collaboration, through which relationships among the music organization, its partners, and communities are reshaped.

As summarized in Table 4, the findings show how the reconfiguration of space generates new opportunities for interaction, fostering trust, dialogue and cross-boundary engagement in cultural activities among the diverse actors involved.

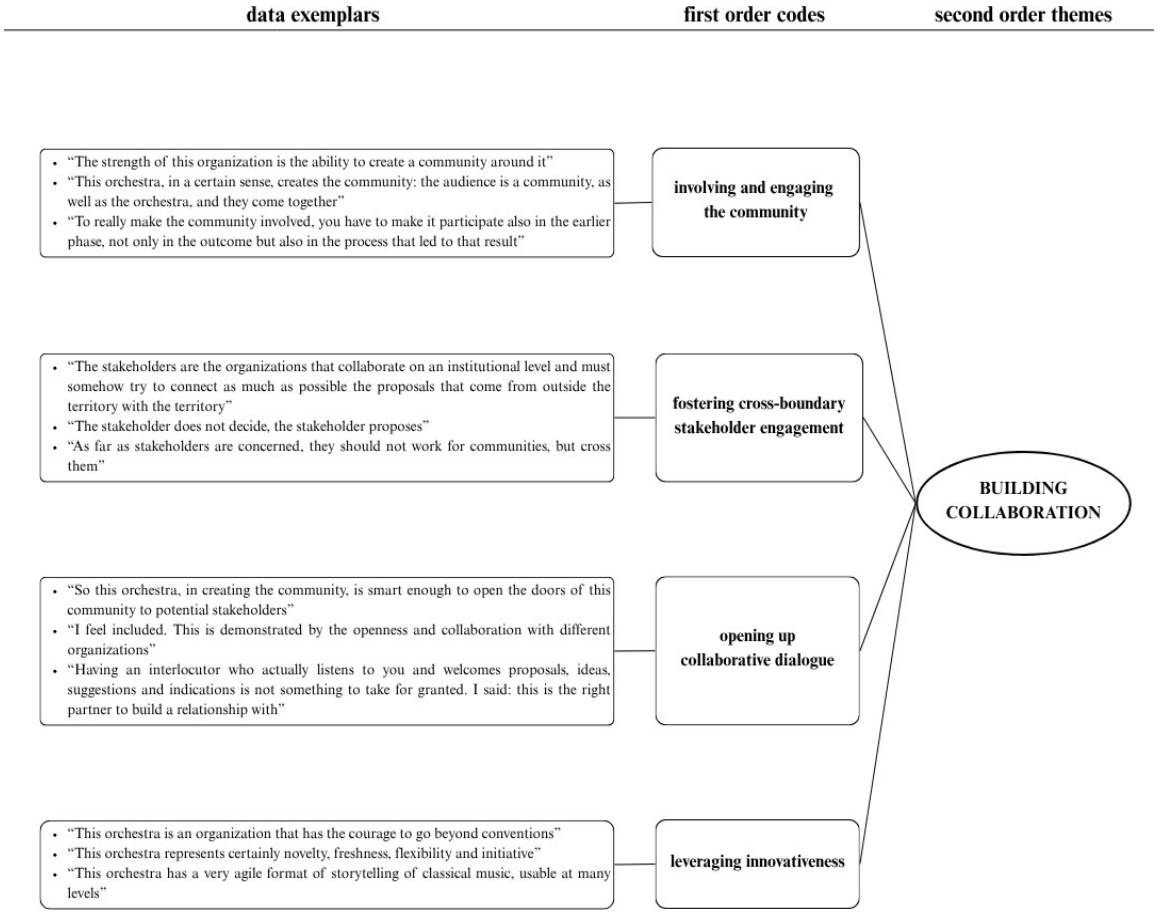


Table 4. Building collaboration

The deconstruction of the space functions as a mediating platform, enabling meaningful engagement with local communities while strengthening cooperation among stakeholders. Events and performances organized in unconventional venues are not merely artistic displays but become relational arenas in which collaboration is initiated, negotiated, and sustained over time.

To really make the community involved, you have to make it participate also in the earlier phase, not only in the outcome but also in the process that led to that result. (Business Partner #1)

The choice of the music concerts' venues plays a critical role in this process. Unstructured or non-traditional spaces foster belonging and shared purpose, inviting both institutional and community actors to engage in co-creative dialogues. Within these spaces, formal hierarchies are flattened, and participants collaborate on equal footing, transforming the event into an arena for collective meaning-making.

As far as stakeholders are concerned, they should not work for communities but cross them. (Cultural Administrator)

These collaborative configurations are perceived as one of the most distinctive outcomes of spatial deconstruction. Stakeholders value openness, reciprocity, and horizontal decision-making, which allow for the co-construction of cultural initiatives that are both socially relevant and contextually grounded.

I feel included. This is demonstrated by the openness and collaboration with different organizations. (Business Partner #2)

Finally, space-driven collaboration is also linked to the innovation of the music proposals. By fostering intersections among institutional logics, artistic and aesthetic experimentation, and social inclusion, the rethinking of performance spaces allows new partnerships and formats to emerge.

The Orchestra is certainly novelty, freshness, flexibility, and initiative. (Business Partner #1)

4.4. Re-signifying cultural spaces

The final mechanism emerging from the analysis represents the outcome of the overall process activated by spatial deconstruction: the re-signification of cultural spaces.

This mechanism materializes when the three dynamics of 'negotiating identity', 'broadening access', and 'building collaboration' intersect and reinforce one another, giving rise to new meanings, uses, and interpretations of space where the cultural performances take place. Through this process, space is no longer a passive backdrop for cultural activity but becomes a symbolic and relational medium through which legitimacy, participation, mutual exchange and collaboration are enacted.

As summarized in Table 5, spatial re-signification unfolds through five interconnected practices: breaking away from traditional venues; democratizing and disseminating classical music; building place-based communities; claiming peripheral and accessible spaces; and widening and educating audiences.

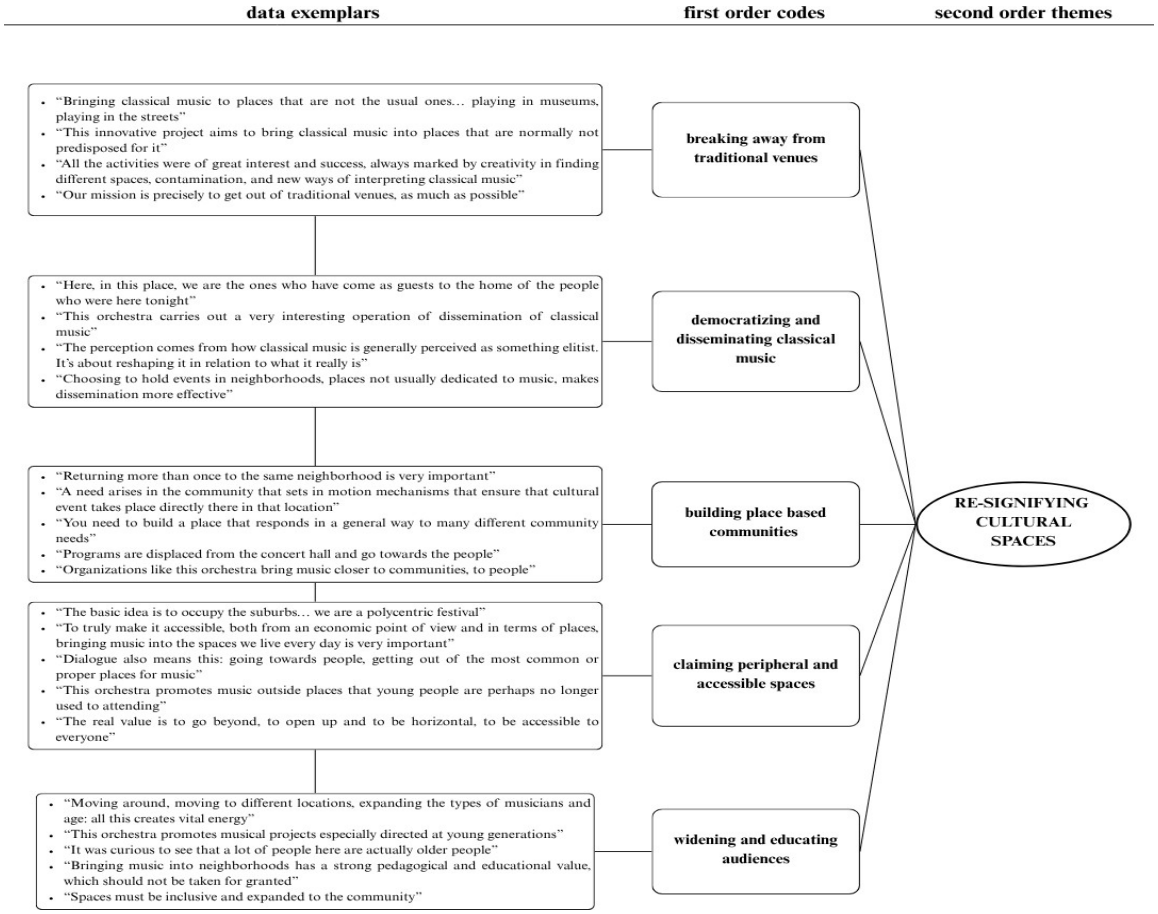


Table 5. Re-signifying spaces

Our mission is precisely to get out of traditional venues, as much as possible. (Staff #1).

All the activities were of great interest and success, always marked by creativity in finding different spaces, contamination, and new ways of interpreting classical music. (Audience #3).

By moving performances into unconventional settings like streets, parks, galleries, and libraries, the music organization and its stakeholders jointly challenge the symbolic hierarchies of classical music and its association with elitist "temples of culture."

Spatial transformation thus becomes a vehicle for democratization and dissemination, enabling broader and more diverse participation and redefining who can access and contribute to cultural life.

The perception comes from how classical music is generally seen as something elitist. It's about reshaping it in relation to what it really is. (Staff #2)

Here, in this place, we are the ones who have come as guests to the home of the people who were here tonight. (Staff #11).

This process also fosters the emergence of place-based communities. By decentralizing performances and returning repeatedly to the same neighborhoods, cultural actors build trust, nurture belonging, and co-produce meaning with local audiences, shaping smaller but loyal communities of classical music amateurs.

You need to build a place that responds in a general way to many different community needs. (Staff #5).

Choosing to hold events in neighborhoods, places not usually dedicated to music, makes dissemination more effective. (Audience #5).

Moreover, spatial deconstruction removes both economic and symbolic barriers that traditionally limit cultural participation. Free or low-cost concerts, held in accessible community-oriented spaces, contribute to inclusion and expand the reach of classical music.

The real value is to go beyond, to open up and to be horizontal, to be accessible to everyone. (Business Partner #2).

Finally, re-signification involves an educational and intergenerational dimension. By engaging young musicians, elderly participants, and marginalized communities, cultural initiatives turn spaces into arenas of learning, dialogue, education and shared creativity.

This orchestra promotes musical projects especially directed at young generations. (Audience #3)

Moving around, moving to different locations, expanding the types of musicians and age: all this creates vital energy. (Cultural Administrator)

In sum, re-signifying space represents the final mechanisms activated by the process triggered by spatial deconstruction, where the three mechanisms previously presented converge. It encapsulates the transformation of cultural venues into shared, participatory, and meaningful environments: spaces where institutional and community boundaries dissolve, allowing new cultural meanings and new forms of engagement to emerge.

5. Discussion and conclusions

This study set out to explore how the deconstruction of space operates as a mechanism for stakeholder engagement within cultural organizations. Building on theories of organizational space (Lefebvre, 1991; Taylor & Spicer, 2007; de Vaujany & Vaast, 2014) and stakeholder engagement (Mainardes et al., 2012; Giorgino, 2016, Reypens et al., 2021; Snis et al.,2021), our research examined how spatial reconfiguration reshapes the relationships among a cultural institution, its partners, and its audiences. Rather than treating space as a static background for cultural activity, we approached it as a dynamic site of meaning-making (Maitlis et al., 2013; Bartunek & Balogun, 2022) where organizational identity, collaboration, and participation are continuously re-negotiated.

Across all stakeholder groups, spatial deconstruction emerges as a shared interpretive frame, a way of rethinking how cultural experiences are produced, accessed, and valued (Beyes & Steyaert, 2011). Deconstructing space activates a process of identity negotiation, when looking at the Orchestra: by performing outside traditional venues, the institution challenges established logics of legitimacy and redefines what it means to be a classical orchestra. Spatial deconstruction translates into expanding participation, fostering accessibility, empowerment, and co-creation with the audience, in places closer to everyday life. It enables collaborative engagement, opening up new forms of institutional mediation and joint cultural production for the partners involved in cultural production.

Spatial deconstruction thus acts not merely as a physical relocation, but as a semantic and relational transformation (Slavich et al., 2020) a way of assigning new meanings (Thomas et al., 2011), identities (Glynn, 2000), and values (Preminger & Drori, 2016) to space. This study contributed to shed light on this re-signification, illustrating how it is a process to discuss, debate, and soften traditional hierarchies among stakeholders, allowing for horizontal exchanges, reciprocal learning, and shared control. This intersection embodies what can be understood as a form of spatial institutional work (Lawrence & Suddaby, 2011; de Vaujany et al., 2019), where actors collaboratively reshape the material and symbolic dimensions of their field to foster inclusion, dialogue, and cultural sustainability. Ultimately, our findings suggest that to deconstruct space shapes its re-signification and illustrate the features and the processes underlying this renewed meaning making process. By challenging the physical and institutional boundaries of where a practice, classical music in our case, “should” happen, stakeholders generate new forms of engagement, collaboration, and negotiation. Spatial deconstruction

therefore operates as both a strategy of organizational renewal and a relational catalyst for community-based cultural value creation.

For practitioners and cultural managers, these findings highlight the strategic potential of spatial experimentation as a lever for engagement and legitimacy. By consciously deconstructing and re-signifying performance spaces, cultural organizations can democratize access, strengthen cross-sector collaboration, and reposition themselves as facilitators of social cohesion rather than as gatekeepers of high culture. Spatial strategies should therefore be conceived not as logistical or aesthetic choices, but as relational practices and tools for cultivating trust, fostering inclusion, and sustaining shared cultural ecosystems in an increasingly fluid and participatory cultural landscape.

Keywords: Spatial deconstruction; space re-signification; organizational space; stakeholder engagement; cultural organizations; meaning-making processes

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Le carriere manageriali apicali negli atenei italiani: un'analisi di genere

Alessia Sammarra[1], Manuela Paolini[2]

1. Introduzione

In Italia, le università statali hanno attraversato un progressivo processo riformatore che affonda le sue radici nelle logiche di aziendalizzazione e managerializzazione proprie del New Public Management. Tra le innovazioni più rilevanti, volte a promuovere un modello di governance universitaria orientato ai risultati e alla valutazione delle performance, la Legge 240/2010, nota come 'riforma Gelmini', ha introdotto la figura del Direttore Generale (DG). Con questa scelta il legislatore ha segnato un deciso rafforzamento della dimensione manageriale degli atenei, attribuendo al DG un ruolo centrale nei processi decisionali e nell'attuazione degli indirizzi strategici.

Comprendere come si arrivi a ricoprire questo ruolo diventa essenziale per cogliere gli effetti di tali riforme su dinamiche di carriera e modelli di governance nel sistema universitario. Tale analisi diventa ancora più significativa se letta nella prospettiva di genere. Infatti, analogamente a quanto osservato in altri comparti del settore pubblico e in continuità con le evidenze del settore privato, nelle università persistono barriere culturali e strutturali che ostacolano il raggiungimento dei ruoli apicali da parte delle donne, nonostante le politiche di promozione della parità di genere adottate negli ultimi anni. Sebbene in Europa sia stata in larga misura raggiunta la parità di genere a livello di dottorato, le donne occupano solo il 30% delle posizioni accademiche senior e appena il 26% dei ruoli di leadership alla guida delle istituzioni di istruzione superiore (Commissione Europea, 2025, p. 13).

La ricerca esistente si è concentrata principalmente sulle carriere del personale docente (cfr., Drake e Svenkerud, 2023; Howe-Walsh e Turnbull, 2016; Śliwa et al., 2024), lasciando in ombra quelle del personale amministrativo e, in particolare, i percorsi di carriera che conducono alla Direzione Generale delle università. Rimangono, così, poco esplorati i tempi, le modalità e i fattori organizzativi che caratterizzano il percorso che conduce a raggiungere questo ruolo, nonché le eventuali differenze fra uomini e donne.

Il presente studio si propone, quindi, di analizzare come e in che misura le differenze di genere condizionino la durata e le tipologie di percorsi di carriera dei DG delle università, e quale sia il ruolo delle caratteristiche di ciascun ateneo nell'influenzare tali percorsi.

A tale scopo, è in corso uno studio empirico sulla popolazione dei DG delle 61 università pubbliche italiane, con l'obiettivo di offrire un contributo originale alla ricerca sulle carriere manageriali nel settore pubblico, un ambito ancora poco sviluppato nonostante la sua grande rilevanza (Huang e Villadsen, 2023). La qualità della leadership amministrativa in queste posizioni è infatti cruciale per la performance complessiva del sistema universitario pubblico, che rappresenta una componente strategica della pubblica amministrazione dei Paesi avanzati. I risultati dello studio forniranno nuove evidenze su come le trasformazioni istituzionali ispirate al New Public Management si intreccino con le dinamiche di genere nel plasmare i percorsi di carriera che conducono alle posizioni manageriali apicali nelle università italiane.

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2. Quadro teorico

2.1. Riforma universitaria e trasformazione delle carriere amministrative apicali in Italia

A partire dagli anni Novanta, il sistema universitario italiano ha vissuto un profondo processo di riforma, guidato dall'adozione dei principi del New Public Management, che ha progressivamente ridefinito la governance, l'accountability e l'organizzazione delle università pubbliche. Le riforme, culminate nella Legge 240/2010 (c.d. 'riforma Gelmini'), hanno promosso un modello di gestione degli atenei orientato all'efficienza, alla performance e alla competizione tra le università, in linea con le trasformazioni osservate nelle amministrazioni pubbliche a livello europeo (Facchini e Fia, 2021).

La letteratura si è concentrata principalmente sugli effetti di tali riforme sulle carriere del personale docente, analizzando le valutazioni, la mobilità accademica, l'internazionalizzazione e le nuove condizioni di lavoro prodotte dai dispositivi di governance basati sulla performance (Rostan, 2010; Abramo et al., 2015; Facchini e Fia, 2021b). Molto meno indagato risulta, invece, l'impatto di tali cambiamenti sul personale tecnico-amministrativo, nonostante esso costituisca una componente cruciale dei processi di gestione e coordinamento delle attività universitarie.

In particolare, la figura del DG, introdotta proprio dalla riforma Gelmini per sostituire il precedente Direttore Amministrativo, rappresenta un osservatorio privilegiato per comprendere come la managerializzazione dell'università stia rimodellando le carriere amministrative, le competenze richieste nei ruoli apicali e le dinamiche di selezione delle élite amministrative interne agli atenei.

A differenza del precedente Direttore Amministrativo, l'incarico di DG prevede un mandato a termine ed è conferito dal CdA, su proposta del Rettore e previo parere del Senato Accademico. Il DG è responsabile, sulla base degli indirizzi del CdA, della gestione e organizzazione dei servizi, delle risorse strumentali e del personale tecnico-amministrativo, nonché della partecipazione alle sedute del CdA senza diritto di voto. In particolare, la riforma Gelmini, nel delineare la figura del DG, introduce importanti implicazioni sul piano della mobilità e della selezione; infatti, il reclutamento può avvenire anche all'esterno dell'ateneo, favorendo così l'ingresso di manager con expertise specialistica ('lateral entry'), mentre la progressione interna dipende sempre più dal conseguimento di obiettivi misurabili. Ciò riduce la stabilità dei percorsi di carriera, aumenta la competizione interna e ridefinisce le traiettorie di carriera del personale amministrativo, accentuando le differenze tra coloro che possiedono le competenze manageriali richieste e chi invece proviene da percorsi tradizionali. Questo nuovo contesto dovrebbe avvicinare i percorsi professionali dei dirigenti amministrativi delle università a quelli del settore privato, rendendoli più dinamici, meno vincolati all'anzianità e fortemente legati al possesso di competenze manageriali specifiche, aprendo al contempo le carriere apicali universitarie a professionalità provenienti dall'esterno e rendendo così i confini del settore più permeabili.

Un aspetto ancora poco esplorato riguarda le implicazioni di queste trasformazioni sulle differenze di genere. La letteratura evidenzia come l'evoluzione verso modelli di carriera più flessibili, basati su performance e competenze manageriali, possa avere effetti ambivalenti per le donne: da un lato, la valorizzazione delle competenze specifiche e la possibilità di ingresso laterale aprono opportunità per candidate esterne al modello di carriera lineare tradizionale; dall'altro, la ridotta stabilità, la forte competizione interna e la centralizzazione della leadership possono amplificare le barriere strutturali e culturali che limitano l'accesso delle donne alle posizioni apicali (Carli e Eagly, 2016).

2.2. Percorsi di carriera e differenze di genere nei ruoli amministrativi apicali

In questo rinnovato contesto, caratterizzato da una crescente attenzione alle competenze manageriali e alla performance, la teoria del capitale umano (Becker, 1964; 1993) offre un quadro interpretativo utile per analizzare le dinamiche evolutive delle carriere dei DG delle università.

Secondo questa prospettiva, il bagaglio di conoscenze, competenze, ed esperienze costituisce una forma di capitale in grado di influenzare i percorsi di carriera e l'accesso alle posizioni apicali. Tuttavia, numerose ricerche mostrano che il capitale umano non si traduce automaticamente in opportunità di avanzamento lavorativo per uomini e donne in modo simmetrico. Infatti, i ritorni del capitale umano differiscono in base al genere, con penalizzazioni sistematiche per le donne sia in termini di progressione che di valorizzazione delle competenze (Correll, 2004; World Economic Forum, 2024). Le discriminazioni di genere possono incidere sulle traiettorie di carriera, limitando le opportunità di avanzamento professionale delle donne verso posizioni apicali anche in presenza di elevati livelli di qualificazione (Metz e Tharenou, 2001).

Processi di selezione e promozione continuano a essere sovente influenzati da preferenze per i membri dell'ingroup. I decisori tendono infatti a riservare le posizioni più prestigiose ai membri percepiti come più simili, spesso uomini, secondo un meccanismo noto come 'riproduzione omosociale' (Kanter, 1977). La sovra-rappresentazione maschile nei ruoli dirigenziali e negli organi decisionali e di governance contribuisce così a riprodurre asimmetrie che limitano la progressione di carriera delle donne nei ruoli manageriali apicali (Cook e Glass, 2014).

Sebbene la rappresentanza delle donne nei ruoli dirigenziali sia aumentata negli ultimi decenni, queste rimangono ancora sottorappresentate ai livelli più alti della gerarchia in quasi tutti i settori, sia pubblici che privati. Secondo il Rendiconto di genere redatto dall'INPS (2024 pp. 37-40), le donne restano fortemente sottorappresentate nelle posizioni di vertice, che occupano solo per il 20% tanto nel settore privato quanto nel settore pubblico, sebbene in quest'ultimo le donne costituiscano la maggioranza del personale.

La letteratura ha individuato un ampio insieme di barriere interconnesse che contribuiscono alla persistenza del cosiddetto soffitto di cristallo, tra cui le differenze nelle preferenze e negli atteggiamenti di carriera delle donne, gli stereotipi di genere, le difficoltà nel bilanciamento tra responsabilità lavorative e familiari, il limitato accesso a reti di influenza, nonché culture organizzative e pratiche di gestione delle risorse umane connotate dal genere, che impongono alle donne standard più elevati di performance per dimostrare la propria competenza (Ramos et al., 2022). Nel loro insieme, questi fattori intrapersonali, interpersonali, organizzativi e sociali interagiscono in modo sistemico nel determinare disparità retributive, una progressione di carriera più lenta, una maggiore probabilità di occupare posizioni di middle management o ruoli di supporto rispetto agli uomini, una minore rappresentanza nei ruoli apicali (Diehl e Dzubinski, 2016; Lyness e Grotto, 2018; World Economic Forum, 2024).

Alcuni studi suggeriscono, tuttavia, che una maggiore presenza femminile nei ruoli decisionali possa contribuire a ridurre i bias di valutazione e le preferenze di ingroup, favorendo una maggiore equità nei processi di selezione e promozione. L'integrazione delle donne nei centri decisionali e negli organi di governo può attenuare la tendenza degli uomini a preferire candidati dello stesso genere e ridurre i pregiudizi nella valutazione delle candidate (Cook e Christy, 2014).

Nel sistema universitario, che rappresenta una componente importante del settore pubblico, tali dinamiche assumono particola rilevanza. Sebbene il fenomeno delle differenze di genere sia stato studiato ampiamente in relazione alle figure accademiche, resta ancora poco esplorato per il personale amministrativo e, in particolare, per l'accesso ai ruoli apicali come la Direzione Generale. Analizzare l'impatto del genere sulle carriere è, dunque, fondamentale per comprendere i meccanismi che regolano l'accesso ai vertici manageriali del sistema universitario italiano.

3. Obiettivi e domande di ricerca

Sulla base delle considerazioni svolte e delle lacune della letteratura esistente, il presente studio si propone di esplorare le differenze di genere nella durata e nella tipologia dei percorsi di carriera dei DG nelle università pubbliche e i possibili legami tra le caratteristiche organizzative degli atenei e la nomina di una donna alla Direzione Generale. A tal fine, la ricerca intende rispondere alle seguenti domande di ricerca:

RQ1: In che misura si osservano differenze di genere nella durata dei percorsi di carriera che conducono alla posizione di DG nelle università pubbliche italiane?

RQ2: In che modo le carriere che portano alla posizione di DG differiscono tra uomini e donne in relazione alla tipologia di percorso seguito, ad esempio tra carriere prevalentemente interne all'ateneo e carriere caratterizzate da mobilità inter-organizzativa?

RQ3: In che misura le caratteristiche organizzative dell'ateneo (dimensioni, percentuale di donne sul totale del personale, presenza di donne in ruoli di governance) influenzano la probabilità che la direzione generale sia affidata a una donna?

4. Metodologia di ricerca

Al fine di rispondere alle domande di ricerca, lo studio prende in esame l'intera popolazione dei DG delle università pubbliche italiane. Attraverso la consultazione del sito web del Ministero dell'Università e della Ricerca (MUR) sono state individuate tutte le università statali accreditate nell'anno 2025 (n = 61). I DG in carica nell'anno di consultazione ed analisi sono stati identificati consultando il sito web istituzionale di ciascuna università. È interessante notare come le donne rappresentino circa un quarto della popolazione di riferimento, costituendo il 26% dei DG in carica.

Le caratteristiche demografiche dei DG (tra cui genere, età, livello e tipo di istruzione) e dei loro percorsi di carriera (tra cui tipo di carriera – interna versus esterna -, mobilità - funzionale, di settore, di ruolo -, tempo impiegato per raggiungere la posizione di vertice) sono state raccolte dai CV pubblicati nella sezione "Amministrazione trasparente" dei siti web istituzionali delle università. Ove non disponibili, i CV sono stati raccolti dai profili LinkedIn degli stessi DG. Dal sito istituzionale del MUR, inoltre, sono stati raccolti dati secondari sulle caratteristiche degli atenei (area geografica, dimensioni, distribuzione per genere dei dipendenti, presenza delle donne negli organi di governo).

Sulla base dei dati raccolti, lo studio adotta un disegno di ricerca articolato in due fasi analitiche. In una prima fase, vengono condotte analisi descrittive finalizzate a mappare le caratteristiche socio-professionali dei DG e le loro traiettorie di carriera, con particolare attenzione alla durata e alla tipologia dei percorsi, al fine di individuarne pattern ricorrenti, peculiarità e differenze. In una seconda fase, lo studio impiega modelli di regressione per analizzare il ruolo delle caratteristiche organizzative degli atenei nella probabilità di affidare la direzione generale a una donna.

5. Contributo teorico e implicazioni per la pratica

Sotto il profilo teorico, questo studio contribuisce anzitutto alla letteratura sulle carriere nel settore pubblico, un ambito ancora relativamente poco esplorato. La ricerca sulle differenze di genere nei percorsi di carriera verso le posizioni apicali, infatti, si è concentrata prevalentemente sui vertici aziendali (Ackah e Heaton, 2003; Bonet et al., 2020), mentre gli studi dedicati all'accesso delle donne ai ruoli manageriali apicali nelle amministrazioni pubbliche rimangono limitati (McDonald et al., 2005; Cohen e Duberley, 2015; Mouratidou e Grabarski, 2021). Analizzando il percorso di carriera dei DG, il lavoro contribuisce a colmare tale lacuna, offrendo una lettura più articolata delle dinamiche attraverso cui norme organizzative, processi di selezione e modelli di governance possono produrre, riprodurre o attenuare le disuguaglianze di genere nelle carriere amministrative apicali.

Un secondo contributo teorico riguarda la comprensione della carriera come processo sociale situato. La ricerca si colloca nel filone di studi che evidenzia i limiti della decontestualizzazione presente in gran parte della letteratura sulle carriere di matrice psicologica (Cohen e Duberley, 2015). Questo approccio ha privilegiato una prospettiva centrata sull'individuo, concentrandosi sulle risorse personali, competenze, capitale umano, motivazione e strategie di agency, come

determinanti principali del successo professionale. Tuttavia, Spurk e colleghi (2019) evidenziano l'importanza di distinguere tra risorse personali e risorse ambientali, sottolineando come fattori strutturali e contestuali possano influenzare significativamente il successo di carriera e il percorso per raggiungerlo. Le risorse ambientali comprendono elementi quali la dimensione organizzativa, le reti di relazioni, le norme culturali e le politiche istituzionali, che possono facilitare o ostacolare l'accesso a posizioni apicali indipendentemente dalle capacità individuali. Questa distinzione introduce una prospettiva più strutturalista nello studio delle carriere, complementare all'approccio soggettivo tipico della psicologia organizzativa, che si concentra prevalentemente sulle percezioni, le aspirazioni e le scelte individuali. In tale ottica, il contesto organizzativo e sociale non viene più considerato come uno sfondo neutro, ma come un insieme di vincoli e opportunità che modellano le traiettorie professionali e contribuiscono a riprodurre disuguaglianze, in particolare di genere, nella progressione verso ruoli di vertice.

In continuità con questa prospettiva, lo studio mostra come le riforme del sistema universitario italiano e la diffusione dei principi del New Public Management abbiano ridefinito le logiche di avanzamento, i criteri di valutazione e le opportunità di mobilità nei ruoli amministrativi apicali. In tal senso, la ricerca amplia il quadro teorico sulle carriere nel public management, mettendo in luce il ruolo delle trasformazioni istituzionali nella riconfigurazione delle élite amministrative universitarie e nei percorsi professionali che conducono alle posizioni di vertice.

Inoltre, lo studio contribuisce a colmare una lacuna persistente nella letteratura sulle carriere, analizzando le condizioni organizzative a livello macro che, nonostante la loro riconosciuta rilevanza (Ng e Sears, 2017), rimangono tuttora poco esplorate. In particolare, lo studio prende in esame come specifici fattori contestuali, quali la localizzazione geografica, la dimensione organizzativa e la presenza femminile negli organi di governo degli atenei, possano operare come meccanismi abilitanti o, al contrario, come vincoli strutturali nelle carriere apicali delle donne. In questo modo, lo studio si inserisce nel più ampio dibattito sul successo di carriera dei gruppi minoritari storicamente sotto-rappresentati, arricchendo la comprensione delle dinamiche strutturali che modellano le disuguaglianze di carriera (Beigi et al., 2025).

Dal punto di vista pratico, comprendere l'evoluzione delle carriere amministrative apicali consente agli atenei di ripensare le strategie di reclutamento, sviluppo e valorizzazione del capitale manageriale, con particolare attenzione alla promozione dell'accesso delle donne ai ruoli di vertice. Le evidenze emerse offrono indicazioni per progettare percorsi di carriera più trasparenti, competence-centred e coerenti con le nuove esigenze di governance introdotte dalla riforma, favorendo condizioni più eque e inclusive. In questo senso, lo studio supporta la definizione di politiche e pratiche organizzative che contribuiscano agli obiettivi di sostenibilità sociale e di gender equality, rendendo le posizioni apicali non solo più raggiungibili, ma anche più rappresentative.

Inoltre, i risultati possono fungere da guida per i professionisti, e in particolare per le donne, che aspirano alla carica di DG, aiutandoli a individuare le scelte di carriera necessarie per accedere ai ruoli apicali. Lo studio si configura, così, come uno strumento utile non solo per comprendere le trasformazioni in atto, ma anche per orientare politiche di sviluppo manageriale, processi decisionali e interventi di equità di genere nelle università pubbliche.

Parole chiave: Carriere manageriali; genere; università

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Exploring the reciprocal relationship between EGS and Dynamic Capabilities

Biagio Maria Amico[1], Rafaela Gjergji[2], Andrea Ancona[3], Valentina Lazzarotti[4], Vitaliano Fiorillo[5]

1. Introduction

Over the past decade, the integration of sustainability into strategic performance management systems (SPMS) has become a central issue in accounting research (Schulte, 2022; Thaher & Jaaron, 2022; Dauerer, 2025). As firms face increasing institutional and stakeholder pressure to align financial performance with sustainability outcomes, ESG is increasingly recognized not merely as a reporting obligation but as a strategic dimension contributing to long term value creation (Adams, 2017). Performance measurement frameworks, historically oriented toward financial and short-term indicators (Pun & White, 2005), are being re-evaluated for their ability to capture the non-financial factors that drive long-term success (Bititci et al., 2012), including environmental impact (Hervani et al., 2005), human capital (Tweedie et al., 2019), and governance quality (Beeri et al., 2019). Recent literature has argued that sustainability is nothing special since it's no better or worse than other intangible assets that drive long-term value and create positive externalities for wider society (Edmans, 2023). Embedding ESG considerations within SPMS thus represents a critical step in reframing managerial accounting as a mechanism for strategic adaptation and organizational learning, rather than as a backward-looking control function (Gasparatos, 2010; Siegrist et al., 2020).

However, such integration remains a complex challenge for many firms (Kotsantonis et al., 2016; Yue et al., 2025). Prior research suggests that sustainability implementation cannot be reduced to the acquisition of technical or operational capabilities alone (Dzhengiz & Niesten, 2020) but it requires Dynamic Capabilities (DCs) (Heubeck, 2024; Liang et al., 2022a; L. Wang & Luo, 2025). DC are a firm's higher-level ability to sense, seize, and transform its internal and external resources to create sustainable competitive advantage (Teece et al., 1997).

While an emerging literature has begun to connect sustainability and DCs (Buzzao & Rizzi, 2021; Inigo et al., 2017), existing studies often treat ESG as a homogeneous construct and implicitly assume a uniformly positive relationship between sustainability engagement and capability development (Ortiz-Avram et al., 2024; Shang et al., 2020). As a result, it remains unclear how firms deploy the DCs necessary to manage ESG material topics effectively, and how these topics, in turn, shape firms' adaptive and innovative potential (Latruffe et al., 2016; Liang et al., 2022a; Patterson et al., 2017).

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Addressing this gap, this study adopts DCT as its primary analytical lens (Teece et al., 1997; Teece, 2007, 2018) and employs the European Sustainability Reporting Standards (ESRS) as a conceptual map to disaggregate ESG into analytically distinct material topics (Hummel & Jobst, 2024; Suta et al., 2025). The ESRS' taxonomy, encompassing environmental[6], social[7], and governanc[8] standards, is considered as the most comprehensive and conceptually robust taxonomy currently available for operationalizing sustainability dimensions (Zerbini, 2017; Figueiredo et al., 2025). Using the ESRS as a conceptual map, the research can systematically capture the environmental, social, and governance domains most relevant to firms' strategic transformation (Velte, 2024).

To capture both the directionality and the heterogeneity of ESG–DCs interactions, the study adopts a mixed-method multiple case-study design (Eisenhardt, 1989; Ravenswood, 2011) that combines a structured assessment of firms' DCs and ESG activities with semi-structured interviews, involving firms in the agribusiness sector. Agribusiness provides a particularly insightful context to explore the ESG–DCs nexus and its integration in SPMS systems (Ndemewah et al., 2019; Leo et al., 2021). The agricultural sector is simultaneously one of the largest contributors to environmental degradation, responsible for approximately one quarter of global greenhouse gas (GHG) emissions, extensive land use change, biodiversity loss, and water depletion (IPCC, 2022; OECD & FAO, 2022) and one of the few industries with unique potential to regenerate ecosystems and support social well-being (Reid et al., 2005). Through regenerative farming practices and inclusive rural employment, agriculture can shift from being a driver of planetary boundaries transgression to a restorative force for both natural and social capital (DeFries et al., 2016; Rockström et al., 2023). At the same time, agriculture remains a sector largely underserved by formal SPMS (FAO & IPA, 2024). This aspect reflects the sector's historical reliance on informal management practices, the limited diffusion of managerial accounting tools, and data constraints that hinder systematic performance evaluation (Fiorillo & Amico, 2024; Latruffe et al., 2016). As a result, also the sustainability efforts are often fragmented and operational rather than strategically aligned (Patterson et al., 2017). This gap makes agribusiness sector a particularly fertile empirical setting for examining how ESG-related practices can evolve into capability-enabling mechanisms (Fiorillo & Lo Zoppo, 2022).

Our study contributes to both academic research and managerial practice. First, it advances research at the intersection of DCT and sustainability accounting by moving from aggregated ESG constructs to a topic-level analysis based on the ESRS taxonomy (Reid et al., 2005; Suta et al., 2025; Velte, 2024). Second, it enriches DCT by demonstrating that the reciprocal relationship between ESG practices and DCs is neither symmetric nor uniformly positive (Castillo-Ospina et al., 2025; Liang et al., 2022a). Third, it contributes to sustainability accounting and SPMS research by reconceptualizing ESG infrastructures as organizational mechanisms that both enable and constrain learning, legitimacy, and strategic adaptation (Bisbe, 2010; Ferreira et al., 2010). Practically, the study offers managers a diagnostic lens to distinguish when ESG investments support adaptability and when they risk generating rigidity, highlighting that strategic value from sustainability depends on firms' ability to institutionalize practices within SPMS, not merely on ESG performance itself (Edmans, 2023).

[6] E1 - Climate Change; E2 - Pollution; E3 - Water and Marine Resources; E4 - Biodiversity and Ecosystems; E5 - Resource Use and Circular Economy

[7] S1 - Own Workforce; S2 - Workers in the Value Chain; S3 - Affected Communities; S4 - Consumers and End Users

[8] G1 - Business Conduct

2. Background

2.1. Background

The concept of Dynamic Capabilities (DCs) originates within the dominant resource- and capability-based perspective (Conner, 1991; Peteraf, 1993; Wernerfelt, 1984), which explains how valuable, rare, inimitable, and non-substitutable resources serve as foundations of competitive advantage (Barney, 1991). Within this theoretical lineage, capabilities are defined as "routines (or collections of routines) that, together with their implementing input flows, confer upon an organization's management a set of decision options for producing significant outputs of a particular type" (Winter, 2003, p.991). Building on this, scholars distinguish between ordinary (or operational) capabilities (ORs) and dynamic capabilities (DCs) (Collis, 1994; Teece et al., 1997). ORs operate at a functional, operational level and enable firms to "make a living in the present" (Winter, 2003, p.992). DCs are higher-order capabilities that allow firms "to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece et al., 1997, p.516). Hence, as Teece (2007, 2018) later better explains, DCs can be disaggregated into three organizational processes: (1) sensing that refers to the firm's ability to scan, interpret, and prioritize signals from the external and internal environment, including technological developments, regulatory changes, market trends, and evolving stakeholder expectations (Day & Schoemaker, 2005; Teece, 2007); (2) seizing which encompasses mobilizing resources and making strategic decisions to capture those opportunities (Teece, 2007); and (3) reconfiguring, which refers to enhancing, combining, protecting, and transforming the firm's tangible and intangible assets (Teece, 2007). Together, the DCs enable firms to adapt to changing environments, shape the ecosystems in which they operate, innovate through new products and processes, and design and implement viable business models, thereby supporting superior long-term performance (Helfat & Winter, 2011; Teece, 2018).

2.2. ESG activities

Environmental, Social, and Governance (ESG) activities have evolved from peripheral corporate responsibility practices to central elements of contemporary strategic management (Edmans, 2023), shaping firm legitimacy, competitiveness, and long-term value creation (Dzhengiz & Niesten, 2020; N. Wang et al., 2023). The institutionalization of ESG has been reinforced by the emergence of structured reporting frameworks (Contrafatto, 2014), such as the European Sustainability Reporting Standards (ESRS) that link sustainability actions with risk management, strategic planning, and performance measurement systems (Hervani et al., 2022; Damtoft et al., 2025), reframing ESG not as compliance but as a strategic opportunity (Edmans, 2023; Hristov & Cory, 2024). Nevertheless, empirical research continues to rely predominantly on aggregated ESG scores and composite indices, which obscure the heterogeneity of underlying practices and limit theoretical insight (Berg et al., 2022; Schulte, 2022) into how specific environmental, social, and governance issues are enacted within organizations (Martiny et al., 2024; Pu, 2025a).

As matter of the fact, the ESG construct encompasses fundamentally different domains. Environmental dimension encompasses activities aimed at reducing ecological footprints, including climate change mitigation, pollution control, water stewardship, biodiversity conservation, and circular resource flows (Dzhengiz & Niesten, 2020), which have been linked to improved operational efficiency (Lozano et al., 2009), reduced vulnerability to regulatory shocks (Costantini & Crespi, 2008), and enhanced innovation outcomes (Schaltegger, 2011). On the social side, employee well-being, human capital development, diversity and inclusion, and community engagement constitute strategic levers for strengthening stakeholder trust and relational capital (Bebbington et al., 2008; Ayele & Singh, 2024), while supply-chain labor and ethical practices play an increasingly important role under globalized production systems (Lock

& Seele, 2017). Governance practices such as board oversight, ethical codes and transparency systems enable accountability and reduce agency problems, thereby supporting overall sustainability performance (Collevecchio et al., 2025).

Despite this diversity, existing research rarely disentangles ESG into analytically meaningful components, leaving unresolved how different sustainability domains impose distinct and potentially conflicting organizational and strategic demands (Martiny et al., 2024). Addressing this gap requires moving beyond monolithic conceptions of ESG toward a more granular understanding of how specific sustainability issues interact with firms' strategic and organizational capacities (Busch et al., 2024; Pu, 2025a).

2.3. Dynamic capabilities and ESG

Despite the parallel development of the ESG and DCs literatures, their intersection remains remarkably underexplored (Amui et al., 2017; Buzzao & Rizzi, 2021; Ortiz-Avram et al., 2024). This line of research has been particularly influential in the literature on Dynamic Capabilities for Sustainability (DCsS) (Dangelico et al., 2017; Inigo et al., 2017; Kabongo & Boiral, 2017), which emphasizes how environmental and social pressures can catalyze sensing processes by increasing managerial attention to emerging risks and opportunities, and seizing processes by legitimizing investments in sustainability-oriented innovation (Carberry et al., 2019). However, much of these studies treat sustainability as a relatively homogeneous construct (Barkemeyer, 2011), obscuring the possibility that different ESG domains (Hristov & Cory, 2024) may activate distinct and potentially conflicting capability mechanisms (Damtoft et al., 2025; Dunfjäll, 2025)

Moreover, the reverse causal direction remains comparatively neglected: DCs studies tends to assume that firms will develop the requisite capabilities (Teece, 2007; Teece et al., 1997), yet empirical research rarely examines how pre-existing endowments influence the institutionalization of ESG implementation within strategic performance management systems (Heubeck, 2024; Liang et al., 2022a). Translating sustainability demands into strategic narratives likely depends on the firm's capacity not only to identify salient ESG issues, but also to mobilize resources and stabilize new routines (Setyaningsih et al., 2024; Wohlgemuth & Wenzel, 2016). Current research provides limited guidance in understanding how different ESG domains impose distinct organizational demands, and how these demands interact positively or negatively with firms' sensing, seizing, and reconfiguring processes (Latruffe et al., 2016; Liang et al., 2022a; Patterson et al., 2017).

To address these gaps, this study investigates the ESG–DCs nexus as a reciprocal and topic-contingent relationship rather than a uniformly "virtuous" loop. Building on DCT (Teece, 2007, 2018; Teece et al., 1997), and leveraging the ESRS taxonomy to disaggregate ESG materiality into analytically distinct domains (Dunfjäll, 2025; Hummel & Jobst, 2024), the paper formulates two research questions that explicitly capture both directions of influence:

(1) How do the different dimensions of ESG (environmental, social, and governance) influence the development and enactment of dynamic capabilities through the processes of sensing, seizing, and reconfiguring?

(2) How do dynamic capability (i.e., sensing, seizing, and reconfiguring) shape firms' approach to ESG different dimensions and material topics?

3. Methodology

To answer the RQs, we employ a mixed-method multiple case study design consisting of an initial quantitative assessment of DCs and ESG activities, followed by an in-depth qualitative investigation (Morse, 2010; Berman, 2017). This design is theoretically grounded in the logic that combining structured measurement with interpretive process data enhances construct validity, mitigates informant bias, and enables more robust theory building (DeLuca, 2011; De Massis &

Kotlar, 2014). Exclusive reliance on narrative accounts has long been recognized as problematic in qualitative research (Feldermann & Hiebl, 2019; Braun & Clarke, 2024) , as it tends to generate retrospective rationalization and impression management (Bjurklo, 2008). To address this limitation, the study introduces a quantitative analysis prior to interviews, not with the intention of conducting statistical hypothesis testing, but to establish an objective and comparable mapping of each firm's capability endowment and sustainability maturity (Kinchin et al., 2010; Berman, 2017; Martyn, 2021; Pino Gavidia & Adu, 2022). This integrated design is consistent with the logic of multiple-case research (Eisenhardt, 1989; Morse, 2010; Berman, 2017), where different forms of evidence complement one another to improve construct validity and support richer theoretical insights (Yin, 1999).

The need for a preliminary quantitative step is reinforced by DCT research, which shows that managerial narratives often overstate firms' ability (Arend & Bromiley, 2009). Because informants frequently conflate intended strategies with actual routines (Wollersheim & Heimeriks, 2016), establishing perceptual baselines through validated scales becomes a critical methodological safeguard (Boateng et al., 2018). Such measures limit interpretive drift (Pentland & Feldman, 2005), clarify the initial conditions of each firm (Yin, 1999), and reduce the risk of mistaking symbolic or aspirational ESG claims for actual implementation (Delmas & Toffel, 2008). Using maturity indicators therefore ensures that the analysis captures substantive practices rather than purely theoretical commitments (Zerbini, 2017; Velte, 2024).

In operationalizing this first phase, DCs has been measured through 15 items adapted from (Shang et al., 2020) covering the three dimensions of sensing, seizing, and reconfiguring (Appendix 1). Each item has been rated on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) to capture the firm's perceived ability to identify opportunities, mobilize resources, and transform operations for sustainability (Da Giau et al., 2020; Shang et al., 2020). On the other hand, ESG activities have been assessed through a set of practice-based indicators derived from the European Sustainability Reporting Standards (ESRS) taxonomy (Appendix 2). This practice-based operationalization avoids the limitations of aggregated ESG indices often criticized for their opacity and lack of conceptual clarity (Edmans, 2023; Dunfjäll, 2025). Together, the DCs and ESG measures produce a structured diagnostic profile for each firm, which functions not as a statistical output but as an analytical anchor for the subsequent qualitative inquiry (Martyn, 2021; Pino Gavidia & Adu, 2022)

After the initial assessment, the study develops qualitative interviews using a semi-structured protocol designed to explore in detail how ESG practices influence, and are influenced by, the firms' sensing, seizing, and reconfiguring capabilities. The protocol (Appendix 3) follows the principles of the Gioia methodology (Gioia et al., 2013), combining open-ended elicitation with theoretically oriented prompts to allow informants to articulate their own interpretations while enabling the researcher to identify higher-order patterns. All interviews are recorded, transcribed, and coded using a matrix structure that crosses ESG themes with DCs dimensions (Yin, 1999). This approach allows the study to identify specific causal mechanisms, directionality of influence, and the polarity of effects (Fitz-koch & Nordqvist, 2017).

The study will employ multiple-case study logic rather than a single case to increase analytic generalizability and strengthen theory building (Gill, 1995; Fridlund, 1997). Case selection will be purposeful and theoretically driven (Eisenhardt, 1989; Hoon, 2013). Firms are drawn from the SDA Bocconi Invernizzi AGRI Lab ecosystem because they exhibit varying degrees of sustainability engagement and organizational complexity. The study aims to involve between six and ten firms; this range is widely recognized as optimal to achieve both theoretical saturation and cross-case analytical depth (Eisenhardt, 1989; Eisenhardt & Graebner, 2007; Ravenswood, 2011). A limited number of cases allows for an in-depth exploration of intra-organizational processes and contextual contingencies, while still enabling meaningful pattern matching and replication logic across heterogeneous organizations (Yin, 1999). Variation will be sought in firm size, ownership form, business activities, and geographic area to identify both common enabling

mechanisms and contextual contingencies (Sneed et al., 2020). Table 1 below provides an illustrative example of the type of firms that could be included in the multiple-case study.

Firm Code	Ownership Form	Core Business Activity	Firm Size (Employees)	Geographic Area (Region)
A1	Family-owned SME	Organic vegetable production	120	Campania
A2	Cooperative	Dairy production and processing	50	Lombardia
A3	Corporate agribusiness	Cereal and seed production	200	Emila-Romagna
A4	Family-owned SME	Viticulture and winemaking	25	Toscana
A5	Social enterprise cooperative	Horticultural and ceral production	3	Sicilia
A6	Corporate agribusiness	Fruit production	30	Sicilia
A7	Family-owned SME	Livestock and feed production	30	Lombardia
A8	Cooperative	Horticultural and ceral production	2	Campania
A9	Cooperative	Rice	10	Piemonte
A10	Family-owned SME	Grain and legumes production	12	Toscana

Table 1. Illustrative Profile of the Selected Case Firms

The analysis integrates both data sources through pattern matching and matrix coding. First, Likert and ordinal results will be summarized to produce DCs and ESG maturity profiles for each firm. Second, qualitative data will be coded using a matrix structure to identify perceived influence directions and the polarity of effects (positive, negative, ambivalent). Triangulation of survey scores, coded interview segments, and documentary evidence will enable the construction of a reciprocal ESG–DCs matrix, the final analytical output of the study. This final matrix visually represents the degree and direction of interdependence between ESG material topics and dynamic capabilities, thereby explaining how sustainability practices function as both antecedents and outcomes of organizational adaptability within SPMS.

4. Expected results

The study is expected to yield a rich, empirically grounded understanding of the reciprocal relationship between ESG material topics and DCs. Drawing on evidence, the analysis will explore how ESG initiatives influence and are influenced by the firm's ability to sense, seize, and reconfigure resources.

The results are expected to show that ESG initiatives can have both positive and negative effects on the development of DCs (Liang et al., 2022b). In the climate change domain, the introduction of carbon footprint monitoring can positively enhance sensing capabilities, as firms learn to interpret climate data and anticipate risks (Čuček et al., 2012). Regarding pollution, adopting integrated pest management and organic fertilizers can overly rigid environmental restrictions may discourage risk-taking and flexibility (Singh et al., 2024). For water and marine resources, excessive reporting burdens for participation in collective irrigation schemes might strain smaller farms and reduce adaptive responsiveness (Gany et al., 2019). Biodiversity restoration encourages transforming capabilities by promoting redesigning production systems (Edwards & Cerullo, 2024). Likewise, implementing resource efficiency and circular economy

practices such as composting or renewable energy production can strengthen reconfiguring routines (Santolin et al., 2024), but may produce negative effects if the investment risks remain uncertain. In the social dimension, actions focused on the own workforce typically reinforce organizational learning and seizing capabilities by building managerial routines for employee engagement (Haile & Tüzüner, 2022), while the costs of continuous training can temporarily divert resources from innovation (Costa et al., 2023). For workers in the value chain, certification programs can improve sensing of upstream sustainability risks (Bloemer & Minner, 2025). Involvement with affected communities can foster transforming capabilities by developing relational capital (Carmen et al., 2022), though unmet stakeholder expectations or social tensions can damage legitimacy and slow adaptation (Barlow, 2022). Engagement with consumers and end-users enhances sensing market trends and consumer values (Alam et al., 2025), but frequent changes in consumer expectations can generate uncertainty and decision paralysis (Samson & Voyer, 2014). Moreover, ESG reporting systems promotes reconfiguring capabilities by formalizing governance and data management (Ragazou et al., 2025), although it may initially slow decision processes or reduce entrepreneurial autonomy (Collevecchio et al., 2025).

On the other hand, the research will also offer evidence of the reverse influence: how DCs enables ESG activities. Firms endowed with strong DCs are expected to demonstrate superior ability to implement ESG practices (Teece, 2007), although these relationships can also be ambivalent (Liang et al., 2022b). Regarding climate change, strong sensing allows firms to anticipate future carbon regulations and invest early in low-emission machinery (Turnheim et al., 2018), while an excessive focus on market signals may lead to premature or poorly aligned investments that strain liquidity (Vazirani et al., 2023). Robust sensing capabilities help mobilize funds for precision fertilization (Xing & Wang, 2024), but when cost efficiency dominates sustainability intent, such actions may be limited to symbolic compliance (Schaltegger & Hörisch, 2017). Effective sensing and seizing in water management foster proactive irrigation efficiency and conservation strategies (Levidow et al., 2014). In biodiversity, dynamic firms often experiment with diversified cropping and agroecological practices (Kremen et al., 2012; Dupré et al., 2017), but rapid transformation without ecological expertise can disrupt existing ecosystem balances (Allen & Malekpour, 2023). In the social sphere, seizing and transforming abilities facilitate workforce well-being programs and equitable labor relations (Regier, 2024), but capability exploitation focused solely on productivity may produce negative social consequences (Bueno, 2022). For workers in the value chain, firms with advanced sensing capabilities can identify sustainability risks in suppliers and collaborate on improvement programs (Bloemer & Minner, 2025). Engagement with affected communities is positively influenced by transforming routines that foster co-created development projects (Westskog et al., 2021). Finally, mature reconfiguring capabilities support transparent governance and ESG reporting (Annesi et al., 2024), although it may initially slow decision processes or reduce entrepreneurial autonomy (Collevecchio et al., 2025). Our findings and proposed reciprocal relationships between ESG activities and DCs are conceptually summarized in the matrix in Table 2.

Impact of ESG activities on DC (1 col) Impact of DC on ESG Activities (2 col)	**Sensing**	**Seizing**	**Reconfiguring**
Climate change	+/- +		
Pollution	+	- 	-
Water and Marine resources	+	+ +	-
Biodiversity		+ +	- +
Resource use and circular economy		+ 	+

Own Workforce		+/- +/-	-
Workers in the Value Chain	+ +		
Affected communities	+	+ -	+
Consumers and end-users	+	+	-
Business Conduct	+	+ +	- -

Table 2. The reciprocal relationship of ESG activities and DCs

5. Conclusion

This study examined the reciprocal relationship between ESG material topics and DCs, responding to recent calls to move beyond aggregated sustainability constructs (Edmans, 2023; Dunfjäll, 2025) and to investigate how specific sustainability domains interact with firms' DCs (Ortiz-Avram et al., 2024). We advance beyond generic "ESG–DCs" assertions (Buzzao & Rizzi, 2021; Inigo et al., 2017; Kabongo & Boiral, 2017) and instead evidences that ESG material topics and Dynamic Capabilities co-evolve not through a uniform virtuous loop (Liang et al., 2022a; Ortiz-Avram et al., 2024), but through differentiated mechanisms whose outcomes depend on the alignment between material sustainability demands and the organization's capability to adapt, absorb, reconfigure them (Teece et al., 1997).

Contributions

This study contributes to the literature in several important respects. First, it advances research at the intersection of DCT and sustainability accounting (Ortiz-Avram et al., 2024) by offering a topic-level analysis of the ESG–DCs relationship (Dunfjäll, 2025). Prior studies have largely conceptualized sustainability as a broad or monolithic construct (Pu, 2025a), limiting the ability to specify how different sustainability challenges interact with distinct capability mechanisms (Amui et al., 2017). By operationalizing ESG through the ESRS taxonomy (Hristov & Cory, 2024), this study demonstrates that sustainability is not a homogeneous driver of adaptation, but a portfolio of material topics whose capability effects vary systematically across environmental, social, and governance domains (Velte, 2024; Suta et al., 2025).

Second, the study contributes to DCT by empirically substantiating that reciprocity between (ESG) activites and capabilities does not imply symmetry or uniform positivity (Arend & Bromiley, 2009; Shang et al., 2020). This finding extends and nuances the emerging literature on dynamic capabilities for sustainability by explicitly incorporating negative and ambivalent effects (Buzzao & Rizzi, 2021; Ortiz-Avram et al., 2024), thereby addressing concerns that DCs research risks becoming normatively biased toward success narratives (Schilke et al., 2018).

Third, the paper contributes to sustainability accounting and SPMS research by reconceptualizing ESG infrastructures as mechanisms that simultaneously enable and constrain organizational learning. Compliance regimes function as externalized sensing devices that translate diffuse stakeholder expectations into operational categories, supporting market access and legitimacy (Adams, 2017). However, the same regimes risk crowding out investments in system integration and routinization, thereby limiting the strategic leverage of sustainability information. This dual role challenges linear assumptions embedded in much of the ESG reporting literature and reinforces the need to examine sustainability controls as organizational infrastructures (Bisbe & Malagueño, 2012; Bourne et al., 2018).

From a practical standpoint, the study provides managers with an analytical framework to diagnose where ESG investments are likely to foster sensing, seizing, and where they are more likely to create rigidity (Ji et al., 2025). The recurrent distinction drawn by interviewees between

"doing sustainability" and "documenting sustainability" underscores that ESG performance alone is insufficient to generate strategic value (Edmans, 2023; Pu, 2025b) unless firms develop the reconfiguring capabilities required to stabilize, integrate, and communicate sustainability practices within SPMS (Bisbe, 2010; Ferreira et al., 2010).

Keywords: Dynamic Capabilities, ESG, Case Study

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The Forgotten Dimension: Antecedents and Outcomes of Social Sustainability Measurement

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1. Introduction

In response to the growing global recognition of the role businesses have in environmental, social, and economic issues (Chiucchi et al., 2025), there has been an increasing willingness among organizations in the world to show their dedication to sustainable development (Chaudhary, 2017), aligning with global initiatives such as the United Nations (UN) Sustainable Development Goals (SDGs), the European Green Deal (European Commission, 2019), the Corporate Sustainability Reporting Directive (CSRD) (European Commission, 2024b), and the Directive on Corporate Sustainability Due Diligence (CSDDD) (European Commission, 2024a). In today's globalized world, firms are increasingly becoming aware of the importance of sustainable business models and practices. Moreover, corporations are increasingly implementing corporate sustainability (CS) and Environmental, Social and Governance (ESG) metrics as additional performance indicators (Kalla and Seiter, 2025; Zatini et al., 2025). Organizations are thus required to establish sustainable objectives, formulate and implement a sustainability strategy (Chung and Parker, 2008) and continuously assess their impact (Beusch et al., 2022).

The motivations behind companies involvement in sustainability issues have been profoundly investigated (Maas et al., 2016) and include regulatory (i.e. Bansal, 2005) and stakeholder pressure (i.e. Gouda and Saranga, 2020), media scrutiny (i.e. Hu and Wu, 2024), and innovation (i.e. Hansen et al., 2009). In addition, the extant literature has documented the role of sustainability control systems (i.e. Hörisch et al., 2015; Johnson and Schaltegger, 2016; Talbot et al., 2021), and of accounting and reporting in fostering sustainability practices within organizations (Burritt and Schaltegger, 2010; Schaltegger et al., 2022). However, academic studies have often overlooked how firms effectively integrate CS measurement, management accounting (MA), and reporting (Maas et al., 2016). The above-mentioned could be due to the segmented approach that empirical research often adopts (Ferreira and Otley, 2009). This could be explained by the fact that empirical papers often investigate broad topics, like the impact of accounting and reporting for sustainability, or specific themes, such as accounting techniques, and sustainability control systems (Maas et al., 2016). Effective sustainability performance evaluation requires a strong interaction among different approaches and stakeholders inside and outside the organization, to gather, analyze and communicate relevant information regarding the overall impact of an organization (Kühnen and Hahn, 2018). This process aims to assist managers' decisions on improving the relationships between the firm, the society, and the environment (Williams et al., 2017). Empirical studies demonstrate the pivotal role of performance measurement systems (PMSs) and performance indicators (PIs) in this process (Lloret, 2016; Riccaboni and Leone, 2010). Environmental and economic indicators and control systems have

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been established tools for decades (Zatini et al., 2025; Tyteca, 1996; Weber, 2018). Nevertheless, compared to the economic and environmental dimensions, social sustainability (SS) has yet to be explored by the extant literature (Anisul Huq et al., 2014; Denu et al., 2023; Hutchins et al., 2019; Mani et al., 2020). This observation is further corroborated by the lack of standardized measurement framework (Kühnen and Hahn, 2018). In fact, measuring social sustainability performance (SSP) comes with significant difficulties (Denu et al., 2023). Firstly, as social issues are predominantly qualitative in nature and involve many stakeholders, their assessment is challenging to achieve through the exclusive utilization of conventional quantitative indicators (Kühnen and Hahn, 2018). Furthermore, SS dimensions often overlap and influence one another, making it difficult to separate and quantify them (Maddaloni and Sabini, 2022). Secondly, there is empirical evidence suggesting that social sustainability measurement (SSM) is highly context-dependent (Macchion et al., 2018). Consequently, according to the foregoing literature SS measures differ across countries, cultures and contexts (Mani et al., 2016). Third, the dynamic nature of SS affects its measurement. As a matter of fact, SS dimensions evolve with societal values, regulatory changes, and stakeholder concerns (Missimer et al., 2017), making it difficult for organizations to measure SS consistently over time, due to shifting benchmarks and emerging issues (Denu et al., 2023). Fourth, unlike environmental sustainability, which benefits from established metrics (e.g., carbon footprints), SS lacks universally accepted indicators (Staniškienė and Stankevičiūtė, 2018). Finally, SSM is a challenging undertaking due to the inherently long-term nature of such an evaluation and the inherent complexity of the human subject (Kamaludin, 2023).

Furthermore, the antecedents that drive companies to evaluate their SSP (Yawar and Seuring, 2017) as well as the perceived outcomes of SSM (Maas et al., 2016) remain unclear. Finally, the literature that collectively explores SS, SSM, antecedents and outcomes is still scarce (Kühnen and Hahn, 2018). Therefore, the aforementioned research gaps offer fertile ground for scholars to further investigate SSM within firms. Henceforth, we propose the following research question (RQ):

- What are some key antecedents that drive organizations to adopt SSM, and what are some perceived outcomes of its implementation?

To advance this evolving research area, scholars are encouraged to adopt qualitative approaches (Broccardo and Mauro, 2024; López-Concepción et al., 2022), like case-studies (Morioka and Carvalho, 2016), extant literature has primarily utilized quantitative methodologies, even though SS is qualitative and hard to quantify (Kühnen and Hahn, 2018). Henceforth, the present work-in-progress study seeks to investigate some factors that drive companies to implement SSM (Yawar and Seuring, 2017) as well as the perceived outcomes of its adoption (Maas et al., 2016), with the ultimate goal of nurturing corporate practices aimed at meeting the UN SDGs (Lu et al., 2021).

To respond to our RQ, the case-study approach turned out to be the ideal choice for a number of reasons. Firstly, we will conduct an exploratory research that focuses on prioritizing the participants' viewpoints (Miles and Huberman, 1994). Secondly, the investigated topic is yet to be fully explored by the extant literature. Finally, this methodological approach facilitates the establishment of a theoretical understanding of the phenomenon within a realistic framework (Fernandez-Vidal et al., 2022).

More specifically, we conducted a case-study of an Italian company operating in the automotive sector. The firm's CEO agreed to take part in this research, but asked the authors to maintain strict anonymity. Velocity Motors is an Italian private limited company and benefit corporation, founded in 1973. Its main headquarters are based in Turin, but it has four other branches in the Piedmont Region. In 2024, Velocity Motors employed 82 men and 35 women, for a total workforce of 117 people, and had a turnover of € 127,7 million.

As a car dealer, its core business involves the retail of Ford-branded vehicles, both new and second-hand, and components. In addition, it offers car rental, repair and maintenance services. Since 2020, Velocity Motors has consistently embedded CS into its strategy and operations, for instance, by reducing their carbon emissions, and employing people with disabilities. In particular, Velocity Motors's sustainability strategy is based on five pillars:

1. Growth policies - Velocity Motors is committed to the adoption of policies, procedures, and safeguards that integrate ESG factors within corporate processes. The company has a variety of goals, including the evaluation and measurement of the impact of company policies and practices on social inclusion, as exemplified by the completion of the Inclusion Impact Index.
2. Commitment to a 360° approach - the company aims to establish collaborative environments and to advocate for sustainability at all stages of the value chain. The organization of volunteering, inclusiveness, and corporate citizenship days, as well as the establishment of collaborative relationships with local academic institutions and the Italian National Research Council (CNR) represent key objectives.
3. People's value - In this case, the aspirational goals are to gain an understanding of the needs of employees, encourage professional development and the attraction of new talent, and promote effective communication both within and outside the company. One of the approaches consists of implementing annual performance review programs that assess skills and knowledge acquisition for both employees and managers.
4. Resources and environment - The goals of Velocity Motors are to manage resources in an effective and efficient manner, to counteract climate change, and to measure and improve. The initiative encompasses a variety of targets, including the selection of a supplier to procure 100% of the energy from certified renewable sources with a guarantee of origin.
5. Innovability - The objective is to digitize in order to streamline processes, cultivate customer loyalty and engagement, and forge strategic alliances for the advancement of sustainability education.

During the same period, the company started to measure its sustainability performance, employing key performance indicators (KPIs), to assess its impact and implement corrective measures if needed. In 2021, Velocity Motors obtained its ESG certification, with a total score of 60/100, in recognition of its commitment to CS. Furthermore, in 2023 it obtained the ISO 9001 governance certification and started the process to get the ISO 14001 environment certification. In the same year, to further substantiate the firm's dedication to ESG pillars as a central element of its strategy and mission, the CEO approved the legal designation of "Benefit Corporation". Due to its long-term commitment and attention to CS, Velocity Motors was deemed the ideal setting for the present case-study.

Both primary and secondary sources were used in the data collection process. Firstly, we conducted 15 semi-structured interviews with the managers and employees of the firm from May to November 2024 both in person and via the Webex and Google Meet platforms. Through these interviews, we sought to understand the motivations and perceived benefits associated with SSM (Gill et al., 2008; Maas et al., 2016; Yawar and Seuring, 2017). Secondly, secondary sources, including sustainability reports, newspaper articles, and information available on corporate websites were consulted. To ensure objectivity and consistency, data triangulation was applied by cross-verifying the qualitative data obtained from interviews with relevant sections of the secondary sources, which were systematically coded by the authors (Fernandez-Vidal et al., 2022).

To ensure the scientific validity of our analysis, we employed the Gioia coding protocol (Gioia et al., 2013). In addition, our qualitative analysis is informed by the principles of the grounded theory (Charmaz, 2006; Glaser and Strauss, 2017; Urquhart and Fernández, 2013). More specifically, it consists of an integrative phase, and a comparison between the themes that emerged from analysis of the interviews, those found in the secondary sources, and concepts in the management control literature.

Based on the analysis of the responses, we could gather some preliminary findings. First, corporate culture, employee inclusion and involvement, and external stakeholder expectations, are antecedents of SSM. The preceding result is in harmony with prior literature on SSM (i.e. Ciocirlan and Pettersson, 2012; Galbreath, 2009; Grubnic, 2014; Staniškienė and Stankevičiūtė, 2018) and complement other papers (i.e. Oware and Mallikarjunappa, 2021). Secondly, this research shows how SSM increases company reputation (Lin et al., 2018), facilitates access to financing (Asimakopoulos et al., 2023; Ho et al., 2021; Huang and Shang, 2019), and nurtures a more flexible and innovative mindset among employees and managers, acting as a unifying force that aligns efforts with strategic goals (Beusch et al., 2022; Burritt and Schaltegger, 2010). Thirdly, by highlighting the complexity of measuring SSP, our preliminary results are in harmony with the findings of previous studies (i.e. Mani et al., 2020; Denu et al., 2023). However, by demonstrating that tailored KPIs and a narrative approach to disclosure, rather than a mere listing of numbers and indicators, are preferable in SSM, the present study expands the findings of previous studies (Staniškienė and Stankevičiūtė, 2018).

This work-in-progress study will provide theoretical and practical contributions. First, it will expand the scholarly discourse on SSM (Kühnen and Hahn, 2018; Mani et al., 2020). In fact, this research will help to bridge the literature gap seeking to garner additional empirical evidence on the definition and measurement of SS (Asiaei et al., 2021; Maas et al., 2016), thus also connecting the integration of SS logics with businesses contribution to the UN SDGs (Lu et al., 2021). Secondly, our findings will further develop the academic literature connecting companies' SS practices and their overall performance and reputation (Sroufe and Gopalakrishna-Remani, 2019). Thirdly, the present study will provide valuable insights to managers and entrepreneurs aiming to develop and measure SS. In fact, by highlighting some antecedents to SSM, it will provide managers with guidance on which factors they should leverage to foster it (Lu et al., 2021). Fourthly, by underscoring the market interest in firms' SSM, this study underlines the importance various stakeholders are placing upon companies' ability to measure and disclose their SSP (Grubnic, 2014). Fifthly, this research shows how firms' SS commitment enhances their overall performance, as it serves as a catalyst for managers and as a foundation for a more unified and coordinated business environment (Beusch et al., 2022; Burritt and Schaltegger, 2010). Finally, our study suggests that policymakers incentives, guidelines, or interventions may prove useful in nurturing SS practices and culture within organizations.

Keywords: Performance measurement systems; social sustainability; social sustainability measurement; ESG; CSR; sustainable development

Disclaimer

The authors have employed artificial intelligence and AI-assisted tools in the writing process to improve the readability and language of this abstract. However, it is important to note that the use of the foregoing technology has been applied with human oversight and control since AI can be incorrect, incomplete or biased.

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Qualità della rendicontazione di sostenibilità e successo sostenibile: un modello di valutazione integrato per le PMI italiane

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1. Introduzione e background della ricerca

La crescente attenzione alla sostenibilità, sia a livello politico-istituzionale che nel dibattito scientifico internazionale, ha reso sempre più evidente la necessità di un'evoluzione profonda dei sistemi di reporting aziendale. Le imprese, infatti, indipendentemente dalle loro dimensioni o dal settore di appartenenza, sono oggi chiamate a rendere conto non solo dei risultati economico-finanziari, ma anche degli impatti sociali e ambientali generati dalle proprie attività (Gray, 2010). Questa evoluzione in termini di rendicontazione aziendale non rappresenta un mero adeguamento normativo, ma un cambio di paradigma che potrebbe persino definirsi culturale e che interesserà tutti gli attori aziendali a vario titolo coinvolti nella gestione dei processi di produzione, uso e comunicazione delle informazioni aziendali (Bebbington et al., 2014). In questo quadro, il reporting aziendale non è più un esercizio di compliance, bensì un processo chiave di individuazione degli obiettivi da conseguire nel medio-lungo termine, di design delle correlate strategie, di guida delle azioni che operativamente ne conseguiranno e, non ultimo, di comunicazione del valore e delle capacità organizzative dell'azienda ai molteplici stakeholders (Adams, 2017) e alla Società intera. Tale processo richiede una forma avanzata di "intelligenza aziendale", intesa come la capacità collettiva dell'impresa di raccogliere, elaborare e interpretare informazioni complesse per orientare decisioni consapevoli e sostenibili. A questo specifico riguardo, il lavoro qui presentato si riferisce a un concetto di sostenibilità intesa in senso ampio e comprensiva di una dimensione economica, una di governance e una sociale che si accompagnano e si fondono indissolubilmente con quella ambientale.

Il quadro normativo relativo a questi temi, facendo riferimento al contesto europeo, presenta un dibattito estremamente variegato e dinamico (e.g., Dinh et al., 2023; Carungu et al., 2025) che ha promosso numerose iniziative internazionali come la "Corporate Sustainability Reporting Directive (CSRD)" e gli standard "ESRS" emanati dall'EFRAG, così come l'elaborazione di specifici framework di misurazione qual è il "GRI", solo per citare alcuni esempi. Da notare che una delle introduzioni recenti che più stanno stimolando il dibattito accademico ed operativo riguarda il mondo delle PMI non quotate (e.g., Allgeier e Feldmann, 2023), per le quali è stato anche proposto lo "standard VSME", acronimo di Voluntary Sustainability Reporting Standard

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for non-listed SMEs (EFRAG, 2024), ad ulteriore testimonianza della volontà di costruire un linguaggio comune della sostenibilità che includa anche le aziende di più piccole dimensioni. In tale contesto, l'applicazione delle suddette indicazioni rimane, tuttavia, un tema ancora sfidante, ampiamente dibattuto e, quindi, ampiamente inesplorato (e.g., Setyaningsih et al., 2024; Galli et al., 2024), soprattutto nella considerazione del contesto europeo che si caratterizza per una forte presenza di piccole (se non addirittura micro) imprese familiari, nelle quali risorse limitate e strutture organizzative meno formalizzate ed articolate possono ridurre la capacità di implementare processi di rendicontazione complessi.

Il presente progetto prende spunto da tali premesse, focalizzandosi, in particolare, sulla questione inerente alla "qualità" del reporting di sostenibilità effettuato dalle PMI non quotate.

Il concetto di "qualità" con riferimento alla reportistica (soprattutto di sostenibilità) aziendale, negli ultimi anni, è stato ampiamente dibattuto in letteratura, ma la trattazione sviluppata resta piuttosto frammentata e, tranne in rare eccezioni (e.g., Johnson, 2015; Roberto et al., 2024), risulta concentrata sulle esperienze delle grandi imprese quotate. Le PMI, pur rappresentando il tessuto produttivo prevalente in Italia e in Europa, risultano ad oggi poco indagate, permettendo l'identificazione di un primo research gap a cui si correla il presente progetto. Lo stesso concetto di "qualità" della disclosure non finanziaria con riferimento alle PMI merita, del resto, maggiore approfondimento includendo, in modo tutt'altro che univoco, dimensioni di "completezza, comparabilità, attendibilità, chiarezza e rilevanza" (Boiral, 2013; Michelon et al., 2015), come altri elementi, ad esempio intangibili, quali l'allineamento tra valori organizzativi e trasparenza comunicativa (Hahn e Kühnen, 2013).

In tale prospettiva, la presente ricerca — che ribadiamo essere ancora in corso — mira a proporre un quadro concettuale e metodologico per valutare la qualità della rendicontazione volontaria di sostenibilità delle PMI italiane, facendo esplicito riferimento all'applicazione dello standard VSME (EFRAG, 2024) all'interno dei report e ponendo specifica attenzione al ruolo delle intelligenze organizzative e tecnologiche che supportano non solo la produzione, ma anche la comunicazione e, non ultima, l'analisi di tale rendicontazione.

In questo senso, il progetto indaga anche sulle potenzialità offerte dall'IA — Intelligenza Artificiale (e.g., Moll e Yigitbasioglu, 2019) nell'analizzare rapidamente ed esaustivamente il contenuto dei report di sostenibilità delle PMI non quotate, garantendo la base informativa ed i feedback necessari affinché possa essere espresso un "giudizio" di qualità sui documenti prodotti. Il lavoro si colloca nel dibattito sulle "intelligenze aziendali" —come promosso dal Convegno AIDEA 2026 — almeno in due diverse prospettive: innanzitutto, interpretando il reporting di sostenibilità come espressione di una forma evoluta di intelligenza aziendale, di tipo sia gestionale che comunicativa; in secondo luogo, permettendo di dibattere il potenziale intrecciarsi delle funzionalità offerte dall'intelligenza artificiale per l'analisi dei report di sostenibilità con il risultato tangibile delle intelligenze aziendali, ovvero la stessa produzione dei report di cui trattasi, con finalità sia interne che esterne.

2. Inquadramento teorico

2.1. Dal reporting finanziario al reporting di sostenibilità

L'evoluzione del corporate reporting è strettamente connessa alla trasformazione delle finalità con lo stesso perseguite a livello di singola azienda. Nella prospettiva classica, l'obiettivo primario della reportistica aziendale consisteva nel fornire informazioni utili agli investitori per poter assumere decisioni economiche razionali. L'approccio contemporaneo sposta, invece, il focus verso la creazione di valore sostenibile per una pluralità di stakeholder (Adams, 2017), con le dimensioni economiche e sociali della sostenibilità che non solo si affiancano, ma si legano indissolubilmente a quella di tipo ambientale, definibile come maggiormente tradizionale.

In questo quadro, numerosi framework teorici potrebbero essere citati e presi come riferimento per comprendere le motivazioni e le finalità della rendicontazione aziendale

soprattutto in ambito di sostenibilità. A mero titolo di esempio, possono citarsi a riguardo la "legitimacy theory" (Suchman, 1995; Cho e Patten, 2007) e la "stakeholder theory" (Freeman, 1984), orientate a chiarire come la rendicontazione di sostenibilità rappresenti rispettivamente un meccanismo di costruzione di fiducia e di legittimazione sociale delle aziende nei confronti delle diverse categorie di portatori di interesse. Parallelamente, la teoria incentrata sul concetto di "intellectual capital" (Stewart, 1997; Edvinsson e Malone, 1997) evidenzia come la capacità di produrre e diffondere conoscenza sia essa stessa fonte di valore economico e sociale. Senza procedere oltre e rinviando alla letteratura esistente per approfondimenti (e.g., si veda De Micco et al., 2021 per una sintesi), già questi sintetici riferimenti permettono di comprendere non solo le molteplici motivazioni alla base del reporting di sostenibilità, ma anche la difficoltà di esprimere un giudizio sulla qualità di tale rendicontazione, com'è obiettivo del presente studio.

In questo quadro, il concetto di qualità della reportistica di sostenibilità (Daub, 2007; Fernández-Feijoó-Souto et al., 2012; Michelon et al., 2015; Boiral et al., 2019) non è limitabile alla quantità di informazioni fornite, ma deve essere in grado di riflettere anche la maturità organizzativa e cognitiva dell'azienda, ovvero la capacità di identificare, riportare e trasmettere informazioni finanziarie e non finanziarie tra di loro connesse all'interno di un coerente e funzionale sistema orientato a favorire il processo decisionale dell'azienda stessa, la comunicazione di rilevanti informazioni all'esterno ed il sensemaking dei diversi soggetti a vario titolo coinvolti. A tal fine e come descritto nel seguente paragrafo, il progetto di ricerca utilizzerà anche il framework messo a punto da Busco, Giovannoni, Riccaboni e Frigo (2024) incentrato sul concetto di "micro-foundations of corporate purpose".

2.2. Il ruolo delle intelligenze aziendali per la costruzione di un framework teorico di analisi

Il concetto di "intelligenza aziendale", come richiamato esplicitamente dal tema del Convegno AIDEA 2026 e dal suo call for papers, rimanda a un insieme di competenze e risorse cognitive distribuite che abilitano l'impresa a percepire, interpretare e agire in contesti complessi, anche apprendendo e posizionando basi per un miglioramento continuo nel tempo o, persino, per un successo sostenibile (Senge, 1990; Nonaka e Takeuchi, 1995; Teece, 2007). In questo quadro, il concetto stesso di intelligenza aziendale può essere interpretato in molteplici modalità tra loro intrecciate e in qualche modo riferibili poi al contesto di reporting di sostenibilità qui investigato, quali:

- l'intelligenza informativa, ossia la capacità di raccogliere e strutturare dati significativi;
- l'intelligenza relazionale, che consente di gestire le interazioni con stakeholder interni ed esterni;
- l'intelligenza riflessiva, ovvero la capacità di apprendere dalle esperienze e trasformare l'informazione in conoscenza organizzativa.

Nel tentativo di inquadrare anche questi aspetti all'interno del dibattito accademico, nel campo della sostenibilità tali dimensioni possono leggersi convenientemente alla luce di alcune proposte teoriche, quale quella incentrata sul concetto di "micro-foundations of corporate purpose" (Busco et al., 2024). Nel loro lavoro, gli Autori analizzano le modalità con le quali le micro-foundations di un'organizzazione - processi, pratiche e interazioni quotidiane - riescono a far prendere forma concreta a un concetto "macro" come il purpose (o, estendendo l'analisi, quello di sostenibilità). In particolare, lo studio evidenzia come i sistemi di performance management (PMS) diventino i dispositivi materiali e simbolici idonei a tradurre i valori e il purpose dell'azienda in comportamenti e decisioni operative, creare connessioni tra livelli strategici e micro-organizzativi, e favorire un apprendimento continuo in ambienti dinamici.

Nelle finalità di questo progetto, il framework delle micro-foundations di Busco et al. (2024) può essere applicato al reporting di sostenibilità poiché le pratiche, gli strumenti e le interazioni sociali che concretizzano il corporate purpose in contesti dinamici sono, di fatto, analoghi alle pratiche e routine che attivano il processo di rendicontazione. In questa prospettiva, il

sustainability reporting non rappresenterebbe un mero output documentale, bensì un insieme di pratiche manageriali e discorsive attraverso cui l'impresa costruisce senso (sensemaking), allinea comportamenti e comunica il proprio purpose e i propri valori, sia internamente che esternamente.

In estrema sintesi e nel contesto del presente progetto, le micro-foundations della disclosure di sostenibilità risiedono quindi nei processi di raccolta, interpretazione e traduzione delle informazioni - nei sistemi di performance management, negli strumenti contabili e nei momenti di confronto interfunzionale - che consentono all'organizzazione di trasformare la sostenibilità da concetto astratto in azione comunicabile e verificabile. Tali elementi costituiscono, pertanto, un elemento centrale dell'"intelligenza aziendale" che sostiene nelle PMI la produzione di una disclosure di sostenibilità di qualità elevata.

Le precedenti considerazioni, anche in relazione al tema del Convegno AIDEA e al progetto di ricerca da noi presentato, potrebbero ulteriormente espandersi fino ad offrire una prospettiva di analisi multidimensionale, in cui la qualità del reporting di sostenibilità potrebbe interpretarsi come funzione congiunta di:

- allineamento ai principi e ai requisiti degli standard (meccanismo di compliance);
- capacità informativa e comunicativa del documento (elementi di chiarezza, rilevanza e comparabilità);
- integrazione con i processi interni di pianificazione e controllo;
- maturità delle intelligenze aziendali, intese come capacità organizzative, digitali e cognitive che supportano la raccolta, l'elaborazione, l'analisi e la diffusione delle informazioni.

Ove tale prospettiva multidimensionale presenti una suggestiva estensione del progetto di ricerca qui presentato, alla fase attuale la proposta metodologica avanzata comprende solo parte di esso. In questo quadro, l'allineamento dei report di sostenibilità redatti dalle PMI in modo volontario allo standard VSME è considerato una proxy della qualità dei documenti analizzati dal team di ricerca.

Come elemento di dettaglio, appare utile far notare che lo standard VSME si struttura in due moduli (EFRAG, 2024):

- Base, corrispondente alla produzione di informazioni fondamentali su ambiente, società e governance (ESG);
- Comprehensive, inerente all'inserimento aggiuntivo di dettagli e dati più specifici, come la valutazione dei rischi climatici e le politiche sui diritti umani.

La considerazione congiunta dei due moduli permette, quindi, di valutare l'informativa di sostenibilità presentata dalle PMI ed apprezzarne la conseguente qualità.

In estrema sintesi e nel suo complesso, il framework ipotizza che il corretto coordinamento ed uso delle intelligenze aziendali conduca a un'alta qualità della disclosure e che tale qualità (valutata, appunto, in termini di aderenza alle VSME) si correli direttamente alla possibilità dell'azienda di rafforzare la trasparenza e di essere "accountable" verso i propri stakeholder.

3. Obiettivo e domande di ricerca

L'obiettivo generale del presente progetto si correla, come evidenziato, alla qualità della rendicontazione volontaria di sostenibilità delle PMI italiane nell'intento sia di proporre un modello di valutazione idoneo a misurarla, che di comprendere come le intelligenze aziendali contribuiscano ad accrescere la qualità raggiunta.

Nello specifico, la prima principale domanda di ricerca affrontata dal progetto è la seguente:

- RQ1. Qual è il livello di allineamento dei report di sostenibilità volontari delle PMI italiane non quotate rispetto allo standard VSME?

Questa RQ permetterà di esprimere un giudizio sulla qualità della reportistica di cui trattasi e verrà sviluppata rispondendo alle sotto-domande (o sotto-temi) di ricerca di seguito indicati:

o RQ1a. Esistono differenze settoriali o dimensionali significative nella qualità del reporting di sostenibilità tra le PMI italiane non quotate appartenenti a differenti industries (con particolare focus sui comparti dell'agri-food e della moda)?

o RQ1b. Nell'analisi dell'allineamento al VSME da parte delle PMI italiane non quotate, emergono delle scelte di rendicontazione peculiari?

o RQ1c. Sulla base dei dati rilevati e del loro trend storico, è possibile individuare dei cluster di PMI italiane non quotate caratterizzati da differenti livelli di maturità informativa e organizzativa?

La seconda domanda di ricerca fondamentale del progetto attiene all'impiego dell'intelligenza artificiale nel processo di rendicontazione aziendale, assumendo nello specifico la seguente formulazione:

- RQ2. Quale ruolo può essere assegnato all'intelligenza artificiale nel processo di analisi e valutazione della qualità dei report di sostenibilità delle PMI italiane non quotate?

Anche in questo caso, l'indagine si articolerà in alcune sottodomande (o sottotemi) di ricerca di seguito riportate:

o RQ2a. In che modo le capacità organizzative (intelligenze aziendali) e digitali (intelligenza artificiale) delle PMI italiane non quotate influenzano la qualità dei loro report di sostenibilità?

o RQ2b. Quali implicazioni emergono per la teoria della rendicontazione aziendale e per le politiche di supporto alle PMI italiane non quotate nella transizione verso pratiche di sustainability reporting di qualità?

4. Metodologia e disegno della ricerca

4.1. Articolazione, database ed estrazione delle informazioni

La ricerca adotta un approccio sequenziale misto (Creswell e Plano Clark, 2018). Nello specifico, l'utilizzo di un mixed-method approach (Modell, 2010) determina l'articolazione del progetto in tre fasi interconnesse che mixano elementi di ricerca qualitativa con elementi di natura quantitativa (Venkatesh et al., 2013) così sintetizzabili:

- analisi empirica dei report di sostenibilità volontari, basata sulla raccolta, classificazione e analisi di un set di report pubblicati da un panel esplorativo di PMI italiane non quotate operanti nei settori agri-food e moda;
- coinvolgimento di esperti, attraverso focus group e questionari strutturati, finalizzato a validare le dimensioni di qualità identificate e ad attribuire un peso di rilevanza a ciascuno dei diversi elementi informativi considerati;
- costruzione di un rating sintetico di qualità della reportistica di sostenibilità basato sull'allineamento ai moduli "Base" e "Comprehensive" dello standard VSME e sui giudizi ponderati degli esperti.

Il panel esplorativo di imprese che è stato al momento definito comprende PMI italiane con un report di sostenibilità volontario pubblicato nel biennio 2024-2025, ovvero per due anni consecutivi (2024 su dati 2023 e 2025 su dati 2024). I documenti sono stati raccolti da siti web aziendali e database pubblici. A ciascun report è applicata una "griglia di codifica" basata sui requisiti del VSME, articolata in numerose sezioni (11 nel modulo Base e 9 nel modulo Comprehensive), con oltre 80 indicatori qualitativi e quantitativi. Tre elementi di analisi considerati di rilevanza informativa generale sono addizionalmente posizionati alla fine della griglia.

L'analisi del contenuto dei report di sostenibilità, di fatto una procedura di content analysis (Krippendorf, 2018) per questo specifico ambito (e.g., Milne e Adler, 1999; Guthrie e Abeysekera, 2006), è supportata da strumenti di "Intelligenza Artificiale (IA)" per l'estrazione automatica delle informazioni testuali e numeriche (Moll e Yigitbasioglu, 2019; Yi et al., 2023). Il software utilizzato per l'estrazione è OpenAI e, in una fase preliminare di test del metodo, le

estrazioni ottenute sono state controllate e validate manualmente dai ricercatori per garantire l'accuratezza interpretativa delle estrazioni stesse (Neuendorf, 2017; Krippendorf, 2018). Nello specifico, ogni report è stato controllato indipendentemente da almeno due ricercatori che hanno poi incrociato le proprie estrazioni. In caso di discrepanze, i ricercatori hanno effettuato un'ulteriore verifica, inclusiva anche del controllo sui prompt di estrazione dell'IA utilizzati.

4.2. Focus group per la ponderazione degli indicatori e la costruzione di rating

La seconda fase della ricerca prevede, come anticipato, il coinvolgimento di esperti provenienti dal mondo accademico, istituzionale e imprenditoriale, organizzati in alcuni focus groups (Morgan, 1997). A tali esperti è, in particolare, richiesto di valutare, tramite scala Likert con 5 opzioni, l'importanza relativa dei temi ESG e dei requisiti informativi previsti dal VSME rispetto alla definizione della "qualità" dei report analizzati. Le loro valutazioni consentono di attribuire un "peso" alle diverse dimensioni del reporting di sostenibilità aziendale, generando una base empirica per l'analisi comparata.

La successiva integrazione dei punteggi di allineamento rilevati con i pesi definiti dagli esperti consente, in ultimo, di calcolare un indice composito di qualità ("quality index" o "rating") della rendicontazione volontaria di sostenibilità delle aziende considerate. Tale indice/rating, successivamente sottoposto ad analisi statistica, consentirà di individuare dei pattern ricorrenti e/o delle differenze sistematiche tra imprese in funzione del settore, della dimensione e delle capacità organizzative dichiarate.

In prospettiva, è inoltre in progettazione una fase di ricerca qualitativa tesa allo sviluppo di alcuni "case studies", appartenenti sempre all'ambito delle PMI italiane non quotate, tesi a comprenderne in profondità i meccanismi organizzativi che generano una rendicontazione di sostenibilità di qualità. Tale fase permetterà di triangolare i risultati quantitativi (Patton, 2014) e rafforzare la validità costruttiva del modello (Modell, 2009).

5. Risultati

5.1. Risultati attesi

I risultati attesi sono molteplici e si correlano ai diversi benefici che potrebbero trarre dallo studio varie categorie di interlocutori.

Per le PMI, la ricerca fornirà un feedback operativo concreto sul livello di allineamento al VSME e indicherà le aree di miglioramento della propria rendicontazione di sostenibilità, rendendo più chiaro cosa viene comunicato e come. Inoltre, l'impiego dell'Intelligenza Artificiale rappresenta un fattore chiave per le piccole e medie imprese, in quanto consentirà di ridurre i costi di elaborazione dei dati, semplificare le attività di rendicontazione e migliorare la capacità di interpretare e comunicare i risultati conseguiti ai propri stakeholder. Grazie a soluzioni automatizzate, anche le realtà di minori dimensioni potranno accedere a strumenti digitali avanzati per effettuare operazioni di analisi dei propri report (quindi di autovalutazione e di eventuale benchmark) che altrimenti richiederebbero risorse non disponibili.

Per i regolatori, emergeranno evidenze empiriche sulle prassi di rendicontazione di sostenibilità in atto, sulle aree coperte e su quelle ancora deboli, con utili indicazioni per l'implementazione della normativa correlata.

Per il mondo accademico, il progetto offre un contributo scientifico originale, riportando al centro del dibattito il tema della reportistica volontaria delle PMI e del suo ruolo nella trasparenza e nella creazione di valore. Il ruolo delle intelligenze aziendali e digitali sarà in tal senso discusso. Per gli esperti coinvolti nei focus groups sarà l'occasione di influenzare il dibattito,

contribuendo a definire non solo lo stato attuale della reportistica, ma anche ciò che "dovrebbe" essere comunicato dalle imprese. Inoltre, il progetto offrirà un momento di confronto unico tra accademici, practitioners, aziende e regolatori.

In aggiunta alle precedenti considerazioni, si evidenzia che il progetto intende offrire contributi anche su altri due fronti tra loro connessi.

Da un punto di vista teorico, questo progetto sviluppa e propone all'attenzione del dibattito un framework integrato atto a coniugare le teorie sulla qualità dell'informazione aziendale con la prospettiva delle intelligenze (organizzative e artificiali) di cui al Call for Papers del convegno AIDEA. In aggiunta, il progetto fornisce una base concettuale utile per definire cosa si intenda per qualità della disclosure di sostenibilità nelle PMI, ambito finora non particolarmente trattato dalla dottrina.

Da un punto di vista metodologico, il progetto sviluppa e testa un approccio operativo composito atto all'analisi della qualità dei report di sostenibilità delle PMI, articolando la proposta in molteplici parti. Innanzitutto, il progetto elabora una griglia di analisi dei report di sostenibilità delle PMI prendendo avvio da quanto previsto dallo standard VSME (EFRAG, 2024). In secondo luogo, il progetto introduce e successivamente discute le potenzialità di un approccio metodologico "ibrido" uomo-macchina (ovvero uso dell'IA congiuntamente al controllo ed alla validazione esperta da parte del team di ricerca umano) per la valutazione dei report, auspicabilmente migliorando efficienza e replicabilità del processo così avanzato. Infine, il progetto permette di elaborare un indice sintetico di qualità (o rating) del sustainability reporting aziendale, atto anche a supportare analisi longitudinali e comparazioni settoriali.

5.2. Risultati preliminari

Essendo un work-in-progress, i risultati al momento disponibili non possono che definirsi parziali. Le prime analisi, condotte su un sottoinsieme limitato di report, indicano un livello di allineamento ai requisiti VSME definibile medio, con maggiore aderenza per quanto riguarda gli elementi inseriti nel modulo Base rispetto a quello Comprehensive.

In merito all'uso dell'Intelligenza Artificiale come metodo di indagine, i risultati preliminari forniscono diversi feedback. Il primo è relativo alle potenzialità dell'IA come metodo di esplorazione dei report di sostenibilità delle aziende: senza dubbio, lo strumento si rileva potenzialmente di interesse, in primis, per le aziende e, poi, per le diverse categorie di stakeholders interessati. La seconda riflessione attiene ad eventuali problematiche legate direttamente all'uso dell'IA, tra le quali richiamiamo la necessità di prompts estremamente specifici e dettagliati e una variabilità non trascurabile nei record estratti.

Nel loro complesso, pur ribadendo ancora che si tratta di output intermedi e suscettibili di cambiamento futuro, i risultati sinora disponibili evidenziano che il metodo qui presentato ha potenzialità di utilizzo non indifferenti, per di più con vantaggi che possono essere chiaramente distinti per tutte le diverse categorie di attori coinvolti e/o interessati a questo processo.

Il prosieguo del progetto permetterà certamente di ottenere risultati maggiormente dettagliati e di approfondire tutte le considerazioni appena menzionate.

6. Conclusioni

6.1. Considerazioni conclusive

Nel suo complesso, la ricerca intende stimolare una riflessione più ampia sul ruolo delle aziende nella transizione verso modelli sostenibili. In questo quadro, il reporting aziendale, lungi dall'essere un mero adempimento burocratico, diventa attore primario del processo, configurandosi come un processo cognitivo che permette all'organizzazione di "conoscere se stessa" e, quindi, di autovalutarsi, allo stesso tempo aprendosi al confronto ed al giudizio esterno per dialogare attivamente con il contesto socio-economico di riferimento e la Società nel suo insieme.

In questa chiave, e riprendendo il tema del Convegno AIDEA, l'intelligenza aziendale è interpretabile come una consapevole capacità riflessiva e comunicativa che deve essere

patrimonio delle nostre aziende. Se presente (o creata e successivamente allenata), tale capacità si concretizzerà nella qualità dell'informazione prodotta, preziosa a fini sia interni che esterni.

La qualità del reporting, in tal senso, non è solo il risultato finale - ovvero l'output desiderato - del processo di analisi, autovalutazione e comunicazione delle informazioni, bensì la variabile chiave di esso, eventualmente esprimibile anche in modo aggregato e diretto tramite l'utilizzo di appositi indicatori sintetici o rating.

In sintesi, il lavoro qui presentato si propone di contribuire al dibattito accademico incentrato sulla trasformazione del reporting aziendale in ambito di sostenibilità. I potenziali benefici per una serie di soggetti (PMI, regolatori, mondo accademico, esperti coinvolti) che abbiamo richiamato in una precedente sezione sono testimonianza della rilevanza di questo tema, da un punto di vista sia teorico che operativo.

6.2. Limitazioni e ricerca futura

Essendo un "work-in-progress", la ricerca presenta alcuni limiti, ad iniziare dal fatto che alcune sue fasi sono ancora in corso di svolgimento.

In aggiunta a questo, va rilevato che il panel esplorativo di imprese attualmente analizzato, ancora ridotto, non consente di ottenere inferenze statistiche robuste, ma solo delle indicazioni che potrebbero definirsi sostanzialmente qualitative.

Ulteriormente, va notato che il tema della valutazione della "qualità" dei report di sostenibilità rimane tuttora aperto al dibattito accademico ed operativo: anche questo progetto conferma che tale valutazione rimane in parte soggettiva, pur se mitigata dall'uso di pesi e dal supporto fornito da esperti. Lo stesso standard VSME risulta, del resto, ancora in parziale discussione e, come di consueto nel richiedere ed identificare ampi set di indicatori di sostenibilità (e.g., Roca e Searcy, 2012), alcune modifiche al set di informazioni e KPIs suggeriti potrebbero aggiungersi in futuro.

Essendo il progetto ancora in corso, una parte delle sue fasi deve ancora essere conclusa. In particolare, l'uso dei pesi e lo sviluppo del rating sono due step al momento in via di realizzazione. Aggiuntivamente, e come ricordato in una precedente sezione, in prospettiva può prevedersi anche un'ulteriore fase di analisi qualitativa tesa allo sviluppo di alcuni case studies su un sottoinsieme di imprese, così da comprendere in profondità i meccanismi organizzativi che generano una disclosure di qualità, nonché per triangolare i risultati quantitativi e rafforzare la validità costruttiva del modello (Yin, 2009; Patton, 2014). Questa estensione del progetto sarà anche fondamentale per comprendere il ruolo giocato dalle micro-foundations (Busco et al., 2024) citate in questo paper.

Sintetizzando, alcune ipotesi di sviluppo futuro della ricerca comprendono i seguenti aspetti:

- l'estensione del dataset utilizzato per le analisi, eventualmente tramite la considerazione di settori di attività aggiuntivi a quelli finora considerati (ovvero, agri-food e moda);
- l'approfondimento qualitativo tramite lo studio di case studies longitudinali, eventualmente anche in ottica comparativa;
- la verifica del modello di analisi qui presentato in contesti internazionali;
- la costruzione di una piattaforma digitale per la valutazione automatizzata della disclosure di sostenibilità aziendale in collaborazione con enti di ricerca, software house e/o associazioni di categoria.

Parole chiave: Sostenibilità; reporting; VSME; qualità

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Sostenibilità e management accounting: evoluzioe dei sistemi di controllo nel Gruppo Ferrovie dello Stato Italiane (2014–2023)

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1. Introduzione

In un contesto caratterizzato da conflitti armati, cambiamenti climatici, pandemie e crescenti disuguaglianze sociali, le imprese sono chiamate a sviluppare competenze capaci di sostenere apprendimento organizzativo, reattività e capacità di mitigazione. In tale scenario, risulta fondamentale investire in sistemi di performance management solidi ed efficienti, in grado di supportare le strategie aziendali (Broccardo et al., 2024) e orientare le organizzazioni verso una gestione più consapevole e attenta alle dinamiche di medio-lungo termine.

Negli ultimi decenni, la ricerca nel campo del management accounting ha subito una trasformazione significativa. L'approccio tradizionale, focalizzato sul controllo dei costi e sul supporto alle decisioni economico-finanziarie, è stato progressivamente superato, spostandosi verso una prospettiva strategica e multidimensionale, nella quale la sostenibilità ha assunto un ruolo sempre più centrale (Varma et al., 2024; Mancini et al., 2016). Storicamente, la contabilità direzionale si concentrava su costi, efficienza produttiva e redditività, supportando la pianificazione e il controllo di breve periodo (Anthony & Govindarajan, 2007). Con il passare del tempo, tuttavia, tale approccio si è rivelato insufficiente nel rappresentare in modo adeguato gli impatti ambientali, sociali e di governance (ESG – Environmental, Social and Governance), i quali incidono in maniera significativa sulla capacità delle imprese di generare valore sostenibile nel lungo periodo (Gibassier & Schaltegger, 2015). Parallelamente, le crescenti pressioni di natura normativa, sociale e di mercato hanno incentivato le organizzazioni ad adottare forme di contabilità direzionale sostenibile, finalizzate a integrare indicatori non finanziari e metriche ESG all'interno dei processi di pianificazione, controllo e decisione strategica (Bebbington & Larrinaga, 2014; Schaltegger et al., 2019).

In questo contesto si è affermato il paradigma del Sustainable Management Accounting (SMA), inteso come l'insieme di pratiche, strumenti e processi contabili volti a supportare decisioni strategiche che integrano, in modo sinergico, le dimensioni economica, ambientale e sociale (Burritt & Saka, 2006). Il SMA rappresenta, pertanto, un'evoluzione del tradizionale management accounting, orientato non solo alla misurazione della performance interna, ma anche alla creazione di valore condiviso (Kramer & Porter, 2011) attraverso una gestione responsabile delle risorse ed un monitoraggio continuo degli impatti generati dalle attività aziendali. Esso consente una maggiore integrazione tra performance economico-finanziarie ed ESG, rafforzando la governance della sostenibilità e migliorando trasparenza e accountability (Johri et al., 2024; Naciti et al., 2022). In questa prospettiva, la contabilità direzionale assume un ruolo proattivo, supportando la transizione verso modelli di business sostenibili (Contrafatto & Burns, 2013; Mancini et al., 2023; Zhen & Rahman, 2024; He et al., 2023; Karim et al., 2023; Nguyen et al., 2023). La crescente attenzione alla sostenibilità ha inoltre portato a ripensare i sistemi di misurazione della performance, includendo indicatori non finanziari e orizzonti temporali più

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ampi: linee guida internazionali, come i Global Reporting Initiative (GRI) Standards, hanno consolidato il principio di trasparenza nella rendicontazione. Il modello GRI si è affermato come standard di riferimento predominante, in quanto offre un quadro sistematico, completo e comparabile per la comunicazione delle performance di sostenibilità (Afolabi et al., 2023; van Oorschot et al., 2024). Il Sustainability Reporting costituisce uno strumento essenziale per informare le parti interessate sulle attività e le politiche aziendali in materia ambientale, sociale e di governance (ESG), consentendo di comunicare in modo trasparente e strutturato l'impegno dell'organizzazione nella creazione di valore sostenibile (Broccardo et al., 2025). Dunque, l'uso di strumenti multidimensionali assolve l'arduo compito di creare valore sostenibile attraverso l'allineamento tra obiettivi economico-finanziari, ambientali e sociali.

Il presente lavoro si concentra sul settore dei trasporti, con particolare riferimento al comparto ferroviario, ritenuto un contesto empirico rilevante per analizzare la transizione verso modelli di gestione sostenibile. Il Gruppo Ferrovie dello Stato Italiane (FS), principale operatore nazionale, rappresenta un caso di studio significativo. Attraverso il proprio Report di Sostenibilità, pubblicato annualmente, il gruppo rende disponibili dati strutturati e comparabili relativi alle performance ambientali, sociali ed economiche. L'analisi longitudinale di tali informazioni consente di osservare l'evoluzione delle performance, degli impatti e delle pratiche di rendicontazione. Inoltre, permette di comprendere come i principi di sostenibilità siano stati progressivamente integrati nei sistemi di governance, nei processi decisionali e nelle attività operative. Il caso FS offre quindi un esempio concreto di applicazione del SMA in un settore ad alta intensità infrastrutturale, contribuendo alla comprensione del ruolo dei sistemi di controllo nell'istituzionalizzazione della sostenibilità.

Nonostante i progressi teorici, la letteratura presenta ancora alcune lacune empiriche. In primo luogo, molti studi adottano approcci cross-sectional o coprono periodi limitati, trascurando una prospettiva longitudinale capace di cogliere i processi evolutivi di integrazione degli ESG (Schaltegger & Burritt, 2017). In secondo luogo, risultano ancora limitate le evidenze relative a settori ad alta intensità infrastrutturale e a forte rilevanza pubblica, come quello del trasporto pubblico ferroviario italiano. Infine, il legame tra sviluppo del sustainability reporting e trasformazione dei sistemi interni di pianificazione e controllo rimane poco esplorato, soprattutto in termini di integrazione effettiva degli indicatori ESG nei processi decisionali e, ancor più sentitamente, nei collegamenti tra dichiarazioni, decisioni e azioni (Larrinaga & Bebbington, 2021; Cho et al., 2015).

Alla luce di tali criticità, emerge la necessità di studi empirici longitudinali che analizzino come le organizzazioni integrino progressivamente la sostenibilità nei sistemi di management accounting, evidenziando eventuali disallineamenti tra strategie dichiarate e performance reali.

2. Obiettivi e domande di ricerca

L'obiettivo del presente studio è quello di analizzare l'evoluzione dei sistemi di rendicontazione ed in particolare, in ottica di sostenibilità, per il Gruppo FS nel periodo 2014–2023, con particolare riferimento alla capacità dell'organizzazione di adattarsi alle sfide del periodo. Attraverso l'esame dei trend decennali di specifici indicatori riportati nei report di sostenibilità, la ricerca mira a fornire una valutazione empirica dell'integrazione progressiva di indicatori riferiti alle dimensioni ambientali, sociali ed economiche nei meccanismi di misurazione e controllo aziendale. È importante precisare che si tratta di un primo studio, limitato a un numero iniziale di variabili analizzate, ma che costituisce il punto di partenza per futuri approfondimenti.

In particolare, lo studio si propone di:

- analizzare l'evoluzione delle performance sociali, ambientali ed economiche del Gruppo FS nel periodo considerato;

- esaminare la relazione tra tali cambiamenti e lo sviluppo dei sistemi interni di pianificazione e controllo, con l'obiettivo di comprendere come il requisito della sostenibilità sia stato incorporato nei processi gestionali;
- indagare il ruolo della contabilità direzionale quale strumento di integrazione strategica nella creazione di valore economico e sostenibile, contribuendo alla transizione verso modelli di corporate governance orientati alla sostenibilità.

Alla luce di tali considerazioni, il presente studio si prefigge di rispondere alle seguenti domande di ricerca:

RQ1: in che modo evolvono nel tempo i principali indicatori di sostenibilità (ambientali, sociali ed economici) del Gruppo FS nel periodo 2014–2023??

RQ2: in che misura i cambiamenti osservati negli indicatori ESG riflettono un progressivo processo di integrazione della sostenibilità nei sistemi di pianificazione e controllo, in linea con i principi del SMA?

RQ3: quali evidenze emergono, dall'analisi congiunta dei dati quantitativi e delle disclosure narrative, in merito al grado di allineamento tra strategie di sostenibilità dichiarate e performance effettivamente conseguite?

Queste domande di ricerca guidano lo studio verso una riflessione più ampia sul ruolo del management accounting quale leva strategica per la sostenibilità e l'innovazione organizzativa.

3. Metodologia

La presente ricerca adotta un approccio longitudinale, basato sull'analisi sistematica dei Report di Sostenibilità pubblicati dal Gruppo FS nel periodo 2014–2023. Tale impostazione metodologica si ispira al paradigma della content analysis applicata alla disclosure di sostenibilità, strumento largamente utilizzato negli studi di management accounting e di corporate sustainability reporting per indagare l'evoluzione dei modelli informativi aziendali (Gray et al., 1995; Guthrie et al., 2006; Michelon et al., 2015). L'adozione di un approccio longitudinale consente di esaminare la traiettoria temporale dei principali indicatori ESG, evidenziando la coerenza e la progressiva integrazione delle dimensioni ambientali, sociali ed economiche nel sistema di controllo direzionale (Bebbington et al., 2001; Burritt & Schaltegger, 2010). L'analisi dei dati quantitativi e qualitativi, finalizzata a individuare pattern evolutivi ed eventuali discontinuità, consente di interpretare l'evoluzione ESG come riflesso dell'apprendimento organizzativo e dell'integrazione progressiva del management accounting sostenibile (Cho et al., 2012).

I risultati quantitativi sono stati triangolati con le informazioni narrative dei report (policies, strategie, obiettivi) per valutare la coerenza tra le dichiarazioni strategiche ed i risultati di performance: viene dunque adottata una qualitative content interpretation (Bouten et al., 2011; Adams & McNicholas, 2007). Inoltre, tale impostazione metodologica è coerente con la prospettiva del SMA, secondo cui la contabilità direzionale deve supportare la pianificazione e la misurazione delle performance sostenibili nel medio-lungo periodo (Schaltegger & Burritt, 2017).

La scelta di un caso singolo (Gruppo FS) si fonda sull'approccio di case study research (Yin, 2018; Eisenhardt, 1989), poiché consente di approfondire il legame dinamico tra strumenti di controllo e processi di sostenibilità in un contesto complesso e strategicamente rilevante per l'economia nazionale. Il focus su un arco temporale decennale permette di cogliere l'evoluzione non solo delle metriche, ma anche del linguaggio contabile e dei modelli di governance sostenibile (Ahrens & Chapman, 2006) negli studi di management accounting. Gli autori hanno analizzato, in questa prima fase dello studio, solo alcuni dei principali indicatori rappresentati all'interno delle tre dimensioni della sostenibilità:

- Area ambientale (focus su efficienza energetica e gestione dei rifiuti):
  - emissioni totali di CO2 (dirette e indirette);
  - rifiuti prodotti.
- Area sociale (focus sullo sviluppo del capitale umano, l'inclusione ed il benessere organizzativo):

- giornate di formazione dei dipendenti;
- presenza delle donne nei vari incarichi lavorativi;
- tasso di assenteismo.

- Area economica (focus sulla performance finanziaria e "redistributiva"):
  - valore economico generato;
  - valore economico distribuito.

I dati sono stati estratti e normalizzati, ove necessario, per consentire la comparabilità nel tempo. La ricerca è stata suddivisa in tre fasi:

- ricostruzione dei trend temporali: mediante analisi grafica si sono valutati i tassi di crescita o calo;
- interpretazione qualitativa dei trend: mediante le strategie e le politiche aziendali dichiarate nei report;
- discussione integrata dei risultati: valutazione del grado di allineamento con i principi del SMA.

In definitiva, questo approccio metodologico è stato guidato da ragioni legate alla disponibilità continua nel periodo analizzato, alla loro rilevanza rispetto alla letteratura sul sustainability reporting ed infine alla capacità di rappresentare dimensioni chiave del SMA.

4. Principali risultati

4.1. Performance ambientale

L'analisi dell'area ambientale restituisce un quadro caratterizzato da un'evoluzione non pienamente lineare. Le emissioni complessive di CO_2 del Gruppo FS, sia dirette che indirette, mostrano in effetti una riduzione non costante nel tempo. In numerosi esercizi, in particolare negli anni più recenti, si rileva una dinamica di sostanziale stabilità o di lieve incremento, riconducibile in parte all'ampliamento dei volumi operativi, all'estensione dei servizi offerti e alla crescita della domanda di mobilità. Tale andamento evidenzia come, pur in presenza di interventi di efficientamento energetico e di iniziative orientate alla decarbonizzazione, il Gruppo non abbia ancora conseguito risultati strutturali nella diminuzione delle emissioni totali.

In altri termini, la transizione ecologica è effettivamente in atto, ma gli effetti delle politiche ambientali implementate si manifestano in modo più graduale rispetto ai progressi conseguiti in altri ambiti. Alcuni indicatori disaggregati mostrano comunque lievi segnali di miglioramento: la quota di energia elettrica da fonti rinnovabili appare in crescita e, parallelamente, si registra un incremento della produttività energetica (misurata, ad esempio, in emissioni per ricavo o per passeggero-chilometro). Ciò testimonia l'esistenza di progressi riconducibili ad una maggiore efficienza operativa complessiva.

Per quanto concerne la gestione dei rifiuti, i dati disponibili delineano un'evoluzione tendenzialmente più favorevole: la quota di rifiuti avviati a recupero o riciclo risulta in crescita, mentre si riduce il ricorso alle tradizionali modalità di smaltimento. Tale andamento riflette una maggiore attenzione verso la circolarità dei materiali e l'adozione di procedure di monitoraggio più rigorose, in coerenza con gli obiettivi descritti nel Piano Industriale e con gli indirizzi della normativa ambientale europea. Nonostante ciò, la produzione complessiva di rifiuti si mantiene su livelli rilevanti, anche in ragione della complessità infrastrutturale e dell'impatto generato dai numerosi interventi di manutenzione e di nuove costruzioni.

Nel complesso, la performance ambientale del Gruppo FS evidenzia l'esistenza di un sistema di rilevazione e controllo solido, pur mostrando la necessità di tradurre più compiutamente le strategie delineate in risultati concreti e strutturali di riduzione delle emissioni. Dal punto di vista del management accounting, tale situazione mette in luce l'opportunità di integrare in modo ancor più stringente gli obiettivi ambientali nei sistemi di pianificazione e controllo, affinché la

sostenibilità ambientale si configuri come una reale variabile di performance e non soltanto come un obiettivo programmatico.

4.2. Performance sociale

L'analisi dei dati ha evidenziato un progressivo consolidamento dell'impegno sociale del Gruppo FS, come dimostrato da alcuni trend significativi, ad esempio: l'aumento delle giornate di formazione, la crescita della presenza femminile nei diversi livelli organizzativi e la graduale, seppur non del tutto lineare, riduzione del tasso di assenteismo. Particolarmente rilevante è l'incremento medio annuo delle giornate di formazione pro capite, che segnala la volontà del Gruppo di investire sul capitale umano quale leva strategica di competitività e sostenibilità. A partire dal 2018, è emersa un'accelerazione riconducibile all'implementazione di programmi orientati alla digitalizzazione, alla sicurezza e alla sostenibilità ambientale. Questo andamento suggerisce che il sistema di management accounting del Gruppo FS abbia progressivamente integrato "nuovi" indicatori nei meccanismi di misurazione e reporting, nello specifico sulla formazione, consentendo un monitoraggio più accurato sia della quantità sia della qualità degli interventi formativi realizzati.

Parallelamente, la presenza femminile ha registrato un miglioramento progressivo, sia nelle posizioni operative sia, in misura crescente, nei ruoli dirigenziali e di maggiore responsabilità. Tale andamento sottolinea un processo di inclusione strutturale all'interno del Gruppo, in linea con i contenuti del Piano Industriale e con le politiche europee in materia di parità di genere. Inoltre, l'aumento della rappresentanza femminile costituisce un indicatore della più ampia trasformazione culturale e organizzativa associata ai principi della sostenibilità, capace di valorizzare la diversità come risorsa strategica, sia sul piano economico sia su quello sociale.

Infine, il tasso di assenteismo mostra un miglioramento progressivo lungo l'intero decennio, con una flessione leggermente più pronunciata a partire dalla fine del 2017. Tale dinamica può essere ricondotta a condizioni di sicurezza più elevate, a un aumento della soddisfazione lavorativa e all'implementazione di politiche di welfare aziendale maggiormente inclusive. La riduzione dell'assenteismo risulta inoltre coerente con una crescente attenzione del management al benessere organizzativo, ormai divenuto un elemento imprescindibile nelle organizzazioni. Nel complesso, i trend sociali analizzati delineano un'evoluzione verso un modello gestionale che riconosce le variabili umane come componenti fondamentali della performance aziendale.

Alla luce di quanto è emerso, il management accounting si è progressivamente evoluto nell'includere indicatori sociali tesi ad orientare le decisioni strategiche in ambito formativo, inclusivo e di welfare, contribuendo così a una visione più integrata e sostenibile della gestione d'impresa.

4.3. Performance economica

L'analisi del valore economico generato mostra una crescita complessiva nel periodo considerato, con un'unica flessione significativa nel biennio 2020-2021, attribuibile chiaramente all'impatto della pandemia da Covid-19 e alle conseguenti restrizioni, tra cui la riduzione della domanda di mobilità ferroviaria. A partire dal 2022, il trend ha ripreso un andamento crescente, sostenuto sia da investimenti infrastrutturali sia dall'attuazione di strategie di diversificazione.

Per quanto riguarda il valore economico distribuito agli stakeholder, quali dipendenti, fornitori, azionisti, comunità e Stato, si è potuto appurare che esso si sia mantenuto coerente con la dinamica crescente del valore generato, con una quota progressivamente più elevata destinata a salari e benefit per i lavoratori, nonché a imposte ed a investimenti in infrastrutture pubbliche. Tale distribuzione evidenzia una gestione orientata a criteri di equità e di condivisione del valore, in linea con i principi della shared value theory, secondo cui la creazione di valore economico risulta sostenibile soltanto se accompagnata da benefici diffusi per la collettività.

Sotto il profilo contabile, la correlazione positiva tra valore generato e valore distribuito indica che il Gruppo ha progressivamente incorporato logiche di value-based management accounting, nelle quali la performance finanziaria è interpretata non più esclusivamente in termini di redditività per l'azionista, ma anche in relazione al contributo complessivo fornito agli stakeholder.

5. Conclusioni e valore della ricerca

L'analisi dei report di sostenibilità del Gruppo FS nel periodo 2014–2023 consente di formulare considerazioni conclusive relative alle tre domande di ricerca inizialmente formulate, delineando un percorso di sostenibilità in consolidamento, seppur ancora caratterizzato da margini di miglioramento, soprattutto sotto il profilo ambientale.

Rispetto alla RQ1, i principali indicatori di sostenibilità esaminati rivelano che la performance del Gruppo FS si è evoluta in modo significativamente positivo nelle dimensioni sociali ed economiche, mentre l'area ambientale rivelerebbe una dinamica più eterogenea. Sul piano sociale, si registra un rafforzamento strutturale nella gestione del capitale umano: l'aumento delle giornate di formazione pro capite, la progressiva crescita della presenza femminile nei diversi livelli organizzativi e la riduzione dell'assenteismo indicano un processo di maturazione verso modelli gestionali più inclusivi e orientati al benessere dei lavoratori. L'area economica presenta un andamento stabile e crescente, con un valore economico generato e distribuito che mostra resilienza anche nei periodi di shock (come la pandemia), confermando la capacità dell'impresa di sostenere la rete di stakeholder attraverso politiche redistributive coerenti e continuative. L'area ambientale, invece, fa emergere le maggiori criticità: le emissioni di CO_2 mostrano un andamento altalenante e non testimoniano un processo di riduzione sistematica. Questo risultato evidenzia le difficoltà intrinseche nel decarbonizzare un settore infrastrutturale complesso e ad alta intensità energetica. Tuttavia, segnali positivi emergono negli ambiti della gestione dei rifiuti e dell'efficienza energetica, dove si osservano miglioramenti progressivi, sebbene non ancora sufficienti a generare un impatto complessivo significativo.

In relazione alla RQ2, i cambiamenti osservati confermano che il Gruppo FS stia gradualmente evolvendo verso un modello di SMA, sebbene tale processo risulti maggiormente consolidato nelle dimensioni sociali ed economiche rispetto a quelle ambientali. In effetti, nelle prime due aree, gli indicatori di performance sono chiaramente integrati nei sistemi di pianificazione e controllo, con evidenze di monitoraggio continuo, rendicontazione strutturata e misurazione dell'impatto. La presenza di KPI relativi a formazione, inclusione, welfare e valore economico redistribuito testimonia un livello avanzato di maturità degli strumenti di accounting sociale ed economico. La dimensione ambientale, tuttavia, evidenzia una distanza ancora significativa tra intenzioni strategiche e risultati conseguiti. La difficoltà nel tradurre le iniziative ambientali in metriche contabili solide, omogenee e integrabili nei sistemi di controllo sottolinea una delle sfide cardine del SMA. È evidente la necessità di sviluppare sistemi informativi in grado di rappresentare in modo più accurato i trade-off tra obiettivi economici, riduzione delle emissioni e investimenti in tecnologie pulite. L'attuale livello di integrazione è dunque promettente, ma ancora in fase di consolidamento.

Rispetto alla RQ3, dall'analisi condotta si evidenziano significative implicazioni per la governance aziendale e per la rendicontazione integrata. I risultati mostrano che il Gruppo FS gode, senza dubbio, di una struttura di governo che riconosce la sostenibilità come elemento strategico, ma la piena integrazione nei processi decisionali richiede ulteriori sviluppi. Il rafforzamento dei meccanismi di accountability, l'allineamento tra strategia e misurazione dell'impatto e la trasparenza nei confronti degli stakeholder emergono come elementi centrali per garantire un'effettiva creazione di valore sostenibile. Per consolidare tale percorso, parrebbe necessario:

- includere sistematicamente KPI ambientali nei sistemi di budgeting e controllo;

- misurare gli impatti reali (e non solo potenziali) delle politiche di sostenibilità;
- integrare maggiormente indicatori ESG nei processi di valutazione delle performance manageriali;
- rafforzare la rendicontazione integrata come strumento di comunicazione e di accountability strategica.

Questo studio contribuisce alla letteratura sul SMA evidenziando che l'integrazione degli indicatori ESG nei sistemi di controllo non segue un percorso lineare, ma presenta dinamiche differenziate tra dimensioni ambientali, sociali ed economiche. Il contributo appena enunciato può essere meglio illustrato soffermandosi su tre principali direttrici. In primo luogo, offre un contributo empirico originale mediante un'analisi longitudinale decennale (2014–2023) dei report di sostenibilità del Gruppo FS, consentendo di osservare l'evoluzione degli indicatori ESG (seppur solo di alcuni) ed il loro grado di integrazione nei sistemi di controllo. In secondo luogo, contribuisce alla letteratura sul management accounting evidenziando come l'adozione di pratiche di sustainability reporting si traduca, in misura differenziata, in cambiamenti nei meccanismi di pianificazione e controllo. In altri termini, si mette in luce un percorso di maturazione non lineare, caratterizzato da asimmetrie tra dimensioni ambientali, sociali ed economiche. In terzo luogo, lo studio fornisce implicazioni teoriche e manageriali, mostrando come, in contesti infrastrutturali complessi, la transizione verso modelli di accounting sostenibile richieda non solo l'introduzione di nuovi indicatori, ma anche una profonda riconfigurazione dei sistemi informativi e dei processi decisionali, al fine di integrare efficacemente la sostenibilità come driver strategico di creazione di valore nel lungo periodo. Nel complesso, la ricerca mostra che la sostenibilità nel Gruppo FS è un processo graduale, in continua evoluzione. Gli strumenti di accounting e controllo stanno modificandosi per incorporare dimensioni non finanziarie, ma la piena maturità del sistema richiede un ulteriore allineamento tra strategia, operatività e misurazione. La vera sfida che emerge da questo studio è che occorrerà non solo ridurre le emissioni di CO_2, ma trasformare la sostenibilità in un driver decisionale, capace di influenzare scelte economiche, investimenti e strutture organizzative. I risultati suggeriscono che l'integrazione delle dimensioni ESG nei sistemi di controllo di gestione si sviluppa in modo non uniforme, evidenziando differenze tra le diverse dimensioni della sostenibilità. Tali evidenze indicano la necessità di ulteriori sviluppi nei modelli di Sustainable Management Accounting, al fine di favorirne una più piena integrazione nei processi decisionali aziendali.

Il disegno di ricerca presenta alcune limitazioni. In primo luogo, l'adozione di un caso singolo limita la generalizzabilità dei risultati, sebbene consenta un'analisi approfondita del contesto studiato. In secondo luogo, l'utilizzo esclusivo di dati secondari, derivanti dai report aziendali, può riflettere logiche di disclosure strategica e non necessariamente rappresentare in modo completo le dinamiche interne ai processi decisionali. Infine, la selezione di un numero limitato di indicatori, seppur rappresentativi, non consente di cogliere l'intera complessità delle dimensioni ESG.

Alla luce di tali limitazioni, futuri studi potrebbero ampliare il perimetro empirico attraverso analisi comparative multi-caso e l'integrazione di dati primari, nonché adottare prospettive longitudinali più estese e set di indicatori ESG più articolati, al fine di colmare le lacune evidenziate e approfondire i meccanismi di integrazione del Sustainable Management Accounting nei processi decisionali aziendali.

Parole chiave: Sustainable management accounting; ESG performance; sustainability reporting; management control systems; longitudinal analysis

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Incompletezza e uso abilitante delle misure di Customer Accounting: evidenze da un'impresa del largo consumo

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1. Introduzione

Le misure di performance sono dispositivi selettivi: rendono alcune dimensioni comparabili e quindi agibili per decidere, valutare e coordinare. Proprio perché parziali e contestabili, possono sostenere apprendimento oppure alimentare gaming, a seconda di come vengono introdotte, rese trasparenti, discusse e collegate ai meccanismi di controllo. La letteratura su enabling/coercive control mostra infatti che la stessa infrastruttura di misurazione può sostenere un'esecuzione intelligente della strategia oppure trasformarsi in un dispositivo coercitivo quando la pressione valutativa è elevata e la misura viene trattata come verità non negoziabile (Adler e Borys, 1996; Jordan e Messner, 2012; Wouters e Wilderom, 2008).

Questa ambivalenza diventa particolarmente visibile nell'attuale transizione customer-centric, che spinge le imprese a quantificare il cliente e a tradurre relazioni, canali, servizi e condizioni commerciali in performance misurabile per cliente o segmento (Vaivio, 1999). In molti contesti la risposta dominante è stata aumentare la granularità e la complessità del calcolo per avvicinarsi a una customer profitability "completa". Tuttavia, dove l'interdipendenza tra canali e servizi è alta e la pressione competitiva e promozionale è intensa, la completezza resta un orizzonte problematico: crescono convenzioni allocative discutibili, opacità, instabilità delle regole e conflitti interpretativi, con il rischio che la metrica diventi base di giudizio punitivo più che supporto al giudizio.

La customer accounting (Bonacchi e Perego, 2019) rappresenta così un setting rivelatore di un problema più generale dei sistemi di performance measurement e management. Non perché l'incompletezza sia peculiare di questo dominio, ma perché qui il trade-off tra "calcolo" e "governo" emerge con particolare forza. La letteratura più orientata alla customer profitability analysis ha mostrato che la CPA può aiutare a identificare clienti non profittevoli e a riallocare risorse verso segmenti più promettenti (Shapiro et al., 1987; Cooper e Kaplan, 1991; McManus e Guilding, 2008), e che il suo grado di sofisticazione varia in funzione di caratteristiche dei clienti, strutture di costo e relazioni di supply chain (Lind e Strömsten, 2006; Holm et al., 2012; Lueg e Ilieva, 2024). In questa prospettiva, la domanda implicita è quando convenga aumentare la sofisticazione del calcolo.

Una linea più critica mette invece in luce cosa accade quando misure inevitabilmente incomplete vengono usate sotto forte pressione valutativa. Da un lato, possono legittimare decisioni miopi, come l'esclusione di clienti che risultano "non redditizi" nei numeri ma restano strategici per accesso al mercato, economie di scopo o apprendimento. Dall'altro, possono innescare resistenze culturali e politiche, conflitti interfunzionali e progetti di customer profitability analysis che si arrestano prima di diventare strumenti di gestione (Boyce, 2000; Lind e Strömsten, 2006; Fish et al., 2017). Queste evidenze chiariscono il rischio, ma lasciano meno

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sviluppata un'altra domanda: non quanto raffinare la CPA, bensì come progettare le condizioni del suo uso in modo che l'incompletezza resti governabile e non si trasformi né in coercizione né in motivo per rinviare l'adozione.

In questo lavoro spostiamo dunque l'attenzione dal perfezionamento tecnico della misura al design istituzionale del suo uso, cioè a diritti, regole, trasparenze e livelli di pressione valutativa che rendono governabile l'incompletezza nelle routine decisionali (Bonacchi e Perego, 2019; 2024). Per rispondere a questa domanda adottiamo il framework di Adler e Borys (1996). Un indicatore è abilitante quando la sua formalizzazione incorpora proprietà che ne rendono possibile comprensione, contestazione e adattamento nell'uso. E' coercitivo quando si impone come standard opaco e unilaterale. A supporto di questa lettura, attingiamo a contributi che mostrano perché gli indicatori funzionano nella pratica: come visualizzano tensioni, come diventano persuasivi nelle arene di review, e come misure deliberatamente parsimoniose possano mobilitare conoscenza locale proprio perché restano contestabili (Catasús e Gröjer, 2006; Catasús et al., 2016; Goretzki et al., 2016; Vaivio, 2004).

Empiricamente, studiamo un singolo caso in una consociata del largo consumo che, sotto forte pressione promozionale, riprogetta la propria architettura di KPI. Invece di avviare una CPA completa, l'impresa introduce una proxy verificabile, il fatturato unitario per cliente/canale, affiancata da quota di mercato e da un set minimo di indicatori sentinella, e investe soprattutto nelle condizioni d'uso: alfabetizzazione economico-contabile, diritti procedurali di contestazione, finestre di stabilità delle regole e un collegamento agli incentivi intenzionalmente moderato. L'analisi non mira a validare la proxy come misura esaustiva della redditività del cliente, ma a chiarire i meccanismi che rendono una misura incompleta una base praticabile di decisione e, simmetricamente, le condizioni che limitano una deriva coercitiva. Il contributo consiste quindi nel proporre un modello trasferibile di customer accounting in action, in cui non è la completezza la risposta, ma il governo istituzionale dell'incompletezza che segnala una precondizione di intelligenza decisionale.

2. Disegno di ricerca e selezione del caso

Il caso, che chiamiamo "Pharmastore", è stato selezionato intenzionalmente come caso critico e strumentale (Eisenhardt, 1989; Scapens, 1990; Pettigrew, 1990; Yin, 2018; Lukka e Modell, 2010). Si tratta di una consociata italiana del largo consumo caratterizzata da tre condizioni che la rendono teoricamente feconda: forte esposizione alla pressione promozionale della GDO, transizione esplicita da KPI volumetrici a KPI customer-centrici, e riconoscimento ex ante dei rischi di deriva coercitiva e gaming connessi alla quantificazione del cliente. In questo contesto, la customer accounting è usata come setting rivelatore non perché "speciale" in sé, ma perché rende immediatamente osservabile un problema più generale: come misure inevitabilmente parziali diventino basi praticabili di decisione e coordinamento senza irrigidirsi in dispositivi punitivi.

Il caso singolo è coerente con l'obiettivo del paper di ricostruire processualmente come una metrica viene prodotta, messa in circolazione e ricevuta nelle arene decisionali, cioè la dinamica production–transmission–reception che spesso resta inesplorata quando gli indicatori vengono trattati come output tecnici (Catasús e Gröjer, 2006). La generalizzazione perseguita è analitica, non statistica (Yin, 2018): ciò che intendiamo rendere trasferibile è un insieme di meccanismi di design e uso che governa l'incompletezza, non la configurazione contingente dell'impresa.

Il framework di Adler e Borys (1996) è utilizzato come ossatura per distinguere formalizzazione abilitante e coercitiva. Le quattro proprietà sono trattate come criteri empiricamente osservabili nel redesign dei KPI. La riparabilità riguarda la possibilità di correggere errori e controversie senza dover aggirare la regola. La trasparenza interna riguarda l'intelligibilità della logica del calcolo, cioè assunzioni, driver, confini e status della misura. La trasparenza globale riguarda invece la comprensione del contesto più ampio in cui la misura opera,

quindi le interdipendenze con altri obiettivi, vincoli e trade-off. Infine, la flessibilità riguarda la possibilità di adattare la misura e le sue regole di uso senza arbitrarietà, preservando al tempo stesso credibilità e confrontabilità.

Coerentemente con Jordan e Messner (2012), trattiamo l'incompletezza come condizione strutturale delle misure. L'oggetto empirico non è stabilire se la proxy sia "vera", ma come la formalizzazione costruisca o eroda contestabilità e credibilità, e quindi quando la misura resti infrastruttura di giudizio invece di diventare autorità non negoziabile. Accanto a questa ossatura, impieghiamo alcuni concetti sensibilizzanti per interpretare perché certe scelte di formalizzazione contino nella pratica: la hope of action e l'ambivalenza riflessiva/ingenua degli indicatori (Catasús et al., 2016), la persuasiveness come esito situato nelle arene di valutazione (Goretzki et al., 2016), la provocativeness delle misure non finanziarie (Vaivio, 2004), e le dinamiche di visualizzazione, classificazione e drammatizzazione degli indicatori (Catasús e Gröjer, 2006).

La raccolta dati, sviluppata nell'arco di circa due anni, copre le fasi di diagnosi, progettazione e implementazione della nuova architettura di misure. Combiniamo interviste semi-strutturate con soggetti chiave della funzione commerciale, del trade marketing, del controlling e della direzione; osservazioni dirette di workshop e percorsi formativi; fonti documentali, come regole di calcolo, materiali di training, reportistica, minute operative e output di dashboard; e dati quantitativi interni, usati non per testare relazioni causali ma per corroborare la ricostruzione processuale e gli esiti organizzativi osservati. Questa pluralità di fonti è coerente con l'obiettivo di osservare non solo la metrica, ma il lavoro organizzativo che la rende utilizzabile nelle routine (Ahrens e Chapman, 2006; Yin, 2018).

L'analisi è stata iterativa, con un continuo andirivieni tra dati e quadro teorico (Pettigrew, 1990; Lukka e Modell, 2010). In una prima fase abbiamo codificato episodi relativi alle criticità dei KPI tradizionali, alle scelte di produzione della proxy, alle modalità di trasmissione e alle modalità di ricezione. In una seconda fase tali codifiche sono state rilette sistematicamente alla luce delle quattro proprietà della formalizzazione abilitante per identificare configurazioni specifiche di diritti, regole e pressioni valutative che stabilizzano un uso orientato a giudizio e apprendimento, oppure innescano derive verso coercizione e gaming. La credibilità dell'inferenza è sostenuta da triangolazione tra fonti, ricostruzione processuale della sequenza di cambiamento e focalizzazione sulle arene in cui i numeri vengono discussi e resi operativi, più che sulla sola architettura tecnica (Scapens, 1990; Ahrens e Chapman, 2006; Yin, 2018).

3. Il caso Pharmastore

Il caso riguarda la filiale italiana di un gruppo multinazionale del largo consumo, attiva sia in GDO/drugstore sia nel canale farmacia/specialty. Negli ultimi anni la pressione promozionale nella GDO si intensifica: sconti fuori fattura, fee crescenti, allestimenti dedicati e consegne frazionate aumentano i volumi ma comprimono il prezzo medio e aggravano i costi di servizio. Nel canale farmacia, invece, pur con volumi più contenuti, si osservano maggiore disponibilità a pagare, processi più lineari e minori costi di assistenza. In un workshop interfunzionale svolto a fine 2023 emerge in modo netto una tensione che incrina il framework volumetrico e che tornerà nelle review successive: a fronte di volumi spediti in crescita, il margine netto resta quasi piatto. L'aumento dei volumi è ottenuto tramite sconti e contributi promozionali che abbassano il prezzo medio e fanno crescere i costi di servizio. Continuare a governare la performance con KPI centrati sui volumi significa quindi legittimare azioni che fanno crescere solo consumando valore.

Da qui la decisione di riprogettare l'architettura dei KPI e, soprattutto, il regime d'uso con cui la performance viene interpretata e discussa. Il punto decisivo non è introdurre semplicemente un nuovo numero, ma costruire una misura capace di rendere visibile un trade-off ricorrente: la crescita che crea valore versus la crescita che lo distrugge. In questo senso, il caso consente di osservare non soltanto la nascita di una proxy, ma anche le condizioni organizzative che ne rendono l'uso praticabile.

La filiale sceglie deliberatamente di non partire da una customer profitability analysis completa per singolo cliente. Una CPA completa richiederebbe una tracciabilità e convenzioni allocative non ancora disponibili, soprattutto per sconti off-invoice, contributi promozionali, fee, costi di servizio e materiali POP imputati a livelli aggregati. Ancora più importante, una CPA completa rischierebbe di diventare subito una base di giudizio individuale, aumentando la probabilità di uso coercitivo e gaming. Il trade-off, quindi, non è tra "misura precisa" e "misura approssimativa", ma tra una sofisticazione tecnica innestata in un contesto ancora centrato sui volumi e ad alta pressione valutativa, e una proxy incompleta ma verificabile, capace di riorientare la lettura del portafoglio dai volumi ai clienti e di creare i prerequisiti per governare una maggiore granularità futura.

L'impresa introduce così una proxy parsimoniosa e controllabile: il fatturato unitario per cliente/canale, inteso come prezzo medio effettivamente realizzato per unità, cioè come effetto combinato di sconti, contributi e mix. La proxy è presentata come dispositivo diagnostico, non come profitto del cliente. Serve a rendere discutibile una domanda ricorrente nelle review: stiamo espandendo quota di mercato erodendo valore? Per evitare l'aura di esaustività, vengono esplicitati da subito assunzioni, componenti economiche e limiti di validità, e nella fase iniziale si esclude un uso individualizzante sotto forma di ranking. Questa scelta costruisce trasparenza interna in senso abilitante: la metrica viene trattata come convenzione leggibile, non come output tecnico autoevidente.

La proxy è letta congiuntamente ad altri indicatori: la quota sul mercato di riferimento e un set ristretto di indicatori sentinella, come resi, time-to-cash, proxy dei costi di servizio e livelli di servizio logistico. Le sentinelle non completano la profittabilità: impediscono piuttosto che la proxy venga ottimizzata contro il sistema. Una promozione può far salire quota di mercato e volumi ma comprimere il prezzo medio; se nello stesso periodo aumentano i resi o si allungano gli incassi, il miglioramento apparente dei volumi nasconde un deterioramento della qualità del ricavo. La lettura integrata non blocca l'azione, ma rende il trade-off non eludibile e obbliga a una discussione informata sulle conseguenze.

Per rendere la proxy una base praticabile di decisione, la direzione avvia la "Value Academy", un percorso formativo stabile per vendite, trade marketing e finance. L'obiettivo non è semplicemente spiegare un numero, ma costruire un linguaggio comune su cosa costituisce il ricavo effettivo, dove si collocano nei conti materiali POP, fee digitali e contributi volantino, e quali costi di servizio siano strutturali oppure dipendano da richieste specifiche del cliente. Il training lavora su documenti reali, come fatture, note di addebito e report resi, e su micro-casi che mostrano come promozioni ad alta visibilità aumentino i volumi ma comprimano il prezzo medio, mentre lanci premium in canali meno promozionati riducano leggermente i volumi ma migliorino il ricavo unitario mantenendo sotto controllo le sentinelle.

Questa fase è centrale per la trasparenza globale. La metrica non viene isolata, ma inserita in un quadro di interdipendenze tra promozione, prezzo medio, servizio, incasso e resi, che consente agli attori di collegare il proprio segmento di performance agli effetti sul sistema più ampio. Le esercitazioni sono progettate per usare quota e fatturato unitario anche ex ante, nelle negoziazioni, nei piani promozionali e nelle decisioni di assortimento, spostando l'uso del numero da pagella ex post a strumento di progettazione e coordinamento.

Parallelamente vengono definite regole d'uso pensate per stabilizzare la persuasività della proxy senza trasformarla in autorità indiscutibile. Tre scelte risultano decisive. Primo, i dati sono visibili a livello cliente/canale, ma si evita la trasformazione immediata in classifiche individuali. Secondo, viene istituzionalizzato un diritto procedurale di contestazione dei dati, con tempi, modalità e responsabilità codificati e con risposta attesa da parte di Sales Finance. Terzo, vengono introdotte finestre di stabilità delle regole di calcolo: eventuali modifiche entrano in vigore solo dall'inizio del periodo successivo, per evitare che la metrica diventi un bersaglio mobile.

Queste scelte operazionalizzano il repair. Quando la misura non torna, il sistema non costringe gli attori ad aggirare la regola o a difendersi informalmente, ma offre canali e procedure

per correggere errori, gestire eccezioni e trasformare controversie in apprendimento organizzativo. Un episodio è particolarmente istruttivo. In un trimestre il fatturato unitario riferito a una grande catena GDO scende nettamente. Il responsabile vendite attiva la contestazione allegando un piano promozionale approvato ex ante che prevedeva un prezzo più basso in cambio di esposizione a scaffale. Sales Finance quantifica l'effetto atteso e il comitato interfunzionale formalizza una regola generale per trattare promozioni analoghe nei report futuri. In questo modo il segnale non viene né spento né trasformato in colpa: viene reso interpretabile e generalizzabile, riducendo lo spazio sia per difese opportunistiche sia per gaming.

Solo dopo avere costruito linguaggio comune, contestabilità e stabilità delle regole, la filiale collega quota e fatturato unitario al sistema incentivante. Il peso del nuovo KPI sul bonus individuale è limitato e introdotto per gradi. Eventuali incrementi sono subordinati ad alcuni trimestri di apprendimento e a una lettura congiunta con le sentinelle. Questa gradualità operazionalizza la flessibilità in senso abilitante: la metrica può essere adattata e incorporata nel controllo senza arbitrarietà, preservando comparabilità e credibilità e riducendo il rischio che l'indicatore diventi una leva forte capace di incentivare distorsioni.

Nel confronto tra GDO e farmacia, l'architettura produce esiti distinti e discussioni più informate. In GDO, strategie basate su forti sconti possono alzare la quota ma abbassare il fatturato unitario e peggiorare resi e incassi. La parte variabile non premia automaticamente il risultato apparente, perché viene filtrato dalle sentinelle e dalle regole di interpretazione. Nel canale farmacia, anche in assenza di crescita dei volumi, l'aumento del fatturato unitario e il controllo delle sentinelle rendono visibile la qualità del ricavo, legittimando scelte commerciali orientate al valore. L'indicatore struttura l'attenzione e la conversazione manageriale, ma non è usato in modo così forte da rendere convenienti comportamenti distorsivi.

A circa diciotto mesi dall'avvio, le misure che avevano reso visibile la frattura iniziale restituiscono un quadro diverso. Volumi e margini si muovono in modo più coerente, il divario tra margine a budget e margine effettivo si riduce e gli scostamenti risultano più spiegabili lungo l'anno. Il controllo del margine diventa un processo continuo: monitorando mensilmente quota e fatturato unitario per cliente/canale, l'erosione del prezzo medio viene intercettata in corso d'opera, non solo a posteriori. Inoltre, la lettura del portafoglio cambia. Il contributo del canale farmacia, marginale nella narrazione per soli volumi, emerge come rilevante in termini di valore grazie a prezzi meno esposti alla pressione promozionale, minori richieste di servizi extra e mix più alto di gamma, inducendo un riequilibrio dei piani commerciali tra GDO e farmacia. In parallelo, marketing, vendite e finanza lavorano sugli stessi numeri e spostano il confronto dalla legittimità del KPI alle conseguenze economiche delle alternative decisionali, usando la proxy come base comune di argomentazione.

In sintesi, pur senza disporre ancora di una CPA completa per singolo cliente, una misura intenzionalmente semplice e incompleta, ma resa leggibile, contestabile, collegata alle interdipendenze di sistema e adattata in modo controllato, produce tre esiti rilevanti: maggiore tempestività nella gestione del margine, emersione di aree di valore sistematicamente trascurate dalla lettura per volumi, e cooperazione interfunzionale più efficace. Solo a valle di questo percorso vengono affrontati i mattoni informativi necessari per eventuali evoluzioni verso una customer profitability più raffinata, evitando di anticipare una sofisticazione tecnica che, in assenza delle condizioni istituzionali costruite, rischierebbe di attivare dinamiche coercitive.

4. Discussione e conclusioni

Il caso Pharmastore mostra che il miglioramento della qualità decisionale non dipende dall'introduzione di un conto economico esatto per cliente, ma dalla costruzione di regole e pratiche che rendono utilizzabile una proxy parziale: comprensibile nelle sue assunzioni, contestabile quando non torna, e capace di orientare le decisioni senza ridursi a una pagella. Questa lettura è coerente con l'idea che gli indicatori non descrivano semplicemente la realtà, ma

la rendano selettivamente visibile e quindi gestibile attraverso pratiche di visualizzazione e classificazione. Il valore informativo non è solo nella formula, ma anche nel modo in cui il numero viene prodotto, diffuso e interpretato nelle arene decisionali (Catasús e Gröjer, 2006).

Un primo risultato teorico consiste nello spostare l'attenzione dall'accuratezza alla teoria dell'indicatore in uso. Nel caso Pharmastore, la forza della proxy non deriva dalla completezza, ma dal suo disegno come dispositivo euristico e revisionabile. Il numero orienta, ma resta correggibile quando non torna, comprensibile nelle sue assunzioni, collegabile ai trade-off di sistema e sufficientemente stabile da preservare confrontabilità e credibilità nel tempo. Ne deriva che la qualità di una misura non può essere valutata solo in termini di fedeltà rappresentativa: conta anche la sua capacità di sostenere un uso intelligente sotto condizioni di incertezza e di incompletezza.

Un secondo risultato riguarda la persuasività dei numeri e la hope of action. I numeri diventano influenti non quando sono veri in astratto, ma quando risultano persuasivi per gli attori in una specifica situazione. Nel caso, la persuasività del fatturato unitario non è data: viene costruita attraverso alfabetizzazione, regole di visibilità, procedure di contestazione e una stabilità sufficiente delle regole di calcolo. Questo sposta l'attenzione dalla metrica come output alla metrica come *framing device*. Allo stesso tempo, il caso mostra che l'ambivalenza degli indicatori non va eliminata inseguendo un verdetto definitivo, ma governata progettando condizioni che rendano produttiva la speranza di azione associata al misurare: sentinelle, uso incentivante moderato, diritti di contestazione e finestre di stabilità.

Un terzo risultato riguarda la capacità delle misure di mobilitare conoscenza locale e coordinamento interfunzionale. Alcuni indicatori sono utli non perché chiudono il giudizio, ma perché rendono espliciti assunti, trade-off e causalità operative, inducendo gli attori a portare nel confronto informazioni che altrimenti resterebbero disperse o tacite (Vaivio, 2004). Nel caso Pharmastore, quota e fatturato unitario non sono solo strumenti di monitoraggio: diventano basi comuni di coordinamento nelle review, mettendo in relazione decisioni promozionali, condizioni commerciali, costi di servizio e tempi di incasso. In questo senso, l'impresa non si limita ad adottare un KPI customer-centric, ma riorganizza il lavoro interpretativo e le regole del confronto nelle arene decisionali.

Il lavoro presenta naturalmente alcuni limiti. I risultati provengono da un singolo caso in un contesto specifico, segnato da alta pressione promozionale e dualità di canale. La trasferibilità è quindi analitica: riguarda i meccanismi osservati, non la performance numerica né una particolare architettura di KPI. Ricerche future potrebbero confrontare contesti in cui la contestazione degli indicatori è più o meno legittimata; identificare condizioni di confine, come peso degli incentivi, turnover manageriale o qualità dei dati, che spostano l'uso verso forme più abilitanti o più coercitive; e seguire nel tempo la sostituzione di proxy semplici con misure più complete, osservando se e quando riemergono derive coercitive. In sintesi, il contributo del paper è spostare il focus dalla ricerca di completezza alla progettazione dell'uso: non basta misurare; occorre rendere l'informazione comprensibile, contestabile e azionabile nei luoghi in cui orienta le decisioni.

Parole chiave: Customer accounting; enabling control; performance measurement; incomplete performance indicators; customer-centricity

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Exploring Human–AI Collaboration for Managerial Control in the Italian Healthcare Sector

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1. Introduction

Over the past decade, the Italian healthcare system has faced increasing pressures to improve efficiency, transparency, and responsiveness in the use of resources (Boffardi, 2022; De Belvis et al., 2024; Ricciardi and Tarricone, 2021). The growing complexity of healthcare data—ranging from clinical records to administrative and financial information—has made managerial control an increasingly knowledge-intensive activity (Abbas, 2025; Brescia et al., 2025; Bose, 2003). Within this scenario, Artificial Intelligence (AI) is emerging as a transformative tool capable of supporting controllers by automating data analysis, detecting anomalies, and generating predictive insights (Brescia et al., 2025; Camilli et al., 2024; Jarrahi, 2018). The integration of AI tools, however, does not simply entail technological innovation but calls for a redefinition of roles, competencies, and collaboration patterns between human controllers and intelligent systems (Bankins et al., 2024; Berente et al., 2021; Lämmermann et al., 2024). Indeed, despite the potential of AI to improve decision accuracy and speed, its integration into managerial control systems within healthcare remains limited and fragmented (Abbas, 2025; Broccardo et al., 2024; Roppelt et al., 2024). Traditional control processes often rely on retrospective data and manual interpretation, leading to delays and inconsistencies, especially in contexts where information is incomplete or ambiguous (Camilli et al., 2024; Jarrahi, 2018; Li et al., 2024). Nevertheless, controllers in healthcare management must frequently operate under uncertainty, facing both data scarcity and interpretive conflicts between clinical and administrative perspectives (Conrad, 2011; Han et al., 2011; Shi et al., 2025). These challenges reveal a gap between the availability of AI-based analytical tools and their actual use in supporting managerial reasoning. The adoption of AI thus raises critical questions about the boundaries of human judgment, the reliability of algorithmic insights, and the ability of controllers to leverage these systems without losing interpretive authority or contextual understanding (Busuioc, 2021; Wubineh et al., 2024).

The relevance of studying AI in healthcare managerial control extends beyond technological efficiency: it touches upon the governance, accountability, and sustainability of healthcare systems (Brescia et al., 2025; Shi et al., 2025). The healthcare sector is characterized by both high informational density and institutional complexity, making it a prime context to observe how human–AI collaboration can shape organizational learning and decision quality (Jarrahi et al., 2023; Kolbjørnsrud, 2024; Nair et al., 2024).

Furthermore, the strategic role of controllers— as mediators between data and decisions— makes them key actors in determining how AI tools are integrated into existing control architectures (Berlinski and Morales, 2024; Granlund and Lukka, 1998; Szukits, 2022).

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Understanding the opportunities and risks of AI-supported control is thus essential to ensure that technological innovation reinforces, rather than undermines, professional judgment and value creation (Abbas, 2025; Kolbjørnsrud, 2024; Meijerink and Bondarouk, 2023).

However, studies on AI adoption in management control have largely focused on private and industrial organizations or have examined the topic through a technical lens (Agostino et al., 2022; Broccardo et al., 2024; Makarius et al., 2020). Few empirical works have explored how healthcare controllers perceive and interpret AI in their daily activities, particularly when operating under conditions of uncertainty, complexity, and equivocality (Koufteros, et al., 2005; Petersson et al., 2022; Shi et al., 2025). Moreover, current models of digital transformation often assume rational and data-driven decision processes, underestimating the interpretive and relational dimensions of controllers' work (Jarrahi, 2018; Lindebaum et al., 2020). This gap substantiates a need to understand how AI can complement, rather than substitute, humans in healthcare control functions. Addressing this gap requires a qualitative, context-sensitive approach capable of capturing both the technical and organizational implications of human–AI collaboration in judgment and decision-making environments typical of healthcare.

To address this gap, this study investigates how controllers of an Italian regional healthcare system perceive the advantages and limitations of AI across three distinct judgment and decision-making scenarios: uncertainty, complexity, and equivocality. Specifically, the research seeks to answer the following overarching question:

RQ: How can human–AI collaboration support managerial control in healthcare?

The study operationalizes this question through three sub-questions aligned with each scenario: (1) how AI supports controllers when data are incomplete or inconsistent; (2) how AI supports controllers when data are complex; and (3) how AI supports controllers in negotiation and consensus when multiple interpretations of the same data coexist. These questions guide both data collection and thematic analysis of open-ended responses from healthcare controllers.

To explore these research questions, the study employs a qualitative approach based on open-ended questionnaires administered to thirty managerial controllers across the Veneto healthcare system. The respondents were invited to reflect on specific scenarios corresponding to uncertainty, complexity, and equivocality, and to describe the perceived benefits and risks associated with AI tools in each case. Thematic analysis is used to identify patterns of reasoning and common perceptions across the sample (Braun and Clarke, 2006). Preliminary interpretations suggest that AI is viewed as a promising but ambivalent ally— capable of improving data reliability and analytical capacity, yet also raising concerns about interpretive transparency, contextual understanding, and professional autonomy. These emerging findings will form the basis for a more extensive discussion on the design of collaborative intelligence in healthcare control systems.

The expected contribution of this study lies in articulating how AI can reshape the epistemic and organizational boundaries of managerial control in healthcare. By analyzing how controllers interpret AI's role in uncertain, complex, and ambiguous contexts, the research provides theoretical insights into human–AI collaboration and practical guidance for digital transformation strategies. The study also aims to inform policymakers and regional authorities on the governance conditions necessary to foster responsible AI adoption in health systems. In doing so, it contributes to a broader reflection on how automation and human judgment can coexist productively, ensuring that technological innovation strengthens accountability, decision transparency, and the quality of healthcare service delivery. These implications highlight the potential of AI as both a technical and institutional driver of change.

2. Methodology

This study adopts a qualitative, exploratory design aimed at capturing the perceptions and expectations of managerial controllers regarding the integration of AI tools in the Veneto

healthcare system. The choice of an open-ended questionnaire, rather than structured interviews or surveys, is motivated by the need to allow respondents to express their reasoning freely, using their own professional language and examples (Brancato et al., 2006; Hansen and Świderska, 2024). This approach aligns with the study's interpretive objective: understanding how human actors make sense of technological possibilities and constraints in their everyday control activities.

The questionnaire includes three open-ended questions, each corresponding to a distinct judgment and decision-making scenario (as in Jarrahi, 2018): uncertainty, complexity, and equivocality.

- Scenario 1 (Uncertainty): Respondents reflect on how AI tools—such as real-time analytics, machine learning, and estimation algorithms—can assist controllers' analysis when data are incomplete, delayed, or inconsistent.
- Scenario 2 (Complexity): Respondents reflect on how AI tools can assist controllers' analysis when integrating and interpreting complex data and diverse data sources (clinical, administrative, and financial).
- Scenario 3 (Equivocality): Respondents consider how AI tools, such as sentiment analysis or decision-support systems, might facilitate controllers' work to build dialogue and consensus when different stakeholders interpret data differently.

Participants are 30 controllers employed in various healthcare units and local health authorities within the Veneto region, selected through purposive sampling to ensure representation across organizational levels and functions. Participation is voluntary and anonymized, in line with ethical research standards (World Medical Association, 2001).

The regional context provides an appropriate empirical setting, given Veneto's advanced digital infrastructure and its active experimentation with data-driven management practices.

Firstly, themes will deductively group controllers' responses around the three scenarios of uncertainty, complexity, and equivocality (Jarrahi, 2018). Secondly, the answers are deductively split into two halves for each scenario, enabling a comparison of perceived key value drivers and critical issues associated with AI tools implementation (Alhakami and Slovic, 1994). Finally, the open-ended responses will be analyzed through thematic content analysis, following the structured coding process of Braun and Clarke (2006). The textual data will be examined inductively to identify recurring patterns, key concepts, and salient metaphors used by participants.

This dual inductive–deductive approach allows the researcher to balance openness to emergent insights with the interpretive guidance of the theoretical framework. The analysis will focus on identifying both instrumental and interpretive dimensions of AI adoption. Instrumental dimensions include perceived efficiency gains, improved accuracy, and data accessibility. Interpretive dimensions, instead, concern issues such as trust in AI-generated outputs, role redefinition, accountability, and the preservation of professional judgment (Busuioc, 2021). By comparing these two dimensions across the three scenarios, the study aims to capture how controllers negotiate the balance between automation and human oversight in decision processes. While qualitative and exploratory, this methodology offers valuable insights into how practitioners conceptualize and anticipate AI's impact before its full implementation. The open-ended nature of the questionnaire ensures that respondents' reflections are grounded in concrete managerial experiences while remaining flexible enough to reveal cognitive and emotional undercurrents in their reasoning. The thematic synthesis will be presented in the form of scenario-based narratives, highlighting both convergent and divergent views among participants. Ultimately, this methodological design enables the study to contribute to the understanding of AI adoption not merely as a technological process but as an interpretive, organizational, and cultural phenomenon. The findings will thus inform both academic debates on human–AI collaboration and practical discussions on the governance of AI in healthcare control systems.

3. Expected findings

Although data collection and analysis are ongoing, several expected patterns can be anticipated based on preliminary readings and the theoretical framework. The study is expected to reveal that controllers perceive AI as a conditional enabler rather than a universal solution. In contexts of uncertainty, AI tools are likely viewed as useful in providing estimates and early signals when traditional reporting is unavailable, yet controllers may express concern about the opacity of algorithmic logic and the risk of overreliance on incomplete data (Busuioc, 2021; Jarrahi, 2018; Lindebaum et al., 2020). This suggests that AI is valued for its capacity to expand informational reach, but not necessarily to replace human inference.

Under conditions of complexity, controllers are expected to emphasize AI's potential to integrate heterogeneous data flows—such as clinical performance indicators, cost accounting data, and resource utilization metrics. They may perceive this integration as improving analytical coherence and facilitating cross-departmental coordination. However, anticipated concerns include data interoperability, standardization issues, and the difficulty of validating AI-generated patterns against domain expertise (Li et al., 2024). In this scenario, AI is seen as a catalyst for analytical depth but still dependent on human contextualization.

In situations of equivocality, where multiple interpretations coexist, AI is expected to play an ambiguous role. Controllers may anticipate that tools like sentiment analysis or natural language processing could help identify differing viewpoints or highlight underlying consensus areas. Yet they may also question whether algorithmic mediation could depersonalize dialogue or reinforce existing biases (Camilli et al., 2024; Hristov et al., 2022; Li et al., 2024). Hence, AI might be perceived as both a facilitator and a potential disruptor of organizational communication.

Overall, the expected findings suggest that AI's legitimacy in managerial control depends on its perceived alignment with professional values such as transparency, accountability, and interpretive flexibility. Controllers are likely to frame AI not as a replacement for human decision-making, but as a cognitive partner that extends human capabilities in processing and framing information. The anticipated outcomes will thus offer a nuanced understanding of how controllers envision human–AI collaboration within the constraints of healthcare governance.

4. Potential implications

The potential implications of this study should be understood as emerging possibilities rather than definitive outcomes. Since data collection and analysis are ongoing, the discussion focuses on how the anticipated findings could inform theory, practice, and policy once empirical validation is completed. The exploratory nature of this research allows the identification of potential trajectories for how AI might reshape managerial control in healthcare—without presuming that such transformations will necessarily materialize in the short term.

From a theoretical perspective, this study has the potential to enrich ongoing debates on human–AI collaboration by offering a scenario-based framework that differentiates between uncertainty, complexity, and equivocality. While existing research tends to treat AI as a homogeneous enabler of decision quality, the proposed approach could demonstrate that its contribution varies according to the informational conditions under which decisions are made (Haesevoets et al., 2025; Kleinberg et al., 2015; Li et al., 2024). This analytical distinction may help refine conceptual models of managerial control, suggesting that collaboration between human judgment and algorithmic analysis is context-dependent rather than universally beneficial. Such theoretical refinement could pave the way for a more contingent understanding of AI use in management control systems, integrating technological affordances with interpretive and institutional logics (Broccardo et al., 2024; Seidel et al., 2025).

Furthermore, the study could stimulate new research directions on the cognitive and organizational mechanisms underlying human–AI interaction. By observing how controllers

articulate trust, skepticism, or ambivalence toward AI, future research might examine how perceptions of technological agency evolve as systems become more embedded in daily routines. These insights could contribute to theories of sensemaking, professional identity, and control by revealing how individuals negotiate meaning when confronted with algorithmic partners. The anticipated findings might thus inspire longitudinal or comparative studies across sectors, exploring whether similar interpretive dynamics arise in other public or private contexts (Haesevoets et al., 2025; Shi et al., 2025).

From a managerial and organizational standpoint, several potential implications emerge. If the expected findings confirm that controllers perceive AI as a conditional enabler, organizations could explore ways to design collaborative decision environments where human and algorithmic inputs are balanced. This might include developing hybrid control dashboards that combine quantitative analytics with qualitative annotations, enabling controllers to contextualize AI-generated insights. Moreover, organizations could consider introducing decision protocols that explicitly define the boundaries of human oversight versus automated recommendation, thereby clarifying accountability in AI-supported processes (Haesevoets et al., 2025; Jarrahi et al., 2023; Kolbjørnsrud, 2024). While these ideas remain speculative, they illustrate how the insights generated by this research could inform the practical governance of AI in healthcare control systems.

The study could also highlight potential skill transformations within the profession of healthcare controllers. The anticipated reflections may suggest that successful AI adoption depends not only on technical competence but also on interpretive and communicative skills. This points to the possible emergence of a new professional profile—what could be termed the augmented controller—capable of mediating between data science and managerial sensemaking. Future training programs and capacity-building initiatives might therefore emphasize hybrid expertise, ethical awareness, and collaborative problem-solving. While these developments remain hypothetical, they represent plausible directions that organizations and policymakers could explore to prepare the workforce for AI-enabled control environments (Abbas, 2025; Camilli et al., 2024; Makarius et al., 2020).

At a policy level, the potential implications relate to how regional and national institutions might support responsible AI governance in healthcare. If the study's anticipated results confirm that trust, transparency, and interpretability are recurring concerns among controllers, policymakers could consider establishing guidelines or frameworks that promote explainable and ethically aligned AI systems. These frameworks could help organizations maintain accountability and safeguard professional autonomy while embracing data-driven innovation. However, such implications are prospective: they depend on the willingness of institutions to translate professional insights into regulatory or policy measures (Haesevoets et al., 2025; Hudson et al., 2019; Petersson et al., 2022). The study could thus serve as a foundation for dialogue between practitioners and policymakers about how to balance efficiency gains with ethical and social responsibility in AI adoption.

In addition, the research may open potential avenues for organizational learning. The scenario-based analysis could encourage healthcare authorities to view AI not merely as a technological investment but as a catalyst for collective reflection on decision processes. By framing uncertainty, complexity, and equivocality as distinct learning opportunities, organizations might use AI projects to experiment with new forms of cross-functional collaboration between clinicians, administrators, and data analysts. This learning potential could, in turn, foster a more adaptive and resilient control culture within the healthcare sector (Evenseth et al., 2022; Hristov et al., 2022; Shi et al., 2025). While these outcomes are not yet observable, they represent promising implications for institutional development.

Another potential implication concerns the ethical and epistemic dimensions of AI use. The anticipated findings could draw attention to questions about the ownership of knowledge, the boundaries of interpretation, and the legitimacy of algorithmic reasoning in healthcare-sector

judgment and decision-making. If controllers express concern about the opacity of AI or the dilution of human judgment, this could stimulate ethical debates about the nature of accountability in hybrid decision systems. Such reflections might eventually inform the design of educational programs, governance structures, or auditing mechanisms that ensure that AI complements rather than constrains human expertise (Haesevoets et al., 2025; Jarrahi, 2018).

Finally, from a methodological perspective, this study could demonstrate the value of open-ended, scenario-based questionnaires as tools for exploring professional reasoning about emerging technologies. This approach could inspire future scholars to adopt similar designs in different contexts, thereby expanding qualitative research on AI adoption beyond technical and performance-oriented paradigms. The method's potential lies in its capacity to reveal not only what professionals think about AI but also how they construct meaning around its role in their work. This interpretive richness could complement quantitative analyses and support the development of mixed-method frameworks capable of capturing the complexity of human–AI collaboration (Jarrahi, 2018; Nair et al., 2024; Shi et al., 2025).

In sum, the potential implications of this study are multidimensional and forward-looking. They do not represent established findings but rather plausible pathways that may emerge from the ongoing analysis. By exploring how AI could support managerial control under varying informational conditions, the research aims to stimulate academic discussion and practical experimentation in healthcare governance. Ultimately, the study seeks to open, rather than close, questions—inviting further inquiry into how human judgment, organizational learning, and technological intelligence can evolve together in shaping the future of managerial control.

Keywords: Artificial intelligence; healthcare; management control

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Life Cycle Costing: limiti ed opportunità dell'integrazione nel Life Cycle Sustainability Assessment

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1. Introduzione

In ambito economico-aziendale, la sostenibilità si configura come una strategia che, attraverso un approccio integrato, consente di armonizzare diverse dimensioni di performance, creando valore per l'intero insieme degli stakeholder, ovvero azionisti, comunità locali e il territorio, mantenendo una visione orientata all'equilibrio economico nel lungo termine.

Per adottare una condotta realmente sostenibile, le imprese devono sviluppare strategie, scelte organizzative e sistemi manageriali orientati alla sostenibilità che ne favoriscano un'efficace applicazione.

Ciò implica una ridefinizione del purpose aziendale, con un'apertura più marcata verso i diversi interlocutori (stakeholder capitalism) e l'adozione di un nuovo concetto di valore basato sulla prospettiva della condivisione (valore condiviso).

Il cambiamento di paradigma richiesto alle imprese è significativo e va ben oltre una lettura superficiale di temi ambientali, sociali e di governance (riassunti nel noto acronimo ESG). Esso richiede l'integrazione concreta di tali aspetti all'interno del modello di business aziendale per garantire la continuità nel tempo.

Il concetto di crescita economica, la quale presuppone un incremento della quantità di risorse consumate, lascia sempre più spazio al concetto di sviluppo sostenibile.

Il termine "sviluppo sostenibile", seppur molto diffuso, non presenta in letteratura una definizione univoca; Gibson (2010) ne sottolinea il carattere trasversale osservando come molte discipline abbiano influenzato e contribuito alla sua definizione, anche in maniera divergente.

Nel corso del tempo, questo concetto ha subito un'evoluzione significativa, adattandosi alle sensibilità della collettività emerse nel dibattito internazionale. Alcuni studiosi, (tra cui Bruynickx et al. 2012), lo descrivono come un contested concept, ovvero un'idea caratterizzata da una definizione ambigua e aperta a interpretazioni diverse.

Esso è strettamente connesso al concetto di sostenibilità, che frequentemente viene considerato come sinonimo.

Nell'ambito della presente analisi, lo sviluppo sostenibile può essere definito come un processo di cambiamento in cui l'utilizzo delle risorse, la direzione degli investimenti, lo sviluppo tecnologico e i mutamenti istituzionali risultano armonizzati rispetto alle esigenze future oltre che presenti. La sostenibilità, invece, rappresenta la capacità di un sistema di mantenersi nel tempo. In un contesto orientato allo sviluppo sostenibile, essa diventa l'elemento imprescindibile che caratterizza non solo il sistema economico, ma anche il suo interfacciarsi con i contesti sociali e ambientali in cui opera.

In tale contesto, lo studio dello sviluppo sostenibile richiede di affrontare questioni complesse associate a una vasta gamma di sistemi dinamici e interdipendenti (Boardman, and Sauser, 2008; Sanneh, 2018; Manioudis and Meramveliotakis, 2022).

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Concetti quali interconnessione, resilienza, capacità di adattamento, auto-organizzazione e feedback sono centrali negli sforzi verso la sostenibilità globale (Williams at al., 2017).

Di conseguenza, i sistemi basati sulla misurazione della sostenibilità e i sistemi di supporto alle decisioni sono essenziali per la trasformazione verso una produzione e un consumo più sostenibili.

A tale fine è opportuno adottare un approccio integrato, "integrated thinking", in cui, gli obiettivi di creazione di valore vengono individuati coinvolgendo i vari stakeholder, la governance formula strategie aziendali che contemplano la sostenibilità, traducendo il tutto in coerenti modelli di business.

Questo passaggio è fondamentale per fare sì che la sostenibilità sia integrata a partire dalle decisioni strategiche, per poi essere incorporata nelle politiche aziendali e nei processi operativi.

La nozione di approccio integrato riprende quella di pensiero sistemico (Senge et al., 2010), in quanto individua nelle interdipendenze e nelle relazionali causali le ragioni di esistenza delle tensioni e dei trade-off.

Alcuni studiosi (Gray, 1992, 2010) hanno evidenziato come l'integrated thinking possa rappresentare uno strumento per gestire le tensioni tra i vari capitali in relazione alla strategia, all'allocazione delle risorse, alla misurazione e al controllo dei risultati.

Pertanto, in ottica di integrazione della sostenibilità nell'ambito del business, la performance deve essere considerata da tre punti vista, quello economica, ambientale e sociale. Si tratta, in sostanza, di una performance che si può definire integrata (Vola, 2025).

La prospettiva della performance integrata presuppone un'analisi accurata della catena del valore per identificare le aree di impatto, raccogliere dati e informazioni e tradurli in indicatori che possano essere utilizzati per definire le priorità e prendere decisioni strategiche.

Il Life Cycle Thinking (LCT) è un approccio che valuta gli impatti di un prodotto o servizio (ambientali, sociali ed economici) lungo l'intero suo ciclo di vita, dall'estrazione delle materie prime fino allo smaltimento.

Questo approccio considera gli impatti lungo l'intero ciclo di vita del prodotto o servizio in esame, tenendo conto di molteplici indicatori di sostenibilità che facilitano l'identificazione dei trade-offs; la metodologia LCT è ben consolidata nel contesto della sostenibilità (Pelletier et al., 2018).

Dal punto di vista operativo, la Life Cycle Sustainability Assessment (LCSA) (Kloepffer 2008) rappresenta un quadro di riferimento completo che integra le dimensioni ambientale, economica e sociale della valutazione di sostenibilità.

L'approccio tradizionale alla LCSA prevede che si combinino diverse tecniche di valutazione dell'impatto per tenere conto degli aspetti ambientali, sociali ed economici; in particolare si tratta di combinare Life Cycle Assessment (LCA), Life Cycle Costing (LCC) e la Social Life Cycle Assessment (SLCA) (Luthin et al., 2024) (Arulnathan et al., 2022).

Una delle principali sfide nella combinazione dei diversi approcci risiede nell'integrazione della valutazione in presenza di requisiti e scale di dati differenti.

L'obiettivo del presente lavoro è discutere l'integrazione della metodologia LCC nell'ambito della LCSA.

Per fare questo, si effettuerà una duplice analisi: nella prima parte del lavoro, si discuteranno i punti di forza e di debolezza della LCC come strumento adatto a valutare la dimensione economica in un contesto di performance integrata, mentre, nella seconda parte del lavoro, tale metodologia sarà testata empiricamente attraverso l'analisi di case study.

La metodologia di ricerca adottata sarà dunque mista, prevedendo l'analisi della letteratura in tema di LCC e LCSA, ed empirica, per quanto riguarda l'analisi dei casi studio.

La finalità del presente lavoro è, quindi, quella di fornire indicazioni teoriche circa l'utilizzo della LCC in ambito LCSA e suggerimenti pratici, relativi alla sua integrazione nella LCSA.

Lo studio condotto è organizzato come segue: una prima sezione è dedicata all'analisi della letteratura in tema di LCSA, nell'ambito della quale si evidenziano punti di forza e di debolezza

della LCC. Successivamente vengono valutate le possibili integrazioni al modello LCC tradizionale, mediante l'individuazione di misure più idonee a valutare la creazione di valore.

Una volta sintetizzato il framework di lavoro adeguato per la misurazione dell'aspetto economico della sostenibilità, intesa come creazione di valore, vengono definiti i parametri di scelta dei casi di studio nell'ambito dei quali valutare l'implementazione della LCC.

La parte successiva del lavoro propone le principali evidenze empiriche e teoriche rispetto all'implementazione della LCC nella LCSA.

Le conclusioni riconducono le evidenze discusse ai contributi teorici evidenziati, mettendo in luce il contributo della ricerca.

Di seguito si riportano le principali evidenze emerse dalla letteratura che rappresenta la base di partenza del lavoro di ricerca.

2. Literature review

Se è vero che i principali studiosi concordano circa il fatto che la LCC rappresenti il metodo di riferimento per la valutazione economica nella LCSA, è altrettanto riconosciuto il fatto che il suo focus esclusivo sui costi sia inefficace nel rappresentare i molteplici aspetti della sostenibilità economica (Arulnathan et al., 2022).

In particolare, le ricerche hanno evidenziato che il costo, considerato come indicatore isolato, non è in grado di rappresentare le complessità e le sfumature delle prestazioni economiche (Arulnathan et al., 2022), portando a richieste di framework di valutazione economica più completi (Wood and Hertwich, 2013).

In sostanza, si evidenzia il fatto che il costo del ciclo di vita non è, di per sé, un indicatore sufficiente per la dimensione economica nelle valutazioni di sostenibilità.

Allo stesso modo in cui l'impronta di carbonio deve essere integrata con la valutazione di altri impatti nella valutazione della sostenibilità ambientale, il LCC e l'aggregazione dei costi richiedono indicatori complementari per fornire una valutazione più completa della sostenibilità economica nella LCSA, inclusa l'identificazione di potenziali compromessi.

Sviluppi recenti sono andati oltre gli approcci tradizionali di LCC per incorporare molteplici categorie di impatto economico.

Secondo Heijungs et al. (2013), infatti, è necessario andare oltre la mera aggregazione di costi, valutando una varietà di impatti da punto di vista economico.

Alcuni lavori, i principali si ricordano quelli di Wood and Hertwich (2013) e Neugebauer et al. (2016), propongono di considerare sei principali categorie di impatto economico da integrare nella LCSA: redditività, continuità, produttività, innovazione, clienti e autonomia, ognuna delle quali rappresenta un aspetto significativo della sostenibilità economica.

Questa visione si propone di superare il limite principale della LCC, la quale, nella sua versione più tradizionale, non ha il respiro necessario per rappresentare accuratamente i vari fattori legati sia alla prosperità sia alla resilienza dei sistemi economici.

Redditività

Indicatori individuati:

- Cost efficiency
- Indicators of profit
- Net Present Value (NPV)
- Internal Rate of Return (IRR)
- Payback Period (PP)
- Return on Investment (ROI)
- Return on assets, costs and sales
- Gross operating surplus

Gli indicatori di redditività rappresentano gli indicatori economici più ampiamente utilizzati nella letteratura esaminata. Ciò riflette la priorità che le organizzazioni attribuiscono alla redditività in un sistema di mercato orientato alla crescita. Gli indicatori di redditività sono generalmente indicatori quantitativi, lagging, e qualsiasi indicazione sulla performance futura deriva dalla stima dei ricavi futuri.

Tutti gli otto indicatori di redditività sopra elencati sono relativamente adatti all'inclusione nell'LCSA rispetto alle altre categorie di impatto.

Tutti richiedono dati sui costi che possono essere raccolti nella fase di inventario di un LCC.

Un altro aspetto importante degli indicatori di redditività è la capacità di considerare l'impatto degli investimenti a lungo termine come infrastrutture, macchinari, ecc.

Indicatori in grado di fornire informazioni sulla redditività di tali investimenti possono essere molto utili nel processo decisionale. Quando si valutano progetti di miglioramento della sostenibilità, un indicatore come il rapporto costo-efficacia risulta più significativo rispetto al confronto tra costi.

La maggiore debolezza nell'utilizzo degli indicatori di redditività rimane l'incapacità di distribuire i ricavi tra attività specifiche all'interno di un processo produttivo o tra flussi specifici.

Continuità

Indicatori individuati
- Risk aspects
- Contribution to GDP/GNP
- Diversification
- Employee satisfaction
- Reliance on imports and contribution to exports

La continuità si riferisce alla capacità di un'azienda di rimanere in attività.

Gli indicatori si riferiscono agli aspetti legati al rischio, alla diversificazione, al contributo al PIL e alla soddisfazione dei dipendenti.

I rischi in questo contesto sono generalmente rischi economici. Questi includono i rischi di investimento (tassi di interesse, ecc.), rischi associati alla regolamentazione governativa (tasse, politiche salariali, ecc.), e rischi di mercato (saldi di consumo, comportamento dei consumatori, ecc.). Tuttavia, non sono non solo i rischi economici che le imprese affrontano, dal momento che esse sono esposte anche a rischi tecnici come cambiamenti nella tecnologia, nella sicurezza e nell'accesso alle risorse.

La varietà dei possibili rischi per qualsiasi attività economica significa che è impossibile evitarli. Di conseguenza, l'enfasi è posta sull' identificazione del maggior numero possibile di elementi di rischio utilizzando metodi di valutazione del rischio strutturati (Andersen, 2008; Sandøy et al., 2005).

Una delle strategie più comuni per affrontare i rischi è la diversificazione. Ciò include la diversificazione dei prodotti, delle fonti di reddito, dell'accesso ai mercati e delle tecnologie utilizzate.

Gli altri due indicatori di stabilità considerati sono il contributo al PIL/PNL e la soddisfazione dei dipendenti. Il monitoraggio del contributo al PIL è stato considerato come una misura di prestazioni stabili, mentre la soddisfazione dei dipendenti è legata a una maggiore fidelizzazione e produttività. La soddisfazione dei dipendenti, in particolare, è stata fortemente correlata alla performance e alla sostenibilità.

Produttività

Indicatori individuati:
- Capital productivity

- Labor productivity

Sono stati identificati due indicatori di produttività: la produttività del capitale e la produttività del lavoro.

Nella letteratura esaminata, il termine si riferisce costantemente al capitale fisso, rappresentato, per esempio, dalle infrastrutture e dai macchinari.

La produttività del capitale è un fattore importante nelle prestazioni economiche a diversi livelli economici ed è influenzata da fattori quali i cambiamenti tecnologici e la manutenzione.

Anche il legame tra produttività del lavoro e performance economica è estremamente affidabile e dipende da fattori quali la soddisfazione dei dipendenti, l'autonomia e gli investimenti nella crescita tecnologica e della conoscenza.

Tutti i dati per la misurazione della produttività del lavoro sono probabilmente disponibili dagli inventari di LCA, LCC e SLCA, mentre la produttività del capitale richiederà un'ulteriore raccolta di dati (Thomassen et al., 2009).

Innovation

Wood e Hertwich (2013) definiscono due tipi di innovazione: (1) innovazione che porta ad un aumento della produzione di un processo a parità di input (innovazione di processo) e (2) sviluppo di nuovi prodotti (innovazione di prodotto). Entrambi questi tipi di innovazione possono portare ad un miglioramento delle prestazioni economiche.

Questa categoria di impatto non ha un indicatore chiaramente definito, ma è stata ampiamente citata nella letteratura esaminata. L'indicatore dell'innovazione sembra essere in gran parte un numero (numero di brevetti, ecc.) che rappresenta le pratiche innovative implementate/sviluppate dall'organizzazione.

L'aspetto più interessante dell'innovazione è la sua connessione con gli altri impatti economici qui definiti. L'innovazione può portare a una crescita della soddisfazione dei clienti e a un aumento della quota di mercato. L'innovazione può portare alla diversificazione dei prodotti e dei mercati che, a sua volta, porta a una maggiore resilienza economica. È anche un motore consolidato della produttività, sia a livello microeconomico che macroeconomico (Howell and Picking, 2017).

L'innovazione può anche portare a una maggiore soddisfazione dei dipendenti grazie alla creazione di conoscenza e ai cambiamenti tecnologici nei luoghi di lavoro.

Di conseguenza, nonostante la mancanza di un indicatore definito, l'innovazione rappresenta una delle categorie di impatto economico più importanti (ed è un indicatore principale).

Se il numero di innovazioni/pratiche innovative viene utilizzato come indicatore, esso può essere applicato lungo tutto il ciclo di vita e a livello di attività o flussi specifici in un processo unitario.

Clienti

Indicatori individuati:

- Market share
- Customer satisfaction

Per questa categoria sono stati identificati due indicatori: la soddisfazione dei clienti e la quota di mercato.

Oltre ad aumentare la redditività, i clienti soddisfatti sono considerati sempre più fedeli, migliorando la redditività e la stabilità futura. Mentre la quota di mercato è un indicatore diretto, la misurazione della soddisfazione dei clienti offre informazioni prospettiche

La quota di mercato non viene utilizzata come misura assoluta, ma le variazioni della quota di mercato sono considerate indicative delle variazioni della soddisfazione dei clienti.

Autonomia

Indicatori individuati:
- Reliance on imports and contribution to exports
- Subsidies
- External finance
- Invested Operating Capital
- Capital productivity

L'autonomia si riferisce all'autosufficienza dei sistemi economici sia dal punto di vista fisico (risorse, beni) che monetario. I quattro indicatori di questa categoria riguardano la dipendenza dalle importazioni, dai sussidi, dai finanziamenti esterni e dal capitale investito operativo.

L'indicatore della dipendenza dalle importazioni (o della bilancia commerciale quando utilizzato con i contributi alle esportazioni), che si riferisce agli input dell'attività produttiva ottenuti attraverso le importazioni, è utilizzabile su scala settoriale.

I sussidi e il loro impatto sia sulle prestazioni economiche che sulla sostenibilità rappresentano un argomento controverso; essi sono considerati parte integrante della promozione di pratiche sostenibili, dell'innovazione e dell'autonomia tecnologica.

Nel complesso, il ricorso ai sussidi è considerato un indicatore di scarsa performance economica nella letteratura esaminata.

Gli indicatori di autonomia individuati sono generalmente indicatori anticipatori di prestazione.

Keywords: Purpose; integrated thinking; life cycle costing; performance integrate; sostenibilità

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Diritti umani e competitività globale: la rendicontazione come leva strategica dell'internazionalizzazione

Elisa Gerbasi[1], Ilaria Mastrorocco[2], Michele Rubino[3]

1. Introduzione

L'internazionalizzazione delle attività economiche ha accresciuto l'esposizione delle imprese a contesti istituzionali eterogenei, caratterizzati da differenti standard normativi e livelli di tutela dei diritti fondamentali. Tale espansione ha incrementato la complessità dei processi di governance e la pressione esercitata dagli stakeholder affinché le imprese adottino comportamenti responsabili e trasparenti (Wettstein, 2009). In questo scenario, la tutela dei diritti umani è divenuta una componente imprescindibile della condotta aziendale e un elemento determinante per la legittimazione delle imprese nei mercati globali (Rubino e Mastrorocco, 2025).

Il consolidamento di tale prospettiva trova fondamento nei United Nations Guiding Principles on Business and Human Rights (UNGPs, 2011), che, a partire dal Protect, Respect and Remedy Framework (Ruggie, 2008), hanno definito la distinzione tra il dovere degli Stati di proteggere i diritti umani e la responsabilità delle imprese di rispettarli mediante adeguati processi di human rights due diligence (Lopatta et al., 2023). La crescente articolazione delle catene globali del valore rende tuttavia complessa la verifica della conformità agli standard sociali e ambientali, generando rilevanti sfide di governance e di coordinamento (Bernaz, 2016).

In tale contesto, la rendicontazione sui diritti umani rappresenta uno strumento attraverso il quale le imprese comunicano il proprio impegno etico e gestionale, rafforzando la trasparenza e l'accountability nei confronti degli stakeholder. Lo sviluppo di tali pratiche è stato favorito sia dall'azione di meccanismi di soft law, come standard volontari e iniziative multi-stakeholder, sia dall'affermarsi di requisiti di hard law che hanno reso più vincolanti gli obblighi informativi in materia sociale (Sikka, 2011; Islam e McPhail, 2011). La disclosure in materia di diritti umani assume pertanto una duplice valenza: da un lato, costituisce una risposta alle pressioni istituzionali generate dall'espansione internazionale; dall'altro, può configurarsi come una leva strategica di legittimazione e di posizionamento competitivo nei mercati esteri (Schrempf-Stirling e Wettstein, 2017).

La letteratura ha ampiamente indagato il modo in cui l'internazionalizzazione influisca sulle pratiche di sostenibilità e di rendicontazione non finanziaria, evidenziando come l'esposizione ai mercati globali accresca le pressioni istituzionali e le aspettative degli stakeholder, incentivando livelli più elevati di trasparenza informativa (Kolk e Fortanier, 2013; Yang et al., 2020; Garanina e Aray, 2021; Raimo et al., 2025). Tuttavia, le evidenze sul ruolo della disclosure come leva strategica a supporto dei processi di internazionalizzazione risultano ancora eterogenee e frammentate, mostrando effetti contingenti al contesto istituzionale, al tipo di disclosure considerata e ai meccanismi attraverso cui essa opera (Pesqué-Cela et al., 2024; Chen e Zhang, 2025). In particolare, la maggior parte degli studi si concentra su misure aggregate di corporate social responsibility o di disclosure ESG, dedicando un'attenzione limitata al contributo specifico

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della rendicontazione sui diritti umani. Inoltre, rimangono ancora poco esplorati i meccanismi attraverso cui le diverse dimensioni della human rights disclosure contribuiscono a rafforzare la legittimità e la competitività delle imprese nei mercati esteri.

Alla luce di tali limiti, il presente studio contribuisce alla letteratura esaminando il ruolo della rendicontazione sui diritti umani nei processi di internazionalizzazione delle imprese, adottando una concettualizzazione coerente con il framework dei United Nations Guiding Principles on Business and Human Rights. In particolare, l'analisi distingue tra le principali dimensioni della human rights disclosure al fine di valutare il contributo differenziato di tali pratiche alla costruzione della legittimità istituzionale e al rafforzamento della competitività nei mercati esteri.

2. Background teorico

La relazione tra la rendicontazione in materia di diritti umani e i processi di internazionalizzazione delle imprese può essere interpretata in modo efficace attraverso un approccio multi-teorico che integra i contributi della Resource-Based View (RBV) (Wernerfelt, 1984; Barney, 1991) e della Legitimacy Theory (Suchman, 1995). Tale prospettiva congiunta è stata già applicata nella letteratura sulla rendicontazione dei diritti umani (Lopatta et al., 2023) e, più in generale, negli studi relativi alla responsabilità sociale d'impresa e al business internazionale (Kolk e Fortanier, 2013; Ellimäki et al., 2021; Ma e Sambharya, 2024).

Secondo la Legitimacy Theory, le imprese intraprendono pratiche di rendicontazione non finanziaria, inclusa quella sui diritti umani, per allineare le proprie attività ai valori e alle aspettative sociali, assicurandosi in tal modo la propria "license to operate" nei diversi contesti istituzionali. L'espansione internazionale espone infatti le imprese a una pluralità di quadri regolatori e pressioni da parte degli stakeholder, incrementando la necessità di dimostrare conformità agli standard etici e normativi riconosciuti a livello globale. In tale prospettiva, la disclosure sociale rappresenta uno strumento fondamentale attraverso cui le imprese, in particolare quelle operanti in paesi in via di sviluppo o in contesti caratterizzati da elevata dipendenza da stakeholder internazionali, cercano di soddisfare le aspettative globali di responsabilità e trasparenza (Azizul Islam e Deegan, 2008). In tale prospettiva, la comunicazione chiara e verificabile delle politiche sui diritti umani e dei processi di human rights due diligence si configura come un meccanismo strategico per preservare la legittimità e mitigare i rischi reputazionali nei mercati esteri.

Oltre alla funzione di legittimazione, la Resource-Based View evidenzia come la rendicontazione sui diritti umani possa generare vantaggi strategici e competitivi di lungo periodo. In questa prospettiva, la trasparenza informativa in materia di diritti umani può essere considerata una risorsa strategica in grado di creare valore e differenziazione, poiché contribuisce allo sviluppo di asset intangibili difficilmente imitabili. In particolare, le pratiche di responsabilità sociale e disclosure favoriscono la costruzione di risorse immateriali - quali capitale reputazionale, fiducia degli stakeholder e competenze organizzative - che rispondono ai requisiti di valore, rarità, inimitabilità e non sostituibilità individuati dalla RBV (Branco e Rodrigues, 2006). L'integrazione del rispetto dei diritti umani nei sistemi di governance e la comunicazione trasparente di tale impegno consentono alle imprese di consolidare relazioni di lungo periodo con interlocutori chiave, riducendo i costi di transazione, agevolando l'accesso ai mercati e facilitando i processi di espansione internazionale.

Su tali basi teoriche, il presente studio analizza l'impatto della rendicontazione sui diritti umani sull'internazionalizzazione delle imprese, considerando sia l'effetto complessivo del fenomeno sia l'influenza specifica delle diverse dimensioni che compongono la disclosure sui diritti umani.

3. Sviluppo delle ipotesi

La letteratura esistente evidenzia come le imprese maggiormente impegnate in attività di corporate social responsibility (CSR) tendano a interagire più intensamente con un'ampia gamma di stakeholder esterni, sviluppando così competenze non di mercato e conoscenze istituzionali più avanzate (Zheng et al., 2015). Tali interazioni rafforzano la capacità delle imprese di operare in contesti globali complessi e di costruire legittimità in ambienti regolatori e culturali eterogenei, condizione cruciale per il successo dei processi di internazionalizzazione (Yin e Zhang, 2012). Inoltre, la trasparenza informativa, in particolare nell'ambito ambientale, sociale e di governance (ESG), contribuisce a ridurre le asimmetrie informative tra le imprese e gli stakeholder esteri. Le evidenze empiriche mostrano che una disclosure più articolata in materia ESG attenua gli svantaggi informativi degli investitori stranieri, favorendo maggiori flussi di investimento e una più ampia partecipazione ai mercati internazionali (Chauhan e Kumar, 2019). Al contrario, pratiche di disclosure deboli possono scoraggiare gli investitori e i partner commerciali internazionali, poiché le imprese vengono percepite come controparti meno affidabili o più rischiose (Aggarwal, Klapper e Wysocki, 2005). Recenti evidenze empiriche indicano che la rendicontazione non finanziaria contribuisce a sostenere la crescita delle esportazioni e la penetrazione nei mercati esteri, rafforzando la fiducia e la visibilità delle imprese presso i partner internazionali (Chen e Zhang, 2025).

In questa prospettiva, la rendicontazione sui diritti umani rappresenta una componente cruciale della trasparenza aziendale. Oltre a soddisfare gli obblighi normativi, segnala la consapevolezza etica dell'impresa, la solidità della governance e l'impegno verso pratiche di business responsabili, rafforzando così la legittimità e la fiducia degli stakeholder nei mercati internazionali. Pertanto, è ragionevole formulare la seguente ipotesi:

H1. Livelli più elevati di rendicontazione sui diritti umani sono positivamente associati al grado di internazionalizzazione delle imprese.

La crescente attenzione verso la condotta etica delle imprese multinazionali ha accresciuto le aspettative degli stakeholder internazionali sull'integrazione dei principi di responsabilità sociale e tutela dei diritti umani nelle strategie e nelle strutture di governance (Engle, 2007). Per mantenere legittimità e fiducia nei diversi contesti istituzionali, le imprese devono non solo adottare comportamenti responsabili, ma anche formalizzare tali impegni attraverso politiche e meccanismi di controllo specifici. L'istituzionalizzazione dei valori etici e degli standard internazionali rappresenta una forma di leadership strategica che segnala integrità, accountability e conformità alle norme globali. Evidenze empiriche confermano che livelli più elevati di impegno e formalizzazione delle pratiche di responsabilità sociale favoriscono la capacità delle imprese di penetrare nei mercati esteri, rafforzando la fiducia dei partner e riducendo i rischi percepiti da investitori e regolatori (Morteza Khojastehpour e Md Abu Saleh, 2020; Martos-Pedrero et al., 2023). In questa prospettiva, la disclosure trasparente degli impegni in materia di diritti umani e delle relative strutture di governance costituisce un segnale di gestione responsabile che accresce la legittimità aziendale nei mercati globali.

L'internazionalizzazione espone inoltre le imprese a rischi sociali, ambientali e reputazionali lungo catene del valore sempre più estese e complesse. La gestione di tali rischi richiede l'adozione di processi strutturati di human rights due diligence e la comunicazione trasparente delle modalità di identificazione e mitigazione degli impatti negativi (Lundan e Muchlinski, 2012). La rendicontazione di tali attività rafforza la resilienza e la percezione di affidabilità dell'impresa presso gli stakeholder (Bissoondoyal-Bheenick et al., 2023) e contribuisce a ridurre la liability of foreignness nei mercati esteri (Hunter e Bansal, 2001).

Infine, le imprese multinazionali sono sempre più chiamate a dimostrare un impegno attivo nel dialogo con gli stakeholder e a predisporre meccanismi di rimedio efficaci in caso di violazioni dei diritti umani. Tali pratiche, in linea con il terzo pilastro dei United Nations Guiding Principles on Business and Human Rights - Access to Remedy (Ruggie, 2013), accrescono l'accountability e la legittimità delle imprese nei mercati di destinazione (Gallhofer et al., 2011). Inoltre, la partecipazione a iniziative multi-stakeholder orientate alla tutela dei diritti umani rafforza la

reputazione e la legittimità relazionale, generando risorse intangibili fondamentali per l'ingresso e la permanenza nei mercati internazionali (Damert et al., 2021).

Coerentemente con il quadro teorico di riferimento e al fine di analizzare in modo distinto le principali dimensioni della rendicontazione sui diritti umani, si propongono le seguenti sotto-ipotesi di ricerca:

H1a. La formalizzazione e la disclosure degli impegni e delle strutture di governance in materia di diritti umani sono positivamente correlate all'internazionalizzazione delle imprese.

H1b. La disclosure dei processi di human rights due diligence e di gestione dei rischi è positivamente associata alla capacità di espansione internazionale delle imprese.

H1c. La trasparenza riguardante i meccanismi di rimedio e il coinvolgimento degli stakeholder contribuisce a consolidare la legittimità e la presenza delle imprese nei mercati esteri.

4. Metodologia

4.1. Sample e modello

L'analisi empirica sarà condotta su un campione globale di imprese quotate del settore manifatturiero, riconosciuto per il suo rilevante impatto ambientale e sociale derivante dall'intenso utilizzo di risorse, dai consumi energetici e dalla complessità delle catene globali di fornitura (Palea et al., 2023). La scelta di questo comparto è particolarmente pertinente per lo studio della human rights disclosure (HRD), in quanto le imprese manifatturiere sono spesso soggette a un attento scrutinio da parte degli stakeholder in merito alle pratiche lavorative, alle condizioni di lavoro e alla gestione dei fornitori (Kaeb, 2007; Islam e McPhail, 2011).

Il campione includerà le imprese appartenenti ai gruppi industriali Industrials, Materials, Consumer Staples, Consumer Discretionary (Cyclical Goods), Hardware Manufacturing e Utilities, secondo la classificazione Refinitiv Business Classification (TRBC), offrendo così una rappresentazione ampia e diversificata dell'economia manifatturiera globale. I dati, riferiti all'esercizio 2024, garantiranno la comparabilità e l'aggiornamento delle informazioni in linea con i principali framework di rendicontazione, tra cui gli GRI Standards e, per le imprese europee, la Corporate Sustainability Reporting Directive (CSRD).

Per testare le ipotesi di ricerca, verranno stimati modelli di regressione lineare (OLS) volti ad analizzare la relazione tra la rendicontazione sui diritti umani e il grado di internazionalizzazione delle imprese.

4.2. Definizioni delle variabili

La variabile dipendente dello studio è l'internazionalizzazione, definita come il grado in cui le attività e i ricavi di un'impresa provengono da mercati esteri (Sullivan, 1994; Lu e Beamish, 2004; Kolk e Fortanier, 2013). In linea con la letteratura in tema di international business e sustainability disclosure, essa è misurata attraverso la variabile International Sales, che rappresenta la percentuale di ricavi realizzati all'estero sul totale dei ricavi consolidati dell'impresa.

La variabile indipendente principale è la rendicontazione sui diritti umani, misurata attraverso un Indice di Rendicontazione sui Diritti Umani (HRDI) sviluppato mediante un'analisi manuale del contenuto dei report di sostenibilità e delle dichiarazioni non finanziarie. L'indice è costruito in coerenza con i principali framework internazionali, in particolare i United Nations Guiding Principles on Business and Human Rights (UNGPs, 2011) e la serie GRI 400 del Global Reporting Initiative, e con la letteratura accademica in materia (Kolk e Fortanier, 2013; Raimo et al., 2025).

L'HRDI comprende 30 indicatori di disclosure, suddivisi in tre dimensioni: (1) Commitment & Governance, (2) Due Diligence & Risk Management, e (3) Remedies & Stakeholder Engagement, in linea con il processo di human rights due diligence delineato dagli UNGPs

(Ruggie, 2013). Ogni elemento dell'indice sarà valutato su scala binaria, assegnando un punteggio pari a 1 se l'informazione è presente nel report e 0 in caso contrario (Raimo et al., 2025). Tale approccio consente di rilevare in modo oggettivo la presenza di pratiche di disclosure rilevanti, escludendo affermazioni generiche o prive di evidenza empirica (Islam et al., 2017).

Il punteggio massimo raggiungibile è pari a 30 punti, corrispondente al livello più elevato di completezza e qualità della disclosure, così distribuiti: Commitment & Governance (8 punti), Due Diligence & Risk Management (12 punti) e Remedies & Stakeholder Engagement (10 punti). Il punteggio complessivo dell'indice HRDI per ciascuna impresa sarà calcolato come somma dei punteggi ottenuti nei singoli item, mentre i sotto-indici dimensionali verranno analizzati separatamente per cogliere differenze di enfasi e maturità nella rendicontazione sui diversi ambiti della tutela dei diritti umani.

La Tabella 1 presenta la struttura e le componenti dell'Indice di Rendicontazione sui Diritti Umani impiegato per l'analisi empirica.

Item	Reference	Descrizione	Score
Commitment and Governance			
1. Policy aziendale sui diritti umani	UNGP 16(a)(d)(e)	Esistenza di una dichiarazione formale sui diritti umani, approvata ai massimi livelli, pubblicamente disponibile e comunicata internamente ed esternamente.	0-1
2. Ambito e aspettative verso terze parti	UNGP 16(c)	Indicazioni su come la politica definisce le aspettative nei confronti di dipendenti, fornitori e partner commerciali collegati alle operazioni dell'impresa.	0-1
3. Riferimento a diritti riconosciuti a livello internazionale	UNGP 12	Esplicito riferimento alla Dichiarazione Universale dei Diritti Umani e alle Convenzioni fondamentali dell'ILO.	0-1
4. Esistenza di programmi di formazione	GRI 412-2/ UNGP 16(d)	Presenza di programmi strutturati di formazione o sensibilizzazione sui diritti umani.	0-1
5. Copertura e partecipazione	GRI 412-2/ UNGP 16(d)	Informazioni su gruppi destinatari (dipendenti, management, fornitori) o dati quantitativi (sessioni, partecipanti, ore di formazione).	0-1
6. Contenuti della formazione	GRI 412/ UNGP 16(d)	Inclusione di temi fondamentali (es. due diligence, non discriminazione, salute e sicurezza, libertà sindacale).	0-1

7.	Ruoli di governance e supervisione	UNGP 19(a), 23–24 / GRI 412-2	Descrizione delle responsabilità interne e dei flussi di reporting in materia di diritti umani.	0-1
8.	Coerenza in contesti complessi	UNGP 23(b)(c)	Informazioni su come l'impresa gestisce i rischi nei contesti affetti da conflitti	0-1
Due diligence and risk management				
9.	Quadro formale due diligence	UNGP 17 / GRI 412-1	Presenza di un processo strutturato per l'identificazione, valutazione e gestione dei rischi e impatti sui diritti umani.	0-1
10.	Integrazione e azioni di follow-up	UNGP 17 / GRI 412-1	Descrizione delle modalità con cui i risultati della due diligence vengono integrati nelle decisioni manageriali.	0-1
11.	Coinvolgimento degli stakeholder	UNGP 18	Evidenze di consultazioni con lavoratori, comunità o soggetti potenzialmente impattati.	0-1
12.	Reattività e integrazione del feedback	UNGP 18	Indicazione di come i contributi degli stakeholder influenzano le risposte e il monitoraggio aziendale.	0-1
13.	Integrazione operativa	UNGP 19(b)	Evidenza dell'inserimento dei risultati della due diligence nelle politiche e procedure operative.	0-1
14.	Priorità e azioni di mitigazione	UNGP 19(b)	Informazioni sulla priorità assegnata ai rischi più rilevanti e sulle misure preventive adottate.	0-1
15.	Sistemi di monitoraggio e indicatori	UNGP 20	Descrizione di meccanismi o KPI utilizzati per valutare la performance in materia di diritti umani.	0-1
16.	Clausole e valutazioni della catena del valore	UNGP 13 (b) / GRI 412-3	Presenza di clausole contrattuali sui diritti umani o procedure di audit sui fornitori.	0-1

17.	Non discriminazione e parità di trattamento	UNGP 11-12/ GRI 406-1	Informazioni su casi di discriminazione e azioni intraprese per prevenirli.	0-1
18.	Libertà sindacale e contrattazione collettiva	UNGP 12-13/ GRI 407-1	Identificazione di operazioni o fornitori a rischio in materia di libertà di associazione.	0-1
19.	Lavoro minorile	UNGP 12/ GRI 408-1	Presenza di rischi significativi di lavoro minorile nelle operazioni o nella catena di fornitura.	0-1
20.	Lavoro forzato o obbligatorio	UNGP 12/ GRI 409-1	Informazioni su rischi o casi di lavoro forzato o coatto.	0-1
Remedies and stakeholder engagement				
21.	Meccanismi di reclamo a livello operativo	UNGP 29	Esistenza e caratteristiche generali dei meccanismi di reclamo disponibili per dipendenti, fornitori o comunità.	0-1
22.	Procedure di reclamo o rimedio	UNGP 22	Presenza di processi interni o esterni per la gestione dei reclami.	0-1
23.	Risultati delle azioni di rimedio	UNGP 22	Informazioni sui casi gestiti, le modalità di risoluzione o la cooperazione con organismi giudiziari/non giudiziari.	0-1
24.	Comunicazione e riservatezza	UNGP 21 (c)	Modalità di comunicazione dei casi nel rispetto della confidenzialità e della tutela delle parti coinvolte.	0-1
25.	Valutazioni o audit sui diritti umani	GRI 412-1	Evidenza di audit o valutazioni sui diritti umani e relativi risultati.	0-1
26.	Rischi per comunità locali o indigene	UNGP 18, 22 / GRI 411-1	Identificazione di rischi o impatti che coinvolgono comunità locali o indigene.	0-1

27. Consultazioni o azioni di rimedio	UNGP 18, 22 / GRI 411-1	Informazioni sulle attività di consultazione e sulle misure di rimedio adottate.	0-1
28. Coinvolgimento strutturato degli stakeholder	UNGP 18	Descrizione di processi strutturati di dialogo con le comunità e i gruppi di stakeholder.	0-1
29. Partecipazione e integrazione del feedback	UNGP 18	Evidenza della frequenza delle consultazioni e del modo in cui il feedback influenza le decisioni aziendali.	0-1
30. Gestione della sicurezza e relazioni con le comunità	UNGP 23/ GRI 410-1	Descrizione dell'approccio aziendale alla gestione delle pratiche di sicurezza e ai rapporti con le comunità locali.	0-1

Tabella 1. Human Rights Disclosure Scoring Framework

Al fine di migliorare la bontà del modello saranno inserite le seguenti variabili di controllo. Nel dettaglio, dimensione aziendale (SIZE), misurata come logaritmo naturale del totale attivo, per la redditività (ROA), data dal rapporto tra utile netto e totale attivo, e per la leva finanziaria (LEV), calcolata come rapporto tra debiti totali e totale attivo, al fine di considerare l'effetto delle risorse, della performance economica e della struttura del capitale sull'internazionalizzazione. È inoltre inclusa la performance ESG complessiva (ESG_SCORE), fornita da Refinitiv, per distinguere l'impegno generale di sostenibilità dalla disclosure sui diritti umani, nonché il rapporto Market-to-Book (MTB), che cattura le opportunità di crescita e le aspettative del mercato nei confronti dell'impresa.

5. Risultati attesi, implicazioni e conclusioni

L'analisi empirica è attesa confermare una relazione positiva tra la rendicontazione sui diritti umani e il grado di internazionalizzazione delle imprese. Le aziende che comunicano in modo più ampio e sostanziale le proprie pratiche in materia di diritti umani dovrebbero mostrare una maggiore capacità di penetrazione e stabilità nei mercati esteri, grazie al rafforzamento della legittimità, della trasparenza e della fiducia da parte degli stakeholder internazionali. In tal senso, la HRD contribuirebbe a ridurre le asimmetrie informative e i rischi percepiti nelle operazioni transfrontaliere, fungendo da leva strategica per la competitività globale.

Dal punto di vista teorico, lo studio intende ampliare il dialogo tra la letteratura sull'international business e quella sulla responsabilità sociale d'impresa, evidenziando come la disclosure sui diritti umani possa essere interpretata sia come risorsa strategica, coerente con la Resource-Based View, sia come meccanismo di costruzione della legittimità, in linea con la Legitimacy Theory. La HRD si configura dunque come un fattore proattivo, capace di sostenere la crescita internazionale attraverso il consolidamento del capitale reputazionale e l'allineamento alle norme e ai valori istituzionali globali.

Le implicazioni manageriali attese indicano che investire in strutture di governance dedicate ai diritti umani, in processi di due diligence e in pratiche di coinvolgimento degli stakeholder può

generare benefici strategici concreti, favorendo l'ingresso nei mercati esteri, la fiducia degli investitori e la solidità delle partnership internazionali. In questa prospettiva, la HRD contribuisce a consolidare la percezione di affidabilità dell'impresa e a ridurre la liability of foreignness nei contesti globali, rafforzando la sua legittimazione presso stakeholder e partner internazionali.

Dal punto di vista manageriale, l'entrata in vigore della CSRD rende ancora più evidente la necessità di integrare la tutela dei diritti umani nei sistemi di governance e nei processi operativi. Le imprese che si adeguano in modo sostanziale ai requisiti della direttiva possono trasformare un adempimento regolatorio in un vantaggio strategico, migliorando il proprio posizionamento presso stakeholder globali, facilitando l'accesso ai mercati internazionali e rafforzando la capacità di stringere partnership transfrontaliere basate sulla fiducia e sulla trasparenza.

Sul piano delle politiche pubbliche e regolatorie, i risultati previsti sottolineano l'importanza di includere indicatori specifici sui diritti umani nei principali framework di rendicontazione obbligatoria. Una disclosure strutturata in tale ambito può infatti contribuire a promuovere la responsabilità d'impresa e a migliorare la comparabilità e la qualità delle informazioni a livello internazionale.

Pur offrendo un contributo innovativo alla letteratura e alla pratica manageriale, lo studio riconosce alcune limitazioni. La natura trasversale dell'analisi non consente di trarre conclusioni causali di lungo periodo, mentre la codifica manuale delle informazioni, sebbene più accurata, può introdurre elementi di soggettività. Futuri approfondimenti potranno adottare approcci longitudinali o multisettoriali per indagare ulteriormente il ruolo della HRD nei processi di internazionalizzazione e nelle strategie di sostenibilità globale. Infine, il rapido sviluppo dell'intelligenza artificiale apre scenari promettenti per lo studio della sostenibilità e dei diritti umani. L'adozione di sistemi avanzati di analisi del linguaggio e di apprendimento automatico potrebbe consentire non solo un monitoraggio più tempestivo dei rischi nelle catene globali del valore, ma anche una valutazione più fine e comparabile della qualità dell'informativa aziendale. L'integrazione di tali tecnologie potrebbe dunque arricchire gli approcci metodologici tradizionali e offrire nuove chiavi interpretative per comprendere come la HRD si configuri all'interno dei processi di internazionalizzazione

Parole chiave: Human Rights Disclosure (HRD); internazionalizzazione delle imprese; orporate Social Responsibility (CSR); human Rights Due Diligence

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The Role of the Sustainability Balanced Scorecard in Shaping Sustainability Integration: A Configurational Perspective

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1. Introduction

Over the past decades, organizations have experienced profound institutional pressures as sustainability practices have increasingly become a central dimension to consider at a business level (Engert et al., 2014). From the compliance point of view, sustainability practices are gradually evolving from a voluntary management initiative to a regulatory requirement demanded by institutional pressures (Postaire et al., 2024; Sundin & Brown, 2017; Contrafatto, 2014; Länsiluoto & Järvenpää, 2010; Pérez et al., 2007; DiMaggio and Powell, 1983). In this context, one of the latest transformative requirements, adopted in the European Union, is the Corporate Sustainability Reporting Directive (CSRD) (Coronella, 2025; CSRD 2022). The Directive expands the scope of sustainability reporting by requiring disclosure of the environmental, social and governance (ESG) matters, influencing in this way organizational strategies and business models. Regardless of how recent the CSRD is, it has already impacted major corporations in Europe and will gradually extend to small and medium enterprises (SMEs) with potential global effects. Such coercive pressures promote isomorphic organizational behaviours by demanding compliance with sustainability reporting standards (Helfaya et al., 2019).

To assure such a compliance, organizations shall integrate sustainability into their strategic planning and control systems (Arjalies and Mundy, 2013; Schaltegger and Burritt, 2010; Malmi and Brown, 2008; Adams and Frost, 2008). This integration process, however, requires a clear view on how sustainability practices can be addressed in the management control systems (Gond et al., 2012). One of the most studied tools that enables integration of sustainability into organizational strategies, is the Sustainability Balanced Scorecard (SBSC) (Figge et al., 2002). Several scholars have underlined through years its key role in strategic sustainability integration (Hristov and Searcy, 2024; Mio et al., 2022; Journeault, 2016; Hansen and Schaltegger, 2016) confirmed by empirical evidence from practitioners (Suarez-Gargallo et al., 2023; Huang et al., 2014).

Although the SBSC has been conceptually developed for more than two decades, the literature remains fragmented and lacks an overall comprehension on how the framework has been designed, implemented, used and evolved (Searcy, 2012). Thus, discovering the status of related research by summarizing and synthetizing the existing literature will help to fill the literature gap across different organizational contexts. To achieve this aim, the Systematic Literature Review (SLR) was conducted by considering the research articles published between 2002 and 2025. Using a reproducible process of database search, the bibliometric analysis was

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performed on 100 peer-reviewed publications. By analysing two decades of SBSC literature, the research article contributes to the sustainability management control literature by identifying and classifying the main research streams, methodological approaches and thematic evolutions surrounding the SBSC, offering in this way an integrative understanding of its theoretical and practical contributions to sustainability management control literature.

While this mapping provides an updated understanding of research patterns, our review also highlights a second, more fundamental gap: although many studies examine specific design features or implementation processes, far less attention has been paid to why organizations develop and use SBSCs in distinct ways. Existing research, in other words, insufficiently theorizes the motivational logics that shape the role played by the SBSC in sustainability integration. Building on the insights emerging from the thematic analysis, this study advances the literature by conceptualizing three distinct configurations of SBSC use: compliance-driven, legitimacy-driven, and value-driven. These configurations illustrate how different underlying motivations influence the design of the SBSC, the purposes it serves, the way it is mobilized in practice, and how it evolves over time.

In doing so, the paper not only provides an integrative overview of two decades of SBSC research but also introduces a novel configurational perspective that explains the varied roles the SBSC can assume in shaping sustainability integration. This dual contribution offers a conceptual foundation for future empirical research seeking to unravel how sustainability control tools respond to institutional pressures, stakeholder expectations, and strategic value creation processes.

2. Methodology

2.1. Article collection process

A SLR was conducted to identify relevant contributions. The SLR method was chosen because, unlike traditional narrative reviews, it "locates existing studies, selects and evaluates contributions, analyses and synthesizes data, and reports the evidence in such a way that allows reasonably clear conclusions to be reached about what is and is not known" (Denyer and Tranfield, 2008, p. 671). To guarantee the accuracy and transparency of the research, the chosen protocol is based on Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement, a guideline for selection and analysis of a literature research sample (Page et al., 2021). The PRISMA 2020 framework ensures that the protocol has a standardized structure to allow the future users to replicate the research by guaranteeing transparency and methodological rigor in all the stages. Specifically, the framework provides precise documentation on inclusion and exclusion criteria and a detailed reporting on how the research develops from initial set to the research eligible sample. The process is represented by the PRISMA diagram in Figure 1 to allow the identification of the sample and the replication for future research. In particular, the selection of the research articles was performed by using Scopus database, identifying two main areas of research: sustainability and Balanced Scorecard (BSC). The research articles must include in their abstract, title or keywords the following keywords: "green," "ecology*," "sustainab*," "environment*," "sustainability balanced scorecard," "SBSC," "balanced scorecard," "BSC". The filters used to exclude the publications were the following: subject area – business, management and accounting; document type – article; language – English; publication stage – final, journal ranking – ABS 2024.

The initial sample, based on the presence of the keywords in the title, abstract or keywords was composed of 3.173 research articles. The screening phase of PRISMA process started by refining the sample with document type, excluding 1.023 articles, resulting in a sample of 2.150 papers to analyse. Next, the publications were excluded based on the subject area of business, management and accounting, resulting in 565 articles. The following exclusion criteria was to consider the articles published only in English language, reducing the research sample to 534

publications. Additional screening was performed by leaving in the sample only the already published articles, leaving behind 5 papers. Finally, the last part of the screening process was based on the ABS 2024 ranking by only including papers that have been published within the ranking, resulting to be 371 research publications. The following phase of the protocol was to identify the eligible articles based on the research question by screening the title and abstract of each publication, resulting in 127 related articles. Additionally, by reading the entire set, the final sample of 100 articles was identified.

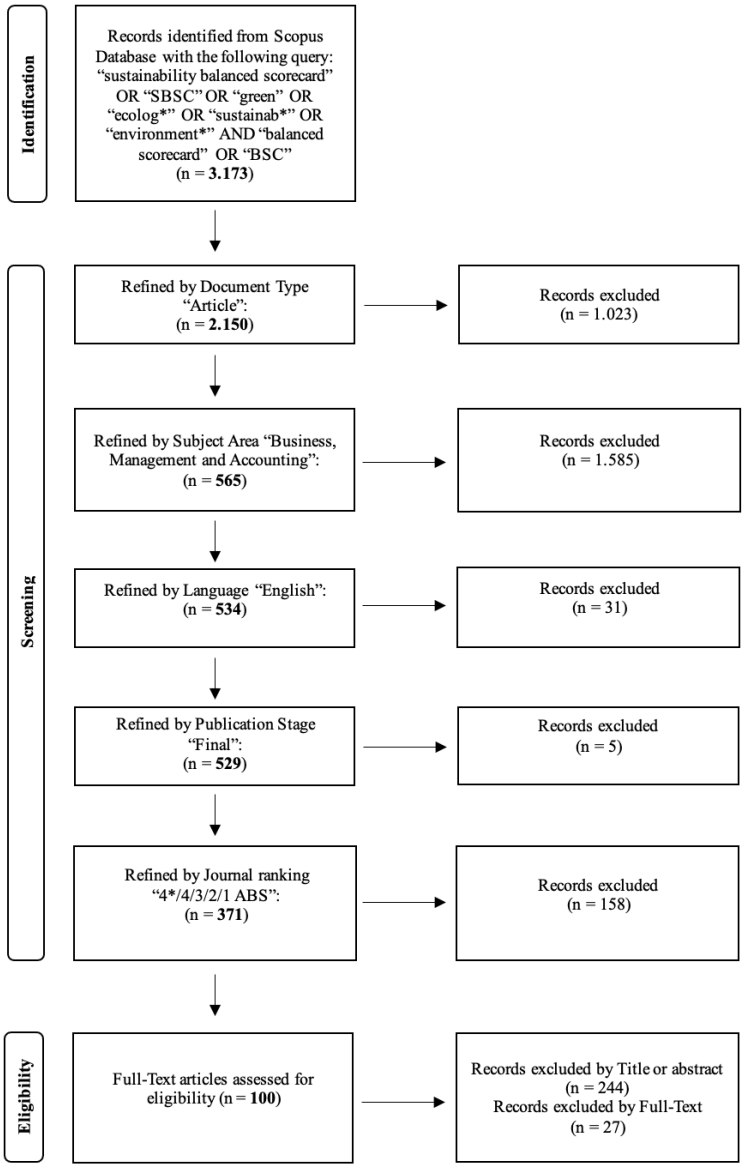


Figure 1. Research protocol for systematic literature review

2.2. Data coding and analysis

The resulting sample was analysed in two ways: i) by adopting a bibliometric analysis for the descriptive statistics, and ii) a text analysis of the final sample of 100 papers for the content analysis.

In terms of bibliometric analysis, we used Bibliometrix software (Aria and Cuccurullo, 2017), widely recognized in the academic research for its ability to provide customized graphical outputs (Camilli et al., 2024). In particular, the Bibliometrix enables science-mapping techniques, such as co-occurrence keyword plus network, which allows to examine the thematic evolution, essential for exploration of the current state of literature.

In terms of content analysis, all articles were carefully read and systematized into an Excel data extraction sheet (Rashman et al., 2009). To examine how SBSC has been addressed and conceptualized in the literature, we employed a thematic analysis (TA) as the core analytical technique. TA was selected for its capacity not only to synthesize heterogeneous and fragmented findings across studies, but also to reveal the underlying assumptions, blind spots, and tensions that characterize the field (Alvesson & Sandberg, 2011; Braun & Clarke, 2006). We developed deductive themes by reading the papers to capture recurring concepts, mechanisms and practices related to design, used, implementation and evolution (see, for instance, Searcy, 2012). The six-phase protocol by Braun and Clarke (2006) was followed:

- Familiarization with the data. All papers were read in full by the authors to gain a comprehensive understanding of their theoretical positions, methodological approaches, and findings related to SBSC.
- Initial coding. We identified recurring codes by reading the papers of the sample to identify significant elements related to design, use, implementation and evolution. Codes were iteratively refined as patterns emerged across studies.
- Searching for and refining themes. Codes were grouped into subthemes that represented coherent clusters of meaning within four macro-level themes (i.e., design, used, implementation and evolution).
- Reviewing and synthesizing. We compared findings across themes to detect overlaps, contradictions, and blind spots. We also ensured consistency in coding and interpretation through peer debriefing sessions among the authors.
- Writing and contextualizing. The thematic map resulting from this process was translated into an analytical narrative that connects empirical findings with broader theoretical frameworks, but crucially also interrogates the implicit assumptions underlying current conceptualizations of SBSC.

3. Findings analysis

3.1. A bibliometric analysis

This section shows descriptive statistics of the sample analysed with Bibliometrix software (Aria and Cuccurullo, 2017) to provide an overview of the SBSC. It presents the annual development (Figure 2), the most relevant sources (Figure 3) and the thematic analysis, through co-occurrence network based on Keywords Plus (Figure 4), of the research articles published within the field.

As the study represents a work in progress, these descriptive results provide only the first phase of the analysis. In the following stage, the research will be expanded through a qualitative content analysis of the selected sample to examine in depth how the SBSC framework is designed, used, implemented and evolved in the past two decades. This approach will allow a more comprehensive interpretation of the quantitative results obtained and will support the filling of the literature gap identified.

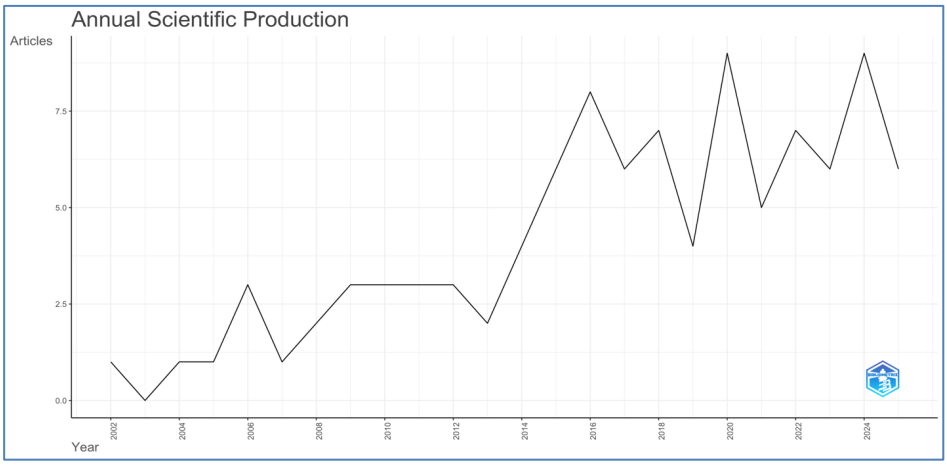


Figure 2. Sustainability Balanced Scorecard articles published over the years

The Figure 2 represents how the academic interest towards the SBSC has evolved in the past twenty-three years. In 2002 Figge et al. elaborate the framework, which provokes a moderate academic interest for the next six years, forming an emerging phase for the SBSC. The next stage of the framework's temporal development goes from 2009 to 2014, establishing a so-called early consolidation stage, where the scholars start to show a consistent interest towards the topic. The third stage (2015 – 2019) comes with a peak in 2016, a year after the Paris Agreement adoption in 2015 through the United Nations' Agenda 2030 about the Sustainability Development Goals (United Nations, 2015). The final and more recent stage of the academic interest falls in the Covid-19 and post Covid-19 periods. In particular, the first peak takes place in 2020 by showing a sharp increase in interest conveyed by the pandemic spread. The second peak of the last stage comes in 2024, which is driven by the institutional pressures for the sustainability reporting with the CSRD introduction.

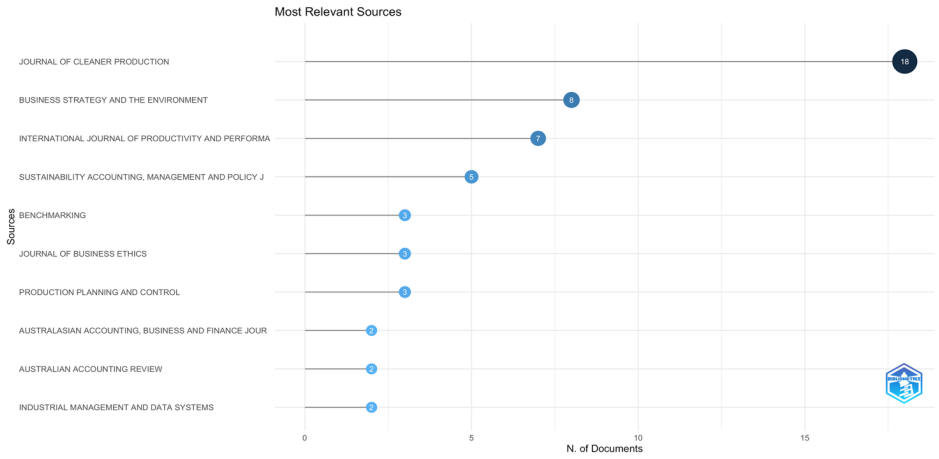


Figure 3. Most relevant sources

The Figure 3 represents the most relevant sources where the research articles were published. The leading journal in publications is the Journal of Cleaner Production with 18 research articles regarding the SBSC framework. Such concentration of publications suggests that the SBSC is primarily considered in the sustainability and environmental management fields, rather than management control and accounting. However, the following two journals, Business Strategy and the Environment and International Journal of Productivity and Performance Management suggest

strong ties with strategic management field. Thus, the SBSC is considered to be a framework for execution of the sustainable strategy rather than a conventional management control tool. The remaining journals in the Figure 3 have far less research articles related to the SBSC than the first three journals, which demonstrates the fragmentation of the discipline and shows that the field is still in its evolving interdisciplinary stage.

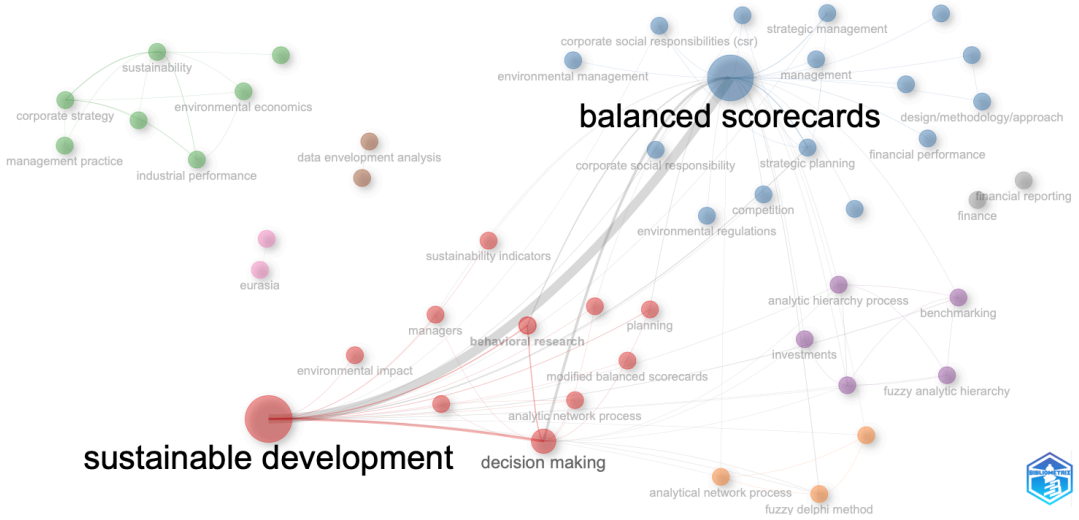


Figure 4. Co-occurrence network of SBSC keywords plus

The Figure 4 shows the thematic analysis based on a co-occurrence network by using Keywords Plus to demonstrate the main topics associated with the analysed research articles. The two main strongly connected keywords are "sustainable development" and "balanced scorecards", which form in the current structure two main clusters. The blue cluster includes terms "strategic management", "strategic planning", "corporate social responsibility", "performance", which indicates a strong connection with the performance management field. The red cluster mainly includes terms such as "sustainability indicators", "environmental impact", "decision making", which reflects sustainability performance management themes. Thus, the strong tie between two main clusters shows that the SBSC sits at the intersection of performance management and sustainable strategy fields, building a bridge for translating sustainable practices into the strategic management. However, there are also smaller clusters that appear in the Figure 3, which illustrate weak connections to the main clusters, emphasising the fragmentation of the research on the SBSC and the context-specific applications.

Taken together, the descriptive statistics represent the status of the research, highlighting the need for a comprehensive and consolidated view for the sustainability management control field.

3.2. Content analysis

Although the content analysis is still ongoing, preliminary insights already point to a key pattern anticipated in the abstract: organizations do not adopt a single, uniformed model of SBSC, but rather mobilize it through three distinct configurations—compliance-driven, legitimacy-driven, and value-driven—emerging in response to institutional pressures but shaped by the underlying motivations for integrating sustainability. Early results suggest that these motivations influence not only the purpose of the SBSC but also its degree of integration within the management control architecture.

More specifically, when sustainability is adopted primarily for compliance reasons, the SBSC tends to be treated through a separated architecture, designed as a technical add-on to meet reporting requirements, often limited to a narrow set of indicators. When sustainability is embraced to gain or maintain legitimacy, the SBSC more frequently assumes the form of a parallel architecture, for instance when firms rely on external consultants exclusively for producing sustainability reports without embedding sustainability into long-term planning or internal decision-making. Finally, when sustainability is adopted for value-driven and strategic motivations, the SBSC tends to be fully integrated into existing perspectives and routines, becoming embedded in strategic planning, internal learning processes, and performance evaluations.

These emerging distinctions indicate that the SBSC does not evolve in the same way across firms. Rather, its design, implementation pathway, use patterns, and evolutionary trajectory are contingent upon the motivational logic that guides the organization's approach to sustainability. The forthcoming content analysis will further develop these insights to refine the three configurations and articulate their theoretical implications for sustainability integration.

4. Conclusions and future research directions

As far as this study represents a work in progress extended abstract, the research is yet to be expanded and ameliorated. In fact, the aim of the paper is to provide a comprehensive understanding of how the SBSC has been designed, implemented, used and evolved across different organizational contexts over the past two decades. Through SLR, supported by bibliometric and content analysis, the study intends to analyse the SBSC literature to explore the current state of research and unveil its fragmented nature. Thus, the final scope is to identify, classify and synthesize the main research streams, methodological approaches and thematic evolutions of SBSC, offering in this way an integrative understanding of its theoretical and practical contributions to sustainability management control literature. In doing so, the study does not only map the existing literature but seeks to analyse how the SBSC has evolved with a broader constantly developing sustainability scene, particularly given the current European institutional pressures.

To interpret the results, the analysis will adopt the theoretical lenses proposed by Burritt and Schaltegger in 2010, distinguishing three perspectives: inside-out, twin-track and outside-in to approach sustainability. The inside-out perspective will highlight how sustainability reshapes internal strategies, performance management, controls and decision-making. The twin-track approach seeks to reconcile internal and external demands, although prior research suggests that organizations often lack the routines and structures required to manage such duality systematically. While the outside-in perspective of sustainability will discover how the coercive pressures promote isomorphic organizational behaviours by requiring compliance with sustainability reporting standards potentially leading to a more symbolic and decoupled use of the SBSC as a management control tool. Interpreting the results through these theoretical lenses will contribute to the understanding whether the SBSC supports the substantive strategic integration or rather responds to the external reporting requirements for the compliance purposes.

Ultimately, this study will contribute to sustainability management control literature by mapping where the field currently stands and by highlighting the paths for further exploration. The expected outcomes include the definition of research opportunities, with particular attention to the methodological approaches.

Keywords: Sustainability balanced scorecard; SBSC; performance management system; sustainability management control

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Innovazione tecnologica per lo sviluppo sostenibile nelle PMI: una revisione sistematica della letteratura

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1. Sviluppo concettuale e obiettivi di ricerca

Nell'attuale contesto, le imprese si trovano a fronteggiare una sfida duplice, in cui intelligenza artificiale (IA) e transizione verso modelli di sviluppo sostenibile si intrecciano in modo sempre più stretto, dando vita ad un paradigma conosciuto in letteratura con il termine "digitainability" (Saáry et al., 2022; Varbanova et al., 2025). Questa dinamica assume particolare importanza per le piccole e medie imprese (PMI) che costituiscono circa il 90% del tessuto imprenditoriale globale (Mago & Modiba, 2022) e che sono riconosciute da importanti framework di policy, come il Green Deal europeo, quali attori chiave nei processi di innovazione e sostenibilità (Commissione Europea, 2020).

Tradizionalmente, la sostenibilità è stata collegata alla performance aziendale mediante l'innovazione verde e strategie ambientali consolidate (Khoshnaw et al., 2024). Oggigiorno, tuttavia, tali meccanismi sono oggetto di una profonda trasformazione dovuta all'introduzione di tecnologie digitali, tra cui l'intelligenza artificiale (IA) riveste un ruolo centrale. L'introduzione di questa tecnologia migliora l'efficienza dei processi aziendali e rafforza la capacità di adattamento dell'impresa, elementi strettamente legati al concetto di agilità organizzativa (Mehmood et al., 2025; Sharma et al., 2025). Inoltre, l'impiego dell'IA favorisce l'adozione di approcci proattivi, orientati alla trasformazione dei dati in scenari predittivi, considerati oggi essenziali per sostenere la competitività (Carayannis et al., 2025). Per le PMI, la gestione di questa transizione risulta particolarmente complessa. Da un lato, esse devono integrare nuovi strumenti e processi innovativi nonostante la disponibilità limitata di risorse e competenze rispetto alle grandi aziende (Mick et al., 2024). Dall'altro, si trovano ad affrontare barriere organizzative e strategiche, come la scarsa conoscenza delle tecnologie e la resistenza al cambiamento (Zajac et al., 2025), spesso aggravata da fenomeni di ansia digitale tra i dipendenti (Mihajlović et al., 2025).

Nonostante la letteratura si concentri spesso sulle grandi imprese o proponga approcci generali, studi recenti evidenziano che l'innovazione tecnologica può avere effetti particolarmente significativi nelle PMI, aprendo opportunità uniche di creazione di valore attraverso la digitalizzazione sostenibile (Zheng & Zhang, 2023), spesso in sinergia con un forte orientamento imprenditoriale "verde" (Alwakid & Dahri). Dal 2019, le ricerche che esplorano il legame tra trasformazione digitale e sostenibilità nelle PMI sono cresciute rapidamente, registrando un'accelerazione a partire dal 2022 e un picco di interesse nel 2025. Il campo rimane tuttavia frammentato, caratterizzato da approcci metodologici e prospettive teoriche eterogenee. Alcuni studi analizzano il contributo della digitalizzazione al raggiungimento di obiettivi

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strategici come lo sviluppo sostenibile (Philbin et al., 2022) o l'internazionalizzazione (Rosyidah et al., 2023), mentre altri propongono modelli prescrittivi riferiti a contesti specifici come l'Industria 4.0 (Dossou et al., 2022). Questi contributi, tuttavia, si concentrano prevalentemente sui benefici attesi, senza considerare le conseguenze negative non intenzionali che le PMI possono incontrare. Tra queste rientrano l'aumento dei costi legati alla gestione dei talenti digitali e la mancanza di un ritorno economico immediato, dovuta agli elevati investimenti iniziali (Reshma & Selvam, 2025). Si aggiungono, inoltre, la crescente dipendenza dalle grandi piattaforme tecnologiche (Chung et al., 2025) e una serie di sfide etiche e sociali, come la tutela della privacy dei dati, l'evoluzione delle norme etiche e la possibile sostituzione di posti di lavoro (Kittipanya-Ngam et al., 2025). Dall'analisi dei principali studi sulle PMI emergono tendenze rilevanti. Denicolai, Zucchella e Magnani (2021) mostrano che digitalizzazione e sostenibilità sono strettamente correlate, pur potendo entrare in conflitto in contesti complessi come l'internazionalizzazione. Ukko et al. (2019) rilevano che una strategia orientata alla sostenibilità rafforza il legame tra capacità manageriali e performance finanziaria, limitando tuttavia l'efficienza operativa a breve termine. Dutta et al. (2020) evidenziano l'importanza delle competenze digitali per l'implementazione efficace di processi sostenibili, mentre Wang e Esperança (2023) e Zheng e Zhang (2023) dimostrano come strumenti digitali avanzati possano migliorare le performance ESG e l'innovazione tecnologica verde, con effetti particolarmente marcati nelle PMI rispetto alle grandi imprese.

Le analisi bibliometriche mostrano due principali filoni di ricerca. Il primo considera la trasformazione digitale come leva strategica per generare valore economico e sostenibile, concentrandosi su strategia e performance complessiva. Il secondo esplora i processi di innovazione, il ruolo degli attori dell'ecosistema e le barriere alla transizione digitale e sostenibile. Alcuni studi collegano concettualmente i due filoni, suggerendo che la trasformazione digitale debba essere interpretata come un fenomeno complesso e interdipendente, in cui le dimensioni tecnologiche, organizzative e strategiche si influenzano reciprocamente.

Tuttavia, il ruolo dell'IA e della trasformazione digitale come leva strategica per integrare innovazione e sostenibilità nelle PMI non è ancora pienamente esplorato, e mancano mappature sistematiche in grado di identificare i temi principali, le connessioni tra approcci teorici e le traiettorie evolutive del campo.

Alla luce di questo gap che emerge da un'analisi della letteratura condotta sugli studi pubblicati tra il 2019 e il 2025, è stata formulata la seguente domanda di ricerca (RQ):

RQ: In che modo la trasformazione digitale, e in particolare l'intelligenza artificiale, contribuisce all'integrazione tra innovazione e sostenibilità nelle PMI?

Il presente studio si propone di colmare questo vuoto attraverso una revisione sistematica della letteratura seguendo il protocollo di Tranfield et al. (2003), integrata da un'analisi bibliometrica quantitativa. Dal database Scopus sono stati selezionati 105 articoli mediante parole chiave mirate, da cui è stato estratto un campione finale di 91 studi. L'analisi condotta con il software VOSviewer ha considerato reti di co-autorialità per Paese, co-occorrenza delle parole chiave e bibliographic coupling, con l'obiettivo di delineare la struttura concettuale e intellettuale del campo, evidenziando filoni di ricerca principali, connessioni tra studi e traiettorie emergenti. Il lavoro è organizzato in tre sezioni principali. La seconda sezione descrive la metodologia adottata, la terza presenta i risultati delle analisi descrittive e bibliometriche, mentre la quarta discute le evidenze emerse, sottolineando i contributi principali, i limiti dello studio e le prospettive per ricerche future.

2. Metodologia

Il presente studio adotta una revisione sistematica della letteratura basata sui protocolli di Tranfield et al. (2003) e Kraus et al. (2020), con l'obiettivo di esaminare la relazione esistente tra IA e sostenibilità. Tale metodologia è stata scelta per garantire un'analisi obiettiva e replicabile.

Attraverso l'applicazione di criteri chiaramente definiti e non casuali, tale metodologia consente di individuare degli articoli rilevanti, la cui analisi fornisce una visione olistica dello stato dell'arte.

Le principali fasi in cui si articola la revisione sistematica della letteratura sono le seguenti:

- pianificazione della revisione;
- identificazione e valutazione degli studi;
- estrazione e sintetizzazione dei risultati;
- diffusione dei risultati della revisione.

Nella fase iniziale è stata identificata la necessità di condurre una ricerca sulla tematica in esame ed è stato definito un protocollo di ricerca. Una prima indagine sui principali database scientifici (Scopus, Web of Science e Google Scholar) ha confermato l'assenza di analisi sistematiche della letteratura sull'argomento. Data la crescente rilevanza dell'integrazione tra sostenibilità e innovazione tecnologica applicata alle PMI, si ritiene utile offrire un'analisi sistematica dei precedenti studi che hanno indagato la reciproca influenza dei due elementi, anche al fine di proporre nuove traiettorie di ricerca.

Successivamente sono state selezionate le seguenti parole chiave: Digital transformation, AI, Artificial Intelligence, CSR, corporate social responsibility, sustainability, ESG, SME, SMEs.

La selezione delle parole chiave deriva da una analisi preliminare della letteratura di riferimento, la quale ha messo in luce una lacuna di ricerca nell'intersezione tra la trasformazione digitale e la sostenibilità con riferimento al contesto delle piccole e medie imprese (Mick et al., 2024).

Query: "Digital transformation" or "AI" or "Artificial Intelligence" and "CSR" or "corporate social responsibility" or "sustainability" or "ESG" and "SME" or "SMEs".

La ricerca è stata effettuata sul database Scopus (Elsevier), ed è stata circoscritta ai campi titolo, abstract e keywords, come suggerito in letteratura (Massaro et al., 2016). Per garantire pertinenza rispetto agli obiettivi dello studio, il filtro tematico è stato limitato all'area "Business Management and Accounting". Sono stati inclusi solo articoli in riviste scientifiche, scritti in lingua inglese e pubblicati dal 2011 ad ottobre 2025 (data dell'estrazione). Il primo contributo individuato nel database Scopus risale al 2011, tuttavia tale lavoro è stato escluso dall'analisi in quanto ritenuto poco pertinente all'argomento oggetto di studio. Il primo contributo utile, dunque, risale al 2019, e ciò sottolinea l'attualità della tematica e la crescente rilevanza accademica che ha acquisito negli ultimi anni. Da questa prima selezione sono emersi 105 articoli.

Nella seconda fase, con l'ausilio del database MS Excel, è stata valutata la pertinenza degli articoli rispetto all'obiettivo della ricerca, attraverso la lettura del titolo e delle keywords. Successivamente, dopo aver letto in modo approfondito gli abstract, sono stati selezionati 91 articoli scientifici, ritenuti in linea con l'obiettivo di ricerca.

Nella terza fase si è proceduto con l'estrazione e la sintesi dei dati. Dal database Scopus, sono stati esportati i dati bibliografici in formato CSV. Prima di procedere con l'esportazione, sono stati selezionati i campi pertinenti per la ricerca (autori, titolo del documento, rivista, affiliazioni, editori, numero di citazioni, abstract, parole chiave, references).

Successivamente è stata condotta l'analisi dei dati mediante l'utilizzo del software VOSviewer, che consente l'analisi dei cluster utilizzando la co-occorrenza delle parole chiave, le citazioni dei documenti e il bibliographic coupling. Poiché le pubblicazioni selezionate per l'analisi sono molto attuali e quindi prive di un numero significativo di citazioni, la modalità più efficace per la mappatura della letteratura risulta essere il bibliographic coupling, in quanto mette in luce le fonti citate in comune e permette di superare il limite delle citazioni (Boyack & Klavans, 2010). Infine nella quarta fase sono stati analizzati e descritti i risultati.

Fasi della ricerca	Risultati
TITOLO-ABS-KEY ("Digital transformation" or "AI" or "Artificial Intelligence" and "CSR" or "corporate social responsibility" or "sustainability" or "ESG" and "SME" or "SMEs")	471
AREA TEMATICA: Business Management and Accounting	197
TIPO DI DOCUMENTO: Articolo	109
LINGUA: Inglese	105
ARTICOLI SELEZIONATI	105
ARTICOLI ANALIZZATI	**91**

Tabella 1. Processo di selezione degli articoli scientifici

3. Risultati

Nella sezione dei risultati viene presentata un'analisi descrittiva e bibliometrica degli articoli scientifici selezionati dal database Scopus, che esplorano il rapporto tra IA e sostenibilità nelle PMI.

La distribuzione annuale degli articoli presenti nel campione analizzato dal 2019 al 2025 mostra che la produzione scientifica, assente fino al 2019, resta limitata anche fino al 2021. A partire dal 2022 si osserva un primo incremento degli articoli e, sebbene nel 2023 si registri una lieve flessione, negli ultimi due anni l'interesse per la tematica cresce in maniera marcata, raggiungendo nel 2025 un totale di 51 contributi. Questi dati evidenziano un campo di studi in rapida espansione, sottolineando come la rilevanza della tematica nel settore manageriale sia ormai consolidata.

Per quanto riguarda la distribuzione territoriale, la mappa della rete di Paesi che hanno collaborato nella ricerca internazionale (costruita con VOSviewer includendo i Paesi con almeno due articoli e un minimo di 3 citazioni) evidenzia 5 cluster, così suddivisi:

1) Cluster Rosso: Croazia, India, Italia, Arabia Saudita, Emirati Arabi Uniti;
2) Cluster Verde: Brasile, Finlandia, Germania, Sudafrica;
3) Cluster Blu: Canada, Indonesia, Malesia;
4) Cluster Giallo: Cina, Pakistan, Portogallo;
5) Cluster Viola: Francia, Tailandia, Regno Unito.

Dal grafico 1 emerge la posizione predominante e centrale della Cina, seguita da India, Pakistan, Italia e Arabia Saudita.



Grafico 1. Mappa di co-autorialità per Paese

Un ulteriore elemento di indagine riguarda l'analisi delle citazioni per documento (Tab. 2). Tale analisi evidenzia che, tendenzialmente, gli articoli più recenti hanno un minor numero di citazioni, considerata la limitata diffusione nella comunità scientifica rispetto ad altri articoli più remoti. Dato il ristretto arco temporale (2019-2025), l'elevato numero di citazioni di alcuni

articoli evidenzia l'interesse e l'attualità per le tematiche trattate nello studio da parte della comunità accademica.

N.	Articoli scientifici	N. di citazioni
1	Denicolai, Zucchella, Magnani (2021)	353
2	Dutta, Kumar, Sindhwani, Singh (2020)	219
3	Ukko, Nasiri, Saunila, Rantala (2019)	194
4	Wang e Esperança (2023)	175
5	El Hilali, El Manouar, Janati Idrissi (2020)	156
6	Zheng e Zhang (2023)	115
7	Nair, Chellasamy, Singh (2019)	86
8	Nudurupati, Budhwar, Pappu, Chowdhury, Kondala, Chakraborty, Ghosh (2022)	83
9	Andersen, Aagaard, Magnusson (2022)	72
10	Hacker (2023)	61
11	Shaik, Alshibani, Jain, Gupta, Mehrotra (2024)	59
12	Savastano, Zentner, Spremić, Cucari (2022)	41
13	Strakova, Talíř, Váchal (2022)	38
14	Zoppelletto, Bullini Orlandi, Rossignoli (2020)	33
15	Ahmad, Wu, Ahmed (2024)	28
16	Khan, Mehmood, Soomro (2024)	27
17	Valdez-Juárez, Ramos-Escobar, Ponce, Ruiz-Zamora (2024)	27
18	Niehoff, Matthess, Zwar, Kunkel, Guan, Chen, Xue, de Oliveira Pereira Grudzien, Pinheiro de Lima, Beier (2022)	27
19	Pylaeva, Podshivalova, Alola, Podshivalov, Demin (2022)	27
20	Akhtar, Tian, Iqbal, Hussain (2024)	25
21	Ogrean e Herciu (2021)	25
22	Hoa e Tuyen (2021)	22
23	Alfarizi, Widiastuti, Ngatindriatun (2024)	17
24	Wang e Zhang (2025)	14
25	Spigarelli, Compagnucci, Lepore (2025)	12
26	Ciravegna-Martins-Da-Fonseca, Oliveira, Pereira, de Sá (2024)	12
27	Carayannis, Dumitrescu, Falkowski, Papamichail, Zota (2025)	11
28	Etemad (2023)	11
29	Touijer e Elabjani (2025)	10
30	Arroyabe, Arranz, de Arroyabe (2024)	10
31	Saáry, Karpati-Daroczi, Tick (2022)	10
32	Zaki, Alhomaid, Ghareb, Shared, Raslan, Khalifa, Elnagar (2025)	9
33	Nkwinika e Akinola (2023)	8
34	Sarango-Lalangui, Rodríguez, Carreño, Galarza (2023)	8
35	Latino (2025)	5
36	Belas, Kliestik, Dvorsky, Štreimikienė (2025)	4
37	Amjad, Rao, Arif, Aftab, Baig, Rahman (2024)	4
38	Akbari, Nobari, Mokhtari, Padash, Moradi (2022)	4
39	Kittipanya-Ngam, Hua Tan, Cavite (2025)	3
40	Mehmood, Kiani, Rehman, Alshibani, Piccardi (2025)	3
41	Degregori, Brescia, Calandra, Secinaro (2025)	3
42	Faisol, Widiawati, Ramadhani, Sumantri (2025)	3
43	Jibril, Amoah, Panigrahi, Gochhait (2024)	3
44	Phiet (2024)	3
45	Farliana, Murniawaty, Hardianto (2023)	3
46	Sklavos, Duquenne, Theodossiou (2022)	3
47	Abdelwahed, Soomro, Bano, Al-Doghan, Elrayah, Soomro (2025)	2
48	Al Koliby, Al-Swidi, Al-Hakimi, Farhan (2025)	2
49	Hwang, Jitanugoon, Puntha (2025)	2
50	Wang, Xu, Mao, Deng, Cao (2025)	2
51	Fülöp e Topor (2025)	2
52	Cumba, Huang, Haggag Kotb Kholaif (2024)	2
53	Sklavos, Theodossiou, Papanikolaou, Karelakis, Lazarides (2024)	2
54	Ejjami (2024)	2
55	Ul Haq, Mohd Suki, Setini, Masood, Khan (2025)	1
56	Bahaw, Forgenie, Sadiq, Sookhai (2025)	1
57	Leipziger, Burtscher, Kanbach, Puumalainen, Kraus (2025)	1
58	Jamwal, Agrawal, Sharma (2025)	1
59	Ingaldi e Ulewicz (2025)	1
60	Jaboob, Al-Ansi, Al-Okaily, Ferasso (2025)	1
61	Khanh e Cuong (2025)	1
62	Bennacer, El Mahdi, Lahmouchi (2025)	1
63	Takawira e Pooe (2025)	1
64	Abedin, Hosseinzadeh, Haghighi (2024)	1
65	Muafi, Suhartini, Mohd Dali, Abdul Hamid (2024)	1

Tabella 2. Numero di citazioni autore/documento

L'analisi successiva si è concentrata sullo studio degli articoli più influenti in termini di impatto accademico.

Su un totale di 65 documenti con almeno una citazione, i lavori più rilevanti, con oltre 100 citazioni, risultano essere quelli di Denicolai, Zucchella, Magnani (2021), Dutta, Kumar, Sindhwani, Singh (2020), Ukko, Nasiri, Saunila, Rantala (2019), Wang e Esperança (2023), El Hilali, El Manouar, Janati Idrissi (2020), Zheng e Zhang (2023).

Nello specifico, lo studio di Denicolai, Zucchella, Magnani (2021), oltre alla digitalizzazione e alla sostenibilità, include anche l'internazionalizzazione come percorso chiave di crescita per le aziende. Dal loro studio emerge che digitalizzazione e sostenibilità sono correlate positivamente, ma entrano in conflitto nel momento in cui l'azienda si internazionalizza. Questa evidenza viene spiegata come una conseguenza della responsabilità della piccolezza, cioè dei limiti delle PMI in termini di risorse e capacità (Freeman et al., 1983).

Ukko, Nasiri, Saunila, Rantala (2019) hanno studiato la relazione esistente tra digitalizzazione, sostenibilità e performance finanziaria. Premettendo che la strategia digitale si debba basare sulla capacità manageriale e sulla capacità operativa, i risultati dimostrano che una strategia di sostenibilità funge da promotrice nella relazione tra capacità manageriale e performance finanziaria; tuttavia, inibisce la relazione tra capacità operativa e performance finanziaria.

Lo studio di Dutta, Kumar, Sindhwani e Singh (2020) si pone l'obiettivo di analizzare, nel contesto delle PMI manifatturiere indiane, in che modo possono essere sfruttate le tecnologie

dell'Industria 4.0. La tematica dell'Industria 4.0 rappresenta una limitazione poiché è relativamente nuova per l'India; pertanto, non si dispone ancora di sufficiente letteratura accademica. Inoltre, l'attuale livello di competenza delle PMI indiane rispetto alle tecnologie digitali rappresenta un ostacolo alla valutazione della maturità delle imprese. Nonostante queste barriere, dalla ricerca emergono le priorità per la trasformazione digitale e prevede che tale processo possa supportare le iniziative di sostenibilità. Studi più recenti (Sawaean & Aburumman, 2025) dimostrano che tali competenze digitali hanno un ruolo di mediazione tra la leadership digitale e la performance innovativa delle PMI. L'adozione di pratiche digitali rafforza l'ecosistema imprenditoriale e accresce la capacità delle PMI di innovare e operare in un'ottica sostenibile (Ramakrishna et al., 2025), specialmente se guidata da una forte imprenditorialità verde (Sklavos et al., 2022).

Wang e Esperança (2023), nel loro lavoro, si pongono l'obiettivo di esaminare il grado di influenza della trasformazione digitale sul mercato e sulle performance di sostenibilità delle PMI cinesi. Nello studio emerge che l'implementazione di strumenti digitali dovrebbe essere una priorità, soprattutto se legata agli obiettivi ESG poiché, in questo modo, la trasformazione digitale può essere sfruttata in maniera strategica per migliorare le performance di sostenibilità. Anche El Hilali et al. (2020) hanno analizzato la relazione tra trasformazione digitale e sostenibilità attraverso uno studio empirico su 41 PMI marocchine. I risultati mostrano che la trasformazione digitale può influenzare positivamente la sostenibilità aziendale se le imprese si concentrano su tre aspetti chiave, ovvero migliorare l'esperienza del cliente – anche attraverso strategie mirate di digital marketing (Bennacer et al., 2025) innovativo e sostenibile (Jibril et al., 2024), e l'integrazione di servizi basati sull'intelligenza artificiale (Hwang et al., 2025) – sviluppare le capacità di analisi dei dati e orientare l'innovazione al livello del modello di business, fattori riconosciuti nel contesto attuale come determinanti per la competitività digitale delle PMI (Touijer & Elabjani, 2025).

Zheng e Zhang (2023), esaminando oltre 2600 aziende manifatturiere cinesi, hanno evidenziato che la trasformazione digitale può stimolare l'innovazione nelle tecnologie verdi. Gli autori sottolineano che la sostenibilità rappresenta il principale meccanismo attraverso cui la digitalizzazione favorisce lo sviluppo di soluzioni tecnologiche ecocompatibili, specialmente se supportate da un adeguato capitale intellettuale verde che moderi l'adozione di strumenti di IA (Crocco et al., 2025). Tuttavia, è necessario un forte orientamento strategico che allinei gli obiettivi digitali a quelli ambientali (Zaki et al., 2025; Shaik et al., 2024), mediante la conversione delle competenze tecnologiche in innovazione di business, mediatrice cruciale per le performance green (Khanh & Cuong, 2025). Di particolare interesse per questo studio è il fatto che le PMI traggono vantaggi più significativi da questa dinamica rispetto alle grandi aziende, come evidenziato anche nello studio di Añón Higón & Torrent-Sellens (2025), in cui emerge che anche le imprese di minori dimensioni possono agire come agenti di cambiamento se possiedono, o sono supportate nello sviluppo di, capacità appropriate.

Successivamente, per approfondire la struttura concettuale del campo di ricerca e individuare i temi portanti della letteratura, è stata condotta un'analisi di co-occorrenza delle parole chiave che ha portato all'individuazione di tre cluster (Grafico 2). Tale analisi permette di visualizzare le relazioni semantiche tra i concetti attraverso il raggruppamento in cluster, che rappresentano i principali filoni di studio.

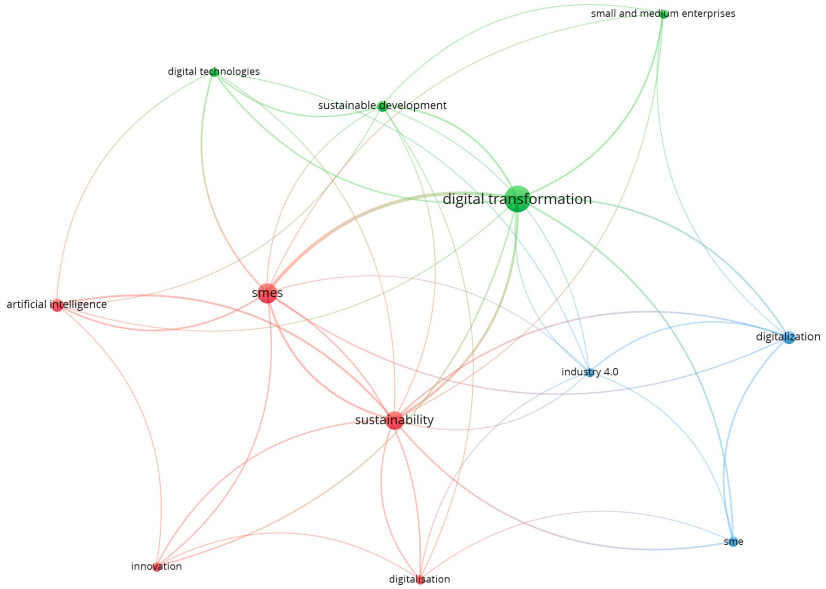


Grafico 2. Mappa di co-occorrenza delle parole chiave per autore

Il primo filone tematico, Innovazione sostenibile (cluster rosso), affronta il tema dell'implementazione dell'innovazione sostenibile e digitale nelle PMI. Le parole chiave predominanti in questo cluster sono smes (24 occorrenze, 32 TLS) e sustainability (19 occorrenze, 28 TLS). L'elevata forza dei collegamenti indica che l'innovazione tecnologica sia ormai inscindibile dagli obiettivi di sostenibilità per le PMI. In questo contesto, l'intelligenza artificiale emerge come uno strumento essenziale per implementare pratiche avanzate, come ad esempio la Green AI (Hacker, 2023; Ul Haq et al., 2025), che rappresenta un'evoluzione della tradizionale intelligenza artificiale attraverso l'integrazione di principi di sostenibilità (Ul Haq et al., 2025). Il secondo filone, Sviluppo strategico (cluster verde), è dominato dal nodo digital transformation, che rappresenta il tema più discusso, essendo sia il termine più citato sia quello con i collegamenti più forti. In questo cluster la trasformazione digitale è interpretata come una leva strategica necessaria per riconfigurare i modelli di business e garantire la crescita a lungo termine delle piccole e medie imprese (Denicolai et al., 2021; Ukko et al., 2019).

Infine, l'Evoluzione industriale (cluster blu), si distingue per il focus tecnico su Industry 4.0 e digitalization. Questo filone analizza l'automazione e l'efficienza dei processi produttivi come base infrastrutturale necessaria per sostenere la transazione sostenibile (Dutta et al., 2020). Il cluster, dunque, definisce un ambito più specifico, centrato sull'Industria 4.0 (Sarango-Lalangui et al., 2023), paradigma che la letteratura più recente sta già evolvendo verso l'Industria 5.0, con una crescente attenzione verso il fattore umano e la resilienza operativa (Latino, 2025; Takawira & Pooe, 2025).

Filone tematico	Cluster	Focus principale	Principali attori / concetti chiave
Innovazione sostenibile	Rosso	Implementazione dell'innovazione sostenibile e digitale nelle PMI, integrazione di pratiche di sostenibilità ambientale	PMI (SMEs), sostenibilità (sustainability), Intelligenza Artificiale, Green AI (Hacker, 2023; Ul Haq et al., 2025)

Sviluppo strategico	Verde	Trasformazione digitale come leva strategica per riconfigurare modelli di business e garantire crescita a lungo termine	Digital transformation, PMI, strategia aziendale, crescita sostenibile (Denicolai et al., 2021; Ukko et al., 2019)
Evoluzione industriale	Blu	Automazione e digitalizzazione dei processi produttivi come base per sostenibilità; Industria 4.0 verso Industria 5.0, con attenzione a resilienza e fattore umano	Industry 4.0, digitalization, automazione, efficienza operativa, resilienza, Industria 5.0 (Dutta et al., 2020; Sarango-Lalangui et al., 2023; Latino, 2025; Takawira & Pooe, 2025)

Tabella 3. Tabella dei cluster tematici delle parole chiave

Per mappare le relazioni tra gli studi più recenti, è stata condotta un'analisi di bibliorgaphic coupling. Questo approccio permette di raggruppare gli articoli in base alle referenze condivise, al fine di evidenziare le diverse scuole di pensiero.

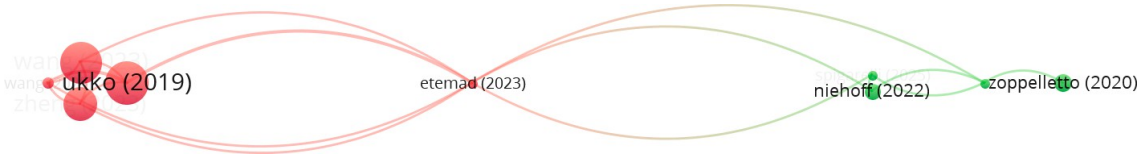


Grafico 3. Mappa di bibliographic coupling per documento

Dall'analisi sono emersi due principali approcci interpretativi, rappresentati dai due cluster. All'interno del cluster rosso sono inclusi gli studi che interpretano la trasformazione digitale come un fenomeno strategico orientato alla sostenibilità e alla creazione di valore, in particolare valore strategico (Etemad, 2023) – generato dalla capacità di convertire le risorse tecnologiche in innovazione digitale attiva (Abdelwaheed et al., 2025) – e di performance (Wang & Esperança, 2023; Valdez-Juárez et al., 2024; Jassem & Abdelfattah, 2025).

Il cluster verde, invece, raccoglie studi che si soffermano maggiormente sulla comprensione dei processi, del ruolo degli attori presenti nell'ecosistema, delle barriere che ostacolano la transizione verde e digitale (Sklavos et al., 2024), intesa come twin transformation (Burtscher et al., 2025). Gli studi evidenziano un approccio più pragmatico alla trasformazione digitale, in quanto viene analizzata come un processo di innovazione continua, talvolta supportato da strumenti operativi di autovalutazione (Latino, 2025), misurabile attraverso item specifici che collegano l'adozione tecnologica alle performance di sostenibilità (Jamwal et al., 2025; Abedin et al, 2024; Pylaeva et al., 2022, Ferraro et al., 2025, Degregori et al., 2025).

4. Discussione dei risultati e conclusioni

L'analisi condotta ha avuto l'obiettivo di rispondere alla domanda di ricerca iniziale (RQ), indagando il ruolo della IA nell'integrazione tra sostenibilità e l'innovazione nelle PMI. La risposta che emerge dalla letteratura non è univoca, ma complessa e multidimensionale, e delinea un panorama in cui convergenza tecnologica e sostenibilità definiscono il nuovo paradigma della digitainability (Saáry et al., 2022; Varbanova et al., 2025). I risultati dell'analisi bibliometrica permettono di scomporre questo ruolo in tre dimensioni principali. La prima, di natura strategico-manageriale, interpreta la trasformazione digitale come un paradigma finalizzato al raggiungimento dello sviluppo sostenibile, con particolare attenzione agli aspetti di sostenibilità ambientale. La seconda, focalizzata sull'implementazione pratica e sull'innovazione nelle PMI, analizza le modalità con cui le PMI adottano strumenti digitali e pratiche innovative. La

trasformazione digitale è vista come una leva per l'innovazione sostenibile a livello di singola impresa, con un forte legame a tecnologie specifiche come, ad esempio, l'intelligenza artificiale e le sue recenti applicazioni nella Green AI (Ul Haq et al., 2025). Infine, la terza area, di carattere tecnologico-industriale, riguarda il contesto dell'Industria 4.0 e le tecnologie abilitanti che supportano la digitalizzazione dei processi produttivi nelle piccole e medie imprese.

Successivamente, attraverso l'analisi di bibliographic coupling è stato possibile approfondire l'architettura intellettuale del campo. Questo studio ha evidenziato la presenza di due principali approcci interpretativi della trasformazione digitale, diversi ma complementari.

Il primo approccio considera la trasformazione digitale come una leva misurabile per le performance aziendali. In questa prospettiva, studi come quelli di Ukko et al. (2019) e Akbari et al. (2022) evidenziano il complesso trade-off tra capacità manageriali e operative necessario per ottenere risultati ottimali. Il secondo approccio interpreta invece la trasformazione digitale come un processo contestuale e collaborativo, ponendo l'attenzione sui processi di adozione, sulle barriere sistemiche e sul ruolo degli attori dell'ecosistema, come intermediari dell'innovazione (Zoppelletto et al., 2020; Niehoff, 2022; Spigarelli et al., 2025). In questa prospettiva, la trasformazione digitale abiliterebbe nuove forme di governance e collaborazione, permettendo di affrontare sfide collettive. Dalla sintesi delle evidenze emerse dai due filoni, è possibile rispondere alla domanda di ricerca (RQ). La trasformazione digitale, integrando sostenibilità e innovazione, agisce come catalizzatore all'interno delle PMI. In primo luogo, assume un ruolo operativo, poiché tecnologie come l'intelligenza artificiale forniscono strumenti avanzati per misurare e tradurre i principi di sostenibilità in pratiche aziendali efficienti. In secondo luogo, riveste un ruolo strategico di connessione: le piattaforme digitali consentono alle PMI di superare i vincoli legati alle dimensioni aziendali, di inserirsi in ecosistemi collaborativi e di garantire la trasparenza necessaria per competere nei mercati globali. Infine, l'efficacia della trasformazione digitale dipende dalla capacità dell'impresa di allineare l'adozione tecnologica con la propria cultura della sostenibilità, creando sinergie tra strumenti, processi e valori organizzativi.

I risultati di questo studio hanno importanti implicazioni sia per la teoria sia per la pratica. Dal punto di vista teorico, lo studio evidenzia la necessità di superare i modelli tradizionali, spesso focalizzati sulle grandi imprese. Il contributo principale risiede nel dimostrare che, per le PMI, le dimensioni della performance interna (tipica di una prospettiva orientata all'efficienza) e della governance esterna (legata alla collaborazione con l'ecosistema) non possono essere considerate separatamente. Pertanto, è necessario sviluppare approcci teorici integrati di "digitainability" che riconoscano le specificità e le differenze nei percorsi di adozione delle pratiche digitali e sostenibili (Arroyabe et al., 2024).

I risultati evidenziano che, per i manager delle PMI, la transizione verso modelli verdi e digitali richiede un approccio duplice. Prima di investire in tecnologie avanzate, è fondamentale sviluppare una leadership in grado di combinare intuizione imprenditoriale e capacità di analisi dei dati (Jaboob et al., 2025). Inoltre, la leadership deve essere in grado di integrare la sostenibilità all'interno della strategia aziendale come componente essenziale del modello di business (Amjad et al., 2024), superando una visione puramente normativa e riconoscendole un ruolo centrale nei processi decisionali, con l'obiettivo di renderla una leva strategica per un'innovazione di valore. Contemporaneamente, è essenziale rafforzare le competenze collaborative e mantenere un ruolo attivo nell'ecosistema di riferimento, così da compensare le limitazioni delle risorse interne. A livello organizzativo, per colmare il divario di competenze digitali e ridurre la resistenza al cambiamento, è importante investire nella formazione continua del personale (Afan Torres et al., 2025; Abedin et al., 2024). Invece, in merito all'interazione con l'ambiente esterno, le tecnologie digitali permettono alle PMI di costruire relazioni più solide e trasparenti con i clienti e i partner, pertanto, la digitalizzazione può essere sfruttata per migliorare il coinvolgimento degli stakeholder, ad esempio attraverso l'uso di piattaforme di co-creazione che facilitano la creazione di valore e la condivisione della conoscenza, la condivisione trasparente dei dati di impatto ambientale che incoraggia la responsabilità condivisa verso obiettivi sostenibili, o l'adozione di

strumenti di comunicazione interattiva per creare esperienze personalizzate che promuovano abitudini sostenibili (Alsafran et al., 2025). In questo modo, la tecnologia assume il ruolo operativo necessario per misurare le performance di sostenibilità e superare il trade-off tra efficienza e innovazione. L'analisi evidenzia per i policy maker l'importanza di promuovere politiche mirate a ridurre il divario tra grandi e piccole imprese (Niehoff, 2022) e a rafforzare il ruolo degli intermediari dell'innovazione, facilitando il trasferimento di tecnologie e competenze all'interno degli ecosistemi aziendali (Spigarelli et al., 2025). Parallelamente, è essenziale che i policy maker garantiscano infrastrutture digitali robuste e accessibili, in grado di permettere la trasformazione dei modelli di business (Afan Torres et al., 2025). È fondamentale che l'adozione di tecnologie digitali sia funzionale al raggiungimento di obiettivi ambientali e sociali (Anón Higón & Torrent-Sellens, 2025), per rafforzare la capacità delle imprese di adattarsi e prosperare anche in scenari futuri incerti (Carayannis et al., 2025).

Lo studio presenta alcune limitazioni. L'analisi bibliometrica si è concentrata esclusivamente sul database Scopus, il che assicura un elevato standard qualitativo dei contributi considerati, ma potrebbe aver escluso lavori rilevanti presenti su altre piattaforme.

Tali limiti indicano diverse direzioni per la ricerca futura. La letteratura ha evidenziato un trade-off iniziale tra innovazione tecnologica ed efficienza operativa (Ukko et al., 2019); pertanto, studi longitudinali sulle PMI potrebbero chiarire se e come questo trade-off venga superato e se i profili di adozione identificati da Arroyabe et al. (2024) rappresentino stadi evolutivi o condizioni più stabili. Inoltre, la ricerca attuale si concentra prevalentemente sulla sostenibilità ambientale, trascurando aspetti legati alla sostenibilità sociale e all'etica. Nuovi filoni potrebbero approfondire l'impatto dell'intelligenza artificiale sui processi decisionali e sui dilemmi etici, nonché sul benessere dei lavoratori nelle PMI, al fine di integrare pienamente la tecnologia all'interno di un approccio complessivo alla sostenibilità.

Parole chiave: Innovazione tecnologica; trasformazione digitale; sostenibilità; PMI; analisi sistematica della letteratura

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L'evoluzione dei sistemi informativo-contabili in risposta alle sfide della sostenibilità

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1. Introduzione

Negli ultimi anni, la crescente centralità della sostenibilità, intesa sia come requisito normativo sia come priorità strategica, ha portato le aziende ad un ripensamento dei propri sistemi informativi, dei processi di controllo e dei meccanismi decisionali. L'Unione Europea ha progressivamente definito un articolato quadro normativo volto a integrare la sostenibilità nei processi aziendali e nei sistemi di rendicontazione, introducendo obblighi informativi sempre più estesi e standardizzati. Iniziative quali la Corporate Sustainability Reporting Directive (CSRD, Direttiva UE 2022/2464), gli European Sustainability Reporting Standards (ESRS) e il Regolamento Tassonomia (Regolamento UE 2020/852) mirano a integrare sistematicamente le dimensioni ambientali, sociali e di governance (ESG) nella gestione aziendale, nella pianificazione strategica e nei processi di informativa esterna (Bini e Giunta, 2023; EFRAG, 2023). Tali interventi normativi richiedono alle organizzazioni di integrare gli obiettivi di sostenibilità nei processi decisionali, rendendoli misurabili attraverso la progettazione di adeguati sistemi di controllo, lo sviluppo di infrastrutture informatiche e di monitoraggio e l'adozione di solidi meccanismi di governance. In questo contesto, le imprese sono chiamate a dotarsi di sistemi informativi in grado di generare informazioni ESG affidabili, verificabili e integrabili con i dati economico-finanziari, così da supportare la qualità e la rilevanza delle decisioni aziendali. Ne derivano significative implicazioni organizzative, procedurali e tecnologiche, che incidono direttamente sull'evoluzione dei sistemi informativo-contabili e dei sistemi di management accounting.

Diversi studi evidenziano il ruolo centrale dei sistemi informativo-contabili nel promuovere la sostenibilità e nel garantire la conformità a quadri normativi in continua evoluzione (Goni et al., 2017; Puroila e Mäkelä et al., 2019; Lavorato et al., 2025). Tradizionalmente concepiti come infrastrutture di rendicontazione finanziaria, tali sistemi sono oggi sempre più interpretati come sistemi socio-tecnici in grado di integrare informazioni finanziarie e non finanziarie, al fine di supportare i processi decisionali interni e la rendicontazione esterna (Troshani e Rowbottom, 2024). Pertanto, riprogettare questi sistemi può risultare rilevante al fine di rendere operativa la rendicontazione di sostenibilità, garantire la tracciabilità dei dati e collegare gli obiettivi ESG alle pratiche manageriali (de Villiers et al., 2021). Le tecnologie digitali come piattaforme cloud, strumenti di data analytics, blockchain e Internet of Things, agiscono come fattori abilitanti di questo processo, contribuendo a migliorare la trasparenza e la verificabilità delle informazioni di sostenibilità (Arnaboldi et al., 2017; Lardo et al., 2020; Galeotti et al., 2022).

Nonostante la crescente attenzione al tema, la maggior parte degli studi si è finora concentrata sul reporting di sostenibilità (Gray, 2010; Bebbington et al., 2012; de Villiers et al.,

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2014; Higgins et al., 2015; Talbot e Boiral, 2018) e sui sistemi di sustainability management control (Söderström et al., 2017; Wijethilake, 2017), mentre pochi Autori hanno indagato come integrare la sostenibilità nei sistemi informativi aziendali (Gond et al., 2012; Maas et al., 2016; Schaltegger e Hörisch, 2017). In particolare, studi recenti suggeriscono che il sistema informativo-contabile svolge un ruolo chiave nell'integrazione della sostenibilità nei processi aziendali (Gond et al., 2012; Schaltegger e Hörisch, 2017; Lavorato et al., 2025), ma le prove empiriche rimangono ancora scarse e frammentate (Dagilienė e Šutienė, 2019; Troshani e Rowbottom, 2024).

2. Obiettivi e metodologia della ricerca

Alla luce del gap individuato in letteratura, il presente studio si propone di indagare l'evoluzione del sistema informativo-contabile in risposta ai nuovi requisiti di rendicontazione introdotti dal framework normativo europeo sulla sostenibilità, con particolare riferimento alla CSRD, agli ESRS e al Regolamento Tassonomia. L'analisi si focalizza sui cambiamenti organizzativi, procedurali e tecnologici attivati da tali pressioni normative, con riferimento alle modalità di raccolta, elaborazione, integrazione e controllo delle informazioni di sostenibilità.

Dal punto di vista teorico, lo studio muove dal presupposto che le recenti normative europee in materia di sostenibilità rappresentano una forma di pressione coercitiva che destabilizza le pratiche di reporting esistenti e impone alle aziende una profonda revisione dei propri sistemi informativo-contabili. Tale cambiamento , tuttavia, non può essere interpretato come un mero adeguamento tecnico, ma deve essere letto come un processo di trasformazione orientato al conseguimento di conformità normativa, legittimità e credibilità nei confronti degli stakeholder.

Per comprendere come le organizzazioni rispondono a queste pressioni e come il cambiamento si traduce operativamente nella riconfigurazione dei sistemi informativo-contabili, lo studio adotta la socio-technical theory (Bostrom e Heinen, 1977; Fischer e Herrmann, 2011) quale principale lente interpretativa. Secondo questa prospettiva, un sistema informativo può essere interpretato come una configurazione integrata di sottosistemi interdipendenti che co-evolvono nel tempo (Troshani e Rowbottom, 2024). In linea con le più recenti elaborazioni teoriche, il sistema informativo-contabile viene interpretato come l'interazione dinamica tra tre sottosistemi principali: ambientale, sociale e tecnico. Il sottosistema ambientale include il contesto istituzionale e normativo entro cui l'organizzazione opera. Il sottosistema sociale comprende gli attori organizzativi coinvolti, nonché le relazioni, le competenze, i ruoli, le strutture organizzative e le pratiche operative attraverso cui il lavoro viene svolto. Il sottosistema tecnico riguarda invece gli artefatti informativi e le infrastrutture digitali, inclusi software, database, piattaforme, moduli di raccolta dati e strumenti di reporting.

In questa prospettiva, il cambiamento del sistema informativo-contabile indotto dalla regolamentazione sulla sostenibilità è interpretabile come un processo di riallineamento socio-tecnico, in cui le organizzazioni sono chiamate a riconfigurare simultaneamente persone, tecnologie e pratiche operative per rispondere alle nuove esigenze informative. Un principio centrale della socio-technical theory è quello della joint optimisation (Pasmore et al., 2019), secondo cui l'efficacia complessiva del sistema dipende dalla capacità di raggiungere un adeguato equilibrio tra le componenti sociali e tecniche, in relazione alle pressioni ambientali. Tale equilibrio non è statico, ma si sviluppa in modo iterativo nel tempo, soprattutto in contesti caratterizzati da elevata incertezza normativa e da requisiti informativi in rapida evoluzione, come quello della rendicontazione di sostenibilità.

Dal punto di vista metodologico, lo studio adotta il metodo del case study (Yin, 2017), ritenuto particolarmente appropriato per indagare in profondità fenomeni complessi e fortemente contestualizzati, quali i processi di riconfigurazione dei sistemi informativo-contabili in risposta a contesti normativi in rapida evoluzione. L'analisi empirica si concentra su Alfa, un grande

gruppo italiano operante nel settore dei trasporti, attivo nelle infrastrutture ferroviarie e stradali, nei servizi passeggeri e merci e nella mobilità urbana.

La scelta del caso appare particolarmente significativa in quanto il gruppo, negli ultimi anni, ha progressivamente rafforzato il proprio impegno nella gestione e nel monitoraggio delle performance ESG, integrando la rendicontazione di sostenibilità nella Relazione Finanziaria Annuale, predisposta in conformità agli ESRS, in quanto soggetto ai requisiti della CSRD. Un passaggio rilevante di tale evoluzione è rappresentato dall'ampliamento della relazione sulla gestione con sezioni dedicate alla governance di sostenibilità, alla valutazione dei rischi, al coinvolgimento degli stakeholder e agli indicatori di performance ESG, strutturate secondo il framework ESRS. In linea con il nuovo quadro normativo, sia la capogruppo sia le società consolidate partecipano ai processi di reporting e controllo della sostenibilità: la capogruppo presidia gli aspetti trasversali, mentre le controllate rendicontano temi e indicatori settoriali rilevanti per i rispettivi ambiti di attività. Inoltre, Alfa ha integrato nel bilancio consolidato anche le informative richieste dal Regolamento Tassonomia, che introduce un sistema di classificazione delle attività economiche sostenibili e richiede la disclosure di indicatori quali la quota di fatturato, CapEx e OpEx allineati alla tassonomia. Tale adempimento assume particolare rilevanza in settori ad alto impatto, come quello dei trasporti, poiché consente agli stakeholder di valutare il contributo dell'impresa alla transizione ecologica. Per rispondere a tali obblighi, Alfa ha avviato già nel 2022 un progetto dedicato alla mappatura e alla rendicontazione dei costi, ricavi e investimenti associati alle attività sostenibili ai fini tassonomici, con l'obiettivo di costruire un processo strutturato e replicabile di raccolta, valutazione e consolidamento delle informazioni.

Al fine di garantire triangolazione e solidità interpretativa, i dati sono stati raccolti attraverso fonti multiple (Yin, 2017), tra cui documenti aziendali interni, materiali pubblicamente disponibili sui siti web del gruppo, presentazioni e report di progetto, nonché interviste semi-strutturate. In particolare, sono state condotte due interviste pilota con il Responsabile Bilancio e Amministrazione Fiscale, svolte rispettivamente nel luglio 2023 e nel gennaio 2024, della durata di circa 40 minuti ciascuna. Tra ottobre e novembre 2025 sono state inoltre realizzate interviste con il Responsabile del Reporting di Sostenibilità, il Responsabile Accounting Policy e Analisi Partecipate e il Responsabile dei Sistemi Informativi. Gli intervistati, direttamente coinvolti nel progetto di adeguamento del sistema informativo, hanno fornito contributi rilevanti per ricostruire l'evoluzione delle pratiche informative e organizzative nel tempo.

I materiali raccolti sono stati integralmente trascritti e sottoposti a un'analisi qualitativa del contenuto (Strauss e Corbin, 1990; Patton, 2014). Le evidenze emerse sono state interpretate alla luce della socio-technical theory, al fine di analizzare l'interazione tra pressioni normative, attori organizzativi e infrastrutture tecnologiche nel processo di cambiamento del sistema informativo-contabile.

3. Risultati attesi

La ricerca è attualmente in corso, pertanto, lo studio non consente ancora di formulare risultati conclusivi; tuttavia, l'analisi preliminare delle fonti documentali e delle evidenze empiriche raccolte permette di delineare alcune prime traiettorie interpretative.

Per rispondere ai requisiti del Regolamento Tassonomia, Alfa ha avviato nel 2022 un progetto strutturato volto a sviluppare un processo sistematico di raccolta, analisi e rendicontazione delle informazioni richieste. Tale iniziativa è scaturita dalla necessità di integrare nel sistema informativo aziendale un insieme di dati tecnici e contabili che, fino a quel momento, non risultavano adeguatamente monitorati e tracciati nei sistemi esistenti.

Il progetto si è articolato lungo tre direttrici principali. La prima ha riguardato un assessment tecnico, volto a identificare le attività economiche del gruppo rientranti nell'ambito della Tassonomia e potenzialmente riconducibili agli obiettivi di mitigazione o adattamento climatico. La seconda ha interessato un assessment contabile, finalizzato a garantire la corretta

individuazione, classificazione e riconciliazione di ricavi, costi operativi e investimenti associati alle attività sostenibili con i dati finanziari del gruppo. La terza ha riguardato una gap analysis dei processi informativi e dei sistemi IT, orientata a individuare le principali criticità in termini di tracciabilità, raccolta, analisi e integrazione delle informazioni necessarie al reporting di sostenibilità.

Per governare la complessità del progetto, Alfa ha costituito un gruppo di lavoro interfunzionale composto da diverse strutture organizzative. In particolare, Sustainability Reporting & Compliance ha assunto il coordinamento del processo; Amministrazione e Bilancio ha contribuito con competenze relative ai principi contabili e alla riconciliazione dei KPI; Climate Risk Resilience ha curato le valutazioni tecniche connesse all'adattamento climatico. A tali strutture si è affiancata, per gli aspetti informativi e contabili del processo di "disclosure tassonomico" a livello consolidato, la funzione Bilancio Consolidato, Gestione e Coordinamento Controllate. Le società controllate hanno assunto un ruolo attivo nella raccolta dei dati e nella valutazione delle attività, seguendo un approccio di tipo bottom-up. Ciascuna società controllata ha individuato referenti interni incaricati dello screening tecnico, della raccolta documentale e della predisposizione dei KPI richiesti.

La prima fase operativa ha riguardato la definizione di linee guida di gruppo, finalizzate a formalizzare metodi, responsabilità e procedure per la valutazione delle attività, la verifica del rispetto dei criteri ambientali e sociali previsti dal regolamento e il calcolo dei KPI richiesti (turnover, CapEx, OpEx). Ciò ha consentito di introdurre un linguaggio comune, uniformare le pratiche e ridurre la discrezionalità operativa tra le diverse società del gruppo. Successivamente, ciascuna controllata ha condotto un processo di screening delle proprie attività economiche, identificando quelle eleggibili e valutandone l'eventuale allineamento ai criteri tecnici della Tassonomia. Le informazioni raccolte sono state quindi trasmesse alla capogruppo per le attività di validazione e consolidamento.

La gap analysis dei sistemi informativi ha fatto emergere una marcata dipendenza da procedure manuali, in particolare template Excel e scambi informali di documenti, evidenziando limiti rilevanti in termini di standardizzazione, affidabilità, verificabilità e capacità di integrazione con il sistema informativo-contabile. Tali criticità sembrano aver favorito l'avvio di un percorso di evoluzione digitale, articolato nell'estensione della piattaforma utilizzata per il reporting di sostenibilità (ESGeo), nello sviluppo di moduli dedicati nel sistema di Enterprise Performance Management (EPM) per l'automazione del calcolo e del consolidamento dei KPI tassonomici e nella progressiva integrazione tra le diverse piattaforme informative.

La fase finale del progetto ha riguardato la predisposizione delle informative di gruppo incluse nella Relazione Finanziaria Annuale, consolidate attraverso le nuove maschere di data entry EPM e processate mediante i sistemi di reporting centralizzato.

Alla luce della socio-tehnical theory, tali evidenze preliminari suggeriscono che l'evoluzione del sistema informativo-contabile di Alfa, osservata nel contesto dell'implementazione del nuovo quadro normativo europeo sulla sostenibilità, può essere letta come un processo di riallineamento socio-tecnico. Tale processo appare innescato da pressioni istituzionali di natura coercitiva, che hanno messo in discussione l'adeguatezza delle configurazioni informative preesistenti e reso necessario un ripensamento congiunto delle componenti organizzative, tecnologiche e procedurali del sistema.

In questa chiave interpretativa, l'adeguamento ai requisiti della CSRD e del Regolamento Tassonomia non si configura come un mero intervento tecnico sui sistemi informativi, bensì come un più ampio percorso di trasformazione, nel quale la riconfigurazione delle infrastrutture digitali si accompagna alla ridefinizione dei ruoli, responsabilità e pratiche operative connesse alla produzione delle informazioni di sostenibilità.

Con riferimento al sottosistema ambientale, le evidenze preliminari indicano che l'introduzione di requisiti informativi standardizzati e verificabili ha ridefinito le aspettative istituzionali nei confronti dell'organizzazione, imponendo nuovi criteri di legittimità basati sulla

capacità di produrre informazioni ESG tracciabili, confrontabili e integrabili con i dati contabili. Tali pressioni sembrano aver generato una discontinuità rispetto alle pratiche precedenti, stimolando l'avvio di un progetto strutturato volto a formalizzare il processo di disclosure tassonomica.

Per quanto concerne il sottosistema sociale, l'analisi preliminare suggerisce che le pressioni normative hanno comportato una riconfigurazione dei ruoli, delle responsabilità e delle modalità di coordinamento. L'istituzione di un gruppo di lavoro interfunzionale e il coinvolgimento attivo delle società controllate indicano un tentativo di ridistribuire le competenze informative e di costruire nuove pratiche operative condivise. In questa prospettiva, il cambiamento del sistema informativo-contabile assume i tratti di un processo collettivo e distribuito, nel quale la produzione delle informazioni di sostenibilità richiede l'integrazione di competenze contabili, tecniche e manageriali.

Con riferimento al sottosistema tecnico, i risultati attesi evidenziano una fase iniziale caratterizzata dal ricorso a strumenti manuali e non integrati, che sembrano aver svolto una funzione transitoria di adattamento alle nuove richieste informative. Tali soluzioni, pur avendo consentito una prima operatività del reporting, hanno messo in luce limiti strutturali in termini di standardizzazione, affidabilità e integrazione con il sistema informativo-contabile. In linea con i principi della socio-technical theory, tali criticità sembrano aver favorito l'avvio di un percorso di evoluzione tecnologica orientato allo sviluppo di soluzioni più strutturate, quali l'estensione delle piattaforme ESG, l'implementazione di moduli dedicati nei sistemi di EPM e la progressiva integrazione tra le diverse infrastrutture informative.

Nel complesso, i risultati attesi suggeriscono che il cambiamento del sistema informativo-contabile di Alfa può essere interpretato come un processo dinamico di joint optimisation, in cui l'efficacia del sistema dipende dalla capacità di riallineare simultaneamente componenti ambientali, sociali e tecniche. In un contesto caratterizzato da incertezza normativa e da requisiti informativi in continua evoluzione, tale riallineamento appare iterativo e graduale, riflettendo un percorso di apprendimento organizzativo volto a stabilizzare nuove pratiche di rendicontazione della sostenibilità.

4. Conclusioni e valore scientifico potenziale

I risultati attesi dello studio consentono di delineare un potenziale contributo alla letteratura sul management accounting e sui sistemi informativo-contabili nel contesto della sostenibilità.

Dal punto di vista teorico, il contributo principale risiede nell'applicazione della socio-technical theory per interpretare i processi di cambiamento dei sistemi informativo-contabili indotti dalle pressioni normative ESG. Tale prospettiva consente di cogliere in modo integrato la dimensione istituzionale, organizzativa e tecnologica del cambiamento, mostrando come le pressioni coercitive si traducono in processi di riallineamento dei sottosistemi ambientale, sociale e tecnico. In tal senso, lo studio contribuisce potenzialmente a colmare il gap evidenziato in letteratura, rendendo più visibili i meccanismi attraverso cui la sostenibilità viene tradotta in pratiche informative e contabili concrete e come queste influenzano la governance, i processi e le infrastrutture informatiche delle organizzazioni (Dagilienė e Šutienė, 2019; Troshani e Rowbottom, 2024).

Dal punto di vista manageriale, lo studio offre prime indicazioni utili per la progettazione di sistemi informativo-contabili in grado di supportare efficacemente la compliance ESG. In particolare, la ricerca consente di mettere in luce le principali criticità e le condizioni abilitanti per l'integrazione dei dati non finanziari, suggerendo possibili linee guida e assetti operativi per le imprese chiamate a confrontarsi con le richieste introdotte dalla CSRD e dal Regolamento Tassonomia. Trattandosi di una ricerca ancora in corso, tali implicazioni si fondano su evidenze preliminari e richiederanno ulteriori approfondimenti empirici. Le successive fasi di analisi saranno pertanto orientate ad ampliare e consolidare il quadro interpretativo mediante ulteriori

interviste, focus group e analisi sistematiche delle evidenze raccolte, al fine di approfondire le dinamiche evolutive dei sistemi informativo-contabili e la loro capacità di supportare la rendicontazione di sostenibilità in contesti normativi complessi.

Parole chiave: Sistemi informativo-contabili; normativa di sostenibilità; teoria socio-tecnica

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Riprogettare i programmi di incubazione per la transizione circolare: evidenze da un caso italiano

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1. Introduzione

L'Economia Circolare (EC), ampiamente riconosciuta quale leva strategica nel processo di transizione verso lo sviluppo sostenibile (Bourdin e Jacquet 2025), rappresenta una trasformazione profonda dei modelli economici tradizionali. Essa promuove un sistema rigenerativo volto a minimizzare la produzione di rifiuti e ad aumentare l'efficienza nell'uso delle risorse tramite pratiche quali il riuso, la riparazione, la rigenerazione e il riciclo (Blomsma e Brennan, 2017; Geissdoerfer et al., 2017; Kirchherr et al., 2017). Riducendo la dipendenza da risorse naturali finite, l'EC non solo evita che i rifiuti confluiscano in discarica o negli ecosistemi naturali, ma consente anche il recupero del valore latente incorporato nei materiali scartati (Siskos e Van Wassenhove 2017; Aranda-Usón et al. 2020). In tal modo, essa contribuisce alla conservazione del valore generato dai beni comuni ambientali (Ostrom 1990) e alla prevenzione della "tragedia dei commons" (Hardin 1968), fenomeno connesso al sovrasfruttamento di tali tipi di beni (Becchetti et al., 2025; Pomoni et al., 2024). L'EC è inoltre in grado di generare consistenti benefici macroeconomici (MacArthur et al. 2015; Geissdoerfer et al. 2017), contribuendo allo sviluppo di infrastrutture resilienti, alla diffusione di pratiche industriali sostenibili, alla stimolazione dell'innovazione e alla creazione di nuove opportunità occupazionali (MacArthur et al. 2015; Morgan e Mitchell 2015; Rossi et al. 2020). In questo contesto, le start-up circolari rappresentano un attore chiave nel promuovere la transizione verso la circolarità e il raggiungimento degli obiettivi di sviluppo sostenibile (SDGs) (Henry et al. 2020). Queste imprese affrontano significative difficoltà nella pianificazione strategica (PS) dei propri business model (Gaurav et al., 2019; Sharma et al., 2024); al riguardo, gli incubatori d'impresa possono svolgere un ruolo cruciale nel rafforzare tali capacità, offrendo servizi mirati, competenze e reti specialistiche in grado di supportare efficacemente la transizione verso modelli di business circolari (Millette et al., 2020). Tuttavia, la letteratura sul ruolo degli incubatori orientati all'EC rimane scarsa e frammentata (Kambanou et al., 2025; Klofsten et al., 2024). Pertanto, questa ricerca si propone di analizzare, attraverso uno studio di caso, il modello operativo di un incubatore orientato all'EC per comprendere come esso supporti la PS del business model circolare delle start-up incubate. I risultati attesi offriranno indicazioni utili per migliorare i programmi di incubazione e contribuiranno all'avanzamento delle conoscenze sulle modalità con cui gli incubatori possono facilitare la transizione verso modelli imprenditoriali sostenibili e circolari.

2. Background teorico e obiettivi della ricerca

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2.1. Start-up circolari: motori della transizione verso la circolarità

Nel contesto dell'EC, le start-up emergono come attori chiave nel promuovere il passaggio verso un'EC e, più in generale, verso obiettivi di sostenibilità (Henry et al. 2020). Sviluppando soluzioni innovative che possono essere scalate o integrate dagli incumbent, queste start-up rappresentano un abilitatore della transizione circolare. Un caso emblematico è rappresentato da "Bioenutra", nata come start-up circolare con sede in Puglia ed evolutasi successivamente in PMI innovativa. L'impresa ha sviluppato un processo avanzato di valorizzazione dei sottoprodotti della produzione dell'olio d'oliva, in particolare delle acque di vegetazione, tradizionalmente trattate come rifiuto oneroso da smaltire. Attraverso un approccio circolare, Bioenutra separa tali acque in tre frazioni: (i) una componente solida utilizzabile per la produzione di biogas o per il compostaggio; (ii) acqua depurata riutilizzabile nei cicli irrigui; ed (iii) estratti di polifenoli ("Momast") di elevato valore per applicazioni nutraceutiche, farmaceutiche, cosmetiche e alimentari. Queste tipologie di start-up sono fondate su principi di circolarità (Sharma et al. 2024; Maaßen e Urbano 2024) e adottano strategie orientate a restringere i flussi di risorse (riduzione degli input), rallentarli (prolungamento della vita utile dei prodotti), chiuderli (recupero e riutilizzo dei materiali) e rigenerarli (ripristino dei sistemi naturali) (Konietzko et al. 2020; Bocken e Geradts 2022). Henry et al. (2020) individuano cinque archetipi di start-up circolari: (i) design-based, che introducono prodotti a ridotto impiego di risorse; (ii) waste-based, che trasformano scarti in input produttivi; (iii) platform-based, che favoriscono la condivisione o i mercati dell'usato; (iv) service-based, che sostituiscono la proprietà con l'accesso; e (v) nature-based, che valorizzano i sistemi naturali senza comprometterne l'integrità. Capaci di adattarsi rapidamente alle condizioni mutevoli del mercato e di adottare modelli di business circolari, queste imprese si distinguono dagli incumbent (Henry et al. 2020; Han et al. 2023) e possono trarre vantaggio competitivo da tali capacità, con rilevanti prospettive di crescita (Klofsten et al., 2024).

2.2. La pianificazione strategica nelle start-up circolari

La PS costituisce un processo gestionale fondamentale per il successo delle start-up orientate ai modelli di EC. Essa può essere definita come uno strumento direzionale volto a guidare le decisioni organizzative attraverso l'elaborazione di strategie competitive di lungo periodo. Tali strategie mirano a valorizzare i punti di forza interni e le opportunità provenienti dal contesto esterno, riducendo al contempo l'impatto delle debolezze organizzative e delle minacce ambientali (Nolan et al. 2008; Hitt et al. 2021; Thompson et al. 2021). Nonostante ciò, la sostenibilità risulta ancora scarsamente integrata nei processi di PS (Valentine 2010; Galvão et al. 2022). Di conseguenza, le imprese tendono ad adottare pratiche sostenibili in modo reattivo o frammentato, senza disporre di un orientamento chiaro su come trasformarle in un vantaggio competitivo. Tale criticità è particolarmente accentuata nel caso delle start-up circolari, che si trovano ad affrontare numerose difficoltà nella definizione e nello sviluppo di modelli di business circolari scalabili, replicabili ed economicamente sostenibili, nonché nella loro effettiva implementazione (ad esempio, Gaurav et al., 2019; Sharma et al., 2024). La loro crescita è infatti ostacolata dalla scarsità di risorse e competenze (Baldassarre et al. 2020), così come dalle difficoltà di accesso a finanziamenti. Infatti, gli investitori mostrano spesso scetticismo nei confronti di tali imprese, aggravando i già presenti gap di investimento nelle transizioni circolari (Kahupi et al. 2021; Kanda et al. 2024). Ulteriori barriere derivano da ostacoli settoriali, dalle caratteristiche del modello di business e dallo stadio di sviluppo dell'idea (Van Opstal e Borms 2023; Kanda et al. 2024; Kasana et al. 2024). Anche la domanda di mercato può risultare limitata, in quanto condizionata da scarsa consapevolezza ambientale, dipendenza da incumbent dominanti e cornici normative deboli o inadeguate (Suchek et al. 2022; Van Opstal e Borms 2023; Von Kolpinski et al. 2023; Kanda et al. 2024; Kasana et al. 2024; Engzell e Kambanou 2024). Il successo delle start-up circolari dipende, quindi, dalla capacità di superare questo insieme

articolato di ostacoli interni ed esterni (Von Kolpinski et al. 2023; Engzell e Kambanou 2024) e di valorizzare le risorse e competenze disponibili. In questo senso, adattando lo Strategic Planning Decision Framework for Circular Business Models (SPDF-CBM) proposto da Puglieri et al. (2022), le start-up circolari dovrebbero pianificare strategicamente il proprio modello di business seguendo cinque fasi: (i) Analisi dei trend circolari: la start-up è chiamata a riconoscere la rilevanza dei principi dell'EC e a identificare, analizzando l'ambiente esterno e le dinamiche politiche, economiche, sociali e tecnologiche, nonché le aspettative degli stakeholder, potenziali opportunità di business circolari non ancora colte dal mercato (ad esempio, una risorsa sottoutilizzata, un costo ambientale nascosto); (ii) Visione circolare e definizione degli obiettivi: la start-up deve integrare la circolarità con la crescita, definendo un modello di business born-circular supportato da una vision di successo di medio-lungo periodo; (iii) Valutazione della fattibilità del modello di business: la start-up deve valutare rigorosamente la propria idea di business e le competenze possedute dal team; (iv) Definizione della strategia competitiva: la start-up deve individuare la strategia competitiva più appropriata al modello di business, considerando la sostenibilità come una fonte di vantaggio economico-competitivo; (v) Prioritizzazione delle strategie: la start-up avvia la realizzazione dell'idea innovativa attuando sperimentazioni e dando priorità a quelle maggiormente aderenti al modello di business circolare.

2.3. Gli incubatori di impresa come attori a supporto della pianificazione strategica delle start-up circolari

Tra i diversi attori coinvolti nel sostegno alle start-up circolari, gli incubatori d'impresa rivestono un ruolo particolarmente significativo nel rafforzare la loro capacità di PS. Il processo di incubazione è stato definito come "an interactive development process where the aim is to encourage people to start their own business and to support start-up companies in the development of innovative products. (…) Besides accommodation, an incubator should offer services such as hands-on management, access to finance (…), legal advice, operational know-how and access to new markets"[5] (Aernoudt 2004, p. 127). Seguendo Abduh et al. (2007), i servizi offerti dagli incubatori possono essere raggruppati in tre categorie: (i) servizi basati sulle strutture; (ii) servizi di consulenza e supporto manageriale; (iii) accesso a reti interne ed esterne. Tra le varie tipologie presenti in letteratura, Grimaldi e Grandi (2005) individuano quattro principali forme di incubatori: (i) Business Innovation Centers (BICs), creati nel 1984 su iniziativa della Commissione Europea, forniscono prevalentemente servizi di base come spazi, informazioni su finanziamenti, assistenza amministrativa e visibilità; (ii) University Business Incubators (UBIs), istituiti all'interno delle università, mirano a sviluppare, integrare e diffondere conoscenza scientifica e tecnologica, offrendo servizi specifici quali consulenza da parte dei docenti, accesso a biblioteche e laboratori, infrastrutture scientifiche avanzate, programmi di R&S e trasferimento tecnologico (Mian 1996); (iii) Independent Private Incubators (IPIs), fondati da investitori privati o gruppi di investimento, spesso assumono partecipazioni nelle start-up con l'obiettivo di accelerarne la crescita. Essi sono spesso identificati come acceleratori; (iv) Corporate Private Incubators (CPIs), promossi da grandi imprese, nascono per sviluppare nuove linee di business derivanti da iniziative interne non altrimenti realizzabili all'interno delle strutture aziendali esistenti. BICs e UBIs operano generalmente come enti non profit, coerentemente con la loro origine pubblica o istituzionale e con la missione di promuovere lo sviluppo economico regionale. IPIs e CPIs, invece, sono orientati al profitto. Inoltre, UBIs e CPIs tendono a sostenere idee di

[5] Nostra traduzione: "un processo di sviluppo interattivo volto a incoraggiare l'avvio di nuove imprese e a sostenere start-up nella realizzazione di prodotti innovativi (...). Oltre a fornire spazi, un incubatore dovrebbe offrire servizi quali management operativo, accesso ai finanziamenti (...), consulenza legale, know-how operativo e accesso a nuovi mercati"

business generate all'interno delle proprie istituzioni di appartenenza, mentre BICs e IPIs supportano prevalentemente progetti imprenditoriali provenienti dall'esterno.

Gli incubatori di impresa possono svolgere una funzione chiave nel supportare le start-up circolari nell'affrontare le molteplici sfide legate alla pianificazione, sviluppo e scalabilità dei loro modelli di business (Millette et al. 2020). Tuttavia, data la specificità dei principi e dei processi della circolarità, i metodi di incubazione tradizionali risultano spesso inadeguati. Gli imprenditori faticano a individuare opportunità circolari e gli incubatori convenzionali spesso non dispongono delle competenze necessarie per supportarli, con conseguenti inefficienze nella valutazione di elementi chiave dei modelli di business circolari, quali flussi di rifiuti, reverse logistics, processi di recupero e modelli di vendita adeguati (Millette et al. 2020; Hull et al. 2021). Per colmare tali lacune, Millette et al. (2020) propongono un modello di incubazione specificamente orientato all'EC (Figura 1).

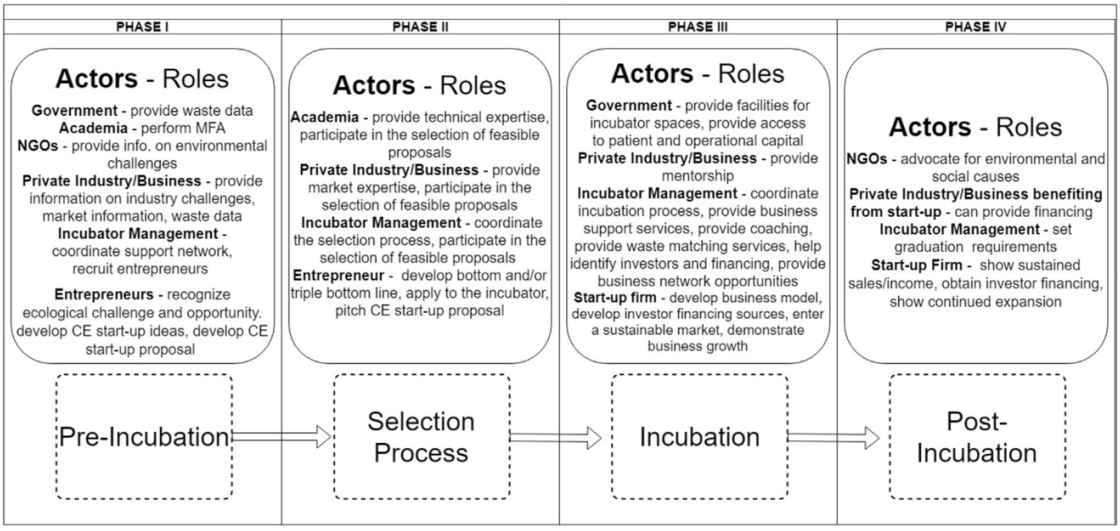


Figura 1. Modello di incubazione orientato alla circolarità, fonte: (Millette et al., 2020, p. 5)

Diversamente dai programmi tradizionali, focalizzati principalmente su idee già sviluppate e sull'accesso ai capitali, questo approccio è proattivo e guida gli imprenditori nel processo di identificazione e creazione di opportunità di business sostenibili. Il modello si fonda su tre pilastri: (i) Material Flow Analysis (MFA): gli incubatori orientati alla circolarità forniscono alle start-up informazioni sui flussi di scarti recuperabili; (ii) Industrial Symbiosis (IS): tali incubatori favoriscono la creazione di reti collaborative tra imprese per ottimizzare l'uso delle risorse e ridurre i costi; e (iii) Entrepreneurial Orientation (EO): gli incubatori selezionano esclusivamente imprenditori capaci di sfruttare i dati sui flussi di materiali per sviluppare soluzioni innovative. Attraverso questi tre pilastri, gli incubatori fungono da ponte tra conoscenze tecniche e opportunità imprenditoriali, sostenendo in modo attivo la crescita di start-up circolari competitive. Alla luce di quanto illustrato, gli incubatori tradizionali devono adattare i propri modelli di business per integrare i principi dell'EC, quali la minimizzazione dei rifiuti, il riciclo delle risorse e il redesign dei cicli di vita dei prodotti (Klofsten et al. 2024). L'offerta di attività di mentorship e coaching da parte di esperti in pratiche di EC, sustainable supply chains, comunicazione con investitori e clienti, riduzione dell'impatto ambientale e rigenerazione delle risorse è di fondamentale importanza (Millette et al. 2020; Kanda et al. 2024). Si raccomanda inoltre l'erogazione di programmi formativi personalizzati per sostenere lo sviluppo di modelli di business innovativi e scalabili, nonché l'offerta di supporto in materia di conformità normativa e strategie di marketing finalizzate ad aumentare la consapevolezza dei consumatori (Bank e Kanda

2016; Klofsten et al. 2024). Analogamente, Surana et al. (2020) suggeriscono di ampliare le attività di incubazione tradizionali allineando i programmi ai SDGs, potenziando il coordinamento tra le iniziative, implementando sistemi di monitoraggio delle performance e promuovendo attività di capacity building multilivello. Nel contesto degli UBIs, Kambanou et al. (2025) evidenziano che l'integrazione della collaborazione con il corpo docente, della formazione orientata alla circolarità, di repository digitali e di specifici incentivi finanziari risulta cruciale per favorire in modo efficace la transizione circolare.

2.4. Domande di ricerca

La letteratura sugli incubatori d'impresa è in continua evoluzione e risulta caratterizzata da numerose lacune conoscitive (Sohail et al. 2023). In particolare, il ruolo degli incubatori nel contesto dell'EC risulta ancora ampiamente inesplorato, con la conseguente necessità di nuovi contributi di ricerca volti a fornire indicazioni per il miglioramento e l'adattamento dei programmi di incubazione (ad esempio, Kambanou et al., 2025; Klofsten et al., 2024). Inoltre, gli studi esistenti si sono concentrati prevalentemente sulla capacità degli incubatori tradizionali di supportare iniziative circolari, mettendo in luce i loro limiti. Analisi approfondite di incubatori specificamente progettati per sostenere iniziative circolari sono ancora scarse. In modo analogo, la letteratura sulle start-up circolari è ancora emergente e necessita di ulteriori approfondimenti (Suchek et al. 2022). Per rispondere a tali gap, il presente studio si propone di analizzare il modello di incubazione di un incubatore orientato alla circolarità, al fine di fornire indicazioni utili ai manager di incubatori tradizionali individuando le leve operative specifiche necessarie per supportare efficacemente la circolarità. In tale prospettiva, sono state formulate le seguenti domande di ricerca:

RQ_1: In che modo gli incubatori d'impresa orientati alla circolarità supportano le start-up incubate nella pianificazione strategica del loro business model?

RQ_2: Quali sono le principali limitazioni e le sfide affrontate dagli incubatori orientati alla circolarità nel fornire supporto efficace alle start-up incubate?

3. Metodologia

Per fornire una risposta alle domande di ricerca sarà adottata la metodologia qualitativa dello studio di caso. Secondo Yin (2018), uno studio di caso costituisce "an empirical inquiry that examines a contemporary phenomenon in depth and within its real-world context, particularly when the boundaries between the phenomenon and its context are not clearly defined"[6] (p. 15). Tale approccio risulta particolarmente idoneo, dato lo scopo esplorativo dello studio e la natura complessa e dipendente dal contesto del fenomeno oggetto di analisi. Inoltre, la ricerca basata sullo studio di caso consente di collegare le osservazioni empiriche ai più ampi dibattiti teorici, contribuendo così a ridurre il divario tra modelli concettuali e fattispecie reali (Gerring 2004; Flyvbjerg 2006; Chiucchi 2015). Più nello specifico, sarà adottato un approccio descrittivo-esplorativo con l'obiettivo di generare una comprensione dettagliata del tema e di fornire una solida base per futuri sviluppi teorici ed empirici, specialmente alla luce della scarsità e frammentazione delle ricerche esistenti sul tema (Chiucchi 2012; Yin 2018). La scelta di basarsi su un singolo studio di caso è appropriata nelle fasi iniziali di indagine di questioni nuove o insufficientemente studiate (Scapens 1990; Otley e Berry 1994) e può offrire un accesso privilegiato a contesti altrimenti difficilmente raggiungibili (De Massis e Kotlar 2014). Tale scelta

[6] Nostra traduzione: "un'indagine empirica che esamina in profondità un fenomeno contemporaneo all'interno del suo contesto reale, in particolare quando i confini tra il fenomeno e il contesto non sono chiaramente definiti"

metodologica risulta inoltre particolarmente adeguata per affrontare domande di tipo "come" e "perché" relative a processi organizzativi dinamici e incerti (De Massis e Kotlar, 2014; Yin, 2018), permettendo al contempo l'analisi di fenomeni sociali complessi all'interno dei loro ambienti naturali e favorendo una comprensione più completa e contestualizzata (Lateef e Keikhosrokiani 2023).

Il caso di studio selezionato è un incubatore italiano presente nell'elenco ufficiale degli incubatori certificati riconosciuti dal Ministero delle Imprese e del Made in Italy e registrati nel Registro delle Imprese alla data del 26 novembre 2025. Tale scelta consente di testare le domande di ricerca su incubatori presumibilmente caratterizzati da standard e servizi di qualità più elevata. In effetti, l'articolo 25, comma 5, del Decreto-Legge italiano n. 179 del 18 ottobre 2012, convertito con emendamenti dalla Legge n. 221 del 17 dicembre 2012, specifica che un incubatore certificato di start-up innovative deve soddisfare una serie di requisiti stabiliti nello stesso articolo: (i) disporre di strutture idonee a ospitare start-up innovative, come spazi dedicati a test, sperimentazioni o attività di ricerca; (ii) possedere attrezzature adeguate alle attività delle start-up, tra cui accesso a Internet ultra-broadband, sale riunioni e macchinari per test, prove o prototipi; (iii) essere gestito o diretto da individui con comprovata competenza in ambito imprenditoriale e innovativo e mantenere una struttura permanente di consulenza tecnica e manageriale; (iv) intrattenere collaborazioni regolari con università, centri di ricerca, istituzioni pubbliche e partner finanziari impegnati in attività e progetti relativi alle start-up innovative; (v) dimostrare un'esperienza adeguata e comprovata nel supportare start-up innovative. La selezione dell'incubatore ha seguito un processo rigoroso. In primo luogo, è stata condotta un'analisi approfondita dei diversi modelli di incubazione offerti da ciascun incubatore certificato, basata su informazioni tratte dai rispettivi siti web ufficiali, documenti interni, report pubblici e articoli di stampa. Tra questi, l'incubatore scelto si è particolarmente distinto sia a livello dimensionale che per il suo forte ed esplicito orientamento ai principi dell'EC. Operando come hub di innovazione industriale, esso supporta iniziative in ambiti strategici quali edilizia sostenibile, energie rinnovabili, EC, sport-tech e biotecnologie, risultando quindi un contesto empirico altamente adeguato ad analizzare pratiche di incubazione orientate alla circolarità. In particolare, esso rappresenta uno dei pochissimi incubatori in Italia con una marcata e dichiarata attenzione ai principi dell'EC. Tale caratteristica lo rende pienamente coerente con gli obiettivi della ricerca, fornendo un contesto empirico solido per l'analisi delle pratiche di incubazione orientate alla circolarità. La raccolta dei dati sarà condotta attraverso una combinazione di metodi al fine di aumentare il rigore dell'evidenza empirica e consentire la triangolazione, mitigando così potenziali bias e rafforzando l'attendibilità dei risultati (Bowen 2009). In particolare, i dati primari saranno ottenuti mediante interviste semi-strutturate con i manager dell'incubatore e con rappresentanti di un gruppo selezionato di start-up incubate. Per i dati secondari si utilizzerà documentazione interna fornita da incubatore e start-up e materiali pubblicamente accessibili, quali siti web ufficiali delle organizzazioni, report pubblici e articoli di stampa pertinenti.

4. Risultati attesi e implicazioni

Questa ricerca si pone l'obiettivo di giungere ad una comprensione sistematica di come un programma di incubazione orientato alla circolarità si differenzi dai modelli di incubazione tradizionali, identificando i principali fattori abilitanti e le sfide nel supporto alle attività di pianificazione delle start-up circolari. L'analisi empirica rivelerà verosimilmente le attività, le competenze, le infrastrutture, gli strumenti operativi e i processi decisionali nonché le principali criticità che caratterizzano un incubatore fondato sui principi dell'EC.

Dal punto di vista teorico, questo studio contribuisce alla letteratura emergente sugli incubatori orientati alla circolarità approfondendo ed estendendo i quadri concettuali sviluppati in precedenza dalla comunità scientifica. Attraverso un'analisi approfondita delle pratiche e dei meccanismi che sorreggono l'incubazione circolare, la ricerca consente l'avanzamento della

comprensione teorica di come i modelli di incubazione possano non solo incorporare e rendere operativi i principi dell'EC, ma anche sostenerli nel tempo all'interno dei processi decisionali strategici delle imprese nascenti. Inoltre, lo studio identifica le principali esigenze e complessità che caratterizzano la PS delle start-up circolari, evidenziando il ruolo degli incubatori di impresa come attori chiave nel supportare tali processi e nel facilitare l'allineamento tra obiettivi strategici, modelli di business circolari e contesto istituzionale.

Dal punto di vista manageriale, i risultati forniranno ai manager di incubatori tradizionali indicazioni operative per progettare, organizzare e affinare i processi di incubazione in modo tale da rispondere alle esigenze specifiche delle iniziative imprenditoriali circolari, consentendo agli incubatori di integrare la circolarità in modo più efficace nei propri modelli operativi, nelle routine, nei meccanismi di governance e nei sistemi di valutazione. In particolare, i risultati offriranno ai manager di incubatori tradizionali indicazioni generali su come erogare servizi fondamentali quali mentoring, formazione, networking (ad esempio, supporto a iniziative di simbiosi industriale) e attività di business support, tutti orientati a sostenere la PS e conseguentemente a favorire la crescita e il successo delle start-up circolari. Inoltre, i risultati potranno offrire rilevanti indicazioni per i manager delle start-up circolari, supportandoli nella comprensione di come adattare e strutturare i processi di pianificazione strategica in funzione delle specificità dei modelli di business circolari, delle interdipendenze di filiera e dei vincoli e opportunità derivanti dal contesto istituzionale.

Dal punto di vista delle politiche pubbliche, lo studio offrirà raccomandazioni su misure in grado di rafforzare il ruolo degli incubatori di impresa come facilitatori chiave dell'innovazione circolare all'interno degli ecosistemi regionali e nazionali, contribuendo così a sostenere la transizione verso l'imprenditorialità circolare su scala nazionale, anche nei settori tradizionali, dove persistono rilevanti criticità legate alla gestione non sostenibile delle risorse naturali. La transizione verso modelli di EC risulta fondamentale per garantire sostenibilità ambientale di lungo periodo, rafforzare la resilienza economica e allinearsi ai SDGs (Donner et al. 2022; Carmona et al. 2023; Ncube et al. 2024; Spada et al. 2025). Nell'ambito dei settori tradizionali, per restare nel comparto di attività della citata Bioenutra, il settore olivicolo-oleario, ad esempio, è ad elevato impatto ambientale (Ncube et al. 2024). L'uso intensivo di acqua, energia e input chimici, nonché la produzione di ingenti quantità di residui e sottoprodotti, tra cui acque di vegetazione e sansa, se non adeguatamente gestiti, possono generare inquinamento idrico, degrado del suolo ed emissioni climalteranti (Enaime et al. 2024; Ncube et al. 2024). In questo contesto, le pratiche circolari, come la valorizzazione dei residui olivicoli in bioenergia, fertilizzanti o bioplastiche, consentono di ridurre la pressione ambientale, diminuire la dipendenza dai combustibili fossili e generare nuove opportunità economiche (Donner et al. 2022; Carmona et al. 2023; Enaime et al. 2024; Ncube et al. 2024). Tale transizione richiede innovazione tecnologica, adeguati investimenti, politiche di sostegno e una maggiore cooperazione tra gli attori della filiera (Donner et al. 2022; Martínez-Moreno et al. 2024). In tale contesto, grazie alla loro capacità di sviluppare soluzioni innovative, le start-up circolari possono fungere da veri e propri catalizzatori della circolarità, trasformando rifiuti e sottoprodotti in risorse e favorendo l'adozione di pratiche ecologicamente sostenibili lungo l'intera catena del valore.

Parole chiave: Economia circolare; start-up circolari; incubatori di impresa; caso studio

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The role of Life cycle Assessment in fostering sustainability in the sea supply chain: a structured literature review

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1. Introduction

Sustainability has become an indispensable condition for corporate continuity, permeating the systems through which organizations plan, measure, and control their activities (Siebenhüner & Arnold, 2007; Lozano, 2020). This growing attention generates internal informational needs, pushing firms to develop systems capable of capturing and processing environmental data that are increasingly required by evolving regulatory frameworks and stakeholders. Indeed, such informational demands influence the way firms define their sustainability disclosure and respond to external expectations, often driven by regulatory and coercive pressures, according to the institutional theory, and by the desire to satisfy the information needs of stakeholders, according to the stakeholder theory.

In Europe, regulatory pressure started in 2003 with the issuing of Directive 2003/51/EC, but it became effective in 2014 with the issuing of the Non-financial Reporting Directive 2014/95/EU, which required bigger companies to release sustainability information in a specific report called the Non-Financial Statement (NFS). Recently, regulators worked to enhance corporate engagement with sustainability topics and in 2022 issued the Corporate Social Responsibility Directive 2022/2464/EU. These regulatory developments illustrate the external context within which firms build their sustainability disclosure.

Within this landscape, institutional theory (Dimaggio & Powell, 1983) helps frame explain how rules, norms and expectations shape firms' adjustments to demonstrate their performance. Firms have increasingly engaged in sustainability reporting to meet regulatory requirements. According to the KPMG Survey, in 2024 96% of the G250 (the world's 250 largest companies by revenue) published a sustainability report, reflecting the growing diffusion of sustainability information (KPMG, 2024). However, this widespread diffusion does not necessarily imply that disclosed information reflects reality. When the misalignment between sustainability disclosure and sustainability performance is positive, it could be symptomatic of a greenwashing approach (Sauerwald & Su, 2019). Greenwashing, or positive sustainability decoupling, occurs when a company releases more information in comparison to the actions it undertakes, thereby overstating its performance. Aware of this risk, firms need management control tools that translate sustainability commitments into actions.

Sustainability reporting reflects institutional pressures and reinforces for reliable information, thereby increasing the relevance of tools, whose outputs can support management accounting systems (Galleli & Amaral, 2025). Several scholars have emphasized the need for management accounting to evolve through new practices and tools. Traxler and colleagues (2020) sustain that sustainability reporting holds the potential to inform management, planning, and control activities only when it is effectively linked to management accounting through tools and systems. To examine this relationship, the Authors draw on the classification of management control systems

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proposed by Malmi and Brown (2008) – namely planning, cybernetic controls, reward and compensation, and administrative and cultural controls. Each category plays a distinctive role: planning helps firms define priorities and future actions; cybernetic controls rely on financial and non-financial performance indicators to support actions; reward and compensation influence behaviors through incentive systems; administrative controls guide procedures, roles and decision-making processes; cultural controls define firms' norms and values. The implementation of management control systems can be seen as a response to the growing need to adopt sustainability reporting systems, which require structured tools to support the information. Advancing sustainability within firms is as much about identifying the sources of environmental impacts as it is about rethinking how resources are used, reinforcing the mechanisms through which sustainability performance is communicated, and progressively redesigning products and services to lower environmental footprint (Siebenhüner & Arnold, 2007; Lozano, 2020). Each stage in the life cycle of products and logistics activities – from resource extraction to production, distribution, and disposal – is associated with environmental, economic, and social impacts. The impacts caused by production and logistics processes need to be controlled through the adoption of measures and strategies that not only quantify "how much impact" is produced but also indicate "how to remedy and reduce it" (Lozano, 2020).

Traditional measurement and control systems, designed to capture financial performance, often fail to capture in the right way the multifaceted and nuanced nature of sustainability. The increasing complexity of challenges requires a rethinking of how organizational performance is defined and evaluated. Such complexity draws attention to a need for management accounting tools that can integrate new forms of environmental data into decision-making processes. Therefore, the path towards sustainability entails aligning strategies, business models, and management tools with environmental, social and economic value creation (Mio et al., 2022). Rather than serving only as a system for financial control, management accounting is increasingly conceived as a platform for translating sustainability objectives into measurable and actionable information (Busco & Quattrone, 2018). By integrating environmental, social, and economic dimensions, management accounting extends its scope beyond internal efficiency toward the evaluation of value creation processes.

This paper focuses on Life Cycle Assessment, a method that can be framed as a non-financial cybernetic control, as it generates structured environmental information and follows a standardized procedure designed to assess the impacts of a product or a service across its entire life cycle. It unfolds on four phases (ISO 14040, 2006): 1. defining the goal, scope and system boundaries of the analysis; 2. compiling the life cycle inventory by gathering data on inputs and outputs; 3. conducting the impact assessment; and 4. interpreting the results in order to define conclusions and identify possible improvements. Once these phases are completed, the dataset provides a foundation for supporting sustainability-related decisions. The information generated through these phases can be used to identify critical challenges along the life cycle, compare alternative options and detect potential trade-offs: in doing so, it offers a transparent view of environmental performance and provides key inputs for managerial decision-making (Bjørnbet & Vildåsen, 2021; Lozano, 2020). Further studies indicate that LCA can also be applied to the analysis of business model configurations, linking environmental effects to the way value is created and delivered (Barbieri and Santos, 2020;Baumann et al., 2022).

Companies employ sustainability tools and initiatives that are often implemented independently of their management and accounting systems, resulting in limited integration and strategic alignment (Lozano, 2020). Among these tools, LCA remains largely linked to technical domain, and the information it generates rarely move into the flows that guide managerial activities. To address this fragmentation, companies need approaches that link environmental assessment and management control practices: combining life cycle thinking with quantitative methods can provide consistent measures of sustainability performance and enhance accountability (Cerchione et al., 2025). The standardized nature of LCA makes its output suitable for evaluating alternative

solutions, identifying trade-offs, and supporting decisions, which are key requirements of management accounting. However, this potential of LCA has not been fully explored (Ascani et al., 2021; Schaltegger et al., 2022) and the integration of life cycle information into planning, cost, and control decisions remains limited.

The significance of this research gap becomes even clearer when considered within the broader transformation of management accounting, which is progressively including environmental, social, and governance dimensions, while the use of new technologies is deeply changing the ways in which information is created, processed, and interpreted.

Although several contributions have examined environmental assessment tools within organization (Ascani et al., 2021; Schaltegger et al., 2022; Cerchione et al., 2025), the integration of life cycle information into management accounting remains limited, raising questions about how environmental data can support firms in decision making and sustainability transition. The aim of this review is to examine how life cycle information has been interpreted and used within management accounting studies. By investigating the role attributed to LCA, this study contributes to a broader debate on the transformation of management accounting and its role in supporting sustainability-oriented business models. It also seeks to discover the way LCA can inform managerial decisions and to identify opportunities for the alignment between environmental assessment and management.

In this perspective, Corporate Social Responsibility (CSR) is a useful interpretive lens to understand how environmental assessments are translated into organizational practices (Arjaliès & Mundy, 2013; Braune et al., 2019), identifying recurring themes and key areas of development (Martins et al., 2023). This adoption makes it possible to understand how the informative role of LCA has been interpreted so far and to outline the conditions under which this tool can effectively support organizational measurement and control systems (Cerchione et al., 2025; Frost et al., 2020). Several studies show a strong connection between CSR, firm performance and the development of performance management and sustainability measurement systems (Martins et al., 2023). CSR is also described as a strategic lever that broadens the scope of managerial decision-making and influences the design of business models (Arjaliès & Mundy, 2013; Braune et al., 2019). The production and sharing of sustainability-related information become central to guiding organizational behavior and supporting transitions (Frost et al., 2020). Methods such as LCA contribute to this process by generating insights that can be embedded into internal decision-making (Cerchione et al., 2025). For this reason, CSR is used as lens useful to discover how firms respond to environmental impacts and how LCA information may contribute to management accounting practices, guiding the analysis of articles by understanding if LCA is used for supporting decision-making processes.

For the purpose of this review, the sea supply chain serves as ideal context in which institutional pressures, decarbonization targets and transition challenges make the demand for life cycle thinking particularly marked. The sea supply chain offers a key setting for observing the potential of life cycle approach, especially given the increasing pressure to reduce environmental impacts and comply with decarbonization targets set by international regulations (IMO, 2023). In 2024, the Marine Environment Protection Committee (MEPC) introduced specific LCA guidelines for assessing greenhouse gas (GHG) emissions “from fuel production to end-use by a ship (Well-to-wake)”, thereby promoting a comprehensive evaluation of maritime systems. The targets for reduction of the emissions set by the International Maritime Organization (IMO) will require the adoption of innovative technologies to mitigate environmental impacts and LCA shows to be a valuable decision-support instrument for guiding technological choices and investment priorities in the sector. Several studies have applied life cycle approach to the assessment of alternative marine fuel and decarbonization strategies (H. Wang et al., 2025; J. Wang, Li, et al., 2025; J. Wang, Yang, et al., 2025), showing that LCA generates evidence that could support technological and investment decisions. However, what is still insufficiently emphasized is that this potential depends on the integration of LCA information into management accounting systems.

2. Methodology

The study is being conducted through a structured review of management accounting literature. This approach offers a systematic way to investigate how a particular topic has been explored, helping to organize current knowledge and highlight topics that require further examination (Massaro et al., 2016). A similar methodological configuration has been used in recent studies adopting structured literature review approaches (Di Vaio et al., 2021). The review aims to understand how the informative role of LCA has been interpreted and framed within management accounting studies. Following Massaro et al. (2016), the structured review is conceived as an empirical study guided by an analytical framework, which ensures transparent and replicable analysis and supports the coding and interpretation of the selected contributions. The framework focuses on the role attributed to LCA and the extent to which life cycle information is connected to management accounting and control systems.

For this review, Scopus was chosen as the primary database because of its broad coverage of peer-reviewed research in the topics involved (Thottoli et al., 2022).

A wide search string combined "life cycle assessment" with "management accounting", other sustainability expressions ("sustainab*", "business model*", "corporate social responsibility"), and specific sector terms ("shipping" OR "sea supply chain" OR "sea logistic*"). The search strategy captures in a targeted way studies referring to maritime and sea logistics activities. This allows the review to consider how LCA approaches are discussed in relation to sectoral characteristics such as environmental regulations, fuel challenges and decarbonization objectives.

The initial search returned 625 records. To enhance the quality and the relevance of the dataset, the results were narrowed by filters to include peer-reviewed articles in English-language in the fields of Social Sciences, Business, Management and Accounting, Economics, Econometrics and Finance, Decision Sciences. After this first screening, 170 articles remained for further analysis (Fig.1).

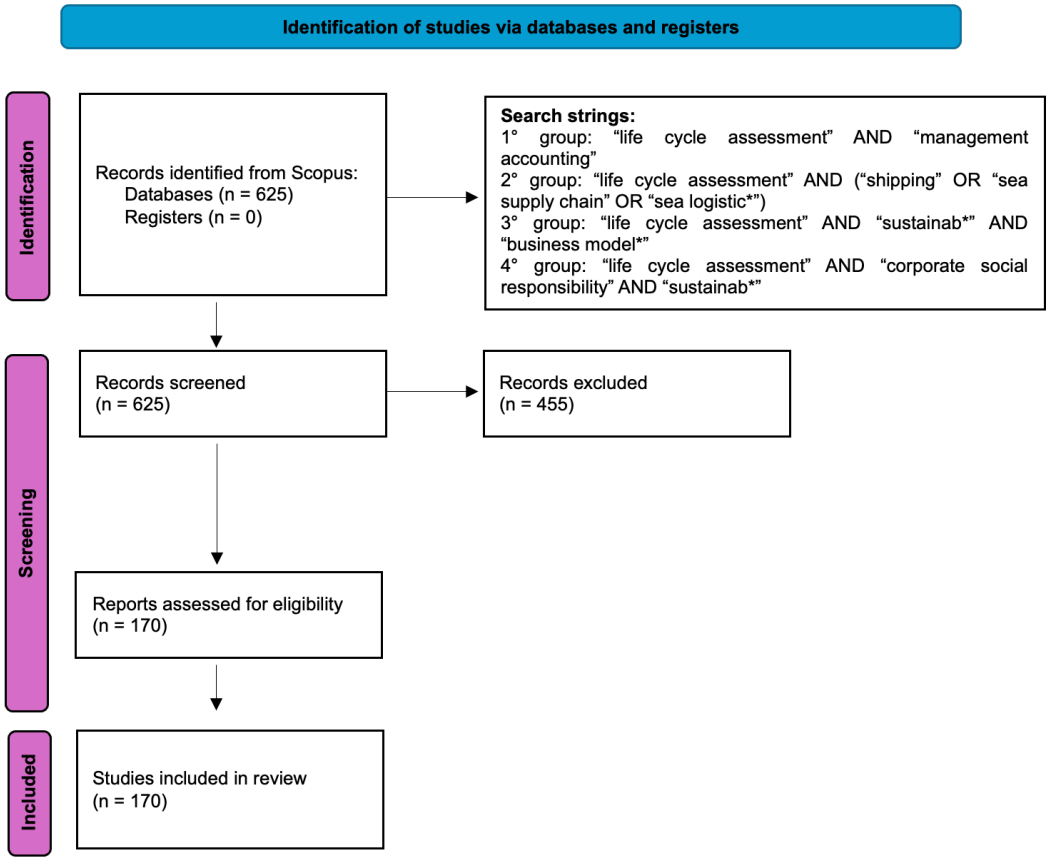


Figure 1. Study selection process

The next text screening aims to verify whether each article fits the scope of the review. This activity is crucial for refining the dataset and ensuring the coherence and quality of the final selection, which will then be used for the data extraction and coding processes. In doing so, two key conceptual definitions were established to support the assessment of the 170 articles: LCA is conceived as "Compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle" (ISO 14040, 2006); management accounting is the set of practices and systems that support firms in generating financial and non-financial information. In line with Schaltegger et al. (2022), management accounting is conceived as a tool that allows organizations to achieve the sustainability transition by linking internal decision processes with wide environmental challenges.

The screening phase is constructed on a protocol for data extraction and classification with an Excel matrix created to function as a systematic repository of all extracted information. Each article is recorded by bibliometric details and content-related analytical variables.

The bibliometric section embraces descriptive data that supports the mapping of the literature and allow comparative analysis across journals, geographical areas and publication type. The variables are title, authors, journal and year, DOI or link, Country and authors' affiliations, citations, keywords, and type of the article (to distinguish between methodological contribution and applicative studies). The second section is a matrix that captures characteristics of each study: aim, country under examination, research questions, methodology and methodological subcategory, sample or empirical context, and results. These variables provide the empirical basis for the analytical framework: bibliographic variables support the descriptive mapping of the field and content variables are used to assess the role attributed to LCA, the purpose for which the life cycle information is used, and its connection with management accounting. Theoretical

perspectives inform the interpretation of the evidence emerging from the studies. In this interpretative phase, the CSR provides the lens through which the collected information is read (Arjaliès & Mundy, 2013). This analysis is complemented by institutional theory (Dimaggio & Powell, 1983) and Malmi and Brown's (2008) framework. The first supports the interpretation of the regulatory and normative context in which LCA adoption is discussed; the second is adopted to identify where LCA is positioned within management systems, distinguishing if its information is mainly employed as a technical tool or an informative input for managerial decisions. The combined use of these lenses provides a complementary framework to examine the spread of LCA and the ways life cycle information is used by firms.

3. Preliminary results

Although the review process is currently ongoing, preliminary results reveal a clear pattern in the way LCA is used within firms. Most contributions adopt LCA as technical assessment tool to quantify environmental impacts or compare alternative scenarios, while few link life cycle information to management accounting practices. The dataset also shows heterogeneity in the way LCA is adopted: some studies apply this tool as technical support in several sectors, such as marine transport, textiles and energy (Böpple et al., 2025; Hou et al., 2025; Lin et al., 2025; Petrescu et al., 2025; Wang H. et al., 2025), while others use the informative role of LCA in decision-making processes (Al-Kuwari et al., 2024; Naranjo et al., 2025) and in the definition of business models (Bjørnbet & Vildåsen, 2021; Koide et al., 2025; Krassnitzer et al., 2025). From a broader perspective, this suggests that, although LCA generates crucial and detailed information about environmental impacts, such information does not circulate into key areas where strategic decisions are made.

The Insights underline the potenti"l us'fulness of life cycle information for firms engaged In sustainability transition. This evidence appears particularly relevant for firms operating along the sea supply chain, where regulatory pressures, fuel-transition choices and decarbonization strategies increase the need for reliable life cycle information.

For these firms the patterns identified so far indicate that LCA is mainly employed to evaluate technological alternatives, where environmental performance and sustainability are increasingly critical, by showing the utilization of LCA information for evaluating alternatives, shaping investments, and aligning operational choices with long-term decarbonization targets. The review also highlights the thematic areas In Ih LCA has been contextualized In MA studies, as well as the research trends that are beginning to take shape. As the review progresses, clarifying these issues will enable to discuss the main theoretical and managerial implications, and to highlight opportunities for further research as well as for the advancement of LCA practices in maritime and logistics firms.

Keywords: Life cycle assessment; management accounting; sustainability; corporate social Responsibility**;** business models; sea supply chain; structured literature review

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Negotiating Management Control in the AI Era: A Socio-Technical Perspective on Organizational (In)stability

Filippo Gentile[1]

1. Introduction

Digitalization is inevitably transforming our world and the world of business. In particular, in the accounting field, the adoption of digital and AI-based technologies has significantly affected the way companies produce, analyse and use accounting information. In recent years, accounting practices have undergone substantial changes. Inevitably, digitalization has also reshaped the work of management accountants, who in this digital era must face numerous challenges deriving from the interaction with intelligent systems. At the same time, recent developments suggest that AI-based technologies may also reshape how management control is enacted and exercised within organizations.
Indeed, the aspect on which this study focuses is how Management Control is negotiated and shaped through interactions between different organizational actors and AI-based systems.

The objectives of this paper are to investigate how Management Control is reconfigured in the presence of AI, while also considering what new skills may be required for the people involved on it.
The motivation for this study arises from the observation that much of the existing literature has concentrated on the impact of digitalization on accounting practices, whereas only a limited number of studies have examined how AI reshapes Management Control and everyday decision-making processes. Moreover, those that have done so often remain largely conceptual, without addressing how these dynamics unfold in practice.

The study will be carried out through a qualitative approach, using a case study that will enable us to analyze how different organizational actors interact with AI-based technologies, how these interactions are negotiated in everyday practices, and how they contribute to shaping Management Control.
This paper has several implications, as it may be useful for organizations seeking to understand how to integrate AI into decision-making and control processes, for people navigating these transformations, and for universities, since the changes in practices and required skills call for adjustments in accounting education, in order to prepare future professionals to operate effectively in AI-driven environments.

2. Literature Review

2.1. Theoretical framework: Actor-Network Theory

To examine how Management Control is reconfigured in the presence of AI-based technologies, and to understand how professional roles evolve within this process, I adopt Actor-Network Theory (ANT) as the theoretical framework.
ANT offers a distinctive lens capable of analyzing accounting not as a set of static practices performed by individuals, but as an outcome of dynamic networks composed of both human and

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non-human actors, such as accountants, managers, data, algorithms and AI systems. From this perspective, Management Control itself can be understood as emerging from these socio-technical interactions rather than being a predefined and centralized function.

From an ANT perspective, technologies introduced are not neutral tools but active participants that shape accounting and decision-making processes. This makes ANT particularly suitable for studying AI in management accounting and Control, where automated models, predictive algorithms and digital platforms increasingly influence organizational action and the exercise of control.

Actor-Network Theory originates from the work of Bruno Latour, Michel Callon, and John Law in the 1980s within sociology, where it was developed to investigate how social order emerges through heterogeneous networks and relationships among people, artefacts and knowledge.

ANT has been applied in accounting research, beginning with the work of Justesen and Mouritsen (2011), who examined its implications, and continuing with the critical assessment by Modell (2020). I consider ANT particularly useful in accounting studies, also given its strong tradition of application.

In this study, ANT provides a powerful framework for analyzing how Management Control is negotiated and enacted through interactions with AI-based technologies and other organizational actors, while also shedding light on how the skills of different organizational actors are shaped within these networks.

For these reasons, ANT aligns well with the objectives of this research.

2.2. Identification of Relevant Literature

The literature reviewed and discussed in the following section was identified through a keyword-based search focusing on the relationship between digitalization, Artificial Intelligence, and the fields under investigation (Management Accounting and Management Control).

An initial search included the following terms:

- "Digitalization" or "Digitalisation" or "Digitization" or "Digitisation" or "Digital Transformation" and "Management Accounting" or "Management Control".

The main search process was then refined by combining terms related to AI, Management Accounting and Control, and organizational practices. The keywords used included:

- "AI" or "Artificial Intelligence" and "Management Accounting" or "Management Control";
- "AI" or "Artificial Intelligence" or "Predictive Analytics" or "Machine Learning" and "Management Control" or "Performance Measurement" or "Decision-Making";
- "Management Accounting" or "Management Control" or "Control Systems" and "Social Practice" or "Human Behaviour" or "Organizational Culture";
- "Management Accounting" or "Accounting Practices" and "ERP" or "Enterprise Resource Planning" and "Control at a distance";
- "Actor-Network Theory" or "ANT" and "Management Accounting" or "Accounting" or "Management Control".

This search strategy allowed for the identification of studies addressing the relationship between AI and Management Accounonting and Control, as well as contributions focusing on the social and organizational dimensions of accounting practices, the role of digital systems in shaping control at a distance, and the application of Actor-Network Theory in accounting research.

In addition, it enabled the inclusion of literature examining digitalization from a broader perspective, providing a comprehensive understanding of the phenomenon under investigation.

2.3. Main Contributions from the Literature

The literature identified through the criteria outlined in the previous paragraph highlights several important streams of research addressing the impact of digitalization and AI on Management Accounting and Control.

A first stream of studies focuses on the impact of digitalization and AI on Management Accounting and Control practices. The contribute of Abbas (2025) is a literature analysis on the impact of AI on Management Accounting, highlighting role changes and the new hybrid professional figure. Other contributions such as Fändrich (2023) and Fändrich and Pedell (2025) show how digital technologies are transforming the area of Management Control, influencing its tasks, instruments, organizational processes, and behavioural aspects, also in specific contexts such as SMEs. All this viewing digitalization as a driver of MC transformation.

Empirical studies further highlight how these transformation unfold in practice. For istance, Cinquini et al. (2025), through a case study on IKEA Italy, show how the use of cloud technologies alters the way accounting practices are performed, with new routines and tasks. Similarly, Ruggeri et al. (2023) examine accounting language games in contexts characterized by digitalization, showing how it influences the production of knowledge for decision-making.

More broadly, Kornberger et al. (2025) and Knudsen (2020) highlight the role of data-driven practices in reshaping knowledge production, power relations, and organizational boundaries.

A second stream of literature focuses on Management Control. Anthony (1965) lays the foundations of discipline, conceptualizing Management Control as a formal and structured process aimed at ensuring the strategic effectiveness. Studies such as Dechow and Mouritsen (2005) highlight how ERP systems contribute to shaping control by integrating information and coordinating activities across organizational units. This perspective is further developed by Quattrone (2009) and Quattrone and Hopper (2005), who conceptualize Management Control as a set of practices embedded in organizational processes, rather than as a purely technical system.

A third stream of resesrch focuses on the dynamics of stability and change in Management Accounting and Control. Burns and Scapens (2000) contribute with the conceptualization of Management Accounting change as a process shaped by rules and routines. Granlund (2001) and Lukka (2007) show how Management Control systems is characterized by both stability and change over time, resulting from the everyday interaction between formal structures and practices.

A recent contribution put in evidence the relationship between AI and other actors within organizations. Indeed, Jarrahi (2018) sustains that AI does not replace human in the decision-making process, but it creates a form of human-AI symbiosis, where decisions emerge from the interaction between these two types of subjects, which possess very different characteristics.

Finally, a part of the literature adopts a socio-technical perspective, which finds its theoretical foundation on the Actor-Network Theory, to analyze accounting practices. Alcouffe et al. (2008) use ANT to explain the relationship between the diffusion of Management Accounting innovations and the alignment between human and non-human actors. Instead, the study of McLean and Hassard (2004) is a critical reflection on the use of ANT in accounting, given the complexity and limitations in producing accounts.

Overall, these contributions provide important insights about the transformation of Management Accounting and Control in the digital era. However, the literature review conducted has revealed important gaps that require a futher investigation.

2.4. Gaps identified in the literature

The literature reviewed shows a growing interest in the impact of digitalization and AI on Management Accounting and Control, with an increasing number of studies published in recent years.

Despite this, a significant part of this literature has focused on the impact that digital technologies is having on Management Accounting practices.

Furthermore, some scholars examined the important issue of how new technologies affect

professionals working in the accounting field, particularly the shift in the Management Accountant's role, from the traditional "bean counter" to more hybrid positions such as business partner or data scientist. At the same time, several studies have examined the impact of digital technologies on decision-making.

However, despite these contributions, there are many important limitations. First, much of the existing literature see technology as an external driver of change, rather than as an actor involved in organizational processes. Second, limited attention has been paid to how Management Control is shaped through the everyday interaction between human and non-human actors. In other words, there is a lack of empirical research on how AI-based systems and organizational actors shape control processes. Third, while the literature treated issues of stability and change in Management Control, these dynamics have rarely been examined in relation to AI. Finally, prior research analyzed the impact of digitalization for professional roles and skills, but these aspects are treated as individual rather than as outcomes emerging from socio-technical interactions. By adopting an ANT perspective, this study addresses these gaps by analyzing how Management Control is enacted and negotiated through networks of human and non-human actors, and how skills emerge within these interactions in the presence of AI-based technologies.

3. Research Methodology

Given the exploratory nature of the research questions highlighted above, this study adopts a qualitative approach based on the analysis of a single case study, in order to understand how AI-based technologies are reshaping the role Management Control within organizations. The choice of a case study is motivated by the opportunity to conduct an in-depth analysis within an organization, allowing us to understand how technologies, people and organizational routines interact in practice. These elements, such as individuals, new technologies, and traditional routines, form a rather complex network. This is precisely why Actor-Network Theory is employed; it allows for an understanding of the relationships among these different elements, especially the interactions between human actors (accountants and managers) and non-human actors (AI systems, data, algorithms), and how these interactions contribute to the enactment of Management Control.

3.1. Selection of Company

The selection of the company will follow specific criteria aimed at identifying a context particularly suitable for exploring the research phenomenon in depth. The objective is to select an information-rich case that allows for a detailed understanding of how AI-based technologies are embedded in organizational practices.

- The first criterion concerns the level of AI adoption in Management Accounting and Control processes, in order to ensure that AI systems play an active role in everyday decision-making and control practices. The selected company should therefore have a sufficiently advanced implementation of AI-based tools.
- The second criterion relates to the analytical relevance of the case. Given the adoption of Actor-Network Theory, the aim is to select a context that allows for an in-depth exploration of socio-technical interactions. The focus is therefore on a setting where the network of human and non-human actors can be meaningfully observed, enabling a detailed understanding of how Management Control is enacted and negotiated.
- A final and more practical criterion concerns access to the field. It is essential to identify a company, and in particular organizational actors within it, who are willing to participate in the study and provide access to relevant information.

Based on these criteria, the empirical setting will consist of a single organization that has implemented AI-based systems within its Management Accounting and Control processes,

allowing for an in-depth analysis of the interactions between human and non-human actors. The choice of a single case study is consistent with the theoretical perspective adopted in this research. Given the use of ANT, the objective is not to compare different organizations, but to explore in depth the complex network of interactions through which Management Control is enacted.

3.2. Data Collection

The data and information needed for the case study will be collected through:

- Semi-structured interviews**:** these interviews will be conducted with the various categories of actors relevant to the investigation, such as management accountants, controllers, CFOs, IT specialists and managers. Depending on the interviewee, the interviews will be designed to explore aspects related to the adoption and use of AI systems, their role in everyday decision-making and control processes, perceptions of these technologies, and how AI-generated outputs are interpreted, used and negotiated in practice.
- Document analysis**:** aimed at gathering additional information concerning the organizational structure, roles, and internal processes, providing further insight into how AI is incorporated into Management Accounting and Control practices.

The decision to rely primarily on semi-structured interviews is also consistent with the logic of Actor-Network Theory, as the information collected from different organizational actors makes it possible to trace how human and non-human actors are connected, how they influence each other, and how Management Control is enacted through these interactions.

4. Expected Findings

Based on the literature reviewed, the considerations discussed above, the objectives of this study, and the ANT framework, the expected findings go beyond the description of role change and focus on how Management Control is enacted and negotiated through the interactions with AI-based technologies:

- First, rather than focusing on changes in the role of the management accountant, shifting from the traditional "bean counter" position to more hybrid and strategic roles, the study is expected to show how Management Control emerges from socio-technical networks characterized by the interconnection between AI systems, data, and organizational actors. In this context, control is not centralized but distributed across multiple actors, both human and non-human.
- Second, the findings are expected to reveal that the use of AI reshapes decision-making processes, as AI-generated outputs become central elements around which organizational actors interact, interpret, and negotiate. This may lead to new forms of coordination, but also to potential ambiguities in the attribution of authority and responsibility. Within this context, specific skills become increasingly relevant, particularly those related to the interpretation of AI outputs, as well as relational, interpretation, and negotiation skills needed to engage with other actors and to critically assess algorithmic insights.
- Third, the study is expected to highlight the emergence of tensions and controversies when AI-based outputs conflict with human judgement, requiring ongoing negotiation among actors and contributing to the redefinition of control practices.
- Finally, the study is expected to show that these transformations have implications not only for individual roles, but also for the skills required across different organizational actors. In particular, the ability to interpret, question, and critically engage with AI-generated insights becomes central within these socio-technical systems. These dynamics also raise important implications for accounting education, suggesting the need to move beyond purely technical digital skills and to prepare future professionals to operate within complex, AI-mediated organizational environments.

5. Conclusions

In conclusion, the aim of this study is to investigate how artificial intelligence is reshaping Management Control by analyzing the socio-technical processes through which control practice are produced and enacted. By combining Actor-Network Theory with a qualitative single case study design, the research moves beyond a purely technological or individual perspective and instead examines how accountants, managers, data and AI systems jointly participate in organizational decision-making and control processes.

The case study, conducted through semi-structured interviews with various relevant actors and combined with document analysis, will provide insights into how AI-based technologies are integrated in everyday Management Accounting and Control activities, and how these interactions contribute to the reconfiguration of control practices, roles, responsibilities, and required skills. The study seeks to provide a deeper understanding of how these elements are negotiated and redefined in the presence of intelligent systems.

The findings of the study will have significant implications for several groups, including organizations, professionals involved in Management Control processes, and universities. For organizations, it will offer insights into how to design control systems that effectively integrate human and algorithmic capabilities. For professional, the study will clarify how working with AI reshapes decision-making and control dynamics, highlighting the need to develop new skills, related to the interpretation of AI-generated outputs, as well as relational and negotiation skills required to interact with other actors and engage with algorithmic insights. For universities, it will highlight the need to rethink accounting education in order to prepare future professionals to operate within complex AI-driven socio-technical environments.

Keywords: Management control; artificial intelligence; distributed control; actor-network theory; case study

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Reframing and overflowing auditing decision-making processes through digitalised sociotechnical infrastructures

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1. Theoretical background

The ongoing digitalization of organizational processes is profoundly reshaping the identity and boundaries of auditing professions, spreading out transparency, efficiency, and timeliness associated with digital technologies. In doing so, digital platforms and corporate information systems do not simply mediate the auditing processes but they become constitutive of it, shaping how information is produced, accessed, and interpreted. They delineate what auditors can access, define verification pathways, and legitimize specific forms of data representation, thereby influencing how auditing decision-making processes are enacted.

Scholars outlined that digitalization constitutes a structural discontinuity for the auditing profession, as it progressively favours the reshaping of audit contributing to transforming it in an increasingly interactive, automated, and continuous process (Vasarhelyi et al., 2010; Rahman et al., 2024). Within this context, auditing appears to be lagging behind other professional fields in the adoption of digital technologies (Austin et al., 2021; Samiolo et al., 2024). The causes of this delay are manifold: internal tensions within audit firms, the absence of clear guidelines from regulators, and, not least, the perceived rigidity of clients' information systems.

Despite a growing attention, in the auditing domain digitalization remains slower than in other professional fields (Vitali & Giuliani, 2024). Empirical research highlights internal tensions within audit firms, an absence of clear regulatory guidance (Austin et al., 2021; Dai & Vasarhelyi, 2016; Samiolo et al., 2024), and perceived rigidity in client information systems as key factors constraining technological innovation in auditing practices.

In particular, studies that adopt a sociological perspective consider digital technologies not merely as decision-support tools but technologies that actively shape the form and temporality of the audit decision-making processes. However, this evolution gives rise to new forms of organizational tension. The growing complexity of algorithms reduces the transparency and intelligibility of decision-making processes, placing auditors in a position of technological dependence (Haugh, 2023). This "algorithmic opacity" conflicts with regulatory demands for accountability and traceability, generating a trade-off between automation and interpretation. The promise of transparency and objectivity associated with digital technologies—from ERP systems to Business Intelligence software and artificial intelligence solutions—is accompanied, however, by a set of ambiguities and tensions. On the one hand, these tools appear to offer new opportunities for data access, operational traceability, and real-time control; on the other hand, they introduce forms of rigidity, standardisation, and technological dependence that may constrain auditors' professional discretion and interpretive capacity (Power, 1997; Issa et al., 2016).

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2. Theoretical perspective

According to the performativity perspective digital platforms are not a neutral backdrop but an actor that actively participates in shaping auditing decision-making processes, configuring networks of relations among human and non-human actors—auditors, controllers, information systems, algorithms, data—thereby influencing what is visible, accessible, and verifiable. In the auditing context, this performativity emerges through the platforms' capacity to determine the boundaries of evidence: they define which data can be extracted, how such data are displayed, and which analytical pathways are rendered legitimate. In doing so, digital technologies do not merely represent organizational reality; they actively produce it, selecting what becomes knowable and, consequently, controllable. During the auditing decision-making processes spaces of calculability are socio-materially constructed through the interplay of humans and devices, such as auditing practices and digital technologies, which act as performative actors (Callon, 1986; Latour, 2005). Through (re)framing, particular forms of calculative practices are made visible while others are marginalized (Cuckston, 2022; Miller, 1991, 2008). As Callon (1998) argues, framing can produce new forms of marketization in which both human and non-human actors shape auditing decision-making processes. This approach allows examination of overflows emerging when calculative boundaries are challenged (Callon, 1998), particularly in digitalized auditing decision-making processes. Prior research demonstrates that reframing and overflowing processes contribute to diverse marketization outcomes (Christensen & Skaerbaek, 2007; Cuckston, 2013, 2018, 2022; Rana & Cordery, 2024). In this study, digitalization is conceptualized as a reframing device that marketizes decision-making processes (MacKenzie, 2009; Munasinghe et al., 2021). In particular, the interplay between reframing and overflowing renders marketization inherently contingent and indeterminate: as frames are challenged, adjusted, or replaced, markets evolve in diverse and path-dependent ways, producing varied institutional configurations and distributions of authority and value. In this view, marketization produces divergent institutional outcomes shaped by local negotiations, emergent constraints, and the ongoing reconfiguration of both calculative practices and organizational responsibilities.

Adopting a performativity perspective makes it possible to move beyond a deterministic view of digitalization as a mere enabling factor and instead focus on the network of mediations through which accounting knowledge and audit judgement take shape. In this perspective, the auditor is no longer an external observer but a translating actor who continually negotiates meanings, constraints, and possibilities for action within a complex sociotechnical network.

Although the literature on digital auditing (Ackerman, 2023; Lombardi et al., 2015; Vasarhelyi et al., 2010) has highlighted the potential of intelligent technologies to enhance audit efficiency and quality, these studies focus predominantly on the opportunities arising from automation, devoting comparatively less attention to the sociotechnical implications of these control infrastructures.

3. Research aim

Building on this gap, the study adopts a performativity perspective to shed lights on the challenges that digitalization poses to auditing decision-making processes. This requires analysing how digital technologies participate in the constitution of auditing practices, how they reshape the distribution of agency across human and non-human actors, and how these transformations affect professional judgment and organizational control.

Hence, this study questions: How does digitalization (re)frame and overflow auditing decision-making processes?

4. Methodology

The study adopts a qualitative and interpretive approach to explore in depth the interactions between human and technological actors and to understand how digitalization shapes audit practices and boundaries. The methodology is based on the analysis of two Italian case studies selected for their differing levels of digital maturity and the complexity of their information systems. The first case concerns a company characterized by a high degree of ERP integration and an advanced digital audit environment, in which the digital platform is a central node for data collection and verification. The second case examines an organization with fragmented information systems, where digitalization remains partial and audit procedures retain a markedly manual and adaptive character.

Both cases allow for an investigation of the performativity of digitalization in reframing and overflowing auditing decision-making processes: in the first case, system rigidity ensures greater traceability but reduces professional discretion; in the second, higher flexibility results in weaker formal control and lower data reliability.

The case research, which is explanatory in nature, followed a retrospective approach (Scapens, 2004), aiming to grasp subjects' perceptions of the role of digitalization in reframing and overflowing auditing decision-making processes. We collected information from field data such as auditing firm's internal documents. And we conducted semi-structured interviews with auditors and internal control managers. The interviews were not type-recorded due to the confidential nature of the discussion, but were conducted in an informal style and transcribed into a draft-report, which was shared with the interviewees. The in-depth interviews aimed to gather data on the subject matter and ensure a diverse range of perspectives and experiences concerning the use of digital platforms in the auditing decision-making processes.

5. Preliminary findings

Findings were then interpreted and discussed in relation to existing literature. The limitation of relying on a retrospective approach consists of asking interviewees to describe, explain, and reflect on events they had experienced (Nor-Aziah & Scapens, 2007), which we mitigate with through data triangulation. The methodological goal is therefore twofold: to understand how technology shapes and constrains audit practices (performativity), and to analyse how auditors and firms negotiate these rigidities in their daily interactions, thereby redefining the boundaries between external audit and the internal control system.

The analysis develops a critical reflection on the epistemic and organizational assumptions underpinning the deployment of artificial intelligence and business intelligence tools in auditing, challenging deterministic claims about their contribution to audit quality. Such evaluation necessitates closer attention to the underlying digital infrastructures—databases, ERP systems, and reporting architectures—that materialize audit evidence and condition its legitimization.

The case analysis highlights how digital platforms do not merely constitute a technical support for auditing decision-making processes but act as agents capable of shaping auditors' behaviour and decisions. In both contexts examined, technology does more than facilitate the collection and processing of data; it defines their logical and semantic structure, implicitly establishing what can be known, verified, and documented.

In Case 1, characterised by a high level of digital integration, the ERP platform centralises data management and imposes a standardised information flow. Audit procedures are executed according to a predefined sequence, rigidly anchored to digital protocols for data extraction, reconciliation, and validation. This configuration reduces the auditor's discretionary space, who is required to operate within pathways dictated by the system's internal logic. In this sense, the platform translates professional practices into algorithmic sequences, ensuring consistency and traceability while limiting the ability to adapt controls to the specific organisational context. Digitalisation thus produces a form of structured transparency, based on formalised processes and comprehensive visibility of operations, albeit at the cost of increasing procedural rigidity.

In Case 2, by contrast, the fragmentation of information systems and the absence of an integrated digital infrastructure render the audit process more flexible yet more opaque. Auditors must continuously negotiate access to data with company managers and manually construct audit evidence, relying on heterogeneous and not always verifiable sources. This condition restores to auditors a more interpretive and "craft-like" role, but increases informational uncertainty and the likelihood of error. In this context, the platform does not impose rigidity; rather, it is absent as a stabilising actor: the sociotechnical network is more fluid, yet also more fragile.

The two cases clearly reveal the trade-off between flexibility and transparency that characterises the digitalisation of audit processes. In highly digitalised contexts, transparency is ensured through full traceability of information flows, but this comes at the cost of reduced flexibility and diminished professional discretion. In less digitalised contexts, by contrast, auditors' greater interpretive freedom is accompanied by lower standardisation and, consequently, reduced verifiability of audit evidence.

This tension challenges the paradigm according to which digitalisation constitutes a linear progression toward a "more objective" and "more efficient" audit. In reality, the effectiveness of digital auditing depends on the actors' ability to negotiate and balance the two poles of this tension. The platform does not eliminate the subjectivity of professional judgement; rather, it reconfigures it, translating it into configuration choices, access parameters, and validation pathways.

The platform emerges as a hybrid actor: it connects and simultaneously disciplines the relationships among auditors, clients, and internal control systems. Any modification within the network—a software update, a new security policy, a restructured database—can alter the ways in which accounting knowledge is produced and legitimised. The auditor thus ceases to be merely a guarantor of information reliability and becomes a translator between human and machine languages, between technological constraints and professional interpretations.

The empirical analysis confirms that digital auditing cannot be understood merely as a technical process of automation, but rather as a sociotechnical practice in which professional competencies, information tools, and organisational logics are mutually co-constructed. Digital platforms, far from being neutral instruments, introduce a new form of computational rationality that tends to privilege what is quantifiable, traceable, and representable. However, the quality of audit judgement continues to depend on interpretive and contextual dimensions that elude full algorithmic codification.

From this perspective, the auditor does not disappear but instead undergoes a role transformation: from a specialist in document verification to a mediator of meanings and a manager of sociotechnical networks. Digitalisation shifts the centre of gravity of auditing from the "verification of evidence" to the "configuration of information sources," positioning the auditor as a central actor in the translation between technological and organisational worlds.

The comparative analysis of the two cases enables a critical reading of the relationship between digitalisation and auditing decision-making processes. The digital platform emerges as an actor that simultaneously enables and constrains auditing practices: it enables, by offering greater traceability and analytical capacity; it constrains, by reducing interpretive flexibility and limiting the adaptation of audit practices to the specific context.

This dual nature suggests that digitalisation should not be interpreted as a linear process of improvement but rather as a field of tensions that requires new cognitive and relational competencies on the part of auditors. Understanding these tensions is crucial for developing an informed governance of digital technologies in auditing—one capable of preserving the professional dimension of judgement while leveraging the potential of automation.

Ultimately, the digitalisation of auditing does not replace human professionalism but redefines its boundaries, positioning the auditor at the centre of a network in which the value of control depends not only on data accuracy but on the capacity to interpret, mediate, and make sense of the new forms of transparency generated by digital platforms.

6. Contributions

This study examines how reframing and overflowing emerges within digitalized auditing processes and how it reshapes auditors' professional judgment. Drawing on insights from socio-technical systems theory, the analysis highlights the tension between enhanced analytical capabilities offered by advanced audit technologies and the cognitive, organizational, and procedural challenges introduced by data abundance and reconfiguration. The findings suggest that digital tools can both support and destabilize decision-making: while automation and data analytics improve efficiency and precision, they can also obscure accountability, amplify information noise, and require new competencies to manage data saturation.

The paper argues that understanding both reframing and overflowing is essential for designing audit processes that maintain reliability and transparency in an increasingly digitalized landscape.

This study provides a twofold contribution. Theoretically, it foregrounds digitalization as an active sociotechnical actor that participates in redefining the institutional and professional boundaries of auditing decision-making processes. Practically, it argues that addressing the structural rigidities embedded in digital platforms is essential for developing informed, critical approaches to the automation of auditing decision-making processes.

Keywords: Auditing; decision-making; performativity

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Stakeholder Engagement under the CSRD: Evidence from Italian Listed Companies

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1. Relevance of the topic

Within corporate processes, stakeholder engagement plays a central role, marking the shift from a responsibility conceived as the exclusive prerogative of the firm to one of a social and shared nature. As early as 1916, economist J. M. Clark laid the foundations of business ethics, social responsibility, and what would later become stakeholder theory, subsequently systematized in Freeman's seminal contribution (Mercier, 2006). In recent decades, managers have had to operate in an environment marked by numerous turbulences arising primarily from two sources: a profound internal change, driven by a paradigm shift in traditional relationships, and an external change—namely the emergence of new actors and groups (public institutions, competitors, non-profit organizations, media, and social interest groups) that are difficult to fit within existing theoretical models. Ignoring the plurality of interest groups can lead to serious negative consequences for corporate governance, such as a loss of legitimacy and trust. It is therefore essential to move beyond the concept of a business led solely by the entrepreneur and embrace the concept of "shared value" (Freeman, 1984). In this perspective, Freeman's (1984) Strategic Management: A Stakeholder Approach introduced-by the standards of the time-an innovative view of corporate governance, conceiving the firm as a central node within a complex network of relationships. It follows that organizations, in defining strategy and conduct, are called upon to consider actors bearing diverse interests (stakes) (Freeman et al., 1990). Freeman thus expanded the classic "input-output" model of managerial capitalism, with the aim of introducing a concept of the enterprise in which the latter was conceived at the centre of a dense network of interdependent relationships, graphically represented by Frooman's (1999) hub-and-spoke model.

Building on these premises, stakeholder theory has contributed to clarifying how firms relate to their various stakeholders. Before defining the modus of dialogue, however, it is necessary to clarify the quid, namely who, operationally, qualifies as a "stakeholder" for a given organization. Identification remains a recurring challenge, as the relationship between stakeholders and firms depends on multiple contingent factors, starting with the context in which the organization operates (Hall & Vredenburg, 2005). Analyzing the operating context in which the firm competes is the starting point for effective relationship management. From this follows the need to manage the relationships among the relevant groups in order to understand their interconnections and subsequently chart their progressive development (Tani, 2020). However, as Greenwood (2007) observes, engagement is not necessarily synonymous with ethical and responsible commitment: it is essential that engagement practices do not devolve into mere window dressing. From this perspective, the engagement process must be interpreted dynamically, and stakeholder mapping represents a crucial step, serving as the foundation for building a long-term strategy aimed at strengthening organizational resilience and legitimacy (Mitchell et al., 1997; Bourne & Walker,

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2005). Alongside the theoretical debate and definitional efforts aimed at simplifying identification, numerous engagement models have been proposed, which organizations may adopt depending on the degree of dialogue and the relevance attributed to interlocutors: from purely informative approaches (Green & Hunton-Clarke, 2003), to consultative approaches based on the collection of opinions and feedback (Tani, 2020), to collaborative approaches in which stakeholders are actively involved in decision-making (Stocker et al., 2020). The implementation and formalization of these latest approaches pave the way for collaborative governance models (Ansell & Gash, 2008), in which decisions are taken through dialogue and cooperation among stakeholders to pursue common goals and generate long-term positive impacts (Stocker et al., 2020). Building an effective collaborative process requires careful planning and the intentional design of engagement modalities. The literature underscores the importance of transparent communication and authentic, substantive engagement (Morsing & Schultz, 2006). According to Owen and O'Dwyer (2005), organizations that adopt a participatory approach achieve more effective outcomes in terms of trust and shared commitment. A subsequent step entails targeted communication of the firm's social and environmental activities; in this way, communication becomes an indispensable tool for fostering stakeholder loyalty (Deegan & Blomquist, 2006). In this perspective, non-financial reporting enables organizations to meet stakeholder needs, thereby generating long-term value (Buallay, 2022).

In light of these observations, interaction modalities can vary and encompass different approaches:

- Informational approaches, based on one-way transmission from the organization to its stakeholders, without direct involvement;
- Consultative approaches, which collect opinions and feedback useful for decision-making, without creating a shared strategy (Freeman, 1984);
- Collaborative approaches, in which stakeholders are actively involved in decision-making under a shared governance arrangement.

The latter approach is grounded in the notion of collaborative governance, whereby decisions are made through dialogue and cooperation among diverse stakeholders, who are consulted to achieve common goals and create long-term positive impact (Ansell & Gash, 2008).

The engagement process is described in literature as an evolutionary model divided into various phases: starting from the identification of those who are identified as "key stakeholders" for the organization, moving on to the management of relevant issues and, finally, arriving at the construction of a relationship process based on dialogue, cooperation and mutual listening (Svendensen, 1998).

Within this framework, practitioner-oriented tools provide operational guidance. The AA1000 framework by AccountAbility comprises: the AccountAbility Principles (AA1000AP), which guide identification, prioritization, and responsiveness; the AA1000 Stakeholder Engagement Standard (AA1000SES), which structures the phases of stakeholder dialogue; and the AA1000 Assurance Standard (AA1000AS), which enables the independent assurance of disclosures. In particular, AA1000SES was developed specifically to support organizations in conducting stakeholder engagement and provides an internationally recognized operational framework. On these premises, stakeholder engagement takes shape as an intentional and cyclical process: (i) mapping and prioritizing stakeholder groups; (ii) defining dialogue objectives; (iii) selecting engagement tools; and (iv) translating feedback into operational strategies.

2. Research aim

Moving from theoretical foundations to reporting practice, the European regulatory framework has rendered stakeholder engagement indispensable. Directive (EU) 2022/2464, the Corporate Sustainability Reporting Directive (CSRD), transposed in Italy by Legislative Decree

No. 125/2024, introduces mandatory reporting under the ESRS, with first-time application for many firms from financial year 2024 (reports published in 2025). The CSRD places the notion of double materiality at the core of disclosure processes. In the absence of structured stakeholder engagement, it becomes difficult to identify impacts, risks, and opportunities and, consequently, to determine what is material-that is, significant-for the organization.

At the same time, the regulatory framework for non-financial reporting is evolving. In 2025, the European Commission introduced the "Simplification Omnibus" package, and the European Parliament approved the postponement of certain reporting obligations, with proposals that reduce the scope of obligated entities and ease some requirements along the value chain. While intended to simplify reporting, these measures have nonetheless generated uncertainty regarding both scope and application. The current European sustainability regulatory framework is therefore facing a period of high uncertainty and regulatory complexity, further accentuated by the recent "Omnibus" proposal presented by the European Commission in February 2025, whose negotiating mandate was adopted by the Council in June 2025. The "Stop the Clock" proposal provides for a two-year delay in the application of sustainability reporting obligations for certain types of companies and postpones the obligation for listed SMEs to 2029. It is precisely within this context of change and uncertainty that this research takes place; it becomes crucial to investigate the actual behavior of organizations and their adopted strategies in response to a complex regulatory environment.

Despite extensive literature theorizing the various modes of dialogue and collaboration with stakeholders, it remains empirically unclear whether, and for what purposes, these methods are adopted by organizations.

Considering the above, this study pursues a twofold objective. First, it seeks to map the stakeholder engagement practices adopted by Italian listed companies in the first CSRD-compliant reports, classifying approaches according to the typologies delineated in the AA1000 Stakeholder Engagement Standard (AA1000SES). Second, it aims to investigate sectoral differences in engagement modalities, using the ATECO code as the criterion for classifying organizations. In so doing, the study contributes to the stakeholder engagement literature by offering empirical evidence from the Italian context during a phase of profound regulatory and organizational transformation, thereby enriching the scholarly debate through the following research questions:

RQ1: How is the stakeholder engagement process evolving in Italy in light of the CSRD?

RQ2: What are the principal stakeholder engagement practices adopted by Italian companies?

RQ3: Are there significant differences in stakeholder engagement modalities across economic sectors?

3. Theoretical Lens

The study draws on Stakeholder Theory (Freeman, 1984) and Legitimacy Theory (Suchman, 1995) as interpretive frameworks. Stakeholder Theory enables the analysis of how organizations identify, prioritize, and engage different stakeholder groups through varying levels of dialogue. The interaction process between the firm and its stakeholders is conceptualized as stakeholder engagement (Freeman, 1984), and is supported by a convergence of organizational theories addressing the motivations behind such interactions, among which legitimacy theory plays a particularly central role. Legitimacy Theory complements this perspective by framing engagement and disclosure as mechanisms through which firms seek to maintain or strengthen their social legitimacy. Within this framework, legitimacy emerges as a key resource required for achieving organizational objectives; acquiring and maintaining it through social responsibility practices and effective stakeholder communication is indispensable. In this sense, while legitimacy theory conceptualizes the need for social consent as fundamental for long-term

organizational survival (Dowling & Pfeffer, 1975; Suchman, 1995), stakeholder theory translates this requirement into practice by identifying stakeholders as the primary actors through whom legitimacy is pursued and sustained over time (Freeman, 1984; Freeman et al., 2010).

4. Methodology

To achieve the research aim, the study adopts a qualitative methodological approach based on Qualitative Content Analysis (QCA) of secondary sources (Elo & Kyngas, 2008). QCA is a systematic and objective method designed to describe and interpret qualitative data such as written texts, visual, and verbal messages (Downe-Wamboldt, 1992; Sandelowski, 1995; Krippendorff, 1980). This approach is particularly suitable for the present research, as it allows for the identification and categorization of recurring terms and sentences into thematic clusters sharing the same semantic domain, thereby ensuring replicability and transparency of the analytical process.

The initial sample comprised 397 companies operating in the Italian market, retrieved from the AIDA (Bureau van Dijk) database (access date: April 2025). A screening process was subsequently carried out to select only those Italian companies required to disclose sustainability information according to the thresholds established by the CSRD. All companies exceeding at least two of the following three criteria-(i) 250 average annual employees, (ii) €40 million net turnover, (iii) €20 million total assets-must provide sustainability reporting. Following this screening, a sample of 290 firms was identified (873 records in total). However, 107 companies were excluded because no public documentation was available on their corporate websites. Consequently, the final analysis was conducted on 184 companies, which disclosed sustainability reports for the entire period under consideration (2022-2024). In total, 552 reports were analyzed, including Sustainability Reports, Non-Financial Declarations, Consolidated Non-Financial Declarations, and Management Reports, depending on the type of document made publicly available by each company. Finally, in order to accomplish the research objective, the selected companies were clustered according to their ATECO (2077) industry classification code and subsequently analyzed.

The analysis followed a deductive qualitative content analysis approach (Burns & Grove, 2005). Thematic categories (Table 1) were derived from established theoretical frameworks and the AA100SES framework. Specifically:

- From Stakeholder Theory (Freeman, 1984), we extracted categories concerning stakeholder salience and identification;
- From the AA1000 Stakeholder Engagement Standard, we derived categories related to the methodological approaches of stakeholder engagement;
- From Legitimacy Theory (Suchman, 1995), we mapped the categories of standards and practices applied in sustainability reporting.

Theoretical Framework	Category	Sub-Category
Stakeholder Theory (Freeman, 1984)	Stakeholder Identification	- Internal stakeholders (employees, management, shareholders); - External stakeholders (customers, suppliers, local communities, regulators)
	Stakeholder Salience	- High salience (explicit recognition and prioritization); - Low salience (generic mention without prioritization)

Legitimacy Theory (Suchman,1995)	Reporting Standards	- GRI adoption; - ESRS/CSRD compliance; - Other international standards (e.g., SASB, TCFD, <IR>);
AA1000SES	Engagement Approaches	- Information (one-way communication); - Consultation (surveys, interviews, focus groups); - Dialogue (systematic bilateral communication); - Partnership/Collaboration (joint initiatives, co-decision-making);

Table 1. Thematic categories, Source: developed by the authors

Texts from the collected reports were manually coded into dichotomous variables (1 = presence of information; 0 = absence of information) and classified into sub-categories and categories derived from the above frameworks. The coded data were subsequently transferred into an Excel dataset, with variables organized according to the predefined categories. To ensure reliability, the analysis was conducted independently by two authors. Any discrepancies were discussed and resolved through iterative dialogue, thereby enhancing the robustness and trustworthiness of the findings.

5. Expected Results and contributions

We expect that in the first reports prepared under the CSRD, stakeholder engagement processes will predominantly focus on informative and consultative modalities, while collaborative methods will remain only marginally implemented-despite the literature on collaborative governance highlighting their significant potential and long-term effectiveness (Hall & Vredenburg, 2005; Ansell & Gash, 2008). Furthermore, we anticipate sector-specific reporting differences: in high-impact industries, such as utilities and energy, engagement will likely be more structured and continuous, with a still minority presence of collaborative approaches; in light manufacturing and B2B services, we expect a prevalence of informative and consultative practices, mainly directed at clients and suppliers, and less extended to communities and territories. Overall, we argue that the adoption of the ESRS and the emphasis on double materiality have triggered a convergence toward more formalized practices. Yet, within the observed timeframe, collaborative methods are expected to remain the exception rather than the rule.

Keywords: Stakeholder engagement; collaborative approaches; sustainability disclosure

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La rendicontazione di sostenibilità negli Enti del Terzo Settore: Barriere e Facilitatori nel contesto dei Banchi Alimentari Italiani

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1. Background

Nell'attuale contesto globale, caratterizzato da profonde sfide di natura sociale, economica, culturale e ambientale, le tematiche connesse allo sviluppo sostenibile e, più in generale, alla sostenibilità hanno assunto un ruolo sempre più centrale nelle agende politiche delle Nazioni (Delgado-Ceballos et al., 2023; Marrone et al., 2024; Annesi et al., 2025). Una tappa fondamentale di questo percorso è rappresentata dall'Agenda 2030, sottoscritta il 25 settembre 2015 dai governi dei 193 Paesi membri delle Nazioni Unite, che delinea un programma d'azione per lo sviluppo sostenibile articolato in 17 Obiettivi di Sviluppo Sostenibile (SDGs) da raggiungere entro il 2030 (Lee et al., 2016).

Nel processo di avanzamento verso il raggiungimento degli SDGs, e dunque verso una transizione sostenibile, un ruolo cruciale è attribuito alle imprese, chiamate a ripensare e riadattare i propri modelli di business al fine di integrare, accanto ai tradizionali obiettivi di profitto, finalità riconducibili alla Corporate Social Responsibility (Zampone et al., 2024; Pontrelli et al., 2025). Sebbene la letteratura scientifica abbia inizialmente focalizzato l'attenzione sulle aziende for profit (Nicolò et al., 2022), uno stream più recente (Meier, 2023; Annesi et al., 2025) ha evidenziato il ruolo degli Enti del Terzo Settore (ETS), oggi considerati partner essenziali nella transizione sostenibile. Gli ETS, oltre a rappresentare la voce organizzata della società civile (Arhin, 2016; Meier, 2023), contribuiscono al raggiungimento degli SDGs attraverso l'erogazione diretta di servizi e svolgendo funzioni di intermediazione tra i diversi settori.

I Banchi Alimentari (BA), istituiti negli Stati Uniti e in Canada diversi decenni fa, sono oggi ampiamente diffusi nei Paesi ad alto reddito, tra cui Regno Unito, Australia, Germania e Italia (Riches, 2002; Oldroyd et al., 2022). In qualità di centri logistici, raccolgono e distribuiscono generi alimentari a enti o organizzazioni di beneficenza di dimensioni più ridotte (c.d. agenzie partner o enti caritativi), che a loro volta forniscono supporto diretto ai beneficiari finali tramite la distribuzione, senza alcun costo aggiuntivo, di pacchi alimentari preconfezionati (Loopstra, 2018; Parker et al., 2020) o somministrazione di pasti caldi (es. mense Caritas). Svolgendo tale funzione, i BA ricoprono un ruolo che va oltre la semplice distribuzione di aiuti alimentari, risultando particolarmente rilevanti nel perseguimento di diversi SDGs (Zainal et al., 2019; Rasteiro et al., 2025), in particolare degli Obiettivi 2, 3, 10, 12.

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Considerata la rilevanza del loro impatto attuale e potenziale sulle comunità, risulta essenziale disporre di sistemi di valutazione delle performance che consentano ai BA di rendicontare in modo trasparente, accurato e verificabile il valore generato (Oldroyd et al., 2022). Poiché i BA sono organizzazioni senza scopo di lucro, tali sistemi non si basano su indicatori monetari, ma si concentrano principalmente su efficienza ed efficacia. L'efficienza, intesa come la quantità complessiva, espressa in peso, di prodotti alimentari distribuiti, e l'efficacia, riferita al grado di soddisfacimento dei bisogni nutrizionali degli utenti da parte dei servizi offerti dalle singole BA (Alkaabneh et al., 2021), rappresentano infatti dimensioni fondamentali affinché la rendicontazione possa restituire una rappresentazione fedele dell'operato dell'ente. La loro rilevanza risulta ancora più evidente se si considera che il ricorso al cibo distribuito grazie all'intervento dei BA è più elevato tra disoccupati, genitori soli, famiglie monoparentali e persone con problemi di salute (Bramley, 2021; Oldroyd et al., 2022; Food Bank Canada, 2025), circostanza che rende indispensabile una rendicontazione capace di cogliere non soltanto la quantità di aiuti distribuiti, ma anche la loro capacità di rispondere ai bisogni di gruppi particolarmente vulnerabili. Alla luce di ciò, la rendicontazione di sostenibilità emerge come un elemento imprescindibile per garantire trasparenza, accountability e legittimazione sociale dell'azione collettiva. In un contesto in cui gli ETS sono chiamati non solo a contribuire al raggiungimento degli SDGs, ma anche a dimostrare in modo sistematico e verificabile gli impatti generati sulle comunità e sui territori, il reporting di sostenibilità assume una funzione strategica e diventa uno strumento centrale di comunicazione e governance (Ricket & Goodspeed, 2025). La rendicontazione sociale deve pertanto configurarsi come un processo partecipato e metodologicamente solido, capace di rappresentare l'intera catena di creazione del valore sociale, dagli input agli outcome e agli impatti, così da offrire una visione completa e coerente del contributo degli ETS allo sviluppo sostenibile (GBS, 2020).

In questa prospettiva, essa si configura come un dispositivo relazionale essenziale per rafforzare la fiducia degli stakeholder, migliorare la comunicazione tra organizzazione e comunità di riferimento e orientare le strategie interne in modo coerente con i bisogni sociali emergenti (GBS, 2020; Ricket & Goodspeed, 2025), contribuendo al tempo stesso a incrementare la trasparenza, l'allocazione delle risorse e la maturazione dei modelli di accountability nel settore non profit (OECD, 2021).

L'importanza della rendicontazione assume un significato ancora più marcato nel caso dei BA, i quali, come evidenziato in precedenza, contribuiscono in modo determinante al perseguimento degli SDGs 2, 3, 10 e 12 (Berardi et al., 2021). La complessità delle reti territoriali in cui operano e la natura multidimensionale degli impatti generati rendono la rendicontazione di sostenibilità uno strumento essenziale per descrivere in modo chiaro, verificabile e comprensibile il contributo prodotto sul piano sociale, nutrizionale, ambientale e comunitario (Grünhaus et al., 2019). Ne deriva una concezione della rendicontazione come un'infrastruttura cognitiva e relazionale indispensabile per governare la complessità dei processi di creazione del valore sociale, migliorare la qualità delle decisioni organizzative, rafforzare la legittimazione pubblica e orientare l'azione strategica degli ETS in coerenza con gli obiettivi di sostenibilità.

In questa prospettiva, il reporting non costituisce un mero adempimento regolamentare, ma un dispositivo strategico capace di qualificare il ruolo dei BA nell'ecosistema Paese e di rafforzarne il contributo al benessere collettivo e al perseguimento del bene comune.

Nonostante tale crescente rilevanza, la letteratura presenta un significativo gap, poiché mancano studi che analizzino in modo sistematico il contributo concreto degli ETS al perseguimento degli obiettivi di sviluppo sostenibile (Pizzi et al., 2020; Meier, 2023) e le connesse pratiche di rendicontazione che, per quanto consta agli autori, risultano ancora poco esplorate, in particolare nel contesto dei BA. Sono assenti contributi che esaminino in profondità le difficoltà che queste organizzazioni incontrano nell'implementazione di sistemi strutturati di rendicontazione, una lacuna particolarmente rilevante alla luce della complessità operativa che caratterizza gli ETS e, ancor più, i BA, i quali si confrontano quotidianamente con problematiche

legate alla scarsità di risorse, alla frammentazione informativa, alla misurazione di outcome intangibili e alla gestione di reti multi attore che richiedono elevati livelli di coordinamento e trasparenza. Pertanto, comprendere tali sfide e analizzare i fattori che ostacolano o facilitano la rendicontazione di sostenibilità appare quindi di fondamentale importanza.

Alla luce del quadro sin qui delineato, il presente working paper si propone di investigare i principali fattori ostativi e i principali facilitatori della rendicontazione di sostenibilità nel contesto dei BA, rispondendo alle seguenti domande di ricerca:

- quali sono le principali barriere che ostacolano le pratiche di rendicontazione di sostenibilità nel contesto dei Banchi Alimentari?
- quali sono i principali fattori abilitanti che facilitano le pratiche di rendicontazione di sostenibilità nel contesto dei Banchi Alimentari?

Per rispondere a tali domande di ricerca, lo studio adotta una metodologia di stampo qualitativo articolata in due fasi. La prima, già parzialmente conclusa, ha previsto la somministrazione di un questionario ai 21 BA operanti sul territorio italiano; la seconda prevede la conduzione di alcuni focus group con una selezione degli stessi enti, al fine di investigare, attraverso la metodologia dei multiple case study (Yin, 2003), le specificità connesse alle principali barriere e ai principali fattori abilitanti emersi. Successivamente, le evidenze raccolte saranno analizzate alla luce dei framework teorici della contingency theory (Thomas, 1986) e dell'institutional theory (DiMaggio & Powell, 1983; Zucker, 1987), elaborando un modello interpretativo in grado di connettere i principali ostacoli individuati con le leve più efficaci per superarli.

Le implicazioni derivanti da questo studio si articolano su più livelli. In primo luogo, il contributo alla letteratura risulta significativo poiché colma un vuoto conoscitivo rilevante relativo alla rendicontazione di sostenibilità nei BA, ampliando il dibattito sul ruolo degli ETS nella generazione di valore sociale. Mentre la ricerca pregressa ha spesso privilegiato le imprese for profit o gli ETS considerati nella loro generalità, l'analisi proposta approfondisce una tipologia organizzativa ad alto impatto sociale ma scarsamente indagata, offrendo evidenze empiriche in grado di arricchire la comprensione dei processi di accountability nel settore non profit. Lo studio, inoltre, contribuisce a qualificare la rendicontazione non come mero adempimento bensì come dispositivo strategico, cognitivo e relazionale centrale nei processi di creazione del valore sociale, avanzando dunque un'elaborazione teorica più articolata delle sue funzioni.

Parallelamente, l'applicazione congiunta della contingency theory e dell'institutional theory consente di estendere tali framework al contesto degli ETS e, in particolare, dei BA. L'interpretazione delle pratiche di rendicontazione alla luce della contingency theory mette in evidenza come esse siano strettamente influenzate da risorse disponibili, configurazioni organizzative e condizioni operative, mentre la prospettiva dell'institutional theory permette di comprendere il ruolo delle pressioni coercitive, normative e mimetiche nell'orientare i comportamenti delle organizzazioni. L'integrazione delle due teorie mostra la loro capacità di spiegare dinamiche proprie di un settore altamente normato, caratterizzato da finalità sociali, elevata complessità gestionale e forte dipendenza da reti di collaborazione, ampliandone così la portata interpretativa.

Dal punto di vista applicativo, i risultati offrono numerose implicazioni per i BA e per gli ETS in generale. L'individuazione delle principali barriere e dei fattori abilitanti evidenzia l'importanza di rafforzare i sistemi informativi interni, sviluppare competenze specifiche sulla misurazione del valore sociale e valorizzare il ruolo delle reti di appartenenza quali leve per la standardizzazione delle pratiche e la diffusione di processi di apprendimento organizzativo. Lo studio intende mostrare come la rendicontazione possa fungere da strumento di governance capace di orientare le scelte strategiche, aumentare la trasparenza verso gli stakeholder e sostenere la legittimazione pubblica, superando concezioni che la relegano a un obbligo burocratico.

Le implicazioni sono altrettanto rilevanti per i policymaker, soprattutto alla luce delle linee guida per la redazione del bilancio sociale degli ETS introdotte con il DM 4 luglio 2019. Le

evidenze empiriche emerse potranno favorire un affinamento delle politiche pubbliche in materia di accountability, suggerendo interventi mirati a facilitare l'implementazione della rendicontazione nei BA e negli ETS in generale. Tra tali interventi rientrano lo sviluppo di programmi di supporto tecnico e formativo, la definizione di piattaforme condivise per la raccolta e gestione dei dati e l'introduzione di standard qualitativi più coerenti con le capacità effettive degli enti. Lo studio fornisce dunque una base conoscitiva utile a orientare politiche di accompagnamento e strumenti regolatori capaci di rendere la rendicontazione un processo realmente funzionale alla governance degli ETS e all'allocazione delle risorse pubbliche.

Infine, sebbene condotto nel contesto italiano, lo studio ha una portata internazionale, poiché i BA analizzati appartengono alla rete nazionale affiliata alla Federazione Europea dei Banchi Alimentari e alla Global FoodBanking Network. Tale collocazione inserisce i risultati in un quadro transnazionale, rendendoli rilevanti per realtà simili operanti in altri Paesi e in contesti socio-istituzionali differenti. Le dinamiche individuate, legate alla complessità organizzativa, alle sfide di misurazione dell'impatto e alla crescente pressione per una migliore accountability, risultano infatti condivise all'interno dei sistemi di food banking nei Paesi ad alto reddito. Ne deriva che le evidenze prodotte, pur radicate nel caso italiano, offrono spunti generalizzabili e trasferibili in ambito internazionale, contribuendo a qualificare in modo più approfondito il ruolo dei BA e degli ETS nei processi di sviluppo sostenibile e nella lotta globale all'insicurezza alimentare.

2. Metodologia

Nell'ambito del presente studio, la strategia empirica prevede un disegno metodologico articolato in due fasi, tuttora in corso.

La prima fase ha previsto la somministrazione di un questionario strutturato ai 21 BA operanti sul territorio nazionale e coordinati dalla Fondazione Banco Alimentare. Lo strumento, veicolato tramite piattaforma digitale (google moduli), è stato progettato per indagare in modo sistematico le pratiche di rendicontazione di sostenibilità, i meccanismi adottati per la misurazione dell'impatto sociale e le modalità di gestione informativa e organizzativa all'interno della rete dei BA. Il questionario si inserisce all'interno di un progetto di ricerca di interesse nazionale (PRIN) volto ad approfondire le dinamiche di accountability, di impatto generato e di network dei BA. Esso comprende diverse sezioni dedicate rispettivamente: (i) alla raccolta di informazioni anagrafiche sull'ente e sul rispondente; (ii) alle pratiche di rendicontazione sociale, con particolare riferimento all'adozione del bilancio sociale previsto dalle Linee guida ministeriali, alle motivazioni sottostanti la sua introduzione o alla mancata adozione, e all'utilizzo di specifici standard di rendicontazione, includendo l'analisi delle principali barriere e dei fattori abilitanti che influenzano l'attivazione del processo; (iii) alle modalità di misurazione dell'impatto sociale, indagando sia l'eventuale implementazione di sistemi formali, sia le ragioni dell'assenza di tali processi, includendo dimensioni quali difficoltà nella raccolta dati, carenza di risorse e natura qualitativa degli outcome; (iv) alla gestione dei volontari, esplorando la composizione delle diverse tipologie di volontari, l'esistenza di modelli organizzativi dedicati, gli strumenti impiegati per monitorare l'apporto orario e l'utilizzo dei dati raccolti ai fini gestionali o rendicontativi; e infine (v) ai temi e agli indicatori di sostenibilità ritenuti rilevanti per l'organizzazione, attraverso scale di valutazione che consentono di misurare sia la percezione della rilevanza dei temi ESG, sia l'effettivo utilizzo e l'importanza attribuita a un ampio insieme di indicatori sociali, ambientali ed economici. A oggi, 15/21 BA coinvolti hanno completato la compilazione, con un tasso di risposta pari a circa il 70%. Tale risultato preliminare consente già di disporre di un corpus informativo significativo, utile a delineare pattern ricorrenti, specificità territoriali e prime evidenze riguardanti le barriere e i fattori abilitanti alla rendicontazione di sostenibilità nel settore.

La seconda fase, attualmente in via di definizione operativa, prevede la realizzazione di una serie di focus group che coinvolgeranno la Fondazione Banco Alimentare, in qualità di nodo

centrale di coordinamento, e un campione di BA territoriali, tra cui Abruzzo, Lombardia, Campania, Lazio e Puglia. L'obiettivo è approfondire qualitativamente le principali evidenze emerse dalla fase survey, adottando la prospettiva dei multiple case study per esplorare le specificità organizzative, le dinamiche relazionali e le condizioni contingenti che influenzano l'adozione di pratiche strutturate di rendicontazione.

L'intero processo di raccolta ed elaborazione dati è pertanto ancora in corso. Le evidenze presentate assumono carattere preliminare e saranno ulteriormente arricchite con l'integrazione dei risultati derivanti dai focus group, al fine di costruire un quadro interpretativo più completo e teoricamente fondato sulle barriere e sui facilitatori della rendicontazione di sostenibilità nei BA.

3. Risultati preliminari

I risultati che seguono hanno carattere preliminare, in quanto riferiti alla sola prima fase della ricerca, quella quantitativa basata sulla somministrazione del questionario ai 21 BA operanti sul territorio nazionale. Alla data attuale hanno completato il questionario 15 enti, pari a un tasso di risposta del 71% circa. L'analisi presentata rappresenta pertanto una fotografia parziale dei processi di rendicontazione di sostenibilità in atto nella rete dei BA, destinata a essere arricchita e approfondita nella seconda fase del progetto, che prevede lo svolgimento di più focus group e l'adozione di un approccio di multiple case study.

3.1. Livello di adozione del bilancio sociale e maturità rendicontativa

L'indagine mostra che la rendicontazione sociale rappresenta una pratica già diffusa ma ancora caratterizzata da una significativa eterogeneità interna. 10 BA dichiarano di redigere un bilancio sociale, mentre 5 non hanno ancora adottato tale strumento. Tra gli enti che hanno avviato il percorso, la maggioranza lo porta avanti da diversi anni, mentre una quota più ridotta si trova in una fase iniziale, avendo introdotto il bilancio sociale di recente.

La variabilità dell'esperienza maturata dai BA è particolarmente rilevante. Si osservano organizzazioni con una lunga tradizione rendicontativa, in alcuni casi superiore al decennio, che hanno progressivamente strutturato processi informativi e modelli di *governance* orientati alla misurazione dell'impatto. Al contempo, altri enti mostrano una maturità più contenuta, con un'esperienza ridotta e procedure ancora in fase di definizione. Ne deriva un quadro in cui la rendicontazione sociale si sta consolidando come pratica riconosciuta, pur con ritmi e modalità differenti a seconda delle caratteristiche organizzative, delle risorse disponibili e del grado di formalizzazione interna.

3.2. Benefici attesi e motivazioni all'adozione del bilancio sociale

Le motivazioni che spingono i BA ad adottare il bilancio sociale sono molteplici e compongono un insieme coerente con la letteratura sulla rendicontazione negli enti non profit. La necessità di misurare e rendere comunicabile il valore sociale generato rappresenta il principale driver. I BA rispondenti evidenziano come la crescente complessità delle attività svolte, la molteplicità degli stakeholder coinvolti e la natura multidimensionale degli impatti richiedano strumenti di comunicazione strutturati, in grado di restituire una visione sistematica dell'operato dell'organizzazione.

Accanto a ciò, emerge in modo significativo l'aspettativa che il bilancio sociale faciliti la costruzione di relazioni più solide con la rete dei partner istituzionali e con i finanziatori, pubblici e privati. La rendicontazione viene interpretata come una leva per migliorare la credibilità e la trasparenza dell'organizzazione, aumentando la capacità di attrarre risorse economiche e instaurare partnership strategiche. Molti enti (7 BA) riconoscono inoltre che l'avvio della

rendicontazione risponde anche a obblighi regolatori e a un più generale processo di adeguamento alle linee guida ministeriali e ai modelli proposti dalla rete di appartenenza.
In alcuni casi il bilancio sociale assume una funzione eminentemente interna, poiché favorisce un migliore coordinamento tra le diverse attività dell'organizzazione, supporta la pianificazione strategica e contribuisce a rendere più consapevole la gestione delle risorse, sia materiali sia immateriali. Si delinea così una duplice dimensione della rendicontazione: strumento di posizionamento esterno e, allo stesso tempo, meccanismo cognitivo e organizzativo che accompagna l'evoluzione della struttura gestionale del BA.

3.3. Standard e riferimenti utilizzati nella redazione

La maggior parte dei BA che redige il bilancio sociale dichiara di utilizzare uno o più standard di riferimento. Le Linee guida ministeriali rappresentano il modello più adottato (9 BA), seguite dalle Linee guida predisposte dalla Fondazione Banco Alimentare (7 BA), spesso usate in maniera complementare. Alcuni enti (3 BA) affiancano ai riferimenti nazionali anche standard internazionali come il GRI, segnalando una maggiore attenzione ai sistemi globali di rendicontazione della sostenibilità.

L'utilizzo congiunto di modelli differenti evidenzia la stratificazione di riferimenti che caratterizza il settore. I BA si trovano infatti a operare in uno spazio istituzionale multiforme, nel quale coesistono pressioni normative, logiche di rete e istanze di accountability verso la società civile. Tale pluralità di standard conduce alla costruzione di assetti rendicontativi flessibili, nei quali le organizzazioni combinano strumenti formali e pratiche operative consolidate nella propria esperienza.

3.4. Barriere all'adozione del bilancio sociale

I 5 enti che non hanno ancora introdotto il bilancio sociale riportano una serie di barriere riconducibili principalmente a vincoli di natura organizzativa. La percezione di un processo eccessivamente complesso, che richiede tempi e risorse difficilmente compatibili con le priorità operative quotidiane, rappresenta il limite più frequentemente segnalato. A questo si affianca la mancanza di competenze interne specifiche, soprattutto in relazione alla gestione dei dati e alla capacità di tradurre le attività svolte in modelli di misurazione e indicatori significativi.
In alcuni casi, l'assenza di risorse finanziarie adeguate limita la possibilità di dedicare personale o consulenti alla redazione del bilancio sociale. Altri enti evidenziano difficoltà nella raccolta delle informazioni necessarie, dovute a sistemi informativi poco strutturati o a processi di monitoraggio non ancora consolidati. Vi sono poi barriere di natura più strategica e cognitiva, come la percezione che il bilancio sociale non rappresenti una priorità rispetto ad altre attività considerate centrali per il funzionamento quotidiano del BA o l'idea che strumenti già utilizzati garantiscano un sufficiente livello di trasparenza verso gli stakeholder.
Nel complesso, tali barriere delineano un quadro in cui le criticità non riguardano la rilevanza percepita della rendicontazione, bensì la capacità concreta di implementarla in contesti caratterizzati da risorse limitate, volumi di attività elevati e tensioni costanti tra esigenze operative e necessità amministrative.

3.5. Fattori abilitanti alla rendicontazione

Accanto alle barriere individuate, emergono alcuni fattori che facilitano l'adozione e il consolidamento delle pratiche di rendicontazione nei BA. In primo luogo, il quadro normativo e regolatorio, insieme al ruolo della rete Banco Alimentare, contribuisce a creare aspettative condivise, standard comuni e un orizzonte istituzionale chiaro. Questo contesto esercita una

funzione abilitante, poiché riduce l'incertezza e orienta le organizzazioni verso modelli rendicontativi riconosciuti e comparabili.
Un secondo gruppo di fattori riguarda la dimensione interna e gestionale dell'ente. Gli organismi che dispongono di sistemi informativi più strutturati, come piattaforme ERP o gestionali avanzati (es. SAP), mostrano una maggiore facilità nel produrre dati in maniera sistematica, condizione necessaria per alimentare un processo di reporting credibile e continuativo. Allo stesso modo, l'adozione di tecnologie digitali innovative, come strumenti di tracciamento basati su *blockchain* (Damavandi et al., 2025) o soluzioni di intelligenza artificiale per l'analisi automatizzata dei dati, può rappresentare un importante supporto nei contesti caratterizzati da scarsità di personale e da un'elevata intensità operativa (Berardi & Valentinetti, 2023).
Infine, la consapevolezza del valore strategico della rendicontazione rappresenta un ulteriore fattore abilitante. Gli enti che riconoscono il legame tra bilancio sociale, miglioramento delle pratiche interne e rafforzamento delle relazioni con i partner risultano più propensi a investire energie nel processo rendicontativo. La rendicontazione si configura così come una pratica che, quando percepita come utile sia per l'interno sia per l'esterno, tende a radicarsi più stabilmente.

3.6. Conclusioni preliminari e future fasi di ricerca

I risultati preliminari delineano un quadro in cui i BA stanno attraversando un percorso di progressiva maturazione delle pratiche di rendicontazione, sostenuto da una crescente consapevolezza dei benefici attesi e al tempo stesso frenato da vincoli operativi e strutturali tipici del settore non profit. La diffusione del bilancio sociale e l'interesse verso la misurazione dell'impatto indicano un movimento complessivo verso forme più avanzate di accountability, sebbene persistano difficoltà legate alla disponibilità di risorse, alla carenza di competenze specialistiche e alla limitata capacità di raccolta ed elaborazione dei dati.

In questa fase emergono anche alcuni fattori abilitanti che sembrano facilitare l'adozione del reporting. Tra essi rivestono particolare importanza la presenza di sistemi informativi più strutturati, come gestionali integrati del tipo ERP, e l'introduzione progressiva di tecnologie digitali capaci di semplificare la tracciabilità e il trattamento dei dati, come soluzioni blockchain e strumenti di intelligenza artificiale. Tali elementi risultano particolarmente rilevanti per i BA caratterizzati da organici ridotti e volumi operativi elevati, poiché consentono di rendere la rendicontazione meno onerosa, più affidabile e maggiormente sistematica.

Queste evidenze saranno approfondite nella seconda fase della ricerca, attraverso i focus group che permetteranno di indagare più dettagliatamente le dinamiche organizzative interne, di chiarire le condizioni che favoriscono o ostacolano l'adozione del bilancio sociale e di comprendere come le tecnologie digitali vengano effettivamente integrate nei processi di gestione e monitoraggio. Tale approfondimento qualitativo consentirà di interpretare con maggiore precisione i risultati emersi dalla survey, distinguendo tra pratiche consolidate e prassi emergenti e mettendo in luce la varietà dei modelli organizzativi presenti nei diversi contesti territoriali.

Lo studio presenta alcune limitazioni, legate soprattutto alla fase ancora incompleta della raccolta dati e al fatto che il campione comprende esclusivamente i BA italiani, sebbene il contesto nazionale, come evidenziato in precedenza, risulti pienamente inserito in un quadro internazionale e quindi ampiamente rappresentativo delle dinamiche dei sistemi di food banking nei Paesi ad alto reddito. Inoltre, l'assenza, nella fase attuale, di un'analisi qualitativa impedisce di cogliere appieno la complessità delle motivazioni e delle dinamiche decisionali che orientano le scelte di rendicontazione. Nonostante tali limiti, il contributo offerto da questa prima fase è significativo, poiché fornisce una mappatura sistematica e finora mancante delle pratiche rendicontative dei BA, identifica barriere e fattori abilitanti poco esplorati nella letteratura e mette in evidenza il ruolo della digitalizzazione come leva potenzialmente decisiva per la maturazione dei sistemi di accountability nel settore non profit.

Le fasi successive della ricerca permetteranno infine di integrare questi risultati in un quadro interpretativo più completo, arricchito dalla prospettiva empirica dei focus group e coerente con i riferimenti teorici adottati. Ciò offrirà un contributo utile sia alla letteratura sulla rendicontazione degli ETS sia ai decisori pubblici e privati impegnati nel campo della sicurezza alimentare e della gestione delle reti solidali, consentendo, da ultimo, di superare gran parte dei limiti evidenziati in questa fase preliminare.

Parole chiave: Rendicontazione; sostenibilità; enti del terzo settore; food bank; SDGs

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Ideologies and institutional logics in the sustainability practices: The Italian steel industry exploration

Laura Rocca[1], Cristian Carini[2], Elisa Mori[3], Matilde Molendi[4]

1. Purpose

In recent years, the growing relevance of sustainability has driven companies to integrate Corporate Social Responsibility (CSR) practices into their business models, strengthening their commitment to social and environmental responsibility (Lozano, 2012). Although CSR has been a recognized concept since the 1950s (Carroll, 1999), its role has expanded significantly, influencing the evolution of corporate business models (Rauter et al., 2017). CSR and sustainability can be seen as expressions of companies' commitment to balancing economic success with stakeholder needs (Freeman et al., 2010) and ensuring political legitimacy in compliance with the social contract (Deegan, 2002). Moreover, CSR can serve as a strategic lever to guide companies toward sustainable development models (Cetindamar, 2007).

The literature presents an ongoing debate regarding the relationship between CSR, value creation, and corporate profitability. While some scholars argue that CSR provides a competitive advantage (Vogel, 2005), others question the actual existence of such a relationship (Kim et al., 2018; Wang & Sarkis, 2017). Several studies also confirm the positive impact of ESG on business performance, including improved stock performance, reduced volatility, and lower risk-adjusted costs (Ahmad et al., 2021; Kim & Li, 2021). However, some scholars report opposite findings arguing that it could negatively impact financial performance. Integrating CSR requires a transformation of business models through a holistic approach that embeds sustainability principles and tools across all operational areas (Geissdoerfer et al., 2018). This transformation aligns with the concept of a Sustainable Business Model (SBM), which integrates sustainability into the company's value proposition, value creation and delivery processes, and value capture mechanisms (Geissdoerfer et al., 2018). Transitioning to a SBM is crucial for addressing the challenges of a rapidly changing environment and society (Neumeyer & Santos, 2018).

One of the main challenges in building a SBM is identifying methods that allow companies to generate economic value while simultaneously providing benefits to society and the environment (Schaltegger et al., 2012).

To support businesses in designing SBMs, research has proposed several frameworks and archetypes. Bocken et al. (2014) identified key SBM archetypes, including maximizing material and energy efficiency, creating value from waste, substituting with renewables and natural processes, delivering functionality rather than ownership, adopting a stewardship role, encouraging sufficiency, repurposing the business for societal or environmental benefit, and developing scalable solutions. Ritala et al. (2018) later expanded this framework to include inclusive value creation.

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Beyond academic frameworks, financial institutions play a crucial role in supporting companies in transitioning toward sustainable business models. Collaboration with these institutions can facilitate ESG risk reduction and drive companies toward more resilient and responsible business practices.

However, especially in Europe, we are facing a "pushing" towards a green and sustainable change in organizational practices, reflecting in new rules and laws from the EU Commission that asked for more accountability towards sustainable business models (i.e. CSRD, Taxonomy,..). But nowadays, we are facing some political and societal changes around that sustainability issues (i.e. Trump's positions on climate change, European's national governments' that requested for a revision of the green requirements). Thus, what could be the reactions to those changes within businesses? Are corporations changing their behaviors due to that? If so, to what extent? What is the organizations' approach to this complexity?

In that realm, there could be seen different institutional logics operating at field and societal level but also ideologies that could impact on organizational practices. The work of Mountford & Cai, (2023) discussed about how integrate ideologies and institutional logics in complex system, they underlined that "We go beyond Thornton et al.'s discussions on the relations between institutional logics and ideologies by elaborating on the role of ideologies in harmonizing mingling institutional logics that co-exist and the formation of hybrid logics. Once we clearly separate out logics and ideologies, our review suggests that ideologies are key to the peaceful co-existence or active contestation of multiple logics on the ground. Put simply, ideologies mediate the relationships between logics at the field level." (p. 376). Thus, there is a lack of research that studied these links between ideologies and hybrid logics in the sustainability change, identifying how these institutional logics and ideologies interplay within the organizational behaviors towards CSR's accountability (Mountford & Cai, 2023). The current paper would like to explain, using an exploratory research, what are the field and societal logics and ideologies that influence the organizations behaviors; that could contribute to the call for research (Mountford & Cai, 2023) on "how practices at the organizational or field level impact the relationships between logics at the macro level, and how these are activated or rejected by ideology" (p. 378).

Thus, the current paper would like to answer to the following research questions:

Do ideologies show themselves in the sustainability practices of corporations?

What are the logics and ideologies that interplay for the social and environmental accountability?

Using the call for future research of Mountford & Cai, (2023), the final RQ is:

"Do logics or ideologies ultimately determine the likelihood of success of a [social and environmental] accountability practice? Or is it some combination of the two?" (p. 378)

2. Design/methodology/approach

The study focuses on a specific sector, the Steel one, in the Italian context. Italy, Germany, and Spain are significant players in the European steel industry, contributing substantially to the region's output. Analysing these countries can provide insights into the practices of some of the largest and most influential steel producers. The steel industry is responsible for around 5% of CO2 emissions in the EU and 7% globally. In the European steel industry, Germany is a major producer, accounts for 26% of the EU's total steel output in 2020. Italy follows with a 15% contribution, while France and Spain each contribute 8%, demonstrating a significant dispersion in steel production across the region. Over half of the steel manufactured within the EU in the same year (56%) was produced via the primary route, which involves the conversion of raw materials into steel. However, 44% of steel production was achieved through recycling, underscoring the industry's commitment to sustainable manufacturing practices. The level of environmental pollution and resource consumption are significant factors for those businesses, making the adoption of ESG (Environmental, Social, and Governance) practices and

sustainability reporting essential. This combination led to an interesting exploratory analysis on how Italian Steel companies approach the sustainability accountability and what are the logics and ideologies behind their behaviours.

The cases were selected based on a research project to understand the level of diffusion of sustainability reporting in the Steel sector and the reasons behind the choice of reporting/not reporting on ESG issues. That project provides a survey at national level and a content analysis of all the sustainability reports available on the companies' websites (coded in Nvivo).

The qualitative methodology is two-fold, incorporating both archival analysis and interviews (Brinkmann & Kvale, 2011; Berg & Lune, 2013). Archival analysis is used to examine sustainability reports and assess the evolution of corporate social responsibility (CSR) policies within companies. Additionally, a series of semi-structured interviews were conducted to explore the sustainability strategies adopted by companies, evaluating the change processes implemented in business models and the reporting procedures used, such as sustainability reports. The interviews involved key figures responsible for sustainability, including Strategy Deployment Managers, ESG Managers, ESG Risk Management Officers, and, in some cases, business owners.

The areas of investigation are structured into five main dimensions:

1. Company Profile – Respondent's role, industry, and revenue;
2. Strategies and Governance – Corporate priorities, board involvement, and sustainability reporting decisions;
3. Environment – Actions to reduce environmental impact and green investments;
4. Social Dimension – Employee welfare, inclusion, training, and community engagement;
5. Governance and Reporting – Ethical codes, cybersecurity, sustainability assurance, and ESG impact on financial data.

The interviews provide an overview of corporate sustainability practices, assessing their operational and strategic impact.

Then, the interviews were coded using the theoretical approach of institutional logics and ideologies provided by Mountford & Cai (2023), in NVIVO (draft Figure 1).

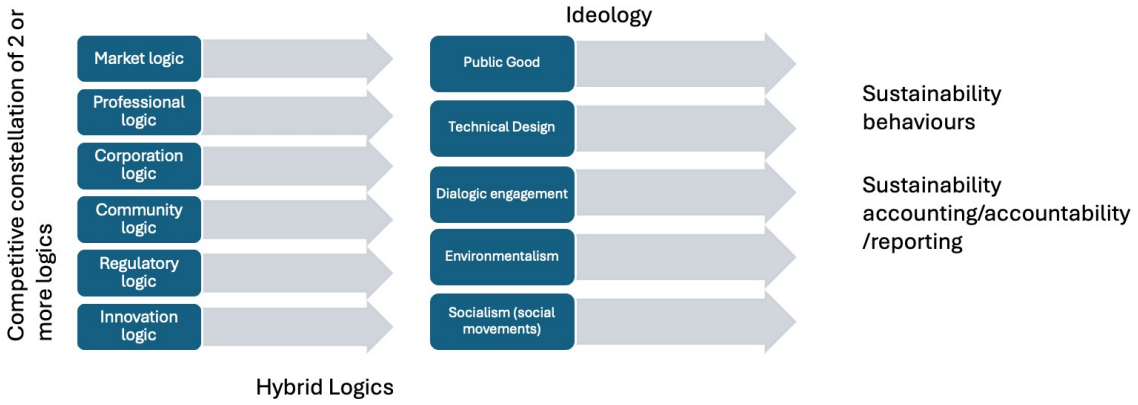


Figure 1. Draft interview coding (authors' elaboration on Mountford & Cai, 2023).

3. Findings

The project is still undergoing, and we have not yet finalized findings to present now.

Our aim is to provide a clear picture of what are the institutional logics and ideologies behind the sustainability accountability practices of different steel companies, and thus suggest that, in a period of political changes, like nowadays, there will be some sustainability practices that will remain and evolve over time – the one based on ideologies (?) – while some other sustainability practices will disappear or will be turn off – the one linked to marked-based or regulatory logic (?).

As a first finding of archival data already coded in Nvivo, here is the description of the content analysis of data reported in sustainability reports by Italian steel companies.

The 2024 and 2025 sustainability reports' analysis offer an increasingly detailed portrait of how Italian steel companies are incorporating sustainability into their strategic operations and reporting practices. The evolution observed across the two years reflects both the intensification of European regulatory requirements and the growing awareness within the sector of the strategic relevance of decarbonisation, circularity and transparent communication to stakeholders. Despite this progress, both years highlight a persistent heterogeneity in the structure, scope and methodology of sustainability reporting, which continues to complicate any attempt at systematic comparison across firms or across years.

The number of companies producing sustainability reports continues to rise. In 2022, 51 reports were identified, compared to 25 in 2021; in 2023 the number increased again to 56, including both Italian and foreign groups. This expansion indicates a clear trend of voluntary alignment with ESG expectations, even before the full implementation of the Corporate Sustainability Reporting Directive (CSRD). Nevertheless, both editions underline several critical issues: non-aligned reporting periods, differences between the consolidation perimeter of financial statements and that of sustainability reports, and frequent use of disclaimers regarding excluded subsidiaries. These inconsistencies significantly reduce the comparability and reliability of KPI benchmarking across the industry. Another recurring issue concerns the definition of material topics. Although materiality analysis is formally acknowledged as a central step, a significant share of reports lacks adequate disclosure of the methodologies applied. In the 2024 edition, 25.5% of reports provide no clear explanation of how material topics were identified, and 31% omit meaningful information on stakeholder engagement practices. The 2025 edition shows some improvement but still finds 15.5% of companies with incomplete methodological descriptions and 22% with insufficiently detailed internal or external stakeholder engagement processes. The growing relevance of "double materiality" is noted, yet only a minority of firms fully apply this approach.

The analysis of KPIs reveals that environmental indicators remain the most consistently reported across the supply chain. Companies routinely provide data on energy consumption, greenhouse gas emissions (Scope 1 and 2, with more sporadic Scope 3 disclosure), waste management and water usage. However, differences in accounting perimeters and methodological choices, especially for Scope 3, continue to limit comparability. Social indicators such as workforce composition, training hours and accident frequency rates are increasingly available, but the depth and granularity of information remain uneven. Governance KPIs are the least standardised, often limited to descriptive statements rather than quantitative measures, particularly in areas such as ethics, anti-corruption and ESG-related risk management frameworks.

Survey findings provided in both years offer an additional lens through which to interpret reporting practices. The majority of companies rely on sector analysis as the primary method for identifying material topics, although in 2023 the analysis of actual and potential impacts gained prominence, signalling a gradual move toward ESRS-aligned practices. Surveys and questionnaires remain the most common tools for internal stakeholder engagement, while workshops and meetings are more widely used for engagement with external stakeholders. These methods provide rapid feedback but present the recurring issue of low response quality and lack of representativeness. Firms also express increasing concern regarding the complexity of EU sustainability regulations; the economic uncertainty linked to the decarbonisation pathway and the growing distance between regulatory expectations and the competitive realities of global steel markets.

Overall, the comparison between the two years shows a sector that is consolidating its ESG practices but still grappling with a structural lack of homogeneity in metrics, methodologies and stakeholder engagement. While sustainability reporting has become more widespread and

sophisticated, the challenge lies in creating coherent, comparable and decision-useful disclosures that can meaningfully guide the sector through the technological and economic transformation required to meet long-term climate objectives.

The empirical evidence emerging from the sustainability reports and survey data can be interpreted through the theoretical lens of institutional logics and ideologies, as presented in the theoretical framework. When viewed semantically, the patterns that recur across firms, such as heterogeneous reporting practices, different materiality assessments, selective stakeholder engagement, and mixed motivations for ESG disclosures, can be understood not simply as technical or procedural outcomes but as manifestations of co-existing and sometimes competing logics shaping organizational behaviour. Trying to identifying some clusters, here is a first attempt to group the archival and survey information.

A first semantic cluster that emerges from the content analysis concerns the predominance of regulatory and compliance-oriented language in sustainability reporting. References to CSRD, ESRS, due diligence, audit assurance, and the need to align reporting with evolving European standards appear persistently across the 2023 and 2024 analyses. This discursive pattern indicates the strong presence of a regulatory logic, which positions sustainability primarily as an external requirement to be met. Such a logic reflects an ideology of procedural conformity, where legitimacy is achieved through demonstrable adherence to formal norms. The observed inconsistencies in reporting perimeters, methodological choices and KPIs, however, suggest that this logic is not yet fully internalized across the field, producing a fragmented landscape in which compliance is uneven and pragmatically negotiated.

A second semantic cluster relates to the market logic, expressed in firms' emphasis on competitiveness, cost pressures, and market positioning in global steel markets. Many companies describe sustainability reporting as a strategic tool for signalling quality, innovation, or risk management to customers and financiers. Such language aligns with the CSR literature linking sustainability to value creation and competitive advantage (Vogel, 2005; Freeman et al., 2010), and mirrors an ideology of instrumental sustainability, where ESG practices are embraced insofar as they enhance the firm's economic performance. This framing also appears in survey responses where firms express concern that regulatory demands may limit global competitiveness. The prominence of this logic helps to explain why environmental KPIs, those most visible to markets, are the most widely reported, in contrast to governance or social indicators that do not yield immediate competitive returns.

A third thematic cluster seems suggesting the presence of an emerging stewardship or environmentalist ideology. References to circularity, decarbonisation as a long-term commitment, or explicit mapping of sustainability goals onto broader societal transitions are visible in a subset of companies, particularly those adopting double materiality or integrating sustainability into strategic planning. These practices resonate with the stewardship and societal value archetypes in sustainable business model literature (Bocken et al., 2014; Geissdoerfer et al., 2018). However, the relatively small number of firms adopting robust impact analysis or long-term environmental targets suggests that this ideology coexists with, rather than replaces, more dominant market and regulatory logics.

Mountford & Cai (2023) argue that ideologies play a crucial mediating role in enabling the coexistence, hybridization or contestation of institutional logics. Applying this lens to the Italian steel sector, a key insight emerges: the observed variability in sustainability practices can be read as evidence of different ideological filters through which firms interpret the pressures and opportunities of ESG transformation. Companies whose sustainability discourse reflects stewardship-oriented language appear to harmonize regulatory and market logics, translating compliance obligations into proactive strategic commitments. Conversely, firms whose discourse remains anchored primarily in cost, compliance or risk aversion appear to experience these logics as competing rather than convergent, resulting in minimalistic or fragmented ESG practices.

Finally, a semantic synthesis across the datasets suggests a possible explanatory hypothesis for future research. Practices that are rooted primarily in the regulatory logic (e.g., assurance statements, formal materiality matrices, KPI disclosures) or the market logic (e.g., energy efficiency, decarbonisation investments linked to competitive positioning) may continue to fluctuate over time, waxing or waning in response to political shifts, regulatory cycles or market conditions. By contrast, practices grounded in ideologically embedded commitments, such as long-term decarbonisation visions, integration of sustainability into corporate purpose, or adoption of double materiality, are more likely to persist and evolve regardless of regulatory uncertainty.

This hypothesis aligns with Mountford & Cai's call to examine whether logics or ideologies determine the success of accountability practices, or whether their interplay shapes organizational behaviour. In the Italian steel sector, the archival and survey data suggest that sustainability practices endure when ideologies stabilize the interaction of multiple institutional logics, whereas practices rooted exclusively in market or regulatory logics could remain susceptible to contextual volatility.

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Il ruolo sociale delle imprese: un'analisi dei bilanci sociali e della percezione della Generazione Z

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1. Introduzione

Il ruolo sociale delle imprese si è progressivamente ampliato, passando da una visione centrata sugli obblighi economici e regolatori a una prospettiva che integra responsabilità ambientali, sociali e di governance, ridefinendo il modo in cui le organizzazioni interagiscono con la società (De Villiers et al., 2021; Weber et al., 2023). In questo scenario, la comunicazione della RSI assume una funzione cruciale: attraverso diversi canali, le imprese cercano di rendere visibili i propri impegni, di costruire fiducia e di ottenere legittimità presso stakeholder sempre più esigenti (Manetti & Bellucci, 2016; Tuan et al., 2024).

Tra gli strumenti disponibili, il bilancio sociale rappresenta uno dei mezzi più consolidati e istituzionalizzati per comunicare iniziative e performance socio-ambientali. La letteratura ne riconosce il valore in termini di trasparenza, formalizzazione e capacità di rendicontare azioni concrete in modo sistematico (Cho & Patten, 2007; Du & Yu, 2021; Alhumud et al., 2025).

Tuttavia, questi documenti non sfuggono alle tensioni tipiche della comunicazione responsabile: da un lato devono rassicurare gli stakeholder sulla credibilità dell'impresa (Lock & Seele, 2017), dall'altro si confrontano con un clima diffuso di scetticismo verso dichiarazioni percepite come eccessivamente autoreferenziali o potenzialmente riconducibili a fenomeni di greenwashing (Skard & Thorbjørnsen, 2014; Pizzetti et al., 2021).

Parallelamente, la Generazione Z emerge come uno degli stakeholder più rilevanti nel panorama contemporaneo (Cammarota & Branca, 2025). Questa coorte, cresciuta in un contesto digitale e profondamente esposta a discorsi su sostenibilità, diritti sociali e inclusione, manifesta aspettative etiche elevate nei confronti delle imprese e un atteggiamento critico verso le forme tradizionali di comunicazione corporate (Francis & Hoefel, 2018; Djafarova & Bowes, 2021). Il loro giudizio sulla credibilità della RSI dipende non solo dai contenuti diffusi, ma soprattutto dalla coerenza tra valori dichiarati e comportamenti osservabili, dall'autenticità percepita e dal tono narrativo utilizzato dai brand (Afzali & Kim, 2021; Joo et al., 2019).

La letteratura sulla comunicazione della RSI e percezione giovanile mostra che da un lato, le imprese tendono a enfatizzare nei bilanci sociali azioni riconducibili a macro-aree quali gestione delle risorse umane, innovazione sostenibile, efficienza delle risorse o iniziative filantropiche verso la comunità (Arena et al., 2023; Ferraro & Veltri, 2024); dall'altro, i giovani sembrano attribuire valore soprattutto a dimensioni come coerenza valoriale, autenticità del messaggio, trasparenza lungo la supply chain e presa di posizione su temi sociali rilevanti.

Questa distanza suggerisce l'esistenza di un potenziale disallineamento tra ciò che le imprese scelgono di comunicare formalmente e ciò che la Generazione Z considera realmente significativo per valutare la responsabilità di un'azienda. Esplorare tale divario è essenziale, poiché un allineamento insufficiente può compromettere la credibilità della comunicazione, ridurre

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l'efficacia delle iniziative RSI e indebolire la capacità delle imprese di ingaggiare una delle generazioni più rilevanti per il futuro consumo e per l'evoluzione dei valori sociali.

2. Analisi della letteratura

2.1. La comunicazione della RSI e social reporting

Negli ultimi anni le imprese non sono più viste soltanto come attori economici, ma come soggetti chiamati a contribuire attivamente al bene comune, in termini sociali, ambientali e di governance (De Villiers et al., 2021; Weber et al., 2023). Questa trasformazione rende la comunicazione un elemento centrale nei processi di legittimazione, costruzione di fiducia e gestione delle aspettative degli stakeholder (Manetti & Bellucci, 2016; Tuan et al., 2024).

La letteratura sulla comunicazione della RSI ha progressivamente distinto tra attività di RSI e loro narrazione: le imprese non solo implementano iniziative sociali e ambientali, ma devono anche decidere come renderle visibili e comprensibili ai diversi pubblici (Golob et al., 2017; Macca et al., 2024). In questo quadro, i social report, bilanci sociali, report di sostenibilità, integrated report, si sono affermati come strumenti istituzionali chiave per rendicontare impegni e risultati ESG, offrendo una base documentale formalizzata, comparabile e spesso legata a cornici regolatorie (Cho & Patten, 2007; Du & Yu, 2021; Troshani & Rowbottom, 2024).

Diversi lavori evidenziano come il social reporting possa funzionare sia come strumento di responsabilità sia come meccanismo di legittimazione simbolica, talvolta più orientato alla costruzione di una narrativa favorevole che a una rappresentazione bilanciata delle performance (Ashforth & Gibbs, 1990; Kamla & Rammal, 2013; Schoeneborn et al., 2020). In parallelo, il rischio di greenwashing, woke-washing o altre forme di "washing" comunicativo è stato ampiamente discusso (Pizzetti et al., 2021; Warren, 2022; Sterbenk et al., 2022), sottolineando come la distanza tra "talk" e "walk" possa danneggiare reputazione e performance (Bhagwat et al., 2020). Tuttavia, questi studi si concentrano soprattutto su ciò che le aziende decidono di rendicontare, mentre meno attenzione è stata dedicata al confronto con le aspettative specifiche di segmenti di stakeholder particolarmente critici e influenti, come i giovani.

2.2. Generazione Z, percezione della RSI e ruolo sociale delle imprese

La Generazione Z è la prima coorte pienamente digitale, cresciuta in un contesto di crisi ambientali, tensioni socio-politiche e iper-esposizione mediatica (Francis & Hoefel, 2018). La letteratura la descrive come una generazione caratterizzata da elevata sensibilità verso temi di giustizia sociale, sostenibilità e inclusione, ma anche da forte competenza mediale e marcato scetticismo verso le forme tradizionali di comunicazione corporate (Djafarova & Bowes, 2021).

Sul piano valoriale, diversi studi mostrano che Gen Z attribuisce rilevanza alla coerenza tra dichiarazioni e comportamenti aziendali: imprese percepite come responsabili sono quelle che integrano la RSI nei processi core, e non solo in iniziative filantropiche marginali (Kim & Austin, 2019). Le aspettative non riguardano quindi solo il "fare del bene", ma la capacità di dimostrare allineamento strutturale tra modello di business, valori dichiarati e impatti generati.

Dal punto di vista comunicativo, Gen Z valuta la RSI attraverso la lente della credibilità del messaggio. Riprendendo la Source Credibility Theory (Hovland et al., 1953; Ohanian, 1990), i giovani giudicano le comunicazioni sulla base di dimensioni quali affidabilità, competenza e goodwill percepiti della fonte (Kim & Ferguson, 2019). In contesti digitali affollati, l'attenzione si sposta inoltre sulla combinazione tra contenuto, messaggero e piattaforma: i canali e i portavoce diventano segnali di autenticità o opportunismo (Spence, 1973; Rim & Dong, 2018).

La letteratura evidenzia come i giovani privilegino contenuti percepiti come autentici, spesso associati a user-generated content, micro-influencer o testimonianze dirette, rispetto alle comunicazioni altamente istituzionalizzate e controllate (Djafarova & Bowes, 2021). Termini come greenwashing e woke-washing sono ormai parte del vocabolario critico di questa

generazione, che riconosce e sanziona iniziative percepite come puramente reputazionali o scollegate dalle pratiche effettive (Delmas & Burbano, 2011; Cammarota & Branca, 2025). Allo stesso tempo, gli studi mostrano l'esistenza di un value–action gap: pur dichiarando alti standard etici, i giovani non sempre traducono queste preferenze in comportamenti d'acquisto coerenti, a causa di vincoli di prezzo, convenienza o assenza di alternative credibili (Carrington et al., 2010). Ciò non riduce la rilevanza delle loro aspettative, ma suggerisce che la RSI funzioni come una lente di valutazione della legittimità del brand più che come unico driver delle scelte di consumo.

2.3. Potenziale disallineamento tra comunicazione della RSI e le aspettative dei giovani consumatori

La letteratura mostra come le imprese, attraverso i social report, privilegino la rendicontazione di iniziative legate a capitale umano, innovazione sostenibile, gestione delle risorse e attività comunitarie, rispondendo a pressioni istituzionali e regolatorie (Cho & Patten, 2007; Du & Yu, 2021; Arena et al., 2023). Parallelamente, la Generazione Z valuta la responsabilità aziendale sulla base di criteri quali coerenza valoriale, autenticità percepita e trasparenza dei processi, attribuendo importanza a un impegno sociale credibile e riconoscibile (Francis & Hoefel, 2018; Afzali & Kim, 2021).

Queste due prospettive, pur riferendosi allo stesso fenomeno, non necessariamente coincidono. Le attività che le imprese scelgono di comunicare nei report potrebbero infatti non riflettere pienamente i criteri attraverso cui i giovani valutano la responsabilità e l'impegno sociale delle organizzazioni. Ad oggi, questo potenziale scarto non è stato analizzato in modo comparativo.

Il presente studio intende colmare tale vuoto confrontando ciò che le imprese dichiarano nei bilanci sociali con ciò che la Generazione Z considera rilevante e credibile, al fine di identificare eventuali aree di disallineamento.

3. Metodologia

Il presente studio adotta un disegno qualitativo in due fasi con l'obiettivo di confrontare le iniziative RSI comunicate dalle imprese nei bilanci sociali con le percezioni e i criteri interpretativi della Generazione Z. I due studi, sono integrati in un framework interpretativo finalizzato a identificare aree di convergenza e possibili disallineamenti tra comunicazione corporate e aspettative giovanili.

3.1. Studio 1: Content Analysis dei social report

La prima fase si basa su una content analysis manuale dei bilanci sociali di cinquanta imprese italiane, selezionate sulla base delle performance economiche riportate nell'Annual Report Mediobanca 2023. Il corpus è costituito dai report di sostenibilità pubblicati nel 2023, caratterizzati da elevato livello di dettaglio e rappresentativi delle principali pratiche di comunicazione RSI nel contesto italiano, in linea con evidenze precedenti (Arena et al., 2023; Ferraro & Veltri, 2024).

L'analisi ha seguito un approccio qualitativo strutturato (Mayring, 2021), finalizzato a individuare e categorizzare le azioni RSI riportate dalle imprese. Il processo di codifica è stato condotto manualmente e ha portato all'identificazione di specifiche attività implementate dalle aziende, come riportato nella sintesi proposta nella Tabella 1.

La procedura di codifica ha seguito un approccio iterativo. In una prima fase è stata costruita una griglia preliminare di categorie sulla base della letteratura sulla comunicazione della RSI e degli standard di reporting. In una seconda fase, la griglia è stata integrata con categorie emergenti dai testi, in linea con un approccio qualitativo induttivo. Due ricercatori hanno codificato

indipendentemente un sottoinsieme dei report, confrontando le discrepanze e affinando la definizione operativa delle categorie.

3.2. Studio 2: Focus group con giovani appartenenti alla Generazione Z

La seconda fase impiega un approccio qualitativo esplorativo basato su focus group con giovani appartenenti alla Generazione Z. Sono stati realizzati tre focus group, ciascuno composto da 6–8 partecipanti, per un totale di 20 giovani appartenenti alla Generazione Z (18–26 anni). I partecipanti sono stati selezionati attraverso un campionamento eterogeneo volto a includere differenti percorsi di studio, genere e background socio-culturale. I focus group sono stati condotti tramite una traccia semi-strutturata che ha guidato la discussione sui temi della responsabilità percepita, dei criteri di credibilità e delle preferenze comunicative. Le sessioni sono state registrate attraverso la piattaforma per videoconferenze Teams e l'analisi tematica è stata condotta attraverso un processo di codifica aperta e successiva aggregazione dei temi ricorrenti. Questa metodologia consente di approfondire valori, aspettative e criteri valutativi che i partecipanti applicano nella lettura dell'impegno sociale delle imprese, in linea con studi precedenti sulla percezione giovanile della RSI (Francis & Hoefel, 2018; Djafarova & Bowes, 2021). La Tabella 1, offre una sintesi dei risultati.

4. Risultati

L'integrazione tra l'analisi dei bilanci sociali e le percezioni emerse dai focus group con giovani appartenenti alla Generazione Z rivela un panorama complesso, caratterizzato da alcune corrispondenze significative ma, soprattutto, da una distanza strutturale tra ciò che le imprese scelgono di comunicare e ciò che i giovani considerano realmente rilevante per valutare l'impegno sociale di un'organizzazione.

Azioni RSI estrapolate dai bilanci sociali	***Percezione GenZ sul ruolo sociale delle imprese***
Equità salariale, inclusione, supporto lavoratori	Necessaria
Progetti ambientali	Rilevanti
Certificazioni e controllo della filiera	Segnale di autenticità
Filantropia e iniziative comunitarie	Sono considerate marginali
Innovazione tecnologica	Non percepiti come CSR

Tabella 1. Convergenza e disallineamenti tra bilanci sociali e percezioni GenZ

4.1. Convergenze: quando le iniziative riportate risuonano con i valori giovanili

Una prima area di convergenza riguarda la rilevanza attribuita al capitale umano. Nei report analizzati, le imprese dedicano ampio spazio a iniziative di equità salariale, inclusione (ad esempio programmi per persone con disabilità), formazione, flessibilità organizzativa e supporto psicologico. Queste dimensioni trovano piena corrispondenza nei focus group, in cui i partecipanti sottolineano la centralità del trattamento equo dei lavoratori come criterio per distinguere un'impresa responsabile da una che non lo è. Il tema delle condizioni di lavoro, richiamato esplicitamente in riferimento a casi noti nel panorama globale, emerge come uno dei principali indicatori di legittimità sociale.

P1: “Mi viene in mente il caso ****... che si dichiara attenta ai temi sociali però poi si scopre che produce scarpe con condizioni dei lavoratori pessime. Più che la responsabilità sociale dovrebbe pensare alla coerenza sociale.”

P5: “Un'azienda responsabile... cerca di trattare equamente i dipendenti.”

Una seconda convergenza riguarda gli interventi ambientali “hard”: riduzione delle emissioni, efficienza energetica, gestione dei rifiuti, riciclo dell’acqua, decarbonizzazione. Anche i giovani considerano l’impatto ambientale un elemento imprescindibile della responsabilità, pur non attribuendo valore a iniziative percepite come marginali o principalmente simboliche. Ciò che risulta rilevante è la capacità dell’impresa di integrare la sostenibilità nei processi produttivi, più che la comunicazione di singoli progetti.

P10: “Se un’azienda inquinava e poi leggo che si sta impegnando per ridurre le emissioni, mi informo per capire se è vero”

P4: “Vado a cercare su Internet per vedere se quello che dicono sul diventare green è vero.”

Infine, un ulteriore punto di contatto riguarda le certificazioni. Nel reporting formale, molte imprese enfatizzano standard ISO, criteri ESG applicati alla supply chain o schemi di valutazione dei fornitori. Questa attenzione ai meccanismi di controllo trova riscontro nei focus group, dove i partecipanti considerano le certificazioni un segnale concreto di trasparenza e affidabilità, utile per distinguere tra impegno reale e greenwashing.

P6: “Sui social gonfiano i numeri. Ci dovrebbe essere un comitato esterno e imparziale che misura questi temi.”

4.2. Disallineamenti tematici tra imprese e GenZ

L’analisi comparativa mette in evidenza anche aree tematiche che, pur essendo molto presenti nei social report, non risultano significative per i giovani. Le iniziative filantropiche rivolte alla comunità sono percepite come contribuiti utili ma non determinanti per valutare la responsabilità aziendale. Nei focus group, pochi riconoscono valore a queste attività, ritenendole distanti dalla “vera identità” dell’impresa e potenzialmente utilizzate per costruire un’immagine reputazionale.

Un secondo disallineamento riguarda le iniziative di innovazione tecnologica o di formazione specialistica. Pur essendo molto frequenti nei report, tali azioni non emergono come criteri valutativi nelle discussioni dei giovani. L’innovazione viene riconosciuta come rilevante per la competitività, ma non come indicatore diretto di responsabilità sociale.

Oltre alle differenze contenutistiche, il risultato forse più significativo riguarda il diverso modo in cui imprese e giovani interpretano la CSR. Nei social report, la responsabilità è rappresentata attraverso una sequenza di iniziative discrete, organizzate per aree tematiche e progettualità. Per la Generazione Z, invece, la RSI è soprattutto un indicatore identitario: un’impresa è responsabile quando appare coerente nei valori, trasparente nei processi e disposta a esporsi su questioni sociali delicate.

P9: “Più che responsabilità sociale dovrebbe pensare alla coerenza sociale.”

P14: “Per me un’azienda responsabile tiene conto dell’intero processo, dalla produzione, al personale, fino al consumatore finale.”

Nei report analizzati, il posizionamento valoriale è quasi del tutto assente, mentre nei focus group i giovani attribuiscono grande peso alla capacità dell’impresa di prendere posizione su temi sensibili, quali discriminazione, equità sociale o diritti civili.

P2: “Un’azienda responsabile è anche un’azienda che integra volontariamente cause sociali e prende parte a dibattiti, come il conflitto Palestina-Israele o cause di razzismo”

Questa divergenza si collega al tema dell’autenticità: mentre la comunicazione istituzionale privilegia un linguaggio controllato e formale, i giovani richiedono narrazioni più dirette, vulnerabili e capaci di mostrare tensioni, difficoltà e limiti del percorso verso la sostenibilità.

Il confronto sistematico tra le due evidenze mostra quindi che il disallineamento non riguarda solo che cosa viene comunicato, ma come viene comunicato e quale funzione narrativa la comunicazione stessa assume.

5. Discussione

I risultati ottenuti mostrano che la distanza tra ciò che le imprese comunicano nei bilanci sociali e ciò che la Generazione Z ritiene significativo nel valutare il ruolo sociale delle organizzazioni può essere interpretata alla luce delle tensioni già evidenziate nella letteratura sulla comunicazione della RSI. Da decenni, gli studiosi sottolineano come i report di sostenibilità svolgano una funzione di legittimazione, costruendo una narrazione che l'impresa usa per presentarsi come socialmente responsabile agli occhi degli stakeholder (Cho & Patten, 2007; Manetti & Bellucci, 2016). Tuttavia, il dibattito sulla loro credibilità è sempre più centrale: studi come quelli di Lock e Seele (2017) e Du e Yu (2021) mostrano che la comunicazione RSI è percepita come affidabile solo quando appare trasparente, coerente e coerentemente integrata nella strategia aziendale.

Il presente lavoro conferma e amplia questa prospettiva, evidenziando come la credibilità non dipenda soltanto dai contenuti comunicati, ma anche dal modo in cui tali contenuti si connettono ai sistemi di valori degli stakeholder emergenti. Secondo McPhail et al. (2024), le imprese sono sempre più chiamate a fungere da "forze per il bene", andando oltre logiche di mera conformità normativa. Nel nostro studio, la Generazione Z interpreta questo ruolo in modo molto simile: non valuta la responsabilità aziendale come un insieme di iniziative discrete, ma come una manifestazione identitaria che richiede allineamento tra dichiarazioni, valori e comportamenti.

Questa interpretazione è coerente con gli studi sulla RSI authenticity, che mostrano come i pubblici riconoscano la responsabilità aziendale solo quando percepiscono un forte legame tra ciò che l'impresa fa e ciò che rappresenta (Joo et al., 2019; Afzali & Kim, 2021). La nostra analisi conferma che i giovani attribuiscono un ruolo centrale a questa autenticità, mentre notano come i bilanci sociali tendano a offrire una rappresentazione più tecnica, focalizzata sul "fare", e meno sul "perché" e sul "come", riducendo così la percezione di coerenza.

Il disallineamento osservato può quindi essere interpretato come una manifestazione della tensione tra la natura istituzionale del social reporting e il carattere più dinamico e relazionale della percezione giovanile. Gli stessi Mayring (2021) e Lewis et al. (2013) ricordano che i documenti aziendali strutturati rispondono a logiche di formalizzazione che portano a selezionare, organizzare e presentare le informazioni secondo criteri prestabiliti. I giovani, al contrario, applicano una logica interpretativa che, come mostrano Francis e Hoefel (2018), privilegia trasparenza processuale, vulnerabilità comunicativa e integrazione valoriale.

La nostra analisi evidenzia inoltre un disallineamento rispetto ai temi prioritari. Gli studi sulle imprese italiane mostrano che la rendicontazione tende a concentrarsi su capitale umano, innovazione, energie rinnovabili ed efficienza delle risorse (Arena et al., 2023; Ferraro & Veltri, 2024; Maione et al., 2025). Sono temi rilevanti, coerenti con molte cornici normative e con gli standard di reporting, ma rappresentano solo una parte delle dimensioni che la Gen Z considera fondamentali. Nei focus group emergono infatti aspettative orientate a inclusione, equità, giustizia sociale e presa di posizione su questioni sociali complesse, temi che la letteratura riconosce come sempre più centrali per la reputazione contemporanea (Sterbenk et al., 2022; Warren, 2022).

Questo scarto richiama anche il dibattito sui rischi di greenwashing e vicarious greenwashing: Pizzetti et al. (2021) mostrano come la percezione di incoerenza tra dichiarazioni e pratiche operative possa minare profondamente la fiducia nei confronti dell'impresa. Nel nostro lavoro, i giovani non accusano esplicitamente le imprese di greenwashing, ma mostrano una sensibilità simile: ciò che viene comunicato nei bilanci sociali non basta per costruire un senso di affidabilità, soprattutto se la dimensione narrativa non rispecchia i criteri attraverso cui valutano l'autenticità.

Infine, i risultati confermano l'idea, già avanzata nella letteratura sulla comunicazione organizzativa, secondo cui la RSI deve essere interpretata non solo come una pratica gestionale, ma come una pratica discorsiva (Schoeneborn et al., 2020), che richiede l'integrazione di molteplici linguaggi e canali. L'impresa, per risultare credibile, deve dunque saper articolare una narrazione che renda visibile l'intero ecosistema di significati associati alla propria responsabilità sociale. In questo senso, i bilanci sociali rimangono strumenti fondamentali, ma rischiano di risultare insufficienti se non integrati in un sistema comunicativo più ampio, capace di dialogare con codici culturali emergenti e di rispondere alle aspettative di stakeholder sempre più attenti e sofisticati.

Nel complesso, la discussione dei risultati suggerisce che il disallineamento osservato non è dovuto alla mancanza di impegno delle imprese, ma alla mancata corrispondenza tra le logiche comunicative del reporting e i criteri interpretativi della Generazione Z. Per ridurre questa distanza, le organizzazioni dovranno ripensare la RSI come uno spazio di negoziazione narrativa, in cui contenuti, valori e forme comunicative si intrecciano in modo dinamico, trasparente e culturalmente rilevante.

6. Conclusioni

Il presente studio ha esplorato la distanza tra ciò che le imprese comunicano nei bilanci sociali e ciò che la Generazione Z considera significativo per valutare la responsabilità sociale aziendale. Attraverso l'integrazione di una content analysis dei bilanci sociali e di un'analisi qualitativa delle percezioni giovanili, è emersa una dinamica di disallineamento che non riguarda semplicemente la selezione dei temi, ma la natura stessa della comunicazione CSR.

Da un lato, i bilanci sociali riflettono logiche istituzionali e regolatorie che portano le imprese a enfatizzare dimensioni tecniche e operative, quali innovazione sostenibile, capitale umano, efficienza delle risorse e iniziative comunitarie. Questi ambiti rispondono a standard di rendicontazione consolidati (Cho & Patten, 2007; Du & Yu, 2021; Troshani & Rowbottom, 2024) e trovano riscontro in una lunga tradizione di studi che interpretano il reporting come pratica di legittimazione (Manetti & Bellucci, 2016).

Dall'altro lato, i giovani valutano la RSI non come un elenco di azioni, ma come un indicatore identitario, attribuendo valore alla coerenza valoriale, alla trasparenza dei processi, alla presa di posizione su temi sociali rilevanti e alla capacità dell'impresa di comunicare in modo autentico (Francis & Hoefel, 2018; Djafarova & Bowes, 2021; Afzali & Kim, 2021). Questa distanza evidenzia che la credibilità della RSI non si costruisce esclusivamente attraverso la rendicontazione, ma attraverso la capacità dell'impresa di connettere le proprie azioni a un sistema valoriale riconoscibile e culturalmente rilevante.

Le conclusioni suggeriscono quindi che il bilancio sociale rimane uno strumento essenziale per documentare e strutturare l'impegno aziendale, ma non può più essere considerato sufficiente per intercettare la sensibilità delle nuove generazioni. Le imprese sono chiamate a integrare forme di comunicazione più narrative, dialogiche e processuali, capaci di mostrare non solo i risultati, ma anche le motivazioni, le sfide e le tensioni che accompagnano il percorso verso la sostenibilità. In questa prospettiva, la RSI diventa una pratica discorsiva multilivello, in cui documenti formali e comunicazione relazionale devono essere interpretati come elementi complementari di un unico ecosistema narrativo (Schoeneborn et al., 2020; McPhail et al., 2024).

Il contributo principale di questo lavoro risiede proprio nel mettere in relazione le priorità comunicative delle imprese con i criteri valutativi dei giovani, offrendo nuove evidenze sul modo in cui la RSI viene interpretata da una generazione destinata a influenzare in modo crescente consumi, reputazione e dinamiche del mercato del lavoro.

7. Limiti e direzioni future di ricerca

Il presente studio presenta alcuni limiti che suggeriscono possibili sviluppi futuri. La natura qualitativa ed esplorativa della content analysis e dei focus group non consente generalizzazioni, ma offre una base per approfondimenti tramite metodi quantitativi o approcci mixed-method. Inoltre, la composizione del campione aziendale – concentrato su settori fortemente regolamentati – potrebbe aver influenzato la tipologia di iniziative rendicontate; analisi estese ad altri settori o contesti nazionali permetterebbero confronti più ampi.

Un ulteriore limite riguarda la focalizzazione sui soli testi dei report, trascurando elementi visuali che contribuiscono alla costruzione della credibilità, inoltre l'analisi di altri canali di comunicazione utilizzati dalle aziende, potrebbe dare nuovi sviluppi alla ricerca.

Allo stesso modo, i focus group forniscono insight ricchi ma non rappresentativi dell'intera popolazione giovanile; future ricerche potrebbero ricorrere a survey su larga scala o approcci longitudinali per valutare la stabilità delle percezioni nel tempo. Infine, il lavoro si concentra sulla comunicazione RSI senza verificare l'effettiva implementazione delle pratiche dichiarate: studi futuri potrebbero integrare audit indipendenti o dati osservativi per esaminare la coerenza tra talk e walk.

Keywords: Responsabilità sociale d'impresa; bilancio sociale; generazione Z; credibilità della comunicazione

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Engaging SMEs in Sustainability: The Multimodal Work of Management Accounting Consultants

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1. Research background

Small and medium-sized enterprises (SMEs) represent a crucial component of the global economy, corresponding to nearly 99% of European enterprises and substantially contributing to employment and GDP. Due to their significant aggregate environmental and social impacts, the involvement of SMEs has been recognized as essential for advancing sustainability practices (Lisi et al., 2023; Martins et al., 2022). Despite this relevance, sustainability in SMEs remains a highly challenging domain. In this regard, several scholars have underscored that SMEs struggle more than larger firms to adopt sustainability accounting practices due to limited financial and human resources, lack of technical competencies, and the absence of formalized internal structures (Soundararajan et al., 2018; Spence, 2016). Beyond resource scarcity, SMEs often face cognitive and interpretive barriers: sustainability concepts may appear abstract or disconnected from daily operations, making the establishment of shared understandings and sensemaking particularly complex in this organizational context (Guidi et al., 2025; Johnstone, 2020).

Recent regulatory demands, such as the Corporate Sustainability Reporting Directive (CSRD) and the Corporate Sustainability Due Diligence Directive (CSDDD), represent a further catalyst for change, prompting firms to adopt enhanced sustainability accounting practices. Although SMEs may not be subject to mandatory compliance, they increasingly face indirect pressure from supply-chain focal companies demanding standardized sustainability information (Dinh et al., 2023; Kosasih et al., 2023). As a result, SMEs need support to interpret, translate, and operationalize sustainability requirements in ways that resonate with their organizational context and capabilities (O'Reilly et al., 2024). In this setting, external actors, particularly management accounting consultants (hereafter, MA consultants), may potentially play an increasingly pivotal role.

MA consultants have historically contributed to organizational and accounting change processes by transferring knowledge, developing new accounting devices, legitimizing innovations, and facilitating the diffusion of accounting and managerial practices (Christensen & Skaerbaek, 2010; Jones & Dugdale, 2002; Malmi, 1999). Their influence extends beyond providing technical expertise; consultants may act as "packagers of solutions" (Malmi, 1999), "travelling merchants" of ideas (Czarniawska & Joerges, 1996), mediators (Christensen, 2005), or even "fashion setters" of managerial innovations (Canato & Giangreco, 2011).

Furthermore, consultants construct and negotiate their role dynamically through everyday interactions, discursive strategies, and the mobilization of multiple artefacts (Chua, 1995; Czarniawska & Joerges, 1996; Sturdy, 2011). Consultants frequently rely on multimodal representations to translate complex frameworks into engaging and locally meaningful narratives

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for SME clients. Such representations not only convey information but also shape interpretations, facilitate dialogue, and may help consultants enrol clients into sustainability accounting practices.

Despite this rich literature, little is known about how MA consultants construct and enact their role specifically in sustainability-oriented engagements with SMEs, and, especially, how they use multimodal practices to engage clients and foster sustainability sensemaking. Existing studies often focus on larger organizations, while SMEs remain underexplored, notwithstanding their recognized need for tailored approaches that address their specificities (Bartolacci et al., 2020). Moreover, the sustainability domain may intensify the interpretive and relational challenges inherent in consulting, due to the contested, multidimensional, and evolving nature of the concept of sustainability (Adolph & Beckmann, 2024; Meuer et al., 2020).

2. Research Aims

Against this background, this study aims to investigate how MA consultants support SMEs' sustainability transitions by constructing and enacting their role, with a particular focus on the multimodal practices they employ to engage clients. Specifically, the research focuses on three interconnected objectives. First, it seeks to investigate how MA consultants define and construct their role within sustainability-oriented engagements with SMEs, acknowledging the dynamic and relational nature of role construction. Second, it aims to analyze the multimodal practices that consultants employ to foster client engagement and facilitate sustainability sensemaking. Third, it examines how these practices influence MA consultants' interactions with SME clients, shaping their participation, understanding, and commitment to sustainability initiatives. Correspondingly, the study addresses the following research questions:

- RQ1: How do MA consultants construct and enact their role in sustainability-oriented engagements with SMEs?
- RQ2: How do MA consultants draw on multimodal practices to engage clients and translate sustainability into locally meaningful accounting practices?
- RQ3: How does the multimodal orchestration of tools and interactions influence SME clients' engagement and sensemaking?

3. Theoretical background

3.1. Sustainability challenges in SMEs

The integration of sustainability accounting practices into SMEs has become a central topic in recent years, reflecting the growing recognition that sustainability transitions cannot succeed without the active contribution of smaller organizations (Bartolacci et al., 2020; Martins et al., 2022). SMEs collectively exert substantial environmental and social impacts, and their contribution to the global economy is significant, as they represent the vast majority of European enterprises. Despite this centrality, the integration of sustainability into SMEs remains challenging. Scholars consistently observe that SMEs face limitations in financial and human resources, technical expertise, and organizational structures when compared to larger firms (Johnson & Schaltegger, 2016; Spence, 2016). Their managerial processes are often informal, which can hinder the systematic collection and reporting of sustainability data and the interpretation of complex frameworks such as the GRI standards or the ESRS (O'Reilly et al., 2024; Paoloni et al., 2025).

Recent regulatory developments add further complexity to the process. The implementation of the CSRD and the CSDDD reshapes the regulatory context for sustainability accounting practices, increasing the expectations placed on firms to provide transparent and comparable sustainability information (Braun, 2025). Although many SMEs may not be directly subject to these regulatory demands, they often experience indirect pressures when they are integral parts of supply chains led by larger firms (Dinh et al., 2023; Kosasih et al., 2023). These pressures

require SMEs to produce reliable sustainability data and align with emerging reporting standards, reinforcing the need for external actors capable of assisting them in navigating these demands.

The accounting literature has shown that SMEs, due to their limited internal resources and specialized expertise, often rely on external MA consultants to introduce, adapt, and formalize accounting practices (e.g., Carey, 2015; Moschella et al., 2023; Perry et al., 2010). In the context of sustainability, their role becomes even more critical. The integration of sustainability-related measures and reporting frameworks requires not only technical expertise but also extensive interpretive work, involving the construction of shared meaning around sustainability accounting practices and sustainability indicators. In this regard, prior literature emphasizes that sustainability accounting practices rely heavily on sensemaking processes (Onkila et al., 2018; Pain et al., 2024), which can be demanding in organizations with fluid roles and limited formalized accounting practices. For these reasons, the role of external actors, such as MA consultants, who can support SMEs in understanding, translating, and operationalizing sustainability accounting practices appears particularly significant.

3.2. Management Accounting Consultants

The literature on management consulting has long debated the nature and evolution of consultants' roles. Early research tended to frame consultants as technical experts hired to resolve organizations' lack of technical competencies and provide access to specialized knowledge (Fincham, 1999; Newton, 2010). This perspective considers consultants as outsiders delivering neutral, rational solutions based on their expertise. Over time, however, research has challenged this view, recognizing that consultants' work is more relational, negotiated, and socially constructed (Czarniawska & Mazza, 2003; da Costa et al., 2020; Sturdy, 1997). Several studies demonstrate that the role of consultants is not fixed but instead dynamically shaped through everyday interactions with clients. For instance, scholars have demonstrated that the boundaries of knowledge between consultants and clients have become increasingly blurred (Fincham et al., 2008; Sturdy et al., 2008). Knowledge flows with clients are often bidirectional as consultants learn from clients and vice versa as knowledge is often co-produced in an iterative and dialogical manner.

Within the accounting literature, consultants are widely seen as key agents of accounting innovation, facilitating the introduction, diffusion, and institutionalization of new managerial tools (Malmi, 1999; Jones & Dugdale, 2002). Scholars have therefore examined how, and through which mechanisms, consultants shape the trajectory of such accounting tools, showing that their role extends beyond the transfer of technical knowledge. Some scholars argue that consultants secure the success and legitimacy of accounting through processes of "fact-building" (Briers & Chua, 2001). Similarly, Qu and Cooper (2011) show that consultants influence accounting practices through "inscription-building", specifically through the ways in which they mobilize inscriptions. Their study illustrates how the implementation of the Balanced Scorecard in the client organization takes form through a process in which consultants' templates are populated with client-specific details to make the technology accepted. These inscriptions act as devices that construct meaning, align interests, and persuade actors and consultants operate as mediators who translate, transform, and reinterpret knowledge rather than simply transferring it. Likewise, Christensen and Skærbæk (2010) note that reports, slides, and seminars represent co-produced consultant-client outputs that temporarily stabilize contested accounting innovations. They demonstrate that consultants are often hired by internal agents of change to legitimize both specific accounting innovations and the broader process of accounting change, helping to resolve controversies with resistant groups who threaten to destabilize the innovation. Consultants' outputs such as reports, questionnaires, and powerpoint presentations become essential tools for managing social conflict and play a central role in the "purification" of an accounting idea, that is, the process through which a previously controversial innovation becomes accepted.

Christensen (2005) further shows, through a public-sector case study, how consultants promote accrual-based accounting reforms by deploying "phantom images" that idealize the new system while discrediting existing cash-based practices. These persuasive images exert strong influence on politicians and public managers and pave the way for epistemic communities built around the conviction that public-sector accounting should converge toward private-sector standards, thereby providing a theoretical foundation for the shift.

Across these studies, consultants' work emerges also as deeply embedded in networks of power, interests, and resistance. The outcomes of accounting innovations depend on these relationships rather than solely on the technical characteristics of the tools themselves (Brivot et al., 2017; Leiby, 2018). Humphrey (1994) shows that consultants may initially be granted legitimacy based on expectations of expertise, only to face challenges or resistance as their competence is assessed in practice. Similarly, Chua (1995) highlights that consultants' authority is continuously negotiated and sometimes contested, especially when internal actors view themselves as equally or more knowledgeable.

Overall, consultants do not merely introduce accounting practices but co-produce them together with clients. This body of work conceptualizes consultants as active constructors and mediators of accounting innovations, embedded within networks of power, interests, and resistance. Their influence often derives from their ability to craft persuasive representations and negotiate meaning through which accounting practices are implemented and gain legitimacy in organizations.

Such a perspective is potentially relevant in the sustainability context, where concepts are ambiguous and contested (Adolph & Beckmann, 2024; Meuer et al., 2020), requiring a sensemaking process that involves both technical and interpretive aspects. However, despite the growing attention on sustainability accounting practices in SMEs, little is known about how MA consultants construct and enact their role specifically within sustainability-oriented engagements in this organizational context.

3.3. Engagement in Consulting Interactions: A Multimodal Perspective

Client engagement is widely recognized as essential for the success of consulting interventions. In the broader management literature, extensive research has examined the dynamics of the consultant-client relationship and how consultants manage this relationship (e.g., Alvesson et al., 2009; Fincham, 1999; Nikolova et al., 2015; Sturdy, 1997). Similarly, in the accounting literature, several studies have shown that MA consultants must secure clients' involvement to co-produce and sustain the adoption of new accounting practices (Christensen & Skærbæk, 2010; Chua, 1995; Qu & Cooper, 2011). Prior studies have highlighted that consultants may deploy diverse resources and tactics to cultivate engagement, ranging from discursive framing and facilitation techniques to the mobilization of inscriptions, visuals, and artefacts designed to render accounting concepts more accessible and compelling (Briers & Chua, 2001; Christensen, 2005; Qu & Cooper, 2011).

Despite this interest, much of the literature has tended to focus on the means through which consultants attempt to foster engagement, while offering limited insights on what "engagement" actually is in practice. While engagement is often taken for granted in consulting research, recent work suggests that the concept is far more complex and contingent. Although not focused on consulting, but on the engagement capacity of performance measurements, Martinez and Cooper (2019) offer valuable theoretical insights showing that engagement is a multidimensional concept. Engagement may refer to sustained attachment to a device, to the affective and cognitive commitment that emerges when users feel able to shape it with their own narratives, or, conversely, it may reflect the coercive need to work with accounting technologies. Crucially, Martinez and Cooper (2019) shift the meaning of engagement from attitudes or intentions to the ongoing socio-material work required to perform an assemblage of interconnected accounting

inscriptions. Engagement, in this view, is produced through the accumulation of multiple devices, each adding layers of calculative, visual, temporal, or narrative order that users must navigate and enact. This understanding shifts attention from individual attitudes to the multimodal conditions that make engagement possible or difficult to sustain.

Interpreting engagement through this lens allows us to delve into what engaging a client really entails, how engagement can be fostered, and why certain accounting configurations may support consultants in making sustainability meaningful for SMEs. Specifically, engagement can be more effectively examined through a multimodal perspective (e.g., Kress, 2010). Recent studies on multimodality emphasize that meaning is constructed not only through written or spoken language but through the interplay of multiple modes of representation such as text, images, videos, audios, and other semiotic resources (e.g., Höllerer et al., 2019). The construction of meaning arises from the dynamic interaction and influence among these modes, which shape how actors perceive and interpret phenomena.

Engagement, therefore, may arise from the orchestration of these semiotic resources rather than from any single mode. Yet, accounting research has only marginally examined how consultants use multimodal practices in their day-to-day interactions with SMEs, and how such practices contribute to cultivating, or constraining, client engagement in sustainability-oriented projects. Given SMEs' limited familiarity with sustainability concepts and tools, this multimodal work becomes central to how consultants build credibility, negotiate their role, and support clients' understanding.

4. Research Design

In order to achieve the aims of this study, we plan to conduct interviews with MA consultants. Following Alvesson (2003: 14), we conceptualize qualitative interviewing as a central mode of knowledge production and the interview encounter as "a socially and linguistically complex situation." According to Alvesson (2003), such conceptualization requires a reflexive approach aimed at viewing the empirical material through multiple understandings. This implies that researchers must devote more attention to the process of questioning and to the interpretive nature of findings (Qu & Dumay, 2011), as well as bring their own pre-understandings into dialogue with the emerging empirical material (Alvesson & Sandberg, 2022).

Within this reflexive paradigm, we consider interviews not merely as verbal exchanges but as complex social and organizational phenomena that may benefit from the integration of visual methods. Rooted in anthropology and sociology, and recently called for within accounting research (e.g., Parker & Warren, 2017; Warren & Parker, 2009), photo elicitation techniques rely on the premise that introducing a photograph into an interview can prompt ways of seeing and thinking that differ from those elicited by words alone, provided that the image disrupts habitual interpretive frames (Harper, 2002) and potentially brings researchers closer to participants' lived experiences (Meyer et al., 2013).

Extending beyond visual elicitation, Warren (2005) highlights the value of photo-interviewing, in which participants are invited to produce their own photographs as representations of their daily experiences, identities, or organizational realities (Warren, 2002). In particular, the variant of reflexive photography positions data as emerging not from the photograph itself nor from the researcher's extraction of meaning, but from the triadic interaction among researcher, participant, and image, through conversations that foster heightened reflexivity concerning the research questions and related issues.

Recent accounting studies have begun to employ these methods to investigate processes of professionalization, identity construction, and the contestation of occupational stereotypes (Parker & Warren, 2017; Warren & Parker, 2009).

We plan to recruit a purposive sample of MA consultants who have recent experience in sustainability-related projects with SMEs (e.g., sustainability reporting, ESG performance

measurement, sustainability strategy and control systems). Potential participants will be approached through consulting firms and professional bodies, ensuring variation in seniority, type of consulting organization, and sectoral focus of their SME clients. This will allow us to capture diverse ways of construing and enacting the consultant's role in sustainability engagements.

Following Parker and Warren's (2017) two-stage approach, first, each participating consultant will be invited to take a set of photographs over a defined period (e.g., 2–3 weeks) before the interview. To focus explicitly on their role and client engagement, we will ask participants to produce three categories of images:

- "consultant role" (2-5 photos): images that depict how consultants perceive themselves. Participants may choose any subjects (such as environments, objects, people, routines, or moments), capturing elements of their work;
- "engaging moments" (2-5 photos): images that, for the consultant, symbolize or convey situations in which they feel they have successfully engaged SME clients with sustainability issues. These may include, for instance, workshop settings, artefacts (e.g., templates, canvases, dashboards), physical spaces, or other objects and scenes the consultant associates with effective client engagement;
- "non-engagement/challenges" (2-5 photos): images that represent situations in which engagement was difficult, resisted, or did not occur as expected.

In the second stage of the research, individual semi-structured photo-interviews will be conducted with each participant. Each interview will begin with a short warm-up on the participant's consulting background and experience with SMEs. Subsequently, the photographs will be used as prompts for discussion. For each image, the interviewer will invite the participant to describe the situation, explain why it represents engagement (or non-engagement), and reflect on the practices and interactions involved and on perceived client reactions.

All interviews will be audio-recorded and transcribed. The resulting transcripts will constitute the primary empirical material for analysis, while the photographs will be used as supplementary data to enrich interpretation.

5. Expected Contributions

The research is expected to contribute to several streams of research. First, it aims to contribute to the growing literature on sustainability accounting in SMEs. This stream of research has begun to examine how SMEs face their unique structural challenges, such as limited resources and a lack of formalized systems (e.g., Johnstone, 2020; Lisi et al., 2023; Martins et al., 2022). Our study is expected to contribute to this body of literature by analyzing the role of MA consultants in the sustainability transition of SMEs. Furthermore, our study aims to show that the barriers faced by SMEs are not only technical, as sustainability accounting practices require ongoing sensemaking processes through which abstract notions become actionable and meaningful within the organizational context. Highlighting consultants' role in facilitating this sensemaking, the study will offer a more in-depth understanding of how sustainability accounting practices can be developed and sustained in SMEs.

Second, the study advances the consolidated stream of accounting research on consultants (e.g., Christensen and Skærbæk, 2010; Qu and Cooper) by extending it to sustainability-oriented engagements in the underexplored SME context. Existing literature has shown how consultants act as mediators, translators, and co-producers of accounting innovations (Malmi, 1999; Jones & Dugdale, 2002); however, empirical evidence on sustainability-oriented engagements remains scarce. SMEs represent a particularly revealing context, as they often lack internal sustainability specialists and thus rely more heavily on consultants to introduce, adapt, and legitimize sustainability practices. The analysis of consultants' multimodal practices will reveal how their role is performed and reconfigured in interaction with SME clients. In so doing, this study will

provide insights into consultants' roles in shaping emerging forms of accounting change linked to sustainability.

Finally, the study introduces a multimodal lens to the analysis of consulting engagements. While recent accounting studies have argued that meaning emerges from the interplay of multiple semiotic modes (e.g., Ronzani & Gatzweiler, 2022), accounting research has rarely examined how consultants orchestrate such multiple modes to mobilize clients, foster understanding, and sustain engagement in accounting innovation processes. Through the use of photo-interviewing techniques, the study will offer a deeper understanding of how multimodal engagement is perceived and enacted in practice.

Keywords: Management accounting consultants; sustainability; SMEs; multimodality

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Il ruolo delle tecnologie digitali e dell'intelligenza artificiale nei processi aziendali: prime evidenze

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1. Obiettivo

Questo articolo si propone di analizzare il ruolo delle tecnologie digitali e dell'intelligenza artificiale (IA) nei processi aziendali e nella definizione di strutture organizzative adeguate, collocandosi nel contesto economico-aziendale e mutuando alcuni principi e aspetti chiave dal diritto dell'impresa. In questa prospettiva, le principali normative europee e nazionali – in particolare l'AI Act, l'art. 2086 del Codice Civile e il Codice della crisi d'impresa e dell'insolvenza (CCII) definiscono, direttamente o indirettamente, requisiti organizzativi per le imprese, i quali sono analizzati alla luce della definizione del ruolo delle tecnologie nei processi aziendali e nell'adeguata struttura organizzativa. In questa prospettiva, le norme sono interpretate come dispositivi regolativi che influenzano i processi aziendali, i sistemi informativi e le responsabilità di governance. A partire da tale obiettivo, l'investigazione degli adeguati assetti organizzativi, amministrativi e contabili, consente di delineare progressivamente contenuti e implicazioni applicative, sviluppandosi a partire dalla riforma del diritto societario del 2003 e proseguendo con l'introduzione del novellato art. 2086 c.c. e con l'entrata in vigore del Codice della crisi d'impresa e dell'insolvenza (CCII). In particolare, con l'introduzione del CCII e dell'art. 2086, comma 2, c.c. nella sua attuale formulazione, gli assetti diventano uno strumento attraverso cui si realizza la modernizzazione dell'impresa, fondata sulla capacità organizzativa di anticipare e governare i rischi, secondo una logica coerente con i principi europei di early warning (Montalenti, 2020).

In questo ambito, l'impatto della digitalizzazione e delle tecnologie, fra cui intelligenza IA, sistemi di business intelligence e algoritmi predittivi, genera degli effetti sulla conformazione degli assetti aziendali. L'integrazione di strumenti tecnologici evoluti può migliorare la capacità dell'impresa di monitorare la propria situazione finanziaria e di prevenire condizioni di non continuità (Fondazione Nazionale dei Commercialisti, 2021,2023). La nuova regolamentazione europea dell'IA (AI Act) introduce obblighi specifici a carico degli utilizzatori di sistemi di intelligenza artificiale classificati come "ad alto rischio" e apre un nuovo fronte riferito alla compatibilità tra adeguatezza ex art. 2086 c.c. e adeguatezza tecnologica richiesta dal diritto europeo. Infine, il grado di formalizzazione richiesto per poter considerare un assetto adeguato è al contempo oggetto di studio (Bastia & Ricciardello, 2020; Montalenti, 2020).

Sebbene il concetto di adeguatezza degli assetti sia un concetto interdisciplinare (Fellegara et al.,2023), l'orientamento prevalente riconosce che l'adeguatezza non è un requisito statico, ma

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un parametro evolutivo che deve adattarsi alla complessità dell'impresa, al settore in cui opera, agli strumenti tecnologici disponibili e alla crescente importanza della prevenzione nella gestione aziendale (Abriani, Schneider, 2023).

In proposito, a seguito della modifica dell'articolo 2086 del Codice civile, ad opera dell'articolo 375 del D.Lgs. italiano 14/2019, nonché degli interventi correttivi, tra cui il D.Lgs.83/2022 italiano, gli assetti devono essere in grado di rilevare eventuali squilibri di carattere patrimoniale o economico-finanziario, rapportati alle specifiche caratteristiche dell'impresa, di verificare la sostenibilità dei debiti e le prospettive di continuità almeno nei dodici mesi successivi e di cogliere specifici segnali di allarme.

Sul piano organizzativo, l'adeguatezza implica la presenza di un assetto che individui ruoli, funzioni, deleghe e responsabilità in modo trasparente, nonché la definizione di flussi informativi verso gli organi sociali, in particolare verso l'organo amministrativo e l'organo di controllo. Sul piano amministrativo, rileva la capacità di governare i processi gestionali, dalla gestione del credito alla tesoreria, dalla pianificazione finanziaria al controllo di gestione. Sul piano contabile, risulta essenziale la capacità di produrre, con cadenza adeguata alle esigenze dell'impresa, situazioni infrannuali, report gestionali, analisi dei margini e dei flussi di cassa, in modo da consentire un monitoraggio continuo della continuità aziendale (Caricasulo, 2023).

L'art. 3 CCII, nella sua formulazione vigente, fornisce un importante criterio di concretizzazione dell'adeguatezza, laddove richiede che gli assetti siano idonei a rilevare squilibri patrimoniali ed economico-finanziari, a verificare la sostenibilità dei debiti e la prospettiva di continuità aziendale almeno su un orizzonte di dodici mesi e a rilevare i segnali di allarme elencati al comma 4. Tra questi segnali figurano, ad esempio, l'esistenza di debiti per retribuzioni scadute di importo significativo, la presenza di esposizioni verso l'erario e gli enti previdenziali, nonché situazioni di ritardo protratto nei pagamenti verso fornitori e intermediari finanziari. In questo contesto, la progressiva digitalizzazione dei processi aziendali e l'impiego di nuove tecnologie assumono un rilievo crescente ai fini della valutazione dell'adeguatezza degli assetti. Ormai la gran parte delle imprese, anche di dimensioni medio-piccole, si avvale di software gestionali (ERP) che integrano i flussi contabili con quelli logistici e commerciali, consentendo un monitoraggio più puntuale dei cicli attivo e passivo (Scognamiglio, 2023).

Dunque, l'IA rappresenta un ulteriore salto di qualità, infatti, negli ultimi anni la digitalizzazione ha registrato una crescita repentina e l'introduzione di tecnologie avanzate, come l'IA, hanno trasformato il funzionamento delle organizzazioni (Trequattrini & Schimperna, 2023). La pandemia da Covid-19 ha ulteriormente accelerato questo processo di digitalizzazione, rendendolo non più una grande opportunità, ma una vera e propria necessità (Andreani et. al, 2025). Le tecnologie intelligenti, come l'IA, hanno rivestito un ruolo centrale nel monitoraggio, nella prevenzione e nella gestione dell'emergenza Covid-19 da parte di organizzazioni, istituzioni e policymakers (Lombardi et al., 2022). L'adozione dell'IA genera effetti rilevanti anche sulla struttura e sulle dinamiche della corporate governance. Mentre la letteratura iniziale si concentrava principalmente sulla efficienza operativa e il vantaggio competitivo dell'IA, ricerche recenti approfondiscono il ruolo dell'IA nella corporate governance (Samara et al., 2025; Cordeiro et al. 2025). L'IA è supervisionata dalla governance aziendale (Davenport & Ronanki, 2018; Ahdadou et al., 2025); l'insieme degli strumenti che, nelle aziende che assumono la forma di società, sono preordinati alla migliore realizzazione del processo decisionale strategico nell'interesse delle principali categorie di stakeholder. Tali strumenti possono essere di natura normativa e di natura organizzativa (Trequattrini, 1999; Lombardi, 2012). In tale prospettiva, il Parlamento Europeo ha emanato un regolamento, l'AI Act, il quale incide direttamente sul governo dell'impresa, imponendo un vero e proprio sottosistema di risk management dedicato all'IA che deve coordinarsi con il sistema di risk management complessivo previsto dal CCII. Nonostante l'ampia letteratura sulla digitalizzazione dei processi aziendali e il sempre maggiore interesse per l'IA governance, si contano ancora pochi studi che integrano il ruolo dell'IA nei

processi aziendali e i principi normativi sugli adeguati assetti. Pertanto, la domanda di ricerca è la seguente:

RQ: Qual è il ruolo delle tecnologie digitali e dell'intelligenza artificiale (IA) nei processi aziendali e nella definizione di strutture organizzative adeguate?

2. Metodologia

È stata utilizzata una metodologia qualitativa per raggiungere gli obiettivi di ricerca e rispondere alla domanda di ricerca (Krippendorff, 2018). L'approccio di ricerca è di tipo qualitativo in quanto appare più adatto per affrontare determinati obiettivi di ricerca, soprattutto quando si dispone di poche informazioni sul problema o sulle possibili opportunità (Hair et al., 2003). Pertanto, tale metodo rappresenta la scelta più idonea per indagare lo stato dell'arte relativo all'integrazione dell'IA nei processi aziendali e alla definizione dell'IA negli adeguati assetti organizzativi. In particolare, abbiamo adottato un approccio di content analysis manuale su fonti secondarie, tra cui AI Act (Reg. UE 2024/1689), Art.2086 c.c., Art 3 CCII, per individuare le tematiche ricorrenti alle quali si è prestata maggiore attenzione al fine di garantire gli adeguati assetti nell'implementazione di IA nei processi aziendali. L'analisi ha riguardato le sezioni normative che includono riferimenti a processi aziendali, responsabilità degli amministratori, requisiti organizzativi, sistemi informativi, gestione dei rischi, tecnologie digitali e IA.

- Sono state investigate le seguenti tematiche di ricerca emergenti: quali processi sono più citati nei testi normativi;
- dove l'IA è considerata più rilevante;
- quali responsabilità emergono per gli amministratori;
- quali caratteristiche deve avere una struttura "adeguata";
- come la normativa collega digitalizzazione, adeguatezza, prevenzione della crisi.

Pertanto, è stato definito un protocollo di ricerca, sviluppato in tre fasi: (i) identificazione dei temi attraverso la lettura esplorativa delle norme; (ii) identificazione di un sistema di categorie; (iii) codifica manuale dei testi normativi focalizzata su processi aziendali, responsabilità degli amministratori, strumenti di monitoraggio e logiche di prevenzione; (iv) analisi delle frequenze e delle relazioni tra le categorie emerse. La coerenza interpretativa è stata garantita conducendo inizialmente l'analisi dei documenti in modo individuale tra noi ricercatori, per poi confrontare le evidenze emerse ed includere nello studio esclusivamente le evidenze condivise.

3. Risultati

I risultati rispondono alla RQ "Qual è il ruolo delle tecnologie digitali e dell'intelligenza artificiale (IA) nei processi aziendali e nella definizione di strutture organizzative adeguate?", mostrando alcuni elementi di complementarità, altri di divergenza, ulteriori elementi sono parzialmente convergenti fino ad arrivare ad alcune tematiche che possono essere utilizzate in maniera integrata. In particolare, i primi risultati si sviluppano lungo i processi aziendali all'interno dei quali entrano le nuove tecnologie, modificando la struttura organizzativa, i processi stessi e le conoscenze all'interno del sistema aziendale anche ai fini decisionali da parte della governance. I risultati propongono un set primario di indicatori di frequenza che saranno esplicitati nella versione finale di questo studio, tracciando l'analisi del contenuto documentale delle fonti secondarie in termini di tematiche emergenti e di principali cambiamenti derivanti dal ruolo delle tecnologie digitali e IA nei processi aziendali e nella definizione di strutture organizzative adeguate.

4. Implicazioni

L'articolo offre implicazioni sia teoriche che pratiche rivolte ad accademici e professionisti. Sul piano teorico, interviene a colmare un gap nella letteratura integrando tre ambiti di ricerca affrontati in modo separato: il ruolo delle tecnologie digitali nei processi aziendali, la definizione di assetti organizzativi adeguati (Montalenti, 2019; Rossi, 2018) e l'impatto delle recenti normative sull'IA (AI ACT, 2024; Samara et al., 2025; Cordeiro et al., 2025). Questo studio, inoltre, contribuisce alla letteratura accademica sui processi aziendali e sulle strutture organizzative adeguate, in particolare nel contesto delle tecnologie digitali e dell'IA. Dal punto di vista pratico, lo studio offre un supporto nello sviluppo di normative sempre più adeguate rispetto alle esigenze delle aziende e nell'adozione di decisioni responsabili per un migliore funzionamento aziendale, evidenziando il ruolo delle tecnologie digitali e dell'IA nel modellare strutture organizzative adeguate.

5. Originalità/valore

L'elemento di originalità risiede nell'interpretare le tecnologie digitali e l'IA come componenti strutturali di strutture organizzative adeguate, alla luce delle normative europee e nazionali e delle prassi emergenti, piuttosto che come meri strumenti operativi.

6. Limiti

Lo studio presenta i limiti propri del metodo qualitativo e dell'analisi documentale. La ricerca è preliminare e basata esclusivamente su fonti normative. L'analisi del linguaggio legislativo consente infatti di delineare il modello di organizzazione e di governance che il legislatore presuppone, rinviando a successivi studi sul come le tecnologie digitali e l'IA vengano introdotte e gestite nelle imprese. Inoltre, i risultati non mirano a descrivere prassi operative, proponendo una cornice concettuale utile per comprendere come la normativa possa orientare la progettazione degli assetti organizzativi Di conseguenza, future ricerche potrebbero integrare casi aziendali e dati empirici, così da verificare quanto il modello delineato dal legislatore trovi effettivo riscontro nelle pratiche aziendali.

Parole chiave: Processi aziendali; adeguati assetti; intelligenza artificiale; nuove tecnologie; azienda; indicatori di frequenza

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Storytelling as a performative tool of management accounting in new venture contexts

Paola Demartini[1], Maria Antonietta Cipriano[2], Silvia Soriano[3]

1. Introduction

Management accounting is a fundamental device for orienting organisational behaviour and guiding actors towards shared objectives (Hopper & Powell,1985; Ahrens & Chapman, 2007). It is not merely a set of measurement and control techniques but a performative language capable of constructing organisational realities (Vosselman, 2014), shaping relationships (Mouritsen & Thrane, 2006), and mobilising cognitive and emotional resources (Boedker & Chua, 2013; Repenning et al., 2022; Mouritsen & Kreiner, 2016). As Catasús et al. (2007) observe, what is measured tends to be managed, yet what is mobilised—that is, discussed, narrated, and shared—is what effectively generates action and change (Llewellyn, 1999; Piber et al., 2019).

In this perspective, management accounting assumes a communicative and symbolic function (Pärl, 2012), becoming an instrument of sensemaking (Weick, 1995) and mobilisation (Callon, 1998). This performative view suggests that accounting is not a passive reflection of organisational reality but a constitutive element of it.

In entrepreneurial contexts, particularly start-ups where numbers often represent projections rather than consolidated evidence, the narrative dimension becomes crucial. Entrepreneurial storytelling (Lounsbury & Glynn 2001, 2019) acts as a vehicle for translating visions into action, building legitimacy, trust, and belonging (Downing, 2005). At its core, entrepreneurial storytelling is a performative, communicative act that constructs social reality rather than reflecting it (Garud et al. 2014; Clarke et al., 2019). Entrepreneurs use stories to translate vision into action, create legitimacy, and build belonging, echoing the sensemaking framework of Weick (1995), and the performative ontology of Callon (1998) and Latour (2005).

These traditions collectively suggest that narratives in entrepreneurial settings are symbolic infrastructures — they enact futures, align heterogeneous actors, and stabilize fragile identities through discourse and representation.

By proposing a combination of these theoretical lenses, based on the same sociological and performative roots, we aim to investigate the role of storytelling as a performative tool of management accounting in new venture contexts.

We will focus on an Italian fintech, Banca Widiba (that is the acronym of Wise Dialogue Bank), launched on the market in September 2014. It can be considered as a case of success, both in terms of the level of innovation, and for its financial and sustainability performance, having achieved several awards for innovation, the breakeven within 5 years after its launch, and a Return on Equity of 31% in 2023, after 10 years (Faccia et al., 2020; Demartini & Del Baldo, 2025).

Our findings confirm that, in dynamic and blurred organisational settings such as those of new ventures, the narrative and visual dimensions are more powerful than numbers for orienting start uppers, investors and employees' behaviour. The study expands the "performative turn" in accounting by showing that communication is central to managerial control. It connects

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sensemaking and cultural entrepreneurship, illustrating that accounting operates both as a cognitive framework and as a narrative that mobilises action.

2. Theoretical framework

2.1. From Measurement to mobilisation

Traditional accounting relies on the assumption that measurement directly influences management—an idea summarised in the adage "what gets measured gets managed." Catasús et al. (2007) challenge this notion, demonstrating that the link between indicating (measuring) and acting is neither direct nor significant. Only when introducing the variable mobilising—the discursive and relational process of building attention and consensus—does the relationship become meaningful.

This reframing suggests that measurement is not an end but a symbolic medium that signals relevance, builds priorities, and generates conversation. As Mouritsen (1998, 2006) emphasises, value creation derives not from numbers themselves but from how they are mobilised through collective discourse, interpretation, and storytelling. Management accounting thus emerges as a performative and communicative practice producing social and cognitive effects that precede economic ones.

We assume that in emerging entrepreneurial environments—where uncertainty is high and historical data scarce—narratives play an even more crucial role in mobilising collective sensemaking and action (Demartini & Del Baldo, 2025). Hence, to develop our framework, we combine the performativity of management accounting practices to the theory of cultural entrepreneurship.

2.2. Cultural entrepreneurship and organisational storytelling

Lounsbury and Glynn (2001, 2019) propose the theory of cultural entrepreneurship, interpreting the entrepreneur as a cultural actor who shapes meanings through symbols, language, and stories. This enables them to establish their organizational identities and make their activities comprehensible, meaningful, and appealing to relevant audiences (Czarniawska, 1997) to attract resources and finally generate wealth creation (see Figure 1).

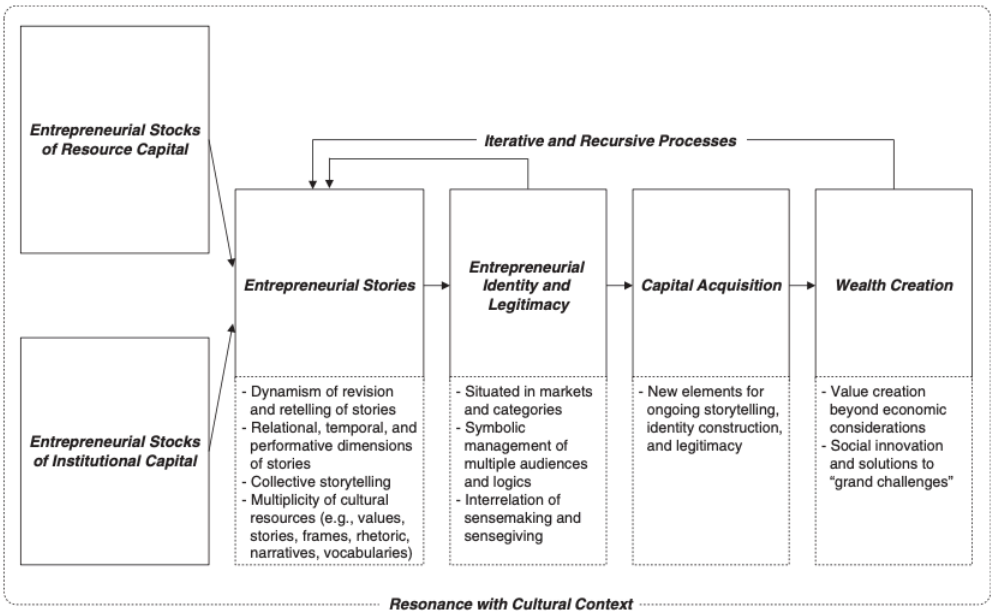


Figure 1. Theoretical Model of Cultural Entrepreneurship (Lounsbury & Glynn, 2019, p.3)

Legitimacy and success depend on the ability to create cultural resonance [4] with stakeholders—defined by:

- Cognitive alignment: consistency between the entrepreneurial narrative and institutional values.
- Emotional impact: capacity to evoke passion, trust, and collective belonging.

Entrepreneurial storytelling thus functions as a device of symbolic mobilisation and social legitimation, reinforcing collective identity and organisational cohesion. Within management accounting, these insights imply that accounting narratives—such as budgets or performance reports and we also include entrepreneurial storytelling—are to be seen as *inscriptions* that construct future realities rather than static depictions of the past (Robson, 1992; Busco & Quattrone, 2015).

3. Research propositions

Based on the integration of these theoretical perspectives, two propositions are advanced:

Proposition 1

When numbers rely on expectations rather than consolidated data, entrepreneurs must employ narrative tools to communicate vision and guide organisational behaviour. Employee conduct is more strongly shaped by the values and symbols embedded in storytelling than by abstract quantitative measures. Management accounting should therefore be interpreted as a sense giving device (Weick, 1995) through which entrepreneurs construct meaning and orient collective action.

[4] About defining the construct of cultural resonance, see Demartini & Del Baldo, 2025, pp.191-193

Proposition 2

The success of an organisation increases when founders, employees, consultants, and financiers actively participate in constructing and disseminating the organisational narrative. Collective storytelling becomes a shared cultural asset that enhances legitimacy, engagement, and organisational culture.

4. Methodology

To understand how the organisational narrative enables the consolidation of collective sense-making, the storytelling of the first few years of Widiba, a fintech start up is analysed. Our timeline of analysis embeds the seed phase (2013), the launch (2014), and the early growth (2015) of the company.

This research was possible thanks to the realization of a book, titled Cronaca Pop di Widiba - Pop Chronicle of Widiba (2018), in which, voluntarily, board members, start-up team, managers, employees and professionals have responded to the invitation to "telling what Widiba was for them, even describing a moment, an experience they consider particularly memorable". A qualitative research design was employed, grounded in interpretive methodology and text analysis. The aim was to understand how cultural processes and collective storytelling contribute to the creation of shared meaning and mobilisation in the start-up setting.

The study drew upon other multiple data sources— external corporate communication to markets and stakeholders, internal communications, social media, and first-hand accounts—to triangulate perspectives and ensure contextual depth. Moreover, one of the authors was directly involved in the launch of the new venture as an independent board member until 2019. The involvement of one of the researchers in the field enabled the authors to develop a broad understanding of the major concerns and challenges "behind the scenes". This has facilitated comprehension of the narratives while also being a potential source of bias, as remarked by Unluer (2012) and Aguinis and Solarino (2019).

In this contribution we present the results of our analysis of the stories collected in the book Pop Chronicle of Widiba (2018). The text analysis focuses on 33 stories of people involved in the start-up setting (i.e. the founder and the start-uppers, the board members, professionals and employees directly involved) placed in the book referring to the years 2013 (seed phase), 2014 (the launch), and 2015 (early growth).

4.1. Approach to text analysis

Text analysis allows systematic examination of the linguistic and symbolic patterns that characterise organisational discourse (Stone et al., 1966). The research assumes that the vocabulary used by members of an organisation reflects the evolution of its culture over time (Levinson, 2003). After establishing the concept of cultural resonance and its two key components—cognitive alignment and emotional impact—the analysis proceeded to identify and code recurring themes across narratives (figure 2).

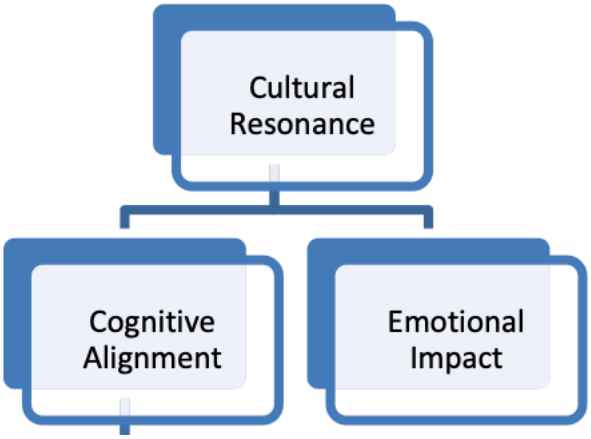


Figure 2. Key components of the construct "Cultural Resonance"

The text analysis focused on four themes: three for unlocking the Cognitive Alignment construct (i.e. Innovativeness, Social Impact, Market Culture) and one for Emotional Impact. Vocabularies are central to meaning creation (Meyer & Höllerer, 2010; Lockwood et al., 2019). Each context unit – a meaningful text fragment expressing one of these themes- was tagged and coded manually to preserve interpretive richness, rather than relying on automated tools.

To build the coding framework, wordlists were compiled from validated sources and expanded via WordNet (Miller, 1995) to include synonyms and related expressions:

- Innovativeness: Based on McKenny et al. (2018), encompassing 147 terms (e.g., creative, innovation, invention, novelty).
- Social Impact: Using Moss et al. (2018), comprising 66 terms (e.g., equality, empowerment, society, benefit).
- Market Culture: Drawing from Cameron et al. (2006), including words such as achievement, performance, growth, competitiveness.
- Emotional Impact: Derived from the Harvard-IV-4 Psycho-Social Dictionary, focusing on words linked to emotion and affiliation (e.g., enthusiasm, affection, passion, trust, belonging).

Each context unit was compared across narratives to identify how cognitive and emotional patterns converged to form a coherent collective story. This coding enabled operationalisation of cultural resonance in the book Pop Chronicle of Widiba.

The database for analysis was structured as it follows:

Phase	**Individuals Story no**	**Role of Individuals**	**Innovativeness Excerpts**	**Social Impact Excerpts**	**Market Culture Excerpts**	**Emotiona Impact Excerpts**

Table 1. Database structure[5]

5. Results

[5] Info available on request.

Operationalizing the construct of cultural resonance highlights the fruitfulness of understanding organisational storytelling as an interactive, negotiated process.

The results of our study confirm that cultural resonance is a complex construct that encompasses cognitive alignment and emotional impact, thereby reinforcing the sense of participation and commitment of qualified human resources in a critical and delicate period for the survival of a company.

5.1. Organisational Storytelling as Inscriptions

"Change and adaptation to a new world do not transform needs but the way of knowing how to meet and grasp them. W. is the bank of all times that has embraced with passion, dedication and study all the tools of today to become effective, efficient, and ready to be competitive." (Founder).

The opening message contained in the Pop Chronicle of Widiba embeds the essential elements of the entrepreneurial narrative. The founder articulates the distinctive feature of the new venture: an orientation towards innovation that positions technology as a means rather than an end. He evokes long-established managerial ideals—effectiveness, efficiency, and competitiveness—while anchoring them in a discourse of passion and commitment.

Collective storytelling within the organization mirrors this founding discourse. For storytelling to become shared and resonant, there must be cognitive alignment and/or emotional impact among organizational members. Analysis of the collected stories reveals coherence—a shared interpretive frame that echoes the founder's themes, while allowing for variation across individual perspectives.

Regarding Cognitive Alignment, the accounts of board members demonstrate comprehensive resonance across all dimensions outlined in the analytical framework. Their narratives integrate notions of innovation, market orientation, and social purpose into a coherent worldview. Conversely, for those occupying more specialized roles—such as IT managers or digital development staff—alignment tends to be selective, oriented primarily around innovation and technological transformation (see Example 1).

Innovativeness "When I was attending team meetings, I was dwelling on a new piece each time: people, systems, ideas and new applications." (Board member)
Social Impact "In W. there is passion that stems from the idea that services are necessary for people, and we have a very high responsibility; enabling customers to experience them in a new and positive way was (and is) the engine that drove the people of W. to dream and realise this dream." (Board member)
Market Culture "There were a need and a new way of listening to and serving customers." (Board member) Innovativeness "We nicknamed ourselves *'incrediBOL'* [BOL stands for *Bank On Line*] because no one believed us that we would succeed in bringing the most modern bank to life inside the oldest bank in the world." (IT manager)

Table 1. Cognitive Alignement (Demartini & Del Baldo, 2025, p.297)

Emotional impact reveals different intensities and affective tones depending on the individual's temporal and functional proximity to the venture's creation. Those involved in the seed and launch phases express deep emotional investment and identification with the founder's vision, while those joining later exhibit more pragmatic enthusiasm tied to daily operational challenges (see Example 2).

"W. is one of the most extraordinary and exciting things of my long professional life." (Board member involved since the seed phase)
"For me, it was love at first sight." (Board member involved since the seed phase)
"I saw the birth of W., experiencing excitement, enthusiasm and pride with the founder… It is a daily challenge where winning is a must and at the same time a great reward." (Employee involved since the seed phase)

Table 2. Emotional Impact (ibidem)

These narratives do more than recount experiences—they inscribe organizational identity. The book Pop Chronicle of Widiba that narrate the collective entrepreneurial storytelling, functions as an inscription: a device that makes sensemaking visible, recordable, and actionable. The founder's foundational story establishes a framework of values and aspirations, while employees' stories materialize and reinforce this framework through their lived experiences.

In this way, organisational storytelling becomes an inscription that translates ideas and values (innovation, responsibility, efficiency, creativity, etc.) into shared representations that guide conduct and sustain collective legitimacy. As such, storytelling operates performatively, constituting rather than merely describing the organization's evolving identity.

5.2. Management Accounting as Cultural Practice

Findings also reveal that in dynamic organisational settings, numbers such as KPIs or performance indices do not precede the narrative but rather translate it symbolically. Economic objectives are embedded within a broader cultural discourse that legitimises and gives them meaning. Echoing Catasús et al. (2007), performance emerges as an effect of mobilisation rather than numerical indication.

Reports, sustainability statements, and engagement indicators become narrative artefacts—tools through which organisational culture renews and legitimises itself. Entrepreneurs act as cultural operators (Lounsbury & Glynn, 2001), constructing entrepreneurial stories that align with stakeholders' values and emotions to gain legitimacy and support.

This operationalisation of cultural resonance confirms that it is a complex, interactive process, encompassing both cognitive alignment and emotional engagement. Such resonance enhances participation, commitment, and identity among human resources—particularly crucial during formative and uncertain stages of organisational life.

5.3. The Performativity of Communication

The performative power of communication emerges as a decisive factor in organisational success. The effectiveness of management accounting lies not only in technological or operational efficiency but in the capacity of communication to render the desired future real through discourse. Language acts as a mobilisation device connecting vision and action, numbers and meaning, control and creativity. The narrative framework transforms accounting practices from mechanical recording into instruments of cultural creation. In this sense, communication performs reality—it produces rather than merely describes it.

6. Conclusions

Integrating the mobilising framework (Catasús et al., 2007) with cultural entrepreneurship theory (Lounsbury & Glynn, 2001, 2019) allows management accounting to be reframed as a performative narrative practice. It does not simply measure what exists; it creates what it

measures. It does not merely describe behaviour; it mobilises it. In this way, accounting, therefore, is a cultural discourse that generates identity, trust, and belonging.

The study highlights three main insights:

- Mobilisation through collective storytelling creates action and performance. Narratives transform data into lived organisational experiences that motivate and align organisation's members.
- In the launch of a new venture, indicators alone do not drive behaviour unless integrated into meaningful, emotionally resonant narratives.
- Management accounting must be reinterpreted as a narrative instrument of cultural governance. Accounting systems can and should serve as communicative infrastructures that sustain vision, values, and participation.

Theoretical Contributions

This research contributes to the growing literature on the performative turn in accounting by demonstrating that communicative processes are not ancillary but constitutive of managerial control. It bridges the gap between sensemaking and cultural entrepreneurship, showing how accounting can be both a cognitive frame and a mobilising narrative.

Managerial Implications

For practitioners, the findings emphasise that leadership requires mastering not only financial metrics but also symbolic communication. Management accountants should act as narrative architects who translate organisational vision into credible and inspiring stories. In contexts characterised by uncertainty—such as digital transformation or start-up ecosystems—storytelling becomes a strategic complement to quantitative control.

Limitations and Future Research

This study acknowledges several methodological and interpretive limitations that also provide avenues for future research development. A primary limitation concerns the insider role of one of the authors, who served as an independent board member of the digital bank during its founding and growth phases. While this involvement provided privileged access and deep contextual understanding, it also carried potential bias stemming from personal engagement and retrospective interpretation. However, the temporal distance between the author's board tenure and data collection enabled greater reflexivity, allowing the insider to engage critically with prior experiences rather than reproducing them unexamined.

A second limitation lies in the case study design and manual coding approach. Although these qualitative methods generated rich, nuanced insights into the dynamics of collective storytelling and sensemaking, they are inherently context-bound. The findings capture the lived meanings of individuals involved in a specific entrepreneurial setting, limiting their transferability to different institutional or cultural contexts. Manual coding, while interpretively rigorous, is also constrained by the researchers' subjectivity and the predefined analytical framework, which may have restricted the emergence of unexpected themes or discursive patterns.

Future research could expand the methodological toolkit to enhance both depth and flexibility. One promising direction is the use of open coding to allow novel categories and relationships to emerge inductively from the data. This approach would enable researchers to remain receptive to unanticipated meanings embedded in organizational narratives, thereby enriching theoretical development.

Another avenue involves integrating computer-assisted text analysis, such as semantic or co-occurrence network analysis, to map the relationships between key words and themes within large

narrative datasets. This complementary method would provide a more systematic and replicable analysis of discourse structures while preserving the interpretive richness of qualitative inquiry.

The findings also highlight a particularly promising field for further investigation: the emotional dimension of organizational storytelling. Emotional resonance emerged as a key factor in mobilizing individuals and sustaining engagement during the venture's creation and growth. Future studies should examine how management practices intentionally shape, amplify, or measure emotional impact as part of broader accounting, control, and communication systems.

Exploring how emotions function as performative forces—interacting with narratives, inscriptions, and calculative practices—could extend the boundaries of management accounting research. This would contribute to a richer understanding of organizations as complex systems where meaning, emotion, and measurement co-produce organizational reality.

Keywords: Management accounting; cultural entrepreneurhip; storytelling

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Measuring Social Return on Investment in sustainable hospitality: a technology-enabled framework for social impact assessment in tourism

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1. Introduction

Tourism and hospitality are among the sectors most closely scrutinised for their social and environmental footprints. Before the COVID-19 crisis, tourism accounted for around 10% of global GDP and one in ten jobs worldwide, a magnitude that underscores both its development potential and its risks in terms of resource use, social equity and local well-being (UNWTO and UNDP, 2017; UNWTO, 2004). The 2030 Agenda for Sustainable Development explicitly recognises tourism under SDGs 8, 12 and 14, and UNWTO and UNDP (2017) call for better alignment of tourism business models with inclusive, low-carbon and community-centred development pathways. In parallel, there is growing pressure on hospitality firms – from investors, regulators, and destination management organisations – to demonstrate their contribution to social value creation, going beyond traditional financial and environmental metrics. Social impact investing and ESG-oriented finance are expanding, but the field still struggles with consistent, decision-useful measures of social outcomes (Roor et al., 2024; Costa and Pesci, 2016). This is particularly acute in hospitality, where benefits (e.g., local employment quality, cultural preservation, community well-being) are diffuse, context-dependent and hard to monetise.

Social Return on Investment (SROI) has emerged as a prominent approach to quantify and monetise the social, environmental and economic value created by projects and organisations, relative to the resources invested. It builds on and extends cost–benefit analysis by explicitly incorporating stakeholder perspectives, non-market outcomes and distributive effects (Lingane and Olsen, 2004; Millar and Hall, 2013; Corvo et al., 2022). While SROI has been widely discussed in social enterprise, health and community projects, systematic applications in tourism and hospitality remain limited and fragmented. Existing work points to both the potential and the methodological challenges of using SROI to understand tourism's social value (Ariza-Montes et al., 2021; Maldonado and Corbey, 2016).

At the same time, hospitality is undergoing a rapid digital transformation: AI-driven revenue management and personalisation, IoT-enabled smart rooms, blockchain-based traceability in supply chains, big-data analytics on guest behaviour and digital platforms that mediate destination experiences (Bulchand-Gidumal, 2024; Zeqiri et al., 2025). Emerging research suggests that these technologies can support more granular, real-time and participatory forms of impact measurement, particularly when aligned with SDGs and destination-level sustainability standards (UNWTO and UNDP, 2017; Zeqiri et al., 2025; UNWTO, 2004).

This work-in-progress paper proposes a conceptual and methodological framework for applying SROI to hospitality enterprises, explicitly integrating sustainability criteria and

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advanced digital technologies for data collection, stakeholder engagement and outcome monitoring. The focus is on hospitality businesses (hotels, resorts, eco-lodges, social enterprises in accommodation and related services) operating within tourism destinations that have explicit sustainability policies or are aligned with frameworks such as the UNWTO sustainable tourism indicators and the Global Sustainable Tourism Council (GSTC) Destination Criteria (UNWTO, 2004; GSTC, 2019).

2. Theoretical background

2.1. Social Return on Investment: foundations and developments

SROI is commonly defined as an analytic tool that monetises social, environmental and economic outcomes and compares them to the value of inputs, yielding an SROI ratio (e.g., "€3 of social value for each €1 invested") (Nicholls et al., 2012; Lingane and Olsen, 2004). Early work by Lingane and Olsen (2004) in California Management Review established methodological guidelines for SROI calculations in corporate and social ventures, highlighting the need for rigorous valuation, transparency on assumptions and sensitivity analysis.

Subsequent guides, notably those developed by the New Economics Foundation and the UK Cabinet Office, systematised a six-stage SROI process: establishing scope, mapping outcomes, evidencing outcomes and giving them a value, establishing impact (deadweight, attribution, displacement and drop-off), calculating the SROI, and reporting and embedding (Nicholls et al., 2012). Corvo et al. (2022) provide a systematic literature review of SROI in Meditari Accountancy Research and show that applications span health, social care, education, environment and employment but remain uneven across sectors and geographies; they also stress the need for better theoretical grounding and methodological standardisation.

In parallel, reviews by Maldonado and Corbey (2016) and Millar and Hall (2013) point to persistent challenges: the risk of over-claiming due to weak counterfactual analysis; the subjectivity of financial proxies; limited stakeholder capacity to engage with complex monetary valuation; and the tendency to reduce rich impact stories to a single headline ratio. Cordes (2017), writing in Evaluation and Program Planning, compares SROI to cost–benefit analysis and emphasises both its promise in capturing broader value for funders and the importance of transparently reporting uncertainties and distributional effects.

More recent work, including Corvo et al. (2022) and Gutiérrez-Nieto et al. (2025), suggests a gradual movement towards "second-generation" SROI, characterised by stronger links to impact investing, integration with lifecycle and sustainability assessment tools, and growing attention to the distinction between measuring impact "to prove" and "to improve" decision-making.

2.2. Social impact measurement in tourism and hospitality

In tourism, social impact evaluation has traditionally relied on non-monetary indicators, often aligned with UNWTO's sustainable tourism indicator frameworks and later with the SDGs (UNWTO, 2004; UNWTO and UNDP, 2017). The GSTC Destination Criteria, for instance, structure sustainability around four pillars – sustainable management, socio-economic benefits, cultural heritage and environmental stewardship – and provide performance indicators that destinations can adapt at local level (GSTC, 2019).

Within hospitality, a large body of research focuses on corporate social responsibility (CSR), ESG practices and sustainability reporting. Pérez and Rodríguez del Bosque (2014), in the International Journal of Hospitality Management, analyse sustainability reporting by Spanish hospitality firms through a Sustainable Development–Stakeholder Relations Management (SD–SRM) lens, identifying both progress and gaps in how firms account for stakeholder-relevant social impacts. Martínez et al. (2013), publishing in Journal of Travel and Tourism Marketing, develop and validate a CSR measurement scale specifically tailored to hospitality, covering

dimensions such as community involvement, employee relations and environmental responsibility.

Empirical studies show that hospitality firms tend to focus on environmental and philanthropic initiatives in their public communications, while social outcomes such as quality of employment, local supplier development or inclusion of vulnerable groups receive less systematic measurement (Martínez et al., 2013; Pérez and Rodríguez del Bosque, 2014; de Grosbois, 2012). At destination level, research on responsible tourism and ESG in hospitality underscores the need for integrated metrics that capture how hotel operations affect community well-being, cultural vitality and social cohesion, not only visitor satisfaction or financial performance (Martínez et al., 2013; Costa and Pesci, 2016).

Despite this, explicit use of SROI in tourism and hospitality remains scarce. Ariza-Montes et al. (2021) apply SROI to assess the impacts of tourism in a specific destination, concluding that the approach can quantify positive social and cultural benefits while highlighting negative externalities, but that data availability and methodological complexity limit its widespread adoption. Case study–based SROI analyses in tourism-related regeneration projects and community programmes similarly reveal potential for making social value visible to policymakers and investors, yet also expose tensions between standardisation and local specificity (Corvo et al., 2022; Maldonado and Corbey, 2016).

2.3. Digital technologies, tourism sustainability and impact data

Digital transformation is reshaping the hospitality industry's operations and its interactions with stakeholders. Bulchand-Gidumal (2024) shows how AI, big data and other "critical digital technologies" are being integrated into hospitality and tourism marketing, enabling personalisation, dynamic pricing and predictive analytics but also raising new questions about privacy and algorithmic bias. Zeqiri et al. (2025) argue that digital tourism platforms leveraging Industry 4.0 technologies (AI, blockchain, VR, IoT) can support the advancement of SDGs by enhancing transparency, participation and resource efficiency in tourism ecosystems.

UN Tourism and other international bodies highlight that innovation and digital tools – such as big-data analytics on mobility, user-generated content, and smart-destination infrastructures – can help measure tourism's impacts more precisely and support better policy and business decisions (UNWTO, 2004; UNWTO and UNDP, 2017). For hospitality firms, this implies the possibility of moving from static, ex-post reporting towards more dynamic, real-time monitoring of social outcomes, including guest behaviour, employee well-being, local procurement patterns and community engagement.

However, the literature also warns that impact measurement in the digital era often focuses on "proving" rather than "improving" impact, and that the abundance of data does not automatically translate into better decisions. Roor et al. (2024) show that many investors use impact metrics mainly for legitimacy and accountability rather than to adapt strategies in ways that enhance real-world outcomes. This tension is directly relevant for SROI in hospitality: advanced technologies may facilitate data collection and valuation, but they can also reinforce box-ticking approaches if not embedded in a learning-oriented governance framework.

3. Research aims and questions

Building on these strands of literature, this work-in-progress study pursues three interconnected aims. First, it seeks to synthesise and critically evaluate existing applications of SROI and related social impact measurement approaches in tourism and hospitality, positioning them within wider debates on sustainable tourism indicators, ESG reporting and impact investing. Second, it aims to develop a conceptual framework for applying SROI to hospitality enterprises that aligns outcome indicators with international sustainability standards – such as the SDGs,

UNWTO indicators and GSTC criteria – while integrating advanced digital technologies to support data generation, stakeholder engagement and continuous learning. Third, the study intends to design and pilot a mixed-method SROI-based methodology across multiple hospitality case studies, generating empirical insights into the social value produced by different business models, including conventional hotels, eco-resorts and social-purpose hospitality ventures.

The core research questions are:

RQ1: How has SROI been conceptualised and operationalised in tourism and hospitality, and what are the main methodological and practical gaps identified in the literature?

RQ2: How can SROI be adapted to capture the social impacts of hospitality firms in a way that is consistent with sustainable tourism frameworks and sensitive to local destination contexts?

RQ3: In what ways can advanced digital technologies enhance or hinder the quality, inclusiveness and usefulness of SROI analyses in hospitality?

RQ4: What does an SROI-based assessment reveal about the social value generated by selected hospitality enterprises, and how can such information inform managerial decisions and destination governance?

4. Methodological framework

This study adopts a sequential exploratory mixed-methods design, combining systematic literature review, qualitative case study research and quantitative SROI modelling. The research is explicitly presented as work in progress: at the time of writing, the literature review and framework development phases are ongoing; empirical data collection with hospitality enterprises is planned but not yet completed.

4.1. Systematic literature review

The first phase involves a structured review of peer-reviewed articles and high-quality reports on SROI, social impact measurement and sustainability in tourism and hospitality. The review strategy builds on Corvo et al. (2022) and Gutiérrez-Nieto et al. (2025) for the general SROI literature, while sector-specific searches target journals such as International Journal of Hospitality Management (Elsevier), Journal of Travel and Tourism Marketing (Taylor and Francis), International Journal of Contemporary Hospitality Management (Emerald), and Journal of Hospitality and Tourism Management (Elsevier), as well as SROI applications in tourism (Ariza- Montes et al., 2021). This phase seeks to clarify how SROI has been deployed – or, in some cases, overlooked – within tourism and hospitality, while mapping the outcome domains and indicators most relevant to capturing the sector's social impact, including decent work, community development, cultural heritage and gender equality. It also engages with key methodological debates on monetisation techniques, attribution issues and the construction of credible counterfactuals. In parallel, it explores how digital technologies are increasingly used to generate, monitor and analyse impact data in tourism, building on recent contributions such as Bulchand-Gidumal (2024) and Zeqiri et al. (2025).

4.2. Conceptual framework and impact map

Drawing from the review, the study will develop an impact map tailored to hospitality firms, aligning SROI outcome categories with SDG targets and GSTC socio-economic and cultural criteria. For instance, the model takes into account inputs such as financial capital (i.e., equity, debt, grants), human resources, physical assets and digital infrastructures, which enable core hospitality activities including accommodation and FandB services, local procurement, staff training, community engagement, cultural programming and environmental initiatives. These activities produce measurable outputs – such as local employment, contracts with SMEs, training

hours, community participation and cultural experiences offered – that translate into social outcomes like improved working conditions and skills for residents, greater inclusion of vulnerable groups and women in quality jobs, stronger local SMEs, enhanced community pride and cultural preservation, and reduced negative social impacts. Financial proxies for these outcomes will be derived from secondary data (e.g., wage differentials, unemployment costs, prior SROI valuations) and stakeholder valuation exercises, consistent with SROI principles and established guidance (Lingane and Olsen, 2004; Cordes, 2017; Nicholls et al., 2012).

4.3. Case study selection and data collection

The empirical component – currently under design – foresees multiple case studies of hospitality enterprises from different segments (e.g., urban business hotels, resort complexes, eco-lodges, social-purpose hospitality ventures) and destinations that have articulated sustainability strategies (e.g., GSTC-aligned or UNWTO-monitored destinations).

Data collection will draw on a multi-layered strategy designed to capture the full breadth of social value created within hospitality contexts. First, documentary evidence – including sustainability and ESG reports, CSR communications and certification records – will be systematically analysed using content-analysis approaches inspired by Pérez and Rodríguez del Bosque (2014) and de Grosbois (2012). Second, semi-structured interviews with managers, employees, local suppliers, community organisations and destination management bodies will surface stakeholders' theories of change and reveal which outcomes they perceive as most meaningful. Third, where feasible, digital trace data such as anonymised HR records (e.g., turnover, training hours), procurement datasets, geolocated guest activity patterns and user-generated content will be incorporated, in full compliance with ethical and privacy standards.

The integration of these qualitative and quantitative sources will enable the construction of robust SROI models for each case, while sensitivity analyses will assess how key assumptions – such as attribution and the duration of outcomes – shape the resulting valuations.

4.4. Role of advanced technologies in SROI implementation

A key contribution of the proposed methodology is its systematic integration of advanced technologies throughout the SROI process. Digital surveys, mobile applications and online platforms will facilitate outcome identification and stakeholder engagement, enabling timely feedback from guests, employees and community members (Zeqiri et al., 2025). Data collection will be strengthened through HR analytics and AI-enabled dashboards for monitoring job quality and training outcomes, IoT and smart-building systems for capturing guest-experience indicators, and supply-chain tools – potentially supported by blockchain – to track local sourcing and fair-trade relationships (Bulchand-Gidumal, 2024). Analytical tools will support impact valuation by linking operational metrics to social outcomes and enabling scenario analyses of alternative hiring or sourcing strategies. Finally, interactive dashboards will enhance reporting and organisational learning by presenting SROI results alongside qualitative indicators and promoting continuous improvement rather than reputational uses (Roor et al., 2024; Costa and Pesci, 2016). The study will also examine whether these technologies improve the robustness, timeliness and stakeholder relevance of SROI analyses, and what organisational capabilities are needed to leverage them effectively.

5. Expected results and contribution

As a work in progress, this study cannot yet present empirical SROI ratios or completed case findings, but several expected contributions can be outlined. First, it is set to offer one of the first integrative frameworks that adapts SROI to hospitality enterprises while aligning it with the

SDGs, UNWTO indicators and GSTC criteria, responding to long-standing calls for tools that link business practices to destination-level sustainability goals. Second, by incorporating AI, big data and digital platforms into the SROI process, the study aims to show how hospitality firms can adopt more dynamic, participatory and fine-grained approaches to social impact assessment, extending current digital transformation research beyond its usual focus on marketing and operational efficiency. Third, forthcoming case studies are expected to compare different hospitality models – such as upscale hotels, community-based lodges and social enterprises – in terms of SROI performance across domains like employment, local economic development, inclusion and cultural heritage, potentially revealing trade-offs and synergies not captured by conventional financial or environmental indicators. Finally, the study aims to generate practical recommendations for hospitality managers and impact-oriented investors on integrating SROI into decision-making, and for destination management bodies on translating firm-level results into coherent destination-wide social impact narratives, contributing to broader debates on standardising social impact metrics in sustainable finance.

6. Limitations and future research directions

The proposed study faces several limitations consistent with those highlighted in the wider SROI literature, including the subjectivity inherent in selecting financial proxies, challenges in establishing credible counterfactuals, the resource-intensive nature of data collection and the risk of reducing complex social outcomes to a single ratio (Millar and Hall, 2013; Maldonado and Corbey, 2016). Within the hospitality sector, further constraints arise from commercial sensitivities surrounding data, uneven levels of digital maturity across firms and destinations and the need to comply with privacy and data-protection regulations when incorporating digital trace data. Future research could build on this work by comparing SROI with alternative impact-measurement approaches in hospitality, investigating cross-cultural variation in how communities value tourism-related social outcomes and assessing how SROI insights shape strategic decisions by hospitality firms and investors over time.

Keywords: Social return on investment (SROI); social impact measurement; sustainable tourism; hospitality industry; digital technologies; ESG

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Track 9: NUOVE FRONTIERE DEL MARKETING: ECOSISTEMI PARTECIPATIVI TRA BRAND, CONSUMATORI E TRAIETTORIE TECNOLOGICHE E SOSTENIBILI

Me, You, and AI: How AI augments value co-creation in brand-customer relationships

Emanuele Ghianda, Domitilla Magni, Francesco Costanzo, Alice Mazzucchelli

Rethinking Emotional Analysis for Digital Management Convergenze e Divergenze tra Intelligenza Ermeneutica, Simbolica e Neurale

Adriana Apuzzo, Mario D'Arco, Antonio Lieto, Mario Testa

Where sectors meet: festival as space of collaboration

Alessia Anzivino, Lala Hu, Roberta Sebastiani

When Nature Becomes Data: How Digital Platforms Are Rewriting Biodiversity

Chiara Ottolenghi, Valentina Cucino, Gennaro Iasevoli

The 30-60-90 Routine: Structuring Community Feedback for Value Co-creation

Alessio Sartore, Paola Signori

Socio-Demographic Profiles and Experiential Retail: Evidence for Designing Experience-Centric Digital Retail Strategies

Massimiliano Ruggiero, Martina Toni, Giovanni Mattia

Strega comanda colore: trova il colore per comunicare la sana alimentazione

Susanna Graziano, Benedetta Grandi, Maria Grazia Cardinali, Guido Cristini

Me, You, and AI: How AI augments value co-creation in brand-customer relationships

Emanuele Ghianda[1], Domitilla Magni[2], Francesco Costanzo[3], Alice Mazzucchelli[4]

1. Introduction

Artificial intelligence (AI) is reshaping how brands design, deliver, and communicate value in contemporary markets, from recommendation engines (Grewal et al., 2021) and automated retail stores (Pillai et al., 2020), to generative tools that co-author marketing content and conversations with customers (Kirkby et al., 2023; Kot & Leszczynski, 2022). Rather than simply adding another channel or touchpoint, AI systems increasingly mediate interactions between brands and customers, promising more personalized, efficient, and adaptive experiences while also triggering concerns about opacity, bias, loss of human contact, and erosion of authenticity and trust (Dwivedi et al., 2021; Kim, 2025). This ambivalence suggests that AI not only enhances marketing relationships, but also transforms the dynamics through which value is created in brand–customer interactions (Chandra & Rahman, 2024).

Service-Dominant Logic (SDL) conceptualizes value as emerging from ongoing relational exchanges in which actors integrate resources to co-create value, rather than passively receiving it (Vargo & Lusch, 2008). Drawing from this perspective, AI can be framed as an operant resource – an entity capable of sensing, learning, and adapting – rather than a passive, operand tool (Mele et al., 2021; Huang & Rust, 2021; Haenlein & Kaplan, 2021). AI can expand customers' access to relevant resources, personalize interactions, and influence decision-making processes and experience along the customer journey (Mele et al., 2021; Peltier et al., 2024). At the same time, SDL research highlights that the same interactions can generate value co-destruction (VCD) when resources are misaligned or misused, leading to diminished well-being for at least one actor (Castillo et al., 2021). In AI-mediated settings, phenomena such as algorithm aversion, perceived manipulation, or the crowding out of human presence may thus undermine trust, authenticity, and perceived fairness in brand–customer relationships (Castelo et al., 2019; Luo et al., 2019; Brüns & Meißner, 2024).

To better understand these mixed dynamics, this paper draws on Actor–Network Theory (Latour, 1996) to move beyond a dyadic view of firm–customer relations and frame AI within a broader socio-technical network (Gutiérrez, 2024). From an ANT perspective, algorithms, datasets, interfaces, brands, and customers are actants that jointly perform programs of action and whose associations are continuously negotiated (Latour, 2005; Gutiérrez, 2024). Outcomes depend on translation, which is the ongoing process through which heterogeneous human and non-human actors align their identities, needs, and activities, allowing networks to stabilize (Li & Zhu, 2024). Misaligned translations can amplify biases, surface irrelevant or culturally inappropriate outputs, and trigger resistance, turning AI into a mediator of VCD (Li & Zhu, 2024).

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Conversely, when the translations hold and the interests remain aligned, AI can help configure new forms of interactive, experiential value co-creation (VCC) (Gutiérrez, 2024; Li & Zhu, 2024).

Despite growing recognition of AI as a network actor, it remains unclear the role played by AI in shaping VCC and VCD in socio-technical networks. Existing studies often focus on customer perceptions rather than the professional perspective, have found mixed results on the opportunities and tensions that arise when AI becomes a third actor in the relationship between brands and customers (Kim, 2025). Moreover, while computational text analysis and topic modelling are increasingly used to study digital communication, few works integrate these techniques with interpretive qualitative analysis to examine how AI-related narratives organize around relational dimensions such as trust, authenticity, and value creation (Mele et al., 2021).

This paper tries to address this gap by providing a better understanding of the role of AI in brand–customer relationships. In particular, the paper represents a first attempt to conceptualize AI as an actant that augments the co-creation process, thereby better supporting the brand-customer relationship. The "augmented co-creation" that the study conceptualizes describes a socio-technical configuration in which AI does not merely support existing interactions but actively extends and conditions the relational space in which trust, authenticity, and value are negotiated among brands and customers. Drawing on ten semi-structured interviews with practitioners engaged in AI-based communication and customer interaction, the study adopts a qualitative–computational research design that combines semantic network analysis, Latent Dirichlet Allocation (LDA) topic modelling, sentiment analysis, and interpretive reading (Andreotta et al., 2019; Nelson, 2020). This mixed analytical strategy allows us to uncover latent thematic structures in practitioners' discourse and interpret how AI is positioned as both an enabler and a disruptor of VCC across key relational dimensions.

The study makes three main contributions. First, it advances an ANT view of AI as a relational actant in value networks, showing how its involvement reconfigures the brand–customer dyad into a broader socio-technical network (Gutiérrez, 2024; Kim, 2025). Second, it refines the notion of augmented co-creation by theorizing the ambivalent ways in which AI simultaneously extends and constrains the network of actors and relationships through which value is co-created or co-destroyed (Li & Zhu, 2024; Castillo et al., 2021). Third, it illustrates how qualitative–computational methods can be mobilized to map narrative frames of VCC and VCD in practitioners' discourse, offering a scalable yet interpretive approach to studying AI-mediated marketing interactions (Baden et al., 2022).

2. Theoretical background

The concept of VCC has its roots in SDL, which posits that value emerges from the relational exchanges that occur between firms and customers (Vargo & Lusch, 2008). More specifically, SDL underscores the central role of mobilizing operant resources, such as knowledge, skills, and increasingly algorithms, to co-create value through interactions: individuals' behaviors are shaped both by the value they perceive in relational interactions and by the value they actively co-create in engaging with firms' production activities (Payne et al., 2008; Vargo & Lusch, 2016). Consequently, value is not predetermined during production but rather emerges from the interactive integration of resources within specific usage contexts (Grönroos & Voima, 2013). Nevertheless, such interactions can also generate VCD, a condition in which the perceived value decreases for at least one of the actors involved in the relationship, such as resources falling short in integrating themselves due to misalignment, misuse, or unexpected side effects (Plé & Chumpitaz Cáceres, 2010; Echeverri & Skålen, 2011).

Recent research on VCC has highlighted the emerging role of AI in marketing and its potential to amplify VCC (Chandra & Rahman, 2024; Paschen et al., 2021; Dwivedi et al., 2021). AI is characterized by its ability to sense, reason, and adapt through continuous learning and interaction with human users (Huang & Rust, 2021; Haenlein & Kaplan, 2021). Within the SDL

perspective, AI can thus be conceptualized as an operant resource – rather than an operand one, which is a static resource – because it is capable of acting upon other resources, learning from interactions, and autonomously adapting its behavior to co-create value. In this sense, AI enables the VCC process to become more interactive, adaptive, and experiential, where humans, algorithms, and brands jointly create value (Peltier et al., 2024). Indeed, AI can act as a relational and cognitive agent that mediates interactions, learns from behavioral data, and adapts its communication and offerings in real time (Mele et al., 2021). Furthermore, with the rise of AI algorithms that are "designed to autonomously make decisions and act with the ability to pursue complex goals under limited supervision" (Finn & Downie, 2025, p. 7), AI will become increasingly central in mediating relationships between brands and customers (Kim, 2025).

In marketing practice, AI systems support a broad spectrum of co-creative activities: from recommendation engines that align offerings with evolving preferences and contexts (Grewal et al., 2021), to generative GenAI tools augmenting firms' and users' content creation, co-authoring messages and assets that better fit situational needs (Kirkby et al., 2023), or substitute human service even in physical retail settings (Pillai et al., 2020). Such AI systems expand customers' resource accessibility through data-driven insights, extend their engagement via adaptive interfaces such as service robots and conversational chatbots (Kot & Leszczynski, 2022; Song & Kim, 2022), and augment their agency by assisting their decision-making processes (Little et al., 2025). In this sense, AI operates as an intelligent interface between firms and customers, co-shaping the choice architecture that underpins marketing decisions (Mele et al., 2021).

Nevertheless, AI adoption can also result in VCC when resources are misintegrated or service processes fail, especially in technology-mediated interactions where opaque or miscalibrated algorithms lead to unintended adaptations and customer resource loss, triggering anger and dissatisfaction (Castillo et al., 2021). For example, disclosing chatbot identity before an interaction may significantly decrease purchase rates because customers infer lower empathy and competence (Luo et al., 2019). Similarly, disclosing that advertisements were created using GenAI seems to decrease the perception of authenticity and trust, resulting in negative attitudes toward the brand and lower purchase intentions (Brüns & Meißner, 2024; Ali et al., 2025). This mechanism, often referred to as algorithm aversion, can backfire on the relationship between the brand and the customer, undermining their co-creative interaction (Castelo et al., 2019). More often, VCC and VCD within the same service encounter, forming a continuous loop in which actors assess, based on the interaction context, whether their well-being has been enhanced or diminished (Hsu et al., 2021).

In this context, the Actor–Network Theory (ANT) (Latour, 1996) is useful to explain when resource exchanges lead to VCC or VCD. The ANT views networks as chains of associations among human and nonhuman actors, better referred to as actants, meaning any entity that can produce effects through its ties with the other entities in the network (Latour, 2005). The outcomes of these network interactions depend on translation, which is the ongoing process by which heterogeneous actants align their needs, identities, and activities so that their associations stabilize, despite misunderstandings and power shifts (Li & Zhu, 2024; Fritz et al., 2020). According to Callon (1984), translation proceeds through four interdependent moments: problematization (defining the issue and the actors involved), interessement (deploying devices and strategies to align actors' interests), enrolment (negotiating and securing acceptance of roles and scripts), and mobilization (stabilizing agreements so the network can act collectively). When these moments of translation hold, programs are understood, and interests align. In this lens, AI algorithms, datasets, interfaces, and brands interact with customers and employees to execute programs, which are scripts, data, and routines that organize actions (Gutiérrez, 2024). AI is thus an actant and often a social intermediary that carries on programs across the network (Gutiérrez, 2024), especially because AI enables the integration of resources and the VCC process.

Nevertheless, it is still unclear how AI influences the VCC/VCD process. In fact, on the one hand, misaligned translations among key actors can result in algorithmic bias from "quantity–

value" imbalances in training data, unauthorized/illicit uses enabled by tool–content collusion and interface exploitation, a collapse of public trust as AI can outpaces platform verification, and privacy violations stemming from large-scale collection of user-generated and even private data (Li & Zhu, 2024). Consequently, if the system surfaces, for instance, irrelevant or culturally inappropriate recommendations, a translation may falter and AI may become a mediator of VCD by transforming meanings and triggering resistance (Gutiérrez, 2024; Li & Zhu, 2024). On the other hand, when data sources, platforms, and AI algorithms are interdependent actants whose interests are aligned through translation value can be created. With alignment in translation, AI acts as an intermediary that reliably executes programs, such as personalized suggestions, supporting the integration and co-creation of consonant resources (Topsakal & Çuhadar, 2024; Gao & Liu, 2023).

According to recent literature, a potential solution to make networks in which AI is involved more stable – and thus create the conditions for VCC – includes establishing network leadership that facilitates cross-departmental collaboration and builds layered governance to align stakeholders around responsible AI principles, such as transparency, accountability, and human oversight (Fang et al., 2026). Furthermore, AI can enable VCC when heterogeneous human and non-human actors are continuously aligned and mobilized through decentralized governance across the GenAI lifecycle, user empowerment via iterative feedback, the use of trusted agents to stabilize relationships, and usability improvements such as integrating the tool into widely used social platforms (Song et al., 2025).

3. Methodology

This study adopts a qualitative–computational approach (Andreotta et al., 2019; Nelson, 2020) to explore how AI is reshaping brand–customer relationships and enabling new forms of augmented co-creation. The research design integrates interpretive qualitative analysis with computational text mining techniques, allowing both the identification of latent thematic structures and the interpretation of underlying meaning patterns within professionals' discourses (Baden et al., 2022).

The empirical material consists of ten semi-structured interviews with marketing professionals and managers actively engaged in AI-based brand communication and customer interaction practices. The participants were selected through purposive sampling to ensure theoretical and professional heterogeneity across sectors (e.g., retail, digital marketing, and consulting). Each interview lasted between 45 and 60 minutes and was conducted via video conferencing. The interview protocol explored themes such as (a) the role of AI tools in daily marketing practices, (b) perceived opportunities and challenges in human–AI collaboration, and (c) the implications for brand authenticity, trust, and VCC. All interviews were audio-recorded and fully transcribed verbatim, resulting in a corpus of approximately 27,000 words.

The analytical process was conducted in five phases:

1. Preprocessing: Interview transcripts were normalized through tokenization, lemmatization, and stopword removal to ensure linguistic consistency and comparability across texts.
2. Semantic Network Analysis: The co-occurrence of key terms and their cosine similarities were mapped to visualize the conceptual relationships among main constructs such as AI, trust, value, human, and brand.
3. Topic Modeling: A Latent Dirichlet Allocation (LDA) model was implemented to detect recurrent discursive themes. The number of topics was optimized using coherence and perplexity scores, achieving statistical robustness and semantic interpretability.
4. Sentiment and Interpretive Analysis: For each topic, representative quotations were extracted, and sentiment analysis was performed to capture the affective tone of

narratives. These results informed an interpretive reading of the tensions between efficiency, authenticity, communication, and creativity

5. Conceptual Synthesis: Findings were integrated into a conceptual framework of augmented co-creation, illustrating how AI acts as a communicative and relational actor mediating human–brand interactions and shaping co-creation/co-destruction dynamics.

4. Results

The preliminary phase of data preprocessing enabled a first overview of the textual corpus collected through the ten semi-structured interviews. Prior to the modeling stage, interview transcripts were normalized and lemmatized to ensure lexical consistency and reduce linguistic noise, in line with established NLP preprocessing standards (Haddi et al., 2013). Figure 1 shows the most frequent words before and after the cleaning process. Prior to normalization, the text was dominated by high-frequency stopwords (e.g., the, to, and), which provided little semantic information. After applying lemmatization and stopword removal, the vocabulary became more representative of the research domain, highlighting keywords such as AI, people, companies, customer, data, brand, and value. This shift confirms the effectiveness of the cleaning process in isolating the substantive dimensions of the discourse, particularly those related to the relational and technological facets of AI-mediated marketing interactions.

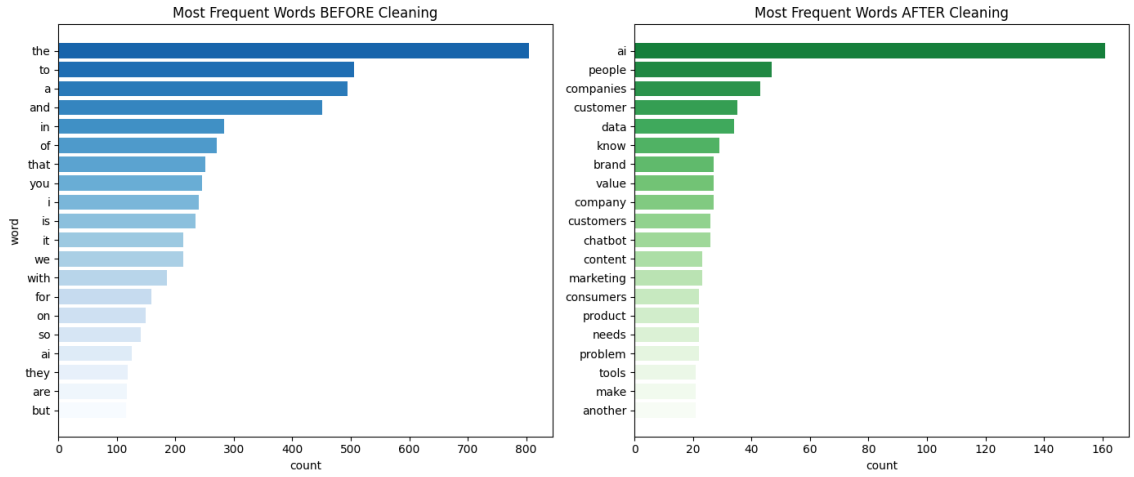


Figure 1. Word frequency distribution before and after text cleaning

An exploratory sentiment analysis was also carried out to gauge the emotional tone of the interviews (Liu, 2020). As illustrated in Figure 2, most participants expressed broadly positive views on the use of AI in marketing (seven cases), emphasising gains in efficiency, greater personalization, and improved value delivery. A smaller group offered more neutral comments (two cases), treating AI mainly as an operational addition rather than a major shift. Only one interviewee voiced negative sentiments, typically linked to worries about authenticity, reduced creativity, or a weakening of human interaction. Hence, the distribution indicates that practitioners tend to see AI as a useful and supportive resource in brand–customer relations, while still remaining alert to its ethical and relational downsides.

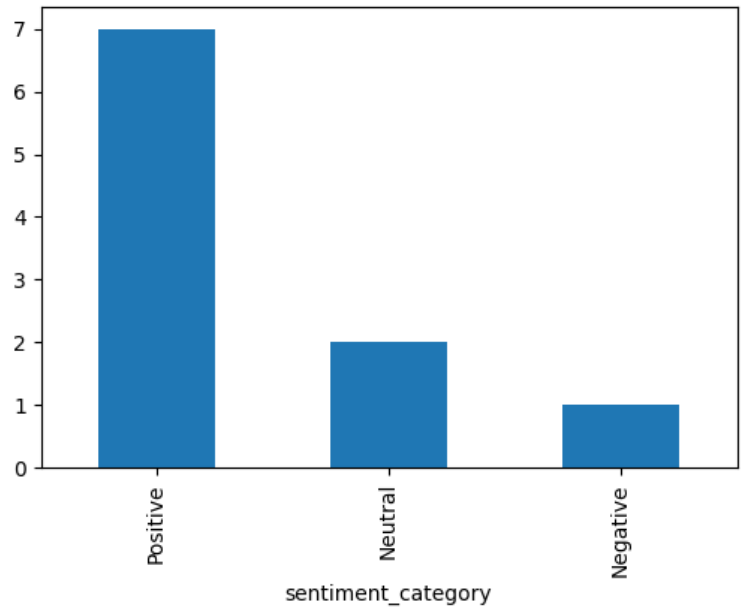


Figure 2. Sentiment distribution across interviews, source: authors' elaboration

To uncover the underlying thematic structures within professionals' narratives, a LDA model was applied to the preprocessed corpus. After testing multiple topic configurations, the model with five topics (n = 5) was selected as the most coherent and semantically interpretable, based on coherence (0.419) and perplexity (503.9) scores. The extracted topics reveal distinct but interconnected dimensions of how AI is transforming brand–customer relationships. Table 1 shows the topics extracted from the LDA model.

Topic	Interpretive Label	Main Keywords	Representative Quotation	Dominant Sentiment
1	AI-enabled trust and value creation	technology, companies, brand, trust, value, intelligence, artificial, customers	AI creates trust and value through personalized, transparent interactions.	Positive
2	Human–AI conversational co-creation	bot, machine, chatbot, people, company, product, know, value	AI acts as a skilled colleague, enhancing human creative work.	Positive
3	Dehumanization in AI-mediated communication	customers, receive, attention, access, creation, tasks, communicate, answers	Automated communication feels efficient but lacks human authenticity.	Negative
4	AI-mediated customer interaction	brand, company, bit, chatbot, project, costumers, needs, data	AI-driven chatbots manage customer needs and collect data, allowing companies to align brand communication with real-time insights.	Neutral
5	Conversational AI and customer–brand relationship	relationship, customers, conversational, interfaces, purchasing, product, experience, customer	Conversational AI strengthens trust and improves the buying experience.	Positive

Table 1. Topics extracted from the LDA model and interpretive synthesis, source: authors' elaboration

The five topics collectively illustrate the ambivalent nature of AI-driven interactions, oscillating between augmentation and dehumanization (Castillo et al., 2021; Mele et al., 2021; Chandra & Rahman, 2024). Topics 1, 2, and 5 emphasize the positive potential of AI as a relational and cognitive partner that enhances trust, personalization, and co-creative collaboration. Conversely, Topic 3 reveals critical narratives around dehumanization, where excessive automation undermines perceived authenticity and empathy in communication. Topic 4 acts as a transitional theme, describing how firms use chatbots and data-driven interfaces to mediate customer interactions—an operational middle ground between efficiency and human connection.

These themes depict AI as a hybrid actor within the brand–customer ecosystem: simultaneously a technological enabler of VCC and a potential source of relational tension when human qualities are perceived as replaced rather than enhanced.

5. Discussion and implications

The findings delineate a multifaceted model of augmented co-creation in which AI, brands, and customers emerge as interconnected actors within an evolving socio-technical network (Latour, 2005; Mele et al., 2021). The LDA-derived frames and interpretive analysis collectively show that AI functions not merely as a technological enabler but as a relational actant – a communicative and cognitive agent mediating exchanges between human and brand actors (Gutiérrez, 2024; Peltier et al., 2024). The findings echo the idea of translation in ANT: value is created when human and technological interests evolve together, and it weakens when this coordination falters (Callon, 1984; Li & Zhu, 2024).

Throughout the analysis, three relational dimensions (i.e. trust, authenticity, and value creation) shape how actors interact. Positive accounts describe AI as a tool that can foster trust through more personalised communication (Gao & Liu, 2023), support creative work and thus enhance value (Little et al., 2025), and encourage exchanges between brands and customers (Kot & Leszczyński, 2022; Song & Kim, 2022). Critical perspectives, however, warn that excessive automation may reduce the human element and weaken perceptions of authenticity (Brüns & Meißner, 2024; Castillo et al., 2021). These views depict AI as a technology that can strengthen marketing relationships but also unsettle them when it undermines human involvement (Chandra & Rahman, 2024).

The resulting conceptual map integrates these insights by visualizing how each actor contributes to trust and value formation through distinct yet overlapping programs of interaction (Figure 3). Brands deploy AI to extend communicative reach and efficiency; customers negotiate their sense of authenticity and agency in response to AI-mediated interfaces; and AI systems dynamically translate inputs between them, shaping the co-creation or co-destruction of value depending on the quality of alignment (Echeverri & Skålen, 2011; Plé & Chumpitaz Cáceres, 2010).

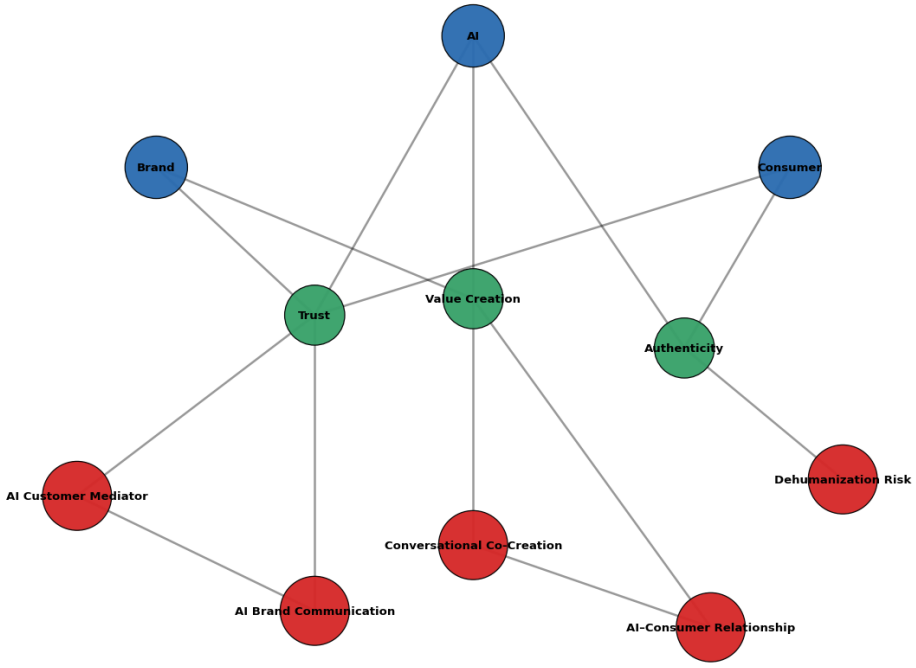


Figure 3. Conceptual map of Augmented co-creation, source: authors' elaboration

The figure illustrates how brands, customers, and AI interact within a shared socio-technical network. The blue nodes represent these three actors, whose connections are shaped by the relational dimensions shown in green – trust, authenticity, and value creation. The red nodes capture the narrative frames that emerged from the topic analysis, highlighting how practitioners see AI both as an enabler of collaboration and a potential source of friction. The network suggests that VCC holds when human and non-human actors stay aligned, while misalignments tend to trigger value loss.

From a managerial standpoint, the findings point to the importance of introducing AI in ways that strengthen relationships rather than simply optimise processes (Fang et al., 2026). This means creating conditions in which transparency is the norm, users feel in control, and human–AI interaction becomes a source of support rather than tension (Haenlein & Kaplan, 2021; Song et al., 2025). Approaches like these help firms retain trust and authenticity while still taking advantage of AI's capacity to adapt and scale.

On the conceptual side, the study brings together insights from SDL (Vargo & Lusch, 2016) and ANT to show how AI reshapes the contours of value creation within marketing systems. As AI tools gain more autonomy and influence, a promising avenue for future work is to examine how these socio-technical networks continue to develop and reorganise over time.

Keywords: Artificial Intelligence; brand-customer relationship; value co-creation; value co-destruction; ator-network theory

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Rethinking Emotional Analysis for Digital Management Convergenze e Divergenze tra Intelligenza Ermeneutica, Simbolica e Neurale

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1. Introduzione

Negli ultimi anni, la convergenza tra intelligenza artificiale, metodologie qualitative e ricerca manageriale ha ridefinito le modalità di esplorazione e interpretazione delle emozioni nei contesti organizzativi e di mercato. Una tale intersezione ha promosso un dialogo sempre più articolato tra forme eterogenee di razionalità – umana, simbolica e neurale – configurando un paradigma di analisi capace di coniugare la sottigliezza interpretativa della ricerca qualitativa con la capacità di generalizzazione dei modelli computazionali (Bankins et al., 2024; Halpin, 2024). All'interno di tale cornice, la collaborazione tra esseri umani e sistemi di intelligenza artificiale emerge in quanto dibattito focale del management contemporaneo. Se da un lato si riconosce il potenziale delle tecnologie cognitive nell'aumentare di produttività ed efficienza, dall'altro si delineano con chiarezza le sfide legate al mantenimento di un'esperienza lavorativa autenticamente umana, fondata su competenze relazionali ed emotive (Bankins et al., 2024).

Il presente lavoro, attualmente in corso di sviluppo, si propone di esplorare in che modo differenti logiche di codifica emotiva – ermeneutica (umana), simbolica (basata su conoscenza esplicita) e neurale (fondata su apprendimento statistico) – interpretino e rappresentino le emozioni espresse nel linguaggio naturale. L'indagine si colloca nell'ambito degli studi sulle emozioni relazionali nei contesti digitali e nel più ampio campo dell' affective computing (Picard, 2000), applicata al comportamento del consumatore e dei dipendenti (Nizette & Hammedi, 2025). L'obiettivo del lavoro è duplice: comprendere in che misura diverse forme di intelligenza convergano o divergano nell'interpretazione dell'esperienza affettiva, nonché analizzare le implicazioni di tali dinamiche per le pratiche manageriali, nei domini del marketing e della gestione delle risorse umane. In molteplici contesti organizzativi, difatti, la capacità di riconoscere e interpretare con precisione le emozioni espresse nel linguaggio degli attori coinvolti – che si tratti di colleghi, collaboratori o membri di comunità professionali online – costituisce una risorsa conoscitiva sempre più strategica. Le manifestazioni emotive che emergono da feedback formali, conversazioni informali, strumenti digitali di collaborazione e interazioni nei network professionali contribuiscono infatti a delineare aspetti chiave del clima interno, della qualità delle relazioni e dei processi di coordinamento sia entro sia tra le organizzazioni (Sahut & Laroche, 2025; Zerbini et al., 2007). Questa abilità, legata alle componenti cognitive e sociali dell'intelligenza emotiva, assume un rilievo particolare nei contesti ibridi e virtuali, in cui la comunicazione testuale o mediata accresce la necessità di saper decodificare correttamente i segnali affettivi impliciti.

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Secondo il World Economic Forum il World Economic Forum (2023, 2025), competenze come empatia, consapevolezza di sé e capacità comunicativa figurano tra quelle maggiormente richieste ai leader del futuro, anche in ambienti organizzativi caratterizzati da automazione e largo impiego dell'IA. Ciò conferma il ruolo centrale della comprensione delle emozioni altrui come base di un management efficace e orientato alla persona. Allo stesso tempo, la crescente integrazione di sistemi di IA generativa nelle imprese – dai chatbot alle applicazioni di sentiment analysis – rende necessario garantire trasparenza e affidabilità nei processi automatizzati di riconoscimento emotivo. Nel settore dei servizi, in particolare, si rafforza la richiesta di soluzioni di XAI in grado di mantenere elevata la fiducia di clienti e dipendenti nelle analisi algoritmiche (Chamola et al., 2023; Kalasampath et al., 2025).

Le organizzazioni internazionali, tra cui il Parlamento Europeo e l'OECD, richiamano l'attenzione sui rischi connessi a un impiego non regolato delle tecnologie di affect recognition, sollecitando l'adozione di procedure di validazione che ne assicurino accuratezza, affidabilità e conformità ai principi etici (OECD, 2025; Ünver, 2024). In tale quadro teorico si consolida l'idea di un approccio integrato, nel quale la potenza analitica dell'intelligenza artificiale si combini con la sensibilità interpretativa dell'intelligenza umana, in una prospettiva di collaborazione cognitiva che produce forme di conoscenza situate e riflessive (Harfouche et al., 2023; Jarrahi et al., 2023).

Il work in progress qui presentato si colloca all'interno di questa linea di ricerca e concentra l'attenzione sull'analisi del linguaggio emotivo che emerge da interviste qualitative relative alle reazioni suscitate da post su LinkedIn in cui altri utenti celebrano traguardi professionali. Tale contesto, divenuto parte integrante della vita lavorativa digitale, rappresenta un terreno empirico particolarmente adatto per osservare come differenti epistemologie – umana, simbolica e neurale – decodifichino la dimensione emotiva. L'indagine si articola attorno a due interrogativi principali:

RQ1**:** Quali emozioni vengono identificate dai tre approcci di codifica (ermeneutico, simbolico e neurale) nell'analisi delle reazioni ai post professionali su LinkedIn?

RQ2: In quale misura e con quali differenze i tre approcci convergono o divergono nella classificazione delle emozioni?

Nel contesto della ricerca manageriale contemporanea, tale orientamento risponde alla direzione degli sviluppi più recenti dell'intelligenza artificiale spiegabile e collaborativa, secondo cui la convergenza tra risultati umani e algoritmici può rafforzare la fiducia nell'integrazione dell'IA nei processi decisionali, a condizione che le responsabilità interpretative restino chiaramente definite (Nizette & Hammedi, 2025).

2. Impostazione metodologica e struttura della ricerca

Per affrontare le domande di ricerca proposte, il work in progress adotta un disegno qualitativo esplorativo fondato su una triangolazione epistemica che integra tre modalità distinte di lettura di uno stesso corpus testuale. L'assunto di partenza è che la comprensione dei processi emotivi risulti più solida e articolata quando prospettive interpretative eterogenee – umana, simbolica e neurale – vengono poste in relazione reciproca. La triangolazione, intesa come impiego simultaneo di metodi o fonti di dati differenti per convergere su un medesimo fenomeno (Carter et al., 2014), consente di mitigare i limiti di ciascun approccio valorizzandone al contempo i punti di forza, producendo una validazione incrociata delle evidenze empiriche.

Il modello metodologico si ispira ai recenti sviluppi della Computational Grounded Theory (Nelson, 2020), che propone un ciclo iterativo di affinamento reciproco tra algoritmi di machine learning e analisti umani per la costruzione teorica. Secondo Nelson (2020), l'inserimento di tecniche computazionali nei metodi qualitativi può essere concepito come un processo di co-generazione: i sistemi artificiali individuano pattern ricorrenti nei dati testuali, mentre l'analista umano ne interpreta il significato e ne valuta la generalizzabilità, creando un circuito virtuoso di scoperta e verifica concettuale. Seguendo questa logica, il nostro disegno di ricerca impiega

algoritmi simbolici e modelli neurali per identificare configurazioni affettive latenti, successivamente confrontate con la codifica umana. Nei casi di divergenza interpretativa, si procede a una rilettura dei testi originari per comprendere la natura dello scarto e, se necessario, a un raffinamento dei criteri di codifica. Questo procedimento induttivo e iterativo richiama i principi del pattern refinement illustrati da Nelson (2020) e la raccomandazione di Venugopal et al. (2025) di impiegare metodi uomo-macchina per generare insight teorici innovativi nelle scienze manageriali e organizzative.

Contesto e procedura di codifica

Il campo empirico riguarda le reazioni emotive ai post celebrativi di successi professionali pubblicati su LinkedIn. È stato costruito un corpus di interviste semi-strutturate a professionisti appartenenti a diversi settori, invitati a descrivere le proprie reazioni emotive alla lettura di tali contenuti. Le trascrizioni di queste interviste costituiscono la base empirica su cui sono state applicate, in parallelo, tre procedure distinte di codifica delle emozioni.

La prima, di natura ermeneutica, si fonda sulla codifica qualitativa manuale condotta da un ricercatore. L'analisi ha seguito un approccio tematico focalizzato sulle categorie emozionali emergenti, assumendo come riferimento la ruota delle emozioni di Plutchik (1982), che distingue otto emozioni primarie e un insieme di emozioni complesse, derivate dalle combinazioni delle primarie. In una prima fase esplorativa, il ricercatore ha esaminato ciascuna trascrizione annotando le emozioni percepite e delineando un sistema preliminare di codici. Successivamente, le definizioni operative dei codici sono state affinate e applicate sistematicamente all'intero corpus, producendo una matrice che costituisce la baseline per il confronto con le codifiche generate artificialmente.

In seguito, il corpus è stato sottoposto al sistema di intelligenza artificiale simbolica DEGARI 2.0 (Dynamic Emotion Generator And Reclassifier), un motore di ragionamento basato sul commonsense progettato per l'attribuzione e la riclassificazione delle emozioni (Lieto et al., 2023, 2024). Il funzionamento di DEGARI si fonda su un'ontologia emozionale ispirata alla teoria di Plutchik e arricchita da un lessico esteso di termini affettivi, nonché su un insieme di regole logiche che consentono di inferire emozioni complesse a partire da quelle di base. Il sistema analizza il testo individuando parole e frasi semanticamente correlate alle emozioni primarie, integrando risorse linguistiche di dominio pubblico come il NRC Emotion Lexicon (Mohammad, 2018). Quando rileva indicatori semantici riconducibili, ad esempio, a "rabbia" o "fiducia", DEGARI attiva le relative categorie di base e, attraverso regole ontologiche, è in grado di inferire emozioni derivate: la co-occorrenza di indicatori di gioia e fiducia può, ad esempio, generare l'inferenza di ammirazione o amore (gioia + fiducia). L'output del sistema consiste in una lista di etichette emotive associate a ciascun testo.

La terza modalità di codifica impiega un modello linguistico neurale di ampia scala (LLM), rappresentato, in questo studio, da GEMINI 3 PRO. Gli LLM si basano su architetture di rete neurale addestrate su vasti corpora testuali, acquisendo la capacità di comprendere contesti linguistici complessi e di generare risposte coerenti (Naveed et al., 2025). L'utilizzo di GEMINI 3 PRO nell'analisi emotiva è stato mediato da una strategia di prompt engineering (Wafa et al., 2025; Xu et al., 2024), che specificava con precisione le istruzioni operative da seguire. Il prompt forniva al modello indicazioni esplicite sull'adozione della tassonomia di Plutchik e sul formato atteso dell'output, chiedendo di identificare e descrivere le emozioni di base e le loro combinazioni complesse, nonché di motivare le inferenze attraverso brevi commenti. Il prompt utilizzato è il seguente:

"Ruolo e contesto: Agisci come un ricercatore accademico esperto di metodologia della ricerca qualitativa, specializzato in analisi delle emozioni e linguistica del discorso. Ti verranno fornite risposte di intervistati provenienti da un'indagine qualitativa. Il tuo compito è identificare e descrivere le emozioni espresse in ciascuna risposta, facendo riferimento al modello del fiore di

Plutchik, che include le otto emozioni di base (gioia, fiducia, paura, sorpresa, tristezza, disgusto, rabbia, anticipazione) e le loro combinazioni complesse.

Istruzioni operative:

Identifica tutte le emozioni di base rilevabili (una o più, se coesistono nel testo).

Se rilevi combinazioni di emozioni che generano emozioni complesse o derivate (es. amore = gioia + fiducia; senso di colpa = tristezza + paura), segnalale esplicitamente.

Fornisci una breve descrizione che spieghi il ragionamento alla base delle emozioni individuate, riferendoti a parole, tono o contesto semantico.

Evita qualsiasi giudizio o interpretazione psicologica soggettiva.

Formato di output richiesto:

RISPOSTA INTERVISTATO: [testo della risposta]

EMOZIONI DI BASE: [elenco di una o più emozioni di base rilevate]

EMOZIONI COMPLESSE (se presenti): [elenco di emozioni complesse e relative combinazioni]

DESCRIZIONE: [spiegazione sintetica che giustifica l'analisi emotiva]"

Pur offrendo analisi articolate e coerenti, gli LLM rimangono modelli in opachi: i processi interni che conducono a un'etichettatura specifica – ad esempio, distinguere tra ansia e anticipazione – non sono direttamente osservabili, se non per abduzione. Questa opacità, unita alla possibile influenza dei dati di addestramento, costituisce un limite noto. Un modello può, infatti, riprodurre associazioni apprese da fonti web che non necessariamente riflettono le intenzioni dell'intervistato. Per mitigare tali rischi, il prompt è stato formulato in modo da ancorare l'analisi al contesto semantico specifico del testo, limitando inferenze basate su associazioni generiche. È opportuno ricordare che modelli di ultima generazione come GEMINI 3 PRO mostrano prestazioni sensibilmente superiori rispetto ai LLM precedenti nei compiti di sentiment analysis ed emotion detection, grazie a architetture più avanzate e dataset di addestramento più diversificati (Mallia, 2025; Yu et al., 2025).

3. Risultati preliminari e analisi comparativa delle codifiche emotive

L'analisi comparativa delle codifiche emotive prodotte dai tre approcci restituisce un quadro articolato in cui convergenze robuste coesistono con divergenze teoricamente istruttive (Tabella 1). Tutti i metodi si ancorano alla medesima architettura concettuale – il fiore delle emozioni di Plutchik – e riconducono le manifestazioni affettive a insiemi di categorie largamente sovrapponibili sul piano delle famiglie primarie. Questa prima evidenza è non banale: la triangolazione consente di ottenere una mappa coerente dei nuclei affettivi ricorrenti nelle narrazioni degli intervistati, confermando che, al di là della specifica lente interpretativa, certi insiemi emozionali si attivano con una regolarità che risponde positivamente alla RQ1. Al contempo, la comparazione mette in luce differenze nel livello di dettaglio, nelle combinazioni tra emozioni e nella coerenza categoriale con cui ciascun metodo restituisce gli stati affettivi offrendo, così, elementi puntuali per la RQ2.

Sulle emozioni positive, in particolare su fiducia e gioia, ricercatore e DEGARI convergono in modo sistematico. La fiducia emerge come sentimento ricorrente e spesso centrale: l'osservazione di successi altrui su LinkedIn può attivare fiducia in sé – quando la risposta è orientata all'auto-efficacia – o riconoscimento della fiducia riposta nell'altro – quando prevale l'ammirazione. La gioia accompagna con frequenza tale dinamica, talora insieme a ottimismo o serenità. L'architettura semantica di DEGARI intercetta con regolarità trust in presenza di espressioni di sicurezza, stima o affidamento, replicando con accuratezza il codice "fiducia" applicato dal ricercatore; quando i testi umani segnalano intrecci di fiducia e gioia (come, ad esempio, "Sono felice per il successo del mio collega, mi fa pensare che anche io potrei farcela"), il sistema simbolico ricompone l'assetto in etichette composte (es. ammirazione). In questo segmento, la vicinanza tra razionalità ermeneutica e simbolica indica che un motore knowledge-

based ben calibrato può produrre etichette allineate al significato contestuale dei passaggi testuali, in modo non distante dal percorso inferenziale deliberato del ricercatore. GEMINI 3 PRO, pur allineandosi sui due poli positivi, tende a leggere fiducia come un equilibrio dinamico tra apertura e difesa e a includere, accanto alla positività espressa, tracce di cautela o di sollievo rispetto a timori impliciti.

Particolarmente istruttiva è la trattazione di anticipazione/aspettativa, emozione ponte che connette orientamento positivo e tensione cognitiva. Molti intervistati descrivono la coesistenza di curiosità verso le storie di successo e di attesa rispetto al proprio futuro professionale. Nelle codifiche umana e simbolica tali passaggi si attestano prevalentemente su anticipazione – intesa come disposizione proattiva al futuro – o su un interesse cognitivo privo di tonalità marcatamente negative; quando emergono sfumature di apprensione, il ricercatore le distingue con etichette dedicate, mentre DEGARI tende a segnalarne la bassa intensità o a non attivare emozioni negative in assenza di marcatori lessicali netti. GEMINI 3 PRO, invece, scompone più spesso l'anticipazione in configurazioni ambivalenti, affiancando alla spinta propulsiva del futuro indizi di insicurezza o lieve frustrazione. Il pattern si ripete quando l'interesse per contenuti formativi o critici ("spunti che mi fanno riflettere e mi incuriosiscono sul mio percorso") viene codificato come interesse/anticipazione dal ricercatore e da DEGARI, mentre GEMINI 3 PRO aggiunge una lieve ansia di miglioramento. È ragionevole ipotizzare che il modello neurale, avendo appreso distribuzioni d'uso su ampie basi testuali, completi l'aspettativa con emozioni che nella pratica linguistica tendono ad accompagnarla, accentuando la dimensione tensiva. Ne risulta una divergenza epistemologica: simbolico e umano privilegiano la funzione di sorpresa e aspettativa, il neurale accentua la componente di tensione o incertezza; la concordanza sull'anticipazione come emozione ponte rimane, ma la granularità del dettaglio diverge rispondendo, così, alla RQ2.

La comparazione delle emozioni complesse conferma il medesimo schema di (quasi) allineamento tra umano e simbolico, con un comportamento neurale più estensivo. La speranza, richiamata spontaneamente in formulazioni come "mi dà speranza vedere che si può avere successo restando autentici", è trattata secondo la struttura di Plutchik come anticipazione+fiducia: il ricercatore la codifica tipicamente combinando i due costrutti – talvolta con l'etichetta esplicita di speranza – e DEGARI opera in modo analogo, generando "ottimismo" o "speranza" a seconda delle sfumature. GEMINI 3 PRO identifica anch'esso speranza/ottimismo come baricentro semantico ma, talora, associa alla tonalità positiva una componente di disapprovazione o lieve disgusto verso toni celebrativi percepiti come eccessivi, andando oltre la singola risposta. Analogo è l'esito sull'ammirazione, rispetto alla quale i tre metodi risultano generalmente coincidenti quando il segnale testuale è netto. Le divergenze si ampliano, invece, per l'invidia. Gli intervistati descrivono sia forme "benigne", legate a stimolo e ispirazione, sia forme "maligne", con tratti di rabbia e tristezza. Ricercatore e DEGARI si mostrano sensibili al contesto pragmatico e modulano le etichette distinguendo i casi di invidia come spinta autopoietica da quelli di disagio competitivo; GEMINI 3 PRO riconosce entrambe le varianti ma tende ad accentuare la componente conflittuale, facendo emergere tracce di frustrazione anche in enunciati globalmente costruttivi. Questo scarto suggerisce che il modello neurale, pur padroneggiando la distinzione concettuale, sovrastimi la probabilità di co-occorrenza di stati negativi quando intercetta lessici tipici dell'invidia.

Sul versante delle reazioni avverse a post percepiti come eccessivi, autoreferenziali o poco autentici, la distanza tra approcci si amplia ulteriormente. Le narrazioni degli intervistati includono spesso fastidio verso contenuti ritenuti stucchevoli o poco autentici. Il ricercatore interpreta tali passaggi principalmente come disgusto – avversione di base – accompagnato da disprezzo – componente valutativa di svalutazione; DEGARI, ricostruisce la coppia attivando disgusto e, quando compaiono marcatori di irritazione, anche rabbia, da cui discende l'etichetta disprezzo. GEMINI 3 PRO riconosce queste traiettorie ma vi affianca categorie semantiche contigue (es. disapprovazione) e, talvolta, introduce elementi ulteriori come lieve rimorso o

tristezza per aver espresso giudizi severi, ampliando il profilo affettivo oltre i confini del lessico plutchikiano.

Pertanto, in questa prima analisi, emerge che, rispetto alla RQ1, tutte le letture – ermeneutica, simbolica e neurale – riconoscono l'intero spettro delle famiglie plutchikiane presenti nel corpus: nelle dinamiche di confronto sociale positivo prevalgono gioia e fiducia, da cui discendono ammirazione, ottimismo e serenità; di fronte a retoriche percepite come artificiose si concentrano disgusto e disprezzo, talora con lieve irritazione; nelle proiezioni al futuro ricorrono anticipazione e fiducia, che compongono speranza; nei dilemmi di esposizione pubblica e timore del giudizio affiorano paura e tristezza; l'invidia, nelle sue varianti benigna e maligna, è riconosciuta trasversalmente. Con riferimento alla RQ2, la convergenza più forte si osserva tra ricercatore e DEGARI mentre GEMINI 3 PRO, pur intercettando le stesse macro-emozioni nella quasi totalità dei casi, diverge su due assi: la proliferazione di etichette per singolo estratto e la propensione a restituire co-occorrenze multiple in luogo di una categoria dominante. Questo comportamento riflette la natura statistico-probabilistica del modello, orientata a coprire lo spazio semantico delle possibilità.

Nel loro insieme, questi risultati – che presentiamo come work in progress – suggeriscono momentaneamente che un sistema simbolico ancorato a un'ontologia solida può avvicinarsi sensibilmente alla sensibilità del ricercatore, mentre un LLM di ultima generazione, pur riconoscendo i medesimi nuclei affettivi, tende a densificare la rappresentazione con componenti aggiuntive e talora latenti.

Famiglia emotiva	**Ricercatore**	**DEGARI (simbolico)**	**GEMINI 3 PRO (neurale)**	**Convergenze**	**Divergenze, virgolettato, note esplicative**
Gioia e Fiducia nei successi altrui (post di traguardi, carriere, etc.)	Codifica fiducia e gioia come asse portante del confronto sociale positivo. Distingue accuratamente tra gioia per l'altro, fiducia in sé e fiducia riposta nel collega.	Intercetta con grande coerenza trust/fiducia quando il testo esprime sicurezza, stima, affidamento, spesso producendo etichette allineate (fiducia, gioia, ottimismo, amore-philia).	Riconosce gioia e fiducia, ma tende ad arricchire con componenti ulteriori (es. cautela, sollievo, equilibrando apertura/difesa).	Forte convergenza sulle famiglie primarie di Plutchik: fiducia + gioia come base di ammirazione, serenità, ottimismo; questo vale per l'intero corpus, specie quando i successi sono percepiti come autentici.	Distonia principale: Gemini eccede in co-occorrenze (fiducia + gioia + sollievo + cautela), mentre ricercatore e DEGARI tendono a una categoria dominante. Esempio: "Sono felice per il successo del mio collega, mi fa pensare che anche io potrei farcela" Ricercatore/DEGARI: fiducia + gioia/ammirazione; GEMINI: aggiunge spesso componenti tensivo–difensive.
Anticipazione/Aspettativa/Interesse (emozione ponte verso il futuro)	Codifica aspettativa/anticipazione prevalentemente in chiave proattiva (curiosità, orientamento al futuro, interesse cognitivo). Quando compaiono sfumature negative (apprensione, ansia), le separa con etichette distinte.	Tende ad attivare anticipazione e interesse con tonalità moderatamente positive; evita di far emergere emozioni negative se il testo non contiene marcatori lessicali netti. Segnala la bassa intensità quando presente.	Scompone molto spesso l'anticipazione in configurazioni ambivalenti, combinando propulsione al futuro con insicurezza, lieve frustrazione, ansia di miglioramento (es. "ansia da prestazione").	Convergenza sulla funzione di "emozione ponte": anticipazione come nodo che connette curiosità, progettualità, riflessione sul proprio percorso.	Divergenza: Ricercatore + DEGARI privilegiano sorpresa/aspettativa come apertura cognitiva; GEMINI accentua la tensione/insicurezza. Esempio: "spunti che mi fanno riflettere e mi incuriosiscono sul mio percorso" Ricercatore/DEGARI: interesse/anticipazione; GEMINI: aggiunge "lieve ansia di miglioramento".

Emozioni complesse positive (speranza, ammirazione, ottimismo)	Tratta speranza secondo Plutchik come anticipazione + fiducia; la codifica spesso come combinazione (anticipazione+fiducia, ottimismo) e, quando il lessico lo consente, usa l'etichetta esplicita di "speranza". Sull'ammirazione, mostra forte sensibilità al contesto (stima autentica vs enfasi artificiale).	Ricostruisce strutturalmente le combinazioni plutchikiane: speranza/ottimismo generati come anticipazione + fiducia, ammirazione come gioia + fiducia. L'output è molto allineato alla logica teorica del ricercatore.	Individua speranza/ottimismo come baricentro, ma espande il profilo affettivo associando talvolta disapprovazione o disgusto lieve verso toni celebrativi eccessivi, andando oltre la singola risposta.	Concordanza generale su: "mi dà speranza vedere che si può avere successo restando autentici" Tutti riconoscono speranza/ottimismo come struttura centrale (anticipazione + fiducia).	GEMINI eccede in "densità semantica": accanto alla speranza introduce valutazioni metadiscorsive (disapprovazione per il tono celebrativo). Ricercatore e DEGARI risultano più "parchi" e aderenti alla micro-unità testuale, GEMINI tende a proiettare sul contesto narrativo più ampio.
Invidia benigna vs maligna (stimolo vs disagio competitivo)	Distingue tra invidia benigna (stimolo, miglioramento, curiosità sul percorso altrui) e invidia maligna (rabbia, tristezza, disagio competitivo). Modula le etichette in base al contesto pragmatico, riconoscendo quando l'invidia funge da spinta autopoietica.	È sensibile al contesto: alterna combinazioni di gioia/anticipazione/fiducia per la forma benigna a disgusto/rabbia/tristezza per la forma maligna. Disprezzo e disgusto emergono quando è esplicito il rifiuto di una forma di invidia "che rode".	Riconosce entrambe le varianti e utilizza esplicitamente la categoria Invidia (rabbia + tristezza), ma tende ad accentuare la componente conflittuale, facendo emergere frustrazione anche in enunciati globalmente costruttivi.	Convergenza concettuale sulla validità della distinzione benigna/maligna, e sul fatto che la prima è spesso descritta come "stimolo" o "curiosità" ("magari un giorno anche io"), mentre la seconda viene riconosciuta e contenuta.	Scarto principale: GEMINI sembra sovrastimare la co-occorrenza di stati negativi quando intercetta lessico legato all'invidia, amplificando rabbia/frustrazione anche dove il ricercatore e DEGARI leggono prevalentemente motivo di miglioramento. Esempio: "L'invidia vera e propria, quella che rode, non mi appartiene" Ricercatore/DEGARI: distanziamento dall'invidia maligna; GEMINI mantiene comunque in background le componenti negative come probabilmente attivabili.
Reazioni avverse a contenuti percepiti come artificiosi, autoreferenziali o "vetrina"	Interpreta il fastidio per post eccessivi come combinazione di disgusto (avversione di base) + disprezzo (valutazione svalutante). Introduce rabbia/irritazione quando il tono viene percepito come ostentativo o manipolatorio.	Ricostruisce la coppia attivando disgusto e, in presenza di marcatori di irritazione, rabbia, da cui deriva l'etichetta disprezzo. Rimane generalmente interno al vocabolario plutchikiano, con buona aderenza ai nuclei semantici negativi.	Riconosce le stesse traiettorie (disgusto, disprezzo), ma vi affianca categorie contigue (es. disapprovazione) e introduce spesso componenti ulteriori: lieve rimorso, tristezza, ansia, talvolta per aver espresso giudizi severi.	Tutti gli approcci concordano sul cluster disgusto–disprezzo come reazione tipica ai post "troppo celebrativi", "vetrine", "televendita del proprio curriculum", "brochure viventi".	Gemini "densifica" la scena affettiva: amplia il profilo oltre il lessico di Plutchik includendo disapprovazione, rimorso, tristezza. Ricercatore e DEGARI risultano più parchi e focalizzati sui vettori disgusto/disprezzo. Esempio: "quelli troppo celebrativi li scorro via"; "non sono per i titoli in maiuscolo e gli emoji a raffica"; "siamo esseri umani, non brochure viventi".
Pressione sociale, confronto e ansia da prestazione	Evidenzia, specie in Int_1 e Int_4, la presenza di aspettativa, vigilanza, apprensione e, nei passaggi esplicitamente critici, paura e tristezza legate al timore del giudizio e alla pressione a mostrarsi sempre performanti. Tuttavia sottolinea	Attiva con parsimonia le emozioni negative (paura, tristezza, rabbia) a intensità bassa e spesso le compensa con fiducia, amore, aspirazione, rispecchiando la presenza di criteri interni e "autostima" implicita.	Esplicita più frequentemente Paura, Ansia, Sottomissione, soprattutto nei riferimenti a "pressione latente", "ansia da prestazione", "narrativa faticosa". Tende a costruire configurazioni in cui l'utente è	Tutti riconoscono la presenza di confronto sociale e percezione di pressione implicita, ma anche il ruolo protettivo dei valori interni (coerenza, etica del lavoro, qualità della ricerca) nel mitigare l'ansia.	Distonia sistematica: GEMINI enfatizza di più il vettore ansioso–sottomissivo, mentre Ricercatore e DEGARI mantengono il fuoco sulla dialettica tra tensione e regolazione (es. "cerco di interpretarla in chiave costruttiva", "non sento il bisogno di mettermi in vetrina"). Questo riflette la

	anche strategie di coping (ridimensionare l'uso della piattaforma, risintonizzarsi sui propri valori).		stretto tra norme sociali e accettazione ("Sottomissione = Paura + Fiducia/accettazione delle norme").		tendenza del modello neurale a completare l'"aspettativa" con emozioni tensionali statisticamente frequenti nei corpora.
Regole implicite, critica alla "narrativa del successo" e desiderio di autenticità	Codifica sistematicamente rabbia, disgusto, tristezza, disprezzo verso la narrativa implicita del "successo permanente", ma li bilancia con fiducia, speranza, ottimismo rispetto alla possibilità di trasformare LinkedIn in uno spazio "più onesto, meno competitivo, più umano e vulnerabile".	Rende questa tensione con combinazioni di fiducia, gioia, aspettativa, ottimismo, amore (per la comunità e per la vulnerabilità condivisa), lasciando in secondo piano la componente di conflitto, pur presente (disgusto/disprezzo a bassa intensità).	Meticolosamente articola disgusto, tristezza, disapprovazione verso la "recita collettiva", la "tendenza sotterranea" a mostrarsi brillanti, accanto a anticipazione, speranza e cluster come Amore, Speranza (anticipazione + fiducia), spesso esplicitati.	Convergenza sull'idea che esistano regole implicite e che la piattaforma incentivi logiche di vetrina/performance, ma anche sull'orizzonte desiderato: più contenuti di percorso, più "non so" e "sto cercando di capire", più vulnerabilità professionale.	GEMINI tende ad esplicitare in maniera molto estesa sia la critica (disgusto/disapprovazione) sia la dimensione propositiva (speranza, amore/agape), "densificando" lo spazio emotivo. Ricercatore e DEGARI, pur convergendo sui nuclei, producono codifiche più economiche. Esempio: "LinkedIn possa evolvere verso una piattaforma più onesta", "non vetrine ma luoghi di scambio", "la vulnerabilità non come debolezza ma come connessione", "non siamo brochure viventi".

Tabella V. Tabella di sintesi comparativa dei tre sistemi di analisi emotiva

4. Discussione dei risultati e valore scientifico potenziale

I risultati finora conseguiti, frutto di una ricerca ancora in corso, offrono stimoli di riflessione su molteplici piani.

L'indagine conferma il valore di una prospettiva multi-razionale nell'analisi delle emozioni, mostrando come le tre forme di intelligenza convergano su un nucleo affettivo comune, riconoscibile attraverso epistemologie differenti. Tale convergenza suggerisce che strumenti di intelligenza artificiale come DEGARI, se opportunamente progettati, possano avvicinarsi al giudizio umano anche in domini complessi come quello linguistico-emozionale. Le divergenze emerse, tuttavia, sono altrettanto significative poiché evidenziano le specificità interpretative di ciascun approccio. L'elevata corrispondenza tra DEGARI e l'analisi ermeneutica mostra come una razionalità basata su regole e concetti espliciti possa generare rappresentazioni affettive comparabili a quelle umane, fungendo da "secondo ricercatore" capace di estendere la scala dell'analisi e garantirne replicabilità e coerenza. In questa prospettiva, l'intelligenza simbolica può essere impiegata come supporto nelle fasi di codifica qualitativa, in un processo di ibridazione che combina l'esplorazione computazionale con la sensibilità interpretativa del ricercatore (Venugopal et al., 2025).

L'analisi condotta con GEMINI 3 PRO evidenzia, invece, la complessità e l'eterogeneità proprie dei modelli neurali. L'ampiezza e la variabilità delle etichette prodotte possono generare risultati articolati ma difficili da interpretare in assenza di un riferimento teorico solido; ne deriva, dunque, l'importanza di mantenere un controllo semantico umano poiché solo l'integrazione tra

competenza ermeneutica e calcolo algoritmico consente di evitare distorsioni interpretative, nonché di preservare l'affidabilità epistemica nell'analisi di esperienze affettive complesse.

Dal punto di vista manageriale e, in particolare, di marketing, i risultati evidenziano l'utilità di una lettura più fine delle emozioni che si manifestano nei contesti digitali di confronto sociale. Comprendere come emozioni positive coesistano con emozioni ambivalenti o negative, come invidia o disprezzo, aiuta a interpretare con maggiore precisione i processi di costruzione del sé e di percezione dell'altro nella comunicazione professionale online. La rilevazione di un'invidia latente, spesso celata dietro forme di cordialità, offre spunti strategici per le pratiche di employee engagement e per la progettazione di messaggi e post più empatici, evitando effetti indesiderati di competizione o inadeguatezza. Strumenti ibridi di analisi emotiva, basati sulla collaborazione tra ricercatore e IA potrebbero, inoltre, consentire il monitoraggio in tempo reale del clima affettivo aziendale, individuando precocemente segnali di disaffezione o malcontento e supportando interventi tempestivi di guida e comunicazione.

Più in generale, la capacità di interpretare con accuratezza le emozioni espresse dai consumatori nelle interazioni digitali – recensioni, commenti, post – rappresenta un vantaggio competitivo cruciale. L'approccio proposto consente di superare i limiti della sentiment analysis tradizionale, ancora troppo legata a modelli black box, e di evolvere verso una emotional analysis trasparente. Tale metodo consente di distinguere non solo la polarità del sentimento, ma la composizione affettiva sottostante offrendo una comprensione più ricca dei driver emozionali che orientano le percezioni di marca e le decisioni di acquisto.

L'adozione di simili strumenti, tuttavia, richiede una nuova alfabetizzazione manageriale all'uso dell'intelligenza artificiale e una competenza emotiva capace di integrare sensibilità etica e capacità analitica. Come osserva McKinsey (2025), la sfida non consiste solo nel disporre di tecnologie avanzate ma nel saperle interpretare e tradurre in decisioni responsabili e orientate al valore relazionale. In questa direzione, la collaborazione tra intelligenza umana e simbolica (DEGARI) diventa strumento di conoscenza, networking e leva di vantaggio competitivo, personale e d'impresa.

Parole chiave: Analisi delle emozioni; triangolazione epistemica; IA simbolica e neurale; confronto sociale digitale

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Where sectors meet: festival as space of collaboration

Alessia Anzivino[1], Lala Hu[2], Roberta Sebastiani[3]

1. Introduction

Festivals are often regarded as platforms for displaying cultural expression, artistic talents, and shared community experiences. They encompass a wide array of events in diversified sectors, from music, film, literature, and performing arts festivals to smaller, localized celebrations of specific traditions or practices (Quinn, 2006). From a marketing perspective, festivals have been analyzed by adopting the relationship marketing approach (Collin-Lachaud & Duyck, 2002; Larson, 2002). However, literature to date focused on specific aspects of festivals, e.g., effects on visitors or marketing management of the festival as a product.

The recent proliferation of festivals as platforms for sustaining cultural industries and local economies has attracted increasing attention from scholars, professionals, and local governments (Lin & Bestor, 2020; Leone & Montanari, 2022).

Festivals have been considered in literature as social constructs that mirror and influence cultural values and identities (Getz, 2010), this perspective offers a lens through which understanding the role of creative and cultural industries within larger cultural and economic ecosystems. Indeed, festivals create opportunities for individuals to discover and build collective understanding and communities (Quinn et al., 2020; Wu et al., 2020), and they are shaped through the interactions of diverse actors who come together at a specific time and place, united by a common purpose (Quinn et al., 2020).

Festivals rely on partnerships between heterogeneous actors, such as companies, non-profit organizations, and public entities, this ensures financial stability, improves cultural offerings, and enhances community engagement (Getz et al., 2006). These collaborations arise from the benefits they offer to the community and to the single actors (Getz et al., 2006): through participation in the organization and management of a festival, public organizations may seek to promote, for example, cultural tourism and social cohesion; private companies can leverage festivals for marketing and brand visibility through sponsorships; and non-profit organizations through these events try to enhance community wellbeing and cultural preservation.

Given this, the study analyzes cultural festivals as platforms, and specifically the relationships among different actors belonging to heterogeneous sectors. In the festival context, so far, previous literature has posed more attention on customer perspective on value co-creation processes (Werner et al., 2020). Indeed, in the context of festivals, multiple interactions are activated among different actors (e.g., partners, local governments, profit and non-profit organizations, etc.) belonging to diversified industries, a topic that has been overlooked in previous studies.

According to Collin-Lachaud and Duyck (2002), festivals are characterized by a multiplicity of financing sources, many targets, and a complex marketing. Indeed, the marketing process of a festival involves interactions among actors with varying degrees of relationships whose interests might differ (Larson, 2002). Festivals can be viewed as systems of heterogeneous units that

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interact to achieve a common purpose. (Troisi et al., 2019). Evrard (1991) identified three marketing levels: upstream (or standard marketing), in which the target is the consumer; downstream, which addresses suppliers of goods and services; and lateral, which is associated with private, non-profit, and public-sector partnerships.

Moreover, previous literature has posed more attention on value co-creation processes considering the customer perspective (Werner et al., 2020), for instance by analyzing co-creation among festival participants (Rihova et al., 2018), while the relationships between the heterogeneous actors that intervene in festivals creation and management have been overlooked.

Our research focuses on how different actors, including profit, non-profit and public organizations, integrate their resources and co-create value in the context of cultural festivals. This study responds to recent calls for a more integrated and comprehensive approach to festival management that considers the cross-sector actors' collaborations and interactions (Andersson et al., 2009; Getz al., 2010; Wilson et al., 2017).

2. Methodology

This study employs a multiple-case study methodology, a qualitative approach well-suited for exploring emerging and complex phenomena (Stake, 1995; Yin, 2014), such as those examined in our research. We chose a multiple-case study approach to develop a more generalizable theory by comparing and replicating findings across different cases (Eisenhardt & Graebner, 2007). Furthermore, this approach enables the investigation of data from several cases throughout a continuous process of comparing empirical data and theory, seeking a close alignment between them (Creswell & Creswell, 2017; Gehman et al., 2018). The empirical data for the investigation consist of two in-depth, longitudinal case studies, aimed at achieving a full understanding of the phenomenon studied in this paper.

Primary data were collected throughout 12 semi-structured interviews conducted between 2022 and 2025 with 8 key informants, which include festival founders, company managers, policymakers, and other key informants.

3. Preliminary Findings

In our preliminary analysis, we identified three aggregate dimensions that explain how heterogeneous actors co-create value when collaborating in managing cultural festivals: actors' engagement, actors' resource integration, and collaboration challenges.

3.1. Actors' engagement

The management and organisation of cultural festivals brings together a wide range of actors and mobilises resources from local institutions, non-profit organisations, and companies. Preliminary findings show that festivals can connect diverse stakeholders by fostering an environment of collaboration that encourages engagement, interaction and the co-creation of value among local companies, cultural associations and artists. Rather than focusing solely on event management, the festivals we analysed prioritised community development and long-term relationship building. This is achieved through tailored engagement strategies that recognise the contributions of each stakeholder and utilise communication channels beyond the festival itself. Many stakeholders use their own social media, for instance, to reach broader audiences throughout the year, intensifying communication before and after the event. These strategies necessitate the reorganisation of roles, as actors' responsibilities often evolve over time. For instance, a non-profit organisation may initially act only as a co-founder, but later become the main promoter of the festival, forming new partnerships with other companies in the process.

Public institutions also experience a change of traditional roles, starting as sponsors and later becoming connectors that link artists, associations, and communities: when public actors assume the role of connectors, festivals benefit from this change and interactions evolve into stable, long-term collaborations that produce new cultural initiatives benefiting broader communities.

3.2 Resource integration

Preliminary results have highlighted the positive outcomes generated by collaboration between the various actors involved in organizing and managing festivals. Festivals bring together organizations with different institutional structures, allowing them to integrate their resources, skills, and knowledge. This cooperation encourages the creation and sharing of knowledge about the communities of reference and their needs. The role of festivals as fertile ground for building new relationships and strengthening existing ones thus emerges, as participants become aware of the specific resources and capabilities of each actor, both at the personal and systemic levels. Preliminary research results also show that each actor involved in the festival contributed not only with economic resources, but also with non-economic resources: cultural organizations brought artists and community associations into contact, while companies, for example, provided essential funding. This integrated contribution strengthened the structure of the festival and improved its long-term impact.

Local public institutions play a dual role: they finance and sponsor festivals, and they also assume the role of connector between festival organizers and local associations, companies, and cultural groups, and through this, they stimulate the broader community involvement. Preliminary findings also show that cultural festivals, through performances, exhibitions, and creative activities, take on an educational role for the public, raising awareness of local traditions and stimulating a deeper understanding of cultural heritage. By highlighting local narratives and artistic expressions, festivals showcase the stories of residents in different neighborhoods. This approach strengthens the ties between artists and their communities and promotes cultural inclusion, enabling marginalized groups to participate actively. Through participatory dramaturgical processes, festivals encourage co-creation, allowing different actors to exchange ideas and perspectives, thus enriching the experience of all the actors involved. The analysis of the interviews and secondary data showed that when actors with different objectives collaborate, the overall mission of the festival becomes a guiding reference for the development of partnerships and the integration of resources.

3.3 Collaboration challenges

The case studies reveal several misalignments that could create frictions and tensions in festival management, largely due to the diverse perspectives, languages, timeframes, and objectives of the actors involved. For example, sometimes organizers noted a limited participation from local communities, despite the festival's themes and aims.

The analysis of data shows a recurring challenge that concerns the attraction of resources and the maintenance of long-term commitment from heterogeneous actors: while a festival's cultural mission can unify contributions from public institutions, companies, and non-profit organizations, aligning their differing objectives and perspectives remains a complex issue. Each actor brings specific priorities and expectations, and although pooling resources can strengthen the festival's impact, it can also generate frictions and tensions that need to be addressed. When economic objectives dominate, the festival risks drifting away from its core purpose of cultural enrichment and community engagement and this may lead to decisions that prioritize the economic sphere rather than artistic or social value, weakening the festival's identity and long-term viability.

Additionally, reliance on multiple funding sources can expose festivals to instability: divergent requirements from stakeholders may result in compromises that dilute the original mission. These conflicting priorities can impede cooperation and slow decision-making processes.

Preliminary findings show the importance of establishing strong communication channels and shared values among stakeholders to manage these complexities. Ensuring that the cultural mission remains central, taking also into account economic issues, is essential to safeguard the festival's integrity, strengthen collaborations, and maintain its impact within the community.

4. Preliminary Conclusions

This ongoing research shows that actors' engagement and the integration of their resources are central to the co-creation of value within the organization and management of cultural festivals. At the same time, several challenges emerge, given the diversity of actors involved and the different goals, languages, and timelines they bring.

Findings indicate that festivals can be considered as a "place" where value is co-created among heterogeneous actors. They act as dynamic platforms (Blasco-Arcas et al., 2020; Kleinaltenkamp, et al., 2019) where public institutions, companies, and non-profit organizations work together, share knowledge, and combine both material and intangible resources. Within this collaborative environment, actors often change their original roles over time, adapting to evolving needs and contributing to value creation not only for the festival itself but also for the broader community. Collaboration frequently extends beyond the event days and continues through social media and communication, throughout the year, strengthening relationships and expanding participation.

Festivals also play an important territorial role by fostering local networks (Hjalager & Kwiatkowski, 2018), enhancing place-based knowledge, and supporting community development: they create a shared environment in which actors collectively define and express the cultural identity of the area, promote inclusive initiatives, and enable beneficiaries to attribute new meanings to cultural activities.

However, cooperation among heterogeneous actors also generates tensions and frictions (Vogel et al., 2022). Divergent interests may lead to outcomes that do not fully align with the festival's cultural mission: economic pressures, for instance, can overshadow social or community-oriented goals. Additionally, the involvement of companies, for example, with high brand awareness, sometimes risks marginalizing the contributions of non-profit organizations.

All these potential frictions require ongoing discussion, communication, and alignment among actors to ensure collaboration remains effective and sustainable. However, paradoxically, differences in perspectives may encourage actors to explore new forms of cooperation and collaboration that could enrich the partnerships and stimulate innovation.

Keywords: Festival; cross-sector partnerships; actors' engagement; resource integration

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When Nature Becomes Data: How Digital Platforms Are Rewriting Biodiversity

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1. Introduction and objectives

Biodiversity has emerged as a critical theme within sustainability and management studies (Testa et al. 2025). It represents a foundational component of the ecological systems that support organizational activity, yet it is simultaneously placed at risk by those same activities. Recognizing this dual condition—organizations relying on biodiversity while contributing to its degradation—introduces a systemic lens through which the relationship between business and the natural environment can be reconsidered. Within this evolving perspective, digital platforms and digital ecosystems are becoming increasingly relevant, as they offer new mechanisms to monitor, coordinate, and manage interactions between firms and ecological resources.

In recent years, both scholars (Winn & Pogutz, 2013; Testa et al. 2025) and consulting firms (Accenture, 2023; Deloitte, 2025) have shown increasing interest in biodiversity.

Although sustainability research has traditionally concentrated on issues such as climate change and pollution, the loss of biodiversity has only recently begun to attract substantial interest within the sustainability management domain (Testa et al., 2025). Scholars argue that bringing biodiversity and related notions—such as ecological systems and the functions they perform—into the management debate broadens the analytical frame through which interactions between firms and the natural environment are examined (Winn & Pogutz, 2013). Businesses activities rely on ecological resources and processes, yet these same activities frequently degrade them through emissions, waste generation, overexploitation, and other pressures. By acknowledging this dual relationship of dependency and influence, the increasing focus on biodiversity encourages a move away from narrow, performance-driven arguments and opens the door to more systemic and critical reflections on how organizations engage with the natural world.

Given that biodiversity is a relatively recent topic within the management domain—gaining momentum in the literature only in the past few years—and considering the rapid expansion of research on digital platforms and digital ecosystems, we identified the need for an initial exploratory step. A quantitative review of the existing literature was considered appropriate to understand how these themes are currently addressed in academic studies. Consequently, conducting a structured literature analysis that organizes and synthesizes prior studies becomes essential to provide researchers with a comprehensive overview of the topic as a whole.

The aim of the present study is to provide a comprehensive analysis of the existing literature at the intersection of biodiversity and digital platforms and ecosystems, through a bibliometric analysis. Bibliometric methods are particularly suitable for identifying the intellectual structure and dominant trajectories of an emerging field, thereby offering evidence-based insights that can inform and direct subsequent research (Siao et al., 2022). Building on this premise, our analysis

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explores how biodiversity is linked to digital platforms and ecosystems, how the resulting thematic configurations relate to one another, and how they have evolved over time. Accordingly, this bibliometric review addresses the following research questions:

RQ1: What are the dominant themes characterizing research that jointly examines biodiversity and digital platforms?

RQ2: How are these themes conceptually related and structured within the field?

RQ3: How have the core themes and their interrelationships evolved over time?

2. Conceptual background

2.1. Biodiversity

According to the Convention on Biological Diversity (1992), biodiversity encompasses the range of living organisms across all environments—terrestrial, marine, and freshwater—and includes variation within species, among species, and across ecosystems. In more concise terms, biodiversity can be described as the diversity of living forms and the variability in their characteristics and functions (Cardinale et al., 2012).

Although the expression biological diversity has been informally used since the nineteenth century, its formal introduction in academic discourse is attributed to Wilson in the late 1980s (Colwell, 2009). Subsequent ecological research has expanded this notion, framing biodiversity as the genetic, taxonomic, and functional heterogeneity of life over space and time (Naeem, 2009). In this view, biodiversity reflects the interaction of organisms with the non-living components of their environment, forming ecological systems.

Contemporary ecological theory emphasizes that biodiversity is far more than a simple count of species. Instead, it represents a hierarchical construct observable at multiple organizational scales—ranging from genes and individuals to populations, communities, ecosystems, and biomes—and it can be examined through different analytical lenses, such as evolutionary or ecological perspectives. For instance, species richness refers to how many species belonging to a certain group (e.g., birds, mammals) exist within a given habitat, whereas at broader spatial scales biodiversity may refer to the distribution, composition, and configuration of ecosystems.

A further distinction concerns the concepts of functional diversity and response diversity. Functional diversity relates to the variety of ecological roles carried out by species within an ecosystem (e.g., pollination or nutrient cycling), while response diversity indicates the range of ways through which a specific function can be performed by different organisms (e.g., pollination by insects versus birds) (Elmqvist et al., 2003). Functional groups thus contribute to the overall performance of ecological systems, and greater species diversity is typically linked to higher levels of ecosystem functioning and productivity (TEEB, 2011).

Taken together, these contributions conceptualize biodiversity as a systemic property: it reflects the diversity of biological components, the ecological processes they support, and the resilience of the systems in which they operate.

2.2. Digital platforms and ecosystems

Ecosystems generate essential contributions to human well-being by providing goods, regulatory functions, and cultural and supporting benefits. These contributions—commonly referred to as ecosystem services—derive from the interaction of living organisms with their surrounding physical environment and include food provision, raw materials, water filtration, climate regulation, and sources of genetic and biochemical resources (MEA, 2005). The Millennium Ecosystem Assessment classifies these services into four broad categories: supporting services that sustain ecological processes, provisioning services that provide tangible resources, regulating services that stabilize biophysical conditions, and cultural services that offer experiential or symbolic value. Over time, the concept has progressively gained relevance across

academic communities, particularly within ecology and economics, as a means to articulate the interdependence between human activities and natural systems (Gómez-Baggethun et al., 2010). Although the underlying idea emerged several decades ago, ecosystem services became a central reference point in sustainability research from the 1990s onward, offering a structured lens for evaluating environmental resources and informing decision-making processes related to development, policy, and resource management (Costanza et al., 1997; De Groot et al., 2002; UNEP, 2008; World Bank, 2009). More recently, research on digital platforms and platform ecosystems has opened a parallel and complementary stream of inquiry. Digital platforms enable coordination among multiple actors—often from distinct sectors or markets—by providing the technological and governance infrastructure necessary to support interactions, data exchange, and collaborative value creation (Kretschmer et al., 2022). Prior studies show that platform-based arrangements can mobilize diverse stakeholders to address large-scale societal issues, such as access to health services, waste reduction, cybersecurity, or financial inclusion (Bode et al., 2019; Ciulli et al., 2020; Rauch & Ansari, 2022). A key feature of these systems is the presence of network effects: when participants benefit from joining, the platform attracts more actors, amplifying the scale of impact (Cennamo, 2021). Scholars argue that when economic incentives align with social or environmental goals, platform ecosystems can generate outcomes that extend beyond conventional organizational boundaries and address complex societal challenges (Porter & Kramer, 2011; Ritala et al., 2021; Ritala, 2024). Drawing these streams together, digital platforms can be conceptualized as organizational and technological infrastructures capable of supporting ecosystem services and biodiversity management. By coordinating heterogeneous participants and leveraging data flows, platforms facilitate monitoring, valuation, and stewardship of natural resources at scale. In this way, platform ecosystems offer a novel avenue through which economic value creation and ecological value preservation can coexist: a condition increasingly recognized as necessary for addressing grand sustainability challenges.

3. Method

A quantitative approach based on bibliometric analysis was adopted to analyze the extant literature that discusses both the topics of biodiversity and platforms. This method has seen a wide increase in adoption during the last few years (Gutiérrez-Salcedo et al., 2018). The bibliometric analysis permits sorting out systematic and orderly literature already existing on the research topic. The analysis consists of a map with a spatial representation of the keywords, countries, or research strands related to each other (Cobo et al., 2012). To develop the analysis, extant papers have been gathered from Scopus online database; instead, for the bibliometric analysis, it has been used VOSviewer software. Scopus was used as a tool for information gathering as it has been described as a "huge multidisciplinary database with citations and abstracts from peer-reviewed journal literature, trade journals, books, patent records, and conference publications... It is the largest abstract and citation database" (Joshi, 2016), and it cover many topics, especially social sciences.

Upon meticulous examination of the pertinent literature, it was conjectured that the key terms "digital," "ecosystem," "platform," and "biodiversity" as the most conceptually central to the scope of the research. Consequently, for the preliminary study, it was resolved to confine the exploration exclusively to the Scopus database. Observing that certain articles also delved into domains such as Agriculture and Biological science, a decision was made to refine the research focus further by delving deeply into the following reference areas: Business, Management and Accounting, Environmental Science, and Social Sciences. Therefore, the final query was as follows: KEY (("digital" AND "ecosystem" OR "platform") AND "biodiversity"). The selection of the documents took place on November 1st, 2025. The period analyzed has been 1997-2025 and the articles searched were only written in English. The year 1997 has been chosen since in that year was written the first article on the topic by Keating and since that year more and more

authors have started to address the issue of biodiversity and digital. The search conducted identified 528 total publications. Given the nature of this study bibliometric, subsequent to the analysis of titles and abstracts of the papers, we undertook a comprehensive examination of all 528 articles identified within the database.

4. Overview of publications

To outline the link between biodiversity and digital platforms and ecosystem, it is important to quantitatively examine evidence from the extant literature. Table 1 reports the size and basic characteristics of the dataset, including the total number of articles (528), the total number of keyword occurrences (5,933), and the number of unique authors (565). Table 1 also indicates the distribution of publications across the two focal streams: 437 articles are classified within the "digital ecosystems" domain and 91 within the "digital platforms" domain.

Query	Number of articles	Number of keywords	Authors
("digital" AND "ecosystem" OR "platform")	528	5933	565
("digital" AND "ecosystem")	437	5026	475
("digital" AND "platform")	91	907	90

Table 1. Quantitative analysis

It is interesting to analyze the evolution of the topic. As shown in figure 1, the phenomenon was already studied in the first years of 2000s then it had a first development in 2014 and it had an exponential growth since 2019.

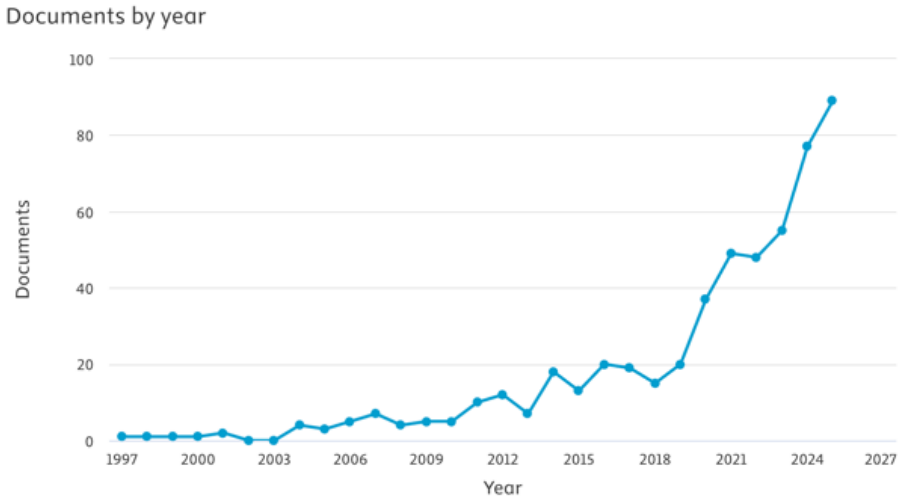


Figure 1. Documents by year

Considering the analysis of the topics, we have decided to do an overview of subject areas that Scopus create, that is outlined in figure 2. It is possible to note that most papers are in the area of Environmental sciences, where 44.5% of documents were written. Then, in the area of Agricultural and Biological Sciences, 23% of articles were written while in Social Sciences, an

area interesting for the debate of the topics, 9.5% of documents were written. Other minor categories are found, but those are considered less interesting for the aim of the present paper.

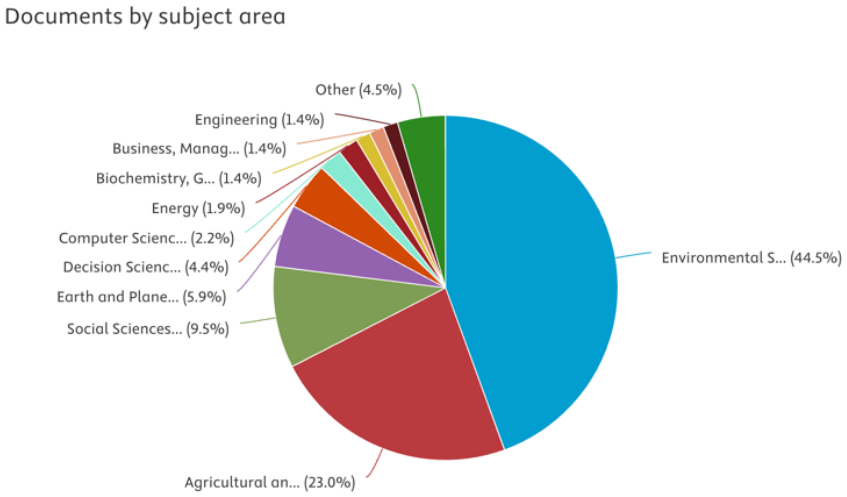


Figure 2. Documents by subject area

Talking of the countries where the first authors of the analyzed papers come from, we can see that in the US there are many authors interested in the subject, in fact 93 papers have been written in the last 28 years. Following we see China with 90 publications, UK with 54 articles and followed by Germany with 53 published articles and Canada and Italy with 39 publications each.

In table 2, there are the five most cited articles. The most cited are "Bioenergy production potential of global biomass plantations under environmental and agricultural constraints" with 348 citations and "On the spatial relationship between ecosystem services and urbanization: A case study in Wuhan, China" with 340 citations. With 332 citations, there is the article by Kasten et al. (2021). Following, there are the articles "Massive soybean expansion in South America since 2000 and implications for conservation" with 296 citations and "How can statistical models help to determine driving factors of landslides?" with 260 citations.

Article title	**Authors**	**Year**	**Source**	**Cited**
Bioenergy production potential of global biomass plantations under environmental and agricultural constraints	Beringer et al.	2011	Gcb Bioenergy	348
On the spatial relationship between ecosystem services and urbanization: A case study in Wuhan, China	Zhang et al.	2018	Science of the total environment	340
The remote environmental assessment laboratory's acoustic library: An archive for studying soundscape ecology	Kasten et al.	2012	Ecological informatics	332
Massive soybean expansion in South America since 2000 and implications for conservation	Song et al.	2021	Nature Sustainability	296

How can statistical models help to determine driving factors of landslides?	Vorpahl et al.	2015	Ecological modelling	260

Table 2. The five most cited articles

5. Findings

In order to answer RQ1, Table 2 summarizes the most frequently occurring author keywords in the dataset and highlights the conceptual anchors of the literature. “Biodiversity” is by far the most prevalent term (n = 504), confirming its role as the dominant focal concept. The second most frequent keyword, “ecosystem(s)” (n = 318), indicates that a substantial share of the literature frames biodiversity within ecosystem-level dynamics rather than in isolation. The prominence of “climate change” (n = 132) suggests that biodiversity research in this domain is frequently embedded in broader debates on environmental risk, mitigation, and adaptation. Notably, “digital storage” (n = 130) appears among the top keywords, signalling the growing relevance of data infrastructures and information management to biodiversity-related research. The presence of the generic term “article” (n = 110) likely reflects indexing practices rather than a substantive theme and should therefore be interpreted with caution. Finally, “forestry” (n = 108) points to a strong application context, suggesting that forest ecosystems represent a central empirical setting in which the biodiversity–digital ecosystem nexus is being investigated.

Keywords	**Frequency**
Biodiversity	504
Ecosystem/Ecosystems	318
Climate change	132
Digital storage	130
Article	110
Forestry	108

Table 3. Most frequent author keywords in the dataset

Figure 3 shows the main clusters of the relationship between biodiversity and ecosystems. To get to this bibliographic spatial map and answer RQ2, the authors have decided to develop a co-occurrence map based on all keywords (5,933) and a minimum occurrence of at least 10 keywords, in order to make the analysis more circumscribed and to bring out those analyses that are treated together. With this combination just mentioned, of the 5,933 keywords, only 179 meet the threshold. In figure 3, each circle stands for a keyword from the dataset. In the chart, it is possible to note that if terms co-occur frequently, they are located close to each other; otherwise, if they are not connected, it means that they are co-occurring less. The circles’ dimension relies upon papers’ numbers that were found to contain that specific keyword. A significant number of keywords refer to “climate change, “forestry”, “land use” and “ecosystem”. Keywords were divided into 5 clusters, represented by colors.

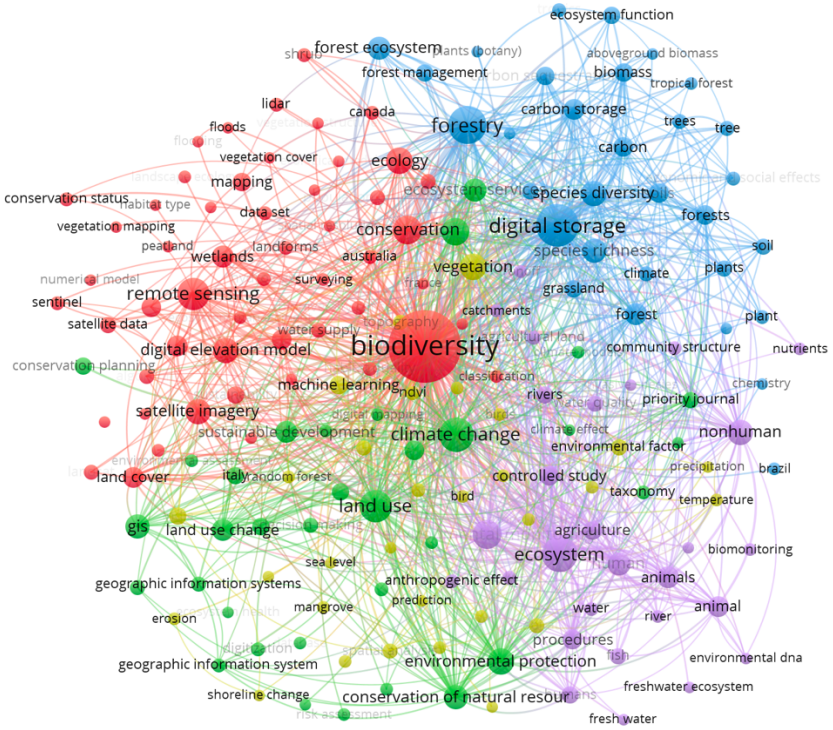


Figure 3. Keyword co-occurrence analysis

The five main clusters outlined from the previous analysis displayed in figure 3 are:

- The main cluster is the red one and represents “Biodiversity”; this cluster shows that authors who deal with biodiversity usually treat it with ecology, conservation, remote sensing and sustainability.
- The blue one is the “Digital storage” cluster, and usually, authors write as well about forestry, ecosystem function, species diversity and carbon.
- The green cluster concerns with “Climate change” and is linked with land use, sustainable development and environmental protection.
- The yellow cluster represents “Vegetation” and is linked with environmental factor, temperature, sea level and habitat.
- The violet cluster is the “Ecosystem” cluster and usually, authors write as well about nonhuman, environmental monitoring, animals and water.

The network visualizes how the literature conceptualizes the relationship between biodiversity and digital-platform ecosystems. Rather than framing these domains as separate research streams, the map shows that they are structurally interdependent: biodiversity operates as the central anchor, while digital-, ecosystem-, and land-use–related keywords connect to it through dense co-occurrence patterns. The short distances between nodes indicate that scientific publications increasingly treat biodiversity not only as a biological construct, but as a data-driven object integrated into broader digital infrastructures. The network highlights that research on platforms and digital systems rarely appears alone; instead, such terms systematically co-occur with ecological and environmental concepts. This reinforces a conceptual transition in the literature, where biodiversity is understood through quantification, data collection, and decision-support mechanisms enabled by platforms and digital ecosystems.

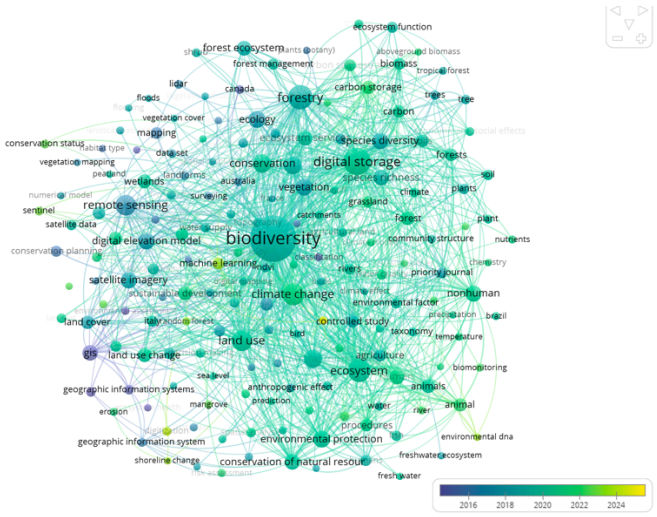


Figure 4. Co-occurrence analysis in overlay visualization

In figure 4, the network retains the same structural configuration as the previous figure, but the addition of temporal information illustrates the evolution of research priorities and answers RQ3. Earlier contributions (represented by cooler tones) are concentrated around traditional themes such as forestry, land use, and conservation. More recent studies (highlighted in warmer tones) cluster around *digital storage, remote sensing, machine learning,* and *platforms*, indicating a progressive integration of digital technologies into biodiversity research. The temporal gradient demonstrates a clear shift from descriptive ecological studies toward data-intensive, digitally mediated approaches. Biodiversity increasingly becomes a measurable and computational object rather than only a biological or ecological concept.

6. Discussions and final conclusion

The analysis shows that research on this topic expanded significantly in recent years, a trend also highlighted by by scholars and consulting firms (Winn & Pogutz, 2013; Testa et al. 2025; Accenture, 2023; Deloitte, 2025). The results indicate that US-based authors the most active contributors to the field and that Environmental sciences remains the primary disciplinary area of interest.

The keywords analysis reveals that scientific publications increasingly treat biodiversity not only as a biological construct, but as a data-intensive and digitally mediated domain, consistent with Cardinale et al., (2012). Biodiversity is progressively framed as a measurable and computational, and monitorable object integrated with broader digital infrastructures.

The prominence of digital-related keywords alongside traditional ecological terminology, suggests the emergence of a hybrid domain in which biodiversity is analyzed through platforms, sensors, and data repositories- confirming Kretschmer et al., (2022).

Overall, the analysis shows that biodiversity and digital platforms/digital ecosystems are increasingly intertwined within the academic debate. Through the keyword clusters, it becomes evident that biodiversity is consistently associated with concepts such as ecosystem monitoring, land-use management, and environmental sustainability, while digital-related terms appear in connection with data storage, remote sensing, and platform coordination. The preliminary bibliometric evidence therefore suggests that digital platforms are emerging as a relevant organizational and technological architecture through which biodiversity can be monitored, shared, and managed collaboratively. However, a critical observation is that despite this growth, the literature remains fragmented and predominantly descriptive; few studies interrogate the

ethical, politic, or socio-institutional implications of digitizing biodiversity, and a mature theoretical framework bridging ecological and digital perspective is still lacking.

7. Theoretical and managerial implications

This study provides empirical evidence confirming the growing relevance of biodiversity within the research on digital platforms and digital ecosystems. The findings suggest that these fields are evolving rapidly and increasingly converge. While prior studies have mainly addressed biodiversity from an ecological or environmental perspective, the bibliometric analysis reveals the emergence of new interconnected themes—such as digital monitoring, data sharing, remote sensing, and collaborative decision-making—that position digital platforms as key enablers of biodiversity management.

A key theoretical contribution of this study is that it identifies the foundations for a conceptual framework capable of interpreting the intersection between biodiversity and digital platforms. More concretely, through the bibliometric clustering process we uncovered five main thematic clusters that structure this emerging research domain. These clusters capture the dominant conceptual pathways through which biodiversity becomes embedded within digital infrastructure, thereby offering an initial scaffold for future theory-building. These results suggest that a new conceptual space is taking shape, one in which biodiversity is not only a biological construct but also a digitally mediated object embedded within socio-technical systems. This contributes to the theoretical understanding of how environmental and digital ecosystems coevolve and how technological infrastructure reshape ecological governance.

From a managerial perspective, this work highlights that digital platforms represent not only a technological infrastructure but also a governance mechanism capable of coordinating heterogeneous actors—firms, institutions, NGOs, and citizens—around biodiversity-related objectives. Managers and decision-makers should therefore consider how platform architectures can be used to collect, integrate, and leverage ecological data, enabling transparency, accountability, and informed strategic decisions concerning natural resources.

In particular, integrating digital tools and data-driven systems into biodiversity strategies requires organizations to invest in data generation, analytics, and user engagement. Platforms that foster knowledge sharing and participation can amplify collective action, align economic and environmental incentives, and contribute to scalable solutions for biodiversity protection. Such an approach supports the transition from isolated, project-based environmental initiatives to collaborative, ecosystem-level strategies that enhance both organizational value creation and environmental impact.

8. Limitations and further research

Some limitations emerge from this study. First of all, it only relies on bibliometric data, not gathering insights from firms and encompassing their perspectives to develop new theoretical and managerial implications. Moreover, even though Scopus is considered one of the most suitable and reliable publication databases for most researchers, some other relevant papers might not be included - or included in other databases – and might have been overlooked. We think it might be interesting for future research on the subject, to deepen the analysis. In fact, it would be interesting to read all the papers in depth and do a systematic literature review and then go into more detail identifying the various important aspects of related issues.

Keywords: Platform; digital; ecosystem; biodiversity; bibliometric analysis

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The 30-60-90 Routine: Structuring Community Feedback for Value Co-creation

Alessio Sartore[1], Paola Signori[2]

1. Introduction

In the current competitive landscape, the paradigm of value creation has shifted significantly. The traditional view of the firm as the sole innovator has given way to a more permeable approach where customers are active participants (Prahalad & Ramaswamy, 2004; Ciasullo et al., 2018). Digitalization has accelerated this trend, providing consumers with the technological capabilities to share feedback, modify products, and interact directly with R&D departments (Gupta, 2023). However, this accessibility creates a double-edged sword for organizations. On one hand, it offers a "sea of information" rich in potential (Chan et al., 2021). On the other, it generates a massive volume of unstructured data that can paralyze decision-making processes. The core problem addressed in this study is how Small and Medium Enterprises (SMEs), which often lack the resources of multinational corporations(Spithoven et al., 2013), can structure this chaotic flow of community insights to fuel continuous innovation without being overwhelmed (Yang, 2012; Lin et al., 2021).

2. Theoretical background

To interpret these dynamics, this study moves beyond the traditional Open Innovation framework to adopt the Service-Dominant Logic (SDL) lens (Vargo & Lusch, 2004; 2016). While Open Innovation explains that ideas flow across boundaries (west & Bogers, 2013), SDL explains why these ideas are valuable. According to SDL, a physical product (like in our case study a bicycle trainer) is merely a distribution mechanism for service provision (the training experience). Consequently, innovation is not just about improving technical specifications but about enhancing the value-in-use. This perspective redefines the customer from a passive recipient to an active co-creator of value (Prahalad & Ramaswamy, 2004). In this context, the most critical knowledge does not reside solely within the firm's engineering department but emerges from the users' daily interactions with the product in real-world scenarios. Understanding why customers will to contribute is crucial for sustaining this co-creation. Recent literature challenges the assumption that users are motivated primarily by financial rewards. Chan et al. (2021) highlight that in digital crowdsourcing and community environments, intrinsic motivations often prevail. Users are driven by the quality of their experience, a sense of belonging to a community, and the desire to see their specific needs reflected in the product. This creates a specific type of feedback: unlike generic market research, community-driven insights are highly contextualized and technically detailed. However, leveraging this "experiential" knowledge requires specific technological and organizational capabilities. While Customer Feedback Acquisition Technologies (Gupta, 2023) provide the necessary channels to capture data (such as social media, support platforms, IoT data), technology alone is insufficient. The bottleneck is often organizational. Integrating external knowledge requires firms to develop absorptive capacity, that is the ability to recognize, assimilate, and apply new information (Zahra & George, 2002). Here, a theoretical tension

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emerges. As noted by Lin et al. (2021), organizational routines can paradoxically affect innovation. Typically, routines are seen as sources of inertia and rigidity that stifle creativity. But in the context of high-volume feedback, the absence of routines leads to chaos and information overload. Lin et al. (2021) suggest that to operationalize external creativity, firms need flexible routines that structure the intake of information without constraining the novelty of the output. The present study builds on this premise, examining empirically how a specific organizational mechanism, that has been called the 30-60-90 Routine, allows an SME to resolve this paradox, transforming the noise of community feedback into a structured engine for continuous product evolution.

3. Methodology

The empirical investigation focuses on a longitudinal case study, as a prominent Italian firm highly specialized in cycling training equipment and accessories. Elite S.r.l. Società Benefit has been founded in 1979 and headquartered in Fontaniva (Padua), the company represents an ideal case study for several reasons. First, it operates in a highly competitive global market, exporting 90% of its production to over 70 countries. Second, despite being an SME (approx. 63 employees), it possesses a strong orientation to innovation, with a dedicated R&D team of 25 collaborators, and a history of technological milestones, such as the introduction of the first wireless trainers in 2004 and the Optical Torque Sensor (OTS) in 2016. Crucially, the firm has recently experienced a shift in its customer base. Following the post-pandemic boom in indoor cycling, the user profile expanded from professional athletes to a broader community of "prosumers" (active users willing to contribute to innovation). This transition challenged the firm's traditional feedback mechanisms, necessitatinga more structured approach to listen to its digital ecosystem, which includes over 137,000 Instagram followers, a dedicated Facebook support group (11,000+ members), and a Strava club (6,000+ active cyclists).

To capture the complexity of this ecosystem, the study adopts a mixed-method approach. This design is particularly effective in innovation management research as it allows for triangulating quantitative patterns of user behavior with the qualitative nuances of experiential knowledge (Bracio & Szarucki 2020). By combining survey data with unstructured digital feedback, we aimed to overcome the limitations of single-method studies, providing both the magnitude of user interest (quantitative) and the meaning behind their suggestions (qualitative). Data collection was conducted through a multi-channel strategy involving both structured instruments and unstructured data harvesting. The primary sampling frame consisted of the firm's newsletter subscribers (approximately 269,000 contacts, segmented into active user groups) and customers interacting via the Zendesk support platform(customer care software). To structure data collection and avoid systematic bias, the target mailing list was split randomly into two distinct clusters:

- Cluster A (Quantitative Focus) - This group received a closed-ended questionnaire designed to measure interest in co-creation, preferred touchpoints, and usage habits. The survey generated 41,349 opens and 1,652 clicks, resulting in 1,037 valid responses. This instrument utilized Likert scales (1-5) to quantify the users' propensity to collaborate and their satisfaction with current touchpoints.

- Cluster B (Qualitative Focus) - The second group received an open-ended instrument aimed at eliciting rich narratives. Users were asked to describe specific friction points, desired features, and the reasons behind their feedback. This instrument generated 34,341 opens, 901 clicks, and 392 full narrative responses.

To incentivize participation without compromising the intrinsic motivation discussed in the theoretical background, a gamification element was introduced: respondents were offered a one-month free trial of the "My E-Training" software. This ensured that the sample was composed of

active users interested in the product experience. Additionally, unstructured feedback was harvested from post-use touchpoints.

We analyzed interactions on the Zendesk platform (which boasted a 97.4% satisfaction rate) and discussions within the Strava community. These channels were selected because they represent what we called 'moment of truth' where value-in-use is experienced and reported. Following the core quality criteria for mixed methods research (O'Cathain et al., 2008), data analysis proceeded through a convergent design where quantitative and qualitative data were integrated during the interpretation phase. Quantitative data were analyzed using descriptive statistics to identify trends in channel preference and co-creation willingness. Qualitative data (open-ended responses and social media comments) underwent a thematic analysis. Responses were manually coded into three categories derived from the literature: (i) Functional Feedback: reports, hardware issues, and feature requests (such as calibration drifts); (ii) Relational Feedback: comments on customer support speed, brand trust, and community belonging; (iii) Symbolic Feedback: Narratives related to identity, achievement, and the pains & gains of training. To ensure interpretative reliability, the quality of the feedback was assessed using a standardized five-point scale (1=low, 5=high) evaluating three dimensions: richness, diagnostic value, and implementability. This evaluation was triangulated across two researchers and the firm's product managers to mitigate subjective bias and ensure that the insights were actionable for the R&D department. Throughout the study, top managers were continuously involved, actively ideating and implementing organizational changes in pursuit of a new Open Innovation model. To validate the findings, a qualitative check was performed: product managers evaluated the relevance of the collected insights through a specific 1-5 Likert scale questionnaire and subsequent in-depth dialogue with the researchers.

4. Findings

The quantitative analysis reveals a pronounced willingness among customers to contribute to innovation processes. Data from the closed-ended survey indicate that approximately 75% of respondents expressed a high or very high interest in taking part in co-creation activities. Specifically, when asked: How motivated are you to contribute to product development?,552 respondents (53%) selected the highest rating on the Likert scale (5), while another 41% expressed moderate to high interest.

The qualitative analysis of the open-ended responses clarifies the nature of this motivation. Consistent with Chan et al. (2021), participation was largely driven by intrinsic factors rather than financial incentives. Although a symbolic reward (a one-month free software trial) was offered, the narrative responses highlighted a 'sense of belonging' to the cycling community and a desire to improve the tools they use daily. Users did not act as paid consultants but as passionate "prosumers" seeking to enhance their own value-in-use. This confirms that the firm's community represents a latent repository of competence that goes beyond mere brand loyalty. While the willingness to participate was widespread, the study reveals that the diagnostic value of the insights was unevenly distributed across digital channels (see Figure 1). The analysis of social media channels (Instagram and Facebook) showed high interaction volumes (the Instagram profile alone generated over 19,000 interactions in the observation period) but low diagnostic quality (rated 2.8/5). Comments here were often brief, emotional, or related to brand image (symbolic feedback), useful for engagement but less actionable for R&D. Conversely, post-use touchpoints such as the Zendesk support platform and the Strava community produced the most substantive feedback (rated 4.9/5 for quality). These channels provided what we define as 'contextualized knowledge': detailed reports on calibration drifts, noise levels at specific wattages, and firmware inconsistencies. This feedback emerged from actual usage experiences (value-in-use) rather than pre-purchase expectations. For instance, the Strava group discussions

often contained technical telemetry data that internal R&D could not replicate in laboratory settings, validating the SDL premise that value is determined by the beneficiary during usage.

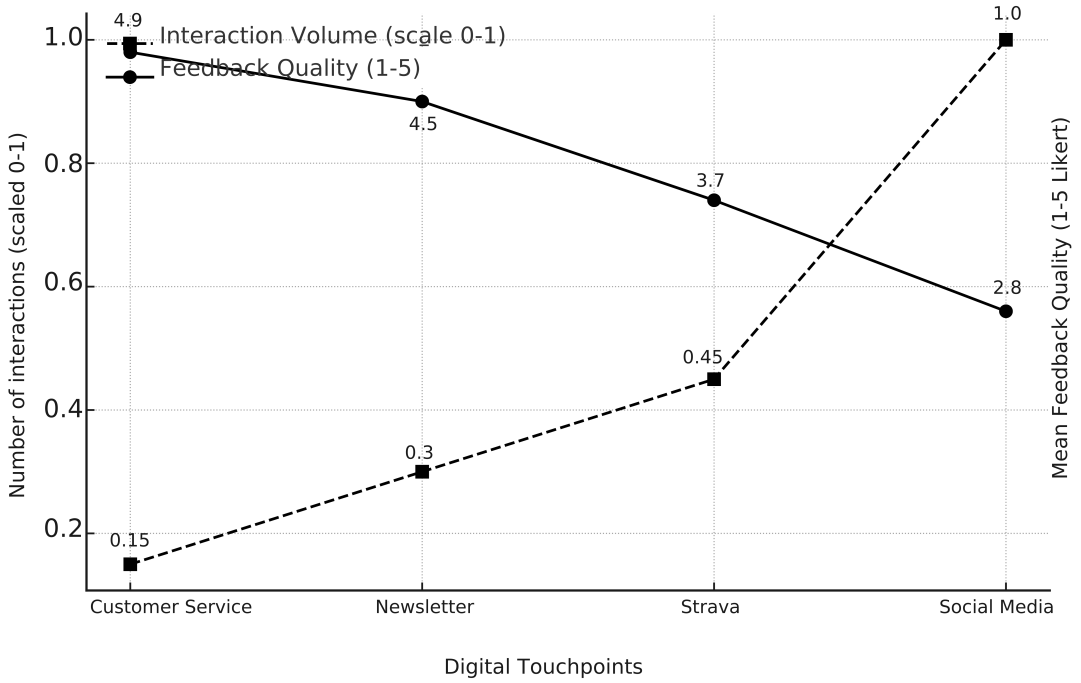


Figure 1. Interaction Volume vs Feedback Quality across Digital Touchpoints

A concrete example of how this feedback loop materializes is the development of the so-called 'Zwift Cog & Click' compatibility update. Through the analysis of support tickets and community discussions, the firm identified a recurring friction point: users with older trainer models felt excluded from the new virtual shifting features introduced by the virtual cycling platform Zwift. This was not a hardware failure, but a gap in the service experience. Initially, this dispersed feedback was treated as noise or simple complaints. However, by applying the structured listening routine, the firm re-categorized these inputs as a prioritized innovation opportunity. This led to the development of a specific firmware update released which enabled older direct-drive trainers to support the new virtual shifting protocols. The impact of this user-driven innovation was immediate. In the weeks following the update, the company registered a 15.3% increase in website traffic, with the specific news page generating over 1,600 unique views in the first few days. More importantly, the sentiment analysis on social channels shifted from frustration to gratitude, reinforcing the trust bond between the firm and its user base.

At this stage, the mixed team of researchers and product managers analyzed the results to assess the efficacy of each touchpoint in generating actionable ideas (see Table 1). This joint evaluation revealed a clear distinction in the efficacy of different channels, validating the Open Innovation model the firm intended to experiment with.

Touchpoint	**Customer Journey phase**	**Type of interaction**	**Efficacy in generating ideas**
Instagram Stories	Engagement/Post-use	Survey answer (closed and open-ended)	Medium
Facebook	Engagement	Comments and link to survey	Medium
Strava	Engagement/Use	Participiation in events and groups	Medium
Reddit	Consideration	Free discussion (no direct link)	Low
Newsletter	Post-use	Direct link to the survey	High
Website	Consideration-use	Informative visits (no interactions)	Low
Reviews	Post-use	Product feedback	Medium
Shop visits	Use	QR code	Medium
Events	Awareness/Engagement	Tablet or QR code on site	Medium
Zendesk	Post-use	Tickets	High
Chatbot	Use/Post-use	Chats (like/dislike)	Low
Knowledge base	Use	Article reads	Medium
Phone calls	Use	Spontaneous conversations	Medium
Focus groups	Post-use	Interviews	High

Ambassador	Awareness/Engagement	Distribtion through personal community	High

Table 1. Perceived effectiveness of touchpoints in generating customer ideas, source: authors' own elaboration

From an organizational perspective, the transition to this open innovation model was not painless. The sheer volume of feedback initially triggered the organizational paradox,described by Lin et al. (2021): the R&D team, accustomed to internal roadmaps, faced cognitive overload and potential inertia (the so-called Not-Invented-Here syndrome). The turning point was the formalization of a new organizational six-months routine, called "the 30-60-90 Routine". This simple yet rigid temporal framework provided the necessary structure to channel external creativity without disrupting internal efficiency:

- 30: day 0-30 (one month of Listening & Filtering) - Dedicated to the aggregation of unstructured data from Zendesk and Community Managers. Feedback is coded and prioritized based on frequency and feasibility;
- 60: day 31-90 (two months of Testing & Feasibility) - The selected insights (like the Zwift compatibility issue) enter a rapid prototyping phase. Here, the firm verifies technical constraints and runs micro-tests, often involving the "Focus Group" of 33 elite cyclists identified in the research context;
- 90: day 91+ (three months of Implementation & Communication) - The innovation is released (for instance, the firmware update) and the outcome is communicated back to the community, closing the loop.

This routine acted as a selective valve allowing the firm to harness the 'sea of information' without drowning in it. It transformed the abstract concept of Open Innovation into a manageable operational process. Top management said that this protocol allowed the company to transform "Feedback Data into Good Data".

5. Conclusion

The findings of this research offer significant empirical contribution to Open Innovation and Service-Dominant Logic (SDL) studies, particularly within the context of manufacturing SMEs. By analyzing the transition of Elite S.r.l. Società Benefit from a product-centric model to a community-driven innovation ecosystem, three major theoretical implications emerge.

First, this study addresses the organizational paradox highlighted by Lin et al. (2021). The literature often presents a dichotomy: rigid routines stifle innovation, while openness fosters it. However, our results demonstrate that in the digital age, openness without structure leads to cognitive overload and inertia. The 'sea of information' generated by 137,000 followers and thousands of support tickets creates a noise that can paralyze an SME's absorptive capacity. The 30-60-90 Routine identified in this case study functions as a dynamic capability that resolves this paradox. It provides the necessary rigidity (fixed timeframes) to manage the unstructured waves of external inputs. This challenges the assumption that Open Innovation requires loose organizational structures. But it also suggests that structured routines are the necessary antecedent to effectively operationalize co-creation. The routine transforms the Not-Invented-Here syndrome from a defensive psychological barrier into a manageable filtering process.

Second, the study deepens the application of Service-Dominant Logic (Vargo & Lusch, 2004; 2016) to physical product development. The discrepancy in feedback quality between social media (high volume, low diagnostic value) and post-use channels like Zendesk and Strava (lower volume, high diagnostic value) confirms that innovation is increasingly driven by value-in-use. While Open Innovation frameworks often emphasize the quantity of ideas (Big Data), an SDL

perspective emphasizes the context of usage (Good Data). The Zwift Cog example illustrates this perfectly: the innovation did not come from a blue sky idea on Instagram, but from users experiencing friction during the actual service provision (the training session). This suggests that for manufacturing firms, the most valuable external knowledge is not creative in the artistic sense, but in the experiential sense, derived from the interaction between the user and the product.

Third, responding to the call for a broader understanding of innovation's social dimension, this study highlights how co-creation fosters social capital. As noted by Chan et al. (2021), intrinsic motivation is key. When Elite S.r.l. Società Benefit implemented the firmware update requested by the community, it did not merely fix a technical issue; it validated the users' expertise. This act of "listening and doing" legitimizes the community, transforming customers from passive buyers into active stakeholders. This reciprocal value creation strengthens brand trust and resilience, creating a social buffer that protects the firm even during market disruptions. From a practitioner's standpoint, this study offers a replicable blueprint for SMEs navigating the complexities of digital feedback in three ways: (i) reimagining Post-Sales as Innovation Hubs: managers should stop viewing Customer Support solely as a cost center dedicated to troubleshooting. Our data shows that platforms like Zendesk and Strava are the richest sources of actionable innovation. Firms should integrate R&D personnel into support loops or create structured reporting channels (like the "Day 0-30" phase) to capture these insights; (ii) implementing lightweight routines: SMEs often fear that Open Innovation requires expensive platforms or massive teams. The 30-60-90 routine demonstrates that a simple, time-based heuristic can be effective. It allows firms to "listen" without losing focus on execution; (iii) gamification and engagement: while this study utilized a simple incentive (free software trial), the high participation rate suggests that users are eager to engage. Managers should explore advanced gamification strategies such as badges for lead contributors or beta-testing leaderboards to sustain this engagement over the product lifecycle, turning sporadic feedback into a continuous dialogue.

6. Limitations and Future Research

This study is not without limitations. Being a single case study focused on the sports equipment industry, the generalizability of the findings to other industries (for example services or Fast-moving consumer goods) requires verification. The analysis focused primarily on digital touchpoints potentially overlooking insights from physical retail interactions. Future research should extend this work in two directions. First, by collecting data to evaluate the 30-60-90 Routine overall impact, as a value driver for different stakeholders. Then by investigating the long-term effects of willingness to contribute to co-creation.

Keywords: Value co-creation; service-dominant logic; open innovation; organizational routines

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Socio-Demographic Profiles and Experiential Retail: Evidence for Designing Experience-Centric Digital Retail Strategies

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1. Introduction

The digital transformation of retail has significantly reshaped the interface between consumers and points of sale, fostering new interaction models and profoundly altering expectations throughout the purchasing process. The increasing integration of digital technologies has accelerated the diffusion of e-commerce, making product search, comparison, and transactions more efficient and accessible, while not diminishing the strategic role of the physical store. On the contrary, existing literature highlights that in-store experiences continue to generate value through sensory, emotional, and relational dimensions that remain difficult to replicate in digital environments (Zamfirache et al., 2024; Ghiuță and Nistor, 2025). Direct contact with products, the possibility of touching or trying them, and the opportunity to assess their physical characteristics play a central role in reducing uncertainty and shaping perceptions of quality, thereby influencing channel choice and purchase intention (Peck et al., 2013; Hermes et al., 2022). Similarly, interaction with sales personnel contributes to both cognitive and emotional evaluations of the shopping experience, as personalised advice and informational support foster trust, satisfaction, and loyalty intentions (Liu and Lee, 2024).

On the digital side, shopping experience is primarily shaped by functional and usability-related dimensions, including ease of use, speed, convenience, and informational clarity. Prior research consistently shows that perceived usefulness and ease of use represent key determinants of consumers' evaluations of digital technologies and e-commerce services (Davis, 1989; Venkatesh and Davis, 2000; Chen and Chang, 2023). Efficient navigation, smooth transaction processes, and reliable delivery services are therefore central elements in shaping positive digital shopping experiences and supporting online purchase decisions (Grewal et al., 2023; Mangano et al., 2021).

Alongside experiential and functional dimensions, sustainability has become an increasingly relevant criterion in consumers' evaluations of retail channels. Consumers show growing attention to environmentally responsible practices, particularly in relation to logistics and last mile delivery, and tend to incorporate sustainability considerations into their overall assessment of shopping experiences (Klein and Popp, 2022; Bjørgen et al., 2019). As such, sustainability can be interpreted not merely as an ethical concern, but as an evaluative dimension that contributes to how consumers perceive and compare physical and digital shopping options.

Against this backdrop, existing research has progressed along three partially separate streams. A first stream compares physical and digital shopping by focusing on differences in channel-related evaluations and outcomes (Zamfirache et al., 2024; Ghiuță and Nistor, 2025). A second stream conceptualises customer experience as a multidimensional construct, emphasising the coexistence of sensory, emotional, relational, and functional elements, particularly within omnichannel settings (Rahman et al., 2022; El Hedhli et al., 2013). A third stream examines

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sustainability-related perceptions in e-commerce and last-mile delivery, highlighting the role of perceived environmental responsibility in the evaluation and acceptance of delivery solutions (Bjørgen et al., 2019; Klein and Popp, 2022; Mangano et al., 2021). While demographic variables are frequently employed in consumer behaviour research (Hossain, 2024), evidence remains fragmented regarding how age and gender systematically shape specific experiential dimensions across physical and digital channels, and how sustainability perceptions co-occur with these experiential evaluations when consumers assess alternative shopping channels.

In this context, understanding how different consumer groups attribute value to physical and digital shopping experiences is particularly relevant for retailers operating in sectors where channel integration has intensified in recent years. This is especially the case for product categories such as consumer electronics, books, and apparel, which have experienced strong digital acceleration and structural changes in shopping behaviour, and where consumers frequently alternate between physical and online channels. Although prior studies have compared online versus offline shopping experiences (Zamfirache et al., 2024; Pathamuthu and Venkateshwari, 2025) and extensively examined technology-related evaluations in digital environments (Davis, 1989; Venkatesh and Davis, 2000; Chen and Chang, 2023), empirical evidence remains limited on how distinct experiential dimensions are weighted across channels by different demographic profiles within these retail contexts. In particular, sensory and relational facets characterising physical retail, functional and usability-related facets characterising digital retail, and sustainability-related perceptions are often examined in isolation rather than jointly within a single profiling-based analysis (Rahman et al., 2022; El Hedhli et al., 2013; Klein and Popp, 2022). This fragmentation limits the managerial usability of existing findings for retailers redesigning both physical touchpoints and digital interfaces as part of their digital transformation strategies (Grewal et al., 2023).

This study addresses this gap by proposing an integrated analysis of sociodemographic profiles, experiential dimensions of physical and digital channels, and sustainability-related perceptions, with the aim of generating profiling-based insights to support retail strategy design. The central objective of the study is to examine how consumer profiling based on shopping experiences can inform digital transformation strategies for retail stores. Rather than treating demographic variables as standalone predictors of channel choice, the study adopts an experience-centric profiling logic, in which age and gender are used to interpret how consumers evaluate sensory, emotional, relational, functional, and sustainability-related aspects of physical and digital shopping differently. Shopping experience is therefore conceptualised as a multidimensional construct encompassing both experiential and functional dimensions across channels.

Accordingly, the study aims to identify significant differences in perceptions of physical and digital shopping experiences across age and gender segments and to examine the role of sustainability in channel evaluation, with a specific focus on retail contexts characterised by strong online–offline integration, such as electronics, books, and apparel. It is important to note that this research represents a work in progress and provides a preliminary empirical basis for future investigations.

Consistent with consumer behaviour literature, age and gender were selected as key profiling variables, as they systematically influence how experiential attributes are evaluated across retail channels (Hossain, 2024). From a methodological perspective, the study adopts a quantitative approach and employs a Likert-scale questionnaire with items scored from 1 to 7, based on validated constructs in the literature (Rahman et al., 2022; Liu and Zhang, 2024; Kiliswa and Mugovax, 2025). The items capture experiential dimensions of physical shopping (e.g. product touch, interaction with sales personnel, emotional responses) and experiential and functional dimensions of digital shopping (e.g. layout, interactivity, ease of use, delivery services), as well as sustainability-related perceptions. The sample consists of 172 participants segmented by age group (Gen Z, Millennials, Adult Consumers) and gender. Data were analysed using one-way ANOVA and independent samples t-tests to compare group means and identify differentiated

patterns in shopping experiences and sustainability perceptions, thereby deriving implications for retail channel design.

2. Methodology

The study adopts a quantitative approach to analyse how different demographic profiles influence perceptions of experiential dimensions across physical and digital shopping channels. The main profiling variables used are age and gender. Age was divided into three groups consistent with literature and commonly adopted generational classifications in consumer behaviour research: Gen Z (18 to 28 years), Millennials (29 to 44 years), and Adult Consumers (45+). Gender was included as a second key demographic variable. Both variables were selected because they are widely employed predictors in studies of consumer behaviour, are easily measurable and interpretable, and are particularly effective at differentiating perceptions, preferences, and shopping choices (Hossain, 2024).

The questionnaire was built using items measured on seven-point Likert scales derived from validated constructs in prior research (Rahman et al., 2022; Liu and Zhang, 2024; Mugovax, 2025). The variables included key dimensions of the physical shopping experience, such as store atmosphere, the ability to touch products, interaction with sales staff and emotional responses, as well as dimensions of the digital experience, including website layout, interactivity, and perceptions of delivery services. Variables related to sustainability were also incorporated to assess both the importance attributed to this factor in purchase decisions and the perceived environmental impact of physical versus digital shopping.

The questionnaire explicitly referred to three retail product categories - apparel, consumer electronics, and books - and respondents were instructed to evaluate their physical and digital shopping experiences within these sectors.

Data analysis was conducted in SPSS using bivariate techniques, including One-Way ANOVA and independent-samples t-tests, to compare group means by age and gender. For ANOVA, homogeneity of variances was assessed using Levene's test: when $p > 0.05$, the assumption was met and standard ANOVA was applied, followed by Bonferroni post hoc tests if significant; when $p < 0.05$, robust ANOVA (Brown-Forsythe or Welch) was used, with Games-Howell post hoc tests (Delacre et al., 2019; Reed & Stark, 1988).

The same procedure was applied to t-tests: the classical test was used under homogeneity ($p > 0.05$), while the Welch correction was applied otherwise ($p < 0.05$) (Delacre et al., 2017; Ruxton, 2006). In all cases, statistical significance was used to assess differences between groups.

3. Results

The results are presented by sample profiling data summarised in Tables 1 and 2, which illustrate the distribution of participants across age groups and gender categories.

Gender	**Frequency (N)**	**Percentage (%)**
Women	99	57.6
Men	73	42.4
Total	**172**	**100**

Table 1. Gender Distribution

Age Group	Frequency (N)	Percentage (%)
Gen Z (18–28)	75	43.6
Millennials (29–44)	61	35.5
Adult Consumers (45+)	36	20.9
Total	**172**	**100**

Table 2. Age Group Distribution

Following the sample profiling, the analysis proceeds with mean comparisons across three subsequent sections, examining differences between groups within the physical and digital channels and in sustainability-related perceptions.

To analyse the effect of age on the variable FIS_1 "Being able to touch or try products is essential for me before purchasing", a comparison was conducted across the three age groups included in the study. A One-Way ANOVA was performed for this purpose.

Levene's test for homogeneity of variances yielded a significance level of 0.002, which is below the 0.05 threshold. This result indicates that the assumption of homoscedasticity was not met, and the analysis therefore proceeded with the robust tests of equality of means, namely the Welch and Brown-Forsythe tests. Both tests showed significance levels below 0.05, suggesting that not all group means are equal.

Based on these results, multiple comparisons were examined using the Games-Howell post hoc test, which is appropriate when variances are heterogeneous. The comparison revealed a significant difference between two groups, with a significance level of 0.008, specifically between Millennials and Adult Consumers.

	(I) Età in classi:	(J) Età in classi:	Differenza della media (I–J)	Errore std.	Sign.	Intervallo di confidenza 95% Limite inferiore	Limite superiore
Bonferroni	18 – 28 (Gen Z)	29 – 44 (Millennials)	,261	,249	,890	–,34	,86
		45+ (Adult Consumers)	–,577	,293	,152	–1,29	,13
	29 – 44 (Millennials)	18 – 28 (Gen Z)	–,261	,249	,890	–,86	,34
		45+ (Adult Consumers)	–,837*	,304	,019	–1,57	–,10
	45+ (Adult Consumers)	18 – 28 (Gen Z)	,577	,293	,152	–,13	1,29
		29 – 44 (Millennials)	,837*	,304	,019	,10	1,57
Games-Howell	18 – 28 (Gen Z)	29 – 44 (Millennials)	,261	,266	,590	–,37	,89
		45+ (Adult Consumers)	–,577	,247	,056	–1,16	,01
	29 – 44 (Millennials)	18 – 28 (Gen Z)	–,261	,266	,590	–,89	,37
		45+ (Adult Consumers)	–,837*	,272	,008	–1,49	–,19
	45+ (Adult Consumers)	18 – 28 (Gen Z)	,577	,247	,056	–,01	1,16
		29 – 44 (Millennials)	,837*	,272	,008	,19	1,49

*. La differenza della media è significativa al livello 0.05.

Table 3. Post-hoc Comparisons of Age Groups for FIS_1

The descriptive statistics table shows that Millennials report a mean score of 5.25, whereas Adult Consumers report a higher mean of 6.08. This indicates that, for Adult Consumers, the ability to touch or try products before purchasing is perceived as more important than for Millennials. This result is also clearly visible in the mean plot, which highlights the gap between the two groups.

	N	Media	Deviazione std.	Errore std.	95% di intervallo di confidenza per la media		Minimo	Massimo
					Limite inferiore	Limite superiore		
18 – 28 (Gen Z)	75	5,51	1,465	,169	5,17	5,84	2	7
29 – 44 (Millennials)	61	5,25	1,598	,205	4,84	5,66	1	7
45+ (Adult Consumers)	36	6,08	1,079	,180	5,72	6,45	3	7
Totale	172	5,53	1,469	,112	5,31	5,76	1	7

Table 4. Descriptive Statistics of Age Groups for FIS_1

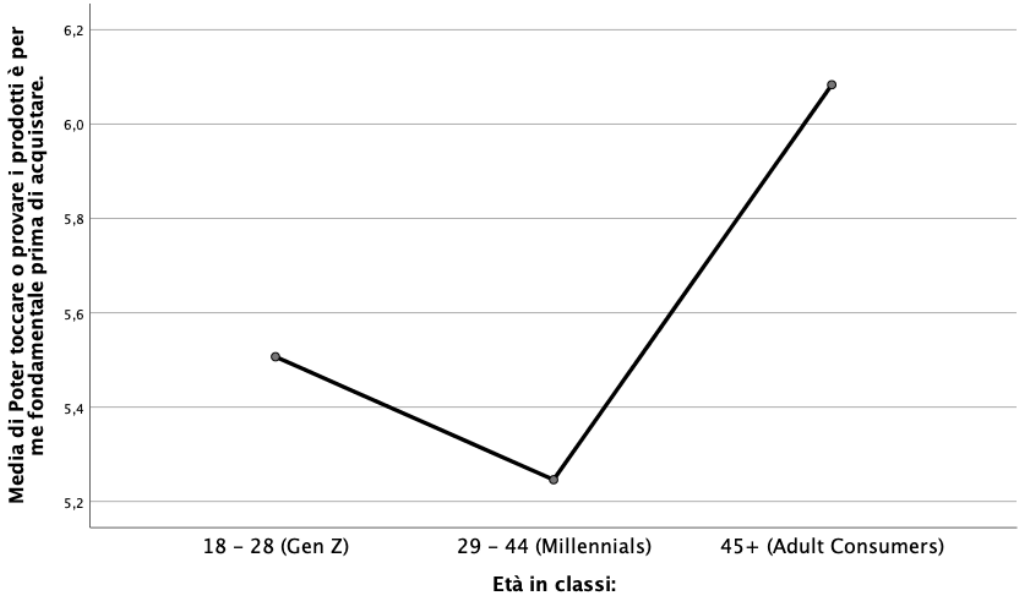


Figure 1. Mean Scores by Age Group by Age Groups for FIS_1

To examine differences across age groups for the variable FIS_2 "The positive emotions I feel while shopping (relaxation, enthusiasm, good mood)", a One-Way ANOVA was conducted. Levene's test indicated a significance level above 0.05, confirming the homogeneity of variances, and the classical ANOVA was therefore applied. The analysis returned a significant p-value below 0.05, indicating that the group means differ. Post hoc comparisons using the Bonferroni test revealed a significant difference between Millennials and Adult Consumers, with a significance level of 0.013.

	(I) Età in classi:	(J) Età in classi:	Differenza della media (I–J)	Errore std.	Sign.	Intervallo di confidenza 95% Limite inferiore	Limite superiore
Bonferroni	18 – 28 (Gen Z)	29 – 44 (Millennials)	,521	,275	,178	–,14	1,19
		45+ (Adult Consumers)	–,450	,323	,496	–1,23	,33
	29 – 44 (Millennials)	18 – 28 (Gen Z)	–,521	,275	,178	–1,19	,14
		45+ (Adult Consumers)	–,971*	,335	,013	–1,78	–,16
	45+ (Adult Consumers)	18 – 28 (Gen Z)	,450	,323	,496	–,33	1,23
		29 – 44 (Millennials)	,971*	,335	,013	,16	1,78
Games-Howell	18 – 28 (Gen Z)	29 – 44 (Millennials)	,521	,272	,138	–,12	1,17
		45+ (Adult Consumers)	–,450	,330	,366	–1,24	,34
	29 – 44 (Millennials)	18 – 28 (Gen Z)	–,521	,272	,138	–1,17	,12
		45+ (Adult Consumers)	–,971*	,339	,015	–1,78	–,16
	45+ (Adult Consumers)	18 – 28 (Gen Z)	,450	,330	,366	–,34	1,24
		29 – 44 (Millennials)	,971*	,339	,015	,16	1,78

*. La differenza della media è significativa al livello 0.05.

Table 5. Post-hoc Comparisons of Age Groups for FIS_2

The descriptive statistics show that Millennials reported a mean of 4.28, whereas Adult Consumers reported a higher mean of 5.25. This suggests that Adult Consumers tend to experience stronger positive emotions while shopping than Millennials do. The mean plot further illustrates this difference between the two groups.

	N	Media	Deviazione std.	Errore std.	95% di intervallo di confidenza per la media Limite inferiore	Limite superiore	Minimo	Massimo
18 – 28 (Gen Z)	75	4,80	1,594	,184	4,43	5,17	1	7
29 – 44 (Millennials)	61	4,28	1,561	,200	3,88	4,68	1	7
45+ (Adult Consumers)	36	5,25	1,645	,274	4,69	5,81	1	7
Totale	172	4,71	1,625	,124	4,46	4,95	1	7

Table 6. Descriptive Statistics of Age Groups for FIS_2

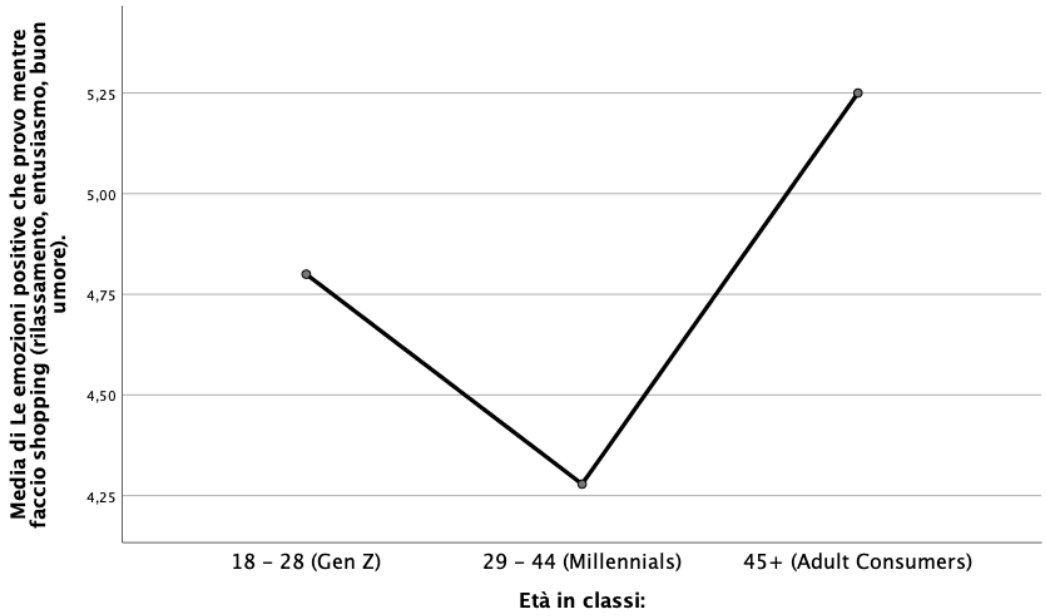


Figure 2. Mean Scores by Age Group by Age Groups for FIS_2

The same variable, FIS_2, was also compared between genders using an independent samples t-test. Levene's test indicated a significance level above 0.05 (p = 0.698), confirming the assumption of equal variances, and the first row of the t-test output was therefore used. The two-tailed test yielded a p-value of 0.004, below the 0.05 threshold, indicating that the mean scores differ significantly between men and women.

Based on the descriptive statistics, women report higher mean scores than men on this variable, suggesting they tend to experience stronger positive emotions during shopping. This pattern is also reflected in the descriptive table.

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie				
		F	Sign.	t	gl	Sign. (a due code)	Differenza della media	Differenza errore standard
Le emozioni positive che provo mentre faccio shopping (rilassamento, entusiasmo, buon umore).	Varianze uguali presunte	,151	,698	2,887	170	,004	,709	,245
	Varianze uguali non presunte			2,928	162,402	,004	,709	,242

Table 7. Independent Samples t-test of Gender Differences for FIS_2

	Genere:	N	Media	Deviazione std.	Media errore standard
Le emozioni positive che provo mentre faccio shopping (rilassamento, entusiasmo, buon umore).	Donna	99	5,01	1,651	,166
	Uomo	73	4,30	1,506	,176

Table 8. Descriptive Statistics of Gender for FIS_2

To examine age differences for the variable FIS_3 "The multisensory atmosphere of the store (lighting, scents, music, colors)", the same analytical procedure used for the previous tests was applied. After checking Levene's test and identifying the appropriate significance thresholds, the results indicated that group means differ. Post-hoc comparisons using the Bonferroni test revealed a significant difference between Millennials and Adult Consumers at the 0.007 level.

			Differenza della media (I–J)	Errore std.	Sign.	Intervallo di confidenza 95%	
	(I) Età in classi:	(J) Età in classi:				Limite inferiore	Limite superiore
Bonferroni	18 – 28 (Gen Z)	29 – 44 (Millennials)	,558	,287	,159	-,13	1,25
		45+ (Adult Consumers)	-,527	,337	,360	-1,34	,29
	29 – 44 (Millennials)	18 – 28 (Gen Z)	-,558	,287	,159	-1,25	,13
		45+ (Adult Consumers)	-1,085*	,349	,007	-1,93	-,24
	45+ (Adult Consumers)	18 – 28 (Gen Z)	,527	,337	,360	-,29	1,34
		29 – 44 (Millennials)	1,085*	,349	,007	,24	1,93
Games-Howell	18 – 28 (Gen Z)	29 – 44 (Millennials)	,558	,285	,127	-,12	1,23
		45+ (Adult Consumers)	-,527	,338	,270	-1,33	,28
	29 – 44 (Millennials)	18 – 28 (Gen Z)	-,558	,285	,127	-1,23	,12
		45+ (Adult Consumers)	-1,085*	,339	,006	-1,90	-,27
	45+ (Adult Consumers)	18 – 28 (Gen Z)	,527	,338	,270	-,28	1,33
		29 – 44 (Millennials)	1,085*	,339	,006	,27	1,90

Table 9. Post-hoc Comparisons of Age Groups for FIS_3

The descriptive statistics show that Millennials reported a mean of 4.08, whereas Adult Consumers reported a higher mean of 5.17. This suggests that Adult Consumers place greater importance on the store's multisensory atmosphere than Millennials do. This pattern is also clearly reflected in the mean plot.

	N	Media	Deviazione std.	Errore std.	95% di intervallo di confidenza per la media		Minimo	Massimo
					Limite inferiore	Limite superiore		
18 – 28 (Gen Z)	75	4,64	1,737	,201	4,24	5,04	1	7
29 – 44 (Millennials)	61	4,08	1,584	,203	3,68	4,49	1	7
45+ (Adult Consumers)	36	5,17	1,630	,272	4,62	5,72	1	7
Totale	172	4,55	1,701	,130	4,30	4,81	1	7

Table 10. Descriptive Statistics of Age Groups for FIS_3

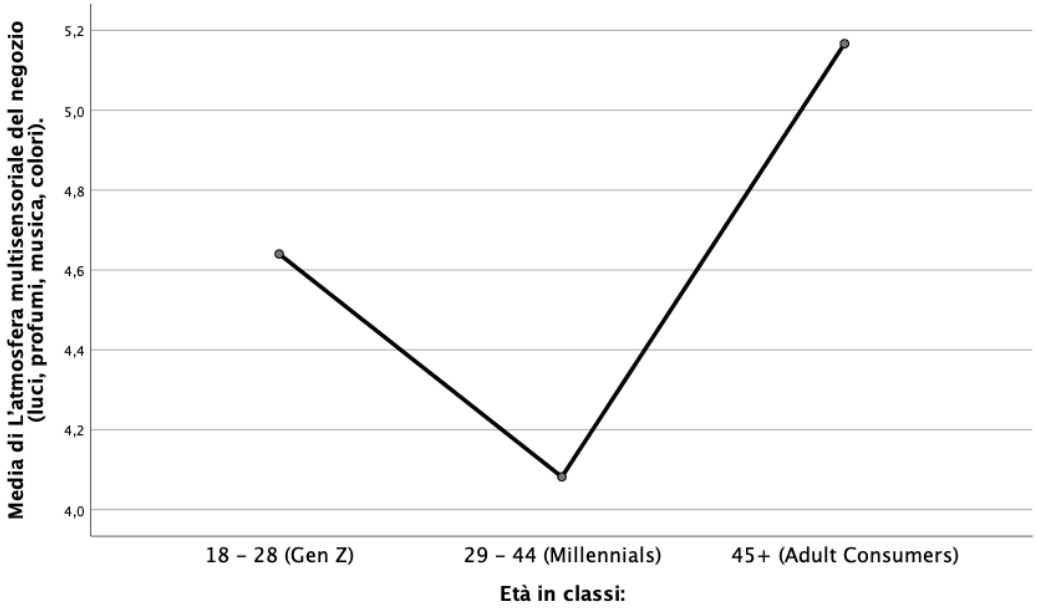


Fig. 3. Mean Scores by Age Group by Age Groups for FIS_3

To examine age differences for the variable FIS_4 “The human interaction with store staff or the opportunity to share the moment with other people”, the same analytical procedure used in the previous tests was applied. After checking Levene’s test and identifying the appropriate significance thresholds, the results indicated that group means differ. Post hoc comparisons using the Bonferroni test showed significant differences between Adult Consumers and both Gen Z ($p = 0.013$) and Millennials ($p = 0.000$), but no significant difference between Gen Z and Millennials.

	(I) Età in classi:	(J) Età in classi:	Differenza della media (I–J)	Errore std.	Sign.	Intervallo di confidenza 95% Limite inferiore	Limite superiore
Bonferroni	18 – 28 (Gen Z)	29 – 44 (Millennials)	,616	,287	,100	–,08	1,31
		45+ (Adult Consumers)	–,974*	,338	,013	–1,79	–,16
	29 – 44 (Millennials)	18 – 28 (Gen Z)	–,616	,287	,100	–1,31	,08
		45+ (Adult Consumers)	–1,591*	,350	,000	–2,44	–,74
	45+ (Adult Consumers)	18 – 28 (Gen Z)	,974*	,338	,013	,16	1,79
		29 – 44 (Millennials)	1,591*	,350	,000	,74	2,44
Games-Howell	18 – 28 (Gen Z)	29 – 44 (Millennials)	,616	,293	,094	–,08	1,31
		45+ (Adult Consumers)	–,974*	,321	,009	–1,74	–,21
	29 – 44 (Millennials)	18 – 28 (Gen Z)	–,616	,293	,094	–1,31	,08
		45+ (Adult Consumers)	–1,591*	,337	,000	–2,40	–,79
	45+ (Adult Consumers)	18 – 28 (Gen Z)	,974*	,321	,009	,21	1,74
		29 – 44 (Millennials)	1,591*	,337	,000	,79	2,40

*. La differenza della media è significativa al livello 0.05.

Table 11. Post-hoc Comparisons of Age Groups for FIS_4

The descriptive statistics indicate mean scores of 4.39 for Gen Z, 3.77 for Millennials, and 5.36 for Adult Consumers. This suggests that Adult Consumers place considerably greater importance on the human relationship with store personnel and on sharing the shopping moment with others. The mean plot clearly reflects this pattern.

	N	Media	Deviazione std.	Errore std.	95% di intervallo di confidenza per la media Limite inferiore	Limite superiore	Minimo	Massimo
18 – 28 (Gen Z)	75	4,39	1,684	,194	4,00	4,77	1	7
29 – 44 (Millennials)	61	3,77	1,717	,220	3,33	4,21	1	7
45+ (Adult Consumers)	36	5,36	1,533	,256	4,84	5,88	1	7
Totale	172	4,37	1,754	,134	4,11	4,64	1	7

Table 12. Descriptive Statistics of Age Groups for FIS_4

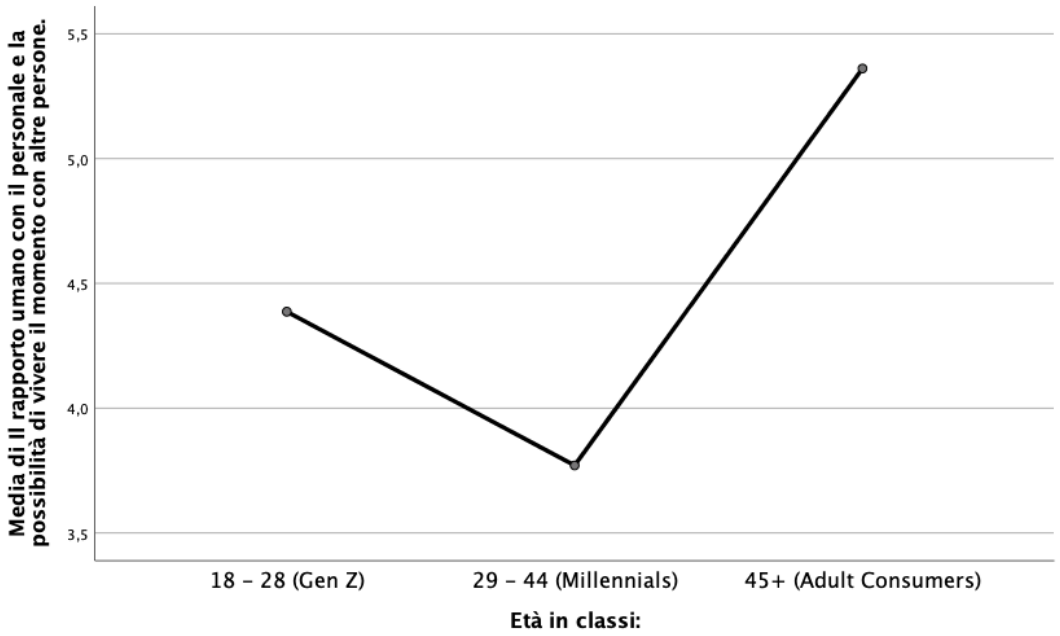


Figure 4. Mean Scores by Age Group by Age Groups for FIS_4

Finally, the variables FIS_1 to FIS_4 were also compared across gender. No significant differences emerged, except for FIS_2, related to positive shopping emotions, as previously discussed.

For the digital section, the variable DIG_1, "A well-designed and visually appealing website/app layout encourages me to continue the shopping experience," was compared between genders using an independent-samples t-test. Levene's test indicated a significance level above 0.05 (p = 0.051), so the first row of the output, assuming equal variances, was considered. The two-tailed test yielded a p-value of 0.009, which is below the 0.05 threshold, confirming that the mean scores differ between men and women.

As shown in the descriptive statistics, women report higher mean values than men, indicating that a visually appealing, well-designed layout tends to influence their continued online shopping experience more strongly. This pattern is also reflected in the descriptive table.

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie				
		F	Sign.	t	gl	Sign. (a due code)	Differenza della media	Differenza errore standard
Un layout ben curato e visivamente piacevole del sito/app mi invoglia a continuare l' esperienza di acquisto.	Varianze uguali presunte	3,851	,051	2,643	170	,009	,469	,178
	Varianze uguali non presunte			2,557	134,179	,012	,469	,184

Table 13. Independent Samples t-test of Gender Differences for DIG_1

	Genere:	N	Media	Deviazione std.	Media errore standard
Un layout ben curato e visivamente piacevole del sito/app mi invoglia a continuare l' esperienza di acquisto.	Donna	99	5,99	1,035	,104
	Uomo	73	5,52	1,292	,151

Table 14. Descriptive Statistics of Gender for DIG_1

For the variable DIG_2 "*If the website is interactive and easy to use, I feel more engaged and motivated to purchase*", a One-Way ANOVA was conducted to examine age differences. After checking Levene's test and identifying the appropriate significance thresholds, the analysis required robust tests, which indicated significant differences across groups. Post-hoc comparisons using the Games-Howell test revealed a significant difference between Millennials and Adult Consumers (p = 0.007).

	(I) Età in classi:	(J) Età in classi:	Differenza della media (I–J)	Errore std.	Sign.	Intervallo di confidenza 95% Limite inferiore	Limite superiore
Bonferroni	18 – 28 (Gen Z)	29 – 44 (Millennials)	,430	,206	,116	–,07	,93
		45+ (Adult Consumers)	–,271	,243	,797	–,86	,32
	29 – 44 (Millennials)	18 – 28 (Gen Z)	–,430	,206	,116	–,93	,07
		45+ (Adult Consumers)	–,701*	,252	,018	–1,31	–,09
	45+ (Adult Consumers)	18 – 28 (Gen Z)	,271	,243	,797	–,32	,86
		29 – 44 (Millennials)	,701*	,252	,018	,09	1,31
Games-Howell	18 – 28 (Gen Z)	29 – 44 (Millennials)	,430	,225	,139	–,10	,96
		45+ (Adult Consumers)	–,271	,192	,338	–,73	,19
	29 – 44 (Millennials)	18 – 28 (Gen Z)	–,430	,225	,139	–,96	,10
		45+ (Adult Consumers)	–,701*	,226	,007	–1,24	–,16
	45+ (Adult Consumers)	18 – 28 (Gen Z)	,271	,192	,338	–,19	,73
		29 – 44 (Millennials)	,701*	,226	,007	,16	1,24

*. La differenza della media è significativa al livello 0.05.

Table 15. Post-hoc Comparisons of Age Groups for DIG_2

The descriptive statistics show a mean of 5.41 for Millennials and a higher mean of 6.11 for Adult Consumers. This suggests that Adult Consumers place greater importance on having an online shopping experience that is simple, intuitive and easy to navigate, whereas Millennials appear to be more focused on the purchase itself rather than on the user friendliness of the interface. This pattern is also visible in the mean plot.

	N	Media	Deviazione std.	Errore std.	95% di intervallo di confidenza per la media Limite inferiore	Limite superiore	Minimo	Massimo
18 – 28 (Gen Z)	75	5,84	1,163	,134	5,57	6,11	3	7
29 – 44 (Millennials)	61	5,41	1,407	,180	5,05	5,77	1	7
45+ (Adult Consumers)	36	6,11	,820	,137	5,83	6,39	4	7
Totale	172	5,74	1,221	,093	5,56	5,93	1	7

Table 16. Descriptive Statistics of Gender for DIG_2

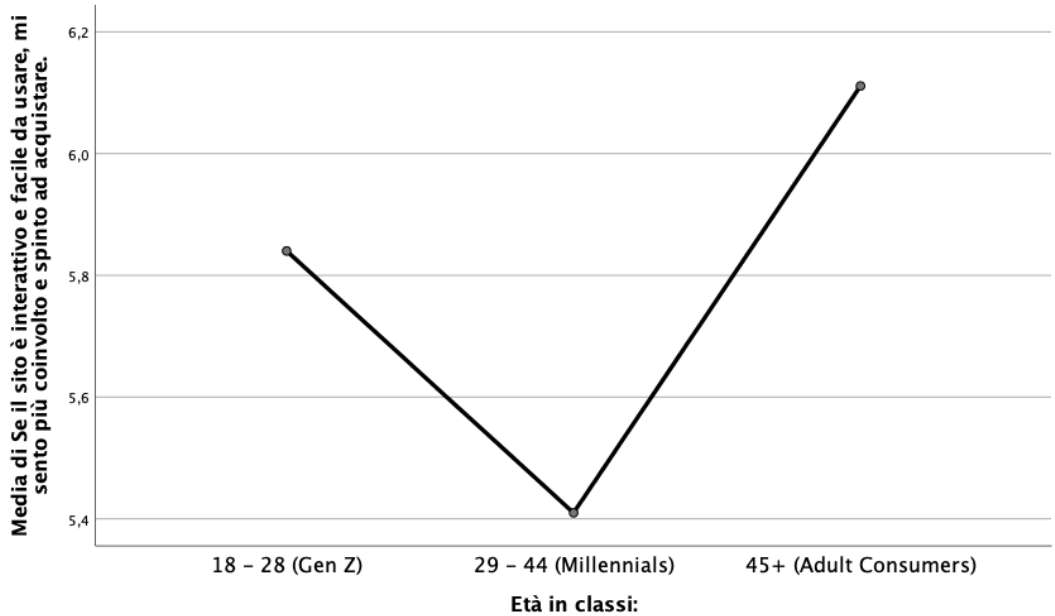


Fig. 5. Mean Scores by Age Group by Age Groups for DIG_2

For the variable DIG_3 "*When I shop online, deliveries arrive within the promised time*", a One-Way ANOVA was conducted. After checking Levene's test and identifying the appropriate significance thresholds, the analysis required robust tests, which indicated significant differences across groups. Post-hoc comparisons using the Games-Howell test revealed a significant difference between Gen Z and Adult Consumers (p = 0.003).

	(I) Età in classi:	(J) Età in classi:	Differenza della media (I–J)	Errore std.	Sign.	Intervallo di confidenza 95% Limite inferiore	Limite superiore
Bonferroni	18 – 28 (Gen Z)	29 – 44 (Millennials)	-,416	,180	,068	-,85	,02
		45+ (Adult Consumers)	-,658*	,212	,007	-1,17	-,14
	29 – 44 (Millennials)	18 – 28 (Gen Z)	,416	,180	,068	-,02	,85
		45+ (Adult Consumers)	-,242	,220	,817	-,77	,29
	45+ (Adult Consumers)	18 – 28 (Gen Z)	,658*	,212	,007	,14	1,17
		29 – 44 (Millennials)	,242	,220	,817	-,29	,77
Games-Howell	18 – 28 (Gen Z)	29 – 44 (Millennials)	-,416	,184	,066	-,85	,02
		45+ (Adult Consumers)	-,658*	,196	,003	-1,12	-,19
	29 – 44 (Millennials)	18 – 28 (Gen Z)	,416	,184	,066	-,02	,85
		45+ (Adult Consumers)	-,242	,182	,383	-,68	,19
	45+ (Adult Consumers)	18 – 28 (Gen Z)	,658*	,196	,003	,19	1,12
		29 – 44 (Millennials)	,242	,182	,383	-,19	,68

*. La differenza della media è significativa al livello 0.05.

Table 17. Post-hoc Comparisons of Age Groups for DIG_3

According to the descriptive statistics, Gen Z reports a mean of 5.45, while Adult Consumers show a higher mean of 6.11. This suggests that older consumers tend to perceive delivery reliability as more consistent or to place greater importance on punctual deliveries than younger shoppers. The mean plot visually reflects this pattern.

	N	Media	Deviazione std.	Errore std.	95% di intervallo di confidenza per la media Limite inferiore	Limite superiore	Minimo	Massimo
18 – 28 (Gen Z)	75	5,45	1,211	,140	5,17	5,73	3	7
29 – 44 (Millennials)	61	5,87	,939	,120	5,63	6,11	2	7
45+ (Adult Consumers)	36	6,11	,820	,137	5,83	6,39	4	7
Totale	172	5,74	1,074	,082	5,58	5,90	2	7

Table 18. Descriptive Statistics of Gender for DIG_3

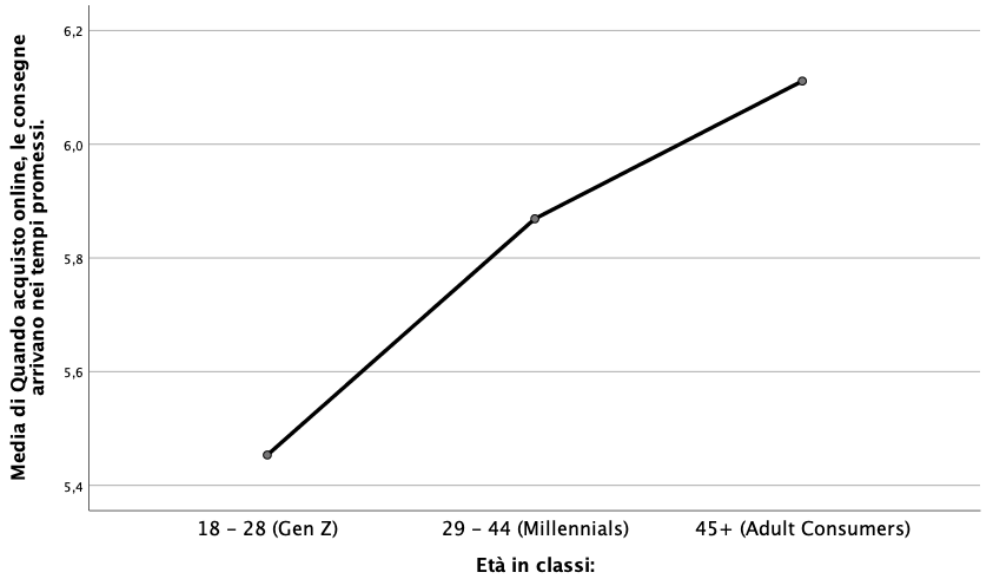


Figure 6. Mean Scores by Age Group by Age Groups for DIG_3

Finally, the variables DIG_1 to DIG_3 were also compared across gender. No significant differences emerged, except for DIG_1, related to the website layout, as previously discussed.

The final section of the analysis focuses on sustainability-related perceptions, beginning with the variable SOS_1 "*When choosing where to shop, how important is sustainability to you?*". Following the ANOVA, after checking Levene's test and applying the appropriate significance criteria, classical ANOVA was used. The analysis showed significant differences across groups, and post-hoc comparisons using the Bonferroni test revealed a significant difference between Millennials and Adult Consumers (p = 0.016).

	(I) Età in classi:	(J) Età in classi:	Differenza della media (I–J)	Errore std.	Sign.	Intervallo di confidenza 95% Limite inferiore	Limite superiore
Bonferroni	18 – 28 (Gen Z)	29 – 44 (Millennials)	,227	,256	1,000	–,39	,85
		45+ (Adult Consumers)	–,652	,301	,096	–1,38	,08
	29 – 44 (Millennials)	18 – 28 (Gen Z)	–,227	,256	1,000	–,85	,39
		45+ (Adult Consumers)	–,879*	,312	,016	–1,63	–,12
	45+ (Adult Consumers)	18 – 28 (Gen Z)	,652	,301	,096	–,08	1,38
		29 – 44 (Millennials)	,879*	,312	,016	,12	1,63
Games-Howell	18 – 28 (Gen Z)	29 – 44 (Millennials)	,227	,268	,675	–,41	,86
		45+ (Adult Consumers)	–,652*	,272	,050	–1,30	,00
	29 – 44 (Millennials)	18 – 28 (Gen Z)	–,227	,268	,675	–,86	,41
		45+ (Adult Consumers)	–,879*	,304	,013	–1,60	–,15
	45+ (Adult Consumers)	18 – 28 (Gen Z)	,652*	,272	,050	,00	1,30
		29 – 44 (Millennials)	,879*	,304	,013	,15	1,60

*. La differenza della media è significativa al livello 0.05.

Table 19. Post-hoc Comparisons of Age Groups for SOS_1

The descriptive statistics indicate a mean of 4.43 for Millennials and a higher mean of 5.31 for Adult Consumers. This suggests that older consumers place greater importance on sustainability when choosing where to shop than Millennials do. The trend is clearly reflected in the mean plot. No significant differences emerged when comparing the variable by gender.

	N	Media	Deviazione std.	Errore std.	95% di intervallo di confidenza per la media		Minimo	Massimo
					Limite inferiore	Limite superiore		
18 – 28 (Gen Z)	75	4,65	1,419	,164	4,33	4,98	1	7
29 – 44 (Millennials)	61	4,43	1,658	,212	4,00	4,85	1	7
45+ (Adult Consumers)	36	5,31	1,305	,218	4,86	5,75	3	7
Totale	172	4,71	1,513	,115	4,48	4,94	1	7

Table 20. Descriptive Statistics of Gender for SOS_1

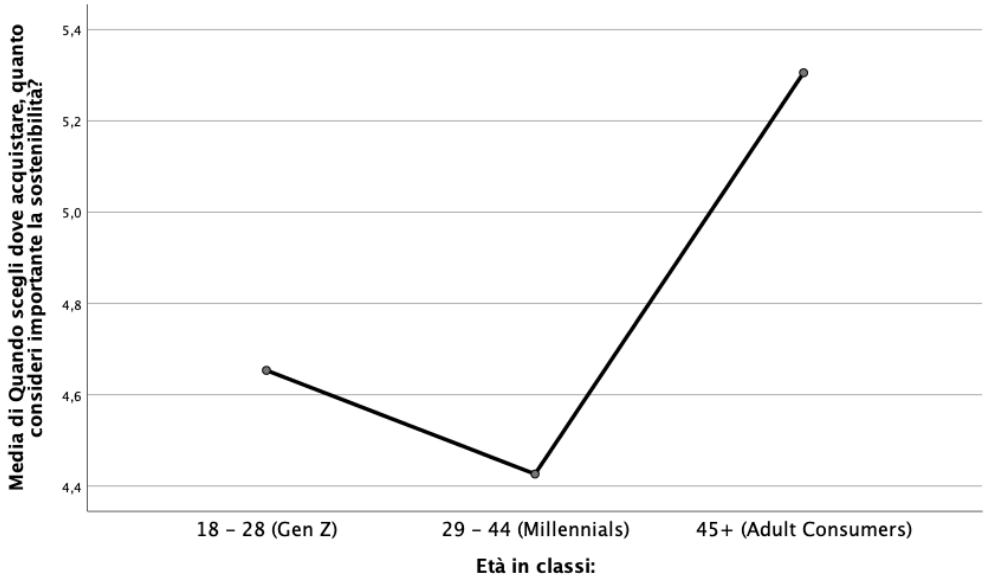


Figure 7. Mean Scores by Age Group by Age Groups for SOS_1

Finally, for the variable SOS_2 "*I believe that online shopping has a greater environmental impact than shopping in a physical store*", gender differences were examined using an independent samples t-test. Levene's test indicated a significance level above 0.05, confirming the assumption of equal variances, so the first row of the t-test output was considered. The two-tailed test showed a significant result (p = 0.003), indicating that men and women differ in their perceptions of the environmental impact of online shopping.

The descriptive statistics show a mean of 4.51 for men and a higher mean of 5.22 for women, suggesting that women are more likely to believe that online purchases have a greater environmental impact than in-store purchases. No significant age differences emerged for this variable.

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie				
		F	Sign.	t	gl	Sign. (a due code)	Differenza della media	Differenza errore standard
Credo che l'acquisto online abbia un impatto ambientale maggiore rispetto al negozio fisico.	Varianze uguali presunte	,082	,775	2,967	170	,003	,715	,241
	Varianze uguali non presunte			2,957	153,424	,004	,715	,242

Table 21. Independent Samples t-test of Gender Differences for SOS_2

	Genere:	N	Media	Deviazione std.	Media errore standard
Credo che l'acquisto online abbia un impatto ambientale maggiore rispetto al negozio fisico.	Donna	99	5,22	1,549	,156
	Uomo	73	4,51	1,582	,185

Table 22. Descriptive Statistics of Gender for SOS_2

4. Conclusion

The findings of this study show that consumer evaluations of physical and digital retail channels differ systematically across demographic profiles, highlighting the relevance of an experience-centric approach to retail strategy design. Age emerges as a particularly influential factor in shaping the evaluation of experiential dimensions. Adult Consumers consistently assign greater importance to key experiential attributes of the physical store, including product touch, emotional engagement, store atmosphere, and interpersonal interaction. In digital environments, there is greater value placed on simplicity, usability, and intuitive interfaces, indicating a preference for frictionless, accessible online experiences. Younger consumers, by contrast, appear more transaction-oriented, prioritising speed and functional efficiency over experiential richness.

Sustainability also plays a distinct role in channel evaluation, particularly among Adult Consumers, who exhibit greater environmental sensitivity when assessing shopping experiences in both physical and digital contexts. This suggests that sustainability functions as an evaluative component of the overall shopping experience rather than as an isolated ethical concern. Gender-based differences are more limited, yet they indicate that women tend to experience stronger positive emotions during in-store shopping, show greater appreciation for visually curated digital interfaces, and perceive a higher environmental impact associated with online shopping.

Overall, the results confirm that experiential preferences are not homogeneous but are shaped by sociodemographic profiles. By adopting an experience-centric profiling perspective, the study contributes to a deeper understanding of how consumers evaluate retail channels in contexts characterised by strong online–offline integration, such as apparel, consumer electronics, and books. These insights provide a foundation for designing targeted digital transformation strategies that align channel-specific experiential configurations with the expectations of different consumer groups.

5. Managerial implications

The study provides actionable insights for retailers aiming to redesign their online and offline value propositions through an experience-centric perspective. The strong experiential expectations expressed by Adult Consumers highlight the importance of preserving and enhancing sensory and relational elements of the physical store, such as product tryouts, interpersonal interaction, and emotionally engaging atmospheres. Rather than being residual features, these elements should be strategically leveraged as core components of the in-store experience, particularly in retail contexts characterised by strong online–offline integration, such as apparel, consumer electronics, and books.

In digital channels, the findings suggest that retailers should prioritise simplicity, usability, and clarity in interface design, as these attributes are especially valued by Adult Consumers and women. For younger consumers, who appear more transaction-oriented, digital experience design should emphasise efficiency through streamlined checkouts, fast product search functions, and

transparent delivery information. This differentiation supports the development of channel-specific experiential configurations rather than uniform digital solutions.

Sustainability also emerges as a relevant dimension of experience design. Given the higher sensitivity observed among Adult Consumers and women, retailers should integrate sustainability cues into both physical and digital touchpoints, for instance through transparent communication about eco-friendly practices, responsible packaging, and green delivery options. Framing sustainability as part of the overall shopping experience, rather than as an isolated ethical message, may enhance its perceived relevance and effectiveness.

Overall, the findings indicate that digital transformation strategies should be grounded in experience-centric profiling, using demographic variables as interpretative lenses for channel-specific experience design. This approach enables retailers to differentiate functional and emotional value across channels and to better align retail experiences with the heterogeneous expectations of different consumer groups.

6. Limitations and Future Research

This study presents several methodological considerations that open avenues for future research. First, the analysis used bivariate techniques, which provided a clear initial picture of how demographic variables relate to different experiential dimensions. However, this approach does not allow for the exploration of the simultaneous effects of multiple variables. Future studies could therefore adopt multivariate methods to enable a more integrated examination of demographic, experiential, and sustainability-related factors, particularly when supported by a broader dataset. Regarding the sample size, it will be expanded in the second phase of the research, as this is an ongoing study.

Another limitation concerns the exclusive use of quantitative data. While this approach ensures comparability and statistical rigour, it does not capture the deeper nuances underlying consumer motivations and interpretations of their shopping experiences. Integrating qualitative methods, such as interviews or focus groups, would complement the quantitative results and provide richer insights. In addition to, while the study focuses on three retail categories characterised by strong online–offline integration (apparel, consumer electronics, and books), future research could further explore sector-specific differences by analysing each category separately. Future research will incorporate additional control variables, such as online shopping familiarity, purchase frequency, and digital literacy, to better isolate demographic effects.

Finally, the operationalisation of sustainability perceptions could be expanded to include additional components, such as behavioural intentions, perceived trade-offs, or the role of specific sustainable practices. This would allow future research to investigate more comprehensively how consumers incorporate environmental considerations into their channel preferences and purchasing behaviours.

Keywords: Consumer profiling; shopping experience; digital transformation; experiential retail; online–offline integration

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Strega comanda colore: trova il colore per comunicare la sana alimentazione

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1. Introduzione

Il colore rappresenta uno degli elementi visivi più influenti nella formazione delle percezioni dei consumatori. Studi precedenti (es. Spence, 2019) hanno infatti dimostrato che il colore non solo è in grado di catturare l'attenzione, ma anche di influenzare le risposte cognitive ed emotive degli individui. Nel corso del tempo, l'influenza del colore è stata studiata in numerosi ambiti, dalle neuroscienze alla psicofisica, dalla psicologia sperimenale alla biologia (Labrecque et al., 2013). Uno degli ambiti in cui è stato studiato maggiormente è quello del marketing. Infatti, sono stati condotti numerosi studi sul colore nel campo dell'avertising (es. Mehta & Zhu, 2009), del branding (es. Bottomley & Doyle, 2006), dell'influenza sull'intenzione d'acquisto (es. Agariya et al., 2012), del design del punto vendita (es. Barlı et al., 2012), etc.

Un filone della letteratura si è dedicato allo studio del colore nel campo del marketing nutrizionale. In particolare, in questo ambito, sono stati condotti numerosi studi relativamente al packaging (es. Hallez et al., 2023), sicuramente una delle leve più importanti che hanno a disposizione sia l'Industria che la Distruzione. Tuttavia, dato che il punto vendita costituisce un elemento fondamentale nelle decisioni di acquisto (es. Hecht et al., 2020), i distributori possono assumere un ruolo particolarmente rilevante nel guidare i consumatori verso scelte più salutari. I retailers hanno a loro disposizione numerose leve in-store (es. assortimento, visual merchandising, comunicazione point of purchase, display, layout, etc.) che possono manovrare all'interno delle strategie di marketing nutrizionale. Una di queste è la comunicazione in store. Studi precedenti hanno dimostrato che l'in-store communication è efficace nell'influenzare le scelte dei consumatori, fornendo informazioni pertinenti e facilitando un processo decisionale consapevole (es. Roggeveen et al., 2023), incoraggiando anche l'acquisto d'impulso (es. Chitty et al., 2017).

Se da un lato l'influenza del colore è stata ampiamente studiata nell'ambito della salute e del marketing nutrizionale applicandolo a diverse leve, resta poco esplorata l'applicazione alla leva della comunicazione in-store. Questa ricerca, ancora work in progress, intende indagare l'impatto del colore in relazione a un'iniziativa di comunicazione in-store, al fine di promuovere l'acquisto di prodotti a valenza salutistica per la prima colazione. Per fare ciò, è stato condotto dapprima un pre-test e, successivamente, un esperimento in ambiente reale, implementando un'iniziativa di comunicazione in-store – una con il colore verde e una con il colore blu - in due supermercati nel nord Italia appartenenti a una delle più note catene della Grande Distribuzione Organizzata (GDO) italiana.

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2. Sviluppo concettuale

La teoria tricromatica di Hurvich & Jameson (1957) sostiene che l'occhio umano percepisce tre colori primari (rosso, verde e blu) da cui derivano tutti gli altri colori dello spettro visibile. Questi colori sono divisi in due categorie: i colori caldi, come il rosso, con lunghezze d'onda più lunghe, e i colori freddi, come il blu e il verde, con lunghezze d'onda più corte. Van Goethe (1970) ha identificato tre attributi del colore: tonalità, valore tonale e saturazione.

Nel corso del tempo, numerose ricerche nel campo della psicologia (vedi Brosch et al., 2010 per una rassegna della letteratura), hanno studiato il legame tra colore ed emozioni, ma anche tra colori e alimentazione (vedi Steiner & Florack, 2023 per una rassegna recente della letteratura). È emerso che i colori caldi e saturi sono spesso percepiti come eccitanti (es. Labrecque & Milne, 2012) e stimolanti (es. Gorn et al., 1997), mentre i colori freddi sono associati alla calma e alla salubrità (es. Hallez et al., 2023). Inoltre, è stato dimostrato che l'utilizzo di colori più desaturati e con una maggiore luminosità è positivamente associato alla percezione di salubrità (es. Tijssen et al., 2017). Ad esempio, il rosso stimola l'appetito (Raghunathan et al., 2006) e fa percepire i cibi come più dolci (Huang & Lu, 2015) o meno salutari (Levy et al., 2012). Mentre, il blu e il verde vengono percepiti come più salutari e sostenibili, ma meno gustosi (es. Hallez et al., 2023). Queste ricerche si basano su campioni ristretti e omogenei, il che ne limita la validità esterna (es. Agariya et al., 2012; Raghunathan et al., 2006). Inoltre, la maggior parte degli studi utilizza contesti sperimentali laboratoriali e stimoli manipolati digitalmente, che non riflettono le condizioni reali di esposizione al colore (es. Huang & Lu, 2015; Hallez et al., 2023). Le misure adottate sono prevalentemente auto-dichiarate, focalizzandosi su percezioni e intenzioni piuttosto che su comportamenti effettivi di acquisto, creando un gap tra atteggiamenti e azioni (es. Agariya et al., 2012; Hallez et al., 2023).

Inoltre, in letteratura, il dibattito su quale colore sia più efficace in termini di percezione di salubrità resta ancora aperto.

Di conseguenza, viene formulata la seguente domanda di ricerca:

RQ1: Quale colore è percepito come più salutare nelle iniziative di comunicazione in-store?

Questa ricerca si pone l'obiettivo, in primo luogo, di determinare se è il blu o il verde a essere più efficace in termini di percezione di salubrità. In secondo luogo, mira a identificare quale dei due colori sia più efficace nello stimolare gli acquisti di prodotti a valenza salutistica. Nelle fasi successive, la ricerca si prospetta inoltre di studiare l'impatto di questa iniziativa sulla capacità di cambiare il comportamento del consumatore, i fattori che moderano l'impatto dell'intervento, analizzando se l'efficacia dipenda dalla salubrità percepita della categoria di prodotto e se l'iniziativa si dimostri significativamente più incisiva sui clienti fedeli all'insegna del distributore.

3. Quadro metodologico

3.1. Pre-test

Al fine di selezionare i colori da testare in ambiente reale, è stato condotto un pre-test con i colori più utilizzati nell'ambito del marketing in-store attraverso un sondaggio online between subject. Sono stati testati sei colori: arancione, giallo, rosso, blu, verde e bianco. Il campione era composto da 144 partecipanti, 64% donne (35% uomini); l'età del campione era: 59% 18-24; 24% 25-34; 6% 35-49; 10% 50-54, 3% 65 o più. Ai partecipanti è stato chiesto di valutare, utilizzando una scala Likert a 7 punti, il livello percepito di salubrità e le diverse emozioni evocate dai colori utilizzati (Zielke, 2006). È stato misurato anche l'interesse generale per la salute (Roininen et al., 1999), che è stato mantenuto come covariata. Al fine di garantire la veridicità delle risposte dei soggetti, è stato incorporato nel sondaggio un attention check - e un intervistato è stato rimosso. Il pre-test ha mostrato che il verde (5,25) e il blu (5,13) sono stati percepiti come significativamente ($p < .001$) più salutari del bianco (4,69), dell'arancione (4,39), del giallo (3,71) e del rosso (3,04). Questo risultato è dunque in linea con la letteratura precedente (es. Hallez et

al., 2023). Inoltre, il blu (5,64) e il verde (5,23) sono risultati più efficaci nell'evocare emozioni positive ($p < .001$) rispetto agli altri. Dato che l'obiettivo di questo studio è quello promuovere l'acquisto di prodotti a valenza salutistica per la prima colazione, sono stati selezionati il blu e il verde come colori da utilizzare in ambiente reale.

3.2. Esperimento in ambiente reale

L'esperimento in ambiente reale è stato implementato installando in un punto vendita la comunicazione con il colore blu e nell'altro quella con il colore verde. Sono stati utilizzati diversi strumenti di comunicazione in-store: bandiere, stopper, calpestabili e crowner. Il messaggio di comunicato era lo stesso per entrambi i punti vendita e faceva appello al beneficio fisico di una dieta sana. Questa scelta si basa sulla teoria del guadagno e della perdita (gain & loss), che deriva dalla Prospect Theory di Tversky & Kahneman (1979). È stata strutturata in un frame di "guadagno" in quanto la promozione di comportamenti considerati "sicuri" (come una "dieta equilibrata") è più efficace se formulata in termini di potenziali guadagni (Rothman & Salovey, 1997). Mentre, l'enfasi sui benefici fisici ("energia") è dovuta al fatto che la comunicazione funzionale è considerata efficace nel modificare i comportamenti legati alla salute (es. Bertolotti et al., 2020).

In particolare, il messaggio recitava: "L'ENERGIA è BENESSERE. Una dieta varia ed equilibrata e uno stile di vita sano sono le basi del tuo benessere. Scopri QUI la nostra selezione di prodotti che, per i loro ingredienti e valori nutrizionali, possono contribuire al tuo benessere fisico."

L'iniziativa di comunicazione in-store ha compreso un paniere di prodotti per la prima colazione (cereali, biscotti e merendine) a marchio del distributore (MDD) identificati, in accordo con l'insegna, sulla base del loro profilo nutrizionale. Il periodo sperimentale è durato sei settimane. L'efficacia del colore è stata misurata attraverso dei questionari semi-strutturati somministrati ai consumatori davanti allo scaffale e l'analisi dei dati di vendita. Il campione dei questionari semi-strutturati includeva 271 individui. In particolare, 135 soggetti sono stati raccolti nel supermercato 1 (blu), 136 nel supermercato 2 (verde), con 91 nella categoria cereali, 90 nella categoria merendine e 90 nella categoria biscotti. Il campione era prevalentemente femminile (64,57%), con un'età media di 52,53 anni e un'età mediana di 54 anni. Per misurare la percezione di salubrità del colore è stata utilizzata una scala Likert a 7 punti, dove 1 rappresentava "per niente salutare" e 7 rappresentava "molto salutare". Inoltre, sono stati misurati il livello di appetito (da 1 che rappresenta "per niente" e 7 che rappresenta "molto affamato"), l'atteggiamento nei confronti della MDD (Burton et al., 1998 - $\alpha = .870$), il confronto tra marchio del distributore e marchio industriale (Liljander et al., 2009 - $\alpha = .934$), l'impegno del distributore per la salute dei consumatori (Anselmsson & Johansson, 2007 - $\alpha = .935$), l'interesse generale per la salute (Roininen et al., 1999 - $\alpha = .733$) che sono state mantenute come covariate, insieme all'età e al genere. Per quanto riguarda i dati di vendita, sono state analizzate le unità vendute - al fine di limitare l'effetto dell'inflazione che ha colpito l'Italia durante quel periodo - senza l'applicazione di promozioni - per isolare l'effetto delle promozioni che potrebbero cambiare il comportamento dei consumatori – confrontandole con quelle dell'anno precedente.

4. Risultati

Utilizzando SPSS, sono state eseguite delle ANOVA a misure ripetute sui dati di vendita. È stata identificata un'interazione significativa ($p < .001$) tra il periodo considerato (il periodo di implementazione dell'esperimento rispetto all'anno precedente), il tipo di prodotto (comunicato rispetto a non comunicato) e il punto vendita ($p < .001$). Nello specifico, per i prodotti comunicati,

il punto vendita con il verde ha mostrato un maggiore aumento delle vendite rispetto all'anno precedente e rispetto agli altri due negozi, crescendo da 12,19 a 13,99. Il punto vendita di controllo ha dimostrato un aumento delle vendite da 4,67 a 5,18, mentre il punto vendita con il colore blu ha mostrato un aumento da 7,32 a 7,36 (entrambi gli aumenti non erano significativi). Per quanto riguarda i questionari semi-strutturati, sono state condotte delle ANCOVA. I risultati hanno indicato che il verde è stato percepito come più salutare del blu (Mverde= 5,19, Mblu = 5,16; p = .031). Di conseguenza, possiamo rispondere alla RQ1 sostenendo che il verde è percepito come più salutare nelle iniziative di comunicazione in-store.

5. Altri risultati attesi

Sulla base della letteratura precedente, che sottolinea l'efficacia delle leve del marketing in-store e della comunicazione nel catturare l'attenzione e influenzare le decisioni di acquisto (es. Garrido-Morgado et al., 2021), si ritiene che l'iniziativa di comunicazione in-store basata sul benessere, indipendentemente dal colore, migliorerà le prestazioni dei prodotti comunicati in termini di vendite. Inoltre, dato che studi precedenti (es. Noar et al., 2020) indicano che il comunicare messaggi chiari e persuasivi, la percezione di salubrità (es. Provencher & Jacob, 2016) e la visibilità (es. Slapø et al., 2021) siano determinanti nel modificare i comportamenti legati alla salute e le intenzioni di acquisto, ci si aspetta che l'efficacia dell'iniziativa nel guidare gli acquisti sarà direttamente correlata all'efficacia percepita della comunicazione, al suo impatto nel cambiare il comportamento del consumatore, alla salubrità percepita del colore e alla visibilità della comunicazione in-store. Ci si aspetta anche che l'efficacia dell'iniziativa sia maggiore per le categorie di prodotti che i consumatori percepiscono già come salutari (nel caso di questo studio, potrebbe riguardare i cereali), ciò dovuto a un maggiore perceived fit tra il messaggio comunicato e la natura del prodotto (es. Siegrist et al., 2008). Infine, dato che la fiducia e la fedeltà all'insegna sono state identificate come fattori chiave che rafforzano l'atteggiamento positivo verso le iniziative e i prodotti MDD, aumentando la probabilità di acquisto (es. Louis et al., 2023), ci si aspetta che l'iniziativa risulterà essere più efficace nell'influenzare il comportamento di acquisto dei consumatori abituali.

6. Conclusioni

I risultati di questo studio da un lato si allineano con la letteratura esistente che associa il verde al concetto di salute (es. Schuldt, 2013), suggerendo così che, nel contesto della comunicazione in-store, questa associazione possa tradursi in una maggiore efficacia in termini di vendite. Dall'altro, questo risultato è in contrasto con il filone di ricerca che riconosce il blu come più efficace nella percezione di salubrità (es. Plasek et al., 2021). Questo fornisce un insight importante per i distributori e per i brand industriali interessati a guidare i consumatori verso scelte alimentari più sane attraverso il marketing in-store. L'implementazione di un'iniziativa di comunicazione con il colore verde si è dimostrata efficace nel potenziare le prestazioni dei prodotti comunicati, anche rispetto al blu, che è un colore molto utilizzato nelle linee di prodotti salutistici. Di conseguenza, si raccomanda di utilizzare il verde desaturato per la segnaletica in-store volta a promuovere opzioni salutari, poiché è stato dimostrato che questa scelta ha una maggiore influenza sugli acquisti effettivi. Inoltre, se fossero confermati i risultati attesi, i manager della distribuzione dovrebbero considerare l'utilizzo della comunicazione in-store come strumento per rafforzare la fedeltà e le associazioni della MDD con un impegno per la salute e il benessere. Questo soprattutto nei prodotti che già godono di un'alta percezione di salubrità, dove dovrebbero concentrare gli sforzi comunicativi e promozionali, evitando dunque di attuarlo su categorie percepite come meno salutari, dove l'intervento potrebbe avere un impatto minore o addirittura irrilevante. Tuttavia, questo studio non è esente da limiti. In primo luogo, le auto-dichiarazioni dei rispondenti sulla percezione del colore potrebbero essere biased. In secondo

luogo, l'efficacia dell'esperimento potrebbe essere stata ridotta a causa dell'implementazione in un contesto sul campo in cui le variabili non potevano essere controllate. In terzo luogo, il campione dei questionari semi-strutturati non è rappresentativo, limitando potenzialmente la generalizzabilità. Future ricerche potrebbero riproporre l'esperimento con un campione più ampio o effettuare un'analisi quantitativa interculturale. Inoltre, l'integrazione di alcune tecnologie, come quella dell'eye-tracking, potrebbe migliorare la nostra comprensione dell'attrattiva del colore e dell'attenzione dei consumatori rispetto all'iniziativa di comunicazione. Ulteriori studi potrebbero testare il colore e i messaggi basati sul benessere attraverso altre leve, come la comunicazione out-of-store, i social media, il sito web, etc.

Keywords: Marketing nutrizionale; comunicazione in-store; percezione dei colori; field experiment

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Track 10: PURPOSE-DRIVEN INNOVATION: A NEW FRAMEWORK FOR SOCIAL ENTREPRENEURSHIP AND HYBRID VENTURES

More Than a Beauty Makeover? Evaluating Organizational Change Toward Sustainability of a Benefit Company in the Cosmetic Industry

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1. Introduction

Globally, firms are increasingly pressured to embrace long-term value creation business models, aligning strategy and operations with social and environmental goals. One significant development in this landscape is the emergence of the Benefit corporation (BC), a new legal structure that may create more ethical and socially responsible organisations (Gamble et al., 2020; Moroz and Gamble, 2021). The BC form embraces a dual-purpose business model, striving for balance between profit maximization and creation of positive social and environmental impact. In recent years, the diffusion of hybrid legal forms has accelerated across jurisdictions – such as Benefit Corporations in the USA (2010), Società Benefit in Italy (2015), Entreprises à Mission in France (2019), and Sociedades de Beneficio e Interés Común (SBIC) in Spain (2022) – raising a central question for scholars and policymakers: do such reforms function as mere signals or translate meaningful organisational change? (Meyer and Rowan, 1977; Hiller, 2013; Stubbs, 2017a, b; Segrestin et al., 2021). Following the 2010 US landmark – namely the first BC statute enacted in Maryland (Maryland General Assembly, Senate Bill 690, Chapter 97, 2010) – BC statutes are now recognised in 39 countries. Within this global landscape, Italy was the first European country to introduce this hybrid corporate form with the 2016 Budget Law (Legge 208/2015; Del Baldo, 2019) and this legal form operates within a broader EU framework that is a key jurisdiction for sustainability rule-setting. Despite the rise and worldwide diffusion of the B-Corp movement, the depth and authenticity of this transition remain in question. In fact, the transition of an organisation into a benefit form is an 'entrepreneurial journey' of a particular kind (Moroz et al., 2018, p. 117), one where actors learn over time how to build environmental and ethical concerns into their organisation. Rather than being a simple formal or symbolic change, the adoption of BC status should imply a dynamic organisational process that requires the development and refinement of new daily routines and procedures, governance arrangements, and cultural commitments (Picciaia and Mari, 2022). Despite the increasing debate among scholars (Blasi and Sedita, 2021; Pollmeier et al., 2025), the key unresolved issue is not whether adoption occurs, but whether it produces substantive reconfiguration across organisational layers. Empirical evidence is inconclusive as to whether these adoptions are predominantly ceremonial (decoupling) or reconnect purpose to fundamental organisational practice (Bromley and Powell, 2012; Crilly et al., 2012). To explore this issue, we examine the case of Acqua dell'Elba, a family-owned fragrance company that became a BC in 2021. Since the adoption of the new legal status, the company has actively progressed toward B-Corp certification 4 (Occhipinti, 2023; Diez-Busto

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et al., 2022). Drawing on Laughlin's (1991) model of organisational change, we analyse how the firm's shift toward benefit status unfolds across its interpretive schemes, design archetypes, and subsystems, thereby assessing the extent to which the transition reflects surface-level adjustments or deeper, transformative change. This framing allows us to distinguish symbolic adjustments, which primarily serve legitimising purposes, from substantive transformations that penetrate core organisational structures and routines. The cosmetics industry represents a critical setting to test the boundary between symbolic adoption and substantive transformation. In fact, firms in this sector often operate under heightened scrutiny from consumers and stakeholders, creating strong incentives to signal ethical commitments while simultaneously confronting the challenge of embedding such commitments into daily practices and operational routines. This tension makes the case particularly suited to investigating whether the transition to benefit status functions mainly as a reputational device or as a catalyst for meaningful organisational reconfiguration. Accordingly, we foreground the nature of change itself and formulate a sharper research question: RQ: Is the adoption of Benefit legal form actually cosmetic or substantive in nature?

Therefore, the objective of this study is to critically examine the nature, motivators, and credibility of the B-Corp transition. The research question is addressed through a single-case study. The research is conducted using semi-structured interviews with key decision-makers, including executives, sustainability officers, and operational managers. Additional data are gathered through longitudinal document analysis (e.g., sustainability reports, certification materials, and internal planning tools). Our case organisation allows us to observe how sustainability management and place-based accountability condition symbolic versus substantive trajectories. Crucially, we operationalise "symbolic vs. substantive" via Laughlin's layers and change types, enabling transparent classification of observed shifts. The case is significant because the company has recently adopted the legal form of SB it is pursuing multiple ISO-based management standards, thereby if restructuring roles, processes, management and governance rotines. Our contribution is threefold. First, we enrich the literature on B-Corp adoption by examining how the SB transition unfolds across organisational layers. In doing so, we shed light on the conditions under which this legal form produces symbolic rather than substantive change. Second, we apply Laughlin's (1991) model of organisational change to the contemporary debate on purpose-driven organisations, demonstrating its analytical value for disentangling surface-level adjustments from deeper transformations. Third, we prvode a nuanced, empirically grounded understanding of how industry and environmental dynamics shape the trajectory and authenticity of the benefit transition. The remainder of this study proceeds as follows. Section 2 introduces the background and theoretical framework, while Section 3 details the research methodology. Lastly, preliminary findings and avenues for future research are discussed.

2. Background and theoretical framework

2.1. Organisational change in Benefit corporations

BC are required to demonstrate that sustainability is not peripheral but central to their value creation model (Haigh et al., 2015; Stubbs, 2017a). Being legally recognised as BC is just the starting point to state the company's approach to sustainability. In fact, the BC status often triggers an in-depth organizational reflection, with changes in managerial practices, operational routines and practices, performance metrics, internal communication, as well as shared value, norms and culture. These changes can translate into a substantive or a symbolic integration of sustainability. Symbolic sustainability integration occurs when organizations adopt sustainability language, certifications, or reporting mechanisms primarily to enhance legitimacy, reputation, or market differentiation without materially altering core processes or decision-making routines (Bromley and Powell, 2012). In contrast, substantive integration is characterized by the reconfiguration of business models, resource allocations, organizational incentives, and operational practices in ways that measurably improve social and environmental outcomes (Eccles and Serafeim, 2013;

Gehman et al., 2019). Research examining the entrepreneurial journey of BC organisations underscores different kind of changes occurring in firms' organizational practices. Exiting literature on BCs have documented changes in governance structures (André, 2012; Hiller, 2013), the use of management information systems as facilitators of organizational change and sustainability integration (Dashwood, 2014; Gond et al., 2012; Fonseca et al. 2021), the formalization of impact measurement practices aligned with recognized standards (Stubbs and Higgins, 2014). Moreover, becoming a BC often stimulates cultural and identity work, prompting organizations to renegotiate their purpose narratives, articulate shared values, and embed sustainability considerations into everyday sensemaking (Grimes et al., 2018). However, several voices highlight that companies face pressures that can encourage "decoupling", that is, the disconnection between formal sustainability commitments and actual organizational practices (Bromley and Powell, 2012; Stubbs, 2017b). As a result, the adoption of the BC legal form risks being enacted as mere symbolic compliance, serving primarily to grant company legitimacy without translating into a credible or substantive integration of sustainability principles. For instance, case-based research by Villela et al. (2019) on Brazilian Small and Medium-Sized Enterprises (SMEs) illustrates that BC certification often functions as a market-oriented legitimacy tool, enabling firms to signal credibility and social responsibility to investors and clients. In fact, the study suggests that the certification itself does not automatically translate into internal transformation. According to the authors, incremental governance adjustments and operational reforms emerged only gradually in two companies, while failed to enact any deep organisational change towards greater sustainability in the other case organisations. These findings echo broader concerns in the literature that hybrid forms—despite their formal legal commitments—remain vulnerable to decoupling, where symbolic adoption of sustainability-oriented structures masks the persistence of conventional managerial routines (Bromley and Powell, 2012). Similarly, Kim et al. (2016) and Stubbs (2017) finds that many certified B Corps use certification to signal legitimacy and differentiate in the market, but internal change varies markedly. Some firms show strong substantive integration of sustainability, while others maintain conventional practices with only superficial adjustments. In this sense, BC certification may provide firms with reputational and market advantages, but without strong internal drivers, organizational capabilities, or governance pressures, it risks being incorporated merely as a symbolic legitimacy-enhancing mechanism. This not only limits genuine sustainability advancements but may also undermine the credibility of the BC movement itself, as firms gravitate toward compliance that enhances legitimacy without fostering substantive mission alignment (Haigh et al., 2015; Gehman and Grimes, 2021).

2.2. Theoretical framework

Organisational change is a complex and multifaceted process, particularly when it involves a shift toward sustainability and CSR, as exemplified by the transition to B-Corp certification. To analyse this transformation, we adopt Laughlin's (1991) model of organisational change, which argues that business must pursue the common good alongside profitability (Mion and Tessari, 2021).

With Laughlin's framework, organisations comprise three interrelated elements – sub-systems (structures, technologies, procedures), design archetypes (formal management systems and organisational structures), and interpretive schemes (values and worldviews) – and change can occur at each level. Laughlin distinguishes between first order (morphostatic) changes (minor adjustments within structure and design archetypes with no shifts in shared value, norms and beliefs); second order (morphogenisis) changes (transformation of interpretive schemes). According to Laughlin (1991), four different pathways of change may occur. Early normative work on the BC itself positions the form as an ethical step toward embedding public-benefit duties in corporate law (Hiller, 2013), further illustrating the potential for second and third-order shifts.

Rebuttal and reorientation tend to yield first-order change, whereas colonization and evolution affect the organisation core and typically align with second-order trasjectories. Several studies have applied Laughlin's model to explore the integration of sustainability in different organisational settings (Bebbington and Fraser, 2014; Guthrie et al., 2017). For instance, a longitudinal case study by Narayanan and Adams (2017) used the model to examine how a global financial services organisation integrated sustainability into its operations, highlighting the role of accounting discourses and calculative practices in enabling radical change. Similarly, Adams and McNicholas (2007) applied the model to investigate sustainability reporting practices, emphasizing the importance of internal discourses and governance structures in shaping organisational responses. Also, Stubbs and Higgins (2014) used similar theoretical foundations to examine the internal mechanisms and processes employed by early adopters of integrated reporting. Hence, Laughlin offers a suitable lens to assess whether B-Corp-related change is symbolic or substantive across different layers of our case organisation. Despite its relevance, no previous study has applied this model in the context of BC. In line with our RQ, we use Laughlin to classify SB-related changes as cosmetic/symbolic (sub-systems only; rebuttal/reorientation) versus substantive (design-archetype reconfiguration; colonisation/evolution; with possible interpretive shifts). We therefore apply Laughlin's model to our case organization in order to test whether the SB reform precipitated substantive redesign of control and governance, beyond cosmetic compliance.

3. Research method

3.1. Case selection

The case organisation, Acqua dell' Elba, is a family-run artisan fragrance company based on the island of Elba, Italy. Acqua dell' Elba, operating in a highly competitive sector dominated by multinational corporations, represents a unique example of a small enterprise that has embedded sustainability at the core of its strategic and operational framework. Since its foundation, the company has sought to intertwine its deep local roots, artisanal values, and environmental consciousness with a forward-looking strategic vision. Consistent with qualitative case research, the organisation was selected through theoretical, purposeful sampling to maximise learning about whether and how a hybrid legal form (Società Benefit) translates into symbolic or substantive organisational change (Eisenhardt, 1989). The case is especially relevant for several reasons. Firstly, the Italian cosmetic-and-fragrance industry remains a late-mover in embracing hybrid legal forms: an extraction from the Assobenefit–InfoCamere register (ATECO 2025 code 20.42 – Manufacture of perfumes and cosmetics) shows that, as of June 2025, fewer than a dozen firms in the cosmetic industry (among them Davines, L'Erbolario, Pettenon Cosmetics, Integra Fragrances and GRC Parfum) have converted to SB, and only about half of these are also certified B-Corp. Acqua dell' Elba adopted the SB legal status in 2021 but is still progressing through the multi-year B Lab certification process, allowing us to observe the critical 'in-between' phase in which statutory public-benefit duties exist without the external certification seal, thereby positioning the firm as a genuine pioneer within its peer group.

Secondly, the organisation's geographical context adds another layer of significance. The company operates on Elba Island, part of the UNESCO MAB Biosphere Reserve "Isole di Toscana", a protected zone that presents both limitations and opportunities in terms of environmental stewardship, tourism sustainability, and local community engagement. The case thus bridges business sustainability with territorial resilience and environmental governance.

Thirdly, Acqua dell' Elba is part of the fast-growing B-Corp movement in Italy, there are only 3,619 companies as of the end of 2023, representing just 1.23 per thousand of all Italian firms. The company was legally recognised as a SB in 2021, and B Lab certification will formally attest its commitment to social and environmental impact, transparency, and accountability when completed. Recent place-branding research conceptualises this symbiotic firm–territory dynamic

as "reverberation branding", showing how Acqua dell' Elba's initiatives co-create value with Elba Island's stakeholders and reinforce the island's sustainable identity (Minestroni and Lucarelli, 2025).

The selection of Acqua dell'Elba as a case is compelling due to its unique territorial embeddedness, artisanal identity, and pioneering role in the Italian fragrance sector.

Therefore, although it is a single case study, difficulties and challenges faced by Acqua dell' Elba in its entrepreneurial journey may well be experienced by other organisations. As such, Acqua dell' Elba is a useful case study to add to the growing body of evidence in the field investigated.

In July 2025, we conducted a first, in-depth interview with the Director of Marketing, Communication, and Sustainability, which provided the initial insider view of the firm's sustainability governance. On this basis, we refined the second-wave protocol (2025-2026). Further interviews with key actors involved in sustainability transition are planned for the end of January.

3.2 Research design

The authors adopted a qualitative research approach with a single-case, exploratory design. Case study methodology (Yin, 2003) offers an in-depth understanding of a specific context, prioritising analytical over statistical generalisations. This methodology allows for capturing the significant features of real-life events by comparing and triangulating multiple sources and perspectives (Yin, 2018). An initial theoretical framework guides data collection and is iteratively refined as evidence accumulates, making the design well suited to exploring Acqua dell' Elba's transition through Laughlin's (1991) lens. To ensure the reliability and credibility of our study, we employed a combination of interviews and document analysis. This approach allowed us to cross-verify information and address any inconsistencies, enhancing the overall quality of the data. It's worth noting that interviewees readily acknowledged their uncertainty about certain events and were proactive in identifying others who could provide accurate information. Semi-structured interviews (one completed; three scheduled) and documentary sources (company disclosures, internal, and secondary documents) were analysed trough manual content analysis procedure. This approach was preferred because it balances thematic consistency with the flexibility required to probe emergent issues (Alvesson and Deetz, 2000; Kvale and Brinkmann, 2009).

3.3. Data collection and analysis

Interviews

Our data collection process involves a cycle of semi-structured interviews, where we posed similar questions to multiple interviewees while maintaining the flexibility to explore intriguing lines of inquiry. We use semi-structured interviews to surface (i) perceived "environmental disturbances", that is the sustainability challenges faced by the organisation and motivations for adopting SB/B-Corp pathways; (ii) changes in structures, roles and processes; (iii) how the organisation responded to these challenges and the effect (if any) this had on the organisations' interpretive schemes and design archetypes (Narayanan and Adams, 2017). Broad themes were identified from Laughlin's pathways of change model and an interview guide (Yin, 2003) developed to aid the reliability of the study. Interview guides (drafted in Italian to avoid linguistic bias) were e-mailed to participants in advance, following Qu and Dumay's (2011) recommendations.

Interviewees were encouraged to raise other relevant issues. The interview questions covered the environmental disturbances faced by the company, their sustainability initiatives, motivations for sustainability engagement, how participants viewed the meaning of sustainability, how (if at

all) decision-making processes had changed, cultural changes observed by participants and structural changes.

Four members of the sustainability department have been identified from the organisation chart as initial respondents. The Director of Marketing, Communication and Sustainability, was interviewed on July 10, 2025. He was identified by researchers as a gatekeeper, facilitating access to additional informants in all functional areas (Dumay, 2010). It confirmed that the mandate sits within the Marketing, Communication, and Sustainability directorate (formally reinforced in 2024), clarified the distribution of operational responsibilities across an inter-functional team (including a process/certifications officer and a social-area lead), and showed how external audits and certifications have catalysed a more formal organigram and data routines. Subsequent, interviews are scheduled as shown in Table 1; conducting interviews across managerial levels support whitin-case variation and reduces single-informant bias.

When	Who	Where	Duration (min)
1-July 2025	Director of Marketing, Communication and Sustainability (gatekeeper)	On-line	90
20-November 2025	Environmental Management System Manager	On-line	30-60
2-December 2025	Sustainability Officer and Carbon Footprint Processes Officer	On-line	30-60
4-December 2025	Carbon Footprint Analyst	On-line	30-60

Table 1. Planned interviews

Interviews were audio-recorded with consent, conducted in Italian and transcribed within 24 hours to preserve detail (Patton, 2014). Interview data will undergo a two-stage manual coding: (i) a deductive read using a codebook anchored to Laughlin (interpretive schemes, design archetypes, sub-systems; disturbances; pathway cues); (B) an inductive read to surface unanticipated sub-themes (e.g., place-based accountability, certification-induced formalisation, role reconfiguration). The researchers independently code a stratified sample and reconcile discrepancies through adjudication sessions; the codebook is updated iteratively. From the codes we develop themes and temporal sequences (rebuttal, reorientation, colonisation, evolution) to classify each episode as symbolic/morphostatic or substantive/morphogenetic (with possible interpretive reframing). Interview transcripts were examined through qualitative content analysis following an interactive, multi-phase procedure; each author analysed transcripts independently and compared interpretations to reach shared results. After iterative comparison of codes and emerging categories, no new categories emerged; we therefore deemed thematic saturation to have been reached.

Insights from the interview with the gatekeeper informed probes for the second wave. Following this process, an initial narrative to analyse case studies (Miles and Huberman 1994; Yin, 2003) was developed from the coded data.

Documentary sources of data

We diversified our data sources, supplementing interviews with company documents, articles from business press, and information from B-Lab Europe.

Documentary sources of evidence were used, firstly, to corroborate and contextualise the interview data and, secondly, as a primary source of data. A manual content analysis is the technique particularly useful for extracting information that is not explicitly presented in a quantitative and structured format but is implicit in the information (Krippendorff, 2018).

The documents analysed included Sustainability Reports 2017 and 2020, Benefit Impact

Reports 2021, 2022, and 2023, the current organisation chart, the corporate 'Sustainability Charter' agreed with local communities, company website, press releases and other documents provided by participants. Table 2 shows a complete list of the papers reviewed in this study. The use of documents allowed us to rely less on respondents providing information related to their sustainability reports and reduced the need to rely on participants' memory recall in relation to past events. These sources were reviewed independently by the authors and coded alongside interview data to enable pattern matching and temporal bracketing, reducing single-observer bias

Secondary data, including the article by Minestroni and Lucarelli (2025), press releases and further website materials, will enrich contextual understanding and corroborate interviews' insights.

n.	Source
1	Sustainability Report 2020
2	Statutory Benefit Impact Reports 2021
3	Statutory Benefit Impact Reports 2022
4	Statutory Benefit Impact Reports 2023
5	Organisation chart
6	Sustainability Charter
7	Minestroni and Lucarelli (2025)'s study
8	Releases and other materials

Table 2. Documentary sources

Consistent with the RQ, coding and thematic analysis will classify observed episodes as symbolic (morphostatic/sub-systems; rebuttal/reorientation) or substantive (morphogenetic/ design-archetype; colonisation/evolution; with possible interpretive reframing). Triangulation will operate both across sources (documents, interviews, web material) and across researchers, increasing credibility (Denzin, 1978; Creswell and Miller, 2000). Data triangulation allows multiple perspectives to be included and can be a means to ensure data saturation, validity, and reliability of search results (Fusch and Ness, 2015; Creswell and Miller, 2000). Between the two main forms of data triangulation (Modell, 2005), researcher triangulation and data triangulation were used. Preliminary results of the data analysis are discussed in the next section.

4. Preliminary findings and future steps

This study contributes to the academic debate by showing how a SME in a sensitive sector can translate a hybrid legal form into organisation-wide change, rather than mere symbolic signalling. Rather than treating SB status as a label, early evidence points to a transformation trajectory affecting structures, roles, routines, and local accountability. Leveraging Italy's first-mover SB statute, the paper illustrates how legal design and territorial embeddedness shape the extent to which SB transitions are cosmetic or substantive, offering insights for similar models such as entreprise à mission in France and SBIC in Spain.

Content analysis of company reports reveals a three-stage evolution. Stage 1 (2020) is narrative and place-based, centred on values and the launch of "Elba 2035". Stage 2 (2021) introduces targets and KPIs, including carbon neutrality, stakeholder initiatives (e.g., Green Week), and the Acqua dell'Elba philanthropic trust. Stage 3 (2022–2023) embeds a structured target–action–indicator logic, including ISO 14001/EMAS III roadmaps, biodiversity partnerships, gender-equality metrics (UNI PdR 125:2022), and multi-year carbon accounting (ISO 14064-1).

This progression reflects a shift from narrative purpose to operationalised commitments, enabling cross-functional alignment and legitimising investment under uncertainty. Interpreted through Laughlin's framework, Stage 1 aligns with rebuttal (morphostatic), Stage 2 with

colonisation, and Stage 3 with evolution (morphogenetic with emerging interpretive change), suggesting a substantive rather than cosmetic transition.

Interview evidence reinforces these findings. Managers frame sustainability as "harmony"—a balance between economic growth, environmental stewardship, and well-being—serving as an interpretive anchor for decision-making. The shift from compliance-driven reporting to a hybrid architecture of practices is described as deliberate. While early reports (2017; 2019) followed GRI standards, the Impact Report has become the central tool, structured around four statutory benefit objectives and cascading into projects and KPIs. It is conceived as "an instrument of listening, transparency and continuous improvement," primarily addressed to the local community rather than capital markets, reflecting place-based accountability (Gray, 2002; Andon et al., 2007).

Governance and roles have been progressively formalised, particularly with the creation of a Marketing, Communication and Sustainability directorate (2024). Strategic oversight sits at director level, while operational responsibilities are distributed across an inter-functional team. External certification has accelerated role clarity and integration across branding, market development, and sustainability practices (Ahrens and Chapman, 2007). Carbon accounting—conducted annually with AzzeroCO2—has supported efficiency investments (e.g., solar panels, supplier switching, retrofits), delivering cost savings and workplace improvements. It also underpins participation in the island's emerging Energy Community, where carbon metrics act as a credibility mechanism (Ascui and Lovell, 2011).

Stakeholder engagement follows a pragmatic, place-based logic rooted in the Elba 2035 project. Managers rely on established local networks (e.g., Park Authority, schools, NGOs), which shape both information flows and indicator relevance. This proximity fosters high levels of community trust, illustrated by rapid COVID-19 fundraising efforts (Interview 1), consistent with community-oriented accountability (Gray, 2002). Initiatives such as Via dell'Essenza, Domus Mellifere, and EU4Oceans function as boundary objects, linking internal controls with territorial partnerships and translating purpose into measurable outcomes.

Overall, the staged evolution and emphasis on place-based accountability provide converging evidence of substantive SB adoption. Ongoing triangulation of documents, interviews, and secondary studies will assess whether observed changes reflect adaptive adjustments or deeper interpretive shifts.

Future research will: (i) extend interviews across functions to test competing explanations (compliance vs interpretive change); (ii) analyse 2024–2025 reports to assess continuity and resourcing; and (iii) strengthen negative-case analysis by identifying symbolic initiatives. A comparative extension within the cosmetics sector (SB adopters vs non-adopters) will further test boundary conditions.

Limitations include the single-case design, which constrains generalisability; the context-specific nature of a family-run Italian SME; and reliance on early-stage and primarily qualitative evidence. Transferability is therefore analytical and most applicable to SMEs with strong territorial embeddedness, engagement with SB/B-Corp frameworks, and emerging KPI systems.

Keywords: Benefit corporation; organizational change; sustainability transitions; laughlin model; case study; cosmetic industry

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Imprenditorialità femminile e migrazione: una revisione sistematica sui meccanismi di supporto formale e informale

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1. Inquadramento teorico

Numerosi studi dimostrano che l'imprenditorialità dei migranti contribuisce significativamente alla crescita economica e sociale delle regioni ospitanti (Achidi Ndofor & Priem, 2011) e rappresenta una strategia per affrontare la discriminazione e gli svantaggi strutturali nel mercato del lavoro (Andrejuk, 2017; Dheer, 2018). L'imprenditorialità migrante si riferisce alle "attività imprenditoriali intraprese da migranti con uno specifico background socio-culturale ed etnico o di origine migratoria" (Sahin et al., 2007) e costituisce spesso una risposta alle limitate opportunità lavorative dovute a fattori quali razza, lingua e origine etnica (Aldrich & Waldinger, 1990; Volery, 2007).

I migranti incontrano frequentemente difficoltà nel mercato del lavoro dipendente a causa di discriminazioni, mancanza di reti sociali adeguate e insufficienti conoscenze istituzionali (Kay & Schneck, 2012). Una barriera particolarmente rilevante riguarda il mancato riconoscimento del capitale umano: nonostante molte donne migranti possiedano titoli di studio elevati, le loro credenziali vengono sistematicamente svalutate, generando fenomeni di dequalificazione che bloccano la mobilità professionale (Creese & Wiebe, 2012; Lens, 2023). Per comprendere queste dinamiche, il presente studio adotta la lente teorica dell'intersezionalità (Crenshaw, 1991; Collins, 2015), che concepisce genere, etnia e condizione migratoria non come entità separate e additive, ma come fenomeni che si costituiscono reciprocamente, generando configurazioni specifiche di svantaggio (Bowleg, 2008; Lassalle & Shaw, 2021).

L'imprenditorialità emerge come percorso per superare questi svantaggi strutturali. Per molte donne migranti, il lavoro autonomo non rappresenta un "Piano B" rispetto al lavoro dipendente, ma un "Piano A" necessario quando le qualifiche non vengono riconosciute (Brieger & Gielnik, 2021). Gli imprenditori migranti avviano frequentemente imprese che servono le loro comunità di origine, sviluppando la cosiddetta "imprenditorialità etnica", una strategia che consente di valorizzare le risorse culturali, sociali e familiari disponibili (Chrysostome, 2010). Tuttavia, l'imprenditoria migrante non rappresenta una soluzione universale: permangono ostacoli significativi nell'accesso al credito, nelle relazioni con clienti e partner commerciali e nella costruzione di reti al di fuori della propria comunità (Bijedić et al., 2017; Brooks et al., 2014).

Le reti sociali emergono come elemento fondamentale nel sostegno alle imprenditrici migranti, con dinamiche nettamente diverse rispetto agli uomini. Le imprenditrici si affidano tipicamente a reti informali incentrate sulla famiglia e sugli amici, mentre gli uomini tendono a utilizzare reti professionali più strutturate (Brush, 1992; Verheul et al., 2002). Sebbene essenziali per il sostegno emotivo e l'assistenza finanziaria, queste reti informali si rivelano spesso meno efficaci nell'accesso alle conoscenze istituzionali, fondamentali per il successo imprenditoriale (Andersson & Larsson, 2016; Minniti, 2005). Le imprenditrici di origine straniera sono inoltre spesso sottovalutate a causa di stereotipi di genere (Apitzsch, 2005), nonostante il loro contributo documentato in termini di innovazione e diversificazione del tessuto imprenditoriale (Verheul et al., 2004).

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2. Obiettivi

Nonostante la crescente importanza delle donne imprenditrici migranti nel panorama socio-economico contemporaneo, la letteratura presenta lacune significative. In primo luogo, sebbene esistano studi sui supporti formali (programmi governativi, incubatori) e sulle reti informali (famiglia, comunità coetniche), manca un'analisi sistematica della loro interazione dinamica e delle possibilità di integrazione strategica (Barrios et al., 2025; Polychronopoulos & Nguyen-Duc, 2023). In secondo luogo, le politiche di supporto all'imprenditorialità migrante adottano spesso un approccio "cieco al genere" o di "managerialismo etnico" che ignora come genere, classe ed etnia si sovrappongano nel definire l'accesso alle risorse (Ram et al., 2017; Villares-Varela, 2018). Questa omogeneizzazione dei bisogni non riconosce le barriere specifiche delle donne migranti, come il doppio svantaggio che intensifica lo scetticismo delle istituzioni finanziarie (Cunha et al., 2024).

Questa revisione sistematica mira a colmare tali lacune proponendo un quadro analitico che integra esplicitamente quattro dimensioni: le barriere affrontate, i sistemi di supporto formale, le reti informali e la loro interazione dinamica. L'urgenza di questo studio è accentuata dal contesto attuale: i flussi migratori verso i paesi OCSE hanno raggiunto livelli record (OECD, 2024), mentre gli interventi di supporto all'imprenditorialità risultano frammentati e insufficientemente adattati alle specificità delle imprenditrici migranti (Desiderio, 2014). Comprendere come articolare efficacemente supporti formali e reti comunitarie esistenti diventa quindi cruciale per promuovere un'inclusione economica effettiva.

Dal punto di vista teorico, il presente studio si distingue dalle rassegne precedenti. A differenza di Chreim et al. (2018), che adotta un quadro di radicamento misto, e di Sarihasan et al. (2023), che applica le teorie del capitale umano e dello svantaggio, questo lavoro adotta una prospettiva esplicitamente intersezionale (Crenshaw, 1991), evidenziando come le donne migranti affrontino configurazioni specifiche di emarginazione. Rispondendo alle sollecitazioni della letteratura recente (DiVito & Ingen-Housz, 2021; Lassalle & Shaw, 2021), l'analisi si concentra non solo sulle singole dimensioni del supporto, ma sulla loro interazione.

La rassegna è strutturata intorno a due domande di ricerca: (1) In che modo le politiche e i programmi di sostegno formale aiutano le imprenditrici migranti a superare le barriere socio-culturali e istituzionali? (2) Quale ruolo svolgono le reti familiari e coetniche nello sviluppo delle imprese delle donne migranti e come si integrano con il sostegno formale? Queste domande consentono di esaminare sia la dimensione istituzionale sia quella sociale-informale, nonché la loro interazione dinamica.

3. Metodologia

Questo studio è stato condotto in conformità alle linee guida PRISMA 2020 (Page et al., 2021). La ricerca si è focalizzata sull'intersezione tra l'imprenditorialità femminile nel contesto migratorio, i meccanismi di supporto formale e le reti informali, adottando una delineazione concettuale che integra le dimensioni del genere, dell'etnia e del supporto imprenditoriale.

La strategia di ricerca ha utilizzato insiemi terminologici validati da precedenti revisioni sistematiche, anziché sviluppare nuovi termini in modo indipendente. Questa scelta metodologica garantisce continuità concettuale con le tradizioni accademiche esistenti, riduce i bias terminologici e favorisce la comparabilità tra studi. La ricerca è stata strutturata attorno a due insiemi di termini: il primo (Chreim et al., 2018) relativo a migrazione e imprenditorialità femminile; il secondo (Polychronopoulos & Nguyen-Duc, 2023) relativo ai meccanismi di supporto. La stringa di ricerca è stata costruita secondo la formula: Set 1 AND Set 2.

Sono state selezionate due banche dati (Scopus e Web of Science) per la loro copertura interdisciplinare e le rigorose procedure di indicizzazione degli articoli sottoposti a revisione tra

pari. I parametri di ricerca hanno incluso esclusivamente articoli scientifici completi in versione definitiva, pubblicati in lingua inglese, nel periodo 2005-2024.

L'implementazione della strategia di ricerca ha prodotto inizialmente 424 record (233 da Scopus e 191 da Web of Science). L'applicazione sistematica dei filtri predefiniti ha ridotto il corpus a 307 articoli potenzialmente rilevanti. La rimozione dei duplicati tramite Zotero (versione 6.0) ha ulteriormente ridotto il corpus a 219 articoli unici.

Prima dell'applicazione completa dei criteri di inclusione ed esclusione, i due ricercatori hanno condotto uno screening pilota su 20 articoli selezionati casualmente per calibrare l'interpretazione dei criteri e garantire coerenza metodologica. L'affidabilità inter-valutatore è stata misurata mediante il kappa di Cohen, ottenendo $\kappa = 0{,}81$, che indica un "accordo quasi perfetto" secondo il framework di Landis e Koch.

Successivamente, due ricercatori indipendenti hanno condotto uno screening parallelo e sistematico di abstract e titoli utilizzando criteri predeterminati. I criteri di inclusione comprendevano: focus specifico sulle imprenditrici migranti; riferimenti espliciti a meccanismi di supporto quali formazione, incubatori, politiche pubbliche e reti coetniche; considerazione della dimensione socio-culturale o istituzionale; presenza di evidenze empiriche o di un quadro teorico rilevante. Sono stati invece esclusi gli studi privi di riferimenti all'imprenditorialità femminile migrante, con focus non imprenditoriale o senza analisi dei meccanismi di supporto. L'applicazione di questi criteri ha portato alla selezione di 40 articoli per l'analisi full-text. Lo screening successivo ha escluso ulteriori 2 articoli per inaccessibilità del testo completo, risultando in un'inclusione finale di 38 studi (Figura 1).

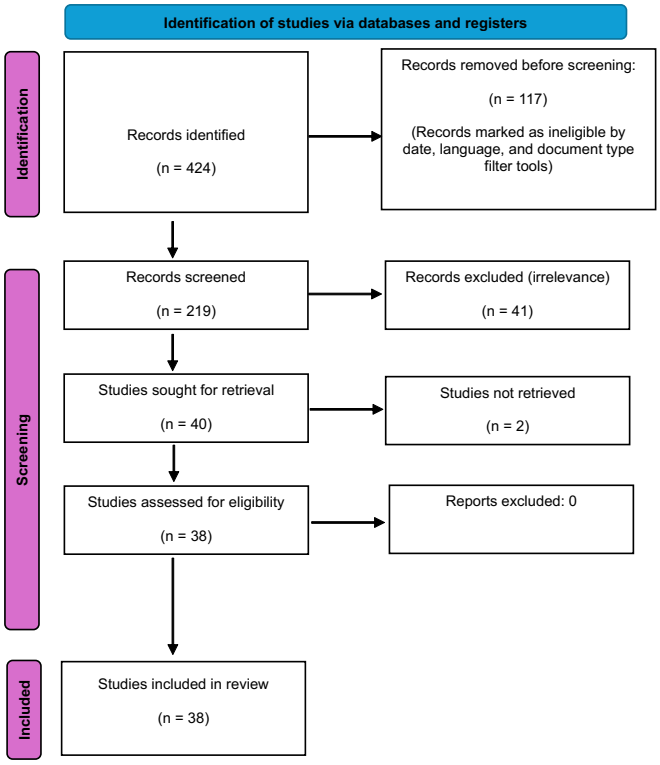


Figura 1. Diagramma di flusso PRISMA 2020 per il processo di selezione dei 38 studi inclusi nella revisione sistematica

La valutazione della qualità metodologica degli studi inclusi ha costituito parte integrante del protocollo. Tutti gli articoli selezionati (n = 38) sono stati verificati per il loro status di pubblicazioni peer-reviewed e per l'indicizzazione in Scopus e Web of Science.

I 38 studi selezionati sono stati analizzati con NVivo 12 attraverso un processo in due fasi. La prima fase ha previsto l'estrazione sistematica dei dati, mappando le caratteristiche bibliometriche, il contesto geografico, l'approccio metodologico, i quadri teorici, i meccanismi di supporto e i principali risultati di ciascuno studio. L'analisi tematica è stata condotta attraverso una lente intersezionale, che ha orientato l'attenzione verso le configurazioni specifiche di svantaggio e supporto emergenti dall'interazione tra genere, etnia e condizione migratoria, piuttosto che verso l'esame separato di ciascuna dimensione. Da questa struttura tematica sono emersi tre pattern distintivi di interazione tra sistemi di supporto formali e informali, concettualizzati come complementarità sinergica, sostituibilità funzionale e conflitto strutturale, approfonditi nella sezione dei risultati.

L'analisi del corpus ha rivelato alcuni pattern distributivi rilevanti per l'interpretazione dei risultati: una concentrazione temporale degli studi nel periodo 2020-2024 (52,6% del corpus); una predominanza di approcci qualitativi (65,8%); una frammentazione disciplinare su 30 riviste accademiche; e una concentrazione geografica nelle economie occidentali, con limitata rappresentazione dei contesti dell'Asia orientale e dell'Africa subsahariana.

4. Risultati

L'analisi preliminare dei 38 studi rivela che i meccanismi di supporto formale e le reti informali interagiscono in modi complessi per aiutare le imprenditrici migranti a superare le barriere strutturali. I risultati preliminari sono organizzati in risposta alle due domande di ricerca, esaminando prima l'efficacia dei supporti formali (RQ1), poi il ruolo delle reti informali (RQ2), e infine le configurazioni di interazione tra i due sistemi.

La letteratura documenta un insieme strutturato di barriere che impattano significativamente sulle traiettorie imprenditoriali delle donne migranti. Queste barriere sono manifestazioni interconnesse delle relazioni tra genere, etnia, classe sociale e condizione migratoria. La concettualizzazione di tali svantaggi è evoluta dal "doppio svantaggio" (Sarihasan et al., 2023) a formulazioni più complesse di "tripla discriminazione" (Maharjan et al., 2025). Una barriera significativa è il limitato riconoscimento delle qualifiche professionali acquisite nel paese d'origine: studi in Norvegia (Munkejord, 2017a) e Scozia (Lassalle & Shaw, 2021) documentano come le donne migranti affrontino ostacoli nel trasferimento delle competenze nonostante un capitale umano sostanziale. Questo processo di dequalificazione è distintamente connotato dal genere e influenza sia i percorsi verso l'imprenditorialità sia la concentrazione settoriale. Le tensioni socioculturali complicano ulteriormente i percorsi imprenditoriali, particolarmente riguardo al conflitto lavoro-famiglia, esacerbato da aspettative culturali di genere che limitano l'autonomia imprenditoriale delle donne (Essers et al., 2013). Il fenomeno è particolarmente acuto per le trailing wives, donne migrate al seguito del coniuge (Lassalle & Shaw, 2021).

La revisione sistematica identifica una sostanziale variabilità istituzionale nei meccanismi di supporto formale tra i diversi contesti nazionali. L'analisi comparativa rivela contrasti significativi nei modelli istituzionali, esemplificati dalla differenza tra l'approccio olandese di "laissez-faire" e il sistema interventista turco con consistenti sussidi statali per le imprenditrici (Ozasir-Kacar & Essers, 2023). Un pattern ricorrente è il divario tra retorica istituzionale e realtà implementativa: nonostante i discorsi inclusivi, molti programmi allocano risorse limitate al supporto imprenditoriale. I programmi di formazione mostrano efficacia significativa quando integrano moduli specifici di genere (Khatib et al., 2024) e flessibilità organizzativa per accomodare le molteplici responsabilità delle donne migranti (Sweet, 2016). Tuttavia, i programmi riservati alle donne comportano compromessi: facilitano l'accesso iniziale al supporto ma rischiano di rinforzare vincoli strutturali che limitano l'integrazione delle donne in reti decisionali economiche

più ampie (Ozasir-Kacar & Essers, 2023). Un risultato consistente è l'importanza della dimensione relazionale e affettiva: gli spazi di supporto operano come ambienti in cui aspettative e identità imprenditoriali vengono negoziate (Webster, 2020). I modelli più efficaci integrano accessibilità linguistico-culturale, flessibilità organizzativa e approcci multidisciplinari che combinano competenze tecniche con supporto psicosociale.

Le reti familiari e coetniche costituiscono risorse chiave nell'ecosistema imprenditoriale delle donne migranti, fornendo supporto multidimensionale attraverso assetti complementari. Le reti familiari fungono da fonti primarie di capitale finanziario e risorse lavorative: circa metà delle imprenditrici etniche utilizza risparmi personali e supporto familiare per l'avvio dell'attività (Piperopoulos, 2012). Le reti coetniche più ampie forniscono risorse specializzate radicate nell'identità culturale condivisa (Colombelli et al., 2020). La dimensione digitale estende significativamente la portata del capitale sociale coetnico, con piattaforme online che operano come infrastrutture informative parallele (Homel, 2020), allineandosi al concetto di "bifocalità" (De Luca & Ambrosini, 2019). Gli assetti di rete mostrano una notevole variabilità contestuale: nelle aree rurali con bassa densità di popolazione migrante, le donne si affidano maggiormente a risorse del paese ospitante, spesso mediate da partner locali (Munkejord, 2017b), mentre i contesti urbani con popolazioni etniche concentrate favoriscono lo sviluppo di robuste reti coetniche (Maharjan et al., 2025). Tuttavia, le reti etniche mostrano importanti sfumature: emergono contraddizioni tra supporto materiale e meccanismi di controllo sociale, con il finanziamento familiare che talvolta limita l'autonomia imprenditoriale (Essers et al., 2013). Evidenze longitudinali rivelano traiettorie evolutive negli equilibri di rete, con transizioni sistematiche da reti dense ed etnicamente omogenee durante le fasi di avvio verso assetti più diversificati durante il consolidamento (Basit, 2017).

L'analisi delle interazioni tra supporto formale e reti informali rivela tre configurazioni distintive. La prima è la complementarità sinergica, in cui i due ambiti svolgono funzioni diverse ma congiuntamente necessarie: in Israele, i programmi governativi aumentano simultaneamente il capitale umano e sociale delle partecipanti (Lerner et al., 2005), mentre in Finlandia i servizi di consulenza migliorano non solo i business plan ma anche le reti sociali delle imprenditrici migranti (Aman et al., 2024). La seconda configurazione è la sostituibilità funzionale, in cui le reti informali colmano sistematicamente le lacune di quelle formali: dove le barriere strutturali limitano l'accesso al credito formale, le reti familiari e coetniche forniscono capitale alternativo per l'avvio (Addo, 2017; Piperopoulos, 2012). Questa sostituibilità è pronunciata dove le politiche di integrazione sono limitate: le reti comunitarie diventano cruciali per i nuovi arrivati, fornendo supporto materiale e compensando canali informativi ufficiali inefficienti (Sitchinava, 2025). La terza configurazione è il conflitto strutturale, che evidenzia incompatibilità sistemiche: le istituzioni finanziarie ostacolano l'accesso al credito attraverso pratiche discriminatorie basate sull'etnia (Maharjan et al., 2025), mentre aspettative culturali intergenerazionali possono scontrarsi con le aspirazioni imprenditoriali, come nel caso delle donne polacche le cui carriere sono subordinate alle priorità domestiche dopo la migrazione (Lassalle & Shaw, 2021).

Un pattern ricorrente è la capacità delle imprenditrici migranti di trasformare potenziali fattori di marginalizzazione in risorse competitive distintive. Ricerche su imprenditrici ghanesi in Sudafrica documentano processi attraverso cui competenze culturalmente specifiche vengono trasformate in vantaggi di mercato nonostante il limitato supporto istituzionale (Ojong, 2016). Utilizziamo il concetto di "capacità d'azione adattiva" per indicare gli aggiustamenti intenzionali e situati attraverso cui le imprenditrici migranti riposizionano le proprie identità, negoziano le norme familiari e comunitarie, e mobilitano selettivamente reti informali in combinazione con il supporto istituzionale per superare le barriere (Adeeko & Treanor, 2022; Essers & Benschop, 2007). Questa coordinazione dinamica suggerisce che i programmi istituzionali dovrebbero integrare e rafforzare il capitale sociale esistente piuttosto che tentare di sostituirlo con meccanismi formali decontestualizzati.

5. Originalità del contributo

Questa revisione sistematica offre un contributo originale alla letteratura sull'imprenditorialità delle donne migranti, colmando le lacune identificate nella ricerca esistente. In risposta alla mancanza di studi che analizzino l'interazione tra supporti formali e informali, il lavoro propone una tipologia di tre configurazioni (complementarità sinergica, sostituibilità funzionale, conflitto strutturale) che cattura le dinamiche relazionali tra i due sistemi. In risposta all'approccio "cieco al genere" delle politiche di supporto, lo studio adotta una prospettiva esplicitamente intersezionale che evidenzia come genere, etnia e condizione migratoria si sovrappongano nel definire l'accesso alle risorse.

Sul piano teorico, il contributo principale risiede nel concetto di "capacità d'azione adattiva", che integra la letteratura sull'intersezionalità con quella sul capitale sociale, mostrando come le imprenditrici migranti non siano soggetti passivi di fronte alle barriere strutturali, ma attori capaci di riposizionare identità, negoziare norme comunitarie e mobilitare selettivamente risorse formali e informali. Questo supera le rappresentazioni unidimensionali delle reti etniche come esclusivamente emancipatrici o costrittive.

Sul piano metodologico, l'applicazione rigorosa del protocollo PRISMA 2020 a un corpus di 38 studi recenti (2005-2024) fornisce una sintesi sistematica e aggiornata che arricchisce la base empirica disponibile, offrendo un quadro analitico replicabile per future ricerche.

Sul piano delle implicazioni pratiche, i risultati suggeriscono che gli interventi efficaci non dovrebbero introdurre meccanismi formali decontestualizzati, ma costruire ponti istituzionali con le reti comunitarie esistenti. I programmi di supporto risultano più efficaci quando integrano accessibilità linguistico-culturale, flessibilità organizzativa e consapevolezza delle barriere intersezionali. Per i policy maker, questo implica ripensare la progettazione degli interventi in collaborazione con le comunità coetniche, riconoscendo il capitale sociale informale come risorsa da valorizzare piuttosto che da sostituire.

Parole chiave: Imprenditorialità femminile migrante; supporto formale; reti informali; intersezionalità; revisione sistematica

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Corporate social responsibility and non-profit corporate foundations: a systematic literature review (2015-2025)

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1. Introduction

Over the past decade, corporate social responsibility (CSR) has consolidated its presence as a central dimension in business strategy and academic inquiry (Dreesbach-Bundy and Scheck, 2017; Burbano et al., 2024). Its relevance is rooted in the capacity of CSR to create shared value, reinforce trust-based relationships with stakeholders, and strengthen corporate reputation across diverse audiences, including employees, customers, communities, and institutional actors (Schwartz, 2024; Zhao et al., 2022; Moon et al., 2024; Petersen and Lemke., 2015). In this scenario, corporate foundations have attracted increasing attention as structured, non-profit instruments through which firms can institutionalize their social commitments and transform them into long-term and purpose-driven initiatives (Gehringer, 2020; Gehringer, 2021; Minefee et al., 2015).

As hybrid organizations situated between business and society, corporate foundations represent an evolution of the traditional philanthropic role of companies. They enable firms to pursue initiatives with a strong social and community impact, while ensuring alignment with corporate strategy and stakeholder expectations (Pedrini and Minciullo, 2011; Monfort et al., 2021). Their distinctiveness lies not only in the types of initiatives they promote, but also in the institutional form through which CSR is organized, communicated, and measured.

The conceptual relationship between CSR and corporate foundations is analysed in debates on the double nature of the company (i.e., economic and social). Mintzberg (1983) early explains that corporate power carries moral consequences. The framework developed by Garriga and Melé. (2004) further articulated the multiplicity of CSR logics (instrumental, political, integrative, and ethical) explaining the simultaneous coexistence of moral commitment and strategic gain within CSR practices. Stakeholder theory (Freeman et al., 2020) proposed a conceptual framework though which CSR can be interpreted as a process of creating multiple forms of value that goes beyond the company's economic objectives, broadening the purpose of business from shareholder value to the creation of multiple stakeholder value.

Corporate foundations, as Gehringer (2021) observes, embody this hybridisation, mediating between corporate priorities and social needs with a degree of autonomy and legitimacy that is not always achievable through internal CSR activities. Their strategic value as institutionalized instruments of CSR are demonstrated in their ability to aggregate resources efficiently, often outperforming in fund raising compared to independent foundations (Rey-Garcia et al., 2018).

The present study aims to contribute to this debate by conducting a systematic literature review (SLR) of peer-reviewed contributions published between 2015 and 2025 in high-ranking journals (ABS 2-4*). It investigates how CSR implemented through non-profit corporate foundations generates value and impact. Moreover, it positions corporate foundations within the broader strategic and conceptual landscape of CSR, addressing their governance, hybridity,

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strategic alignment, and performance measurement. To this aim, this study is guided by the following research question: How does CSR through non-profit organizations create value?

Because research on corporate foundations remains limited, especially when compared with the vast CSR literature, this study seeks to provide an updated mapping of the field, highlight emerging patterns, and identify gaps that require further research.

2. Methodology

2.1. Systematic review approach

The study adopts a systematic literature review approach, which offers transparency, reproducibility, and methodological rigor across all stages of research. As Rousseau (2024) argues, a systematic review must adhere to the same standards of robustness as empirical research, using predetermined, transparent procedures. Similarly, Simsek and Heavey (2023) emphasize the importance of consistency and replicability, noting that the clarity of methodological processes is essential for ensuring the reliability of SLR outcomes.

In line with these principles, the present review was designed with:

- precise documentation of search strategies and parameters;
- clear justification for inclusion and exclusion choices;
- consistent application of coding and categorization criteria;
- iterative refinement of thematic and conceptual categories.

Hiebl (2023) stresses the need to disclose databases, keywords, time frames, and selection filters as an integral part of methodological rigor.

2.2. Scope of the review

The aim of the review is to understand how corporate foundations contribute to CSR strategies and how these hybrid organizations generate both social and economic value. Rather than treating corporate foundations as independent entities, the review situates them within the broader CSR conversation to allow for comparative interpretation. This positioning is necessary because, despite their increasing relevance, corporate foundations remain underrepresented in mainstream CSR scholarship.

Given this conceptual gap, the review incorporates selected papers directly related to corporate foundations even when these were not captured by the initial database search. This choice mirrors the methodological approach used by Gehringer (2021), who combined academic and grey literature to map the domain comprehensively.

It is important to note that this review does not aim to cover the entire CSR literature, which would result in a substantially larger body of studies. Instead, the scope is deliberately restricted to research explicitly addressing corporate foundations within the CSR domain. This focused approach explains the relatively limited number of articles identified and reflects the evolving nature of corporate foundation research.

2.3. Database and time frame

The review uses Scopus as the main database because of its comprehensive coverage in management, sustainability, and social sciences. The chosen time frame, from 2015 to 2025, reflects the impact of the United Nations 2030 Agenda for Sustainable Development. As Hiebl (2023) notes, setting a temporal boundary allows researchers to capture contemporary developments while narrowing the analytical focus. Rousseau (2024) emphasizes that such boundaries should be linked to relevant scientific or policy shifts rather than arbitrary time spans. Therefore, the 2015 threshold aligns with a globally recognized turning point in sustainability debates.

2.4. Search string and query structure

The search string was constructed using Boolean logic to ensure the appropriate balance between specificity and comprehensiveness. Boolean operators allowed for both the inclusion of synonymous terms and the targeted retrieval of articles directly addressing CSR, non-profit organizations, and value creation.

Following Simsek and Heavey's (2023) principles of coverage and coherence, the search string contained three conceptual blocks:

- Corporate Social Responsibility;
- Foundations / Non-Profit Organizations;
- Value Creation / Impact.

Additional filters were applied:

- Only ABS-ranked journals (levels 2-4*);
- Business and management subject areas;
- English-language peer-reviewed articles;
- Journal articles only (no conference papers or book chapters).

This structured approach ensured both thematic precision and alignment with the research question.

2.5. Screening and selection process

The initial search returned 47 articles from Scopus. To ensure a comprehensive analysis, 5 additional articles were incorporated through cross-referencing, following the bibliographic mapping provided in Gehringer (2021). This brought the total to 52 papers.

Screening progessed in two phases:

- Title and abstract screening, which excluded 7 papers (6 off-topic, 1 retracted);
- Full-text assessment, resulting in a final corpus of 45 eligible articles [Table 1].

Papers were included when they offered a substantive contribution to the understanding of CSR, specifically when they examined how CSR initiatives generate social and/or economic value, how CSR practices affect internal or external stakeholder relationships, or how governance, ethical principles, and sustainability frameworks shape responsible corporate conduct. This also encompassed studies explicitly addressing corporate foundations and other hybrid non-profit structures involved in CSR implementation.

Conversely, papers were excluded when CSR was not the main analytical focus (e.g., studies centred on digital transformation or firm competitiveness without a CSR grounding), when contributions addressed highly specific contexts without broader conceptual relevance, when CSR appeared only marginally or without a clear link to value creation or stakeholder dynamics, or when the article had been retracted.

2.6. Coding and thematic classification

Each paper was coded using a structured analytical matrix comprising:

- Authors;
- Title of the Study;
- Year of Publication;
- Source (Journal/Publisher);
- Abstract;
- Inclusion/Exclusion Criteria;
- Thematic Categories;
- Underlying Economic Theory;

- Theoretical Framework/Argument;
- Research Question(s);
- Methodological Approach;
- Main Findings;
- Directions for Future Research.

The coding framework captures authorship, publication details, theoretical grounding, research questions, methodological choices, findings, and proposed future directions, and it enabled to identify recurring methodological patterns, dominant theoretical perspectives, and the main conceptual tensions that characterize the literature.

Following Simsek and Heavey's (2023) principle of connectedness, the articles were grouped into four thematic categories.

2.7. Thematic classification

The thematic categorization reveals three dominant lines of inquiry:

- Stakeholder engagement and organizational performance - Studies in this category analyse how CSR initiatives shape stakeholder perceptions, engagement, trust, and ultimately corporate performance.
- Sustainability and ethical governance - This category addresses the governance structures and ethical principles that shape CSR implementation. It encompasses research on regulatory pressures, decision-making, and sustainability-oriented governance.
- Value creation through social initiatives - These papers focus on social impact, reputational benefits, hybrid organizational forms, and the specific role of corporate foundations in mediating between corporate strategy and social value.

Together, these categories provide the basis for the conceptual analysis presented in the next sections.

3. Analysis and discussion

Literature mapping

The temporal distribution reveals two peaks in 2021 and 2024, indicating a rise in scholarly interest linked to the global sustainability agenda and the institutionalization of CSR practices. The thematic distribution shows that value creation is the most studied area (19 papers) highlighting a shift toward assessing CSR outcomes rather than motivations.

In parallel, the analysis of theoretical frameworks shows the predominance of stakeholder theory, followed by a range of complementary approaches, reflecting a diversified conceptual landscape. Methodologically, the field is dominated by quantitative studies, with only a smaller share of reviews, conceptual papers, and limited qualitative or mixed-methods contributions.

Comparative perspective: CSR in firm and corporate foundations

As a result of the literature review, this section provides a detailed comparison of CSR and corporate foundations across key dimensions [Table 2].

Regulation

CSR has gradually shifted from voluntary norms to institutionalized frameworks, embedded in standards, guidelines, and certifications, influenced by multiple actors (Adib et al., 2020). Corporate foundations extend this regulatory structure by implementing social programs that reinforce corporate legitimacy, especially in particular contexts. Brammer et al. (2021) argue that

groups such as NGOs can intervene to ensure that large corporations act more responsibly, in contexts with weak institutional pressures.

Governance

Corporate foundations face structural governance challenges due to their hybrid nature. Minefee et al. (2015) emphasize the role of governance structures in mediating corporate and social logics, while Gehringer (2021) identifies governance tensions in nearly half of the corporate foundation studies examined. Burbano et al. (2024) show how sustainability-oriented governance innovations are reshaping the overall CSR landscape.

Funding

Corporate foundations manage resources differently from internal CSR budgets. Whereas CSR budgets often target annual initiatives, foundations engage in long-term investments, partnerships, and advocacy (Gehringer, 2020). Rey-Garcia et al. (2018) note that corporate foundations outperform independent ones in raising programmatic resources.

Strategic alignment

Strategic alignment concerns the consistency between foundation activities and corporate values. Monfort et al. (2021) similarly assert that coherence between corporate and foundation communication enhances trust. Gehringer (2021) interprets this alignment as strategic hybridization.

Hybridity

Hybridity is the defining characteristic of corporate foundations, reflecting their dual orientation toward corporate and social logics. Gehringer (2021) identifies hybridity at multiple levels, strategic, organizational, and contextual, in which foundations must bring together profit-driven ratios with philanthropic missions.

Measurement and metrics

Measurement is central to CSR credibility. Juščius and Jonikas (2016) describe CSR strategies as proactive or reactive, emphasizing the importance of evaluation systems capable of capturing both tangible and intangible impacts. Zhao et al. (2022) argue that aligning CSR with objectively measured practices improves employee engagement and organizational credibility**.**

Cultural impact

CSR shapes internal values and cultural identity. Corporate foundations contribute to embedding social purpose within organizational culture by stabilizing long-term commitments.

Market and reputation

Eng et al. (2020) and Hsu et al. (2022) show that CSR enhances legitimacy and reduces reputational risk. Corporate foundations amplify these reputational gains by demonstrating sustained commitment to social causes.

Overall, the comparative analysis reveals that, although CSR and corporate foundations share a common ethical foundation, they differ in terms of structure, scope, and the level of strategic

development of their activities. CSR represents the internalization of social responsibility within corporate operations, while corporate foundations externalize and institutionalizes this responsibility in distinct organizational forms. Across all dimensions, corporate foundations emerge as key channels for extending corporate responsibility into the social domain.

4. Conclusion and future directions

The SLR highlights how CSR has evolved from a voluntary practice into an institutionalized strategic framework integrated into business models. Corporate foundations are emerging as hybrid organizational structures that turn CSR commitments into high-impact, long-term social initiatives. They strengthen corporate reputation, and foster value creation that integrates social and economic dimensions.

From a theoretical perspective, the centrality of stakeholder theory reflects the importance of stakeholder trust and engagement in CSR strategies. Complementary theoretical perspectives enrich this field by explaining the mechanisms through which CSR generates both business and societal benefits.

Methodologically, the prevalence of quantitative studies underscores a growing emphasis on impact measurement. However, the limited use of qualitative and mixed-method approaches suggests the need for more exploratory research which can capture complex social dynamics.

Future research opportunities include:

- analyze governance models that balance corporate autonomy and oversight;
- explore forms of strategic alignment and organizational hybridity;
- develop impact assessment frameworks for corporate foundations that integrate social, economic, and reputational indicators.

Corporate foundations represent promising but underexplored organizational forms. Their ability to combine corporate resources with social missions positions them at the forefront of the evolution of CSR toward more strategic, collaborative, and sustainable models.

Value creation through social initiatives		**Stakeholder engagement and organizational performance**		**Sustainability and ethical governance**	
Tang R.W., Mi L., Chan X.W., Yan H. and Cavusgil S.T.	2025	Abdallah-Ou-Moussa S., Wynn M., Kharbouch O. and Rouaine Z.	2024	Schwartz M. S.	2024
Osei Bonsu C., Liu C. and Yawson A.	2024	Tenakwah E.J., Chen J., Ying S. X., Li Y. and Wu H.	2024	Waddock S., Henriques I., Linnenluecke M., Poggioli N. and Böhm S.	2024
Moon J., Hwang, J. and Lee W. S.	2024	Zeng H., Li X., He Y. and Meng S.	2024	Burbano V.C., Delmas M. A. and Cobo M.J.	2024
Fontoura P. and Coelho A.	2022	Heucher K., Alt E., Soderstrom S., Scully M. and Glavas A.	2024	Pandey N., Andres C. and Kumar S.	2023

Kowszyk Y. and Vanclay F.	2021	Abid R.	2023	Tiberius V., Stiller L. and Dabić M.	2021
Monfort A., Villagra, N. and Sánchez, J.	2021	Hsu B. and Chen Y.-M.	2022	Brammer S., Nardella G. and Surdu I.	2021
Eng T., Ozdemir S., Gupta S. and Kanungo R.P.	2020	Iguchi H., Katayama,H. and Yamanoi J.	2022	Wang X., Li F. and Sun Q.	2018
Buhmann K., Taylor M. B. and Giuliani E.	2019	Zhao X., Wu C. and Zhou Z.	2022	Sartor M., Orzes G., Di Mauro C., Ebrahimpour, M. and Nassimbeni G.	2016
Tate W.L. and Bals L.	2018	Hang H., Rodrigo, P. and Ghaffari M.	2021	Maon F. and Lindgreen A.	2015
Calvo-Mora, A., Domínguez-CC, M. and Criado F.	2018	Lee E.S. and Szkudlarek B.	2021	Minefee I., Neuman E. J., Isserman N. and Leblebici H.*	2015
Kaul A. and Luo J.	2018	Giacomin V., Jones G. and Salvaj E. H.	2021		
Dreesbach-Bundy S. and Scheck, B.	2017	Manuel T. and Herron T.L.	2020		
Juščius V. and Jonikas D.	2016	Adib M., Zhang X., Zaid Mohammad A.A. and Sahyouni A.	2020		
Petersen H. L.and Lemke F.	2015	Potdar B., Guthrie J., Gnoth J. and Garry, T.	2018		
Sacchetti S.	2015	Theodoulidis B., Diaz D., Crotto F. and Rancati E.	2017		
Gehringer T.*	2021	Antonetti P. and Ansea M.	2017		
Gehringer T.*	2020				

Jung, T., Harrow J. and Leat D.*	2018				
Rey-Garcia M., Sanzo-Perez M.J. and Álvarez-González L.I.*	2018				
*added manually					

Table 1. Outlook of papers as classified into the relevant thematic categories emerged according to the analysis. Categories are indicating the main relevant issues in understanding the impact of CSR to identify their relationship with corporate non-profit foundations

Dimension	**Corporate social responsibility**	**Corporate foundations**	**References**
Regulation	Voluntary certification and regulatory standards guide companies toward stakeholder expectations. CSR is integrated into risk, ethics, and sustainability control systems. Increasing codification of CSR through ESG frameworks and mechanisms that define corporate legitimacy.	Separate non-profit legal entities affiliated with companies. Subject to the law on foundations or non-profit organizations. They operate within their own area of expertise, aligning themselves with the company's sustainability objectives. Corporate foundations are influenced by the transparency and accountability requirements associated with public-private partnerships.	Maon et al. (2015); Minefee et al. (2015); Sartor et al. (2016); Wang et al. (2018); Adib et al. (2020); Brammer et al. (2021); Pandey et al. (2023); Burbano et al. (2024); Schwartz (2024); Tenakwah et al. (2024); Waddock et al. (2024)
Governance	Supervision of the board of directors and executives (ESG/CSR committees), internal policies, strategy, and disclosure of information. The role of integrating governance into CSR is important, with particular emphasis on ESG committees and multi-level coordination.	Boards often include members appointed by the company. Governance varies depending on the degree of corporate control and stakeholder involvement. For corporate foundations, governance increasingly includes independent oversight and stakeholder representation, balancing	Maon et al. (2015); Minefee et al. (2015); Gehringer (2020); Gehringer (2021); Brammer et al. (2021); Mukherjee et al. (2022); Pandey et al. (2023); Burbano et al. (2024); Schwartz, (2024); Tenakwah et al. (2024)

		autonomy with strategic alignment.	
Funding	CSR budgets integrated into annual business planning. Project-based allocations and partnerships. CSR expenditures are considered strategic investments.	Corporate donations or grants. Ability to pool and leverage resources with public and non-profit partners. Corporate foundations diversify funding sources with the goal of creating long-term social value.	Rey-Garcia et al. (2018); Gehringer (2020); Gehringer (2021); Giacomin et al. (2021)
Strategic alignment	CSR is shifting from reactive philanthropy to integrated shared value strategies that incorporate sustainability into the business model.	The alignment ranges from reputational philanthropy to mission-driven, translating the corporate purpose into social initiatives. Foundations act as strategic extensions, implementing social innovation projects that complement the company's core mission.	Minefee et al. (2015); Rey-Garcia et al. (2018); Adib et al., (2020); Gehringer (2021); Schwartz (2024); Waddock et al. (2024)
Hybridity	The hybrid nature of CSR manifests itself in a dual logic, economic and social, and requires adaptive structures.	Hybrid organizations at the intersection of business and civil society. Exhibit strategic, organizational, and contextual hybridity. Corporate foundations bridge corporate and civil society-oriented missions.	Rey-Garcia et al. (2018); Gehringer (2020); Gehringer (2021)
Measurement and metrics	ESG disclosure and impact measurement remain central challenges.	Corporate foundations increasingly adopt evaluation frameworks aligned with SDG indicators and corporate impact assesment methods.	Juščius et al. (2016); Gehringer (2020); Zhao et al. (2022); Waddock et al. (2024)
Cultural impacts	Corporate cultural responsibility has an impact on cultural progress, fostering organizational and societal cultural change.	Dedicated programs can protect and promote local cultures. Corporate foundations act as cultural ambassadors, reinforcing corporate values across local communities and international contexts.	Maon et al. (2015); Gehringer (2021); Tenakwah et al. (2024)

Market and reputation	Leadership attributes shape reputation and performance. CSR communication strategies influence market reputation, investor trust, and brand value.	Announcements about the creation can affect market value. The visibility of the foundation reinforces the narrative of the company's legitimacy, especially when accompanied by long-term commitments.	Petersen et al. (2015); Eng et al. (2020); Giacomin et al. (2021); Monfort et al. (2021); Bo-Xiang Hsu et al. (2022); Mukherjee et al. (2022); Moon et al. (2024)

Table 2. Comparative framework of corporate social responsibility and corporate foundations as emerging according to the multidimensional analytical approach adopted in the review

Keywords: Corporate foundations; corporate social responsibility; value creation; hybridity

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Navigating the Nexus: A Systematic Review of Barriers and Enablers for Social Enterprises in Social Procurement

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1. Introduction

Social procurement (SP) is an initiative of utilizing organizational purchasing power to enhance social value. Presently, it has garnered significant attention and evolved into a critical policy measure and management tool in sustainable supply chain management (Barraket et al., 2016). SP is an insightful transfer of organizational intentions from purely economic to social. It includes a procurement mechanism that aims to create earning opportunities for social enterprises (SE). SEs are a form of hybrid organizations that have emerged as the distinctions between the private, public, and non-profit sectors have become increasingly indistinct and more fluid. Hybrid organizations are the descendants of two distinct species (OED., 2010) and within the literature on organization and management, the term has been utilized to characterize entities that transcend institutional boundaries (Brandsen & Karré, 2011; Jay, 2013; Pache & Santos, 2012) and function across multiple domains. SPs' initiatives for empowering SEs address various social issues, including poverty, employment, and social exclusion (Furneaux & Barraket, 2014). It help to create a quasi-market for SE, facilitating their growth and providing a margin to employ disadvantaged individuals. Often, SP policies impose new obligations on SEs to generate employment opportunities for individuals experiencing disadvantages (Loosemore et al., 2020).

Despite increasing research interests, the literature remains fragmented across various disciplines, including public administration, supply chain management and operations management. Present studies have focused on a single dimension, such as examining micro-level barriers or a single sector, which often lack an integrated view (Małyjurek & Szymczak, 2024; Goal et al., 2019). There is an urgent need for a holistic analysis of the integration of SP into SE (Aitken, 2022; Natoli et al., 2023). This systematic review synthesizes contemporary literature to provide clarifying the conceptual foundations, a holistic mapping of the field, persistent challenges, and systemic enablers that define the complex relationship between procurement and social enterprise.

Considering recent research, this study synthesized the contemporary literature on SP with a precise focus on integration with SP. Hence, the research objectives are to map the current conceptual terrain and identify the dominant theoretical lenses, synthesize systemic barriers, and topologize operational pathways through a systematic literature review (SLR).

2. Methodological framework

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To ensure rigorous analysis, this study adopts SLR methodology, following the PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses). A systematic literature review is a form of research synthesis employed to provide a comprehensive overview of the current state of research (Burgers et al., 2019; Pasca et al., 2021). Initial search was performed in academic database Scopus, using the key terms (TITLE-ABS-KEY ("social procurement") AND TITLE-ABS-KEY ("social enterprises") OR TITLE-ABS-KEY ("social entrepreneurship")). Scopus is recognized due to its most comprehensive coverage of research articles, abstract and citation database of scientific literature worldwide (Chadegani et al., 2013). It encompasses a wide range of sources, including journals, conferences, and other publications, covering multiple disciplines such as social sciences. Compared to Web of Science, Scopus encompasses a larger array of sources, providing a more comprehensive and varied coverage of academic literature Meho et al., 2008. The research was limited to the English language, with no time limitation. In the initial phase, all the titles and abstracts were analyzed for relevance to the core research objectives. All studies addressing the interaction between procurement and SE are considered in the first phase (Figure 1).

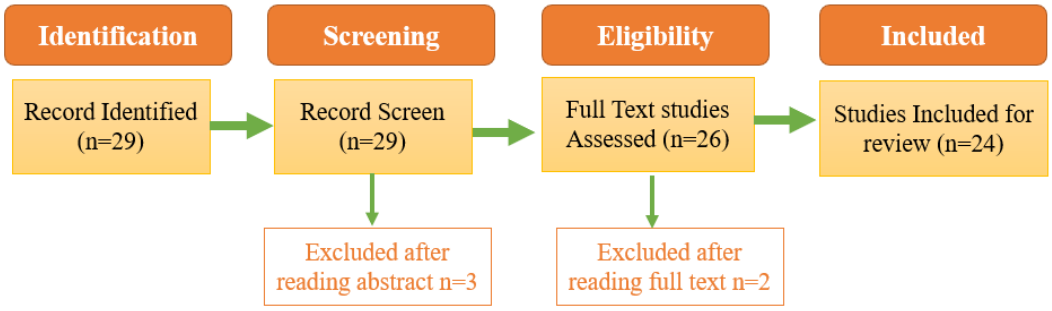


Figure 1. PRISMA Flowchart. Source: Pasca et al., 2021

Three studies were excluded at this stage. During the screening phase, 26 studies were thoroughly reviewed, with full article reading. At this point, 2 studies were excluded. This exclusion is due to general SE studies without a procurement link. 24 studies are finally included, and structured Excel sheet was developed to code publication with various details, including research purpose, methodology, geographical and sectoral context, primary findings, and identification of barriers and enablers. Through this process of screening, coding, and theme development, 4 analytical themes were identified, which help authors to structure the findings.

3. Findings

The synthesis of the selected articles reveals a core tension in the potential of policy endorsements of SP. The generation of consistent social value is hindered by various types of barriers, including commercial, institutional, and operational (Loosemore, 2015; Barraket & Loosemore, 2018). This issue manifested across 4 interrelated thematic areas: 1) conceptual foundations that frame the practices, 2) hindrances created by multi-stakeholders, 3) Pathways for integration that enable it, and 4) a broader ecosystem that can sustain it.

Conceptual and Institutional Foundations

The foundation of SP is developed through the theories of New Public Governance that mark it as a tool for co-creation and networked service delivery within a multi-actor state (Barraket, Keast, & Furneaux, 2015; Hastings & Weate, 2018). A significant contribution of the present literature is the examination of institutional conflict between the social welfare logic of SE and

the commercial logic of SP (Razmdoost & Alinaghian, 2024; Meqdadi, Johnsen, & Pagell, 2020). Various empirical studies indicate that the implementation of SP practices is more influenced by external pressure than by the actual intentions and internal normative beliefs of organizations. Particularly, pressures arise through mimetic isomorphism from peers and coercive isomorphism from government mandates (Nawaz & Guribie, 2024). To handle these conflicts, a buying firm can engage in "institutional work" through proper actions to decrease cognitive conflicts, legitimize new practices, and cross-sector boundaries (Razmdoost & Alinaghian, 2024). Furthermore, the conceptualization of research is complemented by Hunt, Haneberg, and de Boer (2024), who position SE as an alternative source of public welfare.

A Multi-Stakeholder Landscape of Barriers

The literature consistently delineates a multifaceted ecosystem of obstacles that hinder the incorporation of SEs into procurement processes. These barriers are persistent across diverse economic and geographical contexts, from Botswana and Lithuania to the UK and Australia (Kuruneri, Dube, & Obadire, 2025; Loosemore, 2016; Kanapinskas, Plytnikas, & Tvaronavičienė, 2014; Natoli, Lou, & Goodwin, 2023). These barriers can be segregated into two main groups. The first group is relevant with the "Capacity and Visibility Gaps" in SEs themselves. Such issues involved small operational scales, a track record of operations, financial instability, a lack of awareness, and low visibility in relationship-driven supply chains (Kuruneri et al., 2025; Loosemore, 2015). The second group, that is more crucial, is Structural and Regulatory Deficiencies. This consists of legal frameworks that are unable to support policy implementation, governance, and accountability issues, as well as a lack of monitoring systems. In some cases, a rigid procurement culture that focuses on achieving the lowest price instead of the best social value (Kuruneri et al., 2025). In such scenarios, these barriers are even more detrimental for marginalized groups, such as Indigenous businesses struggling with financial difficulties, accessing business advice, and joining industry networks (Denny-Smith & Loosemore, 2017; Loosemore & Denny-Smith, 2016).

Pathways to Integration and Co-Creation

Even with the above-discussed barriers, this article identified the concrete pathways through which SEs can successfully engage with procurement systems. One way is "Competition on Unique Value", through which SEs win the contracts. It receives no special treatment, but by offering specialized services that qualify for procurement streams focusing on innovation or initiated in a specific location. This is an identified point where social and commercial value can be aligned (Hunt, 2025). Another pathway is "Strategic Relationship Configurations," which are crucial. In such scenarios, successful transition often requires basic dyadic buyer-supplier relationships to more intricate triadic or quadratic frameworks. It includes intermediaries such as NGOs, specialized social brokers, or primary contractors. These intermediaries play a crucial role in building trust, reducing perceived risk, and facilitating the growth of SEs as suppliers (Meqdadi et al., 2020; Barraket, 2020; McNeill, 2020). However, such cross-sector partnerships often indicate that they frequently function as "cooperative" arrangements that are transactional and focused on risk mitigation, rather than as "collaborative" initiatives founded on a shared vision and collective value creation. This limitation is due to project-based industry structures, business pressures, and a lack of relational skills (Barraket & Loosemore, 2018; Loosemore et al., 2020).

Policy, Ecosystems, and Macro-Impact

Furthermore, this analysis suggests that realizing SP potential requires a shift beyond simplistic policy mandates to foster a supportive ecosystem. Firstly, it focuses on the importance

of “Enabling Ecosystem Components, which includes capacity-building frameworks for both suppliers and buyers, digitalization, and AI-driven platforms. Moreover, it emphasizes the formalization of intermediary roles to enhance market transparency, social value verification, and matchmaking efficiency (Delina & Šulová, 2025; Natoli et al., 2023). Secondly, the SP practices are being framed more in terms of their “Strategic Macro-Impact”, such as Agenda 2030. In such cases, SP is seen as a strategic tool with large-scale infrastructures that can create jobs, reduce poverty, and build resilient communities (LePage & Renaerts, 2023; Allen et al., 2023). Finally, “Local Government” is recognized as a crucial catalytic actor, distinctly equipped to promote collaborations and serve as an anchor institution within networked governance frameworks to tackle hyper-local social and economic issues (Hastings & Weate, 2018).

Through this in-depth analysis barriers and enablers are mapped mentioned in table 1.

Theme	Barriers	Enablers
Conceptual & Institutional	Mimetic/coercive isomorphism, institutional logic conflicts;	Cross-sector boundary spanning; institutional work;
Multi-Stakeholder Landscape	Rigid procurement culture; capacity gaps; lack of visibility	Intermediary roles; Strategic relationship configurations;
Pathways to Integration	Lack of supportive ecosystems; transactional cooperation vs. collaborative partnerships	Competition on unique value; triadic/quadratic frameworks
Policy & Ecosystems	weak local government engagement	Digital platforms; policy alignment with SDGs; anchor institutions

Table 1. Barriers and Enablers of SE into the SP

4. Discussion

The goal of this systematic review was to synthesize the literature on the integration of SP and SE. The results reveal that the field has both promising and problematic aspects. Social procurement, on the one hand, is a powerful tool for creating social value, whereas on the other hand, a long-standing conflict between new social goals and conventional business practices makes this challenging to achieve. The most important insight from this synthesis is that the change occurs at multiple levels simultaneously. Tis analysis underlines, obstacles and solutions are interrelated across four domains: concepts, relationships, systems, and support frameworks. There is a strong connection between the four themes. The prevailing concepts and theories regarding procurement (Conceptual Foundations) directly influence the practical obstacles encountered (Barriers). A culture that prioritizes the "lowest price" often creates rules that overlook social value. To overcome these barriers, new types of relationships and pathways are necessary. These should extend beyond simple transactions to include complex partnerships with intermediaries who foster trust and develop skills. However, these new relationships are too fragile to sustain without a supportive environment that includes clear rules, training, and technology. A policy mandate will not be effective without an accompanying transformation in mindset and interpersonal skills. All parts must move forward simultaneously.

Practitioners must navigate important tensions inherent in this cycle. Organizations often view SP as a risk to be avoided rather than an opportunity to be leveraged, which limits its scope and potential. The literature distinguishes between superficial "cooperation" to fulfill contractual obligations and profound "collaboration" rooted in a shared vision, suggesting that the former

currently prevails in the field. Local initiatives are effective, but the most challenging problems, such as national laws or industry-wide culture, require change on a larger scale.

This synthesis connects theory to real life. "Institutional work" is an academic term that describes the conscious effort needed to change habits. In practice, this means that procurement officers are forming new partnerships. Digital matchmaking platforms are a real-world example of "ecosystem development" in the same way. Overall, SP is not just a procurement issue; it is also a system change issue. The results show that adding social clauses to existing systems is insufficient.

This systematic analysis provides a clear and organized picture of a field that is complex and rapidly evolving. It enhances both theoretical and practical understanding in three fundamental aspects. First, this article provides a strong and connected framework to the scholars and researchers. This analysis combines ideas from different areas, for example public management, supply chain studies and institutional theory, to offer a clearer picture of SP, ranging from policy pressure (Macro level) to typical partnerships (Micro level). Second, the most important next steps are to monitor long-term results, learn about new digital tools and platforms, and examine how policies work in different countries, especially those with developing economies. Finally, for policymakers and managers, it goes beyond simply listing problems and provides a plan of action. The review highlights areas of the system that require improvement, including simplifying the tender process for small businesses, establishing stronger support networks, and enhancing procurement teams' ability to manage relationships effectively. It demonstrates that to be successful, everyone in the ecosystem must work together.

5. Conclusion, limitations, and future research

This review finds that the main challenges with SP integration into SE are the difficulty of incorporating new social values into existing, inflexible buying systems. This potential to build inclusive communities and help reach global goals is enormous; however, two main challenges exist: many SEs are not stable enough in their operations, and secondly, traditional buyers are not open to new ideas. The research indicates that the most effective approach is a dual and connected strategy. There is a need to improve the procurement systems that SEs conveniently join and support, which require support networks and intermediaries, trust-building, training, and technology implementations for transparent social value creation. This research has limitations as it depends on a single database, Scopus, and lacks empirical evidence. Therefore, future research requires access to broad academic databases and empirical analysis. Further research may also adopt empirical studies on context base such as developing countries. Further studies may also investigate how SP affect SE scalability over the time and how digital tools integrations such as AI-driven platform improve the transparency.

Keywords: Social procurement; social enterprise; systematic review; public management; cross-sector collaboration; institutional work; sustainable supply chain

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Cooperative Bridging: Investigating transnational employee well-being and organizational learning between Senegal and Italy

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1. Introduction

In the context of post-2020 development cooperation, characterized by calls for inclusive governance, horizontal partnership, and social innovation, cooperative enterprises have regained policy and academic attention as democratic, locally embedded, and socially responsible economic actors. The present study explores how transnational cooperative partnerships between Senegal and Italy, facilitated through development cooperation programs such as the Programma di Partenariato Italia-Senegal 2024-2026, impact employee well-being, participation, and governance experiences in cooperatives across both contexts. Although cooperative development features prominently in Italian cooperation policy, particularly in Senegal where cooperatives are leveraged for job creation and reintegration of return migrants, little is known about the micro-level organizational effects of these initiatives. Specifically, how do cooperative employees, often youth, women, and migrants, experience governance, voice, and inclusion in cooperatives shaped by transnational knowledge flows? What tensions emerge when organizational models cross national and cultural boundaries? And to what extent do these partnerships result in mutual learning?

This extended abstract presents a comparative, qualitative research design that addresses these questions through a multi-sited case study of cooperative organizations in Italy and Senegal. Rather than idealizing cooperatives as inherently democratic, we treat them as contested institutional spaces where norms of participation, accountability, and legitimacy are continuously negotiated by workers, members, and managers (Battilana et al., 2009; Battilana et al., 2015; Borzaga & Tortia, 2006; Pache & Santos, 2013).

2. Context

Senegal is a key priority country for Italian development cooperation, with over €259 million in active projects in 2023, of which 28% was allocated to private sector and employment initiatives (AICS, 2023). Many of these projects support cooperatives in agriculture, agro-processing, and manufacturing industries, especially among women and youth in Kaolack, Thiès, and Dakar. Italian cooperatives, particularly in regions such as Emilia-Romagna and Lombardy, participate in these partnerships through technical assistance, training exchanges, and diaspora engagement. The Dakar office dedicated substantial effort in 2023 to planning future action. This included finalizing the Italy-Senegal Partnership Program 2024-2026 (AICS, 2024), which was developed through consultation with Italian organisations and ratified through institutional meetings with local governmental counterparts.

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More in detail, the Italy-Senegal Partnership Program 2024-2026 provides a strategic framework for bilateral development cooperation aligned with Senegal's national priorities and the UN 2030 Agenda for Sustainable Development. Grounded in a rights-based and results-oriented approach, the Program adopts the Theory of Change to frame development as a multidimensional and transformative process. It prioritizes inclusive development, with particular attention to women, youth, rural communities, and other vulnerable groups, and treats gender equality and social inclusion as cross-cutting principles. It addresses key structural challenges in Senegal, including rural poverty, youth unemployment, climate vulnerability, and migration, through four strategic areas: rural development and food security; education and vocational training; employment and private sector development; and environmental sustainability. Migration is approached as a structural development issue, emphasizing regular mobility, rights protection, reintegration of returnees, and the role of diasporas. Implemented through multi-level partnerships and robust monitoring mechanisms, the Program exemplifies a cooperative, context-sensitive model of development cooperation that implements the principles of the 2030 Agenda through horizontal partnership and long-term sustainability. The 2024-2026 Program is set to total €105 million, and it adopts a Result-Based Management approach for effective monitoring and evaluation.

The 2023 Annual Report of the AICS Regional Office in Dakar provides a comprehensive overview of Italy's development cooperation in West Africa, highlighting its strategic orientation, operational results, and future perspectives within the framework of the UN 2030 Agenda for Sustainable Development. The Report is structured around the five pillars of the 2030 Agenda: People, Prosperity, Planet, Peace, and Partnerships, which serve as both an analytical lens and an operational framework. This approach emphasizes the multidimensional and interconnected nature of development, framing cooperation as a transformative and participatory process rather than a set of isolated interventions. Central to this vision are the principles of national ownership, inclusion, and results-based management. In particular, partnerships constitute a transversal element of Italy's cooperation model. The Report emphasizes the role of the Italy System, involving civil society organizations, universities, local authorities, diasporas, and private actors, and promotes horizontal, multi-level partnerships based on co-creation and mutual learning. Overall, the 2023 Annual Report portrays Italian development cooperation in West Africa as a results-oriented and people-centered policy, aligned with the principles of the 2030 Agenda and committed to fostering inclusive, sustainable, and resilient development pathways in the region.

While program documents describe these collaborations in terms of capacity building and knowledge transfer, few empirical studies have examined how such partnerships impact the internal dynamics of cooperatives, especially from the point of view of the employees who must navigate both local traditions and international development norms (Poledrini, 2015). Based on preliminary document analysis (AICS, 2023; AICS, 2024; Defourny & Nyssens, 2017; Cappellaro et al., 2025), we argue that cooperative employees in Senegal and Italy may encounter conflicts between imported governance models and local social hierarchies (e.g., respect for elders or religious leaders), unequal participation dynamics within cooperatives, despite formal democratic structures and emotional and identity-related pressures when serving as cultural or linguistic bridges in transnational projects (Gammelgaard et al., 2020). These propositions ground the project's focus on the lived experiences of governance and cooperation within the transnational field.

3. Literature review

Cooperative governance literature has long highlighted the tensions between participatory ideals and managerial realities (Battilana et al., 2015; Pache & Santos, 2013; Ometto et al., 2019; Smith et al., 2013). Cornforth (2004) identifies governance paradoxes where member control coexists with technical or hierarchical management. Storey et al. (2014), show how cooperatives

may become "hybrid" organizations, blending market logic and democratic legitimacy, often creating ambiguity for members. Battilana et al. (2009) introduce the concept of institutional entrepreneurship, where actors within organizations challenge or adapt institutional templates. In a transnational context, such entrepreneurial behaviour may involve reinterpreting cooperative values to align with local cultural or religious norms. Jaumier (2017) offers an ethnographic perspective on how worker cooperatives navigate "bureaucratization of democracy," revealing that formal democratic procedures may mask inequalities in voice and influence. These dynamics may be particularly relevant in development projects, where external reporting and auditing mechanisms shape internal processes. Varman and Chakrabarti (2004) argue that democracy in cooperatives is socially embedded, often shaped by local power relations such as caste, patriarchy, or patronage. This insight could be relevant for Senegal, where informal authority structures coexist with formal governance norms. Together, these works suggest that employee experience of democracy cannot be inferred from governance design alone. Participation must be understood as an embedded and evolving process, shaped by context, power, and culture.

Looking at the transnational cooperative partnerships, that involve not just financial or technical flows, but also the movement of ideas, values, and organizational models. Saka-Helmhout et al. (2020) emphasizes that institutional practices are rarely transferred wholesale; instead, they undergo a process of translation, where local actors deconstruct and reconstruct norms to fit new environments. Gooderham et al. (2011) stress that successful knowledge transfer requires both institutional compatibility and relational trust, conditions that may not always exist in development settings with asymmetrical power relations. Jackson (2012) critiques the imposition of Western management systems in African contexts, advocating for recognition of indigenous organizational knowledge. In Senegal, traditional collective economic forms (e.g., tontines, family lineages, Islamic moral economy) may offer alternative governance logics to imported cooperative templates.

Going deeper into the bridge between western and developing countries (such as AICS, 2024) using the lens of cooperative organisations, Cappellaro et al. (2025) provide a significant theoretical and empirical contribution to the study of international development governance by shifting the analytical lens from individual intermediary organizations to what they term "intermediary clusters", networks of organizations that collaboratively mediate between global mandates and local institutional contexts. Their research focuses on the United Nations' "Delivering as One" (DaO) reform, implemented between 2007 and 2015, which aimed to improve development effectiveness by integrating the operations of UN organizations within eight pilot countries. Through extensive fieldwork, the authors develop the concept of "contextual bridging" to explain how these intermediary clusters align global development goals with local governance environments. The study identifies a dynamic process in which internal collaboration within clusters is strengthened through the amalgamation of operations and the development of a cohesive collective voice, which is then entrenched locally through power-sharing with host governments and the careful calibration of the collaborative purpose to local political and institutional realities. This process enables intermediary clusters to navigate complexity, absorb coordination costs, foster local ownership, and translate global mandates into context-sensitive practices. While the study focuses on UN country teams, its theoretical implications extend far beyond, offering a framework for understanding how other organizational forms, such as transnational cooperatives, might function as intermediary clusters capable of contextual adaptation. Their findings highlight how organizational hybridity and interorganizational collaboration can produce adaptive, trust-based governance mechanisms, rather than static or hierarchical ones. Moreover, Cappellaro et al. (2025) call for future research into similar dynamics outside the UN system, emphasizing the need to understand how non-traditional actors, like cooperatives, may contribute to development governance through locally embedded, globally informed practices. Another interesting work is that of Gammelgaard et al. (2022) that critically examines the emerging landscape of transnational development governance through a

postcolonial lens, arguing that what appears to be inclusive or collaborative engagement in fact often reproduces deep-seated global asymmetries. Their work interrogates how private corporations, donor states, and multilateral institutions engage with development in Africa through what they term the "corporate scramble," a process that extends and reconfigures colonial patterns of economic and political control under the guise of partnership and capacity building. Drawing from critical political economy and postcolonial theory, the authors show that contemporary development governance, particularly in "transglocal" arrangements that blend global mandates with localized implementation, often positions African states and institutions as sites for experimentation, intervention, and extraction, rather than as equal partners. They highlight how formal mechanisms of cooperation, such as public-private partnerships and donor-driven projects, are framed in neutral, technocratic terms but are deeply embedded in geopolitical logics of control, dependency, and selective inclusion. Their analysis reveals how notions of development are governed not only by policy and resource flows, but also by normative hierarchies and structural constraints that privilege Northern agendas and institutions. This critique is directly relevant to studies of cooperatives operating within international development frameworks, as it raises urgent questions about voice, ownership, and epistemic authority in transnational partnerships. The authors provide a valuable framework for examining whether and how cooperatives might challenge, replicate, or rework these dynamics. In this sense, their work offers both a caution and an opportunity: it warns against romanticizing development partnerships while opening conceptual space for alternative governance models that foreground mutual accountability, historical consciousness, and postcolonial justice.

According to that literature, the current paper would like to adopt the Cappellaro et al. (2025) framework for the exploratory research on how cooperatives engaged in transnational collaboration, how that entails building institutional arrangements that genuinely empower local members and stakeholders, including through co-determination of priorities and budgetary choices. In Senegal, this may involve incorporating traditional knowledge systems or local development needs into governance frameworks that originate from European cooperative models. These mechanisms also require cooperatives to absorb the transaction costs of collaboration, especially those previously borne by local actors, and to mobilize their global networks to deliver contextually relevant technical expertise and policy advocacy. The value of this framework for cooperative research lies in its attention to both structure and agency. It emphasizes not only how organizations coordinate across boundaries but how they become locally meaningful by embedding themselves within the institutional, cultural, and political ecologies of place. Moreover, the notion of contextual bridging provides a useful lens to study the micro-level dynamics of identity negotiation and inclusion within transnational cooperatives. It allows us to theorize how return migrants, local leaders, and cooperative workers function as boundary-spanning agents, translating between global cooperative ideals and the lived realities of work and governance in Italy and Senegal. Finally, this framework aligns with postcolonial critiques of development partnerships (e.g., Gammelgaard et al., 2022), which caution against romanticized notions of "local participation" that obscure structural inequalities.

According to that, this research investigates how transnational cooperative partnerships, specifically between Italian and Senegalese actors, can contribute to inclusive, democratic development by adapting and embedding governance practices through mechanisms of contextual bridging. Building on Cappellaro et al.'s (2025) model and postcolonial critiques of global-local development relations (Gammelgaard et al., 2022), the study aims to bridge macro-level institutional dynamics with micro-level worker experiences and agency within cooperatives.

The main research question of the current work is:

How do Italian–Senegalese cooperative partnerships enact mechanisms of contextual bridging to promote locally owned, inclusive development governance?

This main question is accompanied by several related sub-questions: How do cooperative employees experience governance, voice, and inclusion within organizations influenced by transnational knowledge flows? What tensions arise when organizational models move across national and cultural boundaries? And to what degree do these partnerships foster reciprocal learning?

These overarching questions are explored through two interrelated levels of analysis: organizational governance and worker experiences within the transnational cooperative context.

The research aims to critically examine the governance dynamics shaping transnational cooperative partnerships between Italy and Senegal, focusing on how mechanisms of contextual bridging (Cappellaro et al., 2025) are enacted and negotiated by organizations and individuals across national boundaries. Specifically, it explores the extent to which Senegalese institutions and cooperative members exercise substantive authority and voice in processes of formal project design, agenda setting, and decision-making, issues closely tied to ongoing critiques of asymmetry and tokenistic participation in North–South partnerships (Gammelgaard et al., 2022; Gammelgaard et al., 2020). The study also investigates the micro-level consequences of such transnational cooperative engagements, examining how participation affects worker inclusion, identity formation, and perceived empowerment within hybrid organizational settings (Battilana & Dorado, 2010; Ghio & Verona, 2022). In doing so, the research contributes to the literature on hybrid organizations and interorganizational collaboration (Doherty et al., 2014; Mair et al., 2015), while also addressing a gap in postcolonial development scholarship by foregrounding cooperatives as institutional actors that mediate between global governance regimes and locally grounded democratic aspirations (Cappellaro et al., 2025, Gammelgaard et al., 2022).

4. Methodology

This exploratory research adopts a comparative, multi-sited qualitative case study approach grounded in the principles of grounded theory (Charmaz, 2006; Glaser & Strauss, 1967). The aim is to develop empirically anchored insights into how transnational cooperative partnerships between Italy and Senegal enact mechanisms of contextual bridging and democratic governance. The multi-sited design allows for a cross-contextual understanding of cooperative governance in two distinct but interconnected settings, thereby enabling a richer analysis of the dynamics at play in both the Global North and South.

Fieldwork in Senegal will be conducted across three sites: Kaolack, Thiès, and Dakar. These regions were selected due to the presence of cooperatives engaged in agriculture, textiles, and service sectors that have documented or emerging links with Italian cooperative partners. In Italy, research will be carried out in the regions of Emilia-Romagna and Lombardy, both hubs of cooperative innovation and migrant-inclusive enterprises. Case selection within these regions will focus on cooperatives active in social care, and agro-food sectors, with particular attention given to those employing Senegalese migrants or participating in projects aligned with South–South cooperation or return migration schemes.

Data collection will rely on a triangulation of qualitative methods. Semi-structured interviews will be conducted with cooperative employees, return migrants, cooperative leaders, and transnational facilitators who mediate between Italian and Senegalese organizations. These interviews will explore themes such as participation, decision-making, identity formation, and transnational learning. Focus groups will also be held with cooperative members to elicit collective reflections on democratic practices, knowledge sharing, and organizational inclusion. In addition, documentary analysis will be undertaken on key governance materials, including cooperative statutes, partnership agreements, internal meeting minutes, and training manuals. To capture the lived and embodied dimensions of cooperative work and governance, the study will also include participant observation in selected cooperative activities in both countries.

The data analysis will combine thematic coding with grounded theorizing. Interview transcripts, fieldnotes, and documentary data will be subjected to an iterative coding process using open and selective coding stages to identify recurring patterns in how participants describe governance processes, learning, and identity (Corbin & Strauss, 2008). Particular attention will be paid to variations in how contextual bridging is experienced across the two national settings. Cross-case comparison will be used to systematically trace both convergences and divergences in governance dynamics, with the aim of understanding how transnational models are adapted, hybridized, or resisted at the local level. Finally, findings will be triangulated with official policy documents and cooperative governance frameworks to assess the extent to which lived practices align with or diverge from formal institutional expectations.

The current work is in progress – so, we have no findings yet as we have already analysed only the public documents and we need to start the interview process.

5. Contribution

The study advances a micro-foundational perspective on transnational development cooperation, integrating insights from cooperative governance, institutional theory, and organizational learning. It positions employees not just as beneficiaries but as active agents in the co-production and translation of organizational norms.

By documenting employee perspectives across two national contexts, the study generates rare comparative data on how cooperative governance is practiced and perceived at the grassroots level in transnational settings.

For development agencies like AICS and cooperative unions, the findings will inform more inclusive training programs that centre employee experience and social context, will monitor frameworks that measure democratic participation, financial or employment metrics and it will support for reciprocal learning exchanges, where Southern cooperatives are not only recipients but knowledge contributors.

6. Conclusion

Transnational cooperative partnerships offer powerful opportunities for inclusive development, but their success depends not only on resources and models, but on how those models are interpreted and enacted by workers on the ground. By placing employee narratives and expectations at the centre, this research moves beyond idealized visions of cooperation and toward a grounded, democratic development practice.

Keywords: Cooperative Bridging; employee well-being; inclusion; Italy; Senegal; transnational partnership

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Dal mindset alla postura strategica: concettualizzazione e misurazione dell'Individual Humane Entrepreneurial Orientation

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1. Introduzione

L'imprenditorialità guidata dal purpose (purpose-driven innovation) è diventata un canale centrale attraverso cui gli attori imprenditoriali rispondono a grandi sfide contemporanee quali sovraconsumo di risorse, degrado ambientale e disuguaglianza sociale (Cucino et al., 2025), temi chiaramente richiamati anche dall'Agenda 2030 delle Nazioni Unite. Al di là di pratiche incrementali di Corporate Social Responsibility (CSR), un numero crescente di iniziative imprenditoriali sta infatti perseguendo forme di innovazione esplicitamente orientate alla creazione di valore condiviso, combinando sostenibilità economica con risultati sociali e ambientali osservabili (Parente et al., 2018). Questo cambiamento è particolarmente evidente tra le micro, piccole e medie imprese (MSMEs) e tra le imprese ibride (hybrid ventures), che integrano logiche commerciali e mission-driven, riposizionando l'imprenditorialità come leva di trasformazione sociale e non soltanto come meccanismo di generazione di ricchezza.

In questo dibattito, l'intersezione tra imprenditorialità, sostenibilità e gestione human-centric ha favorito l'emergere della teoria della Humane Entrepreneurship (HumEnt), che concettualizza una postura strategica capace di integrare l'orientamento imprenditoriale con la sostenibilità sociale e ambientale e con un forte impegno verso le risorse umane dell'impresa (Parente et al., 2018, 2021). La HumEnt è stata discussa per le sue basi epistemologiche (Parente et al., 2018) e per il suo potenziale nel generare lavoro dignitoso e benefici sociali più ampi (Kim et al., 2018). La ricerca empirica esistente ha iniziato a mostrare come i principi HumEnt influenzino strategie e pratiche organizzative (ad es., Anggadwita et al., 2021; Vesci et al., 2023) e come possano essere associati a risultati di performance (Vesci et al., 2025; Le, 2022).

Una questione cruciale, ma ancora poco esplorata nella ricerca su purpose-driven e hybrid venturing, riguarda dove nasca il purpose e come esso diventi azionabile. In questo filone di ricerca, la HumEnt riconosce esplicitamente che le scelte imprenditoriali affondano le radici nella cultura organizzativa, ma anche nei valori personali e negli orientamenti di imprenditori e forza lavoro (Parente et al., 2018; Vesci et al., 2023). Tuttavia, nonostante il crescente interesse per la Humane Entrepreneurial Orientation (HEO) come costrutto a livello d'impresa, sappiamo ancora relativamente poco su come i suoi elementi fondamentali si manifestino a livello individuale, soprattutto tra i nascent entrepreneurs, definiti dal Global Entrepreneurship Monitor come gli individui in età lavorativa attivamente coinvolti nell'avvio di una nuova impresa, che si aspettano di diventarne proprietari (o comproprietari) e che hanno intrapreso azioni concrete per avviarla negli ultimi 12 mesi (GEM Report, 2025; Reynolds, 2005). Recenti studi hanno infatto evidenziato la necessità di studiare l'entrepreneurial orientation oltre il livello organizzativo

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(Robinson & Stubberud, 2014; Koe, 2016) e concettualizzare la sustainability orientation e la human resource orientation non solo come postura d'impresa ma anche come orientamento individuale (Parente et al., 2020; Crudele et al., 2025).

Per colmare questo gap, lo studio propone, attraverso lo sviluppo concettuale e un test empirico preliminare, una nuova scala di misurazione, l'Individual Humane Entrepreneurial Orientation (IHEO), che cattura il grado in cui gli individui integrano nel proprio mindset e nelle proprie tendenze comportamentali: (i) l'individual entrepreneurial orientation, (ii) l'individual sustainability orientation e (iii) l'individual human orientation.

Proponendo una scala con adeguate proprietà psicometriche, questo studio intende fornire ai ricercatori uno strumento affidabile per misurare l'HEO negli individui, abilitando ulteriori analisi sulle sue implicazioni per il comportamento imprenditoriale e per l'imprenditorialità purpose-driven.

Inoltre, lo studio intende offrire un contributo anche sul piano applicativo, fornendo a educatori e policy maker un riferimento per la progettazione di programmi capaci di promuovere imprenditori humane-oriented, in grado di integrare sostenibilità ambientale e sociale con un forte impegno verso il benessere e lo sviluppo delle risorse umane all'interno delle proprie imprese. In particolare, lo studio indaga come i valori e le caratteristiche associati all'approccio HumEnt si configurino nei nascent entrepreneurs, cercando di rispondere alla seguente domanda di ricerca (RQ): In che modo le caratteristiche e i valori associati a un approccio HumEnt si configurano a livello individuale nei nascent entrepreneurs?

2. Framework Teorico

2.1. Humane Entrepreneurship e Humane Entrepreneurial Orientation

Alla luce del crescente acuirsi delle sfide ambientali, e in risposta alla richiesta di una forma di impresa che recuperi la centralità dell'essere umano e del senso di umanità, rispettando al contempo la società nel suo complesso (Business Roundtable, 2019; Melé, 2016), l'imprenditorialità ha reagito generando modelli di business che incorporano, in modo strategico, la cura per l'ambiente, le comunità e i dipendenti. Coerentemente con tale evoluzione, la HumEnt è emersa come un nuovo framework teorico che amplia la nozione di entrepreneurial strategic posture proposta da Covin e Slevin (1989). Introdotta inizialmente da Parente et al. (2018) e successivamente sviluppata da Parente et al. (2020) e Vesci et al. (2023), la HumEnt interpreta gli imprenditori come soggetti al contempo orientati alla ricerca di opportunità e portatori di valori human-centered. L'assunto di fondo è che le imprese possano, e debbano, perseguire il vantaggio competitivo promuovendo simultaneamente il coinvolgimento dei dipendenti, l'equità sociale e la cura della comunità, preservando l'integrità ambientale (Kim et al., 2018; Parente et al., 2018; Criado-Gomis et al., 2018).

In questa prospettiva, la performance economica non viene negata né compressa, ma piuttosto integrata e completata dalla responsabilità sociale e ambientale. Ne deriva un ampliamento della postura strategica imprenditoriale, denominata Humane Entrepreneurial Orientation (HEO) (Parente et al., 2018), che riflette l'intenzionalità dell'impresa nel perseguire simultaneamente competitività, sostenibilità e benessere delle risorse umane coinvolte nell'impresa (Vesci et al., 2024). L'HEO non è semplicemente la somma di tre dimensioni separate; rappresenta piuttosto un comportamento strategico che integra in modo congiunto tre orientamenti (Parente et al., 2018, 2021; Vesci et al., 2023): (1) l'Entrepreneurial Orientation (EO) (Covin & Slevin, 1989), (2) la Sustainability Orientation (SO) (Shepherd & Patzelt, 2011; Schaltegger & Wagner, 2011; Muñoz & Dimov, 2015) e (3) la Humane-Resource Orientation (HRO) (Kim et al., 2018; Parente et al., 2018, 2021; Vesci et al., 2023, 2024).

Tuttavia, sebbene la HEO sia concettualizzata prevalentemente come postura strategica di livello organizzativo, la logica della HumEnt implica che tale postura affondi le proprie radici anche in valori, convinzioni e orientamenti individuali (Parente et al., 2018; Vesci et al., 2022),

soprattutto nelle fasi iniziali dell'azione imprenditoriale, quando il progetto è ancora in costruzione e dipende in larga misura dalle disposizioni personali del fondatore e del team. Coerentemente con le indicazioni della letteratura che invita a considerare l'EO anche a livello individuale (Robinson & Stubberud, 2014; Koe, 2016; Clark et al., 2024) e con l'attenzione crescente verso declinazioni individuali della sostenibilità (Parente et al., 2020), risulta quindi teoricamente e metodologicamente rilevante tradurre le tre componenti della HEO in un framework di livello micro. In altri termini, comprendere "quanto" e "come" un individuo incorpori orientamento imprenditoriale, sostenibilità e principi human-centered nel proprio mindset e nelle proprie tendenze comportamentali consente di cogliere le micro-foundations dell'approccio HumEnt e di osservare precocemente la possibile emergenza di posture strategiche di tipo humane prima ancora che esse si consolidino in pratiche e assetti organizzativi. Per queste ragioni, nella sezione successiva discutiamo le tre dimensioni della HumEnt al livello individuale, Individual Entrepreneurial Orientation (IEO), Individual Sustainability Orientation (ISO) e Individual Human Orientation (IHO), che costituiscono la base concettuale della scala Individual Humane Entrepreneurial Orientation (IHEO).

2.2. Individual Entrepreneurial Orientation (IEO)

L' EO è un concetto originato da Miller (1983) e articolato in tre dimensioni: innovatività, proattività e propensione al rischio. Successivamente, Covin e Slevin (1989) ne hanno ulteriormente consolidato la diffusione attraverso il concetto di entrepreneurial strategic posture (ESP). Negli anni seguenti, Lumpkin e Dess (1996) hanno raffinato l'EO proponendo un modello a cinque dimensioni che include autonomia, innovatività, propensione al rischio, proattività e aggressività competitiva. Nel tempo, l'EO è stato ampiamente riconosciuto dalla comunità scientifica come un costrutto a livello d'impresa in grado di influenzarne la performance (ad es.: Grande et al., 2011; Hafeez et al., 2011; Chandrakumara et al., 2011; Gupta & Gupta, 2015). Ad esempio, utilizzando un modello a cinque dimensioni, Koe (2013) ha rilevato che innovatività, proattività, propensione al rischio, aggressività competitiva e autonomia incidono positivamente sulla performance aziendale. Inoltre, Dada e Watson (2013) hanno considerato l'EO come un costrutto olistico, confermandone la relazione positiva con performance finanziarie e non finanziarie. Tuttavia, negli ultimi anni, diversi autori hanno suggerito che l'EO possa essere considerata anche come un costrutto a livello individuale (Robinson & Stubberud, 2014). Tale indicazione ha aperto nuove opportunità di ricerca, consentendo di indagare l'EO da una diversa prospettiva. Gli studi che hanno analizzato l'Individual Entrepreneurial Orientation (IEO) concordano nel considerarlo un costrutto multidimensionale, composto da elementi simili a quelli dell'EO a livello d'impresa. Ad esempio, Chien (2014) ha evidenziato una relazione positiva tra IEO e performance aziendale; analogamente, Bolton (2012) ha dimostrato un legame tra IEO e successo dell'impresa. Questi contributi forniscono spunti rilevanti sull'IEO come declinazione individuale dell'EO. Tuttavia, gran parte di tali studi si concentra soprattutto sulla relazione tra IEO e performance. Inoltre, poiché l'IEO è una concettualizzazione relativamente recente, è necessario dedicare maggiore attenzione all'operazionalizzazione dei suoi elementi nelle ricerche empiriche (Martins & Perez, 2020; Hassan et al., 2021).

L'IEO può essere definito come la capacità, la competenza e la disponibilità (o motivazione) di un individuo a diventare imprenditore (Taatila & Down, 2012). In quanto concetto sviluppato più recentemente, l'IEO richiede anche strumenti di misurazione e scale dedicate (Frunzaru & Cismaru, 2021). Covin and Selvin (1989) hanno offerto un punto di partenza con le tre dimensioni dell'EO; successivamente, Bolton e Lane (2012) hanno sviluppato una scala a livello individuale basata sulle stesse tre dimensioni di innovatività, propensione al rischio e proattività. L'IEO è considerata una competenza imprenditoriale che può essere sviluppata attraverso l'apprendimento esperienziale (Sahoo & Panda, 2019). Studi recenti evidenziano una relazione positiva tra IEO ed entrepreneurial intention (Ekpe & Mat, 2012; Martins & Perez, 2020; Robinson & Stubberud,

2014; Zhang & Bruning, 2011). Ibrahim e Lucky (2014), ad esempio, analizzando un campione di studenti presso l'Università della Malesia, hanno riscontrato una relazione positiva e significativa tra IEO ed EI. Hassan et al. (2021) hanno inoltre rilevato un ruolo diretto e indiretto dell'IEO e dell'entrepreneurship education nel determinare l'intenzione imprenditoriale degli studenti, attraverso la mediazione delle motivazioni imprenditoriali. L'IEO cattura il grado in cui gli aspiranti imprenditori sono innovativi, proattivi e propensi al rischio nel processo di avvio dell'attività imprenditoriale. In generale, le nuove iniziative che presentano una più elevata entrepreneurial orientation mostrano un potenziale maggiore in termini di performance (Rauch et al., 2009). Di conseguenza, è importante valutare in che misura gli aspiranti o nascent entrepreneurs si impegnino attivamente nell'innovazione, siano disposti ad assumere rischi calcolati e mantengano un approccio orientato al futuro nello sviluppo del business, poiché la loro entrepreneurial orientation può favorire la creazione di imprese di maggior successo (Bolton & Lane, 2012; Clark et al., 2024).

2.3. Individual Sustainability Orientation (ISO)

La Sustainability Orientation (SO) si è sviluppata nell'ambito della sustainable entrepreneurship, un'area di ricerca che rimane ancora ambigua. Di conseguenza, anche il dominio della sustainability orientation risulta tuttora poco definito. L'analisi della letteratura evidenzia infatti l'assenza di un consenso sulla definizione di SO: alcuni autori si concentrano esclusivamente sulle questioni ambientali, mentre altri includono sia dimensioni ambientali sia sociali. Inoltre, sebbene molti studiosi continuino a considerare la SO come una concettualizzazione di livello organizzativo, recenti contributi propongono di misurarla a livello individuale (Parente et al., 2020; Crudele et al., 2025). Non è inoltre chiaro se la SO debba essere intesa come postura strategica, atteggiamento o motivazione all'azione, poiché in letteratura sono state adottate tutte queste categorizzazioni.

Sebbene siano state proposte numerose scale di misurazione della SO, la maggior parte deriva dalla scala di Kuckertz e Wagner (2010), adattata nel tempo a concettualizzazioni di tipo attitudinale o comportamentale. Tuttavia, poiché l'HEO è una postura strategica misurata a livello d'impresa, e presenta componenti sia attitudinali sia comportamentali, la misurazione della SO non risulta altrettanto consolidata in letteratura ai fini della misurazione dell'HEO. Parente et al. (2020) definiscono la SO come un orientamento strategico di livello d'impresa, evidenziato dal fatto che i comportamenti organizzativi mostrano un elevato impegno nella preservazione dell'ambiente naturale, ma anche attenzione e rispetto per iniziative e azioni guidate da istanze sociali. Coerentemente, in questo lavoro definiamo l'ISO come un orientamento a livello individuale, riscontrabile quando il comportamento dell'individuo manifesta un elevato impegno verso la tutela dell'ambiente naturale e, al contempo, rispetto per iniziative di natura sociale e azioni volte a migliorare la qualità della vita nella comunità locale.

In questa prospettiva, un punto di partenza per la generazione di item utili a misurare l'ISO, così come inquadrata nell'IHEO, sembra essere la proposta di Muñoz e Dimov (2015), che invita a considerare atteggiamenti e convinzioni degli imprenditori rispetto alla sostenibilità. Poiché HumEnt concepisce l'HEO come una postura strategica al tempo stesso attitudinale e comportamentale, la concettualizzazione e l'operazionalizzazione proposte per l'ISO coprono semanticamente entrambe le dimensioni della sostenibilità, ambientale e sociale. Gli item risultano inoltre in grado di catturare sia gli aspetti attitudinali (orientamento) sia quelli comportamentali (azioni) inclusi nel dominio della SO così come definito dai teorici di HumEnt.

2.4. Individual Human Orientation (IHO)

La Human Resource Orientation (HRO) si fonda sull'assunto che rispettare e coinvolgere i dipendenti rappresenti una strategia efficace per conseguire risultati organizzativi (Parente et al.,

2022). Tuttavia, l'HRO, così come intesa nel dominio della HumEnt, costituisce un costrutto relativamente nuovo: sebbene il management delle risorse umane (HRM) sia un tema ampiamente trattato, un modo per valutare l'HRO in termini di postura strategica è porre attenzione alle humane resources practices, intese come azioni intraprese per perseguire in modo strategico specifiche pratiche. Sfortunatamente, non esiste una scala di misurazione condivisa del comportamento di imprenditori/top manager che risulti pienamente coerente con l'HRO nel dominio della HumEnt (Parente et al., 2020; Vesci et al., 2022). Inoltre, la letteratura non presenta un accordo sul numero e sulla tipologia di politiche e pratiche HR che rientrano nel perimetro dello HRM.

Kim et al. (2018) hanno proposto un insieme di politiche e pratiche di gestione delle risorse umane strettamente connesse alla HumEnt, interpretandole alla luce dei principi dello Humanistic Management (Melè, 2016). A partire dalle concettualizzazioni di HRO proposte da Kim et al. (2018) e testate da Le (2022), che descrivono le modalità con cui l'HR management viene integrato nella visione di HumEnt degli autori, identifichiamo e definiamo quattro dimensioni principali che dovrebbero qualificare l'IHO a livello individuale: (a) empatia, intesa come il grado in cui un individuo condivide emozioni e informazioni con gli altri; (b) equità, intesa come il grado in cui un individuo tratta gli altri in modo giusto e paritario; (c) enablement, inteso come il grado in cui un individuo fornisce agli altri ciò di cui hanno bisogno per sviluppare i propri progetti (di vita) al meglio delle proprie capacità; e (d) empowerment, inteso come il grado in cui un individuo condivide informazioni e risorse con un'altra persona nello svolgimento di un compito, offrendo la possibilità di partecipare al processo decisionale.

3. Metodologia

Per proporre e testare una scala di misurazione dell'IHEO, abbiamo condotto uno studio quantitativo basato su analisi fattoriale esplorativa (EFA). I dati utilizzati derivano dal database nazionale GUESSS Italia (somministrazione ottobre–dicembre 2023), coordinato dal GUESSS Board Italy con il supporto delle università partecipanti. La rilevazione ha raccolto complessivamente 4.374 questionari provenienti da oltre 26 atenei italiani, coinvolgendo giovani appartenenti a differenti ambiti disciplinari e livelli di studio. Ai fini del presente lavoro, abbiamo utilizzato un sottoinsieme delle variabili disponibili nel dataset GUESSS Italia, selezionate perché coerenti con l'operazionalizzazione delle tre dimensioni dell'IHEO. Inoltre, l'analisi è stata condotta su un sottocampione di nascent entrepreneurs, definiti come individui che, da soli o con altri, stanno attivamente cercando di avviare una nuova iniziativa imprenditoriale, prevedono di diventarne proprietari (o comproprietari) e hanno intrapreso azioni concrete di start-up negli ultimi 12 mesi (GEM Report, 2019; Reynolds, 2000).

In linea con le raccomandazioni metodologiche di Churchill (1979) e Kline (2005), lo studio adotta misure multi-item su scala Likert a sette punti per tutti i costrutti, al fine di garantire affidabilità e validità nella rilevazione della loro natura multidimensionale. Il questionario include scale adattate dalla letteratura precedente (Kim et al., 2018; Bolton & Lane, 2012; Muñoz & Dimov, 2015; Le, 2022) per misurare le tre dimensioni dell'IHEO.

L'IEO cattura il grado in cui i nascent entrepreneurs risultano innovativi, proattivi e propensi al rischio nel processo di avvio dell'attività imprenditoriale, mediante la scala Likert a 7 punti composta da 10 item proposta da Bolton e Lane (2012).

Poiché l'HEO è concepita in seno alla Hument come una postura strategica al tempo stesso attitudinale e comportamentale, la scala proposta per misurare l'ISO è stata derivata da due scale presentate da Muñoz e Dimov (2015): (i) la Sustainability Orientation scale, dalla quale sono stati adattati due item attitudinali (uno relativo alla sostenibilità ambientale e uno a quella sociale); e (ii) la Sustainability-Oriented Entrepreneurial Actions scale, dalla quale sono stati adattati due item comportamentali (uno sociale e uno ambientale). Più nel dettaglio, per misurare la SO, Muñoz e Dimov (2015) hanno indagato atteggiamenti e convinzioni degli imprenditori riguardo

alla sostenibilità, riflessi nelle loro percezioni della venture che stavano creando, utilizzando una scala Likert a 6 item (a sua volta adattata da Kuckertz & Wagner, 2010). Per misurare le sustainability-oriented entrepreneurial actions, gli autori si sono concentrati sul grado in cui gli imprenditori miravano a risolvere problemi di sostenibilità nella definizione di obiettivi immediati durante lo sviluppo dell'impresa, attraverso una scala Likert a 8 item, le cui dimensioni derivano dallo studio di Dyllick e Hockerts (2002) e rappresentano otto obiettivi tradizionali di sostenibilità. Di conseguenza, per valutare l'ISO proponiamo quattro item che coprono semanticamente entrambe le dimensioni della sostenibilità, ambientale (due item) e sociale (due item). Tali item consentono inoltre di cogliere sia gli aspetti attitudinali (orientamento) sia quelli comportamentali (azioni) che rientrano nel dominio della SO così come definita nell'ambito HumEnt. Infine, i quattro item selezionati sono stati adattati spostando il focus dal livello organizzativo a quello individuale, al fine di allineare la misura dell'Individual Sustainability Orientation con quella dell'Individual Entrepreneurial Orientation.

Nella concettualizzazione originaria di Kim et al. (2018), la dimensione HRO presenta una duplice natura: da un lato, riguarda caratteristiche personali del manager; dall'altro, considera la prospettiva del leader che, di fronte a sfide differenti, riconosce l'importanza di implementare un HRM strategico attraverso specifiche pratiche di gestione delle risorse umane. Per questa ragione, le dimensioni sono intese come costrutti comportamentali, la cui misurazione si basa sui comportamenti di manager e imprenditori in termini di azioni svolte per realizzare ciascuna dimensione. Di conseguenza, la scala di Kim et al. (2018) per emphaty, equity, enablement ed empowerment è stata sviluppata con riferimento al livello d'impresa, coerentemente con il livello di postura strategica concettualizzato nel dominio HumEnt. Per allineare tale concettualizzazione a una prospettiva individuale di humane orientation, abbiamo selezionato un item per ciascuna dimensione (empatia, equità, enablement ed empowerment; per un totale di 4 item) e lo abbiamo adattato dal livello organizzativo a quello individuale, così da allineare la misura dell'IHO a quella dell'IEO.

È stata quindi condotta un'exploratory factor analysis (EFA) per identificare la struttura latente del costrutto IHEO a livello individuale. Per l'estrazione e l'interpretazione dei fattori è stata applicata una Principal Axis Factoring con rotazione Oblimin. L'adeguatezza dei dati all'analisi fattoriale è stata valutata attraverso la misura Kaiser-Meyer-Olkin (KMO) e il test di sfericità di Bartlett.

4. Risultati preliminari

Il campione finale dell'analisi è composto da 651 nascent entrepreneurs. Il campione è composto per il 58,7% da uomini e per il 39,8% da donne, con un'età media pari a 23,1 anni (DS = 2,06). Con riferimento al background familiare, il 59,9% del campione dichiara che nessun genitore è lavoratore autonomo e/o proprietario di un'impresa. Al contrario, il 40,1% riporta una forma di imprenditorialità familiare: nel 23,2% dei casi è il padre, nel 5,7% la madre e nel 11,2% entrambi i genitori. Per quanto riguarda l'area disciplinare, la quota più ampia proviene da un background ingegneristico (28,9%), seguita da Business/Management (18,3%) ed Economia (16,9%).

I risultati dell'analisi fattoriale esplorativa (EFA) sui 18 item mediante Principal Axis Factoring con rotazione obliqua (Oblimin con normalizzazione di Kaiser), mostrano elevata adeguatezza del campione (KMO = .913), e il test di sfericità di Bartlett è risultato significativo (χ^2 (153) = 5252.537, $p < .001$), confermando la fattorizzabilità della matrice di correlazione. Sulla base del criterio degli autovalori > 1, sono stati estratti quattro fattori che spiegano complessivamente il 52,54% della varianza. La pattern matrix ha restituito una soluzione interpretabile: sia i 4 item di ISO ($|\lambda|$ = .587–.847) che di IHO (λ = .531–.787) saturano su un fattore con carichi elevati, supportando la distinzione empirica delle dimensioni di sostenibilità e orientamento umano. Gli item di IEO mostrano invece una struttura a due componenti: IEO_8–

IEO_10 (appartenenti alla sottodimensione "proactiveness") saturano sul primo fattore (λ = .456–.915) e IEO_1–IEO_7 (appartenenti alle due dimensioni "risk taking" e "innovativeness") sul secondo (λ = .423–.777). Nel complesso, l'EFA conferma una struttura coerente con le dimensioni teoriche per ISO e IHO, mentre per IEO emerge una segmentazione interna che suggerisce la presenza di sottodimensioni e richiede ulteriori verifiche nelle analisi successive. Complessivamente, la scala IHEO finale comprende 4 fattori e 18 item e presenta buone proprietà psicometriche, offrendo una base affidabile per future ricerche sulla HumEnt a livello individuale.

5. Conclusioni e implicazioni

Questo studio contribuisce alla letteratura sull'imprenditorialità e sulle purpose-driven businesses estendendo il costrutto di Humane Entrepreneurial Orientation (HEO) al livello individuale e introducendo il concetto di Individual Humane Entrepreneurial Orientation (IHEO). Sebbene la ricerca abbia ampiamente analizzato l'HEO a livello d'impresa, rimane limitata la comprensione di come i principi HumEnt si manifestino negli individui, in particolare tra i nascent entrepreneurs. Integrando Individual Entrepreneurial Orientation (IEO), Individual Sustainability Orientation (ISO) e Individual Human Orientation (IHO), il lavoro propone un impianto concettuale e fornisce evidenze empiriche preliminari a supporto di una misura multidimensionale dell'IHEO, contribuendo a colmare un gap rilevante nella letteratura.

Sul piano teorico-metodologico, lo studio adatta costrutti consolidati a livello organizzativo (ad es., Kim et al., 2018; Muñoz & Dimov, 2015; Bolton & Lane, 2012) a un framework di misurazione individuale, rispondendo alle sollecitazioni che invitano a considerare entrepreneurial orientation e sustainability orientation anche come costrutti di livello micro (Robinson & Stubberud, 2014; Koe, 2016). I risultati dell'analisi fattoriale esplorativa supportano in modo chiaro la distinctiveness delle componenti ISO e IHO, mentre la dimensione IEO mostra una segmentazione interna in due componenti, suggerendo che l'orientamento imprenditoriale individuale possa presentare una struttura più articolata nelle fasi iniziali dell'azione imprenditoriale. Nel complesso, tali evidenze indicano l'utilità dell'IHEO per analizzare le micro-fondazioni dell'approccio HumEnt, pur richiedendo ulteriori verifiche (ad es., CFA e test di robustezza su campioni diversi) per consolidare la struttura della scala.

I risultati di questo studio offrono implicazioni rilevanti per formatori e docenti di imprenditorialità, policy-maker e practitioner interessati a promuovere una nuova generazione di imprenditori responsabili e humane-oriented. In primo luogo, identificando le dimensioni chiave dell'IHEO, la ricerca evidenzia l'importanza di coltivare negli aspiranti imprenditori non solo competenze di business, ma anche mindset etici e orientati alla sostenibilità. Le istituzioni educative svolgono un ruolo cruciale in questo processo, poiché possono utilizzare tali evidenze per progettare curricula che vadano oltre la formazione manageriale tradizionale. I programmi dovrebbero integrare apprendimento esperienziale, mentoring ed esposizione a sfide imprenditoriali reali, assicurando che gli studenti sviluppino sia competenze cognitive sia competenze socio-emotive necessarie a guidare imprese capaci di bilanciare redditività e responsabilità ambientale e sociale e attenzione alle persone. Business school e incubatori dovrebbero inoltre valorizzare progetti a impatto sociale, collaborazione interdisciplinare e framework di decision-making etico, dotando gli aspiranti imprenditori di strumenti utili a navigare contesti complessi mantenendo un forte impegno verso sostenibilità e valori "humane".

Per i decisori pubblici, lo studio suggerisce la necessità di sviluppare politiche mirate e sistemi di incentivi in grado di sostenere l'imprenditorialità umana e sostenibile già a livello individuale. Governi e istituzioni dovrebbero investire in programmi di formazione, opportunità di finanziamento e iniziative di mentoring dedicate a giovani imprenditori che mostrano elevate caratteristiche di IHEO. Ciò potrebbe includere grant per startup con missione sociale o ambientale, incentivi fiscali per imprese fondate da student entrepreneurs orientati a pratiche sostenibili e partnership tra università e leader industriali per facilitare trasferimento di

conoscenze e strutture di supporto. Inoltre, l'integrazione di strumenti di assessment basati su IHEO all'interno di programmi imprenditoriali finanziati con fondi pubblici potrebbe aiutare a identificare e coltivare individui ad alto potenziale in linea con i principi della HumEnt. Promuovendo una cultura di responsabilità imprenditoriale, accademia e policy-maker possono contribuire allo sviluppo di un ecosistema dell'innovazione in cui le imprese non siano solo orientate al profitto, ma anche agenti di cambiamento sociale positivo.

Un'ulteriore implicazione pratica riguarda in modo specifico i nascent entrepreneurs, per i quali il purpose tende a costituire una risorsa ancora in formazione e non pienamente tradotta in scelte organizzative e pratiche operative. In questa fase precoce, strumenti come la scala IHEO possono supportare incubatori universitari, programmi di pre-accelerazione e percorsi di entrepreneurship education nel rendere misurabile e implementabile l'orientamento humane e purpose-oriented, aiutando a identificare i profili che presentano maggiore coerenza tra ambizione imprenditoriale, sostenibilità e attenzione alle persone. In termini operativi, l'IHEO può essere utilizzata (i) come strumento di diagnosi iniziale per personalizzare mentoring e formazione, (ii) come metrica di valutazione ex ante ed ex post dei programmi (per monitorare l'evoluzione del purpose e delle tre componenti nel tempo), e (iii) come supporto alla progettazione di interventi mirati che trasformino il purpose dichiarato in comportamenti concreti, ad esempio attraverso project work su problemi socio-ambientali, feedback strutturato sugli impatti e attività di team-based learning orientate a empatia, equità, enablement ed empowerment.

Nonostante i contributi offerti, lo studio presenta alcuni limiti che è opportuno riconoscere. In primo luogo, la ricerca si basa su un campione di nascent entrepreneurs che, sebbene appropriato per indagare l'Individual Humane Entrepreneurial Orientation (IHEO), può limitare la generalizzabilità dei risultati ad altre popolazioni. Studi futuri potrebbero estendere questa linea di ricerca esaminando l'IHEO in imprenditori già avviati o in differenti ecosistemi imprenditoriali, così da valutarne l'applicabilità oltre la popolazione studentesca.

In secondo luogo, lo studio si fonda su dati self-reported, che possono introdurre bias di desiderabilità sociale. I rispondenti potrebbero aver sovrastimato o sottostimato il proprio orientamento verso l'imprenditorialità umana in funzione di aspettative personali o sociali. Ricerche future potrebbero integrare dati comportamentali o disegni longitudinali per verificare se le percezioni auto-riferite si traducano in comportamenti imprenditoriali effettivi.

Infine, lo studio può essere condizionato dal contesto, poiché fattori istituzionali, culturali ed economici potrebbero influenzare in modo diverso la rilevanza e l'impatto dell'IHEO nelle diverse aree geografiche. Ricerche future dovrebbero quindi considerare confronti cross-culturali o testare la robustezza del framework IHEO in Paesi e ambienti educativi differenti.

Keywords: Individual humane entrepreneurial orientation; humane entrepreneurship; nascent entrepreneurship; scale development

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Purpose-Driven Leadership and ESG Governance Amplification: Managing E-S Interdependence for Supply Chain Resilience in the Aerospace Industry

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1. Introduction

The contemporary global operating environment is distinguished by a mounting and systemic degree of uncertainty, predominantly driven by climate change, the energy crisis and geopolitical tensions, which surpasses conventional market risk and underscores the inherent vulnerability of supply chains. As evidenced by recent disruptions, the business realm is profoundly influenced by VUCA (Volatility, Uncertainty, Complexity, Ambiguity) environments (Volpe & Castaldo, 2021), where risks are not isolated but intricately interconnected, thereby substantiating Peter Drucker's caution that "the gravest peril in periods of turbulence does not lie in the turbulence itself. It is to act with yesterday's logic" more relevant than ever (Drucker, 1980). Climate change and the resulting energy crisis are no longer, in fact, exogenous threats, but systemic risk factors that affect cost structures and operational stability. The necessity for an expedited energy transition, in conjunction with the volatility of fossil fuel prices, has exposed the fragility of logistics paradigms predicated on pure efficiency, for example. As Yossi Sheffi (2007) contends in the context of supply chains, the relentless pursuit of Just-in-Time (JIT) manufacturing has been demonstrated to engender suboptimal levels of vulnerability. Consequently, the enhancement of supply chain resilience and the integration of strategic redundancy have emerged as the contemporary imperative for achieving competitive advantage.

Similarly, the geopolitical tensions of recent years are eroding confidence in globalisation and introducing significant political and strategic risks into corporate planning. In such a situation, the Board of Directors can no longer limit itself to mitigating traditional agency risk (Jensen & Meckling, 1976), but must evolve, as theorised by Michael Power (2004), into a risk governance system focused on monitoring non-financial risks. In order to cope with disruptive scenarios, governance should ensure that the company develops dynamic capabilities - the ability to perceive, capture, and quickly reconfigure resources - as outlined by David Teece (2018). This is particularly crucial in the context of managing strategic decisions pertaining to reshoring or geographical diversification, which are often imposed by periods of instability (Adorbor et al., 2021). The current scenario thus pushes companies to adopt a stakeholder-centric perspective (Freeman, 1984), integrating Environmental, Social, and Governance (ESG) factors and supply security as critical metrics of performance and resilience (Wildgoose et al., 2012) and, even more so, as the foundations of organisational survival and long-term value creation. For example, getting involved in supply chain digitisation programmes can lead to a pretty significant rise in ESG scores, and this improvement is mostly driven by stronger corporate governance (Zhu &

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Zhang, 2024). In other words, companies are no longer judged only on how much money they make, but also on how well they can mix environmental (E) and social (S) responsibility with solid governance systems (G). However, despite the growing focus on sustainability, literature and managerial practice reveal a paradox: although ESG pillars are conceptually interdependent, their management and reporting often occur in a fragmented manner, limiting the organisational capacity to anticipate and govern the complex risks that emerge along SCs (Berg et al., 2022).

This contribution, which is currently in the form of a working paper, addresses the aforementioned deficit by proposing an organisational analysis based on purpose-driven leadership. This analysis is intended to serve as a lever to amplify the integration and governance of ESG dimensions (Annesi et al., 2025). The focus of this analysis is on the interdependence between the E and S pillars, as will be explained shortly.

The Corporate Purpose is the fundamental raison d'être of an organisation, going beyond the mere creation of value for shareholders, according to the now dominant view of stakeholder theory. It is not merely a mission or vision, but rather "the aspiration of what the company wants to be and how it intends to contribute to the world" (Hollensbe et al., 2014). The extant literature defines purpose as a guiding principle that provides an answer to the existential question of why the organisation exists (Gartenberg et al., 2019). It has been demonstrated that it acts as a catalyst for strategic alignment (Craig, 2018), motivating stakeholders and providing a moral compass in contexts of high uncertainty (Frey, 2025), where 'old management models based on predictability are no longer effective' (Johansen, 2012).

Purpose-Driven Leadership can be defined as the practical and strategic implementation of Corporate Purpose (Ribeiro et al., 2024). The purpose is not merely declared, but firmly anchored to governance structures, culture, and decision-making processes (Cardona et al., 2019).

The Purpose-driven Leader employs purpose as the primary criterion for resource allocation and systemic risk management (Porter & Kramer, 2011). This individual personifies the organisation's corporate values, fostering a culture of authenticity and integrity (George et al., 2007), and plays a pivotal role in fortifying the corporate structure (Ribeiro et al., 2024).

Purpose-driven Governance ensures that a company's actions (including responses to environmental "E" and social "S" innovation) are consistent with its long-term commitment to all stakeholders (Eccles et al., 2014). Despite its growing theoretical centrality and solid empirical evidence linking it to superior financial performance (Edmans, 2020; Gartenberg et al., 2019), the literature on Purpose-Driven Leadership still lacks a single, shared operational definition. This terminological and conceptual inconsistency represents a significant research gap that hinders its systematic measurement and consistent integration into Corporate Governance frameworks.

The present study aims to address this theoretical lacuna by proposing a robust, conceptual definition of purpose-driven leadership, which is essential for analysing its impact on risk governance mechanisms in contexts of systemic uncertainty.

In more specific terms, with regard to the supply chain, the research aims to examine how leadership, through the internalisation and widespread sharing of the corporate purpose, manages to expand Governance (G) in order to strategically channel and balance the critical E-S interdependence in the supply chain.

The following research questions have been identified as the guiding principles for the investigation:

RQ1: In what manner does the adoption of environmental innovations (E) along supply chains influence the social and labour practices (S) of the organisation?

RQ2: What is the specific contribution of Purpose-Driven Leadership in enhancing Corporate Governance (G)?

The research adopts an applied perspective, focusing on the aerospace industry. This sector was selected for its strategic importance in terms of the resilience of its supply chain and the robustness of its governance systems.

2. Theoretical background

The present research is positioned at the intersection of corporate governance, sustainable supply chain management, and purpose-driven leadership, and takes as its starting point the enduring ambiguity that still surrounds the notion of corporate purpose. For several decades, debates on corporate governance have been dominated by agency theory, with the classic formulation of Jensen and Meckling (1976), and Friedman's doctrine of shareholder primacy, which effectively reduced corporate purpose to the maximisation of shareholder value (Friedman, 1970). In this view, governance mechanisms are primarily designed to align managerial behaviour with shareholders' financial interests, while broader societal concerns are treated as constraints, or, at best, as instrumental resources for reputation and long-term profitability. The progressive erosion of this paradigm, under conditions of systemic uncertainty and mounting environmental and social crises, has reactivated stakeholder-oriented perspectives, most notably Freeman's stakeholder theory (1984), which conceptualises long term value creation as dependent on managing interdependent relationships with a plurality of stakeholders. Within this stream, corporate purpose is reinterpreted as a commitment to serve society by creating value for stakeholders (Edmans, 2020) and is increasingly framed as a central lever for strategic orientation and organisational resilience, rather than as a purely discursive complement to profit seeking (Teece, 2018).

In this context, Purpose-driven Leadership should be understood less as a call to action to lead with values, and more as a small-scale institutional mechanism for turning a company's strategic purpose into real organisational practice. By placing the firm's why at the core of decision making, it provides a potential basis for value alignment, ethical management of externalities, and enhanced accountability (Ricart & Rey, 2022). At the same time, the literature highlights a persistent tension between substantive and symbolic enactment of purpose. In the absence of adequate governance architectures, purpose-driven leadership may be confined to rhetoric, generating a decoupling between aspirational statements and everyday practices. The notion of fit for purpose governance, developed in the adaptive governance field, offers a useful corrective. It reframes governance design as a diagnostic exercise that begins with an explicit clarification of purposes, proceeds through a systematic analysis of the socio, ecological and institutional context, and assesses whether existing configurations of structures and processes are actually capable of delivering the intended outcomes (Esposito De Falco et al., 2024).

This perspective resonates with recent work that conceptualises corporate purpose as the metabolism of the firm and proposes a multidimensional framework, structural, systemic and strategic, to analyse how purpose shapes organisational architectures and stakeholder relationships over time (Quinn & Thakor, 2018). Taken together, these contributions suggest that purpose driven leadership is unlikely to generate meaningful change in isolation. It must be embedded in governance mechanisms that are intentionally designed, monitored, and periodically reassessed in terms of their capacity to enact, rather than merely signal, corporate purpose in complex and uncertain environments (Esposito De Falco et al., 2024).

A second theoretical pillar of this research speaks to a persistent and consequential gap in the sustainable supply chain management literature. Despite the diffusion of ESG frameworks in both scholarly and managerial discourse, existing studies still provide a partial and fragmented understanding of the causal directionality and managerial implications of interdependence among the Environmental, Social and Governance dimensions (Sancak, 2023). In particular, the ways in which environmental pressures and technological or regulatory innovations in the environmental domain cascade into practices, vulnerabilities and distributive tensions in the social domain along supply chains remain under theorised. This omission is not simply a technical limitation. It reflects a more general tendency to treat ESG components as parallel and additive, rather than as dynamically interacting systems. A more critical stance acknowledges that ambitious decarbonisation strategies or environmental innovations can generate second order social effects, such as new forms of inequality, heightened precarity or labour rights violations within supplier

networks. Understanding the E to S relationship therefore requires a re-examination of the role and scope of governance. Governance cannot be reduced to a residual container for compliance and reporting. It constitutes the institutional infrastructure through which firms anticipate, govern and, where possible, mitigate socio environmental trade-offs, including those that emerge in distant tiers of global value chains. A politically aware conception of just transition must therefore account not only for the technical feasibility of environmental targets, but also for their social distributional consequences, and for the governance arrangements that shape who bears the costs and who appropriates the benefits of transition.

These theoretical perspectives are particularly relevant in the aerospace and defence industry, which is the setting for the present study. Firstly, the supply chains in this industry are extremely complex. They are characterised by considerable length, stringent regulatory requirements, and a multilayered network of tier 1, tier 2, and tier 3 suppliers involved in the provision of critical components and materials. This structural configuration amplifies information asymmetries, complicates the monitoring of environmental and social performance and creates fertile ground for the decoupling between corporate purpose as declared at the apex of the firm and practices enacted in peripheral nodes of the chain. Secondly, the sector is subject to intense environmental pressure (Castaldo, 2021a). The imperative to reduce carbon emissions drives substantial investments in sustainable aviation fuels, hydrogen propulsion and electrification. These environmental innovations are not neutral from a social standpoint. They require extensive reskilling and upskilling of the workforce, reconfiguration of occupational profiles, and the ethical sourcing of new materials, often associated with sensitive mining activities and local community impacts. The E to S challenge is therefore particularly acute in this context, since environmental trajectories directly reshape the social fabric of both internal labour forces and external supplier networks.

Third, governance in aerospace and defence assumes a critical character that goes beyond the boundaries of individual firms (Castaldo, 2020). Flight safety, the dual use nature of many technologies, and the geopolitical relevance of defence activities impose exceptionally high standards of oversight, transparency and risk management. It is important to note that any ethical, social or environmental failure along the supply chain can quickly escalate into systemic risk. The ramifications of such an event may encompass implications for national security, public trust, and the legitimacy of the sector in its entirety. In such a context, the alignment between corporate purpose, governance structures and ESG dynamics along the supply chain is not only a matter of normative desirability. It becomes a strategic, institutional and political necessity.

These considerations have direct implications for the research design. The aerospace and defence sector, with its hyper complex multi-tier supply chains, high innovation intensity and critical governance requirements, represents an ideal laboratory for an in depth and process-oriented investigation. For this reason, the study adopts a case study strategy that focuses on selected firms and supply chains within the sector. This approach makes it possible to trace how purpose is interpreted and translated into governance mechanisms, how these mechanisms travel across organisational and contractual boundaries, and how environmental initiatives generate intended and unintended social consequences along the chain.

3. Methodology

The exploratory nature of the research questions, which focus on organisational mechanisms and complex causal processes, calls for a qualitative case study design (Eisenhardt, 1989; Ellram, 1996). A multiple case study strategy was therefore adopted, involving two major strategic players in the aerospace sector, namely Leonardo S.p.A. and Magnaghi Group, both operating as Original Equipment Manufacturers or Tier 1 suppliers of complex systems.

The selection of companies was conducted through theoretical sampling (Yin, 2018), with the objective of identifying cases that demonstrate three core features. Firstly, it is vital that

corporate purpose is clearly articulated and publicly disclosed, so that it can be examined as an explicit reference for strategic and governance choices. Secondly, the firm must demonstrate a substantial commitment to environmental innovation, evidenced by initiatives such as programmes on sustainable aviation fuels or analogous decarbonisation strategies. Thirdly, the firm is obliged to publish Environmental, Social and Governance reports that include Environmental and Social indicators related to the supply chain. This enables an assessment of how purpose and ESG commitments are translated beyond organisational boundaries.

To enhance the validity and reliability of the findings, the research design relies on data source triangulation (Yin, 2018). This strategy is of particular importance in light of the intangible and often contested nature of corporate purpose and the mix of formal and informal dimensions that characterise governance arrangements. The triangulation of leaders' perceptions with documentary evidence, such as ESG disclosures and internal policies, facilitates a more robust reconstruction of how purpose is interpreted, institutionalised and enacted within and across the selected organisations.

The core of the data collection consists of in-depth interviews conducted with senior executives (e.g. Chief Sustainability Officers, Chief Procurement Officers, or the CEO themselves) from the selected companies (Primary Data). The objective of these interviews is to explore the perception and effectiveness of Purpose-Driven Leadership, investigating how purpose is communicated, internalised and translated into supplier selection and management criteria. The investigation sought to identify specific case studies that would shed light on the challenges encountered in managing E-S trade-offs and the accountability mechanisms (G) that are activated by leadership.

The primary data was supplemented by a systematic analysis of public and internal company documents (i.e. Secondary Data). These documents include sustainability reports (or non-financial reporting, in line with standards such as the Corporate Sustainability Reporting Directive (CSRD)), codes of conduct for suppliers and, where accessible, board of directors' minutes. Document analysis is essential for verifying the scope of governance (G) and measuring the extent to which social due diligence (S) requirements have been formally extended to critical supply chains in response to environmental (E) challenges. Furthermore, these documents provide the basis for contextualising companies' E-S performance.

Finally, in order to contextualise the actual risk and resilience of the supply chain, data from ESG rating agencies (e.g. MSCI, Sustainalytics) and/or publicly available news items relating to environmental or social controversies in the companies' supply chains were consulted (Contextual Data). This source provides an external empirical context to validate the practices declared by leadership and risk management in general.

The integration of these three sources will provide a comprehensive and robust view, thus overcome the limitations of a single perspective and ensure that conclusions on leadership and governance are anchored in both strategic perception and operational formalisation. The data analysis followed an iterative approach.

The data collected from interviews and documents were analysed using thematic analysis. The following aspects will be examined: first, the challenges and responses in terms of the social dimension of ecological transition (E-S, or Just Transition); second, leadership practices for sharing objectives; and third, the evolution of governance mechanisms (G) in response to these challenges. The objective of this study is to identify patterns and chains of evidence across a series of case studies in order to draw conclusions.

4. Results and discussion

The emerging evidence from the cases points to a pronounced and often underestimated nexus between environmental innovation and social dynamics along the supply chain. As firms transition to hybrid or electric propulsion systems and experiment with sustainable aviation fuels,

they must reconfigure not only their technologies, but also their skills, roles, and relationships with suppliers. This transition requires significant investment in the retraining of line technicians and supplier maintenance personnel yet training activities for suppliers are not always incorporated into environmental KPIs. In such cases, a widening skills gap becomes evident, accompanied by the potential for social tension and disputes, particularly in organisational contexts where productivity and safety requirements escalate while support and capability building lag behind. Environmental innovation also reshapes procurement practices. The search for new materials, such as cobalt and lithium, pushes buyers into unfamiliar supply chains, often located in regions with fragile labour protections. In these spaces, governance must extend anti-slavery and human rights policies to tiers that had never previously been monitored. The environmental agenda therefore exposes firms to new social and ethical vulnerabilities rather than simply generating linear sustainability gains. Within this evolving landscape, purpose emerges as a crucial interpretive lens and organisational resource that connects leadership orientations with governance practices. In the most advanced cases, purpose is not merely a slogan or branding device. It functions as an explicit decision-making criterion that can override traditional efficiency metrics. Managers' reports instances in which purpose has been used as a veto principle in supplier selection, legitimising the decision to accept higher marginal costs in order to maintain higher social standards in the supply chain, and thereby challenging the long-standing dominance of lowest cost logics (Craig, 2018; Ellsworth, 2002). Concurrently, purpose becomes a catalyst for the redesign of governance architectures. Cross-functional ESG committees, overseen by the Board and led by C-level executives, are entrusted with the authority to evaluate and sanction supplier conduct, and when deemed necessary, to exclude suppliers that demonstrate deficiencies in social parameters, even in instances where their environmental performance is technically proficient. In such cases, the fundamental purpose of governance provides the ethical and symbolic legitimacy for its expansion into domains that were previously regarded as peripheral or negotiable. Such domains include, but are not limited to, living wages, worker safety and community impacts (Donna, 2020; Rusconi, 2019).

These preliminary findings suggest that environmental innovation in hypercomplex sectors indicates that environmental innovation in hypercomplex sectors does not necessitate the implementation of more sophisticated technologies or reporting systems. It surfaces deep organisational questions about who is responsible for the social consequences of transition and how far corporate governance should extend beyond the legal boundaries of the firm (Annesi et al., 2025). Purpose oriented leadership appears to act as a bridge, translating abstract commitments into concrete governance choices that redistribute costs and benefits along the supply chain. At the same time, the cases highlight significant tensions and limits. Purpose can empower leaders and committees to challenge established procurement routines, yet its effectiveness depends on the credibility of governance mechanisms, the consistency of decisions over time and the willingness to absorb economic trade-offs in the name of social protection. These dynamics, which play out in specific episodes of supplier evaluation, contract renewal and investment in training, provide fertile ground for further case-based inquiry into the micro foundations of just transition and purpose driven governance in industries marked by high technological intensity and systemic risk.

A contribution to the field of Organisational Theory

The ensuing discourse aims to draw parallels between these findings and extant literature, thereby advancing the argument that: (a) Purpose-driven leadership can be considered both an ethical construct and an organisational governance mechanism that resolves E-S trade-offs; (b) Supply Chain Resilience (SCR) is a direct function of the breadth of G, determined by the depth with which purpose is shared and formalised.

The strategic reflections that have emerged from this analysis thus far converge on the necessity of adopting a robust conceptual framework in order to address the interdependence of ESG risks. In this regard, the notions of Corporate Purpose and Purpose-Driven Leadership should not be regarded as mere rhetorical devices; rather, they constitute the foundational principles upon which the development of corporate resilience within the VUCA environment can be built (Castaldo, 2021b).

5. Conclusion: implications, limitations and future research

Although the study is still in progress and the findings remain preliminary, the emerging evidence already suggests a meaningful contribution to the theoretical debate on Sustainable Supply Chain Management. The analysis shifts attention away from a narrow focus on Environmental, Social and Governance reporting towards a more fine-grained understanding of the internal organisational mechanisms that govern the interdependence among the three pillars. In particular, the cases indicate that purpose and leadership operate as causal drivers that shape the effectiveness of governance in mitigating the social risks generated by ecological transition, that is, in managing the E to S nexus rather than simply documenting it.

For managers in the aerospace industry and, by extension, in other highly complex and capital-intensive sectors, several implications begin to surface. First, the management of just transition should not be treated as a technical or operational issue delegated solely to sustainability or procurement functions. It ought to be elevated to the board agenda and integrated into the core governance of strategic risk. Second, executive remuneration systems should be reconsidered so that they reflect the interdependence between environmental and social outcomes along the supply chain, rather than relying exclusively on firm level financial or isolated ESG metrics. Third, substantial and sustained investment in fostering a deep and shared understanding of corporate purpose appears crucial. Such investment can help move the organisation beyond a compliance driven approach and reposition environmental and social commitments as strategic imperatives that permeate relationships with suppliers and other stakeholders.

At the same time, the study is subject to several limitations that need to be acknowledged. From a methodological standpoint, the qualitative and case-based design allows for rich, process-oriented insight but does not permit statistical generalisation. Future research could build on these findings by testing the proposed framework with quantitative data on a broader sample of firms and supply chains. From a sectoral standpoint, the specific characteristics of aerospace and defence, including hyper complexity, stringent regulation and the criticality of components may constrain the transferability of insights to other industries. Comparative studies in different sectors would therefore be useful to explore contextual contingencies and boundary conditions. Finally, from a temporal standpoint, the analysis captures a particular phase in the evolution of governance and leadership practices. Longitudinal research would be needed to examine how purpose driven governance architectures evolve over time and to assess the long-term effectiveness of purpose-oriented policies in sustaining just transitions and resilient supply chains.

Keywords: Leadership, Governance, Resilience, Supply Chain, Aerospace

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From Purpose-Oriented Policies to Purpose-Driven Ecosystems: a data-driven framework for territorial diagnosis and policy alignment in social inclusion

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1. Introduction

The problems that come with social inclusion in Europe have gotten bigger, more complicated, and more interdependent. These problems include child poverty, labour market alienation, demographic imbalance, limited access to key services, and territorial marginality. These factors have made it clearer than ever that standard public policies don't work well for social vulnerability that is deeply rooted in society and varies by region. Most interventions are linear, programmatic, and sector-based, while the problems they try to solve are relational, cross-sectoral, and adaptable. Consequently, several social policies yield disjointed responses, challenges in coordination, and restricted revolutionary potential, particularly in areas where vulnerabilities accumulate throughout missions.

In recent years, the literature has agreed on the necessity for approaches that prioritize purpose, mission, and collaborative value creation in policy formulation. Mission-oriented innovation strategies (Mazzucato, 2018; 2021) contend that governments should embrace socially relevant missions that not only provide direction but also engage many stakeholders, guide investments, and promote experimentation. Missions serve as "public purpose compasses" that guide group activities toward systemic change instead of small improvements. This perspective is enhanced by the concept of purpose-oriented policies, which transcend programmatic classifications or administrative divisions, being fundamentally rooted in the attainment of defined societal objectives.

Simultaneously, a concurrent line of inquiry in public administration has proposed that public value is co-created through the interactions among institutions, organizations, service providers, and communities, rather than being solely provided by the government (Osborne et al., 2016; Osborne, 2021). This public service logic viewpoint stresses relational processes, context specificity, and collaborative governance, demanding systems that can coordinate value generation among many actors. One of these systems is a purpose-driven ecosystem (Lyon et al., 2025): following Moore's definition (1993) they are not just networks or partnerships; they are collaborative and competitive governance infrastructures where people work on common goals, share skills, plan actions, and keep learning.

This ecosystemic logic is especially important when dealing with wicked problems, which are problems that have non-linear causes and interactions at many levels (Kania et al., 2013). Social inclusion in Italy exhibits precisely these characteristics and the vulnerabilities overlap differently among regions because of their demography, local resources, and institutional set up. The literature on place-based policies (Barca, 2009; Iammarino, Rodríguez-Pose & Storper, 2019)

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emphasizes that effective territorial governance must be founded on thorough assessments of local needs and resources, facilitating tailored, mission-aligned actions.

This research enhances theoretical discussions by establishing a thorough analytical model for assessing territorial priorities and policy coherence, finally illustrating the necessity and rationale for purpose ecosystems to realign public action with purpose-driven objectives. The analytical framework incorporates OT9 indicators which refer to the European Cohesion Policy's thematic objective dedicated to promoting social inclusion, combating poverty, and addressing all forms of discrimination, in ISTAT territorial indicators database. These constitutes the main analytical framework through which territorial vulnerabilities and social policy needs are assessed reaching a stringent classification of six structural domains (missions) and regional clustering based on mission priorities. The integration with project-level investment mapping (on 'social inclusion and health' sector for the 2021-2027 programming cycle) and a multi-dimensional coherence matrix allow to evaluate the congruence between needs and financial obligations and point out the conceptual operational model for purpose ecosystems.

OT9 indicators show that there are big differences in trends that are not random; they are systematic and long-lasting. This shows that we need governance structures based on common goals that can break down administrative barriers (Emerson & Nabatchi, 2015).

The theoretical and empirical justifications converge on a principal research inquiry: How can purpose-driven ecosystems be developed and implemented to synchronize purpose-oriented policies with geographically specific social inclusion requirements?

There are two main ways that the study adds to the field. First, it suggests a data-driven framework that may turn scattered information into a complete territorial diagnostic, which will help policymakers find structural weaknesses, shortages in investment, and strategic misalignments. Second, it creates a model for a purpose ecosystem that is based on evidence from Italy and may be used in other mission-driven policy areas as well.

2. Theoretical Framework

This study is built on three primary theoretical areas: mission-oriented innovation policy (Mazzucato, 2018), public service logic and value co-creation (Kania et al., 2013), and place-based development (Barca, 2009). These sets of literature elucidate the challenges standard public policies have in tackling intricate societal issues and propose that purpose-driven ecosystems (Dahlmann et al., 2020) may provide a structurally distinct and perhaps more efficacious governance framework.

According to Mazzucato (2018), mission-oriented innovation policy calls for a change in the role of the state from being a passive fixer of market failures to becoming an active shaper of markets and a conductor of systemic change. Missions are socially meaningful, politically acceptable, and analytically manageable goals that establish the direction for action. They get institutions, scientists, technologists, and citizens to work together to find answers that need people from different fields to work together. In this way, missions provide a public purpose that brings together investments, institutions, and people. Sectors are only administrative tools, whereas missions describe shared goals that go beyond boundaries. They necessitate the amalgamation of varied knowledge repositories, ongoing experimentation, iterative learning, and flexible coordination. This obviously contradicts the traditional concept of hierarchical policy execution, which is based on linear causal chains, limited rationality, and stable institutional settings (Mazzucato, 2021).

In the context of social inclusion, missions are especially pertinent because to the multi-dimensional nature of vulnerabilities, their impact on various groups, and the necessity for sustained coordination among welfare systems, labor markets, educational institutions, health services, housing authorities, and community stakeholders. Social missions, including reducing NEET rates, alleviating child poverty, boosting long-term care, or improving geographical

accessibility, are intrinsically cross-cutting, rendering them analytically and practically aligned with mission-oriented methodologies.

In this context, purpose-oriented policy represents an advancement of mission-oriented thought. Missions set out common goals, whereas purpose-oriented policies make sure that strategic goals, resource allocation, coordination mechanisms, and local execution all work together (Neumeyer et al., 2019). In other words, they link missions to real-world operations and territories, making sure that goals guide not only words but also how public action is organized.

Changes in public administration, especially the rise of Public Service Logic (Osborne et al., 2016), have made the move from hierarchical policy execution to mission-oriented governance stronger. Public Service Logic contests the notion that public value is imparted in a top-down manner by governments; rather, value is perceived as co-created through the interactions among public institutions, service providers, communities, and individuals. Public services are not just pipes; they are relational systems that are part of the communities they serve (Osborne, 2021).

From this point of view, government is not just about making rules; it's also about making places where different people can share information, set priorities, and adjust their plans (Emerson & Nabatchi, 2015). This is especially important for social inclusion, because weaknesses are connected, they do not have predetermined solutions and require co-produced interventions, continuous monitoring, and iterative adjustment. This logic is reflected in the design of purpose-driven ecosystems (Hollensbe et al., 2014), which mobilize actors at strategic, tactical, and operational levels to co-create public value and integrate their contributions into shared missions.

The Collective Impact framework (Kania et al., 2013) provides a complementary perspective on collaborative governance. It posits that large-scale social change requires not isolated projects but structured, multi-actor alignment, characterized by five conditions: a common agenda; shared measurement systems; mutually reinforcing activities; continuous communication; a backbone organization. This model has inspired numerous policy initiatives in complex domains such as education, public health, and community development. However, subsequent research has enriched and problematized its initial formulation. Hanleybrown, Kania, and Kramer (2012) emphasize the importance of coordination mechanisms and capacity-building, while Kania, Hanleybrown, and Juster (2013) highlight the need to embrace emergence in complex systems. They argue that social change cannot be centrally planned but must evolve through adaptive cycles of experimentation, learning, and distributed leadership.

More recently, Collective Impact scholarship has integrated equity-centered perspectives (Kania et al., 2022), emphasizing that collaborative governance must address structural inequities and power asymmetries, especially in contexts characterized by long-term marginalization. This resonates strongly with the Italian context, in which regional inequalities reflect not only economic conditions but institutional, demographic, and historical dynamics.

Collective Impact frameworks are thus deeply aligned with the architecture of purpose ecosystems. Both emphasize shared purpose, distributed roles, adaptive learning, and common measurement systems. Both reject bureaucratic fragmentation in favour of coordinated action. And both recognize the structural importance of backbone organizations or governance hubs capable of sustaining long-term collaboration.

Social inclusion is a classic example of a complex adaptive challenge. Vulnerabilities arise from the interaction of multiple factors - economic, demographic, institutional, social, spatial - that evolve over time in non-linear ways (Neumeyer et al., 2019). This makes simplistic, linear models of policy insufficient. Complex problems display feedback loops and tipping points; unpredictable responses to interventions; shifting dependencies; emergent outcomes (Adner, 2017). Tensions and paradoxes are present to balance interdependence and competition and to align social value logics with commercial sustainability (Jacobides et al., 2018).

In parallel, research on innovation ecosystems (Adner, 2017; Jacobides et al., 2018) shows that transformative change emerges not from isolated efforts but from the interaction of diverse

actors, resources, and feedback mechanisms. Ecosystem thinking is thus a natural extension of mission-oriented governance in contexts of complexity.

Place-based development also intersects with complexity. Scholars such as Iammarino, Rodríguez-Pose, and Storper (2019) argue that regional inequalities are structurally embedded and path-dependent, shaped by historical trajectories, institutional configurations, and spatial interactions. Overcoming these inequalities requires not only investment but institutional and strategic innovation, including governance arrangements capable of absorbing complexity and enabling local adaptation.

The place-based policy paradigm (Barca, 2009) highlights the importance of tailoring interventions to territorial characteristics rather than applying uniform solutions. According to this view, policy effectiveness depends on understanding local socio-economic conditions; recognising institutional capacities and constraints; addressing structural rather than superficial deficits; embedding interventions in local governance networks.

Place-based logic also emphasizes that territories possess latent potential as well as deficits. Purpose ecosystems, as multi-stakeholder systems that aligns diverse actors around a shared societal purpose, enabling co-creation of social value and measurable impact (Emerson & Nabatchi, 2015), operationalize this dual perspective: they seek not only to correct vulnerabilities but to mobilize local assets towards purpose-driven transformation (Hollensbe, 2014).

Unlike traditional networks or innovation ecosystems, the defining feature is purpose-driven collaboration, focused on social, economic, and environmental outcomes beyond individual organizational goals (Neumeyer et al., 2019); purpose-driven ecosystems emerge as the governance architecture that integrates all dimensions: they are mission-oriented, multi-level, polycentric, adaptive, territorially grounded, co-creative and systemic (Jacobides, 2018).

3. Methodology

The methodology developed for this study translates the conceptual foundations outlined above into an operational, data-driven framework for diagnosing territorial vulnerabilities and assessing the alignment between regional needs and public investment patterns, focuses on Italy's twenty administrative regions (with Trentino-Alto Adige analysed in its two autonomous provinces).

3.1. Operationalizing Missions Through OT9 Indicators

The first analytic step consisted in transforming the OT9 thematic area (Promoting Social Inclusion, Combating Poverty, and any Discrimination) into a structured set of six mission areas. This classification draws on the methodological approach discussed by Mazzucato (2018; 2021), whereby missions must represent socially relevant, analytically identifiable, and empirically grounded domains of public purpose. The six mission identified are:

childhood and family vulnerability;
ageing and long-term care;
labour-market exclusion and NEET vulnerability;
inner areas and access to services;
legality and safety;
housing deprivation and neighbourhood fragility.

Each mission was assigned a priority score (0–1–2) for each region using a robust, replicable, three-dimensional assessment model. The first dimension is related to the severity of current conditions, evaluates whether regions are significantly worse than the national average for a given indicator. This comparative approach reflects the territorial benchmarking tradition in regional studies (Iammarino et al., 2019). Thresholds were applied to classify deviations above 20% as critical, between 5% and 20% as moderately critical, and below 5% as non-critical.

The second dimension, the changing trend over the past decade, examines whether regional trajectories diverge from national patterns. This longitudinal approach reflects the notion, central to mission-oriented innovation policy, that the capacity for transformation depends not only on absolute levels but also on dynamic trends. Indicators were classified as critical when regional improvements lagged behind national improvements (for resource indicators) or when vulnerabilities worsened or improved less rapidly than the national average (for problem indicators). Divergences greater than 20 percentage points signalled critical issues.

The last considered dimension, the structural weight of indicators, recognizes that some indicators (as child poverty, labour irregularity, access to essential services, organized crime, and long-term care expenditure) are foundational determinants of social inclusion (Osborne et al., 2016): if these indicators were weak, the mission was automatically assigned a critical dimension.

The combination of these three dimensions yielded a mission priority classification where 2–3 critical dimensions indicated high priority (2), one critical dimension indicated medium priority (1), and no critical dimensions indicated low priority (0). This classification allowed for a systematic comparison across regions and formed the basis for subsequent clustering.

3.2. Mission-Based Regional Clustering

Using the resulting mission priority scores, the study grouped regions into four mission-based clusters, reflecting recurring patterns of social vulnerability. Clustering allowed for identifying territorially coherent mission profiles rather than treating each region in isolation, aligning with the literature on territorial systems and regional advantage (Asheim et al., 2011). The clusters are:

- Southern Complex Regions (Sicily, Calabria, Campania, Apulia), characterized by multi-dimensional vulnerabilities across missions related to childhood poverty, ageing fragility, labour exclusion, legality, and urban deprivation.
- Inner Areas and Demographic Fragility (Basilicata, Molise, Abruzzo, Umbria, Aosta Valley, Trentino-Alto Adige, Sardinia), where ageing and accessibility issues dominate.
- Mature and Polarized North (Piedmont, Liguria, Lombardy, Veneto, Friuli-Venezia Giulia), with widespread ageing, inner-area accessibility issues, and metropolitan housing challenges.
- Complex Centre (Tuscany, Emilia-Romagna, Marche, Lazio), featuring diverse but consistent vulnerabilities in childhood poverty, labour-market detachment, and inner-area fragility.

Clustering served two purposes: (1) identifying territorial patterns that reflect deep structural logics, and (2) creating a basis for cluster-level coherence assessments.

3.3. Mapping and Classifying Project-Level Investments

A dataset of regional projects from Open-Cohesion database, for the programming cycle 2021-2027, related to the thematic area ‘Social inclusion and health’ was then analysed to classify each investment into the six missions. Classification relied on a mission-specific semantic dictionary constructed through an iterative refinement process that incorporated thematic keywords. Projects that could not be reliably assigned to missions (due to technical, administrative, or cross-sectoral nature) will be documented separately, providing insight into potential blind spots in policy design.

Investments were aggregated at both regional and cluster levels and normalized as percentages of total regional or cluster investment. This generated a detailed portrait of how resources are currently allocated across missions.

The core analytical contribution of the methodology is the development of a coherence matrix, which evaluates alignment between mission priorities (needs) and mission-specific

investments (responses). This approach reflects the normative principles of a purpose-oriented policymaking, which emphasize the alignment of purpose, strategy, resources, and evaluation (Mazzucato, 2018).

The coherence matrix integrates: mission priority levels; investment intensity (mission investment share); deviation from national investment patterns (delta); underfunding conditions at regional and cluster levels.

Through the combination of these dimensions, missions were classified into four coherence categories:

- Coherent when high-priority missions received adequate investments;
- Underfunded mismatch when high-priority missions received disproportionately low investments;
- Overfunded when low-priority missions absorbed substantial resources;
- Neutral when investments aligned moderately with needs.

4. Preliminary results

The empirical analysis conducted offers a comprehensive description of Italy's territorial social inclusion landscape. By combining mission-based regional analysis, cluster-level vulnerability structures, investment distributions, and the coherence matrix, the results give a complete and evidence-based picture of how well mission-oriented needs and policy responses are aligned or how often they are not.

Figure 1 shows a very uneven distribution of social inclusion needs across different areas.

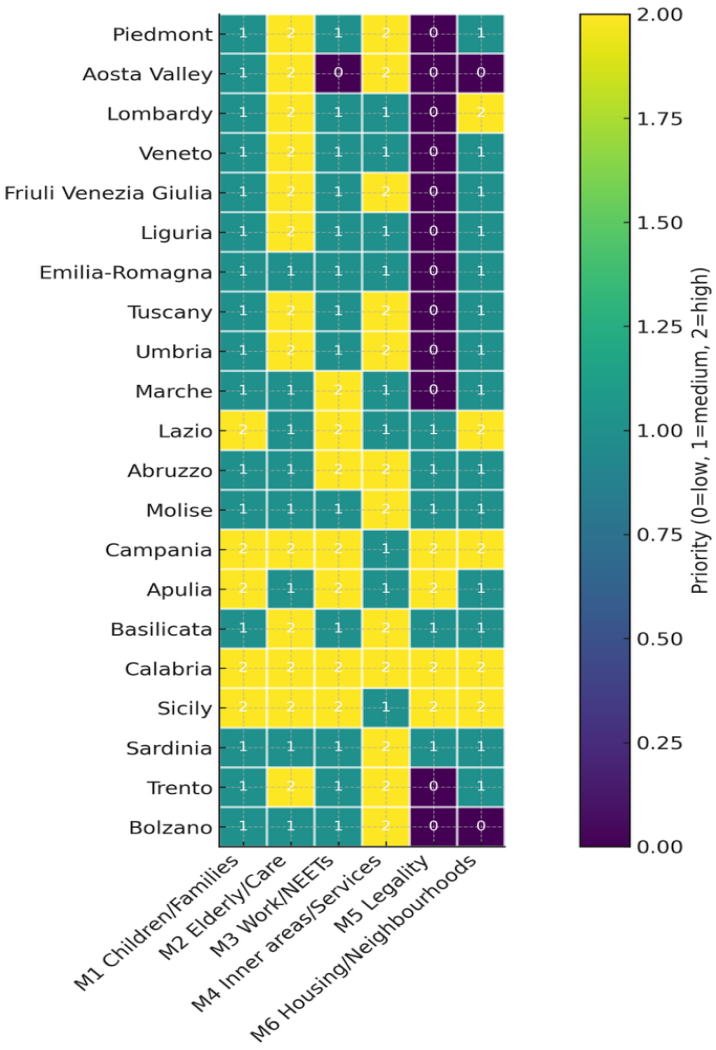


Figure 1. Regional Priorities Analysis

Southern regions such as Calabria, Sicily, Campania, and Apulia display consistently high priority levels (2) across multiple mission areas, including childhood and family deprivation (M1), labour exclusion and NEET vulnerability (M3), legality and safety (M5), and housing and neighbourhood fragility (M6). This confirms the presence of cumulative, mutually reinforcing vulnerabilities characteristic of complex, path-dependent regional systems.

These regions have structural disadvantages including long-term poverty, lack of jobs, inadequate assistance systems, and being around criminal networks. On the other hand, a group of regions that are mostly in the Inner Areas and the mountainous belt, such as Basilicata, Molise, Abruzzo, Umbria, Aosta Valley, and the autonomous provinces of Trento and Bolzano, place a high value on M2 (elderly care) and M4 (access to services). These patterns are linked to demographic decline, aging, depopulation, and weak infrastructure, which are all problems that peripheral regions have had for a long time. In the northern industrial areas of Lombardy, Piedmont, Veneto, Liguria, and Friuli-Venezia Giulia, the situation is different. For example, missions M1 and M3 are not as important, but missions M2 (aging) and M6 (housing/urban polarization) are more critical.

Figure 2 translates regional priority profiles into four coherent territorial clusters. This representation captures the systemic logic of vulnerability rather than its region-specific manifestations.

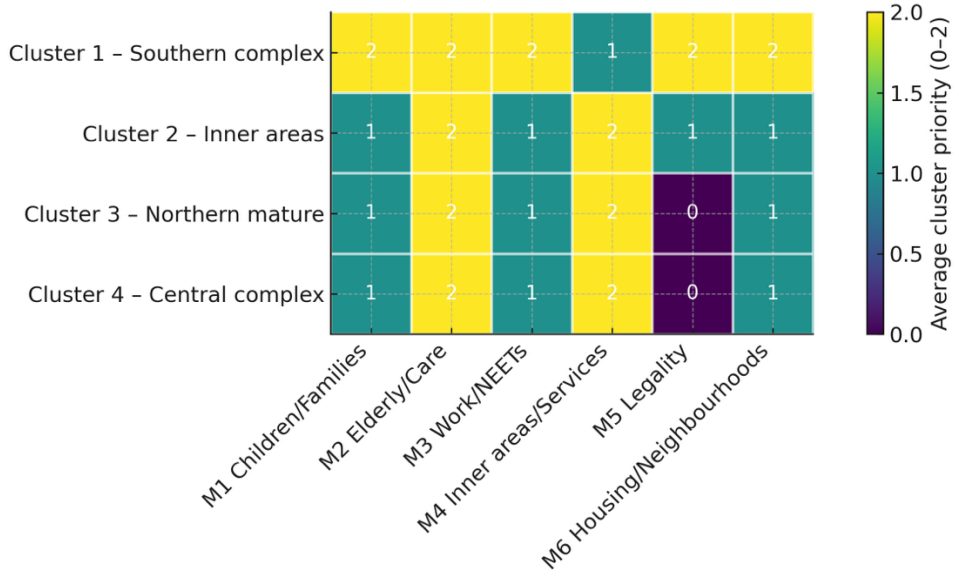


Figure 2. Clustering of priority missions

The Southern Complex Cluster (Cluster 1: Calabria, Sicily, Campania, Apulia) demonstrates uniformly elevated mission priorities across all dimensions except M4. This reflects a condition of systemic and overlapping fragility, where social, economic, and institutional deficits coalesce to form a complex challenge requiring multisectoral and multi-actor interventions.

The Inner Areas Cluster (Cluster 2: Abruzzo, Molise, Basilicata, Sardinia, Umbria, Trentino-Alto Adige, Aosta Valley) is characterised by very strong priorities in M2 and M4, confirming the deep influence of demographic transitions and spatial inaccessibility. The cluster's relative stability in the remaining missions illustrates that certain vulnerabilities are territorial in essence and resistant to sector-based policy solutions.

The Mature North Cluster (Cluster 3: Piedmont, Liguria, Lombardy, Veneto, Friuli-Venezia Giulia) shows a pattern of moderate to high vulnerabilities in M2, M4, and M6. These regions face a paradox typical of advanced economies: while performing strongly on aggregate socio-economic indicators, they exhibit emerging fragilities in elderly care, peripheral service provision, and metropolitan cohesion.

The Complex Centre Cluster (Cluster 4: Emilia-Romagna, Tuscany, Marche, Lazio) presents a hybrid pattern, combining urban vulnerabilities (Lazio) with inner-area fragilities (Marche and Tuscany). M1, M3, and M4 emerge as the most consistent missions, highlighting the tension between labour-market transitions, educational/childhood fragility, and territorial inequalities.

Figure 3, the heatmap of investment shares by mission and region, reveals a striking misalignment between regional needs and the allocation of public resources.

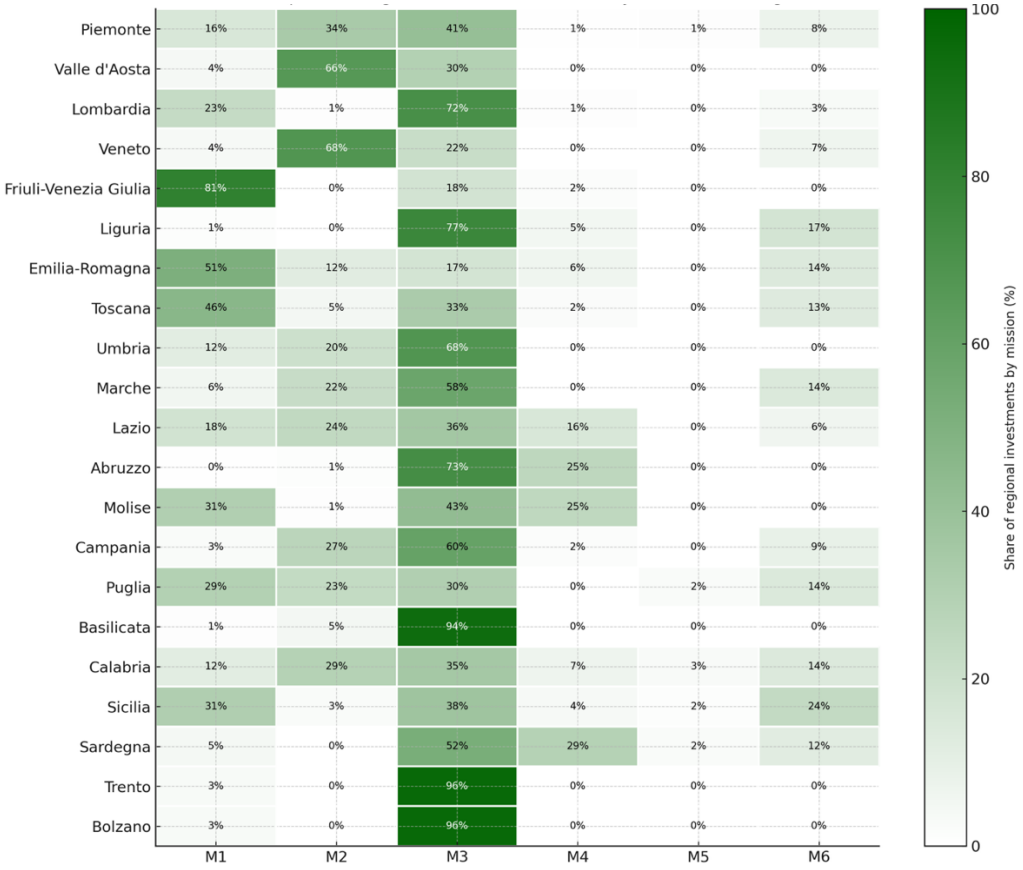


Figure 3. Co-creation of Project Value

Across numerous regions, investments are mostly in M3 (Labour/NEET), and in certain cases, they make up more than 70–90% of all regional spending. This pattern shows that long-standing labor policy tools are slow to change, but it doesn't match up with the mission goals we talked about earlier, especially in areas where other problems are more serious. The excessive investment in M3 demonstrates path dependency and sectoral rigidity, which contradicts mission-oriented policy concepts that necessitate directionality and coordinated investment across domains.

On the other hand, missions like M5 (Legality) and M4 (Inner places/Services) get very little or no funding in most places, even though they are very important to many regions, especially in the South and Inner Areas. This indicates that significant systemic issues continue to be inadequately handled at the institutional level, prompting apprehensions over the efficacy of existing governance structures.

Another interesting discovery is that Friuli-Venezia Giulia has a very unique profile, with more than 80% of its resources going to M1 (Children and Families). This may indicate a determined strategic focus, implying that mission-specific specialization is feasible.

Overall, the investment heatmap shows how inadequately diversified, sectorally fragmented, and not purpose-aligned public spending still is.

Finally, figure 4 integrates mission needs, investment shares, and deviations from national investment averages. It provides the most definitive assessment of alignment between territorial vulnerabilities and public action.

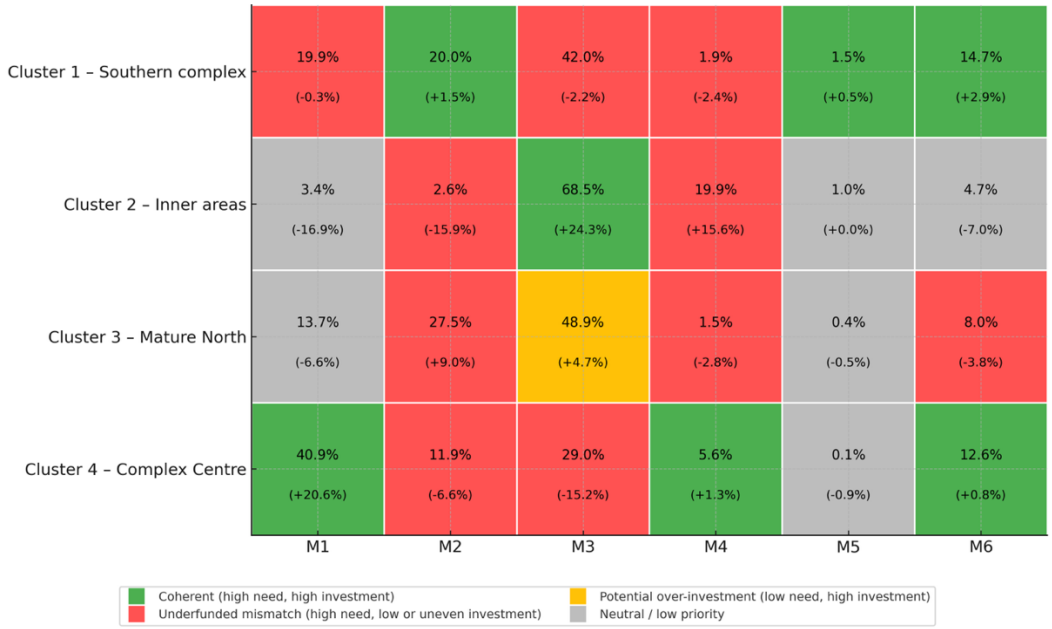


Figure 4. Gap Analysis

There are systematic misalignments in all four clusters:

- Cluster 1 (Southern Complex Regions): even though there are serious, overlapping vulnerabilities, high-priority missions like M1, M3, M5, and M6 are not getting enough money or are getting it in an uneven way. Investment levels are not high enough to meet the structural depth of vulnerabilities. This shows that governance is fragmented, and institutions don't work together well.
- Cluster 2 (Inner Areas): the most surprising fact is that M2 (Elderly/Care) is chronically underfunded, even though it is the cluster's most important purpose. It gets much less money than the national average. The investment surplus in M4 (+15.6%) is due to periodic territorial initiatives, but it doesn't make up for the systemic deficits in long-term care infrastructures.
- Cluster 3 (Mature North): this group shows a mix of too much investment in M3 (where vulnerabilities are low) and too little investment in M2 and M6 (where vulnerabilities are rising). The mismatch shows that mature economies are facing new problems that public policies haven't yet dealt with.
- Cluster 4 (Complex Centre): the Centre has the most internal variation. M1 and M4 are in sync, but M3, a mission that has been shown to be weak in Lazio and Marche, is still underfunded, which makes it less likely that systematic, mission-driven reforms will happen.

5. Conclusions

The research aims to examine if Italy's regional investment trends correspond with the mission-specific social inclusion requirements indicated by OT9 indicators, and how purpose-driven ecosystems could function as governance frameworks to rectify discrepancies. The findings offer a definitive and strong response through an integrated technique that includes mission diagnostics, geographical clustering, investment mapping, and coherence evaluation. Italy's current policy landscape shows a lot of systematic inconsistency between the requirements of different regions and how resources are distributed.

The mission-based diagnostics showed that the regions are very different from each other. For example, the Southern regions are very fragile in many ways, the Inner Areas have demographic and infrastructure problems, and the Mature North is starting to have social and

spatial issues. The investment analysis revealed that public resources do not correspond to this differentiated geography; rather, they adhere to path-dependent trends, especially with regard to excessive funding for labor-market interventions, while structural mission domains such as legality, long-term care, childhood poverty, and access to inner areas remain significantly underfunded.

The coherence matrix verified the structural characteristics of these misalignments. No group shows that needs and investments are fully aligned. Instead, there are underfunded high-priority missions and overfunded low-priority missions in all territorial configurations. This shows that administration is fragmented and there is no coordination based on missions. These results immediately corroborate the principal theoretical assertion of the study: purpose-ecosystems are essential governance frameworks for reconciling purpose-oriented policies based on missions' priorities with localized social inclusion requirements.

In this context, purpose-driven ecosystems operate as the multi-level, polycentric, adaptable, and participative governance framework necessary for transforming missions into coherent, context-sensitive actions. They represent the tenets of purpose-driven innovation policy, the relational basis of public service logic, and the spatial awareness of place-based development.

Keywords: Purpose Ecosystems; entrepreneurial university; social inclusion

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Sostenibilità tra forma e sostanza: analisi dell'Earnings Management nelle B-Corp italiane

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1. Introduzione

La questione del rapporto indissolubile tra la natura dell'azienda e i propri fini è da sempre imperniato nel dibattito scientifico economico-aziendale. Le riflessioni attorno a tale relazione identitaria fondamentale si riducono ad una questione sostanziale che richiama il dualismo teorico tra il soggettivismo e l'oggettivismo (Paolone & D'Amico, 2017), ovvero, come ricorda tra gli altri Ferrando, se l'azienda debba essere considerata come un attore del sistema economico e sociale autonomo e, pertanto, dotato di propri fini, o invece come lo strumento attraverso il quale specifici soggetti perseguono i propri interessi (Ferrando, 2020).

Muovendo dagli elementi definitori dell'azienda, relativamente alla sua natura e alle sue finalità, la più autorevole letteratura la definisce come un istituto economico-sociale (Paolone & D'Amico, 2017), la cui attività risulta essere di significativo interesse per la società, abbracciando imprescindibilmente una dimensione etica che ne incorpora la dimensione economica e sociale, contribuendo a definirne obiettivi e strategie (Ruisi, 2010).

A tal riguardo, citando tra gli altri Borgonovi, il concetto stesso di "istituto" – fondamentale nella dottrina economico-aziendale italiana, tedesca e centro-europea – consente di operare una distinzione di fondo tra le motivazioni prime per le quali nascono determinate tipologie di istituti, i quali possono essere di ordine economico (come per l'impresa moderna), o non economico, (come ad esempio per la famiglia o per l'ente pubblico), dalle dimensioni rilevanti per il loro funzionamento (ad esempio la dimensione economica risulta essere rilevante anche per istituti che non sono mosse da motivazioni di ordine economico, e viceversa quelle giuridiche, etiche, ecc., sono rilevanti in istituti che si muovono seguendo motivazioni di ordine economico) (Borgonovi, 2014). Ulteriormente, l'autore sottolinea come le decisioni assunte dall'azienda, ancorché quelle che si fondano sul principio della convenienza economica, sottostanno a talune regole che risolvono le relazioni tra le persone ed i gruppi sociali, le quali possono essere o codificate (nei sistemi di diritto formale) o consolidate nei comportamenti sociali e quindi uniformemente accettate senza necessità di obblighi giuridici (Borgonovi, 2014) .

Di fatto, pur nelle significative differenze fondative che caratterizzano le diverse scuole di pensiero , la disciplina dell'Economia Aziendale, nell'obiettivo di definire l'azienda, la identifica come istituto le cui finalità sono ben lontane da quelle del profitto nel breve termine, ma che invece abbraccia finalità di lungo termine risultanti dall'integrazione di interessi diversi e divergenti e orientati al mantenimento di un equilibrio istituzionale nel lungo periodo.

Tale paradigma, tuttavia, sembra aver subito un processo di decoupling perdendosi progressivamente nel tempo con lo sviluppo economico capitalistico, fino a convogliare in una "fallacia" (e.g.: Reiman, 1981) come definita da diversi autori, secondo cui la crescita economica risulterebbe endemicamente iniqua, instabile e nel medio-lungo termine dannosa per l'ambiente e per l'umanità.

Negli ultimi due decenni, il panorama imprenditoriale globale ha assistito a una crescente pressione da parte di stakeholder, investitori e policy-maker affinché le imprese trascendano il paradigma della massimizzazione del valore per gli azionisti (shareholder value) (Friedman,

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2007) e, in particolare la crisi finanziaria del 2008, unita alla crescente urgenza delle sfide climatiche e sociali, ha accelerato la domanda di modelli di business più etici, responsabili e sostenibili (Welford e Frost, 2006; Dias et al., 2016). In questo contesto, la Corporate Social Responsibility (CSR) è evoluta da attività filantropica marginale a elemento strategico centrale (Kim, 2022).

Tuttavia, la diffusione crescente di strumenti come il reporting non-finanziario e di sostenibilità ha portato con sé lo scetticismo diffuso riguardo al tema del cosiddetto "greenwashing" (Gatti et al., 2019), ovvero la pratica di utilizzare la comunicazione di sostenibilità come strumento per distogliere l'attenzione da performance ambientali, sociali o etiche discutibili (Boiral et al., 2017). La letteratura ha evidenziato come le imprese possano adottare una "CSR Masquerade" (Prutina, 2015), un approccio opportunistico in cui l'impegno sociale dichiarato non è pienamente integrato nella governance e nelle pratiche aziendali (Forcadell e Aracil, 2021).

Questa tensione tra impegno dichiarato e performance effettiva è particolarmente rilevante nel campo della trasparenza finanziaria. L'Earnings Management (EM), definito come l'alterazione discrezionale dei risultati finanziari da parte dei manager per influenzare le percezioni degli stakeholder (Schipper, 1989; Prencipe e Viarengo, 2022), rappresenta una delle principali minacce all'integrità del reporting aziendale. L'asimmetria informativa, connaturata al rapporto tra insiders (manager) e outsiders (stakeholder), crea l'opportunità per tali manipolazioni (Baskaran et al., 2020).

Per rispondere a questa esigenza di credibilità, sono emersi nuovi modelli organizzativi e standard di certificazione. Tra questi, la certificazione B-Corp (Certified B-Corporation) si distingue come uno degli standard globali tra i più innovativi e risulta essere fortemente imperniati sulla "buona governance". Gestita dall'ente no-profit B-Lab, la certificazione B-Corp valuta le aziende in termini di performance sociale e ambientale in senso ampio e di governance – e, dunque, anche di trasparenza –, richiedendo il soddisfacimento di requisiti specifici dettati da un assessment rigoroso (il B Impact Assessment), la modifica dello statuto societario per includere la considerazione degli stakeholder (stakeholder governance) e la pubblicazione di un documento di reporting non-finanziario con cadenza annuale.

In modo parallelo rispetto al "movimento" B-Corp, in alcuni ordinamenti sono emerse forme giuridiche inquadrabili nella definizione di "benefit corporation" (come ad es.: le Low-Profit Limited Liability Company – L3C introdotte nel 2008 nello Stato del Vermont e le Social Purpose Corporation – SPC in California, Washington, Florisa. in Italia, le "Società Benefit" (SB) sono state introdotte con la L. 208/2015). Sebbene la letteratura recente (es. Prencipe et al., 2025) abbia iniziato a indagare la relazione tra l'adozione dello status giuridico di BC e le pratiche di EM (spesso con risultati controintuitivi che suggeriscono un potenziale aumento dell'opportunismo manageriale), rimane un vuoto significativo riguardo all'efficacia della certificazione volontaria B-Corp.

La certificazione B-Corp, a differenza dello status legale di Società Benefit, implica un processo di verifica e audit esterno da parte di B-Lab. Questo studio si propone di colmare questo gap, indagando se la certificazione B-Corp rappresenti un meccanismo efficace per aumentare la qualità dell'accounting e del reporting.

L'obiettivo primario di questo studio è analizzare se le imprese italiane che ottengono la certificazione B-Corp mostrino una riduzione nelle pratiche di Earnings Management successivamente all'ottenimento della certificazione. La nostra research question, pertanto, è la seguente: La certificazione B-Corp, agendo come meccanismo di commitment e di scrutiny esterno, riduce l'opportunismo manageriale misurato attraverso le pratiche di EM?

Si ipotizza dunque che il processo rigoroso e i requisiti di trasparenza imposti da B-Lab agiscano come un vincolo credibile (costly signal) sulla discrezionalità manageriale, spingendo le imprese certificate verso una maggiore integrità del reporting finanziario. Questo studio mira a

dimostrare l'efficacia della certificazione come strumento non solo di performance di sostenibilità, ma anche di trasparenza economico-finanziaria.

2. Framework Teorico e Sviluppo delle Ipotesi

La relazione tra impegno verso lo sviluppo sostenibile e qualità del reporting (assenza di EM) è complessa e la letteratura esistente offre risultati ambigui (Ehsan et al., 2020; Velte, 2024). Come delineato da Prencipe et al. (2025) nel contesto delle Società Benefit, emergono due prospettive teoriche contrapposte per interpretare questa relazione, che adattiamo al contesto delle B-Corp certificate.

2.1. La Prospettiva dell'Opportunismo Manageriale (Agency Theory)

La prima prospettiva, radicata nella teoria dell'agenzia, suggerisce che i manager possano utilizzare l'impegno nella CSR in modo opportunistico (Prior et al., 2008; Mahrani e Soewarno, 2018). In questa visione, la certificazione B-Corp potrebbe essere ricercata da manager che desiderano costruire una "reputazione etica" (Hasler, 2014) da usare come scudo per mascherare comportamenti opportunistici, incluso l'EM (Palacios-Manzano et al., 2021). L'investimento in una certificazione "socialmente responsabile" potrebbe servire a deviare l'attenzione degli stakeholder (Javed et al., 2020) o a ridurre il loro scrutinio (Janning et al., 2020), concedendo ai manager maggiore libertà per manipolare i bilanci.

Studi recenti che analizzano forme ibride, come le Società Benefit legali, hanno trovato supporto empirico per questa visione, rilevando un'associazione positiva tra l'adozione dello status di BC e l'EM (Prencipe et al., 2025). Questo suggerisce che l'impegno formale verso obiettivi sociali, se non accompagnato da un adeguato monitoraggio, può creare tensioni che i manager risolvono opportunisticamente (Ehsan et al., 2022; Mion, 2020). Se questa prospettiva fosse valida, ci aspetteremmo che la certificazione B-Corp non abbia alcun effetto sull'EM, o addirittura lo aumenti.

2.2. La Prospettiva della Strategia a Lungo Termine: Stakeholder, Legitimacy e Signaling Theory

La seconda prospettiva, che guida il nostro studio, si basa su un'integrazione della teoria degli stakeholder, della teoria della legittimità e della teoria della segnalazione.

La Stakeholder Theory postula che le imprese socialmente responsabili mirino a costruire relazioni fiduciarie e a lungo termine con tutti i loro portatori di interesse (Ehsan et al., 2020). La trasparenza e l'integrità del reporting finanziario sono fondamentali per mantenere questa fiducia (Gras-Gil et al., 2016). In questa ottica, l'EM è antitetico alla logica B-Corp, poiché eroderebbe la fiducia degli stakeholder e vanificherebbe gli investimenti fatti per ottenere la certificazione.

La Legitimacy Theory suggerisce che le imprese adottano pratiche come la certificazione B-Corp per ottenere o mantenere la legittimità sociale (Del Baldo, 2019). La certificazione funge, pertanto, da "segnale" di adesione a un sistema di valori etici (André, 2012). Per essere efficace, questa legittimità deve essere mantenuta attraverso la coerenza tra valori dichiarati (trasparenza B-Corp) e azioni (reporting finanziario non manipolato).

Stakeholder e Legitimacy Theory sono profondamente legate da un nesso logico-deduttivo: alcuni autori sostengono che considerare le due teorie come totalmente distinte sarebbe errato perché entrambe sono radicate nella Political Economy Theory e sono teorie sistemiche che si concentrano sul ruolo delle relazioni tra organizzazioni, Stato, individui e gruppi (Deegan, 2002; Gray et al., 1996). Questi due approcci teorici sono, pertanto, collegati sociologicamente, a causa dell'ampliamento e crescente considerazione degli stakeholder come controparti nel contratto sociale tra imprese e società (Deegan, 2002).

Infine, la Signaling Theory (Connelly et al., 2011) riveste un ruolo cruciale nella costruzione del framework. L'ottenimento della certificazione B-Corp è un processo costoso, complesso e volontario. Rappresenta un "segnale credibile" (costly signal) inviato al mercato per distinguersi dai concorrenti che praticano "greenwashing". Affinché questo segnale sia efficace e mantenga il suo valore (ad esempio, nell'attrarre "impact investors" (Gangi et al., 2022) o talenti, l'impresa deve dimostrare un allineamento comportamentale. La certificazione B-Corp, con i suoi requisiti di audit e di reporting pubblico (gestiti da B-Lab), agisce come un meccanismo di bonding e monitoring che riduce l'asimmetria informativa (Shi et al., 2024; Anderson et al., 2024) e vincola i manager a un comportamento trasparente.

2.3. Ipotesi di ricerca

A differenza dello status legale di Società Benefit (Prencipe et al., 2025), che può essere adottato con la modifica dello statuto e che comporta minori controlli esterni, la certificazione B-Corp richiede una verifica ex-ante (il BIA) e ongoing (la ricertificazione triennale). Per tale ragione, si ipotizza che questo rigoroso processo di enforcement esterno da parte di B-Lab sia il fattore discriminante che allinea l'impegno dichiarato con la qualità dei processi di accountability.

Mentre la prospettiva dell'opportunismo manageriale non può essere scartata a priori, il presente studio si basa sulla prospettiva della strategia a lungo termine e della "segnalazione credibile". Attraverso tale studio si ipotizza che le B-Corp certificate, avendo investito risorse significative per segnalare il loro impegno etico, siano meno propense a mettere a rischio tale investimento attraverso pratiche di EM. La certificazione agisce come un meccanismo di governance che migliora la qualità dei processi di accounting e reporting.

Pertanto, formuliamo la seguente ipotesi:

H1: L'ottenimento della certificazione B-Corp è associato a una riduzione statisticamente significativa delle pratiche di Earnings Management nelle imprese italiane, rispetto a un campione di controllo di imprese non certificate.

3. Metodologia di ricerca

Per testare l'ipotesi di ricerca appena presentata, lo studio adotta un disegno di ricerca quantitativo basato su dati panel e un modello Difference-in-Differences (DiD).

3.1. Campione e raccolta dati

Il nostro campione di analisi sarà composto da due gruppi di imprese italiane per le quali saranno raccolti i dati economici e finanziari nel periodo 2015-2024:

- Gruppo trattato (Treated Group): Il gruppo di trattamento è costituito da tutte le imprese italiane che hanno ottenuto la certificazione B-Corp tra il 2018 e il 2022. L'elenco delle imprese e la data esatta della prima certificazione (l'evento di trattamento) sono stati estratti dal database ufficiale di B-Lab. Il dataset finale è di 152 imprese B-Corp selezionate.
- Gruppo di Controllo (Control Group): Il gruppo di controllo è formato da imprese italiane non B-Corp con caratteristiche simili alle imprese B-Corp selezionate, sulla base di una serie di variabili.

Il processo di selezione del gruppo di imprese di controllo avviene mediante una prima selezione casuale di 5000 imprese tra il totale delle imprese italiane. Successivamente, per garantire la validità dell'analisi DiD e trattare i possibili self-selection bias (in quanto le imprese che scelgono di diventare B-Corp sono intrinsecamente diverse), il gruppo di controllo viene affinato utilizzando un modello di Propensity Score Matching (PSM). Il modello si fonda sulla definizione dei due gruppi definiti come segue:

- Costruendo una variabile binaria T (treatment) che determina se una osservazione è sottoposta al trattamento oppure no;
- La variabile assume valore T = 1 se l'unità osservata è stata sottoposta al trattamento, mentre T = 0 se l'unità osservata non è trattata.

A questo punto viene applicato un modello di regressione di tipo probit/logit con T come variabile dipendente e una serie di caratteristiche come variabili indipendenti, al fine di stimare la teorica probabilità di ciascuna osserva-zione di essere sottoposta a trattamento, includendo x variabili come determinanti capaci di influenzare tale probabilità:

$$T = Costante + Controlli + \varepsilon$$

La funzione di propensity score risultante ha T come variabile dipendente e x come variabili indipendenti:

$$p(x) = prob(T = 1|x) = E(T|x)$$

Dove il propensity score è la probabilità condizionata di essere sottoposti al trattamento date le x caratteristiche pretrattamento.

Conseguentemente, le imprese non B-Corp vengono virtualmente "abbinate" 1:N con le imprese B-Corp sulla base di covariate pre-trattamento (il vettore Controlli rilevate nell'anno precedente alla certificazione), quali: settore industriale (ATECO), dimensione (logaritmo degli asset totali), redditività netta (ROE), leva finanziaria (Leverage), età, localizzazione geografica.

Sulla base del risultato del PSM, ossia il valore di probabilità che un'impresa del gruppo di controllo possa "subire il trattamento" (diventare B-Corp sulla base delle covariate) sarà costruito il gruppo di controllo, affinché esso risulti quanto più vicino possibile al gruppo di imprese trattate, riducendo così o possibili effetti spuri.

I dati finanziari e anagrafici necessari per l'analisi (sia per il matching PSM che per il modello DiD) sono estratti dal database AIDA di Bureau van Dijk (BvD), che fornisce una copertura completa delle società italiane (Prencipe et al., 2025).

Il campione finale, dopo un'ultima fase di trattamento e pulitura dei casi che presentano missing values, costituirà un panel dataset bilanciato composto dalle imprese B-Corp (treated group) e dal loro campione di controllo (matched group), osservati per un decennio, in modo che per ciascun caso siano osservabili un minimo di 3 anni prima e un minimo di 3 anni dopo l'evento di certificazione.

3.2. Variabile dipendente: Earnings Management (EM)

In linea con la letteratura recente che cerca di superare i limiti dei modelli tradizionali (es.: Jones, 1991; Dechow et al., 1995), misureremo l'Earnings Management (EM) utilizzando il modello di conditional earnings sviluppato da Stubben (2010).

$$\begin{aligned}\Delta AR_{it} = \alpha + \beta_1 \Delta R_{it} + \beta_2 \Delta R_{it} \times SIZE_{it} + \beta_3 \Delta R_{it} \times AGE_{it} + \beta_4 \Delta R_{it} \times AGEsq_{it} \\ + \beta_5 \Delta R_{it} \times GRRp_{it} + \beta_6 \Delta R_{it} \times GRRn_{it} + \beta_7 \Delta R_{it} \times GRM_{it} \\ + \beta_8 \Delta R_{it} \times GRMsq_{it} + \varepsilon_{it}\end{aligned}$$

Dove Δ è la variazione annuale; *AR* sono i crediti; *R* è il fatturato totale; *SIZE* è il logaritmo naturale degli asset totali; *AGE* è il logaritmo naturale del tempo trascorso dalla fondazione delle aziende; *GRRp* rappresenta il prodotto della variazione dei ricavi (*R*) aggiustata per la mediana dell'industria e di una variabile binaria che assume il valore di 1 quando la variazione corretta per la mediana dei ricavi è presente nell'anno t per l'azienda $i > 0$, altrimenti 0; *GRRn* rappresenta la variazione mediana dei ricavi (*R*) aggiustata per il settore per una specifica impresa. Viene

ulteriormente moltiplicata per una variabile fittizia che assume il valore di 1 se la variazione mediana aggiustata per il settore dei ricavi nell'anno t per l'azienda $i < 0$ e 0 altrimenti; GRM è il margine lordo mediano aggiustato per l'azienda nel settore; *AGE* e *GRM* sono quadrati e indicati rispettivamente come *AGEsq* e *GRMsq*.

L'entità dei residui ottenuti dal modello di guadagni condizionati funge da approssimazione dei crediti o delle acquisizioni discrezionali (DA_{it}) anomali. Questa variabile è di interesse primario in questo studio e funge da proxy per l'EM.

Pertanto, questa variabile è stata utilizzata per condurre la nostra analisi primaria basata sulla DiD.

Il modello appena presentato è stato scelto per la sua robustezza e in quanto presenta un minor grado di distorsione nel rilevare la manipolazione degli accruals basata sui ricavi (Prencipe et al., 2025). Il modello di Stubben (2010) stima i ricavi "attesi" (non discrezionali) di un'impresa in un dato periodo e, di conseguenza, i discretional accruals (*DA*) sono calcolati come la differenza tra i ricavi effettivi e i ricavi attesi.

La nostra variabile dipendente è rappresentata dal valore assoluto dei discretional accruals (|*DA*|) derivati dal modello di Stubben (2010). Il valore assoluto è utilizzato perché i manager possono manipolare gli utili sia verso l'alto (income-increasing) che verso il basso (income-decreasing) (Zang, 2012), ed entrambe le pratiche indicano una bassa qualità del reporting. Un valore più alto di |*DA*| indica un maggiore livello di Earnings Management.

3.3. Modello di Analisi: Difference-in-Differences (DiD)

Per valutare l'impatto causale della certificazione B-Corp sulla riduzione dell'EM, utilizzeremo un modello Difference-in-Differences (DiD) con effetti fissi (Fixed Effects). Il modello DiD permette di isolare l'effetto del trattamento (certificazione) confrontando l'evoluzione dell'EM nel gruppo trattato (B-Corp) prima e dopo la certificazione, rispetto all'evoluzione dell'EM nello stesso periodo nel gruppo di controllo (non B-Corp).

La specifica del nostro modello econometrico sarà la seguente:

$$EM_{it} = \beta_0 + \delta(BC_i * PC_t) + \beta_1(BC_i) + \beta_2(PC_t) + \gamma'(Controlli_{it}) + \alpha_i + \theta_t + \epsilon_{it}$$

Dove:

EM_{it}: È la nostra misura di Earnings Management (Stubben (2010) per l'impresa i nell'anno t.

BC_i: È una variabile dummy che assume valore 1 se l'impresa i appartiene al gruppo trattato (B-Corp certificate) e 0 se appartiene al gruppo di controllo (matchato).

PC_t: È una variabile dummy che assume valore 1 per gli anni successivi all'anno della certificazione (trattamento) e 0 per gli anni precedenti.

$BC_i * PC_t$: È il termine di interazione DiD, il nostro coefficiente di interesse. Il coefficiente δ (delta) cattura l'effetto medio del trattamento (certificazione B-Corp) sul livello di EM.

$Controlli_{it}$: È un vettore di variabili di controllo standard della letteratura sull'EM per assorbire ulteriori fonti di eterogeneità. Tale vettore è costituito dalle covariate utilizzate per il Propensity Score Matching (PSM).

α_i: Rappresenta gli effetti fissi a livello di impresa (firm fixed effects), per controllare tutte le caratteristiche inosservabili e costanti nel tempo specifiche di ciascuna impresa (es. cultura aziendale).

θ_t: Rappresenta gli effetti fissi a livello di anno (year fixed effects), per controllare gli eventi a livello macroeconomico che impattano tutte le imprese (es. cicli economici, cambiamenti normativi).

ϵ_{it}: È il termine di errore.

La nostra ipotesi (H1) sarà supportata se il coefficiente risulterà negativo e statisticamente significativo. Un coefficiente negativo indicherebbe che, dopo la certificazione, le B-Corp (gruppo trattato) hanno ridotto l'EM in misura significativamente maggiore rispetto a quanto fatto dal gruppo di controllo nello stesso periodo.

Saranno applicati, inoltre, ulteriori modelli per testare la robustezza della relazione e dei risultati, inclusa la verifica dell'assunto dei parallel trends (verificando che non sia significativo negli anni pre-trattamento) e l'utilizzo di misure alternative di EM (es. Modified Jones Model (Dechow et al., 1995)).

4. Risultati attesi e implicazioni

Questo studio si attende di trovare relazione positiva e significativa tra l'adozione del modello B-Corp e la qualità del reporting e della trasparenza, ipotizzando che i livelli di EM scendano dopo l'adozione del modello B-Corp. Ipotizziamo, pertanto, che il coefficiente (delta) del modello DiD sia negativo e significativo, dimostrando che la certificazione B-Corp è un meccanismo efficace nel ridurre l'Earnings Management.

Attraverso i risultati attesi dello studio ci si propone di approfondire le seguenti implicazioni teoriche: da un lato, la relazione ipotizzata avrebbe implicazioni significative per il dibattito accademico sulla relazione tra responsabilità sociale e impegno verso la sostenibilità e qualità del reporting (Ehsan et al., 2020).

Ulteriormente, i risultati attesi supporterebbero le teorie attraverso le quali lo studio deduttivamente interpreta il fenomeno come presentate nel paragrafo 2, confermando come gli standard di sostenibilità volontari, se sufficientemente rigorosi e supportati da meccanismi di enforcement esterni (l'audit di B-Lab), possono allineare gli incentivi manageriali alla trasparenza a lungo termine (Stakeholder Theory) e agire come segnali credibili (Signaling Theory) che distinguono le imprese "genuine" da quelle che praticano "greenwashing", confermandone la legittimità ad operare (Legimacy Theory).

Con riferimento alla prospettiva del Managerial Opportunism, i risultati attesi si porrebbero in contrasto con la prospettiva dell'opportunismo manageriale, o quantomeno ne definirebbero i limiti. Suggerirebbero che, sebbene l'adozione di uno status legale possa essere usata opportunisticamente (come rilevato da Prencipe et al., 2025), la certificazione volontaria e verificata agisce come un vincolo più forte.

Inoltre, lo studio evidenzia la dicotomia tratra certificazione (B-Corp) e "Status Legale" (BC/SB): questo studio contribuirebbe a chiarire la confusione concettuale e di impatto tra i due modelli, evidenziando l'importanza dei meccanismi di verifica e monitoraggio.

Infine, lo studio propone talune implicazioni pratiche: con riferimento ai manager e le imprese, il verificarsi della relazione ipotizzata dimostrerebbe che l'ottenimento della certificazione B-Corp non è solo un esercizio di marketing, ma un impegno strategico che richiede (e probabilmente induce) un miglioramento tangibile nei processi di governance interna e di reporting finanziario.

Ulteriormente, il segnale che la certificazione rappresenta fornirebbe agli investitori un'euristica decisionale: la certificazione B-Corp può essere considerata un proxy affidabile di un minor rischio di manipolazione contabile e di una maggiore trasparenza, riducendo l'asimmetria informativa. Tali implicazioni potrebbero contribuire ad informare informare i policy-maker rispetto all'efficacia di tali assessment volontari e di tali standard, al fine di favorire l'integrazione di questi modelli nel framework normativo sulla disclosure non-finanziaria.

Infine, i risultati dello studio confermerebbero il valore del processo di audit e di trasparenza richiesto dalla certificazione B-Corp, validando il suo ruolo nel promuovere un'economia più responsabile e trasparente.

5. Conclusioni

Questo studio si propone di investigare una questione centrale nel dibattito sulla sostenibilità aziendale: le certificazioni di sostenibilità, e in particolare la certificazione B-Corp, rappresentano un segnale di impegno reale verso la trasparenza o sono solo una forma sofisticata di "greenwashing"?

Adottando una metodologia robusta (DiD su un campione matchato PSM) e una proxy consolidata di misurazione dell'Earnings Management (Stubben, 2010), questo studio mira a dimostrare empiricamente che le imprese italiane certificate B-Corp riducono significativamente le manipolazioni contabili dopo aver ottenuto la certificazione.

Ci aspettiamo di concludere che la certificazione B-Corp non è un "CSR Masquerade", ma un efficace meccanismo di governance che, attraverso la verifica esterna e l'impegno pubblico, allinea gli obiettivi di sostenibilità con l'integrità e la qualità del reporting finanziario. Questo studio cerca di fornire una prova tangibile che i modelli ibridi, come il modello B-Corp, fungono da "costly signal" di impegno concreto verso la sostenibilità. Tale impegno non può sottostare al compromesso di dovere o volere mascherare performance non reali, tentando di apparire virtuosi o di utilizzare tale segnale come strumento strategico di posizionamento e di differenziazione. La trasparenza e l'accountability rappresentano parte integrante di tale impegno e sono un perno fondamentale della buona governance orientata allo sviluppo sostenibile.

Parole chiave: Earnings Management; certificazione B-Corp; qualità del reporting; signaling theory; Difference-in-Differences

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From beneficiaries to agents of change: exploring the role of social enterprises in community transformation in Kenya

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1. Introduction

As the world confronts unprecedented social, environmental, and economic challenges that are hindering progress toward the Sustainable Development Goals (SDGs), the need to understand, support, and leverage the potential of innovative businesses that prioritize both people and the planet has never been more critical (WEF, 2024; Negri et al., 2023). Social enterprises (SEs) have emerged as pivotal actors to develop highly innovative solutions to critical social and environmental challenges. Defined as organizations whose purpose is to achieve a social mission through market mechanisms (Santos, 2012), SEs, combining social and economic goals in the same organizational "hybrid" form, are increasingly relevant also in African economies for their transformative role and capacity to address societal grand challenges (Ciambotti et al., 2025; Dey et al., 2016; see also Tobias et al., 2013; Mair et al., 2016).

Literature on SEs has grown rapidly in the last years, especially investigating hybrid business models (Davies and Doherty, 2019; Santos et al., 2015), strategies to scale impact (Bocken et al. 2016; Ciambotti et al., 2023; Lall and Park 2022) and governance mechanisms (Battilana et al., 2015). Moreover, in Sub-Saharan Africa, social enterprises often fill institutional voids by mobilizing local actors around livelihood and environmental missions (Littlewood et al., 2025). Yet, the mechanisms through which beneficiaries evolve from recipients to agents of transformation remain underexplored (Lorenzo-Afable et al., 2020; Lashitew et al., 2020; 2024; see also Ridley-Duff, 2012)

Despite their crucial role, literature that amplifies the voices of beneficiaries remains scarce. Social entrepreneurship research typically adopts a top-down management perspective, where beneficiaries are viewed as passive recipients of value, and social issues are often framed from entrepreneurial and organizational viewpoints, emphasizing resource allocation, opportunity recognition, and the role of entrepreneurs as change agents (Hervieux and Voltan, 2018).

Recent research has emphasized the understanding that social change emerges from the collective efforts of various actors within social entrepreneurship (Cameron, 2018). Within social enterprise literature, a stream of scholarship is now focused on the empowerment of beneficiaries as a leading aspect for social enterprises. This is particularly relevant for the cases of Work Integration Social Enterprises (Battilana et al., 2015; Farmer et al., 2021) or fair trade social enterprises (Kim, 2025; Ciambotti et al., 2023).

However, the literature is largely limited in terms of the processes through which beneficiaries are activated to disseminate and scale impact at the community level, in order to achieve transformative and long-term change. The fact that the group of beneficiaries is involved

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in defining the processes for creating impact does not necessarily translate into a lasting impact that extends to the community. Previous literature perspectives assume that there is alignment between social enterprise and beneficiary actors, but this is not always the case. There might be a tradeoff between the organizational actions, perceptions, goals, and the beneficiaries' commitment and efforts, for instance, in terms of "temporal misalignment" (future vs long-present) or "intent misalignment" (SE vs beneficiaries), "Impact scope" misalignment (single beneficiary group vs community) (Kim et al., 2019; Kannothra et al., 2018).

This research aims to unveil how and why SEs generate and scale impact to the local communities through the participation and integration of their beneficiaries. To address this question, we conducted a qualitative inductive study in Kenya, focusing on social enterprises that work in close collaboration with their beneficiaries to carry out their activities and generate impact within the communities they serve. This research aims to explore the processes through which transformative and long-lasting change can be enabled, specifically by examining the interaction between social enterprises and their target beneficiaries in local community settings in developing countries. In doing so, we investigate engagement and activation practices adopted not only by the enterprises themselves, but also by representatives of the beneficiary groups. Through a field visit and semi-structured interviews, we collected a total of 50 interviews, together with secondary data, notes, pictures and videos which enables data triangulation. The sample includes both social enterprises and cooperatives, as well as community-based organizations. The main sectors of operation include coffee production (e.g., Gitwe Farmers Cooperative and Ritho Farmers Cooperative in the Kiambu district), honey production (see figure 1) (e.g., Baringo Honey, MACODEV CBO, and Apiculture Venture), and agriculture in rural areas (including horticulture, fruit, herbs, and dried fruit). Additional operational areas include ethical fashion (e.g., Kazuri Beads and Tribearth) and waste management, with social enterprises active in coastal or urban settings, particularly near major landfill sites in Nairobi (e.g., Bottle Logistics and Africa Collect Textiles).

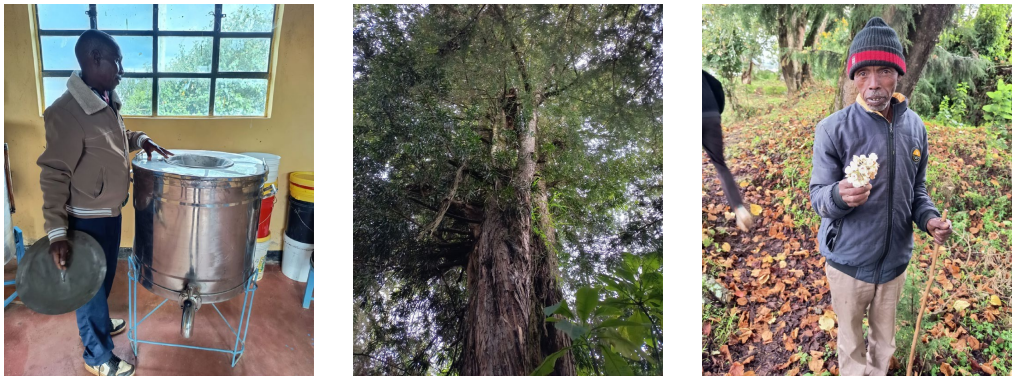


Figure 1. #SE8 Honey Community-Based Organization representative and one of the beneficiary/supplier groups' leaders

The extended abstract proceeds as follows: we first illustrate some relevant theoretical underpinnings, to then synthetize the preliminary findings and highlight major contributions and implications for theory and practice.

2. Brief theoretical background

Recent scholarship in social entrepreneurship has shifted attention from firm-level dynamics to the relational and participatory dimensions that shape how social enterprises (SEs) interact with and involve their beneficiaries (Saebi et al., 2019; Ciambotti et al., 2025). This shift reflects a growing interest in understanding how social change emerges from the collective interplay of

actors within SE ecosystems (Cameron, 2018; Kannothra et al., 2018), and how this interaction can contribute to transformative and sustained impact at the community level (Tobias et al., 2013).

A key development in this stream is the triadic perspective introduced by Kim (2025), which moves beyond the traditional dyadic view of SEs and beneficiaries by incorporating the role of external evaluators. This framework recognizes the active agency of beneficiaries, who can influence both the process and outcomes of social impact initiatives by aligning or misaligning with organizational goals and by leveraging communication with third-party evaluators. This perspective highlights the complexity of the impact creation process, where agency is distributed across multiple actors and embedded within specific social and institutional contexts.

The question of agency activation is particularly salient in contexts characterized by poverty and inequality. As shown by Kim et al. (2019), beneficiaries often operate under a "long-present" temporal logic, where the future is not disconnected from the present, but rather unfolds through incremental and cyclical actions. This contrasts with the future-oriented logic typically adopted by SEs, leading to temporal misalignment that can hinder coordination and shared vision. Nevertheless, when short-term improvements are structured to produce interconnected gains, they may serve as stepping stones for broader developmental processes.

The literature also emphasizes the importance of value appropriation by stakeholders as a foundation for legitimacy and entitlement in value distribution (Bacq & Aguilera, 2022). Yet, participation is not without its challenges. As Ruebottom (2025) notes, the type of "participation work" that SEs engage in, whether open or protective, has consequences for both inclusivity and the reproduction or disruption of community inequalities. This raises critical questions about how social enterprises design participatory processes that can contribute to systemic, community-level transformation.

Against this backdrop, our study seeks to understand the conditions under which beneficiary participation becomes a driver of transformative, community-level impact. It interrogates how SEs can activate a form of agency that mobilizes collective action and supports sustained change, even in contexts marked by temporal, intentional, and structural misalignments between enterprises and their target groups.

3. Research method

3.1. Research setting and sampling

This research adopts a qualitative and inductive approach to investigate how social enterprises engage with their beneficiaries to activate agency and generate transformative community-level impact. The study is grounded in the interpretive tradition, aiming to uncover situated meanings and processes emerging from the field (Gehman et al., 2018; Miles and Huberman, 1994).

Data collection was conducted between July and August 2025 across different regions of Kenya, a country characterized by vast economic, social and political challenges (Kolk and Rivera-Santos 2018; Lashitew et al. 2020; Zoogah et al. 2015), and severe resource constraints such as limited access to financial resources, information technologies, human resources, and raw materials, as well as policy and infrastructure deficits (Ciambotti and Pedrini 2021; George et al. 2016). At the same time, many African countries are experiencing rapid economic and population growth and increasing urbanization as young people leave rural areas to seek better lives in towns and cities (African Economic Outlook 2019). Recent estimates report that there are approximately 44,000 SEs in Kenya (British Council 2017) and policies have been developed to support their establishment and growth (OECD/EU 2017).

The Kenyan context provides therefore a fertile context due to the presence of diverse community-based organizations and networks of social enterprises and vibrant hybrid organizations, community entrepreneurship traditions, and active government and NGO support for inclusive enterprise models.

3.2. Data collection and analysis

We conducted 50 semi-structured interviews with key informants, including representatives from 30 social enterprises (SEs) (see table 1) and 15 community representatives (CRs) (see table 2), who hold leadership or coordination roles within beneficiary groups.

SE#	Social Enterprise	Product	Role	Location
SE#1	Gitwe Farmers Cooperative	Coffee	Secretary manager	Kiambu
SE#2	Ritho Farmers Cooperative	Coffee	Secretary manager	Kiambu
SE#3	Afriwomen Connect	Financial services	Founder	Nairobi
SE#4	Jumatatu Farmers Cooperative	Coffee	Chairman	Kabazi
			Secretary	Kabazi
SE#5	Blessed Business Handicrafts	Handicrafts	Founder	Nakuru
SE#6	Baringo Honey	Honey	Founder	Baringo
SE#7	Karunga Women Group	Handicraft (wool)	Founder	Karunga
SE#8	MACODEV CBO	Honey	Production manager	Mariashoni
SE#9	MALANDO Cooperative	Honey	Vice-chairman	Mariashoni
SE#10	Kwale Recycling Centre CBO	Waste management	Data and community manager	Kwale
SE#11	Tribearth	Ethical handicraft (gems)	Director	Diani
			Employee	Diani
SE#12	Mwana Resource Centre	Business support	Founder	Diani
SE#13	Diani Turtle Watch	Conservation	Marketing and community manager	Diani
SE#14	Apiculture Venture	Honey	Founder	Nairobi
SE#15	Kuza Freezer Africa	Cold storage for fishers	Founder	Mombasa
SE#16	Andy Speaks 4 Special Needs Persons Africa	Assistance to disabilities	Founder	Nairobi
SE#17	Xolani Nature Glow	Soap and beauty care with women groups in slums	Founder	Nairobi
SE#18	Azaavi Food	Dry fruits processing	Founder	Nairobi
SE#19	Botanic Treasurers	Moringa	Founder	Nairobi

SE#20	Everest Enterprises	Horticulture	Project Coordinator	Nairobi

Table 1. List of Social Enterprises sample

CR#	**SE affiliation**	**Activity**	**Role**	**Location**
CR#1	Gitwe Farmers Cooperative	Coffee farming	Secretary and leader	Kiambu (Kiongera)
CR#2	Gitwe Farmers Cooperative	Coffee farming	Chairman and leader	Kiambu (Chanjua)
CR#3	Ritho Farmers Cooperative	Coffee farming	Farmer and leader	Kiambu
CR#4	Baringo Honey	Honey	Trader and leader	Baringo
CR#5	Karunga Women Group	Handicraft (wool)	SE Member and leader	Karunga
CR#6	MACODEV CBO	Honey	Active member	Mariashoni (Sogot nature group)
CR#7	Apiculture Venture	Honey	Founder Lancel social enterprise - Apiquest	Nairobi
CR#8	Azaavi Food	Dry fruits processing	Consumer Ambassador	Nairobi
CR#9	Azaavi Food	Dry fruits processing	Cooperative leader	Machakos
CR#10	Tegemeo Cereals Enterprise Limited	Agriculture	Chairman and Farmers Lead of Opendo Group	Gatonga
CR#11	Ocean sole	Waste management	Team leader at Ocean Sole Mamaz	Kilifi (Mijikenda village)
CR#12	SeedPro Africa Ltd	Agriculture	Chairman	Kabati
CR#13	Omina Otsieno Enterprise	Brass artisans	Member (SE leader)	Kibera
CR#14	Omina Otsieno Enterprise	Brass artisans	Chairman	Kibera
CR#15	Bottle Logistics	Waste collector	Glass waste supplier	Dandora dumpsite

Table 2. List of Community Representatives sample

The interview protocol was designed to explore key themes such as engagement strategies, perceptions of agency, mechanisms of participation, and the translation of individual involvement into broader community outcomes. Interviews were conducted in person, in English or local languages with translation when necessary, and lasted between 45 and 90 minutes. All interviews were audio-recorded, transcribed, and complemented by field notes and on-site observations.

Data are being analyzed using the Gioia methodology (Gioia et al., 2013), which enables the systematic development of grounded theoretical insights. The analysis process involves identifying first-order concepts derived from participants' own terms, abstracting them into second-order themes, and organizing them into aggregate dimensions to construct a structured

representation of the underlying processes. Collaborative coding and data triangulation will be employed to ensure analytical rigor and enhance the trustworthiness of the emerging findings.

4. Preliminary findings and contributions

Preliminary analysis of the 50 interviews conducted across Kenya between July and August 2025 reveals a set of evolving strategies adopted by social enterprises (SEs) to foster transformative change within the communities they serve. These strategies are not static but reflect a shared learning process between SEs and their beneficiaries, varying across different stages of enterprise development.

A key finding is that beneficiary engagement unfolds as a gradual and dynamic process. In the early stages, engagement is often instrumental, with SEs relying heavily on existing community leaders (typically chairpersons or local influencers) to mobilize participation. Most social enterprises reported that, when launching their operations, the first step in working with and for the benefit of the community was to meet directly with community leaders to gain their approval for the enterprise's vision, as well as for the rationale and modalities of community involvement. As emphasized by representatives from SE#6, SE#14, and SE#25, "without such approval, operating within the local context would not have been possible".

While effective initially, this approach often exposes the initiative to risks of power asymmetries and individual interest domination, which can limit inclusive participation and hinder impact scalability. In particular, the main challenges reported by social enterprises concern the difficulty of truly engaging and activating community leaders, who often occupy a merely institutional role within community dynamics. Additional obstacles include self-interested behavior and the dominance of personal or political agendas among these leaders, which undermine efforts to foster meaningful and long-term community engagement aimed at transformative, rather than superficial, change.

Over time, SEs begin to adapt their strategies. A more selective and structured approach to activation emerges, where Community Representatives (CRs) are identified and trained based on their capacity for inclusive leadership, community mediation, and peer influence. These CRs are not chosen arbitrarily but are recognized for their ability to represent diverse interests, foster trust, and act as positive role models. In several cases, SEs invest in strengthening their relationship with CRs, described as built on shared vision, trust, and long-term partnership, and even adapt their business models accordingly, recognizing the CR's role in balancing social mission and economic sustainability in hybrid organizational settings. The data reveals different approaches to community engagement. One approach involves working through the leaders of beneficiary groups within the social enterprise, leveraging individual activation that is detached from political logics of involvement. This model emphasizes the potential to foster not just a single role model but multiple figures within the community who can drive engagement by initiating moments of dialogue and peer exchange. Under the guidance of the social enterprise, these group leaders have proven effective in activating "dormant" members, reducing internal marginalization, often rooted in age, gender, or ethnic differences, and promoting the adoption of positive practices, such as in agriculture.

On the other hand, some organizations have adopted a different model by introducing a designated representative or officer from the social enterprise, selected from within the community based on their expertise, contextual knowledge, and leadership qualities, who is trained to monitor motivation levels within the beneficiary group and, in some cases, to serve as a trainer, for example as an agronomist. These varied approaches appear to enable community activation at different paces and in distinct ways, particularly by fostering dialogue around existing and potential social impact, encouraging collective recognition of key impact drivers, and strengthening the community's capacity to collaborate toward broader and more transformative change.

The progressive shift in engagement practices reflects an underlying alignment with the "long present" temporal logic (Kim et al., 2019), whereby incremental and short-term achievements (often visualized and communicated through tools such as demo farms or pilot projects) are used to build momentum toward broader, long-term transformation. This stepwise approach builds trust, fosters a sense of belonging, and gradually activates individual and collective agency across the community.

In relation to the research question, findings suggest that the agency of beneficiaries is most effectively activated when SEs provide a clearly defined role for CRs in the process of social value creation. This activation is not achieved solely through community legitimacy or positional authority but through the attribution of responsibility, recognition, and opportunity to shape the initiative, confirming the insight of Bacq and Aguilera (2022), on the link between value appropriation, legitimacy, and entitlement.

From a theoretical perspective, this study contributes to literature on beneficiary engagement in social entrepreneurship by illustrating how agency is cultivated not as a static trait, but as a relational and evolving process, contingent on leadership configuration, trust-building mechanisms, and institutional learning. It also nuances the triadic perspective (Kim, 2025), showing that while initial alignment with local leaders may facilitate early participation, scaling impact requires deeper, more representative, and distributed forms of engagement. Finally, the findings enrich debates on temporal alignment in impact strategies, highlighting the operational relevance of the "long present" as a bridging logic for collective transformation.

5. Research limitations and future research

This study, while offering novel insights, is subject to certain limitations. First, the contextual specificity of Kenya limits the generalizability of findings to other socio-institutional environments; future research should conduct comparative studies across diverse African or Global South contexts.

Second, as the data reflects early-stage analysis, longitudinal observation would be valuable to capture how engagement dynamics evolve and sustain over time.

Third, this research primarily focuses on SE–beneficiary interactions; future work could include other ecosystem actors (donors, regulators, NGOs) to analyze how multi-stakeholder interdependencies shape community transformation.

Finally, quantitative validation or mixed-method approaches could strengthen causal explanations regarding how specific engagement mechanisms translate into measurable social impact outcomes.

6. Conclusion

This study advances understanding of how social enterprises in Kenya activate the agency of beneficiaries to drive transformative community change. By moving beyond managerial and firm-centric paradigms, it emphasizes relational, temporal, and contextual dimensions of social impact.

Findings suggest that transformation emerges not merely from delivering social value, but from co-producing it through inclusive participation, distributed leadership, and temporal alignment with local worldviews. The study underscores the importance of recognizing beneficiaries as co-creators—agents capable of reshaping institutional arrangements and sustaining long-term change.

Theoretically, this work contributes to the growing body of scholarship that redefines social entrepreneurship as a collective and participatory process rather than an individualistic one. Practically, it offers actionable insights for social enterprises and policymakers seeking to design engagement models that foster empowerment, trust, and durable impact at the community level.

Keywords: Social entrepreneurship; engagement practices; community entrepreneurship

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Costi-benefici della sostenibilità: Evidenze dall'Impatto delle Certificazioni B-Corp sulle performance di vendita

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1. Introduzione

Negli ultimi anni la consapevolezza delle questioni di sostenibilità è aumentata notevolmente. Tra gli stakeholder, i consumatori mostrano un crescente interesse per il consumo sostenibile e diventano più consapevoli delle conseguenze delle proprie azioni (Giesler e Veresiu, 2014; Bianchi et al., 2020; Bergianti, 2025). Il consumo sostenibile implica soddisfare i bisogni umani fondamentali senza eccessi, ponendo l'accento sulla sostenibilità ambientale e sul benessere delle generazioni future (Quoquab e Mohammad, 2020). Questo approccio comprende scelte consapevoli sullo stile di vita, come preferire prodotti che limitano le emissioni di sostanze tossiche, praticare il riciclo e il riutilizzo per minimizzare i rifiuti e adottare uno stile di vita a basso impatto (Laroche et al., 2011; Spielmann, 2021). Leonelli et al. (2025) mostrano che i consumatori preferiscono acquistare prodotti sostenibili. Inoltre, scoprono che i consumatori non consultano direttamente i bilanci di sostenibilità per informarsi sulle iniziative sostenibili. Allora, in che modo i consumatori integrano la sostenibilità nelle loro decisioni di acquisto? Come riconoscono le informazioni ESG pertinenti per orientare le loro scelte? Queste domande sono importanti perché Leonelli et al. (2025) evidenziano che i consumatori incontrano diverse difficoltà nell'ottenere le informazioni ESG delle imprese. Tuttavia, una volta acquisite, tendono a integrarle nelle loro decisioni di acquisto.

Allo stesso tempo, le aziende si impegnano ad adottare pratiche sostenibili (Villela et al., 2019).

Cerchiamo di rispondere a queste domande esaminando se la certificazione sostenibile di terze parti stimoli gli acquisti dei consumatori da parte di aziende attente ai criteri di sostenibilità. Nel nostro studio analizziamo le variazioni nelle vendite conseguenti all'ottenimento della certificazione B Corp da parte delle aziende. Focalizzarsi su tali certificazioni è fondamentale per due motivi. Primo, è abbastanza facile per i consumatori riconoscere la certificazione, poiché le aziende certificate B Corp possono utilizzare un logo B Corp ben visibile sui loro prodotti. Ciò rende l'acquisizione di informazioni molto più semplice, poiché i consumatori non devono impegnarsi molto a cercare attivamente tali informazioni. Secondo, tali certificazioni esterne sottopongono le attività sostenibili a una valutazione approfondita, che conferisce una validazione sostanziale alle affermazioni di sostenibilità delle aziende. La certificazione B Corp si è affermata come uno strumento strategico per colmare l'asimmetria informativa tra le aziende e gli stakeholder (Parker et al., 2019; Paelman et al., 2021; Lepkowska-White et al., 2023).

Secondo la teoria dei segnali (Spence, 1973; Connelly et al., 2011), in mercati saturi di affermazioni di greenwashing, le certificazioni di terze parti agiscono come segnali affidabili e ad alto costo di qualità, che, teoricamente, dovrebbero generare premi di mercato e aumentare la fidelizzazione dei clienti (Parkinson, 1975; Elité e Teyssier, 2016).

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Usiamo un campione di aziende B Corp italiane in un panel che copre il periodo dal 2019 al 2023. L'Italia rappresenta un contesto empirico ideale, come hub europeo di primo piano, per il movimento B Corp. Sul piano metodologico, questo lavoro va oltre una mera correlazione. Utilizzando un modello a effetti fissi per controllare l'eterogeneità non osservata, testiamo la validità della teoria dei segnali nel contesto della sostenibilità.

I risultati empirici forniscono prove a sostegno dell'ipotesi del surplus di valore. Riscontriamo che la certificazione B Corp aumenta il volume di vendite, confermando la sua funzione di potente segnale di mercato. I nostri risultati si mantengono anche in diversi test di robustezza. Inoltre, mentre osserviamo un aumento marginale dei COGS, che riflette il costo tangibile di "pulire" il processo produttivo, questo è più che compensato dall'incremento del margine lordo di profitto. Ciò suggerisce che la certificazione permette alle aziende di aumentare il volume di vendita, superando i costi di sostenibilità. Infine, l'analisi dell'eterogeneità rivela un nuovo effetto di amplificazione urbana: l'impatto positivo sulle vendite è più marcato per le aziende situate in aree metropolitane ad alta densità, probabilmente a causa di una maggiore concentrazione di consumatori attenti alla sostenibilità.

Questo studio contribuisce alla letteratura esistente sulla sostenibilità aziendale e sulla performance finanziaria. Innanzitutto, va oltre l'analisi tradizionale della redditività netta (ROA/ROE) concentrandosi sull'efficienza operativa e sulla struttura dei costi. Decomponendo l'impatto finanziario in vendite, costi delle merci vendute e margine lordo, evidenziamo il trade-off specifico tra i costi di conformità e i benefici della differenziazione di mercato, confermando l'ipotesi di un surplus di valore. In secondo luogo, testiamo esplicitamente la teoria dei segnali nel mercato italiano, dimostrando che la certificazione B Corp funge da meccanismo chiave per ridurre l'asimmetria informativa e sbloccare i premi di mercato. In terzo luogo, scopriamo l'effetto di amplificazione urbana, aggiungendo un aspetto geografico all'analisi spesso trascurato negli studi precedenti. Infine, forniamo robuste evidenze empiriche dall'Italia, un importante hub del movimento europeo delle B Corp.

2. Stato dell'arte, quadro teorico e sviluppo dell'ipotesi

2.1. B Corps and B Corp certification

B Corp è una certificazione rilasciata alle aziende che adottano pratiche sostenibili (Ferraro et al., 2025). È accessibile a tutte le imprese a livello mondiale ed è gestita da B Lab, un'organizzazione non profit statunitense fondata nel 2006, tramite un questionario di 215 domande (B Lab, 2024). B Lab definisce le pratiche sostenibili per le aziende in cinque aree chiave: ambiente, lavoratori, comunità, clienti e governance (B Lab, 2024). Successivamente valuta quanto bene le aziende implementano queste pratiche attraverso la B Impact Assessment (BIA), che esamina le pratiche con impatto positivo sulla società e sull'ambiente (Blasi & Sedita, 2021). Per ottenere la certificazione, le aziende devono (i) ottenere almeno 80 punti su 200, (ii) impegnarsi legalmente a una governance degli stakeholder (dove consentito dalla legge nazionale) e (iii) divulgare pubblicamente le informazioni sull'impatto delle loro pratiche (B Lab, 2024).

L'interesse accademico per le B Corp è cresciuto negli ultimi anni. Le prime ricerche si sono focalizzate sugli aspetti motivazionali della certificazione (Hickman et al., 2014; Chen e Kelly, 2015; Kim et al., 2016; Diez-Busto et al., 2022), sottolineando il ruolo della leadership fondata sui valori e la distinzione nel mercato. Altri studi hanno esaminato le dimensioni di governance e di operatività, come la configurazione strutturale delle cinque aree di impatto (Gazzola et al., 2019), gli effetti longitudinali della certificazione (Villela et al., 2019) e i meccanismi di responsabilità orientati agli stakeholder (Nigri et al., 2020). Bianchi (2020) ha analizzato le motivazioni degli stakeholder nella scelta delle B Corps, evidenziando che le ragioni principali per supportarle sono: a) responsabilità sociale e ambientale, b) soddisfazione personale e c) salute e qualità della vita. Le performance ambientali e sociali sono state analizzate sia da una

prospettiva aziendale che settoriale. Liute e De Giacomo (2022) hanno utilizzato un framework triple bottom line per valutare le pratiche ambientali delle B Corps nel Regno Unito, mentre Cantele et al. (2021) hanno esaminato gli antecedenti organizzativi delle performance di sostenibilità. Anche la dimensione sociale ha ricevuto attenzione: Ardito et al. (2021) e Contreras et al. (2022) si sono focalizzati sull'equità di genere, sul comportamento innovativo e sulla cultura aziendale. Di recente, Boni et al. (2023) hanno esaminato come le B Corp contribuiscano agli Obiettivi di Sviluppo Sostenibile (SDGs) e hanno confrontato il loro impatto con quello delle imprese non certificate.

2.2. Certificazione B Corp e sales gap

Focalizzandosi specificamente sull'impatto della certificazione B Corp sulle performance finanziarie, le evidenze empiriche restano miste (Chen e Kelly, 2015; Romi et al., 2018; Gazzola et al., 2019; Parker et al., 2019; Richardson e O'Higgins, 2019; Paelman et al., 2021; Ferioli et al., 2022; Lee et al., 2023; Bringas-Fernandez et al., 2024).

Alcuni studi evidenziano un legame positivo. Gazzola et al. (2019) e Paelman et al. (2021) hanno riscontrato, rispettivamente, correlazioni positive con il reddito netto e con la crescita del fatturato, suggerendo che le aziende più sostenibili sono anche le più redditizie. Ferioli et al. (2022) hanno inoltre confermato una performance finanziaria superiore delle aziende certificate nel settore della moda in Italia. Chen e Kelly (2015) hanno analizzato la crescita dei ricavi delle B Corp e hanno riscontrato un aumento statisticamente significativo superiore alla crescita media delle aziende pubbliche dello stesso settore SIC, ma prive di certificazione. Tuttavia, non hanno riscontrato una differenza notevole nella crescita dei ricavi rispetto alle aziende private non B Corp.

Altri forniscono evidenze negative o neutrali. Parker et al. (2019) hanno studiato l'impatto della certificazione B Corp sui tassi di crescita a breve termine e hanno riscontrato un rallentamento della crescita, più pronunciato nelle aziende più piccole e più giovani. Tendenze simili sono state osservate da Pollack et al. (2021) e da Bringas-Fernandez et al. (2024), che hanno riportato rendimenti economici inferiori o l'assenza di differenze statisticamente significative tra le aziende certificate e quelle non certificate. La stessa tendenza è stata riscontrata da Richardson e O'Higgins (2019) e da Lee et al. (2023), i quali hanno concluso che, sebbene la certificazione produca risultati non finanziari positivi, le evidenze sull'impatto diretto sulle performance finanziarie sono scarse. Nonostante l'aumento della letteratura disponibile, rimane un divario significativo.

Al massimo delle nostre conoscenze, nessun studio ha indagato direttamente l'impatto della certificazione B Corp sulle performance di vendita delle aziende, tenendo conto anche di altri elementi, come il costo del venduto (COGS) e l'utile lordo (Gross Profit).

L'unica eccezione parziale è rappresentata dal lavoro di Romi et al. (2018), che ha analizzato se essere una B Corp influisce sulla produttività dei dipendenti e sulla crescita delle vendite. Per quanto riguarda il primo aspetto, non si è riscontrata una differenza significativa nella produttività dei dipendenti tra le B Corp e le altre aziende senza certificazione. Tuttavia, la produttività è significativamente più alta nelle B Corps, dove il trattamento dei dipendenti è riconosciuto come "un'area di eccellenza". In termini di crescita delle vendite, le B Corps mostrano tassi di crescita superiori rispetto ai loro omologhi tradizionali. In particolare, le B Corps che si distinguono per l'attenzione al consumatore registrano una crescita delle vendite notevolmente superiore. Il nostro studio mira a colmare questa lacuna analizzando se la certificazione funge da un efficace segnale di mercato che stimola le performance di vendita.

2.3. Quadro teorico e sviluppo dell'ipotesi di ricerca

Questo studio si basa sulla teoria dei segnali (Spence, 1973), che fornisce una spiegazione solida del perché le aziende divulgano volontariamente informazioni oltre i requisiti normativi (Salvi et al., 2021), in particolare per mitigare le asimmetrie informative tra gli insider (aziende) e gli outsider (consumatori e stakeholder). In mercati in cui la qualità del prodotto o gli attributi etici non sono osservabili, l'asimmetria informativa genera attriti (Salvi et al., 2021). Grazie alla crescente consapevolezza e all'informazione dei consumatori, le certificazioni sono diventate uno strumento utile per guidare le loro scelte d'acquisto. Le certificazioni rappresentano un importante veicolo di informazione, permettendo alle aziende di comunicare direttamente i propri valori e i propri metodi di produzione. Inoltre, la certificazione incoraggia le aziende a investire nella misurazione dell'impatto sociale, portando a decisioni più informate, a una maggiore credibilità e a esternalità positive di carattere sociale e ambientale (Paelman et al., 2021; Bringas-Fernandez et al., 2024).

Nel contesto della sostenibilità, le certificazioni di terze parti costituiscono un mezzo essenziale di comunicazione. Come osservato da Elité e Teyssier (2016), le certificazioni di terze parti sono significativamente più efficaci nel ridurre lo scetticismo rispetto alle affermazioni aziendali non supportate da prove. Inoltre, Rajgopal et al. (2025) affermano che la sostenibilità delle aziende spesso manca di sostanza economica ed è prevalentemente simbolica. Dal momento che la certificazione B Corp richiede una valutazione da parte di terzi, è importante focalizzarsi su di essa per assicurarsi che i risultati non siano influenzati dal greenwashing. Il rigoroso processo di valutazione richiesto da B Lab funge da 'segnale costoso', convalidando l'impegno dell'azienda nei confronti degli standard sociali e ambientali. Tale certificazione riduce l'asimmetria informativa sulla condotta etica dell'azienda, favorendo la fiducia dei consumatori e riducendo lo sforzo cognitivo necessario nelle decisioni di acquisto. Coinvolgendo un revisore esterno per verificare le proprie pratiche, le B Corps segnalano la loro qualità e affidabilità, il che, secondo la teoria, dovrebbe tradursi in un vantaggio competitivo sul mercato.

Partendo dal presupposto che la certificazione B Corp funge da segnale credibile di affidabilità, differenzia i prodotti e si allinea alla crescente consapevolezza dei consumatori, riteniamo che le aziende certificate registreranno prestazioni di vendita superiori. In particolare, la riduzione dell'asimmetria informativa dovrebbe favorire la preferenza dei consumatori e l'incidenza degli acquisti. Pertanto, formuliamo la seguente ipotesi:

H1: La certificazione B Corp ha un'influenza positiva sulle prestazioni di vendita di un'azienda.

3. Metodologia

3.1. Selezione del campione

Per verificare la nostra ipotesi, il campione include aziende B Corp italiane certificate in diversi settori entro dicembre 2023. Le aziende sono state selezionate dal sito ufficiale di B Lab, filtrando quelle con sede in Italia. Per garantire la coerenza dei dati in questa analisi, sono stati consultati anche i siti web delle aziende. Abbiamo raccolto i dati contabili e finanziari delle B Corp dai database di AIDA e di Moodie. In particolare, abbiamo considerato il periodo dal 2019 al 2023, dato che il 2019 è stato il primo anno in cui i dati sono stati resi disponibili. La raccolta si è fermata al 2023 perché, al momento della raccolta, molte aziende non avevano ancora dati per il 2024. Alla fine del 2023, in Italia c'erano 243 B Corps. Il nostro dataset inizia con 221 B Corp. Abbiamo scelto le B Corp italiane perché l'Italia è stata il primo paese europeo ad adottare la legge sulle Benefit Corporation, con la Legge di Stabilità n. 208 del 28 dicembre 2015. Le aziende che perseguono la certificazione B Corp entro tre anni devono anche diventare benefit corporation, se non lo sono già.

3.2. Specificazione del modello e variabili di misurazione

Per testare la nostra ipotesi, eseguiamo la seguente equazione di regressione (OLS):

$$(1) \quad Sales_{i,t} = \beta_0 + \beta_1 BCorp_{i,t} + \beta_2 ROA_{i,t-1} + \beta_3 Size_{i,t} + \beta_4 Tangibility_{i,t} + \beta_5 CR_{i,t} + \beta_6 \frac{D}{E_{ratio_{i,t}}} + e_{i,t}$$

La variabile dipendente, Vendite, rappresenta il fatturato netto annuale rapportato alle attività totali. Moody's Analytics definisce le vendite come il totale dei ricavi generati dalle attività operative dell'azienda (fatturato netto).

In analisi aggiuntive, abbiamo utilizzato misure alternative: l'utile lordo (Gross Profit - GP) e il costo del bene venduto (Cost of Goods Sold - COGS). La prima rappresenta la redditività lorda dell'azienda prima di spese operative, interessi e tasse. I COGS sono i costi diretti sostenuti per produrre i beni o servizi venduti dall'azienda.

La nostra principale variabile di interesse è B Corp: è uguale a 1 per gli anni successivi all'ottenimento della certificazione B Corp da parte di un'azienda e a 0 prima di allora.

Includiamo diverse variabili di controllo.

Controlliamo il ROA ritardato (ROA), definito come l'utile prima delle voci straordinarie rapportato alle attività medie, poiché la redditività dell'anno precedente potrebbe influenzare le vendite dell'anno corrente (ad esempio, le perdite dell'anno precedente potrebbero indurre le imprese a spingere di più sulle vendite attraverso la deflazione dei prezzi, come evidenziato da Roychowdhury nel 2006). Inoltre, le aziende più redditizie potrebbero avere opportunità di investimento migliori (Heras-Saizarbitoria et al., 2011; Bose et al., 2022), che potrebbero generare vendite più elevate.

La dimensione (Size) è il logaritmo naturale delle attività totali dell'azienda. Le grandi aziende sono probabilmente soggette a una pressione maggiore per investire in pratiche sostenibili, data la loro maggiore disponibilità di risorse (Arora et al., 2021).

La tangibilità (Tangibility) è il rapporto tra gli impianti, le proprietà e le attrezzature nette di un'azienda e il suo totale delle attività. Campello (2007) dimostra che la tangibilità degli asset può influenzare le vendite in determinate condizioni.

CR (Current Ratio) sta per rapporto di liquidità ed è calcolato come attività correnti divise per passività correnti.

Il rapporto D/E indica il rapporto tra il debito totale e il capitale proprio (D/E Ratio) e rappresenta la proporzione di finanziamento dell'azienda proveniente dal capitale di debito rispetto al capitale proprio.

Appendix A elenca le definizioni di tutte le variabili. Includiamo gli effetti fissi per firm, year e clusterizziamo gli standard errors a livello aziendale (company level). Winsorizziamo le variabili continue ai livelli del 1% e del 99%.

4. Risultati e discussioni

La Tabella 1 presenta i risultati delle statistiche descrittive relative alle variabili utilizzate nel nostro studio.

Nel Panel A, presentiamo le statistiche riassuntive delle variabili chiave sull'intero campione. Come mostrato nella tabella, la variabile dipendente – Vendite – ha una media dell'1,041%, indicando vendite generalmente positive nelle B Corps. Inoltre, la principale variabile indipendente, B Corp, ha una media di 0,659. Infine, per quanto riguarda le variabili di controllo, ROA, Dimensione, Tangibilità, CR e D/E Ratio hanno valori medi rispettivamente di 4,539%, 15,789%, 0,156%, 1,880% e 1,459%.

Il panel B fornisce statistiche descrittive separatamente per le B Corp non ancora certificate e per le stesse B Corp certificate, utilizzando le differenze del test t univariato. Si osserva che la B Corp certificata ha una media di vendite più alta (1,095%) rispetto a quando non era certificata

(0,936%). Le B Corp certificate presentano anche valori più elevati di ROA e Dimensione – rispettivamente 5,338% e 15,875% – rispetto a quelli registrati prima della certificazione. Al contrario, le B Corp certificate hanno un rapporto D/E inferiore (1,377%) rispetto a quello prima della certificazione (1,617%).

Panel A: Statistiche riassuntive

La tabella sopra riporta le statistiche riassuntive relative alle variabili chiave utilizzate nel nostro studio. Tutte le variabili sono definite nell'Appendice A e sono state winsorizzate ai livelli dell'1% e del 99%.

Panel B: Univariate (t-test) differences

Variable	N	Mean	Median	Std Dev	Min	Max	p25	p75
SALES	520	1.041	0.931	0.665	0.206	2.263	0.627	1.296
B Corp	520	0.659	1.000	0.474	0.000	1.000	0.000	1.000
ROA	520	4.539	3.895	14.119	-19.665	25.485	0.980	8.625
Size	520	15.789	15.826	2.178	12.553	19.310	14.370	17.389
Tangibility	520	0.156	0.077	0.168	0.003	0.471	0.021	0.265
CR	520	1.880	1.510	1.271	0.625	4.107	1.143	2.304
D/E Ratio	520	1.459	0.625	2.723	0.015	5.300	0.220	1.495

	Pre-Certification		Post-Certification			
Variables	N	Mean	N	Mean	Diff	t-stat
SALES	177	0.936	343	1.095	-0.159	-2.601
Size	177	15.621	343	15.875	-2.255	-1.264
Tangibility	177	0.156	343	0.152	0.012	0.785
CR	177	1.965	343	1.837	0.128	1.093
D/E Ratio	177	1.617	343	1.377	0.239	0.950

La tabella sopra fornisce statistiche descrittive distinguendo le aziende certificate B Corp e le aziende non certificate. Tutte le variabili sono definite nell'Appendice A e sono state winsorizzate ai livelli dell'1% e del 99%.

Tabella 1. Statistica Descrittiva

La Tabella 2 riporta la correlazione di Pearson. Le due misure, Vendite e B Corp, sono significativamente e positivamente correlate. I risultati univariati sopra forniscono una prima evidenza che la certificazione B Corp influisce positivamente sulle vendite delle aziende. Poiché B Corp è la nostra variabile principale, i risultati indicano che la certificazione B Corp funge da segnale di fiducia per i consumatori, influenzando positivamente le vendite. Per quanto riguarda l'analisi di correlazione, i risultati mostrano che la multicollinearità non costituisce un problema. Il coefficiente di correlazione più forte si osserva tra le variabili di controllo Tangibilità e Dimensione, pari a 0,408. Gujarati (1995) e Kennedy (1999) suggeriscono che i problemi di multicollinearità non si verificano quando il coefficiente di correlazione è inferiore a ±0,8 o ±0,9. Inoltre, nella Colonna 2, abbiamo valutato la potenziale multicollinearità utilizzando l'analisi del fattore di inflazione della varianza (VIF). La multicollinearità è considerata irrilevante quando i

valori di VIF sono inferiori alla soglia critica di 10 (Gujarati, 1995). Il valore più alto è rappresentato dalla variabile Dimensione (8,33). In un test di robustezza, abbiamo rimosso la variabile di controllo Dimensione e ottenuto risultati simili. Pertanto, si può concludere che la multicollinearità non costituisce un problema nell'interpretazione dei risultati di questo studio.
La tabella 2 presenta le correlazioni di Pearson tra le variabili chiave utilizzate nel nostro studio. Inoltre, la Colonna 2 riporta il fattore di inflazione della varianza. Tutte le variabili sono definite nell'Appendice A. Sono state winsorizzate ai livelli del 1% e del 99%.

Tabella 2. Matrice di correlazione di Pearson e VIF

La Tabella 3 presenta i risultati dell'equazione di regressione principale (1). Evidenzia una relazione positiva e statisticamente significativa tra le aziende con certificazione B Corp e le loro

Variables	**VIF**	**SALES**	**BCorp**	**ROA**	**Size**	**Tang**	**CR**	**D/E**
SALES		1						
BCorp	2.97	**0.114**	1					
ROA	1.16	**0.237**	**0.079**	1				
Size	8.33	**-0.314**	0.055	**-0.089**	1			
Tang	2.28	**-0.147**	-0.034	0.006	**0.408**	1		
CR	3.53	-0.029	-0.048	**0.159**	-0.025	**-0.223**	1	
D/E	1.36	0.032	-0.042	**-0.146**	-0.014	**0.142**	**-0.234**	1

vendite. La colonna 1 mostra i risultati senza variabili di controllo (Coefficiente su B Corp = 0,088**), mentre la colonna 2 mostra i risultati del modello di regressione completo (Coefficiente su B Corp = 0,142***). Entrambe le colonne confermano l'ipotesi formulata in questo studio. Questo risultato illustra come le aziende che ottengono la certificazione B Corp siano in grado di raggiungere un livello di vendite superiore. Questo risultato si allinea anche con ricerche precedenti che dimostrano come, grazie alla certificazione B Corp, le aziende ottengano migliori performance finanziarie e redditività (Gazzola et al., 2019; Paeleman et al., 2021; Ferioli et al., 2022). A differenza di studi precedenti, abbiamo utilizzato le vendite anziché il ROA o altre misure di redditività, poiché si tratta di effetti indiretti o risultati. Inoltre, possono essere più suscettibili a manipolazioni contabili. Tuttavia, le vendite sono meno soggette a manipolazioni e sono direttamente collegate alla sostenibilità. I risultati, in linea con la teoria del segnale, dimostrano che la certificazione B Corp funge da segnale costoso che le aziende usano per attrarre i consumatori e comunicare informazioni sulle proprie pratiche sostenibili. Una comunicazione aggiuntiva con i consumatori riduce l'asimmetria informativa tra aziende e consumatori, consentendo alle aziende di coinvolgere un numero maggiore di clienti. Di conseguenza, i consumatori tendono a preferire i prodotti e i servizi certificati rispetto a quelli non certificati.

	(1)	(2)
	SALES	SALES
B Corp	**0.088****	**0.142*****
	(0.047)	**(0.046)**

ROA		-0.002
		(0.003)
Size		-0.256**
		(0.106)
Tangibility		0.607
		(0.511)
CR		-0.020
		(0.017)
D/E Ratio		0.022**
		(0.018)
Intercept	0.983***	4.912***
	(0.031)	(1.695)
Observations	520	520
Fixed Effects	Firm, Year	Firm, Year
Clustering of SE	Firm Level	Firm Level
R-squared	0.013	0.093

La tabella 3 mostra l'impatto della certificazione B-Lab sulle vendite dell'impresa, secondo l'equazione di regressione (1). La colonna (1) presenta i risultati senza includere le variabili di controllo, mentre la colonna (2) mostra i risultati del modello di regressione completo. Tutte le variabili sono definite in Appendice A. Sono stati inclusi effetti fissi per impresa e per anno, e gli errori standard sono stati raggruppati a livello di impresa. Tutte le variabili continue sono state trattate mediante la winsorizzazione ai livelli del 1% e del 99%. ***, ** e * indicano rispettivamente significatività statistica al livello del 99%, 95% e 90%.

Tabella 3. L'impatto della certificazione B Corp sulle vendite delle aziende

Per sostenere la nostra tesi iniziale, sono già stati eseguiti alcuni test di robustezza e ne sono previsti altri in futuro.

Abbiamo condotto un'analisi aggiuntiva decomponendo la variabile dipendente Vendite nei suoi due componenti principali: Margine Lordo (ML) e Costo delle Merci Vendute (CMV). Questa decomposizione ci permette di capire se l'aumento delle vendite è principalmente guidato da un 'effetto markup' (prezzi più alti) o da un 'effetto volume' (aumento della produzione e delle quantità vendute). I risultati, mostrati nella Tabella 4, Sezione A, indicano un'associazione positiva e significativa tra la certificazione B Corp e sia il CMV (Coefficiente su B Corp = 0,017*) sia il ML (Coefficiente su B Corp = 0,117***). La decomposizione delle vendite in ML e CMV offre un'analisi interessante sul trade-off tra costi e benefici della sostenibilità. Innanzitutto, confrontando i coefficienti per il CMV, si osserva una riduzione di entità dal periodo pre-certificazione (Tabella 5, Sezione B, Coefficiente su B Corp = 0,036***) al periodo post-

certificazione (Coefficiente su B Corp = 0,017*). Questa traiettoria suggerisce che il costo è più elevato durante la fase preparatoria, in cui le aziende investono intensamente per aggiornare le filiere e i processi per rispettare gli standard rigorosi di B Lab. Una volta certificate, le aziende sembrano raggiungere una stabilizzazione operativa o beneficiare di economie di scala, poiché l'aumento del volume di vendite diluisce l'incidenza dei costi di produzione sostenibile. In secondo luogo, e più importante, l'impatto post-certificazione sul ML (Coefficiente su B Corp = 0,117***) è proporzionalmente maggiore rispetto all'impatto sul CMV (Coefficiente su B Corp = 0,017*). Questa differenza indica che la certificazione B Corp genera un surplus di valore. Di conseguenza, i guadagni di fatturato derivanti dall'effetto markup e dalla crescita del volume superano i costi incrementali.

Questa scoperta mette in discussione la visione tradizionale della sostenibilità come un costo netto, dimostrando invece che, per le B Corp, l'efficienza nel catturare valore supera il costo di conformità. Questa conclusione ha importanti implicazioni teoriche per la teoria dei segnali. Sebbene le pratiche sostenibili comportino un aumento marginale dei costi operativi, la certificazione funge da segnale di mercato che sblocca un maggiore potere sui prezzi per le aziende e, di preferenza, per i consumatori. Ciò si allinea a quanto rilevato da Bianchi et al. (2020), secondo cui i valori sociali e ambientali dei consumatori sono i principali driver dell'aumento della spesa e della preferenza per le B Corp.

Panel A: Decomposizione delle vendite in costo del venduto e margine lordo

	(1)	(2)
	COGS	Gross Profit
B Corp	**0.017***	**0.117*****
	(0.009)	**(0.042)**
ROA	0.001	-0.001
	(0.001)	(0.003)
Size	-0.031**	-0.229**
	(0.014)	(0.106)
Tangibility	-0.096	0.501
	(0.078)	(0.349)
CR	-0.019**	-0.008
	(0.008)	(0.0147)
D/E Ratio	-0.002	0.023
	(0.002)	(0.017)
Intercept	0.839***	4.240**
	(0.221)	(1.705)

Observations	510	519
Fixed Effects	YES	YES
Clustering of SE	Company	Company
R-squared	0.014	0.216

Panel B: Costo del venduto pre-certificazione

	COGS
B Corp	**0.036*** **
	(0.009)
Intercept	1.805***
	(0.671)
Observations	146
Fixed Effects	YES
Clustering of SE	Company
R-squared	0.006

La tabella sopra mostra i risultati di un'analisi aggiuntiva in cui sostituiamo e scomponiamo le nostre vendite dipendenti. In particolare, nel Panel A, esaminiamo il Costo del Venduto (COGS) nella Colonna 1 e il Margine Lordo (GP) nella Colonna 2. Il Panel B si concentra sul COGS delle aziende prima della certificazione. Tutti i modelli includono variabili di controllo, che non sono elencate per brevità. Tutte le variabili sono definite nell'Appendice A. Consideriamo gli effetti fissi e raggruppiamo gli errori standard per impresa. Winsorizziamo tutte le variabili continue ai livelli del 1% e del 99%. ***, ** e * indicano rispettivamente significatività statistica al livello del 99%, del 95% e del 90%.

Tabella 4. Analisi Aggiuntive

Infine, si indaga sull'effetto della certificazione B Corp in diverse aree geografiche italiane. Concentrandosi su aziende situate in aree metropolitane altamente popolate come Roma, Milano e Napoli, si riscontra un coefficiente pari a 0,172** (Tabella 5, Panel A), superiore in magnitudine rispetto a quello del modello di base (Coeff. su B Corp = 0,142***). Sebbene la significatività statistica si limiti al livello del 5% ($p < 0,05$), probabilmente a causa della ridotta dimensione del campione nel cluster urbano, l'entità economica più elevata fornisce un insight cruciale. Suggerisce che la certificazione B Corp agisca come un motore di mercato più forte nelle grandi città. Ciò si allinea con il concetto di ambienti urbani che concentrano una quota maggiore di consumatori con preferenze pro-sociali e potere d'acquisto (Laroche et al., 2001). Le reti informative più dense nei centri metropolitani favoriscono la diffusione del segnale di sostenibilità, aiutando le aziende certificate a ottenere un riconoscimento reputazionale superiore alla media nazionale.

Panel A: Concentrandosi solo sulle regioni che ospitano le tre città più popolose: Roma, Milano e Napoli.

	SALES
B Corp	**0.172****
	(0.072)
Intercept	5.833
	(1.475)
Observations	223
Fixed Effects	YES
Clustering of SE	Company
R-squared	0.194

Panel B: Escludendo le regioni che ospitano le tre città più popolose d'Italia

	SALES
B Corp	**0.131****
	(0.066)
Intercept	3.686
	(3.103)
Observations	297
Fixed Effects	YES
Clustering of SE	Company
R-squared	0.070

Il Panel A evidenzia l'impatto delle B Corp sulle vendite nelle tre città più popolose italiane: Roma, Milano e Napoli. Il Panel B mostra l'impatto della certificazione B Corp sulle vendite di tutte le B Corp, escludendo quelle nelle tre città più popolose. Tutti i modelli includono variabili di controllo, che non sono elencate per brevità. Tutte le variabili sono definite nell'Appendice A. Sono stati applicati effetti fissi e gli errori standard sono stati raggruppati a livello aziendale. Abbiamo winsorizzato tutte le variabili continue ai livelli del 1% e del 99%. ***, ** e * indicano rispettivamente significatività statistica ai livelli del 99%, 95% e 90%.

Tabella 5. Cross-Sectional test

5. Limiti della ricerca

La principale limitazione riguarda la composizione del campione, che comprende solo le B Corps italiane, riducendo la generalizzabilità dei risultati e rendendo difficile trarre conclusioni per altre regioni. Tuttavia, queste limitazioni non compromettono la qualità complessiva dello studio e offrono spunti preziosi per future ricerche. Infatti, studi futuri potrebbero includere B Corps di altri paesi. Riconosciamo che il nostro modello di regressione esclude variabili di controllo che ricerche precedenti su aziende quotate in borsa hanno incorporato. Dato che il nostro campione è composto da imprese private, le analisi sono limitate dai dati disponibili nei database AIDA e Moodie. Pur riconoscendo questa limitazione, riteniamo che i nostri risultati offrano un contributo nuovo e prezioso alla letteratura sulla sostenibilità e sulle organizzazioni ibride.

Parole chiave: B-Corp Certification; sales performance; sustainable information asymmetry; signaling theory

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Appendice A: Variabili

NOMI DELLE VARIABILI	DEFINIZIONI
B CORP	Indicator variable equal to one starting the year a company receives the B Corp certification and zero before that.
SALES	Total sales scaled by total assets.
COGS	A firm's Cost of Goods Sold, scaled by total assets.
GP	A firm's Gross Profit, measured as the company's gross profitability scaled by total assets
CR	Current Ratio, calculated as current assets divided by current liabilities.
ROA	Return on Assets, calculated as Net Income scaled by average assets.
SIZE	Natural logarithm of the firm's total assets.
TANG	Tangibility, it refer to net plant, property and equipment scaled by total assets.
D/E	**Total Debt scaled by total Equity**

Track 11: SISTEMI E AZIENDE DI TUTELA DELLA SALUTE

Developing Patient Engagement KPIs for Performance Management in Primary Healthcare Setting: A Digital-Driven Framework
Giulia Cattafi, Monica Giancotti, Marianna Mauro, Giorgia Rotundo

Addressing SDGs unintentionally while managing the COVID-19 crisis: Insights from Italian Healthcare
Benedetta Siboni, Paola Canestrini, Abeer Hassan

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Luigina Paglieri, Fabiana Scalabrini, Andrea Bonomi Savignon, Denita Cepiku

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Federico Lega, Francesca Ferrè, Luisa Paolina Rizzi, Marianna Ginocchietti, Elisa Ducoli, Michela Filippi, Paolo Gubitta, Elena Fanton, Claudio Costa

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Fiorella Pia Salvatore, Francesco Maria Nacci, Piervito Bianchi, Marco Taliento

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Marta Russotto, Marco Ferretti, Benedetta Pini

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Antonio Nisio, Grazia Dicuonzo, Michele De Filippis

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Ilaria Elisa Vannini, Michela Piccarozzi, Maria Grazia Provenzano

Verso un sistema di indicatori di performance per la Supply Chain ospedaliera: evidenze da un'analisi multi-caso
Giulia Interlandi, Valeria Belvedere, Stefano Villa

Il cuore green della sanità: la sfida dell'eco-innovazione per i middle managers

Luca Piubello Orsini, Vincenzo Riso, Stefano Landi, Chiara Leardini

Verso un modello integrato di Patient Blood Management: gli impatti di un percorso ospedale-territorio

Gaia Bassani, Luca Barcella, Silvia Gelsumini, Varusca Brusegan, Francesco Poggioli, Alberto Benigni, Michela Seghezzi, Roberto Marozzi, Cristina Schiantarelli, Giulia Ravasio, Eleonora Sanga, Gavino Napolitano, Daniele Marchetti, Maria Grazia Alessio, Federico Chiodini, Roberto Moretti, Cristina Caldara, Andrea Gianatti, Ferdinando Luca Lorini, Gabriele Pagani, Gianluca Vecchi, Alessandro Amorosi, Simonetta Cesa, Francesco Locati

La valutazione multidimensionale dei servizi sanitari territoriali nella prospettiva "Citizen Care in Community"

Claudio Travaglini

Le preferenze di clinici, manager ibridi e amministrativi nelle scelte di adozione dell'innovazione in sanità

Alessandra Da Ros, Stefano Landi, Claudia Bazzani, Chiara Leardini

Beyond Adoption: Artificial Intelligence and Organizational Transformation. An Empirical Study

Alba Miranda, Annunziata Tarulli, Raffaele Silvestri, Domenico Morrone

Benessere e Accountability: Determinanti della Disclosure sull'SDG 3 nei PIAO Ospedalieri

Vincenzo Pontrelli, Lara Oliva, Angelo Rosa, Arcangelo Marrone

Progettazione di un modello di riferimento per l'implementazione di soluzioni digitali innovative e sostenibili nell'attuale sistema della Salute

Claudia Salvatore, Lorenzo Mercurio, Alessandra Ricciardelli, Alessio Piras, Maddalena Illario

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Alessandra Pernice, Francesca De Domenico

Innovazioni tecnologiche e Medicina di Genere: verso modelli personalizzati di assistenza sanitaria

Grazia Dicuonzo, Antonio Fusco, Virginia Milone, Nadia Cipullo

Developing Patient Engagement KPIs for Performance Management in Primary Healthcare Setting: A Digital-Driven Framework

Giulia Cattafi[1], Monica Giancotti[2], Marianna Mauro[3], Giorgia Rotundo[4]

1. Background and Conceptual Development

Performance measurement represents a strategic cornerstone for public healthcare organizations, as it supports continuous improvement, accountability, and evidence-based decision-making. Yet, "what cannot be measured cannot be improved," and in the domain of primary healthcare this principle has critical implications. Recent empirical evidence from Italian Local Health Authorities (LHAs) indicates a marked scarcity of robust patient engagement (PE) key performance indicators (KPIs) within performance plans, and where such indicators exist, they are often generic, inconsistently defined, or disconnected from established conceptual domains.

This gap is particularly problematic because patient engagement—encompassing cognitive, behavioural, and emotional dimensions—has been widely recognized as a determinant of care quality, adherence, self-management, and ultimately system-level sustainability. In the transition toward digital-era governance, the integration of PE metrics within performance management systems requires not only conceptual clarity but also reliable, standardized measurement tools, supported by digital technologies capable of enabling real-time data collection and monitoring.

2. Aims

This research-in-progress aims to:

- address the current measurement gap observed in LHA performance plans by offering a structured, actionable set of PE KPIs for primary healthcare, grounded in the three core domains of patient engagement (cognitive, behavioural, emotional), capable of supporting performance evaluation and strategic decision-making;
- design a digital-enabled measurement model identifying data sources, collection methods, and digital tools necessary for monitoring such indicators over time.

3. Methodological Framework

The study adopts a sequential mixed-methods design.

- Phase 1 – Systematic Document Analysis (completed):

Building on prior analysis of all 110 Italian LHAs' performance plans, we confirm the limited and inconsistent presence of PE-related indicators. Indicators were extracted, categorized,

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and mapped against existing PE frameworks, highlighting substantial conceptual and operational fragmentation.

- Phase 2 – Conceptual Development of PE KPIs (ongoing):

A structured literature review and expert consultations are being used to define a preliminary set of PE indicators aligned with: Cognitive engagement (awareness, health literacy, informed decision- making); behavioural engagement (adherence, self-management behaviours, proactive use of services), emotional engagement (satisfaction, relational continuity).

- Phase 3 – Digital-Driven Measurement Model (ongoing):

To ensure feasibility and real-time applicability, each KPI will be associated with: specific digital data sources (mobile apps, electronic health records), collection processes (patient-reported digital surveys), and monitoring dashboards enabling continuous performance assessment.

This phase leverages digital-era governance principles (interoperability, real-time data flows, user- centric systems) to enhance the measurability and utility of PE indicators.

4. Expected results

The project is expected to deliver:

- a validated set of PE KPIs explicitly linked to the cognitive, behavioural, and emotional domains;
- a digital monitoring framework demonstrating how these indicators can be systematically collected and integrated into primary healthcare performance management and measurement systems;
- a practical roadmap for LHAs to incorporate PE metrics into performance plans, strengthening patient-centered governance;
- insights into barriers and enablers related to data availability, standardization, and organizational digital maturity.

Preliminary evidence confirms the urgent need for standardized, patient-centred indicators capable of capturing how public healthcare organizations engage, inform, and empower patients. The proposed framework aims to bridge the gap between policy ambitions of patient-centeredness and the operational reality of performance measurement.

5. Contribution

This research advances the debate on patient-centered performance management by providing:

- a conceptually grounded and operationally feasible KPI system;
- an explicit integration of digital technologies into PE measurement;
- and a scalable model that can inform national strategies and organizational practices in primary healthcare.

By offering measurable, digital-enabled KPIs, this study supports the evolution of primary care toward more transparent, accountable, and patient-engaging performance systems.

6. Author Contribution

Marianna Mauro and Monica Giancotti conceived and designed the research project. Giulia Cattafi and Giorgia Rotundo were responsible for the extraction of performance plans of Italian Local Health Authorities (LHAs) and conducted the first phase of document analysis aimed at identifying patient engagement indicators (Phase 1 – Systematic Document Analysis). Monica Giancotti led the conceptualization and development of the study results, with particular reference

to the definition of patient engagement KPIs (Phase 2 – Conceptual Development of PE KPIs). All authors are jointly involved in the ongoing development of the digital-driven measurement framework (Phase 3 – Digital-Driven Measurement Model). The writing of the extended abstract is the result of a collaborative effort among all authors.

Keywords: Patient engagement; key performance indicators; performance management; primary care

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Addressing SDGs unintentionally while managing the COVID-19 crisis: Insights from Italian Healthcare

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1. Introduction

Including SDGs in the organisations' management and accounting allows decision-makers and managers to effectively account for which dimensions of well-being they affect and contribute. Thus, in the last decade many organisations have engaged with the SDGs within their practices (Bebbington, Unerman, 2020) and attempts to account for and be accountable for environmental and social impacts have proliferated, accompanied by intellectual efforts of scholars (Laine et al., 2022).

Health providers hold decisive characteristics for SDGs achievement as they act on the community's health and beyond. Indeed, their public action impact at the spatial level, addressing the needs of different stakeholders, and at the inter-temporal level, affecting the citizens' health of today but also of tomorrow (Gherardi et al., 2021). Moreover, they contribute to reducing inequalities between territories, moving and employing many people, addressing gender and diversity issues, developing advanced technologies, producing non-recyclable waste and cooperating within a vast stakeholder network. The health sector already uses non-financial measurement systems to plan and assess its objectives (Mitchell et al., 2021) and accounting scholars show that the rewriting of accounting practices in this sector has already begun, supported by new frameworks of social and moral responsibility (Vesty et al., 2023). However, as stated by Cavicchi et al. (2022), SDGs engagement in this sector is recent, and the management and accounting literature on this topic has not yet flourished. The few existing studies (e.g. Busco et al., 2020) affirm that the health sector generally addresses Goals No. 3 (health and well-being), No. 4 (quality education), No. 5 (gender equality), No. 8 (decent work and economic growth), and No. 9 (industry innovation and infrastructure). Notwithstanding, little is known if the health sector explicitly pursues SDGs. Moreover, despite SDGs are increasingly relevant in healthcare accountability, they are still weakly embedded in strategic planning, management accounting, and reporting (Cavicchi et al., 2022).

Worldwide, the COVID-19 pandemic represented a disrupted progress toward the SDGs (Parker, 2020), and it intensified accountability demands (urgency, resource reallocation, legitimacy pressures). According to Hörisch (2021), the pandemic posed a significant threat to attaining the SDGs, yet it also presents certain opportunities within specific SDG domains. The author discerns patterns indicating the opportunities or threats associated with various SDGs. The identified patterns shed light on the SDGs requiring additional efforts for achievement in the aftermath of the pandemic. In these circumstances, accounting for health providers has become increasingly visible and contested during the pandemic health crisis, hence requiring a shift from

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a technical practice to one that embraces social and moral values (Vesty et al., 2023). Indeed, the pandemic has been defined as a wicked problem, characterised by dramatic, inconsistent, unpredictable and uncertain events – turbulent times –generating a complex and constrained context featuring high levels of complexity, uncertainty and divergence, often caused by information scarcity and data-related problems (Phillips et al., 2023), whereby resolving one aspect develops other issues and inhibits planning strategies to prevent adverse outcomes. In addition, a wicked problem is characterised by a conflict about the values involved and disagreement about the possible solutions or principles that should guide improvements (Head, 2022) or different positions to accommodate (Warner et al., 2021). In this context, the SDGs lens helps navigate the complexity and adverse effects experienced during grand challenges, as the COVID-19 pandemic has been defined (Carnegie et al., 2023; Rinaldi, 2022). However, applying the SDGs lens to wicked problems is often scant in empirical research, especially when dealing with health issues (e.g. Bennich et al., 2020). Furthermore, the actions for achieving the organisation's objectives do not often consider the interactions between the SDGs, thus missing the holistic sense of the UN's SDGs 2030 Agenda (Nilsson et al., 2016).

Considering these gaps, the current research aims to investigate the SDGs engagement of Italian healthcare providers from the planning phase during and after the COVID-19 pandemic. Research questions (RQs) are:

- RQ1: Do healthcare organisations' crisis management and return-to-normalcy decisions relate to multiple SDGs? And if so, how?
- RQ2: Do and how interconnections, synergies, and trade-offs among SDGs emerge through these decisions?
- RQ3: Are managers aware of the SDG-related consequences of their actions?

To answer these RQs we refer to the Emancipatory Accounting Theory (EAT), considering accounting as socially and morally embedded practice (e.g. Carnegie et al., 2023) and the potential for unintended emancipatory outcomes. Through a multiple case study applying qualitative methods (group interview and documentary analysis), the paper explores the variety of SDGs addressed by a sample of Italian health providers in managing the health crisis and normalcy return planning.

Given that accounting must be empirically studied in the contexts in which it operates (Carnegie et al., 2023), this research considers Italy as one of the first countries intensely touched by the virus (Worldometer, 2020), hence experimenting a situation of great complexity, intense uncertainty and dynamism which prevented from identifying linearity between solutions and consequences, predicting present and future effects, in a context of contrast between important values essential for the survival of human beings (i.e., closures to protect the health of vulnerable people vs. continuation of commercial activities).

Our paper offers an original and innovative contribution to advancing understanding of SDG engagement among health providers, addressing a gap that, to our knowledge, has not been explored in prior research. Its significance lies in its potential to shape scholarly thinking, inform knowledge development, and enhance policy and practice related to SDG engagement in healthcare and beyond. The study is rigorous, employing robust and appropriate concepts, analytical approaches, theoretical frameworks, and methodologies.

2. Theoretical framework

Recent research stressed the multidimensionality of the accounting practice, however, adding a social and moral responsibility nuance (Carnegie et al., 2023). Given that accounting is not neutral or impersonal but results from a human operation, its processes display a plurality of

values and interests involved in the organisations' decisions. Indeed, it discloses or hides the prioritisation of values and groups of beneficiaries of certain services, goods and treatments and others who are excluded. It can reveal conflicts and compromises, but it's still about choosing what to give visibility to (Grossi et al., 2023).

Prior SDGs accounting research applies various theories to explain organisations' viewpoints, including, for example, impression management (Boiral, 2016), greenwashing (Hassan et al., 2020) and legitimacy (Adler et al., 2018). However, the lack of a comprehensive theoretical model cannot motivate organisations to identify a strategy to deal with UNSDGs. Therefore, this paper contributes to the debate and introduces emancipatory accounting theory (EAT).

EAT supports that power relations in society have an influence on how things are understood (Field, 2018). Hence, this theory foresees to enhance the participation of other sectors of society, who would otherwise not participate in decision-making (Xolislie and Bekithemba, 2021). It promotes equality and equity in all its forms, advocates social justice, freedom, peace and team spirit, and changes people's hearts and minds (Foulger, 2010) it is essential to set conditions necessary to emancipate people to confront the lived realties.

Notably within the realm of accounting discourse the EAT studies of Tinker (1984, 1985) recognize an actual accounting indications that has focus on social influence. EAT can reflect the concern, through communication and democratic practice, to align diverse progressive interests, identities and projects. Therefore, any accounting is understood to encompass both emancipatory and oppressive dimensions and these and their relative influence can change so that accounting can become more (or less) emancipatory (e.g. Brown et al., 2015; Gallhofer et al., 2015; Dillard et al., 2016). The recent study of Martinez and Himick, (2023) reinforce the concept by explaining that accounting's emancipatory is about revealing the inner working of a dominant system and the conflicts that it glosses over by rethinking the fundamental theoretical foundations of accounting and society.

Many recent studies discussed the possibility of adopting EAT in social/nature accounting. These studies support the idea that the emerging area of social accounting research provides an excellent starting point for developing a more refined emancipatory tool: a pragmatic means of social as well as a theoretical construct which is not entirely grounded in a critical discourse (Galhofer and Haslam, 2019; Maroun and Atkins, 2018).

In this study, we are joining the same debate to bring this literature into analysing ways in which social accounting can be framed to address UNSDGs. We believe that social accounting that provides details on how organisations are taking a dynamic approach to conservation could, potentially, lead to ecological and environmental improvements that leads to the implementation of EAT. In doing so, we are addressing the research gap highlighted by Cuckston (2018) that is more studies that searches for emancipatory elements and behaviours is necessary to isolate best practice and define examples that companies can follow. Indeed, further work is needed in reporting practices to explore and develop stronger theoretical frameworks that can lead to transformational activities, which we suggest in our current study.

3. Research method

3.1. Institutional setting and sample (IRCCSs)

Italian public health is guaranteed by the National Health Service (NHS), whose health care and research driving force are the IRCCSs (Istituti di Ricovero e Cura a Carattere Scientifico). IRCCSs are hospitals of excellence with a peculiar characteristic that also distinguish them from each other: each IRCCS specialises in a single disciplinary field (mono-thematic IRCCS) or

integrates several fields (poly-thematic IRCCS). To date, in Italy there are 53 IRCCS: 23 are public institutes, while 30 are private.

IRCCS have been essential in assistance, research and knowledge sharing during the COVID-19 emergency (January 2020-March 2022), innovating research and health care during the pandemic. Indeed, in 2020, the central government funded them with 7 million euros to advance knowledge on the virus, treatments and vaccines (Italian Ministry of Health, 2020). Thus, the pandemic has accentuated their pre-eminent position in the NHS.

This paper explores the presence of SDGs in strategic decisions and planned activities undertaken by a sample of three IRCCS for COVID-19 management and normalcy return. The IRCCS studied are based in the same region (Emilia Romagna), which is considered a benchmark and comparable to many Central/Northern European regions while being one of the early and substantially impacted by the pandemic. The IRCCS studied are the Polyclinc of Sant'Orsola (PSO), the Rizzoli Orthopaedic Institute (ROI) and the Romagna scientific Institute for the Study and treatment of Tumors (RIST). They have been chosen because located in the same territorial basin hence sharing the same regional regulatory context as well as representing the diversity of such institutes based on legal form, specialisation, size, etc. The first is a public university hospital, an example of large and poly-thematic IRCCS (specialised oncohematology and transplants). The last two represent stand-alone and mono-thematic IRCCSs of different sizes operating in diverse areas. Specifically, ROI is public and specialised in orthopaedics and traumatology, while RIST is private and specialised in tumours.

3.2. Data source and analysis

The current research applies two qualitative methods to analyse the SDGs' presence in pandemic management and normalcy return planning in the IRCCSs: a semi-structured group interview with the sample of IRCCSs (PSO, RIST and ROI) and a documentary analysis of the performance plans of PSO and ROI (RIST is private hence have no obligation to publish a performance plan). The research adopts Yin's (2014) six-stage case study process (plan, design, prepare, collect, analyse, and share) to ensure scientific rigour and justify the findings.

Sampling was not expanded to other IRCCS based on the conceptual density or sufficiency principle, whereby data collection stops when it reaches a sufficient or adequate depth of understanding to satisfy the research design's hypotheses and grasp the phenomenon's complexity (Nelson, 2016). This concept favours the quality of the data collected (their richness, depth, diversity and complexity), over the quantity of data collected (Fusch, Ness 2015). Hence, an 'across-method triangulation' has been applied as a combination of different techniques on empirical units, so that the defects of one technique become the strengths for the application of the other (Denzin, 1970). Data collected by different methods and researchers enhance results triangulation, which allows different outputs to be reached, whose merger strengthens the validity of the findings (Bloor, 2001).

The group interview involves the Chief Executive Officers (CEOs), who are in the best position to disclose strategic and managerial decisions (Caldarelli et al., 2013). The interviews were conducted in a group context in a formal setting, following an interview guide (Qu and Dumay, 2011), using a structured question format that have been developed using prior studies. Interviews enable researchers to understand the interviewees' experiences and viewpoints (Rowley, 2012). A group interview is a research technique that collects data from a group of people interacting with the moderator on a predetermined topic. This technique acknowledges the researcher's active role in creating the group discussion for data collection purposes (Morgan, 1996). The circular discussion allows for managing all points of view, guaranteeing time savings

(Qu & Dumay, 2011). The interview guide does not expressively address the SDGs for not conditioning the answers. It explored (a) the activities decisive in tackling the health emergency and the main criticalities, (b) the lessons learned between the first phase of the emergency management and subsequent ones, (c) the strategic directions to face the pandemic evolution and to deal with further emergencies in the future and (d) the role IRCCSs will play in National Recovery and Resilience Plan implementation and within the future NHS setup.

The group interview took the form of an online round table carried out on the 24th of September 2021 and lasted 1 hour and 10 minutes in an event open to citizens within an academic initiative to bring research and civil society closer. The discussion was transcribed and sent to interviewees for validation. Then, the authors proceeded with the manual thematic analysis of the transcripts, identifying (i) the interventions implemented during the health crisis and the subsequent phases, (ii) their consequences on the macro-micro level and (iii) SDGs interconnections.

The documentary analysis identifies the SDGs in the strategic decisions and planned activities envisaged by the institutes after the COVID-19 outbreak for normalcy return planning in the performance plans of the two public IRCCSs. Derived from the ad-hoc method mapping SDGs into policies of the EU Commission (see Miola et al., 2019, p. 21), it verifies whether PSO and ROI decisions and activities can be connected to the 169 targets of the 17 SDGs, considering their missions as research hospitals.

Documentary analysis permits observing the type of information disclosed, dealing with and quantifying a large volume of qualitative information. Indeed, it focuses on the quantity of observed characteristics within a text and enables the interpretation and contextualisation of meanings (Bowen, 2009). The current study considers the performance plans published by PSO and ROI on their website for the 2021-2023 triennial, which is the period immediately following the COVID-19 outbreak. They articulate strategic decisions in four performance dimensions: health care, internal process, research, and economic sustainability.

The documentary analysis requires understanding the meaning of the performance plans content, assigning the appropriate SDG targets and identifying the type of information disclosed. The single observation of a target corresponds to a Goal cited in the performance plans. Hence, it derives the identification of the SDGs present in the performance plans and the frequency count.

Both the analysis of the interviews and PPs presuppose a subjective interpretation by the analyst to link the text content with the SDGs. An exact match has not been sought, but it has been considered that the IRCCSs alone cannot, for example, solve hunger in the world or create partnerships for global development explicitly aimed at developing countries as prescribed by some of the SDGs. Instead, the Agenda contains guiding principles on some topics (e.g. sensitivity to gender issues that generate inequalities, attention to the consumption of non-renewable natural resources, the creation of inter-organisations networks and alliances for pursuing purposes from which it benefits the entire community), whose declinations of meaning are contained in the targets.

4. Findings

Concerning RQ1, the study identifies several SDGs in the decisions and actions for health crisis management and normalcy return planning of the IRCCSs' sample. As outlined in Table 1, interview reveals that pandemic management addressed 6 Goals: besides SDG No. 3, it involves economic growth (No. 8), innovation (No. 9), sustainable urban contexts (No. 11), solid institutions (No. 16) and partnership (No. 17). The issues mainly overlooked in pandemic

management relate to the Agenda's pillar of people and the dimension of environmental protection.

Goal	***1. Reduce poverty***	***3. Health and well-being***	***4. Quality education***	***5. Gender equality***
Pillar	*People*	*People*	*People*	*People*
Dimension	*Economic growth*	***S*ocial inclusion**	*Social inclusion*	*Social inclusion*
Phases	Normalcy return	Pandemic management and Normalcy return	Normalcy return	Normalcy return

Goal	***7. Clean energy***	***8. Decent work and economic growth***	***9. Industry, innovation and infrastructure***	***10. Reduce inequalities***
Pillar	*Prosperity*	*Prosperity*	*Prosperity*	*Prosperity*
Dimension	*Environmental protection*	*Economic growth*	*Economic growth*	*Economic growth*
Phases	Normalcy return	Pandemic management and Normalcy return	Pandemic management and Normalcy return	Normalcy return

Goal	***11. Sustainable cities and communities***	***12. Sustainable production***	***16. Solid institutions***	***17. Partnership for the Goals***
Pillar	*Prosperity*	*Planet*	*Peace*	*Partnership*
Dimension	*Social inclusion*	*Environmental protection*	*Social inclusion*	*Economic growth*
Phases	Pandemic management and Normalcy return	Normalcy return	Pandemic management and Normalcy return	Pandemic management and Normalcy return

Table 1. SDGs found detailed per pillar and dimension of sustainable development

Considering how the SDGs are being pursued, some decisions and actions corresponding to SDGs have different impacts, which can be read through a micro-meso-macro lens (e.g. Osborne et al., 2021). This also contributes to answering RQ2 concerning SDG interconnections. The activities set by IRCCSs touch on some SDGs more than others, and they do not always focus on single issues separately or ignore their relationships and interdependencies. Indeed, in pandemic management, some interventions involve more than one Goal per time, and their outcome is consistent at the micro-macro levels. For instance, at the micro level, IRCCSs reorganise internal spaces, processes, and assistance paths. Also, in compliance with the social distancing requirements, they extend the laboratories' access hours, introduce homeworking, and revise project schedules. Accordingly, the abovementioned interventions impacted employees, patients and their families. Indeed, they contribute to ensuring good health and well-being (Goal No. 3),

enhancing working conditions and maintaining economic growth (No. 8) and making human settlements and communities safe and resilient (No. 11). At the meso level, the institutes cooperate for knowledge sharing on COVID-19 with an extensive network of local, national and international institutes, aligning with the partnerships advocated by Goal No. 17. Other interventions have a broader scope, impacting at a macro level. They include prioritising COVID-19 in treatment and research, contributing to advancing knowledge on an unprecedented topic for society's well-being. Indeed, all IRCCSs insert COVID-19 among their research lines. Also, as an alternative to ordinary projects suspended by the pandemic, they launch original remote trials and develop new medical devices. Besides Goal No. 3, these interventions create resilient infrastructures that promote innovation (No. 9).

Conversely, other interventions do not always have positive outcomes. It is the case of establishing home-working for some employees or alternating workstations and deferring screening activities, non-urgent surgeries, and ordinary projects. Such interventions successfully limit the virus spread among workers, patients and their families (micro level) and pursue several Goals. Nonetheless, they result in postponing treatable diseases (macro level), worsening some working conditions (meso level) and partially counteracting the pursuit of the same Goals. The interviewees are aware of the repercussions of these choices. Still, they admit that they could not plan better solutions, given the constraints of the emergency regulations and the information scarcity, as stated by the PSO's CEO:

Our IRCCS [...] must respond to all the population diseases. In the pandemic, efficiency in health care was a diktat to guarantee a universalistic NHS. [...] So now we have to chase after the missed diagnoses, we find more patients at an advanced stage of the disease, which, if caught earlier, would have been treatable; we have endless waiting lists, etc.

The documentary analysis reveals 51 observations of SDGs targets within ROI's performance plan and 61 observations within PSO's performance plan, covering 12 Goals out of 17 (Figure 1). This broadens the range of Goals the health sector can address, as IRCCSs do not involve just those strictly related to their mission but may have wider repercussions. Conversely, it emerges that the Goals not covered concern the environment and the exploitation of natural resources, as well as ending hunger.

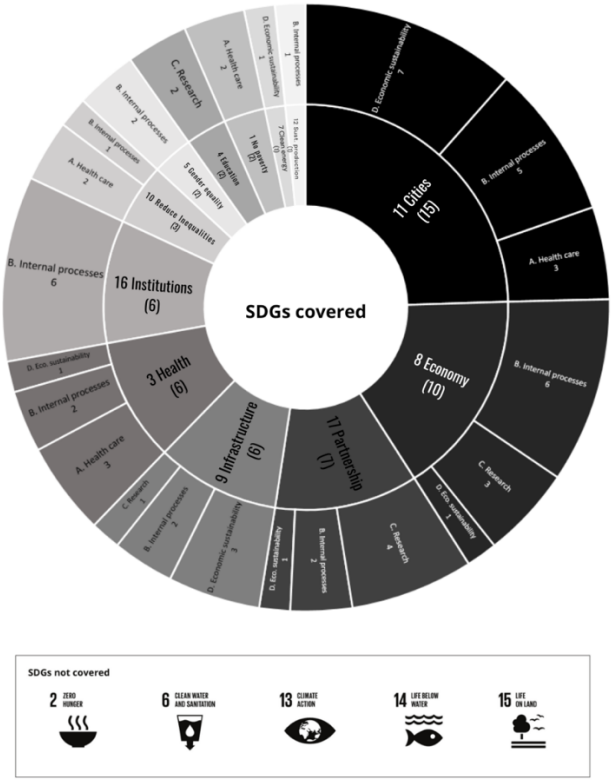


Figure 1. SDGs across the performance dimensions (target frequencies)

As Fig. 1 shows, the interconnection between SDGs also emerges from the documentary analysis (RQ2). Like pandemic management, in defining the new normalcy, ROI and PSO address various Goals concurrently to guarantee their high-quality services throughout the territory and strengthen research networks, drawing on the lessons learnt from the pandemic experience. This result aligns with the SDGs literature (e.g., Abhayawansa et al., 2021), which considers the set of Goals as a coherent whole, highlighting the interconnections among different issues, and providing an integrated framework to address the most pressing global challenge.

As for RQ3, none of the interviewees directly mention the pursuit of the SDGs, nor one of the performance plans analysed contain any deliberated statement about pursuing the UN SDGs' Agenda. Hence, this study reveals that SDGs may be pursued even if not expressly declared. Thus, organisations' engagement in SDGs may not require full awareness since each organisation directly or transversally addresses the SDGs by pursuing its mission. Possible explanations are the lack of an SDG-managerial culture or that pursuing the SDGs at a strategic level is not required by law. However, SDGs are progressively widespread in all societies, and their themes touch the organisations' actions, even if not in a conscious way by the managers. Two considerations derive from some SDGs' frequency and relevance for internal processes. On the one hand, for the IRCCS government, some sustainability issues are decisive for their mission and are relevant for internal consistency. Contrary to previous research evidence, since SDGs engagement is unintentional among these IRCCSs, it is unlikely that they cherry-pick the Goals relevant to their mission or those they wish to unveil, discarding the others. On the other hand, organisations willing to address SDGs for building future resilient and sustainable public services (Osborne & Strokosch, 2021) should introduce them into their strategy and incorporate an SDGs culture into their mission

and values. Accordingly, the Agenda engagement goes beyond the reporting process (Guthrie et al., 2020). Besides, given that SDGs are still not explicitly encapsulated in many organisations' strategic decisions, it may indicate a lack of awareness of the several areas on which the organisations' action can impact and the interconnections, synergies and compounding effects with positive or adverse outcomes. To raise this awareness, therefore, further actions are needed to promote SDGs encapsulation in organisation management and accounting.

5. Conclusions

While acknowledging a certain amount of subjectivity engaged in empirical work and the impossibility of representing the complex variety that characterises these institutes on the Italian territory, this study holds six main findings. (1) The decisions and actions set by IRCCSs for health crisis management and normalcy return planning involve several SDGs, (2) although not intentionally, and (3) some are not primarily connected to their mission. (4) The actions implemented by IRCCSs pertain to multiple SDGs, highlighting interconnections, trade-offs and adverse effects. (5) The range of SDGs involved in normalcy return planning increases compared to health crisis management, and (6) the most recurring SDGs are functional to the internal consistency of IRCCSs.

This study makes a novel and meaningful contribution to the management and accounting literature by deepening insight into how health providers engagement with the SDGs, addressing an area that has received little to no prior attention. It is significant in its potential to inform academic debate, expand existing knowledge, and support the development of policy and practice concerning SDGs engagement within healthcare and other sectors. The paper is methodologically sound, drawing on well-established and appropriate concepts, theoretical perspectives, and analytical approaches to ensure rigor.

The paper contributes, specifically, to the literature by providing evidence on the management and accounting of health providers, shedding light on SDGs' engagement in turbulent times addressing wicked problems, and providing examples of the variety of SDGs the health sector can address. Indeed, reading organisations' management and accounting through the SDGs lens helps understand the positive and negative impact of strategic decisions and interventions. Further, analysing their impacts on the micro-macro levels allows for considering what a specific action entails at a systemic level and for multiple publics (Warner et al., 2021). This confirms the heuristic role of SDGs in clarifying alternative positions and specific aims to achieve (Vesty et al., 2023), perhaps at the expense of others. Accordingly, it reinforces the potential of using the SDGs to read organisations' outcomes across all 17 Goals.

Furthermore, the SDGs found in the health crisis management of the IRCCS studied predominantly comprise the pillars of prosperity, along with the dimensions of economic growth and social inclusion. The pillar of people is more present in normalcy return than in health crisis management, while the environmental dimension appears almost forgotten both during the emergency and in defining the new normalcy. Among the paper's contributions is the suggestion of an additional pillar, that of pandemic, and another dimension, that of preparing for unpredictable events. Therefore, reading IRCCSs' decisions and activities for health crisis management and normalcy return planning through the SDGs sheds light on the sustainability issues related to these institutes' mission. However, their management and accounting are not composed of values oriented towards sharing a vision of peace based, for example, on respect for life, freedom, justice, and human rights or the creation of partnerships in the health sector for global development explicitly aimed at developing countries or the protection of the planet and its natural resources. Indeed, the pandemic prioritised health issues and relegated planet protection

and environmental matters to a non-central position or a deferrable problem within the health sector, hence flattening future generations' prosperity chances to the advantage of the current one.

Hence, on the one hand, this study demonstrates how it is possible to adhere to sustainability principles without being aware of them nor explicitly planning such adherence. SDGs engagement is underestimated by considering only those who explicitly assert it. Hence, SDGs research should imply both latent or explicit engagement within organisations' management and accounting. Besides that, the lack of awareness of the several areas on which the organisations' action can impact and the interconnections, synergies and compounding effects with positive or adverse outcomes requires further actions to promote SDGs encapsulation in organisation management and accounting. On the other hand, this research reveals that such institutes do not embody the institutional role of pursuing sustainability prescribed especially for public organisations by the Agenda. Consequently, the results agree that COVID-19 has induced the redefinition of sustainability as the intersection of economy, environment, society and human health (Hakovirta, Denuwara, 2020). Also, it confirms the path to social and moral nuances that accounting takes.

The current study is affected by some limitations related mainly to generalising the results. Firstly, IRCCSs have peculiarities related to the Italian context, and the research concerns a small sample of institutes located in the same region. The prompt reaction of the IRCCSs studied to the pandemic can derive from the region considered, traditionally virtuous in health provision, or justified by the IRCCSs qualification, assigned to hospitals of excellence. Therefore, these results cannot be extended to the entire IRCCSs distributed throughout Italy, nor to health providers in general, as they are the outcome of an exploratory study. Secondly, the study analyses the period immediately following the COVID-19 outbreak without considering previous time horizons that could have embedded other SDGs and allowed for tracking changes (Siboni & Canestrini, 2024). Indeed, the research focuses on the COVID-19 era, an extraordinary event that has altered the regular management of the health sector.

Consequently, further research is required. Other studies might apply similar mappings to a larger group of institutes working in the health sector to discover their engagement with SDGs. Longitudinal research can explore SDGs involvement in strategic planning before and after the pandemic. These studies could reveal best practices to share, enhance the SDGs culture, increase knowledge, and encourage broader SDGs engagement in the sector. Finally, further investigation should engage with SDGs impact measurements to assist institutes in the health sector.

Keywords: SDGs accounting; pandemic management; emancipatory accounting theory; healthcare; multiple case study; Italy

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La regolamentazione dell'intelligenza artificiale in sanità: il modello italiano tra governance pubblica e innovazione responsabile

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1. Introduzione

L'intelligenza artificiale rappresenta una delle trasformazioni più significative che il settore sanitario contemporaneo sta affrontando, con implicazioni dirette sulla qualità diagnostica, l'efficienza operativa e la responsabilità clinica. Negli ultimi tre anni, l'adozione di algoritmi per la diagnostica medica assistita, sistemi di supporto decisionale clinico, piattaforme di monitoraggio dei pazienti e strumenti di triage ha conosciuto diffusione esponenziale, creando contemporaneamente opportunità sostanziali di miglioramento della qualità assistenziale e rischi concreti quali bias algoritmico non controllato, violazione della privacy, erosione della responsabilità medica individuale e ineguaglianza nell'accesso alle tecnologie. Questa dualità ha stimolato, a livello internazionale, un processo complesso e ancora in evoluzione di normazione dell'IA in ambito sanitario. Il dibattito accademico sulla governance del SSN sottolinea da tempo l'importanza di strumenti orientati all'autonomia responsabile e alla misurazione sistematica delle performance come basi per governare l'innovazione (Borgonovi, 2000; Borgonovi, 2022).

La comunità internazionale ha avviato nei ultimi tre anni un processo di regolazione che riflette visioni strategiche diverse. La Commissione Europea ha adottato nel giugno 2024 l'Artificial Intelligence Act (AI Act), primo quadro legislativo comprensivo a livello mondiale basato su approccio "risk-based" che differenzia i requisiti normativi secondo il grado di rischio per diritti, sicurezza e salute dei cittadini. Parallelamente, singoli Stati hanno elaborato strategie che talora integrano il framework europeo, talora si differenziano significativamente. L'Italia, con la Legge 23 settembre 2025, n. 132, ha inserito disposizioni che recepiscono l'AI Act europeo ma aggiungono elementi di originalità significativa: governance pubblica multilivello, ownership statale degli algoritmi core, sandbox regolatori, uso esteso di dati sintetici, accentuazione della responsabilità medica, auditing continuo.

La gara pubblica indetta da Agenas (Agenzia Nazionale per i Servizi Sanitari Regionali) per la realizzazione di una piattaforma nazionale di IA in sanità, finanziata con risorse del Piano Nazionale di Ripresa e Resilienza, rappresenta un esperimento di public procurement innovativo con implicazioni strategiche che trascendono il contesto nazionale. Tuttavia, rimane ancora incerto come tale modello si posizionerà rispetto alle esperienze internazionali consolidate e se avrà effettiva capacità di generare un impatto sostenuto nel tempo.

La presente ricerca intende rispondere a: come il modello italiano di governance dell'IA in sanità, strutturato dalla Legge 132/2025 e dalla piattaforma Agenas, si colloca nel contesto normativo internazionale? Quali sono i suoi punti di forza distintivi e quali criticità restano irrisolte? Quali

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insegnamenti empirici emergono dall'implementazione di sistemi di IA responsabili nelle democrazie europee?

2. Lo stato dell'arte: sfide normative globali dell'IA in sanità

2.1. Origini e contesto della questione normativa

Lo sviluppo dell'intelligenza artificiale in ambito sanitario ha generato, dal 2018 in poi, una crescente consapevolezza della necessità di una governance normativa più articolata rispetto ai quadri regolatori preesistenti, disegnati per dispositivi medici tradizionali e per software sanitario statico. Questa consapevolezza è nata dall'osservazione di tre fenomeni concomitanti: la capacità dei sistemi IA di mutare comportamento nel tempo attraverso il retraining continuato, la difficoltà nell'interpretare il "ragionamento" di algoritmi complessi (cosiddetto problema dell'explainability) e l'emergenza empirica di bias sistematici negli algoritmi quando applicati a sottogruppi demografici non adeguatamente rappresentati nei dati di addestramento (Schmidt et al., 2024).

La letteratura accademica internazionale ha iniziato a studiare ed organizzare sistematicamente queste problematiche a partire dal 2020. Studi in epidemiologia e medicina hanno documentato casi concreti di fallimento: algoritmi di triage ospedaliero che discriminavano I pazienti afroamericani, sistemi diagnostici radiologici sviluppati su casistiche prevalentemente caucasiche che perdevano precisione in altre popolazioni, piattaforme di monitoraggio domiciliare che generavano falsi allarmi nei pazienti con comorbidità non rappresentate nei dati di training (Zhang et al., 2023). Parallelamente, il campo del diritto medico e del diritto sanitario ha iniziato a interrogarsi sulla responsabilità civile quando un medico si affida a un algoritmo che produce danno: è responsabile il medico che ha scelto di usare il sistema? Il produttore del software? L'ospedale che ha implementato la soluzione senza adeguato testing territoriale?

Queste incertezze hanno stimolato enti regolatori nazionali, agenzie europee e organizzazioni internazionali a formulare linee guida dapprima settoriali e poi progressivamente comprensive. La FDA negli USA ha pubblicato nel 2021 guidance su algoritmi medici, enfatizzando real-world performance monitoring. L'European Medicines Agency ha avviato nel 2023 dialogo con industrie per standardizzazione dei requisiti. Tuttavia, fino al 2024, non esisteva quadro normativo europeo unitario e cogente. Questa lacuna ha generato una situazione di "regulatory fragmentation" in cui aziende che operavano a livello europeo dovevano conformarsi a requisiti disomogenei.

2.2. Letteratura internazionale e architetture normative emergenti

La recente rassegna sistematica di Schmidt et al. (2024), pubblicata su Nature Medicine, fornisce la mappatura più comprensiva dei modelli normativi IA in sanità a livello globale, analizzando documentazione normativa e policy da 47 paesi. Gli autori producono una tassonomia ordinata lungo due assi principali: il grado di centralizzazione dell'autorità regolatoria (da centrali/federali a decentrate/locali) e il timing della validazione richiesta (ex-ante, cioè prima dell'uso clinico, versus ex-post, cioè basata sul monitoraggio del real-world evidence). Dalle loro analisi emergono conclusioni fondamentali: nessun modello è manifestamente superiore agli altri, ma ogni riflette trade-off culturalmente e istituzionalmente specifici tra velocità di innovazione e protezione del paziente. Modelli che enfatizzano centralizzazione e validazione ex ante (come Unione europea, Francia e Italia nel nuovo assetto) producono generalmente tecnologia più robusta dal punto di vista della sicurezza e garantiscono accesso più equo tra diversi contesti geografici e socioeconomici, ma comportano time-to-market significativamente prolungato e

barriere all'entry più elevate per innovatori più piccoli. Modelli che invece privilegiano decentralizzazione e validazione ex post (Regno Unito, Stati Uniti, Corea del Sud) accelerano l'innovazione e consentono un accesso rapido a soluzioni, ma generano diseguaglianza geografica e socioeconomica nell'accesso e comportano rischi maggiori di danno ai pazienti durante la fase di learning clinico reale.

Zhang et al. (2023), in una rassegna decennale sull'evoluzione della normativa dell'IA medica, offrono analisi di casi di fallimento implementativo. L'insegnamento principale che emerge è che assenza di governance robusta e coinvolgimento inadeguato di clinician stakeholder nel design normativo sono predittori significativi di fallimento progettuale. Quando cioè processi decisionali su regolazione dell'IA in sanità escludono medici, infermieri, responsabili di reparti clinici dal tavolo delle decisioni, la tecnologia che ne risulta spesso non è adatta alla pratica clinica reale, genera friction con flussi di lavoro consolidati, e quindi viene scarsamente adottata.

La letteratura internazionale distingue inoltre tra due approcci fondamentali alla questione della "black box" algoritmica. Un primo approccio, prevalente in Europa e Giappone, richiede che gli algoritmi siano interpretabili e che le loro decisioni siano tracciabili e spiegabili ai clinici e ai pazienti. Un secondo approccio, più frequente negli Stati Uniti, accetta algoritmi "black box" a patto che la loro performance venga validata empiricamente su dataset reali indipendenti e che venga implementato un rigoroso monitoring post-deployment (Caruana et al., 2015; Lorenzini et al., 2023).

2.3. Modelli specifici e loro caratteristiche

La Commissione Europea, con l'AI Act adottato nel giugno 2024, ha stabilito un quadro armonico basato su risk stratification. Sistemi IA classificati come "ad alto rischio" per salute e sicurezza (tra cui molte applicazioni sanitarie) devono soddisfare una serie di obblighi: documentazione tecnica completa, dataset di training documentato, controllo ex ante prima di commercializzazione, sistema di auditing ex post, capacità di interruzione ("off switch") controllata da utenti umani, supervisione umana significativa non meramente formale. Tuttavia, il quadro europeo lascia un margine considerevole di implementazione nazionale: non prevede l'approvazione centralizzata per singoli algoritmi (che rimane competenza delle autorità nazionali), non specifica chi conduce la validazione iniziale (se agenzia pubblica o ente privato notificato), non fornisce linee guida dettagliate su standard di performance accettabili (es., quale sensibilità e specificità minime richieste). Questo lascia spazi di interpretazione che diversi paesi europei hanno colmato in modi diversi.

La Germania con il suo sistema DiGA (Digitale Gesundheitsanwendungen, applicazioni sanitarie digitali) ha deciso di accelerare significativamente il percorso autorizzativo, consentendo il rimborso di soluzioni digitali in fase di raccolta di evidenze, generando feedback clinico iterativo durante l'uso reale. Questo approccio, documentato da studi empirici, accelera l'availability di soluzioni innovative, ma comporta rischi di validazione incompleta all'ingresso e può generare situazioni in cui i pazienti sono sottoposti a tecnologie non sufficientemente dimostrate (Krinke et al., 2022).

La Francia, con il sistema PECAN (Parcours d'Évaluation Clinique des Applications Numériques), offre un percorso di fast-track regolatorio parallelo al sistema standard, insieme a sandboxes sperimentali, con particolare enfasi sulla protezione della privacy e sulla tracciabilità dei dati. La documentazione ufficiale del sistema francese mostra un'architettura intermedia tra il rigore europeo e la velocità anglosassone (Ministère des Solidarités et de la Santé, 2024).

Il Regno Unito ha adottato un approccio esplicitamente "pro-innovazione" con regolazione leggera e oversight settoriale diffuso, preferibilmente attraverso autoregolazione dell'industria e

supervisione posteriore piuttosto che approvazione ex ante. Questo approccio, descritto nel White Paper governativo del 2023, mira a posizionare il Regno Unito come centro di innovazione in IA, ritenendo che la regolazione eccessiva sposti innovatori verso altri paesi (UK Government, 2023).

Gli Stati Uniti, attraverso la FDA (Food and Drug Administration), hanno elaborato linee guida per gli algoritmi medici che privilegiano la real-world evidence e la validazione continua post-deployment, con una flessibilità significativa su quali algoritmi richiedono approvazione preventiva e quali possono essere monitorati successivamente. Documentazione FDA mostra approccio pragmatico focalizzato sulla performance misurabile piuttosto che su aspetti di explainability (FDA, 2023).

Il Canada sta sviluppando un modello basato su auditing continuo coordinato da una figura di "AI Data Commissioner" che verifica periodicamente comportamento e impatto degli algoritmi nel tempo. Il Giappone mantiene approccio più conservatore rispetto ai paesi anglosassoni, con enfasi su validazione rigorosa e security-by-design. La Corea del Sud ha scelto un modello ministeriale accelerato con enfasi sulla rapidità, considerando l'IA come componente strategica della competitività nazionale (OECD, 2024; IMF, 2023).

2.4. Integrazione della prospettiva nazionale italiana

Parallelamente alle dinamiche internazionali, il contesto sanitario italiano ha affrontato la questione dell'IA digitale attraverso le lenti della ricerca accademica e della pratica clinica. La letteratura italiana su politica sanitaria, organizzazione ospedaliera e management ha documentato come la digitalizzazione dei servizi sanitari sia un processo complesso caratterizzato da resistenze professionali, frammentazione regionale, vincoli di finanziamento e difficoltà di change management. Questi studi forniscono un contesto essenziale per comprendere perché il modello italiano adottato per l'IA è strutturato com'è.

Studi empirici su ospedali italiani hanno evidenziato che fattori determinanti per il successo dell'implementazione di tecnologie digitali (inclusa l'IA) includono: accettazione da parte di medici e infermieri, qualità della formazione e dell'onboarding, allineamento tra l'architettura normativa e la pratica organizzativa effettiva, leadership manageriale robusto. Crucialmente, la ricerca mostra una correlazione significativa tra il successo dell'implementazione e la presenza di una governance normativa chiara, stabile e condivisa con gli operatori clinici, esattamente ciò che la Legge 132/2025 intende fornire strutturalmente (De Domenico,et al., 2024).

Un'altra dimensione rilevante della ricerca italiana riguarda la cybersecurity. Con la progressiva digitalizzazione, le vulnerabilità agli attacchi informatici hanno raggiunto livelli critici, soprattutto nei servizi di urgenza e emergenza. La ricerca condotta da associazioni professionali ospedaliere ha raccomandato l'implementazione di principi di "security by design", audit esterni regolari, penetration testing sistematici, un incident response plan definito e formazione continua del personale. Questi insegnamenti sono stati incorporati negli obblighi che la Legge 132/2025 pone su Agenas nella gestione della piattaforma nazionale (Macinati, 2023).

La riflessione sulla responsabilità gestionale nel contesto digitalizzato della sanità italiana ha generato un'ulteriore letteratura rilevante. Il tema cruciale è: con l'inserimento di algoritmi nei processi decisionali clinici, come cambia la catena di responsabilità? Studi recenti raccomandano di ancorare le responsabilità nel contesto clinico concreto, definendo chiaramente gli endpoint clinici di interesse, sottoponendo nuove soluzioni a sperimentazione controllata su sottogruppi prima della diffusione generale, implementando un monitoring continuo con capacità di interruzione rapida se i dati post-implementazione rivelano problemi. Questi principi costituiscono il fondamento della logica dei sandbox regolatori previsti dalla Legge 132/2025 (Cimbali, 2023; Comite, 2025).

Infine, è evidente che l'applicazione pratica richiederà anche un profondo percorso di trasformazione delle competenze nel Sistema Sanitario Italiano, già avviato con l'introduzione della leva digitale. La figura del manager sanitario di nuova generazione deve essere 'trasformativa', capace di recuperare autonomia gestionale, anticipare gli eventi ed elaborare strategie condivise per uscire dalla cultura dell'emergenza e affrontare in modo proattivo le trasformazioni imposte dall'intelligenza artificiale e dalla digitalizzazione (Borgonovi, 2025).

3. Il contesto nazionale: la Legge 132/2025, Agenas e l'assetto normativo italiano

3.1. Struttura della legge e principi fondamentali

La Legge 23 settembre 2025, n. 132, intitolata "Disposizioni e Deleghe al Governo in Materia di Intelligenza Artificiale", rappresenta l'articolazione nazionale del recepimento dell'AI Act europeo, ma con aggiunte di significato sostanziale che riflettono scelte strategiche consapevoli sulla governance dell'IA in sanità. La legge non si limita a trasporre obblighi europei ma aggiunge tre componenti di originalità distintiva.

Primo, prevede governance pubblica strutturata a livelli multipli, coinvolgendo simultaneamente ACN (Agenzia Cybersicurezza Nazionale), AgID (Agenzia per l'Italia Digitale), Agenas (Agenzia Nazionale per i Servizi Sanitari Regionali), Garante Privacy e società scientifiche. Crucialmente, questi soggetti non assolvono ruoli meramente regolativi nel senso di "veto-power"; assolvono piuttosto funzioni di coordinamento positivo dello sviluppo dell'IA sanitaria. Non è quindi un modello dominantemente restrittivo, ma piuttosto di "governance collaborativa", in cui lo Stato promuove attivamente la ricerca, lo sviluppo e il deployment di IA affidabile e socialmente responsabile, accompagnando il percorso con supervisione robusta.

Secondo, la legge introduce ownership pubblica e controllo strategico degli algoritmi core attraverso una piattaforma nazionale gestita da Agenas. È un'infrastruttura critica del servizio sanitario, di proprietà statale, analogamente ai servizi di assistenza ospedaliera essenziali. La gara pubblica lanciata per il PNRR prevede che il vincitore sviluppi soluzioni interoperabili in formato aperto, laddove tecnicamente fattibile, accessibili a tutte le regioni italiane, con governance trasparente. Parallelamente, la legge autorizza sandbox regolatori in cui sviluppatori pubblici e privati possono sperimentare soluzioni con rigore metodologico, senza gravami regolatori completi, durante la fase pilota.

Terzo, la legge promuove l'uso esteso di dati sintetici. Per affrontare i due vincoli che tradizionalmente hanno ostacolato la ricerca sull'IA sanitaria in Italia, a causa di vincoli di riservatezza che rendono lento l'accesso ai dati reali, e lentezza dei processi di autorizzazione da parte di comitati etici, la legge autorizza esplicitamente la creazione di dataset sintetici che replicano la distribuzione statistica dei dati reali senza contenere informazioni identificabili di pazienti individuali. Scelta pionieristica in Europa, questo approccio consente ai ricercatori di addestrare modelli robusti, testare algoritmi, effettuare validazione metodologica senza attendere mesi o anni per l'accesso a dati clinici reali, preservando simultaneamente la privacy individuale (Aindo, 2025).

3.2. Il ruolo di Agenas: funzioni, architettura, aspettative

Nel nuovo assetto, Agenas diviene il fulcro centrale dell'intero sistema di governance dell'IA sanitaria italiana. Le funzioni assegnate sono molteplici e complesse: responsabile di procurare e gestire tecnicamente la piattaforma nazionale, coordinare i sandbox sperimentali regionali, amministrare gli dataset sintetici, fornire formazione standardizzata agli operatori sui sistemi implementati, condurre auditing continuo sulle performance algoritmiche monitorando I bias per

sottogruppi demografici, facilitare l'interoperabilità tra sistemi informativi regionali eterogenei, fornire supporto metodologico ai clinici che implementano algoritmi.

Questo ruolo centralizzato rappresenta una scelta strategica di posizionamento che è sostanzialmente unica in Europa per il suo grado di integrazione. La Germania, con DiGA, ha un ruolo più passivo di rimborso. La Francia, con PECAN, ha un coordinamento light. Il Regno Unito e gli Stati Uniti affidano responsabilità a molteplici enti senza un coordinamento centrale. Il modello italiano, invece, richiede a un'agenzia sanitaria pubblica di svolgere una funzione attiva di governance positiva, non solo di filtro normativo.

Questa scelta comporta sia opportunità che rischi. Tra le opportunità: coordinamento effettivo tra regioni con capacità molto eterogenea, preservazione della sovranità tecnologica italiana rispetto a soluzioni estere, possibilità di raccogliere empiricamente dati comparativi sull'implementazione e sugli esiti, riduzione delle diseguaglianze geografiche nell'accesso. Tra i rischi: concentrazione di responsabilità che espone Agenas a vulnerabilità reputazionali, possibile slittamento temporale nell'implementazione con perdita di momentum, resistenze organizzative da parte di regioni che vedano Agenas come intrusione nella loro autonomia, incertezze sulla sostenibilità economica post-PNRR, quando il finanziamento iniziale sarà esaurito.

4. Metodologia di ricerca

4.1. Design della ricerca

Questo articolo adotta una metodologia di comparazione strutturata di policy integrata con sintesi narrativa della letteratura scientifica e analisi di documenti normativi. L'approccio combina metodi comparativi di policy analysis (Merton, 1987) con la mappatura della letteratura empirica secondo le linee guida PRISMA adattate alla narrative review (Popay et al., 2006). La comparazione si articola in tre dimensioni analitiche fondamentali: (i) struttura della governance dell'IA (centralizzazione vs. decentramento decisionale), (ii) timing della validazione normativa richiesta (ex-ante vs. ex-post), (iii) carattere della proprietà e del controllo degli algoritmi (pubblico vs. privato vs. misto).

4.2. Selezione dei casi e giustificazione

La comparazione internazionale include nove contesti selezionati su base di criteri espliciti: (i) rappresentatività geografica (Europa, Nord America, Asia), (ii) diversità di modelli normativi (centralizzato, decentralizzato, misto), (iii) disponibilità di documentazione normativa ufficiale e letteratura scientifica, (iv) rilevanza diretta per il dibattito europeo e italiano. I contesti analizzati sono: Unione Europea (AI Act quadro armonico), Italia (Legge 132/2025 focus principale), Germania (DiGA approccio accelerato), Francia (PECAN fast-track e sandbox), Regno Unito (pro-innovation approach), Stati Uniti (FDA real-world evidence), Canada (auditing continuo), Corea del Sud (accelerazione ministeriale), Giappone (conservatorismo e sicurezza).

5. Risultati: analisi comparativa dei modelli normativi

5.1. Quadro tassonomico dei modelli emergenti

L'analisi della letteratura e dei documenti normativi individua quattro modelli distinti che caratterizzano il panorama globale. La categorizzazione è basata su due assi principali: grado di centralizzazione dell'autorità decisionale (asse orizzontale, da centrale a decentrato) e timing della validazione richiesta (asse verticale, da ex ante a ex post).

Modello risk-based centralizzato (UE, Italia, Francia). Questo modello classifica sistemi IA secondo il grado di rischio per la salute e i diritti, imponendo obblighi crescenti: documentazione tecnica completa, testing su dataset indipendenti, auditing ex ante prima dell'uso clinico, monitoraggio continuo ex post, explainability, supervisione umana. L'Unione europea con l'AI Act rappresenta il framework armonico, ma consente l'implementazione nazionale. Italia si differenzia mediante l'ownership pubblica degli algoritmi core, sandbox espliciti e formalizzazione dei dati sintetici. Francia combina l'approccio risk-based con il fast-track per soluzioni a basso-medio rischio.

Modello accelerato iterativo (Germania DiGA, Corea). Questo approccio privilegia rimborso rapido di soluzioni digitali in fase di raccolta evidence, generando feedback clinico continuo durante l'uso reale. La Germania consente accesso a soluzioni digitali con evidenza preliminare, monitorando poi impatto post-deployment per decidere se continuare rimborso. La Corea persegue una strategia ministeriale di rapida adozione, considerando l'IA come priorità nazionale di competizione. Benefici di questo modello: innovazione accelerata, accesso rapido ai benefici, engagement della comunità clinica nel testing reale. Rischi: validazione incompleta all'ingresso, possibilità di danno durante il learning clinico, diseguaglianza nell'accesso durante la fase iniziale.

Modello pro-innovazione decentralizzato (Regno Unito, USA). Questo modello affida l'oversight ad agenzie settoriali con una regolazione leggera e una preferenza per l'autoregolazione industriale e la supervisione posteriore. Nel Regno Unito, il governo ha esplicitamente scelto un approccio "pro-innovation", volto a ridurre le barriere normative per posizionare il paese come centro dell'innovazione. Negli USA, la FDA offre guidance su algoritmi medici, ma con flessibilità significativa su quali richiedono approvazione preventiva. Benefici: agilità amministrativa, stimolo all'innovazione, attrattiva per imprese innovative. Rischi: assenza di controllo ex ante porta a disuguaglianze geografiche e socioeconomiche, la protezione da rischi ignoti è debole, la responsabilità legale rimane ambigua.

Modello ibrido auditing-centrico (Canada, Giappone). Canada propone un modello basato su auditing continuo coordinato da una figura di "AI Data Commissioner" che verifica periodicamente il comportamento e l'impatto degli algoritmi nel tempo, con la capacità di intervenire se emergono problemi. Il Giappone mantiene un approccio conservatore, con enfasi sulla validazione rigorosa e sulla security-by-design, raggiungendo un equilibrio tra protezione e innovazione ragionevole. Questi modelli rappresentano posizionamenti intermedi tra estremi di regolazione e libertà.

5.2. Trade-off normativi sistematici e posizionamento dell'Italia

L'analisi comparativa rivela trade-off normativi sistematici ai quali ogni governo si confronta, e le scelte effettuate nel posizionamento di diversi paesi. La riflessione sulle scelte di policy tra decentramento e centralizzazione richiama direttamente l'impostazione di Borgonovi sul bilanciamento tra efficacia, efficienza e responsabilità sociale (Borgonovi, 2022).

Trade-off tra velocità di innovazione e protezione del paziente. Modelli accelerati (Germania DiGA, Corea) consentono l'accesso rapido a soluzioni innovative con benefici immediati, ma comportano rischi di danno ai pazienti durante fasi di validazione incompleta. Modelli conservativi ex ante (UE pura, Francia normativa) proteggono meglio da rischi ignoti, ma ritardano i benefici e aumentano i costi di innovazione. L'Italia tenta un posizionamento intermedio mediante sandbox regolatori che riducono i tempi rispetto all'approccio europeo puro (da 24-36 mesi potenzialmente a 18-24 mesi), consentendo la sperimentazione controllata senza un peso regolatorio completo, ma riducendo però il gap innovativo rispetto ai modelli accelerati.

Trade-off tra innovazione privata ed equità d'accesso. I modelli privatizzati (UK, USA, Germania) consentono un'innovazione rapida, ma generano disuguaglianze geografiche e socioeconomiche significative: gli ospedali ricchi e le università prestigiose accedono prima alle soluzioni migliori, mentre gli ospedali piccoli e le aree rurali rimangono indietro. Modelli con proprietà pubblica (Italia) garantiscono un accesso più omogeneo tra regioni e livelli di ospedale, preservando la sovranità, ma richiedono investimenti fiscali sostenuti e l'assolvimento di funzioni gestionali che il pubblico potrebbe non sempre svolgere in modo efficiente. L'Italia fa una scelta consapevole di privilegiare l'equità e la sovranità rispetto alla velocità privata.

Trade-off tra velocità di approvazione e qualità della soluzione. Modelli con approvazione centralizzata ex ante (UE, Francia, Italia) producono generalmente tecnologia più robusta perché sottoposta a valutazione rigorosa, ma i tempi autorizzativi si prolungano. Modelli decentralizzati (UK, USA) consentono sperimentazioni parallele e multiple, che possono accelerare il learning, ma generano inconsistenza tra le giurisdizioni e minore garanzia sulla qualità minima.

Trade-off tra trasparenza algoritmica e innovabilità. Modelli che richiedono l'explainability degli algoritmi (UE, Francia, Italia) migliorano la fiducia e l'accountability e consentono la supervisione clinica informata, ma possono rallentare l'implementazione di algoritmi "black box" che potrebbero presentare prestazioni superiori. Modelli che accettano black box, purché validati empiricamente (USA), offrono soluzioni potenzialmente più accurate, ma riducono l'intelligibilità per i clinici.

L'Italia, attraverso la Legge 132/2025 e il modello Agenas, ha effettuato scelte consapevoli su questi trade-off: ha scelto di privilegiare protezione robusta, equità di accesso e sovranità statale rispetto alla velocità massimale di innovazione; ha scelto di mantenere il requisito di supervisione clinica e di interpretabilità; ha scelto di investire pubblicamente in infrastruttura anziché lasciare l'innovazione unicamente al settore privato. Queste scelte riflettono una visione dell'IA come "bene comune sanitario" più che come "commodity innovativa privata", coerente con la natura del servizio sanitario italiano.

5.3. Tabella sintetica comparativa

Dimensione	**UE (AI Act)**	**Italia (L. 132/2025)**	**Germania (DiGA)**	**Francia (PECAN)**	**Regno Unito**	**USA (FDA)**	**Canada**	**Corea**	**Giappone**
Centralizzazione	Media	Alta	Media-bassa	Media	Bassa	Bassa	Media	Media-alta	Media
Timing validazione	Ex-ante	Ex-ante + sandbox	Ex-post iterativo	Ex-ante + fast-track	Ex-post	Ex-post	Continuo	Accelerato	Ex-ante
Ownership algoritmi	Misto pub-priv	Pubblico core	Privato	Privato	Privato	Privato	Misto	Misto	Misto
Sandbox/pilot	Facoltativi	Obbligatori	Remoti	Espliciti	Assenti	Assenti	Impliciti	Limitati	Limitati

Dati sintetici	Non formalizzato	Formalizzato	Non usato	Limitato	Non usato	Limitato	Non usato	Limitato	Usato
Explainability	Richiesta	Richiesta	Non richiesta	Richiesta	Flessibile	Flessibile	Enfatizzata	Enfatizzata	Richiesta
Protezione paziente	Molto elevata	Molto elevata	Moderata	Elevata	Moderata	Variabile	Elevata	Moderata	Molto elevata
Barriera entry innovazione	Moderata-elevata	Moderata-elevata	Bassa	Moderata	Bassa	Moderata	Moderata	Bassa	Moderata
Equità accesso	Alta	Molto alta	Moderata	Alta	Bassa	Bassa	Alta	Moderata	Alta

Tabella 1. Tabella sintetica comparativa

6. Discussione: integrazione tra evidenza internazionale, letteratura accademica e scelte italiane

6.1. Coerenza tra insegnamenti della ricerca internazionale e design della Legge 132/2025

L'analisi rivela convergenza significativa tra insegnamenti della letteratura accademica internazionale, evidenze empiriche da implementazioni in altri paesi, e scelte legislative effettuate dalla Legge 132/2025. Questa convergenza non è casuale ma riflette, verosimilmente, un processo consultivo in cui decision-maker italiani hanno assimilato lezioni dalla letteratura e da esperienze di altri paesi.

Zhang et al. (2023) e Schmidt et al. (2024), sulla base di analisi decennali di implementazioni di IA in sanità, concordano nel sottolineare che governance chiara e stabile, accettazione professionale da parte di medici e infermieri, coinvolgimento esplicito di clinician stakeholder nel design di sistemi normativi sono prerequisiti cruciali di successo implementativo. La Legge 132/2025 incorpora direttamente questi insegnamenti: prevede obblighi formali di coinvolgimento di società scientifiche, richiede supervisione medica significativa non meramente formale, definisce chiaramente ruoli e responsabilità, stabilisce un processo di feedback da clinici agli sviluppatori durante la sperimentazione in sandbox.

De Domenico, Noto e Vermiglio (2022), in ricerca qualitativa-quantitativa su campioni ospedalieri italiani, identificano variabili critiche di adozione di tecnologie digitali: accettazione professionale, qualità della formazione e dell'onboarding, allineamento tra quadro normativo e pratica organizzativa. Dimostrano una correlazione positiva tra il successo dell'implementazione e la presenza di una governance normativa chiara. La Legge 132/2025 risponde direttamente a questi findings mediante obblighi su formazione standardizzata (funzione di Agenas), allineamento tra politica normativa e operatività clinica (attraverso coinvolgimento di società scientifiche), accessibilità delle soluzioni (mediante ownership pubblica che garantisce accesso omogeneo).

Macinati et al. (2021), sulla base di una ricerca FIASO-Mecosan sulla cybersecurity nella digital health, raccomandano: progettazione secondo i principi di "security by design" non come afterthought, audit esterni regolari, penetration testing sistematici, incident response plans definiti, formazione continua. Tutti questi elementi sono incorporati negli obblighi che la Legge 132/2025 pone su Agenas (supervisione ACN su security, requirement di audit continuo).

Comite (2025) analizza specificatamente rischi organizzativi della digital health assistita da IA e raccomanda di ancorare responsabilità nel contesto clinico concreto, definendo endpoint clinici chiaramente, sottoponendo soluzioni a sperimentazione controllata su sottogruppi prima di diffusione generale, implementando monitoraggio continuo con capacità di interruzione. Questi principi costituiscono esattamente il fondamento della logica dei sandbox regolatori italiani.

6.2. Posizionamento italiano nel paesaggio europeo e internazionale

L'Italia, con la Legge 132/2025 e il programma Agenas, effettua un posizionamento normativo distintivo nel panorama europeo. Non è scelta "conservatrice" in senso inibitorio, né "anti-innovazione" nel senso di ostacolo deliberato al progresso. È piuttosto un approccio consapevole di "innovazione responsabile": accogliere i benefici potenziali dell'IA, accompagnandoli con governance robusta, trasparenza procedurale, protezione esplicita dei diritti dei pazienti, superamento delle diseguaglianze di accesso geografiche e socioeconomiche.

L'Italia si distingue nel contesto europeo per tre scelte originali. Primo, l'ownership pubblica degli algoritmi core è unica in Europa per estensione e formalizzazione. Mentre Germania, Francia e UK consentono soluzioni private e pubbliche in parallelismo, con la public procurement di soluzioni private, l'Italia decide che gli algoritmi strategici siano di proprietà statale. Questa scelta, rara in Europa e ancor più rara a livello globale, riflette la visione dell'IA medica come parte dell'infrastruttura sanitaria critica, analoga ai servizi ospedalieri. Ha implicazioni di sovranità (Italia non dipende da fornitori esteri per capacità tecnologiche critiche), equità (algoritmi sono accessibili a tutte le regioni indipendentemente dalle capacità finanziarie), accountability (proprietà pubblica facilita la responsabilità verso i cittadini).

Secondo, l'uso esteso di dati sintetici è formalizzato nel framework normativo italiano. Mentre altri paesi sperimentano con dati sintetici, l'Italia li autorizza esplicitamente come strumento di ricerca e sviluppo. Questo consente ai ricercatori pubblici e accademici di addestrare modelli robusti senza attendere mesi per l'accesso a dati reali, accelerando l'innovazione pur preservando la privacy.

Terzo, la centralità della supervisione clinica non è soltanto verbale. La Legge 132/2025 richiede che ogni algoritmo implementato nel SSN rimanga sotto la supervisione esplicita di un medico responsabile, non come formalità amministrativa, bensì come elemento funzionale del decision-making. Questa scelta ha implicazioni significative: protegge l'autonomia decisionale clinica, consente una supervisione umana genuina anziché illusoria e mantiene il medico come agente morale responsabile.

6.3. Criticità residue e rischi implementativi

Malgrado i punti di forza e la coerenza con la letteratura internazionale, persistono criticità significative che la ricerca deve evidenziare con franchezza. Alcuni rischi sono inerenti al modello; altri derivano da incertezze di implementazione.

Rischi di tipo economico-finanziario. Il finanziamento PNRR della piattaforma Agenas è limitato (50 milioni di euro per tre anni 2024-2027). Tuttavia, il sostenimento di una piattaforma nazionale di IA sanitaria comporta costi ricorrenti significativi: development, maintenance,

security patching, monitoring continuo, aggiornamento di algoritmi, supporto agli utenti clinici. Come Agenas assicurerà l'operatività della piattaforma dopo l'esaurimento del finanziamento PNRR? Non esiste formalmente risposta a questa domanda nei documenti pubblici consultati. La letteratura italiana sulle digital health project failures (Macinati, 2023) identifica l'assenza di un modello economico sostenibile oltre la fase pilota come fattore predittivo significativo di fallimento progettuale.

Rischi di attuazione su un territorio eterogeneo. Il Servizio Sanitario Nazionale italiano è notoriamente frammentato tra regioni con capacità molto diverse: dal Nord ultramoderno e digitalizzato al Sud, con deficit strutturali di infrastrutture digitali, personale e formazione. Come Agenas coordinerà l'implementazione in questo territorio? Come garantirà che gli algoritmi sviluppati con casistiche del Nord (dove la concentrazione di ospedali universitari e centri di eccellenza) funzionino equamente al Sud? La letteratura italiana documenta ampiamente come la frammentazione sia un vincolo storico che ha ostacolato la digitalizzazione nazionale. La Legge 132/2025 non affronta esplicitamente questo; si assume implicitamente che Agenas avrà la capacità di affrontare l'eterogeneità regionale, un'assunzione ottimistica che richiede una verifica empirica.

Rischi di bias e generalizzabilità. Se gli algoritmi sono sviluppati e validati su dati concentrati geograficamente (es., negli ospedali universitari della Lombardia) e poi deployati nazionalmente, il rischio di bias demografico è alto. La letteratura internazionale documenta che gli algoritmi addestrati su casistiche prevalentemente settentrionali o di istituti di eccellenza perdono performance quando applicati a contesti diversi. Come Agenas affronterà questo? Richiederà retraining locale? Testing sui sottogruppi prima della diffusione generale? Non sono chiare le risposte nei documenti attuali.

Rischi di responsabilità civile irrisolti. Con supervisione medica e ownership pubblica, chi è responsabile in caso di danno al paziente? Il medico che ha scelto di usare l'algoritmo? L'ospedale che l'ha implementato? Agenas che l'ha fornito? Lo sviluppatore privato se esterno? Nessun framework giurisprudenziale consolidato esiste a livello europeo in merito, e la letteratura legale internazionale identifica tale incertezza come un ostacolo significativo all'adozione clinica dell'IA.

Rischi di slittamenti temporali e perdita di momentum. I processi di gara per le infrastrutture pubbliche digitali in Italia presentano, storicamente, rischi di slittamenti temporali significativi. Se la gara Agenas si protrae oltre le timeline attualmente previste, il rischio di perdita di momentum politico e finanziario è concreto.

6.4. Contributi al dibattito europeo e replicabilità del modello

L'esperienza italiana offre al dibattito europeo insegnamenti contrastanti ma rilevanti. Da un lato, dimostra che è possibile conciliare innovazione responsabile con governance pubblica robusta, senza necessariamente sacrificare velocità assoluta: sandbox regolatori italiani promettono di abbreviare tempi di approvazione rispetto a un framework europeo puro, facilitando l'innovazione anche quando l'ownership rimane pubblica. Questo contraddice la narrativa che la governance pubblica sia necessariamente lenta.

Da un altro lato, il modello italiano mostra che la governance pubblica efficace richiede un investimento sostenuto e una capacità gestionale che non tutti i paesi europei possiedono in misura eguale. Un'agenzia come Agenas può funzionare efficacemente in un contesto italiano grazie alla storia del Servizio Sanitario Nazionale unificato, alla tradizione di ricerca sanitaria accademica solida e alla disponibilità di risorse. Il modello potrebbe essere replicabile in Spagna, in Portogallo e nei Paesi Nordici, che condividono caratteristiche strutturali simili. Sarebbe probabilmente

ingestibile in contesti con una maggiore frammentazione amministrativa (es., alcuni paesi dell'Est europeo con una capacità statale più debole).

L'esperienza Agenas costituirà, nei prossimi tre-cinque anni, banco di prova cruciale. Se l'implementazione procedesse secondo piani e generasse benefici clinici misurabili con tempi autorizzativi ragionevoli (18-24 mesi), diventerebbe modello exportable e influenzerebbe la policy europea verso una maggiore governance pubblica. Se, al contrario, slittamenti temporali e problemi organizzativi si prolungassero, comporterebbe la delegittimazione dell'intero approccio di governance pubblica a livello europeo, rafforzando narrative di privatizzazione.

7. Conclusioni

La Legge 132/2025 e il programma Agenas rappresentano un tentativo ambizioso e originalissimo, nel contesto europeo del governo pubblico, consapevole e responsabile dell'IA in sanità. Questa originalità risiede nella combinazione unica di: governance pubblica robusta, ownership statale degli algoritmi core, supervisione clinica centralizzata, sperimentazione controllata tramite sandbox, formalizzazione di dati sintetici.

L'analisi storica e comparativa produce la conclusione che il posizionamento italiano emerge come risposta coerente e informata alle lezioni della letteratura accademica internazionale. Studi su fallimenti implementativi, ricerche sui fattori determinanti successo o insuccesso di digital health, analisi di modelli normativi globali, tutti suggeriscono che governance chiara, coinvolgimento clinico, infrastruttura pubblica robusta, sovranità nazionale sono elementi che aumentano la probabilità di successo. La Legge 132/2025 e Agenas rappresentano trasposizione di questi insegnamenti in assetto normativo e organizzativo concreto.

I contributi che l'Italia può offrire al dibattito globale sono significativi. Primo, dimostra che l'innovazione responsabile nell'IA sanitaria è un obiettivo raggiungibile senza rinunciare a una velocità ragionevole. I sandbox regolatori italiani sono disegnati per abbreviare I tempi di approvazione rispetto a un framework europeo puro, pur mantenendo garanzie di protezione robuste. Secondo, dimostra che la governance pubblica dell'IA non è necessariamente contraddittoria con l'innovazione: l'investimento pubblico in infrastruttura può generare un'innovazione accelerata proprio come la privatizzazione, con il beneficio aggiuntivo dell'equità di accesso. Terzo, offre un modello replicabile per le democrazie sanitarie europee che intendano preservare la sovranità tecnologica e l'equità in un'era di dipendenza da algoritmi proprietari di grandi tech corporations.

Il prossimo capitolo della storia italiana di IA sanitaria dipenderà dall'esecuzione effettiva: dalla gestione della gara Agenas, dai risultati empirici dei pilot territoriali, dal feedback che I clinici forniranno durante l'implementazione, dalla sostenibilità economica che il sistema dimostrerà. La comunità scientifica, la ricerca accademica in ambito sanitario e le organizzazioni professionali mediche avranno un ruolo cruciale nel documentare sistematicamente questo processo, nell'identificare problemi durante l'implementazione e nell'offrire insegnamenti tempestivi per la correzione di rotta. Solo attraverso questo monitoraggio e questo feedback continuo, il modello italiano potrà tradursi da promessa teorica in realtà operativa di beneficio pubblico.

7.1. Limitazioni della ricerca

Questa ricerca presenta limitazioni riconosciute che circoscrivono l'ambito di validità delle conclusioni. Primo, la Legge 132/2025 è di recentissima attuazione (settembre 2025) e la piattaforma Agenas è in fase di gara; pertanto, dati empirici di impatto reale su pazienti, clinici e

sistemi ospedalieri sono assenti. Questo significa che le analisi sono prospettiche, basate su intenzioni normative e design teorico più che su outcomes misurati nella pratica. La ricerca offre quindi la valutazione della coerenza interna del modello e l'allineamento con l'evidenza internazionale, non la validazione empirica dell'effettività. Secondo, l'accesso alla documentazione normativa e alla letteratura scientifica è ineguale tra paesi: mentre i modelli europei sono ben documentati, i modelli francesi, giapponesi, coreani rimangono scarsamente coperti dalla letteratura scientifica peer-reviewed in inglese; informazioni provengono da documenti governativi non sempre trasparenti. Questo comporta un'analisi meno profonda di questi contesti. Terzo, la ricerca è prevalentemente qualitativa; la standardizzazione degli indicatori di outcome (efficacia clinica, sicurezza, equità di accesso, velocità di innovazione) tra paesi rimane altamente problematica, impedendo la meta-analisi quantitativa rigorosa di dati comparativi. Infine, la prospettiva è esplicitamente europeacentrica; sebbene contesti nordamericani e asiatici siano inclusi, l'analisi potrebbe sottostare a elementi di realtà locale che caratterizzano specificamente questi modelli.

Queste limitazioni suggeriscono che la ricerca dovrebbe essere intesa come primo contributo per analizzare una domanda complessa e multidimensionale, che apre numerose possibilità di approfondimento: valutazione empirica dei primi anni di implementazione della Legge 132/2025 e Agenas, raccogliendo dati su tempi autorizzativi reali, outcomes clinici di algoritmi implementati, feedback di clinici e pazienti, analisi dei modelli francese, giapponese, coreano con accesso a fonti in lingua nazionale e a esperti locali, analisi economica comparativa dei costi di diversi modelli normativi, ricerca qualitativa con stakeholder italiani (clinici, pazienti, manager ospedalieri, esperti di IA) su percezioni e criticità che emergono durante implementazione.

Parole chiave: Intelligenza artificiale; sanità digitale; governance normativa; politica sanitaria comparata; piattaforme pubbliche; responsabilità medica; digital health

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Benessere, leadership e sostenibilità: verso un modello italiano di leadership compassionevole

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1. Introduzione

Il sistema sanitario italiano sta vivendo una fase di profonda trasformazione, segnata da criticità gestionali e da una crescente difficoltà nel mantenere sostenibilità e qualità dei servizi di cura. La situazione è ulteriormente aggravata da limiti infrastrutturali, dall'aumento della richiesta di assistenza e dalla complessità nel trattenere i professionisti. Il Servizio Sanitario Nazionale è pertanto chiamato a fronteggiare simultaneamente numerosi cambiamenti di carattere demografico, epidemiologico e professionale.

In particolare, l'invecchiamento della popolazione rappresenta una delle principali sfide: la quota di cittadini con età superiore ai 65 anni ha raggiunto il 23,8% rispetto a una media UE del 21,1 (OECD, 2023). A ciò si accompagna un'aspettativa di vita sempre più elevata e un quadro epidemiologico caratterizzato dalla crescente prevalenza di patologie croniche (OECD, 2023), (De Vries et al., 2023).

Parallelamente, il sistema sanitario italiano deve far fronte a una significativa carenza di professionisti sanitari, con valori medi sensibilmente inferiori rispetto alla media OCSE (Cartabellotta et al., 2025). L'Organizzazione Mondiale della Sanità ha stimato che entro il 2030 mancheranno a livello globale circa 14 milioni di operatori sanitari (De Vries et al., 2023). La scarsità di personale, unità all'aumento della domanda dei servizi, determina una pressione crescente sulle organizzazioni sanitarie e sui professionisti rimasti in servizio, chiamati a "fare di più con meno" (Viotti e Converso, 2016).

Le ragioni che spingono i professionisti ad abbandonare il lavoro sono complesse e multifattoriali, riconducibili a dimensioni individuali, organizzative e di sistema (De Vries et al., 2023). Le nuove generazioni, inoltre, mostrano una minore disponibilità ad accettare elevati livelli di stress o condizioni di lavoro poco conciliabili con la vita privata (De Vries et al., 2023) (Loft e Jensen, 2020) (Enea et al., 2024). Questo fenomeno, unito alla maggiore qualificazione

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professionale dei giovani, accresce la loro propensione alla mobilità e al cambiamento (Loft e Jensen, 2020; Enea et al., 2024). Coloro che restano nel sistema sperimentano spesso un aggravio di carichi e turni prolungati, con effetti negativi sulla salute fisica, sul burnout e sulla soddisfazione lavorativa, fattori che a loro volta incidono sull'intention to leave (Loft e Jensen, 2020; Clari et al., 2024) (De Simone e Planta, 2017). La letteratura indica infatti che tra il 12% e il 64% degli infermieri manifesta l'intenzione di lasciare il proprio posto di lavoro (Loft e Jensen, 2020), con correlazioni significative rispetto a soddisfazione lavorativa, stress, burnout, equilibrio vita-lavoro e retribuzione (Loft e Jensen, 2020; De Simone e Planta, 2017; Bagnasco et al., 2023).

Il malessere del personale si manifesta anche attraverso indicatori indiretti, come l'aumento delle richieste di limitazioni al lavoro – cresciute del 60% nel 2022 rispetto al 2019 (Colombo et al., 2025) – e il tasso di assenteismo dovuto a permessi, malattie o congedi (Colombo et al., 2025). Questi fenomeni, oltre a segnalare un deterioramento del benessere organizzativo, incidono in modo rilevante sulla produttività e sulla qualità dell'assistenza.

In questo contesto, l'obiettivo organizzativo-aziendale diventa quello di attrarre e mantenere (retention) il personale sanitario, rappresentando una priorità strategica per la sostenibilità del SSN. Diversi studi evidenziano come i manager e i dirigenti sanitari svolgano un ruolo determinante nel prevenire l'abbandono del lavoro, influenzano direttamente la motivazione e il benessere dei professionisti (De Vries et al., 2023; Bagnasco et al., 2023). Lo stile di leadership si conferma infatti una variabile predittiva degli esiti sul paziente e del benessere degli operatori (Bagnasco et al., 2023; Mete et al., 2022).

2. Sviluppo concettuale

Davanti a problemi nuovi ci chiediamo se i modelli organizzativo-aziendali rispondenti ad esigenze di aumento della performance (paradigma del management by objective tipo del New Public Management), possano essere ancora l'unica e dominante risposta o se sia necessario esplorare ed integrare modelli nuovi, in particolare quelli nati e sviluppati in contesti di alta professionalizzazione come i contesti assistenziali. Tra i modelli che stanno riscuotendo attenzione è la compassionate leadership.

La compassionate leadership mira a creare una dimensione culturale basata sul supporto tra colleghi, dirigenti e collaboratori in un ambiente dove ci si prende cura dell'altro. Le sue potenzialità sono particolarmente evidenti nel settore sanitario, dove il personale è particolarmente esposto al rischio di burnout e stress lavoro-correlati. Come definito da Atkins e Parker (2012), essa si basa su quattro componenti fondamentali – attenzione, comprensione, empatia e azione – e mira a creare una cultura organizzativa fondata sul rispetto, sull'ascolto e sul supporto reciproco (Atkins e Parker, 2012)

Studi condotti da M. West nel Regno Unito (West e Chowla, 2017; West, 2021; West et al., 2022) e in altri contesti internazionali (Shuck et al., 2019; Paakkanen et al., 2021) hanno dimostrato che la compassionate leadership e, più in generale, la Compassion at Work, contribuisce a ridurre burnout e stress, a migliorare il clima organizzativo e la soddisfazione lavorativa, e a rafforzare la retention, nonché a migliorare gli esiti di cura. I compassionate leader grazie alla loro capacità di mettere in relazione le esperienze degli altri con le proprie sono in grado di comprendere i bisogni e i sentimenti e di percepirli simili alle proprie esperienze (Hopkinson, 2014). I leader compassionevoli creano un ambiente di lavoro positivo e collaborativo, in cui i dipendenti si sentono valorizzati e supportati. Questo approccio, caratterizzato da empatia e comprensione, non solo rafforza le relazioni interpersonali ma si traduce anche in un miglioramento delle prestazioni individuali e di gruppo (Cameron, 2011).

Questo approccio, particolarmente rilevante nel settore sanitario, risponde alla domanda cruciale: chi si prende cura di chi cura?

Il presente contributo si inserisce nel dibattito sulla sostenibilità del personale sanitario, proponendo una riflessione teorico-empirica su un progetto di ricerca in corso, "Compassionate Leadership: the Italian Way". Il progetto biennale mira a definire e validare un modello italiano di compassionate leadership, capace di integrare i valori fondativi della sanità pubblica con un approccio alla leadership orientato all'ascolto, all'empatia e alla cura reciproca, in coerenza con la cultura e la missione del SSN.

Sul piano teorico, il progetto contribuisce ad ampliare la letteratura sui modelli di leadership nel settore sanitario, ponendosi all'intersezione tra studi sul benessere organizzativo, sulla retention del personale e sulla leadership sostenibile. L'approccio proposto supera la prospettiva dominante di tipo prestazionale, trasformazionale o transazionale, per promuovere una visione rinnovata della dimensione relazionale e valoriale della leadership, centrata sulla cura reciproca e sull'equilibrio tra performance e benessere. In questa prospettiva, la ricerca si inserisce nel più ampio dibattito internazionale sulla revisione dei paradigmi introdotti dal New Public Management, offrendo una lettura aggiornata e coerente con la missione pubblica del SSN.

3. Obiettivi

L'obiettivo generale della ricerca è di indagare in modo sistematico il potenziale della leadership compassionevole come leva per la sostenibilità delle risorse umane e la qualità organizzativa nel SSN. Partendo dal riconoscimento che la retention dei professionisti rappresenta oggi una delle principali criticità del sistema, lo studio intende analizzare come pratiche di leadership fondate su attenzione, supporto e benessere possano incidere positivamente sul clima organizzativo, sulla soddisfazione lavorativa e sull'intenzione dei professionisti di rimanere nel proprio contesto di lavoro.

Gli obiettivi specifici si articolano su quattro assi strategici, coerenti con l'articolazione del progetto:

- Adattamento e validazione del modello italiano di Compassionate Leadership
- Tradurre e contestualizzare al sistema sanitario italiano il modello elaborato nel Regno Unito tenendo conto delle peculiarità culturali, linguistiche e organizzative del SSN.
- Costruire un framework teorico-operativo che identifichi comportamenti osservabili e competenze chiave di leadership compassionevole, utili per dirigenti, coordinatori e team sanitari.
- Validare gli strumenti di misurazione in lingua italiana per rilevare i livelli percepiti e agiti di compassionate leadership.
- Analisi empirica degli effetti della compassionate leadership
- Valutare l'impatto della leadership compassionevole su variabili organizzative (clima, fiducia, sicurezza psicologica) e individuali (benessere, burnout, soddisfazione lavorativa).
- Esaminare le relazioni tra leadership, benessere e intention to leave, verificando il ruolo di mediazione esercitato dalla soddisfazione lavorativa e dal senso di appartenenza.
- Identificare eventuali differenze in base a ruolo, anzianità e contesto organizzativo.
- Sperimentazione e apprendimento organizzativo
- Implementare un percorso di formazione e ricerca-azione in due aziende sanitarie locali partecipanti al progetto, rivolto a dirigenti e coordinatori.
- Favorire la diffusione di pratiche di leadership compassionevole attraverso workshop, laboratori di co-design ed esperienze riflessive supportate da moduli e-learning.
- Promuovere processi di apprendimento organizzativo e di diffusione culturale della cura reciproca.

- Produzione di evidenze e linee guida per la governance del personale sanitario

Nel complesso, la ricerca mira ad utilizzare un approccio di implementation science per offrire un contributo teorico e applicativo alla letteratura sulla leadership sanitaria e alle pratiche di gestione del capitale umano nelle organizzazioni pubbliche ad alta intensità professionale.

4. Quadro metodologico

Il progetto adotta un approccio di *implementation* science proponendo di studiare sistematicamente i determinanti e i processi che influenzano l'adozione, l'adattamento e la sostenibilità di interventi di leadership compassionevole. In particolare, tramite l'utilizzo di approcci *mixed-methods* mira a ottimizzare l'impatto della leadership compassionevole nella pratica reale. La metodologia è stata disegnata per garantire robustezza empirica, partecipazione dei professionisti e trasferibilità dei risultati all'interno del SSN.

La ricerca si articola nelle seguenti fasi, cronologicamente integrate:

- Adattamento e costruzione del modello italiano della leadership compassionevole
- Revisione sistematica della letteratura internazionale e traduzione del materiale formativo del National Health Service - UK.
- Contestualizzazione del modello attraverso focus group e workshop con dirigenti e coordinatori sanitari, per garantire coerenza culturale e operativa con il SSN.
- Implementazione e formazione
- Realizzazione di un percorso formativo rivolto a dirigenti, coordinatori e figure di middle management nelle aziende sanitarie coinvolte nel progetto.
- Il percorso prevede otto incontri formativi (4 ore ciascuno) integrati da moduli e- learning e sessioni di riflessione guidata, per facilitare la traduzione pratica dei principi della compassionate leadership.
- Validazione empirica
- Approccio quasi-sperimentale longitudinale con gruppo sperimentale (3 servizi assistenziali di 2 Ausl) e gruppo di controllo (3 servizi assistenziali di 1 Ausl).
- Analisi quantitativa: utilizzo di questionari validati a livello internazionale e tradotti in italiano (C@W-LBI, MBI-HSS, PERMA Profiler, Job Satisfaction, Intention to Leave), con raccolta dati in tre momenti.
- Analisi qualitativa: interviste semi-strutturate e focus group per esplorare percezioni, esperienze e cambiamenti organizzativi percepiti.
- Triangolazione dei dati per rafforzare l'affidabilità dei risultati e comprendere in profondità i meccanismi di cambiamento.
- Disseminazione e trasferimento del modello
- Restituzione dei risultati alle aziende partecipanti.
- Produzione di linee guida operative per l'adozione del modello in altri contesti regionali e nazionali.

5. Risultati conseguiti o attesi

Trattandosi di un progetto in corso recentemente avviato, i risultati della sperimentazione saranno disponibili solo dopo il primo anno, ma a breve saranno disponibili quelli relativi all'analisi sistematica della letteratura, con le relative implicazioni per il sistema sanitario italiano. Inoltre, fin da ora, sulla base del quadro teorico di riferimento e delle evidenze internazionali, è possibile delineare alcuni esiti attesi e le relative implicazioni scientifiche e organizzative.

Ci si attende che l'implementazione del modello italiano di compassionate leadership possa produrre effetti positivi su tre livelli:

- A livello individuale, un miglioramento del benessere psicologico, della soddisfazione lavorativa e del senso di appartenenza, accompagnato da una riduzione dei livelli di burnout e di stress lavoro-correlato. La leadership compassionevole, infatti, favorisce processi di riconoscimento reciproco e sostegno emotivo che incidono sulla motivazione intrinseca e sulla resilienza professionale (Buonomo et al., 2022).
- A livello organizzativo, un rafforzamento del clima interno, della collaborazione interprofessionale e della sicurezza psicologica del team, elementi che possono tradursi in una maggiore coesione e in una percezione più elevata di fiducia verso la leadership e
- l'istituzione di appartenenza (Buonomo et al., 2022).
- A livello sistemico, un contributo alla sostenibilità delle risorse umane nel SSN, attraverso la riduzione dell'intention to leave e dell'assenteismo, il miglioramento della retention (Chamanga et al., 2025)e, nel lungo periodo, l'aumento della capacità attrattiva delle organizzazioni sanitarie pubbliche.

In prospettiva, i risultati attesi potranno fornire evidenze empiriche originali sul nesso tra compassionate leadership, benessere organizzativo e retention, ancora poco esplorato nel contesto italiano.

Il progetto si propone inoltre di offrire strumenti concreti di misurazione e intervento, basati su evidenze scientifiche, che potranno essere trasferiti ad altre regioni e contesti organizzativi. Il valore della ricerca risiede quindi nella possibilità di integrare la dimensione relazionale della leadership con la sostenibilità manageriale del SSN, contribuendo a sviluppare una cultura organizzativa in cui la cura delle persone — pazienti e professionisti — diventi un principio guida della governance sanitaria. La prospettiva di lungo periodo è quella di consolidare un modello di leadership sostenibile, capace di attrarre, motivare e trattenere i professionisti della salute, promuovendo organizzazioni più umane, resilienti e orientate alla cura delle persone e di chi cura.

Sul piano manageriale e di policy, il progetto contribuisce a sviluppare strumenti concreti per la valutazione e lo sviluppo della leadership nei contesti sanitari pubblici. Le evidenze attese potranno orientare le strategie di human resource management i programmi di formazione manageriale, supportando le direzioni aziendali e regionali nella costruzione di ambienti di lavoro più attrattivi, sostenibili e centrati sul benessere del personale.

6. Conclusione

La riflessione proposta evidenzia come, nel quadro delle attuali tensioni del sistema sanitario italiano, la questione della sostenibilità del personale non possa più essere affrontata solo in termini di risorse o di vincoli normativi, ma richieda una rinnovata attenzione alle dimensioni relazionali e culturali della leadership.

Il progetto "Compassionate Leadership: the Italian Way" si colloca in questa prospettiva, con l'intento di esplorare empiricamente in che modo pratiche di leadership fondate su ascolto, empatia e attenzione al benessere possano contribuire a migliorare il clima organizzativo e a favorire la permanenza dei professionisti nel SSN. Pur essendo una ricerca ancora in corso di avvio, il suo valore potenziale risiede nella possibilità di fornire un modello di leadership coerente con la cultura e la missione pubblica della sanità italiana, offrendo strumenti utili alla governance del personale e alla formazione dei futuri leader sanitari.

L'obiettivo di lungo periodo non è soltanto validare un modello teorico, ma promuovere una riflessione più ampia sulla cura delle persone come competenza manageriale. In tale direzione, la compassionate leadership può rappresentare una leva concreta per sostenere il benessere

organizzativo e rafforzare la capacità del sistema sanitario di rispondere alle sfide di sostenibilità e qualità che lo attendono.

Parole chiave: Compassionate leadership; retention to leave; intention to stay; middle management; sanità

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Network Governance and Managerial Innovation for Community-Based Healthcare: A Strategic Framework for Territorial Value Creation

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1. Introduction

The Italian National Health Service is undergoing a profound institutional and organisational transformation aimed at strengthening territorial healthcare organisations, improving equity, and increasing access to integrated socio-health services. The reform impetus, accelerated by the National Recovery and Resilience Plan (PNRR), Mission no. 6.1, has introduced innovative regulatory, managerial, and infrastructural models designed to support a shift from hospital-centric to community-based care. In this context, Case della Comunità (CdC) represent the cornerstone of a reconfigured network of primary and integrated care services. They embody an organisational logic inspired by hub-and-spoke architectures, multi-professional integration, and community engagement strategies, enabling personalised care pathways and continuous management of chronicity.

This evolving paradigm can be theoretically framed through network governance (Provan & Kenis, 2008), a model that emphasises horizontal coordination among autonomous yet interdependent actors, including local health authorities, municipalities, third-sector organisations, private accredited providers, and community networks. This network positions CdC as strategic nodes in collaborative networks where socio-health services are co-produced across institutional boundaries (Romiti et al., 2020; Giusti et al., 2025).

Network governance has been widely recognised for its capacity to address complex public problems through shared decision-making, distributed leadership, and the mobilisation of diverse knowledge bases (Ansell & Gash, 2008; Klijn & Koppenjan, 2016). In healthcare organisations, multi-actor networks have proven effective in improving continuity of care, coordination, and population health management (Ferlie et al., 2013; Goodwin, 2016). The Italian reform aligns with international evidence showing that integrated community care systems enhance health equity, reduce unnecessary hospitalisations, and foster patient-centred models of chronic care (WHO, 2018; Valentijn et al., 2013). Moreover, from a managerial standpoint, the operation of territorial healthcare organisations requires advanced tools such as multi-level performance management systems (Bevan & Hood, 2006), inter-organisational coordination mechanisms (O'Toole, 2015), shared budgeting processes (Bovaird, 2007), and digital integration platforms that enable data sharing, clinical information continuity, and population health analytics (Adler-Milstein & Jha, 2017). The use of these tools stresses the importance of such managerial innovation especially performance governance, digitalisation (e.g., FSE, DSS), and participatory evaluation as necessary enablers for territorial integration.

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The theoretical framework is further strengthened by the lens of Community Governance and Building (Zazzera, 2021) and Citizen Involvement Models (Longo & Barsanti, 2022), which highlight the centrality of community engagement initiatives in enhancing legitimacy, co-creation of value, and responsiveness to local needs. This resonates with international research showing that community participation improves health outcomes, increases trust, and strengthens accountability mechanisms in public services (Bussu & Galanti, 2018; Renedo & Marston, 2015).

The "leadership in the plural" (Kjellström et al., 2024), is a notion deepened in this work in progress and aligned with collaborative leadership theories (Huxham & Vangen, 2000; Denis et al., 2012). In particular, the concept developed by Kjellström et al., (2024) represents a significant evolution in leadership theory, particularly within public-sector contexts characterised by complexity, professional hybridity, and multi-actor interdependence. Contrary to traditional leadership models centred on the actions of a single, formally designated leader, plural leadership conceptualises leadership as an emergent, relational, and collective process distributed across multiple actors, roles, and organisational boundaries. This view departs from individualistic and heroic paradigms by framing leadership as an ongoing practice rather than a static positional attribute. In plural leadership, authority, influence, and decision-making capacity are dispersed and negotiated through interactions among organisational members. Theoretically, leadership in the plural aligns closely with concepts of distributed leadership, which emphasises how leadership is enacted through shared practices embedded in social and organisational routines rather than exercised solely by individuals occupying hierarchical positions (Spillane, 2006).

Plural leadership has become an essential organisational logic in healthcare organisations where clinical, managerial, and community actors should collectively coordinate care pathways, allocate resources, and negotiate governance arrangements across institutional boundaries. In these complex environments, no single leader or profession monopolises the knowledge, authority, or legitimacy needed to steer interdependent service networks. Instead, leadership emerges as a collective, relational accomplishment distributed across heterogeneous actors who contribute distinct epistemic resources and institutional mandates. The plural-leadership framework articulated by Denis et al., (2012) conceptualises leadership as a dynamic and situated process generated through the interaction of multiple leaders rather than through hierarchical command, offering a theoretical foundation particularly suited to territorial and community-based healthcare systems.

The capacity of plural leadership to integrate diverse expertise is strengthened by relational coordination, which stresses that shared goals, shared knowledge, and mutual respect are necessary to align high-interdependence tasks such as chronic-care management and community participation (Gittell, 2002; Gittell et al., 2016). Yet, the epistemic cultures that characterise clinical professions, administrative actors, and community groups differ significantly, shaping what is considered legitimate evidence and appropriate care (Knorr-Cetina, 1999). Effective plural leadership requires mediating these epistemic divides, often through boundary spanning-roles and practices that enable communication, translation, and negotiation across organisational interfaces. Tushman's (1977) foundational work on boundary roles demonstrates how individuals positioned at organisational peripheries facilitate the flow of information and innovation across groups, a mechanism that has since been shown to be vital in integrated healthcare organisations and multi-organisational networks.

In healthcare, these boundary-spanning functions are frequently fulfilled by hybrid professionals who combine clinical, managerial, and sometimes community-oriented responsibilities (Noordegraaf, 2015; Hendrikx, 2017). Their hybrid identity equips them to navigate multiple institutional logics and reduce friction between professional autonomy, cost-efficiency imperatives, and community needs. Contemporary research on institutional complexity reinforces this point, noting that plural leadership is most effective when actors can interpret, blend, and selectively activate institutional logics to support joint decision-making and integrated service delivery (Thacher & Rein, 2004; Greenwood et al., 2011). However, plural leadership is

not inherently benign. Collaborative governance research warns that without supportive structures, clear role definitions, shared accountability frameworks, and facilitative leadership, multi-actor collaboration can produce coordination overload, role ambiguity or symbolic participation (Huxham & Vangen, 2013; Emerson & Nabatchi, 2015). In the territorial network of healthcare organisations this risk could be amplified by entrenched professional hierarchies, informational asymmetries, and the fragmentation of digital and organisational infrastructures. Therefore, plural leadership must be supported by concrete integrative mechanisms: jointly developed care pathways, digital boundary objects such as shared electronic records, regular cross-professional routines, and spaces for inter-organisational sensemaking (Oborn et al., 2011; Kellogg, 2009). When these enabling conditions are present, plural leadership becomes a powerful integrative force, transforming diverse epistemic communities into coordinated and community-responsive territorial healthcare networks capable of generating sustainable public value.

The main aim of this study situates its inquiry within the broader debates on public value, network capabilities, and co-production (Osborne, Radnor & Strokosch, 2016; Moore, 1995), recognising that collaborative territorial healthcare networks contribute to social, economic, and health outcomes essential for sustainable public governance.

The remainder of the work is organized as follows: Section 2 details the methodological design; Section 3 presents the expected results and conceptual model; Section 4 discusses theoretical and managerial implications by developing conclusions, limitations, and directions for future research.

2. Method

The study adopts a conceptual–analytical and exploratory research design, appropriate for examining emergent organisational forms and governance arrangements within complex public-sector organisations. This design enables the construction of a theoretically grounded yet empirically informed framework for interpreting the governance of territorial healthcare networks, with a specific focus on the CdC. Methodologically, the research follows a multi-strand strategy that integrates documentary analysis, systematic literature review, case-based reasoning, and framework synthesis in order to derive robust conceptual categories and evaluative instruments.

First, the qualitative document analysis was carried out on national legislation, PNRR policy acts, regional decrees, local organisational guidelines, and programmatic documents defining the operational characteristics of the CdC model. This phase ensures that the conceptualisation of territorial healthcare networks is grounded in the actual normative and strategic architecture shaping their implementation. Following established approaches in public administration research (Bowen, 2009), document analysis is used not only to extract formal policy content but also to interpret underlying governance logics, institutional priorities, and managerial assumptions.

Secondly, the study conducts a literature review across major scientific databases (Scopus, Web of Science, PubMed). The review spans international scholarship on network governance, integrated care, co-production, public value, community engagement, digital health, and inter-organisational collaboration. This step provides the theoretical scaffolding necessary to situate the Italian reforms within broader global debates on health-system transformation and to identify key analytical constructs such as coordination mechanisms, collaborative advantage, and performance governance. Furthermore, to explore how these theoretical principles manifest in practice, the study draws on case-based reasoning, incorporating case studies from selected Italian local healthcare authorities (Aziende Sanitarie Locali) and territorial socio-sanitary networks. The inclusion of case elements aims to capture the managerial practices, leadership structures, digital infrastructures, and community engagement strategies emerging in the early implementation of CdC. This approach aligns with the tradition of case study research in public management and

health policy (Yin, 2017), enabling sensitivity to context-specific dynamics while supporting analytic generalisation. The fourth phase involves framework synthesis, through which insights from both the literature and case-based evidence are integrated into a multi-dimensional analytical model. This synthesis clarifies the interrelations among governance modes, managerial tools, network capabilities, and community participation in shaping territorial performance.

Finally, drawing on public-value chain methodologies (Bryson, Crosby, & Bloomberg, 2014) and established integrated-care evaluation frameworks, this work in progress engages in the development of performance indicators and analytical tools. The resulting evaluative architecture is intended to measure multiple dimensions of network performance, including inter-organisational collaboration intensity, integration and continuity of care, resource optimisation, equity outcomes, and population well-being. This set of methods will aim to support the assessment of territorial healthcare networks not merely as organisational units but as collaborative systems generating public value.

3. Results

The expected results of the study point toward a coherent and mutually reinforcing set of findings that collectively illuminate how territorial healthcare networks and, particularly CdC, can be effectively governed and assessed within a network-governance paradigm. Emerging evidence suggests that the CdC model exhibits a high degree of structural and functional convergence with the principles of network governance, which emphasise collaborative coordination, distributed authority, and inter-organisational interdependence. Taking into account the multidimensional complexity of healthcare organisations' needs, no single hierarchical actor can ensure effective territorial care delivery on its own; rather, performance depends on the capacity of multiple organisations and professional groups to collaborate, share information, and jointly pursue population-health objectives.

A conceptual representation of these expected findings is provided in Figure 1, which offers a visual synthesis of the systemic configuration underpinning territorial healthcare governance. The diagram places Network Governance at the apex, illustrating its function as the overarching logic guiding organisational behaviour across the system. The flow into Territorial Healthcare Networks reflects the translation of governance principles into operational structures. The horizontal articulation of Managerial Innovation and Community Engagement act as lateral forces shaping CdC performance, while Digital Transformation enables integration. At the base, Performance Evaluation captures the cumulative outcomes generated by the system. As a whole, the diagram conveys a cascading yet interactive model, aligning with contemporary research that positions territorial care as a dynamic ecosystem where governance, organisational capabilities, social participation, and digital infrastructures collectively shape performance.

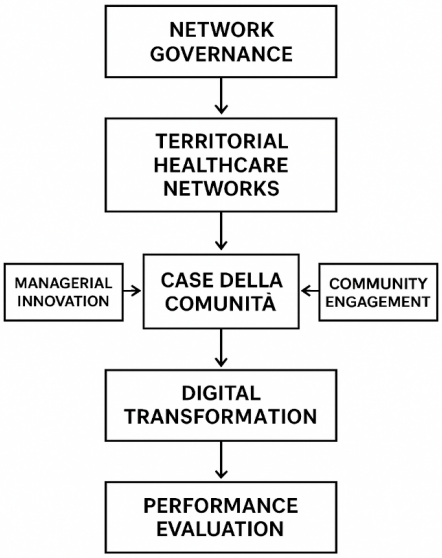


Figure 1. Diagram of territorial healthcare network governance and performance pathways

Within this governance architecture, the results are expected to highlight the importance of a distinct set of managerial tools that enable operationalisation of collaborative arrangements. These include shared performance frameworks, joint planning and budgeting mechanisms, interoperable digital platforms for real-time information exchange, participatory governance instruments supporting co-production, and leadership models grounded in distributed responsibility rather than hierarchical control. A further key result concerns the development of a multidimensional performance evaluation framework capable of capturing the complexity of territorial healthcare networks. The study is expected to propose macro-level indicators related to public value creation (equity, accessibility, population well-being), meso-level measures focused on organisational functioning and coordination intensity, and micro-level indicators assessing continuity of care, patient experiences, and personalised care trajectories. This tripartite approach is consistent with integrated-care evaluation models and reflects the need to assess territorial healthcare organisations as systemic entities rather than a collection of organisational units. The results also highlight the critical role of leadership and trust as behavioural determinants of network performance. Leadership should emerge not as a singular function but as a plural, distributed process mediated by relational dynamics among municipalities, local health authorities, third-sector organisations, and community actors.

In addition, the results highlight the centrality of digital health infrastructures as enablers of integrated territorial care. Tools such as the Fascicolo Sanitario Elettronico, decision-support systems, and data analytics platforms support population stratification, predictive modelling, care personalisation, and inter-organisational coordination. Because digital maturity is associated with improvements in quality, efficiency, and integration, digital transformation is anticipated to represent a foundational condition for the functioning of territorial healthcare organisations.

4. Discussion and conclusions

The research proposes a comprehensive and multi-layered conceptual framework that links governance models, organisational architecture, managerial tools, community engagement, digital infrastructures, and performance evaluation within territorial healthcare networks. By articulating the interdependencies among these dimensions, this work in progress contributes to

the theoretical consolidation of territorial healthcare organisations as a networked public-service ecosystem, moving beyond traditional hierarchical models of healthcare facilities. The previous Figure 1 visually synthesises this architecture, reinforcing the interpretive centrality of the CdC as bridging structures that mediate between policy intentions, organisational dynamics, and community-generated value.

Overall, this work aims to advance understanding in several domains. First of all, in the network governance theory, by situating territorial healthcare within collaborative, multi-actor structures, and in the community-based health systems, by foregrounding the value of community engagement initiatives as components of governance rather than peripheral add-ons. Moreover, collaborative and plural leadership should be developed through the recognition of shared leadership as a determinant of network performance, just as the digital-health organisational strategies should be developed by identifying digital infrastructures as enabling conditions rather than mere technological supports. Finally, the measurement of public value, by proposing a multidimensional evaluation architecture capable of broadly capturing systemic outcomes at the micro, meso, and macro levels, could be developed in future research.

However, despite these contributions, the study presents limitations that must be acknowledged. The framework is predominantly conceptual and exploratory, and while informed by empirical cases, it does not yet include a full-scale, systematic empirical validation across multiple territorial contexts. Given the substantial heterogeneity of Italian regional health systems, future research should critically assess how the proposed model performs across diverse implementation environments. Moreover, while the framework integrates digital infrastructures as enabling conditions, the field of digital-health ecosystems is rapidly evolving. Artificial intelligence, predictive analytics, and data-sharing protocols raise ethical, technical, and governance challenges that exceed the scope of the present conceptualisation. Future studies should explore how algorithmic decision support, interoperability standards, and digital equity concerns reshape network governance. The conceptual framework implicitly assumes a positive relationship between network governance and performance outcomes, but empirical studies show that networks can also produce coordination overload, ambiguous accountability, and decision paralysis. Thus, a number of critical perspectives should be developed by examining the conditions under which networks fail, fragment, or devolve into symbolic implementation.

Building on these limitations, comparative, multi-region studies should assess the applicability of the framework in heterogeneous operational contexts, identifying conditions for success and failure. The development of statistically validated indicators and predictive models could enhance evaluative precision and support evidence-based policy decisions. Thus, research using participatory action research, deliberative processes, and social network analysis could illuminate community governance dynamics in greater depth. Further analysis of distributed leadership and relational coordination can help identify competencies, behaviours, and organisational cultures that sustain collaborative advantage for the territorial healthcare organisations.

In conclusion, while the present work in progress provides a conceptual foundation for analysing governance and performance within territorial healthcare networks, further empirical and theoretical research is required to validate, refine, and operationalise the proposed framework. The model offers a promising starting point for advancing both academic scholarship and policy practice, supporting the development of territorial healthcare organisations capable of delivering integrated, equitable, and community-oriented public value.

Keywords: Territorial healthcare organisations; network governance; public value; plural leadership

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Mappare i bisogni per governare il cambiamento: un modello di network governance per le Case della Comunità

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1. Introduzione

Alla luce dei profondi mutamenti che stanno interessando il sistema di welfare italiano, i quali aprono la strada a visioni organizzative capaci di riconoscere la natura complessa, relazionale e riflessiva dei sistemi sociosanitari, diventa cruciale rileggere le aziende e le reti di tutela della salute come sistemi complessi, adattivi, capaci di apprendere, evolvere e rispondere in modo flessibile alle esigenze mutevoli della comunità (Plsek e Greenhalgh, 2001; Grossi, 2019). In contesti in cui si agisce con persone per persone, diventa una condizione abilitante e imprescindibile inserire la dimensione relazionale per pensare e valutare il valore pubblico generato dalle politiche e dai servizi sanitari territoriali (Folgheraiter, 2003). In questa cornice, le Case della Comunità (CdC) si configurano come un'evoluzione del modello di assistenza sociosanitaria precedentemente rappresentato dalle Case della Salute (CdS). Introdotte dal Decreto Ministeriale 77/2022, si presentano come architrave della riorganizzazione dell'assistenza territoriale, con la finalità di offrire servizi sanitari e sociali in modo integrato e coordinato. Questa ridefinizione mira a superare la frammentazione dell'offerta esistente (Maciocco, 2018) e promuovere al contempo una visione intersettoriale e partecipativa dell'assistenza (Costa e Donato, 2023) e della salute individuale e collettiva, configurando le CdC come dispositivi strategici capaci di leggere le disuguaglianze sociali e territoriali e integrare cura e partecipazione (Costa, 2023).

Nonostante il potenziale innovativo delle CdC, la loro effettiva capacità di coordinamento nel territorio risulta ancora limitata, compromettendone l'efficacia soprattutto nelle aree più remote (Costa et al., 2022). Attualmente, queste strutture stanno attraversando una fase di transizione organizzativa: il modello prevalente è ancora quello delle CdS, ma il DM 77/2022 ha introdotto nuovi standard qualitativi, quantitativi, strumentali e tecnologici per l'assistenza territoriale. Il presente progetto di ricerca si colloca proprio in questo delicato passaggio, analizzando e accompagnando l'evoluzione da CdS a CdC. Il modello organizzativo delle CdC si configura come un'iniziativa complessa che richiede un approccio di governance reticolare e inclusivo.

L'obiettivo generale è, per l'appunto, la definizione di un modello organizzativo per le CdC capace di garantire un coordinamento inter-organizzativo efficace. Tale coordinamento non è un esito spontaneo dell'aggregazione di strutture o della co-localizzazione fisica, bensì l'effetto di meccanismi di governance (strutturati, relazionali e informativo-digitali) progettati, sostenuti e adattati ai contesti (Provan e Kenis, 2008).

Il presente elaborato propone un disegno di ricerca multi-caso incentrato su quattro diverse strutture del contesto di Parma e provincia. L'analisi quantitativa e qualitativa dei quattro cotesti differenti mira a definire un modello scalabile e replicabile.

Lo studio è pertanto guidato dalle seguenti domande di ricerca:

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- Quali meccanismi di governance e di coordinamento, strutturali, relazionali e informativo, rendono efficace l'integrazione sociosanitaria nelle Case della Comunità?
- Come, tali meccanismi, variano e si combinano nei diversi contesti?

Trattandosi di uno studio in fase preliminare ed esplorativa, non si intende fornire risposte definitive a tali domande. Tuttavia, l'analisi comparativa delle quattro strutture prese in esame, delineata successivamente, consentirà di elaborare una prima rappresentazione dei processi di coordinamento tra gli attori coinvolti, costituendo una base per la successiva definizione del modello organizzativo.

2. Quadro teorico

In questo scenario di cambiamento, la collaborative (Ansell & Gash, 2008) e la network governance (Provan e Kenis, 2008) integrate con i principi di co-produzione e co-creazione di valore nei servizi pubblici (Moore, 1997; Bovaird, 2007; Osborne et.al., 2016) appaiono come linee guida per l'intero processo di analisi e definizione di un modello guidato da un approccio partecipativo che coinvolgerà attivamente la popolazione (Baraldi et al., 2015) nella rilevazione dei bisogni e nella co-progettazione del servizio.

Il funzionamento efficace delle CdC, poggia sulla capacità di coordinare attori, risorse e competenze provenienti da settori diversi (sanità, sociale, amministrazione locale, associazionismo). La gestione di tali network inter-organizzativi impone la necessità di compiere scelte strategiche e consapevoli su più aspetti: modalità di governance, meccanismi di coordinamento, ruolo della fiducia tra gli attori coinvolti o ancora trade-off tra gli obiettivi di efficienza, inclusione e legittimità delle decisioni (Emerson et.al., 2012). Questo filone teorico permette di focalizzarsi sui meccanismi concreti (es. accordi, interfacce, ruoli di confine, routine) che consentono alle CdC di funzionare come punti di integrazione e non come semplici contenitori fisici di servizi.

Nell'ambito della sanità territoriale e dell'integrazione sociosanitaria, la qualità e l'appropriatezza dei servizi sono direttamente correlate al grado di coinvolgimento degli utenti e della comunità (Buoso e Viscomi, 2024). La co-produzione è intesa non come volontarismo, ma come routine organizzativa che modifica flussi informativi, aspettative e responsabilità, con impatti misurabili su accessibilità, continuità e appropriatezza (Sicilia et.al., 2015; Osborne et.al., 2016).

Il modello di governance concepito per le CdC richiede, per tanto, un processo decisionale ibrido che riconosca l'asimmetria intrinseca del potere e delle responsabilità nel settore sanitario. Se infatti, da un lato l'inclusione di cittadinanza, utenza e associazioni può aumentare la democratizzazione (Ansell et.al., 2020) e la legittimità delle decisioni, dall'altro lato la sostenibilità organizzativa e finanziaria rimane responsabilità primaria dell'attore pubblico che detiene il mandato istituzionale. In questa prospettiva di network governance, il processo partecipativo assume una funzione di co-creazione di proposte (Nasi et.sl., 2024), l'utenza e le associazioni agiscono come fornitori di conoscenza situata (data la conoscenza specifica delle esigenze locali e dell'esperienza d'uso del servizio), tale conoscenza è integrata dall'ente pubblico con la propria conoscenza tecnica, legale e di fattibilità. La decisione finale è quindi frutto di una negoziazione mediata (Thomson e Perry, 2006; Nicolini, 2013), dove l'autorità, pur mantenendo il potere di veto o di modifica, è istituzionalmente vincolata a considerare, rispondere e giustificare le proprie azioni rispetto agli input ricevuti dalla rete (Battini, 2011). La co-produzione di decisioni e servizi permette così, una migliore corrispondenza tra le esigenze della comunità e le risposte fornite dal sistema sociosanitario, influendo direttamente sulla performance di rete (Mauro e Campanale, 2018).

Gray (1989) concepiva la collaborazione con una visione integrativa, rappresentandola come un processo in cui le parti, con visioni differenti, affrontano in modo costruttivo le loro divergenze e riescono a trovare soluzioni che superano i confini delle rispettive percezioni di ciò che è

realizzabile. Affinché la collaborazione evolva in una co-produzione efficace, è quindi necessario che gli elementi integrativi (es. relazioni personali, fiducia reciproca, impegni informali) non prevalgano sugli elementi aggregativi (che si manifestano nei ruoli organizzativi formali e nelle strutture rigide). Il modello deve quindi trovare il giusto equilibrio tra integrazione e aggregazione (Ring e Van de Ven, 1994) formalizzando così il processo attraverso i meccanismi di governance espliciti (Ansell e Gash, 2008). Tale processo di collaborazione e co-produzione deve essere inteso come "iterativo e ciclico" (Ring e Van de Ven, 1994), riconoscendo che l'apprendimento, l'adattamento e la negoziazione sono essenziali per il successo a lungo termine di una prospettiva integrativa (Thomson e Perry, 2008) in un ambiente complesso e in evoluzione come quello sociosanitario. Altra determinante da integrare nel modello è infatti, la dinamicità del contesto sociosanitario così che possa conferire la capacità di adattarsi alle eterogeneità sociodemografiche e logistiche dei diversi scenari. È necessario prevedere flessibilità e sensibilità (Sangiorgi et.al., 2024) nell'applicazione di meccanismi di rete, al fine di garantire una replicabilità in contesti differenti del modello sviluppato (Valentini 2024).

3. Metodologia

Il disegno di ricerca adotta la strategia di multiple case study, ritenuta particolarmente efficace per analizzare fenomeni complessi all'interno dei loro contesti reali (Yin, 2009). Questa scelta metodologica permette di rafforzare la validità esterna e la robustezza delle conclusioni consentendo un confronto sistemico, una ricerca di pattern comuni e un aumento della capacità di generalizzazione teorica (Scapens,1992).

Su questa premessa il modello ipotizzato parte da una mappatura dei bisogni sanitari e sociosanitari di diverse realtà del Comune di Parma e della sua provincia, attraverso la selezione di quattro strutture in contesti territoriali distinti: urbano, rurale e montano. I tre partner principali del progetto sono: il Comune di Parma che svolgerà il ruolo di coordinamento tra gli attori del territorio garantendo al contempo un allineamento con le politiche sociali e sanitarie locali, l'AUSL di Parma che rappresenta l'attore principale nell'organizzazione e nell'erogazione dei servizi sanitari e sociosanitari e l'Università di Parma che fornirà supporto scientifico e metodologico. Un ruolo cruciale sarà inoltre ricoperto dagli Enti del Terzo Settore e dalla cittadinanza attiva, il cui coinvolgimento nella progettazione e nell'erogazione dei servizi di assistenza sanitaria e di welfare locale rappresenta un elemento cardine (Abimbola, 2020; De Weger et al., 2022; Van der Knaap et al., 2019).

In questa fase iniziale si è consapevoli che la selezione delle CdC è parziale; infatti, l'ampliamento dei casi verrà ripreso in uno stadio successivo del lavoro.

In questa tappa sono state individuate le seguenti strutture: la Casa della Comunità Lubiana San Lazzaro rappresentativa del contesto urbano; la Casa della Salute di San Secondo e la Casa della Salute di Langhirano espressione del territorio rurale; e la Casa della Salute di Tizzano-Val Parma, che incarna le specificità del contesto montano.

Il disegno di ricerca empirica combina una indagine quantitativa e una indagine qualitativa sugli stakeholder organizzativi e comunitari, secondo una logica multi-caso. Questa impostazione consente un'analisi approfondita utile per cogliere la percezione dei servizi, i bisogni emergenti e le dinamiche relazionali tra gli stakeholder (Ugolini et.al., 2020).

La survey sarà somministrata a un campione di residenti nei diversi contesti (urbano, rurale, montano), stratificati per Comune e frazioni, reclutati tramite sportelli delle Case della Comunità, medici di medicina generale, Terzo settore e canali on line.

La componente qualitativa prevede: (i) focus group con le professionalità già presenti nelle équipe multiprofessionali che operano nelle strutture (medici di medicina generale, infermieri di comunità/familiari, assistenti sociali, responsabili CdC, dirigenti distrettuali e rappresentanti del Terzo Settore), organizzati per setting assistenziali e tematiche specifiche; (ii) interviste semi-strutturate rivolte ai policy maker e ai rappresentanti del Terzo Settore; (iii) e questionari

strutturati, distinti in due versioni: uno rivolto alla cittadinanza e l'altro destinato agli operatori sociosanitari delle Case della Salute/Comunità.

Il questionario rivolto ai cittadini del Comune di Parma e della sua provincia sarà somministrato con l'obiettivo di raccogliere in modo partecipativo percezioni, bisogni e proposte rispetto ai servizi territoriali, rappresentativo delle principali aree territoriali (urbana, rurale e montana). La somministrazione agli operatori permetterà invece di integrare una valutazione esterna basata sull'esperienza e sulla percezione degli utenti, con una valutazione interna fondata sulla prospettiva organizzativa dei lavoratori pubblici. Questa differenziazione consentirà di raccogliere dati da target eterogenei e complementari, anche rispetto ai focus group, e di costruire una lettura multilivello della qualità, dell'efficacia e dell'aderenza dei sevizi ai bisogni della comunità.

L'utilizzo combinato di diversi strumenti di rilevazione rappresenta un ulteriore vantaggio strategico, poiché consente di cogliere la complessità dell'innovazione nei servizi sociosanitari, raccogliere prospettive eterogenee da parte degli stakeholder coinvolti (Greenhalgh et.al., 2017) e promuovere soluzioni collaborative più aderenti ai bisogni reali delle comunità (Jagosh et.al., 2012).

La componente quantitativa fornirà invece un inquadramento contestuale dei bisogni sanitari e sociosanitari della popolazione di riferimento. Quest'ultima però risulta più complessa, in quanto si focalizza sull'analisi dei dati epidemiologici e amministrativi, il che implica la gestione di dati sensibili riferiti ai singoli cittadini, con potenziali implicazioni per la tutela della privacy. Per affrontare questa criticità, sarà necessario coinvolgere il Responsabile della Protezione dei Dati (DPO), al fine di definire modalità sicure e conformi per l'accesso e l'elaborazione di tali informazioni. Si ipotizza, in collaborazione con i Medici di Medicina Generale (MMG), di avviare una procedura per la raccolta del consenso informato da parte dei cittadini, valutando contestualmente la possibilità di aggregazione e anonimizzazione dei dati raccolti, in quanto il trattamento delle informazioni sanitarie richiede misure specifiche di salvaguardia e il rispetto delle regole in materia di consenso e protezione, essenziale per garantire fiducia e legittimità nel processo di analisi (European Union Agency for Fundamental Rights, 2018). Questa fase rappresenta un passaggio delicato e al contempo strategico, in quanto condizionerà la qualità e la profondità dell'analisi dei bisogni sanitari e sociosanitari della popolazione.

Per migliorare ulteriormente la credibilità dei risultati e la robustezza del disegno di ricerca, verrà applicata una strategia di triangolazione su diversi livelli, a partire dalle fonti e dai metodi di rilevazione così da consentire il confronto delle diverse prospettive degli stakeholders. Anche i ricercatori interverranno nella fase triangolazione della teoria per confrontare le letture dei risultati e integrarle a diversi filoni teorici, ridurre la soggettività, identificare i pattern ricorrenti e rafforzare la validità teorica (Halkias et.al., 2022).

L'analisi seguirà così una logica within-case e cross-case, con pattern matching (Yin, 2009) tra configurazioni teoriche e pattern empirici osservati. L'utilizzo di Qualitative Comparative Analysis (QCA) (Ragin, 1993) permetterà di indagare come diverse combinazioni di condizioni (assetti di governance, caratteristiche dei contesti, intensità della partecipazione) si associano agli esiti di integrazione, accesso ed equità (Cucari, 2019; Thomann e Ege, 2020). Qualora siano disponibili dei dati relazionali sufficientemente densi, sarà inoltre impiegata una Social Network Analysis per descrivere la struttura della rete (grado, densità, centralità) e collegarla ai risultati in termini di valore pubblico (Da Silvia et.al., 2022).

La Tabella 1, riportata di seguito, illustra sinteticamente le diverse fasi metodologiche previste all'interno del progetto.

FASE	OBIETTIVO	STRUMENTO

Mappatura del contesto	Identificazione dei servizi esistenti e degli attori principali nell'ecosistema del servizio sanitario di Parma	Ricerca documentale, revisione delle politiche e analisi della letteratura
Selezione dei casi studio	Cogliere le variabili tra i centri sanitari urbani, rurali e montani	Mappatura degli stakeholder
Indagine partecipativa	Comprensione delle esigenze locali e delle percezioni relative ai servizi	Interviste semi-strutturate, focus group e questionari
Analisi quantitativa	Analisi dei dati dei servizi presi in esami	Dati epidemiologici (AUSL); dati amministrativi e demografici (Comune)
Progettazione e implementazione del modello delle CdC	Modello di governance partecipativo replicabile	Integrazione e analisi dei dataset

Tabella 1. Fasi del progetto

4. Risultati attesi

Sebbene il lavoro empirico sia nella sua fase iniziale, sia l'inquadramento teorico che l'analisi dei quattro casi territoriali mostrano come le CdC assumano configurazioni profondamente differenziate in base alle caratteristiche demografiche, geografiche e organizzative dei contesti in cui operano.

Nel contesto urbano della Casa della Comunità Lubiana San Lazzaro, l'elevata densità abitativa e l'eterogeneità sociodemografica producono una domanda ampia, diversificata e spesso complessa. La vicinanza all'Azienda Ospedaliero-Universitaria della città la rende un nodo cruciale della rete territoriale, facilitando la continuità assistenziale ma generando al contempo flussi consistenti che possono tradursi in congestione e sovraccarico operativo. L'offerta è articolata (medicina generale, specialistica, infermieristica di comunità, percorsi per fragilità, prevenzione e screening) e integra in modo strutturato funzioni sociali grazie alla collaborazione con il Comune e il Terzo Settore. Da tale configurazione emergono bisogni specifici: monitoraggio continuo dei carichi di attività, coordinamento più solido dei flussi con l'ospedale, capacità di anticipare la domanda attraverso pattern di accesso e fasce orarie critiche.

Nel contesto rurale in cui si trova la Casa della Salute di San Secondo si presenta una ridotta densità abitativa con una distribuzione della popolazione su un territorio ampio, che richiede un modello multisede e un coordinamento istituzionale stretto tra i comuni limitrofi. La sede opera come polo integrato, garantendo prossimità attraverso medicina generale, ambulatori infermieristici, attività preventive e sportelli PUA (Punto Unico di Accesso) e sportelli ADI (Assistenza Domiciliare Integrata). L'integrazione sociosanitaria è consolidata, ma il territorio presenta criticità specifiche legate alla limitata disponibilità di specialistiche e alla necessità di rafforzare le risorse professionali. Da queste dinamiche emergono bisogni legati alla lettura fine delle differenze intra-territoriali, alla garanzia di continuità assistenziale per anziani e famiglie multiproblematiche e a una programmazione più accurata delle specialistiche per evitare disallineamenti e ridondanze tra sanitario e sociale.

Sempre nel contesto rurale, la Casa della Salute di Langhirano rappresenta un punto di riferimento per i comuni montani e rurali adiacenti. L'offerta è complessa e diversificata, si configura infatti quasi come un piccolo hub territoriale. I servizi includono Medicina Generale e Pediatria, una ricca gamma di ambulatori specialistici (Disturbi Cognitivi e Demenze, Ostetricia, SerDP, Psicologia Clinica, Medicina dello Sport ecc.), sportello PUA e un Ambulatorio Infermieristico e un Ambulatorio Integrato per la Cronicità (a gestione infermieristica). La struttura ospita anche servizi ad alta intensità come l'Ospedale di Comunità, l'Hospice, il CSM (Centro di Salute Mentale) e la Neuropsichiatria d'Infanzia e Adolescenza. Tale configurazione pone al centro come bisogni primari il coordinamento logistico e inter-professionale su un vasto territorio di competenza per garantire continuità assistenziale tra i servizi ad alta e bassa intensità.

Infine, nel contesto montano della Casa della Salute di Tizzano–Lagrimone si evidenziano invece condizioni strutturali differenti: bassa densità abitativa, popolazione anziana, isolamento geografico e difficoltà di collegamento. La CdS, insieme al presidio per la continuità assistenziale, costituisce un presidio essenziale per ridurre gli spostamenti verso la città capoluogo di Parma. L'offerta (medicina generale, infermieristica di comunità, presa in carico delle cronicità, ADI, punto prelievi e alcune specialistiche) si concentra sul contrasto all'isolamento e sul valore della domiciliarità. Le criticità riguardano la carenza di personale, la complessità logistica e la difficoltà nel garantire continuità specialistica. I bisogni emergenti includono il rafforzamento della continuità assistenziale nelle fasce critiche, il potenziamento della presa in carico delle cronicità, il coordinamento delle équipe mobili e una programmazione specialistica coerente con i vincoli territoriali.

Una prima lettura integrata dei quattro contesti evidenzia come le CdC non possano essere pensate secondo logiche uniformi: ciascun territorio presenta configurazioni specifiche della domanda e gradi diversi di complessità organizzativa, che richiedono strumenti capaci di adattarsi alla variabilità locale.

Nel contesto del comune di Parma (meno nella provincia), si riscontra la presenza di un'infrastruttura sanitaria territoriale avanzata (Ugolini et al., 2020), all'interno della quale sono già in corso sperimentazioni di nuove forme di governance dei servizi, fondate sulla riflessività critica degli operatori e dei cittadini. Ne è l'esempio il Patto Sociale di Parma, un accordo partecipato tra Comune, Aziende Sanitarie, Università, Terzo Settore e altri attori per coordinare politiche sociali e sanitarie, promuovendo inclusione, prossimità e sostegno alle persone fragili. L'Osservatorio del Patto Sociale è lo strumento di monitoraggio e analisi che supporta la cabina di regia nel valutare l'efficacia delle azioni e proporre miglioramenti per il welfare cittadino; promuove processi di co-costruzione del sapere tra professionisti, utenti e comunità, con l'obiettivo di generare nuove pratiche trasformative e modalità di interazione tra istituzioni, professionisti e cittadini (Osservatorio del Patto Sociale, 2025). In questo spazio di riflessione il presente studio potrebbe tradurre tali dinamiche in un cambiamento concreto, valorizzando gli incontri già esistenti delle équipe multiprofessionali e trasformandoli da momenti di riflessione e confronto interno a occasioni strategiche per la raccolta e l'analisi dei bisogni della comunità in cui il servizio è inserito. In questo scenario le équipe multiprofessionali assumerebbero un ruolo di traduzione delle evidenze in azioni concrete di miglioramento e co-progettazione dei servizi, anche attraverso una rielaborazione costante della propria pratica professionale (Schön, 2017). Creare così uno spazio generativo, capace di orientare l'azione sociosanitaria in modo più aderente e responsivo alle esigenze locali (Gramigna et.al., 2022). Ciò permetterebbe di andare oltre la gestione dei singoli casi, di includere l'interpretazione dei dati e di restituirli alla comunità generando processi di apprendimento organizzativo e innovazione sociale (Ceccarelli, 2023).

In tale direzione, si potrebbe prevedere la creazione di un Osservatorio Digitale Territoriale (ODT), concepito come ambiente dinamico per la raccolta, l'organizzazione e l'analisi continua dei dati relativi ai bisogni sanitari, sociali e organizzativi del territorio specifico di riferimento. L'ODT rappresenterebbe non solo uno strumento tecnico, ma un dispositivo abilitante per la governance riflessiva delle Case della Comunità, capace di alimentare un circuito informativo

multidirezionale tra cittadini, operatori e istituzioni e di sostenere un processo decisionale continuo e informato.

Esso faciliterebbe la capacità delle CdC di anticipare la domanda, modulare l'offerta e orientare le risorse in modo più equo ed efficace. A tal fine, l'aggregazione e l'anonimizzazione di fonti eterogenee di dati (come dati epidemiologici, amministrativi e derivanti dalle indagini sul campo) in un'unica architettura informativa garantirebbe trasparenza, tracciabilità e sicurezza, nel pieno rispetto della normativa sulla protezione dei dati personali (GDPR 2016/679). L'integrazione dei dati abiliterebbe così le analisi multilivello che intercettano sia le dinamiche strutturali sia le traiettorie emergenti dei bisogni locali.

Dispositivi partecipativi di questo tipo contribuirebbero a ridurre le asimmetrie informative e a valorizzare i saperi situati, in coerenza con i principi della co-produzione e della governance collaborativa (Emerson et al., 2012; Nabatchi & Leighninger, 2015).

5. Discussione

Collocato nella fase preliminare e fondato sull'analisi della letteratura, il presente studio, seppure privo di evidenze empiriche, mira a inquadrare un modello organizzativo per le CdC proponendo uno schema decisionale ibrido in grado di bilanciare l'inclusività della rete con la responsabilità decisionale dell'AUSL. La sfida metodologica è rappresentata dalla configurazione di un disegno di ricerca multiple case study capace di cogliere le esigenze di adattamento alle specificità locali (Provan e Kenis, 2008), necessarie per garantire la replicabilità del modello.

Tale configurazione mira, perciò, a generare valore pubblico attraverso l'attivazione di performance multidimensionali, capaci di coniugare efficienza organizzativa, equità distributiva e accessibilità ai servizi (Porter, 2010). In tale prospettiva, le CdC si configurano come dispositivi di prossimità in grado di intercettare i bisogni complessi e promuovere una presa in carico integrata, soprattutto nei contesti territoriali più fragili; tali strutture ben radicate e coordinate riescono inoltre a contribuire alla riduzione degli accessi inappropriati al Pronto Soccorso (Ugolini et.al., 2020), obiettivo coerente con le finalità del DM 77/2022. Tuttavia, per distinguere correlazioni da causalità, è necessario disporre di dati granulari che tengano conto delle variabili contestuali (Olier et.al., 2023), rafforzando così la capacità valutativa del sistema. In questo senso, la valutazione delle performance non può limitarsi a indicatori quantitativi, ma deve includere dimensioni di valore percepito, prossimità e impatto sociale, in un'ottica di accountability e miglioramento continuo (Nuti e Vainieri, 2020).

La necessità di misurare e gestire il valore generato introduce un terzo filone teorico: Management Control e il concetto di Data-Enabled Plublic Value (Gagliardo et.al., 2024). In tale ottica, l'informazione non è vista solo come rendicontazione ex post, ma come leva per decisioni quotidiane (Argyris, 1996) e per l'apprendimento adattivo del network in contesti inter-organizzativi (Kraatz, 1998; Coghlan e Coughlan, 2015). Questo aspetto si lega con l'innovazione digitale e l'introduzione di nuovi strumenti digitali, la cui adozione nei sistemi sociosanitari non può prescindere da un disegno organizzativo, coerente e con un valore percepito da parte di professionisti e cittadini (Miccu, 2021; Costantini et.al., 2024). In assenza di tali elementi, molte soluzioni rischiano di essere abbandonate o di non scalare efficacemente (Greenhalgh et.al., 2017). La scalabilità, infatti, richiede una governance dei dati solita, capacità di integrazione tra attori e sostenibilità degli oneri organizzativi (Portz et.al., 2024).

La governance multilivello delle Case della Comunità necessita quindi di meccanismi di apprendimento e accountability per armonizzare gli standard nazionali con le autonomie regionali e aziendali (Natali et.al.,2023). Questo approccio, che mette in rete approcci e attori, è in grado di promuovere una visione sistemica e intersettoriale della salute (World Health Organization, 2023).

Il contributo del lavoro è rappresentato dall'articolazione di un modello di governance delle Case della Comunità che trae fondamento da una mappatura partecipata e periodica dei bisogni.

Attraverso un disegno multi-caso che include contesti urbani, rurali e montani, si analizza come le diverse configurazioni di rete (NAO, lead organization, shared governance) si combinano con le specificità territoriali per abilitare integrazione sociosanitaria, accessibilità ed equità. Si ipotizza un cruscotto di indicatori multilivello per la misurazione del valore pubblico e si propone l'istituzionalizzazione di un Osservatorio Digitale Territoriale quale dispositivo di apprendimento e di governo. In tal senso, il lavoro intende offrire un riferimento pratico per dirigenti pubblici e policy maker impegnati nel ridisegno della sanità territoriale.

I principali limiti del progetto riguardano la fase esplorativa e la numerosità dei casi per cui i lavori successivi includeranno analisi cross-case sistematiche (pattern matching/QCA), misure longitudinali e la valutazione degli effetti organizzativi (accountability, sostenibilità degli oneri). La replicabilità del modello dipenderà dalle condizioni abilitanti (commitment, data governance, competenze di facilitazione) e dalla capacità di bilanciare inclusività e responsabilità.

Parole chiave: Case della Comunità; integrazione sociosanitaria; network governance; co-produzione; valore pubblico; welfare territoriale

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Sitografia

Report Osservatorio Patto sociale.pdf

Oltre la Rational Choice: la transizione dei modelli di pianificazione nelle ASL della Puglia

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1. Inquadramento teorico: la crisi del modello razionale e la necessità di nuovi paradigmi

Le teorie economiche e di management classiche hanno posto al centro dei loro sviluppi il principio dell'intelligenza razionale, o rational choice (Smith, 1776; Mill, 1844). Le dimensioni cognitive, computazionali e analitiche hanno alimentato i modelli matematico-formali incentrati sulla massimizzazione dell'efficienza operativa e della quantità di output (Taylor, 1911; von Neumann & Morgenstern, 1944; Simon, 1947). Tale approccio ha favorito l'affermarsi del modello "ospedalocentrico" e la governance sanitaria ha avuto come obiettivi principali la massimizzazione degli output erogati e la riduzione dei costi. La salute è stata trattata come qualsiasi commodity, da misurare in termini puramente prestazionali (Cifalinò et al., 2020).

A partire dalla fine del secolo scorso questo approccio ha mostrato tutti i suoi limiti. Il bisogno di salute è cambiato profondamente e vi è stato un incremento della complessità: l'aumento esponenziale delle cronicità, l'invecchiamento progressivo della popolazione e la nascita di nuove vulnerabilità socio-sanitarie. In tale contesto, il modello ospedalocentrico, adatto alla cura delle acuzie, si è mostrato, in ragione della sua rigidità e frammentazione, inadeguato e insostenibile per le cronicità e per il sostegno socio-sanitario (Ciasullo et al., 2020). Ha mostrato tutti i suoi limiti nella capacità di fornire una risposta efficace e di qualità e di rendere il sistema sostenibile (Dicuonzo et al., 2025).

Al fine di realizzare un'organizzazione e una gestione del sistema sanitario e, nel suo ambito, delle aziende, negli ultimi decenni si è andato affermando il paradigma delle intelligenze multiple (Gardner 1983; Goleman 1995; Kahneman 2011). In campo manageriale e, nello specifico, nell'analisi dei PIAO, possiamo classificare le seguenti intelligenze:

- L'Intelligenza Razionale (Rational Choice) si basa sulle dimensioni cognitiva, computazionale e analitica. Attraverso di essa si misurano, si calcolano, si ottimizzano le risorse e si definiscono gli standard quantitativi.
- L'Intelligenza Emotiva (Goleman, 1995) riguarda la capacità di riconoscere e gestire le emozioni proprie e altrui. Nel management sanitario, si traduce nell'umanizzazione delle cure (Busch et al., 2019; Todres et al., 2009) e nell'attenzione al paziente, nel mettere al centro del processo di diagnosi e cura la dignità della persona, nel mostrare empatia nella relazione di cura, nel supportare psicologicamente.
- L'Intelligenza Relazionale e Sociale consiste nella capacità di costruire reti e connessioni tra soggetti diversi attraverso l'integrazione tra ospedale e territorio, il dialogo tra medici di base e specialisti, il coinvolgimento delle associazioni di volontariato e delle famiglie.

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- L'Intelligenza Sistemica (One Health) è la capacità di vedere il quadro d'insieme e le interconnessioni tra elementi apparentemente distanti, ad esempio comprendendo che la salute umana dipende da quella animale e ambientale, o che investire oggi in prevenzione ambientale riduce i costi oncologici negli anni o per la salute pubblica.
- L'Intelligenza Contestuale (o Situazionale) è la capacità di adattare le soluzioni standard alle specificità del territorio, ad esempio non applicando le norme in modo adempimentale, ma calandole nella realtà geografica e sociale locale.
- L'Intelligenza Narrativa (Sensemaking) è la capacità di applicare il principio della coerenza ai documenti di programmazione per presentare un quadro comprensibile di come creare valore pubblico, collegando in modo unitario i singoli obiettivi. che superando, l'approccio tayloristico-weberiano, analizza il funzionamento delle aziende alla luce delle dimensioni comportamentali e organizzative, che tengono conto anche dei fattori emotivi (la relazione di cura, la fiducia), relazionali l'integrazione tra professionisti, il rapporto con il territorio) e sistemici (l'interconnessione tra la salute umana, animale e ambientale, secondo l'approccio One Health) (Zinsstag et al., 2011; Atlas, 2013).

Le aziende sanitarie, in questa ottica, sono considerate come "sistemi complessi adattivi" (Borgonovi, 2008; Plsek & Greenhalgh, 2001; Lipsitz, 2012), la cui capacità di creare valore non è semplicemente data dalla quantità di prestazioni prodotte ed erogate, ma dalla capacità di generare impatti multidimensionali (outcome) che includono equità, inclusione sociale e benessere percepito (Bland, 2019; Burns et al., 2024). È invece necessario recuperare la dimensione etica e sociale dell'azienda pubblica, che non trova la sua legittimazione nel pareggio di bilancio, bensì nella capacità di rispondere ai bisogni complessi della comunità (Leardini, 2012).

In questo quadro, le teorie contemporanee del decision making contribuiscono a chiarire il legame tra le intelligenze multiple e la programmazione. La letteratura organizzativa ha infatti superato da tempo l'idea della decisione come atto pienamente razionale (March & Simon, 1958; Simon, 1977), mostrando come le scelte nei sistemi complessi derivino da processi incrementali (Lindblom, 1959), non lineari, distribuiti e fortemente dipendenti dal contesto, in una logica adattiva necessaria alla sostenibilità degli attuali sistemi sanitari resilienti (Braithwaite et al., 2023).

Nelle aziende sanitarie, ciò implica che la programmazione – e in particolare la costruzione dei PIAO – non possa basarsi esclusivamente su criteri ottimizzanti tipici della rational choice, ma richieda un approccio in cui le diverse forme di intelligenza orientino l'analisi del problema, la cooperazione tra gli attori e i processi di sensemaking collaborativo (Weick, 1995; Mintzberg, 1976). L'integrazione di intelligenze diventa, quindi, un prerequisito per assumere decisioni efficaci, coerenti con la complessità dei bisogni e capaci di generare valore pubblico, attraverso logiche non più transazionali, ma di co-creazione e di governance collaborativa (Osborne et al., 2023; Torfing et al., 2024).

2. Il contesto di riferimento: PNRR, DM 77/2022 e la sfida della pianificazione

Il Piano Nazionale di Ripresa e Resilienza (PNRR), Missione 6, e il successivo D.M. 77/2022 rappresentano la risposta istituzionale a queste nuove esigenze in Italia, definendo nuove logiche e strumenti di governance che, superando la visione parziale sulle singole dimensioni della performance, conducano ad una misurazione e valutazione integrata del Valore Pubblico (Deidda Gagliardo et al., 2021; Meynhardt, 2009), che si focalizzi su una convergenza tra qualità erogata, qualità percepita e integrazione multiprofessionale.

La riforma presenta un nuovo disegno gestionale e organizzativo basato sulla centralità del paziente e sulla prossimità: Case della Comunità (CdC), Ospedali di Comunità (OdC) e Centrali Operative Territoriali (COT) saranno i nodi di una rete che sposta il baricentro della cura dal territorio all'ospedale (Fortino et al., 2024). È, tuttavia, necessario evitare che anche questa

riforma ricada nelle patologie del passato, cioè realizzare strutture che diventino "cattedrali nel deserto" senza modificare i modelli gestionali di presa in carico. Il Piano Integrato di Attività e Organizzazione (PIAO) può rappresentare un tentativo di porre a sistema la programmazione in una prospettiva di valore pubblico (Nisio et al., 2025) e costituire lo strumento per declinare la strategia nazionale e regionale nei piani e nei programmi delle singole aziende sanitarie.

La domanda di ricerca che guida il presente lavoro è dunque la seguente: i PIAO delle Aziende Sanitarie Locali (ASL), chiamati a governare questa transizione epocale, stanno evolvendo verso modelli di pianificazione basati sulle intelligenze multiple e sul Valore Pubblico, o rimangono ancorati a logiche di mero adempimento burocratico e al rational choice?

3. Obiettivi della ricerca e approccio metodologico

Lo studio si inserisce nel più ampio Progetto GRINS (Growing Resilient, INclusive and Sustainable - Spoke 2), che si propone di sviluppare nuove logiche e strumenti per la misurazione del valore e della performance pubblica. L'indagine empirica, con l'obiettivo di colmare il divario tra il nuovo modello di assistenza sanitaria territoriale e le logiche e gli strumenti di pianificazione, programmazione e controllo attualmente in vigore, ha adottato un approccio qualitativo basato sulla Content Analysis dei Piani Integrati di Attività e Organizzazione 2025-2027. Oggetto di analisi, allo scopo di delineare il quadro delle modalità di pianificazione, è la totalità delle Aziende Sanitarie Locali della Regione Puglia: ASL Bari, ASL Foggia, ASL Lecce, ASL Taranto, ASL Brindisi e ASL BAT (Barletta-Andria-Trani).

La ricerca adotta un approccio misto (mixed-method) articolato in fasi coerenti con il progetto GRINS.

- Fase 1 - Definizione del Framework (Deduttiva): In questa fase è previsto lo sviluppo di una matrice di valutazione articolata in tre livelli, costruita ispirandosi ai modelli multidimensionali internazionali (Arah et al., 2006; Senn et al., 2021) e all'analisi normativa del DM 77/2022. Il modello identifica:
  - Livello Macro (Abilitatori e Valore Pubblico): Impatto sociale, equità, sostenibilità e fiducia, al di là della mera sommatoria delle prestazioni, evidenziati attraverso obiettivi spia, quali, ad esempio, l'accessibilità per le fasce deboli, l'approccio One Health e la medicina di genere (Dicuonzo et al., 2025).
  - Livello Meso (Governance di Rete): Integrazione ospedale-territorio, PDTA, coordinamento tramite COT e capacità relazionali della rete (approccio relazionale) (Levesque & Sutherland, 2017).
  - Livello Micro (Operatività): Accessibilità, presa in carico, qualità percepita e dell'esperienza del paziente, umanizzazione delle cure, uso della tecnologia (telemedicina) come fattore di inclusione (Ahlgren & Lind, 2023).
- Fase 2 - Analisi dei PIAO (Induttiva): Content Analysis dei Piani Integrati di Attività e Organizzazione 2025-2027 delle ASL Bari, Foggia, Lecce e Taranto. I documenti sono stati analizzati utilizzando il framework Micro-Meso-Macro come griglia per valutare il grado di coerenza tra quanto dichiarato nella programmazione e le dimensioni del valore pubblico definite dal framework del progetto GRINS e dalla letteratura sulle Intelligenze Multiple (Impatto sulla salute, Equità e Inclusione, Fiducia e Soddisfazione, Sostenibilità).

4. Principali risultati (Work in Progress)

L'analisi comparata tra il modello teorico e i documenti programmatici restituisce un quadro di un sistema sanitario regionale in una fase di delicata transizione, in cui sono compresenti elementi innovativi e resistenze burocratiche.

Il primo dato che emerge con nettezza è l'isomorfismo strutturale e la persistenza della Rational Choice. Infatti, si rileva un'evidente omogeneità nella pianificazione delle infrastrutture

fisiche. Tutti i PIAO oggetto di analisi mostrano un'attenzione accesa alla compliance con le prescrizioni del DM 77/2022. Gli indicatori di output tipici della rational choice (numero di Case di Comunità da attivare, numero di COT da implementare, percentuali di completamento dei lavori edilizi) sono nettamente prevalenti. Ad esempio, l'ASL di Bari e l'ASL di Taranto riportano nel dettaglio la pianificazione per la realizzazione degli investimenti del PNRR. Gli obiettivi di output, quali la realizzazione di infrastrutture fisiche e tecnologiche, sono considerati come traguardi finali piuttosto che come determinanti dell'impatto sul miglioramento della salute. Vi è una prevalenza della dimensione procedurale, attenta al rispetto delle normative e degli indirizzi nazionali, rispetto a quella relazionale. Ad esempio, si stabilisce che dovrà essere realizzato un certo numero di Case di Comunità, ma non si definisce come verranno modificate le interazioni tra medici di famiglia, specialisti e pazienti.

Il Valore Pubblico è ancora definito in modo formale. Infatti, la sezione 2.1. "Valore Pubblico" presenta le principali criticità. Spesso, e in particolare nei PIAO dell'ASL Brindisi e dell'ASL BAT , gli obiettivi di Valore Pubblico tendono a sovrapporsi a quelli della performance organizzativa (mantenimento dell'equilibrio economico, rispetto dei tempi di pagamento o di erogazione dei LEA). Sebbene importanti, questi attengono all'efficacia interna e non all'efficacia sociale esterna. Latitano quasi ovunque indicatori di outcome di salute a lungo termine correlati alle nuove strutture territoriali. Ad esempio, non vi sono indicatori e target espliciti che misurino l'impatto delle COT sulla riduzione del tasso di ospedalizzazione. Il Valore Pubblico rischia così di essere un'enunciazione teorica, una sorta di "etichetta vuota" (box-ticking), priva di una reale capacità di orientare le decisioni strategiche verso il bene comune (Burns et al., 2024).

Nonostante il quadro delineato, si riscontrano alcuni interessanti elementi di introduzione di intelligenze manageriali più evolute, capaci di leggere e interpretare i bisogni e le problematiche specifici delle collettività e dei territori. Esempi in tale senso sono i seguenti.

La pianificazione dell'ASL Foggia mostra una forte consapevolezza delle specificità orografiche del Gargano e dei Monti Dauni. In una logica di intelligenza contestuale e di capacità adattiva, la tecnologia non è considerata un fine, ma un mezzo per incrementare l'equità nell'accesso alle cure. Ad esempio, il progetto di telemedicina non è considerato solo un'innovazione tecnica, ma è soprattutto uno strumento per ridurre le disuguaglianze territoriali, garantendo il diritto alla salute dei cittadini residenti nelle aree interne.

Nel PIAO di Lecce si riscontra un'attenzione maggiore ai temi dell'umanizzazione e dell'accessibilità "soft". Un esempio significativo è la consapevolezza che i progetti di miglioramento dell'efficienza digitale, se non accompagnati dall'implementazione di servizi di facilitazione digitale per gli utenti anziani e fragili, possono generare nuove barriere (digital divide). Questo dimostra un'attenzione all'User Experience che va oltre la semplice erogazione della prestazione clinica, promuovendo un approccio integrato e inclusivo all'uso delle tecnologie digitali. Tale attenzione può essere considerata un atto di cura relazionale (Bland, 2019).

Dall'analisi del PIAO dell'ASL BAT emerge un'attenzione alla gestione del capitale umano e al benessere organizzativo. Nelle procedure di valutazione della performance individuale, che, se pur ancora caratterizzate da formalismo, includono accanto agli obiettivi di risultato anche comportamenti organizzativi attesi. Anche la trasparenza e l'anticorruzione non sono perseguite in ossequio a norme imperative, ma costituiscono il prerequisito etico del valore pubblico, necessario per costruire fiducia nella cittadinanza.

Nel documento dell'ASL Brindisi è posta particolare attenzione all'integrazione tra ospedale e territorio nella gestione del farmaco. La gestione della farmaceutica territoriale e la continuità dei percorsi non sono solo un obiettivo di riduzione dei costi, ma anche di garanzia dell'accesso alle cure per i pazienti cronici. L'intenzione di governare la "filiera" della salute indica un'intelligenza sistemica volta a collegare i diversi ambiti aziendali.

Un altro esempio è dato dal PIAO dell'ASL Taranto, in cui l'inquinamento ambientale è identificato come una determinante critica per la salute, poiché è correlato all'incidenza di patologie tumorali. Pertanto, nella programmazione 2025-2027 vi è l'integrazione di obiettivi

specifici di sanità pubblica, come l'investimento PNC-PRACSI su 'Salute, ambiente, biodiversità e clima' con il potenziamento della sorveglianza epidemiologica attraverso l'aggiornamento del Registro Tumori. Ciò rappresenta un superamento della Rational Choice, in quanto sposta l'attenzione dall'efficacia interna (curare bene il paziente) all'efficacia sistemica (agire sulle cause ambientali della malattia).

Anche nel PIAO dell'ASL Bari si rinvengono segnali di superamento del paradigma puramente razionale. Infatti, vi sono obiettivi specifici legati al progetto "Intelligenza Emotiva" per la prevenzione delle dipendenze nelle scuole , nonché l'istituzionalizzazione della "Valutazione Partecipativa" e l'attenzione alla medicina di genere nella formazione. Ciò indica che, pur in un contesto di prevalenza della compliance normativa, l'intelligenza emotiva e relazionale inizia a farsi strada come leva operativa.

5. Discussione sui primi risultati

Le evidenze empiriche mostrano un marcato disallineamento temporale e concettuale tra la dimensione strutturale e quelle organizzativa e gestionale. Le ASL pugliesi viaggiano a due velocità; paiono rapide ed efficienti nella costruzione della parte hardware (edifici, tecnologie, procedure amministrative), più incerte e lente nel design e nell'implementazione della parte software (modelli relazionali, cultura della presa in carico, valutazione d'impatto). Nella struttura dei PIAO il rational choice è predominante: nonostante l'ipertrofia dei documenti, densi di tabelle e riferimenti normativi, la visione politica e sociale non è pienamente enunciata.

Tale approccio burocratico è spiegabile alla luce della teoria della razionalità limitata (Simon, 1947), come recentemente rielaborata negli studi sul comportamento decisionale nelle organizzazioni sanitarie pubbliche (Bellé et al., 2024). I decision makers delle ASL (direttori generali, staff di pianificazione) operano in un ambiente in cui si riscontrano informative, pressioni temporali stringenti (scadenze PNRR) e modelli assistenziali ad elevata complessità organizzativa (Fortino et al., 2024). Ciò non rende possibile la massimizzazione di una funzione di utilità globale come richiesto dalla Rational Choice. I decisori sono soggetti a bias cognitivi sistematici e a "rumore" (noise) decisionale, ovvero a una variabilità casuale, incoerente e indesiderata nei giudizi professionali che riduce la qualità della governance, determinando ingiustizia, imprevedibilità e spreco di risorse (Kahneman et al., 2021; Bellé et al., 2024).

Ciò porta il management sanitario ad abbandonare la ricerca di soluzioni ottimali per ripiegare su soluzioni 'soddisfacenti' (satisficing). Dall'analisi del contesto pugliese attuale, ciò si manifesta nella prevalenza della compliance formale. L'approccio adempimentale nei processi e nei contenuti della pianificazione (Nisio et al., 2025) surroga la razionalità trasformando la pianificazione in una strategia difensiva per gestire l'eccessivo "carico amministrativo" (administrative burden), che sottrae risorse alla creazione di valore pubblico (Cantarelli et al., 2024; Moynihan et al., 2018).

In tal modo l'ente ottiene la legittimazione procedurale al fine di ridurre la complessità interna, ma ignora i reali bisogni di salute, per cui la definizione e la misura del valore pubblico sono considerate un puro box-ticking, senza alcun impatto sui beneficiari finali (Burns et al., 2024; Ahlgren & Lind, 2023), in una logica di "compliance cosmetica", priva di impatto reale (Ilea & Ilea, 2024).

La complessità sistematica è derubricata a mera complicazione burocratica e non vengono proposti modelli di governo delle relazioni sistemiche. La dimensione del sensemaking organizzativo risulta deficitaria: i piani elencano un insieme di obiettivi disgiunti (fare 3 COT, assumere 5 infermieri, ridurre le liste d'attesa del 10%), per i quali non è indicato come possano convergere per creare valore pubblico per una comunità specifica (Levesque & Sutherland, 2017).

Tuttavia, vi sono segnali di innovazione che lasciano intravedere una transizione in fieri. Nel complessivo approccio burocratico, per rispondere al nuovo insieme di bisogni, vi sono primi esempi di utilizzo delle intelligenze multiple.

6. Conclusioni e prospettive

Lo studio conferma che la riforma dell'assistenza territoriale in Puglia è, al momento, orientata a garantire l'avanzamento fisico delle realizzazioni previste dal PNRR e dal DM 77. Per far sì che la riforma abbia un impatto positivo sul benessere della collettività e degli individui, è necessario un cambio di paradigma negli strumenti di governance e di accountability pubblica (Mussari et al., 2022), intesa non come mero adempimento formale, ma come assunzione di responsabilità sociale verso il territorio, che deve orientare le scelte strategiche fin dalla loro genesi (Leardini et al., 2014). Il PIAO non può restare un mero adempimento; deve evolversi in un vero strumento di pianificazione integrata che attivi l'intelligenza manageriale distribuita (Akgün et al., 2007). In questa prospettiva, il progetto GRINS può fornire un contributo rilevante, poiché il framework multilivello proposto (Micro-Meso-Macro) e la libreria dinamica di indicatori in fase di sviluppo non sono meri esercizi accademici, bensì supporti cognitivi per il management sanitario (Dicuonzo et al., 2025).Gli indicatori validati per misurare le prestazioni e gli impatti ai tre livelli consentono ai manager di interpretare e valorizzare le dimensioni immateriali che oggi sfuggono alla pianificazione. È pertanto necessario mantenere il rigore analitico della rational choice per garantire la sostenibilità economica, ma considerarlo strumentale alla generazione del valore pubblico che può essere generato attraverso le intelligenze multiple. Solo in questo modo la nuova rete territoriale potrà andare oltre gli aspetti infrastrutturali e rendere le diverse articolazioni previste dal DM 77/2022 (Case e Ospedali di Comunità, COT, centrali operative) nodi di un'unica rete di assistenza di prossimità. In definitiva, è necessario superare la logica dell'adempimento per generare un vero ecosistema di salute e di coesione sociale.

Parole chiave: Intelligenze multiple, valore pubblico, pianificazione integrata

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Enabling Human-Centric Healthcare: How Enabling Technologies Support Patient Humanization, Participation and Empowerment in Industry 5.0 perspective

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1. Introduction

In the current economic and social scenario, we are experiencing the coexistence of two industrial revolutions: Industry 4.0 (I4.0) and Industry 5.0 (I5.0). While I4.0 has seen production processes at the centre of the revolution, with the introduction of enabling technologies such as Additive Manufacturing, Augmented Reality, Autonomous Robots, Big Data and Analytics, Cloud, Cybersecurity, Horizontal and Vertical System Integration, Internet of Things (IoT) and Simulation (Rüßmann et al., 2015; Brunelli et al., 2017; Bortolini et al., 2018; Romeo et al., 2018; Büchi et al., 2020; Leong et al., 2020; Mubarok, 2020) and improvement factors (Martinelli et al., 2021; Wan et al. 2015; Ardito et al., 2019), I5.0 is based on some fundamentals standard to the previous version but represents an evolution aimed at bringing people back to the centre of business management (Sindhwani et al., 2022; Xu et al., 2021). In this context, I5.0 is based on the affirmation of the fundamental role of technology and innovation in achieving not only the effectiveness and efficiency of production processes, but above all in affirming the centrality of people, resilience and sustainability in its three pillars (Xu et al., 2021; Leng et al., 2022; Ríos et al., 2024).

This centrality and fundamental focus of I5.0 are evident in numerous studies and definitions that affirm that this is the real revolution currently underway (Nahavandi, 2019; Paschek et al., 2022; Piccarozzi et al., 2024a; Ghobakhloo et al., 2024). At the same time, it can be said that I5.0 has retained some distinctive aspects of I4.0, such as enabling technologies, innovative and heterogeneous tools designed to support businesses in achieving production effectiveness and efficiency, as well as continuous improvement and management cost containment (Müller et al., 2020; Maddikunta et al., 2022).

In I5.0, too, enabling technologies play a central role. We can identify not only those typical of I4.0 already mentioned, but also other, more innovative ones, such as Artificial Intelligence (AI), modern digital twins and collaborative robotics (cobots) (Maddikunta et al., 2022; Piccarozzi et al., 2024a). These enabling technologies fulfil and seek to achieve the new and challenging objectives of I5.0 related to human centrality, primarily enabling human-machine integration in physical but also digital environments (Bartoloni et al.,2022) to foster deeper collaboration and enable improved working conditions oriented towards well-being (Piccarozzi et al., 2024b) as well as participation and empowerment (Alves et al., 2023; Ivanov, 2023).

This transformation is affecting all sectors, not only purely industrial ones, and is also spreading to contexts with high human capital intensity, such as healthcare (Gomathi et al., 2023; Basulo-Ribeiro and Teixeira, 2024). In this context, digitalisation has been driving profound and

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radical changes in service quality, efficiency, and, above all, in improving patient access to care (Menvielle et al., 2017; Gjellebæk et al., 2020).

In this sense, technologies have the role of redefining the relationship between patients and the healthcare system, allowing for the introduction and dissemination of new human-centred approaches and models of care (Calvillo et al., 2013) that are capable not only of managing but also of adopting a predictive and personalised approach (Basulo-Ribeiro et al., 2024; Taj and Jhanjhi, 2022), with a significant contribution especially during the pandemic period (Khan et al., 2020; Golinelli et al., 2020).

It is precisely because of this contribution that we now talk about Healthcare 5.0 (Mohanta et al., 2019; Wazid et al., 2022), i.e. the application of I5.0 principles to the healthcare sector through innovative technologies and approaches capable of elevating the system to the centrality of the human being (Basulo-Ribeiro et al., 2024; Tandel et al., 2024). As with I4.0, enabling technologies also represent a concrete operational lever that can support healthcare professionals in their interactions with patients, helping increase trust and effective communication (Khan et al.,2024), as well as empathy and collaboration (Ríos et al., 2024).

Although the topic is widely discussed and there is growing interest in studying and exploring the application dynamics of I5.0 in various sectors, the literature still highlights a significant gap. In particular, there is a need to investigate in greater depth the link and impact of enabling technologies on patients and patient management, going beyond technical and organisational studies (Maddikunta et al., 2022; Basulo-Ribeiro et al., 2024). In this context, this research aims to investigate enabling technologies and their contribution to humanisation, participation, and patient empowerment.

Humanisation of care refers to the practice of treating patients not merely as clinical cases but as whole persons whose dignity, emotional needs, and individual experiences are respected and integrated into their care processes, fostering empathetic and respectful relationships between patients and providers (Reyes Téllez et al., 2024; Hickmann et al., 2022).

Patient participation denotes the active involvement of patients in decisions affecting their health, including sharing information, expressing preferences, and engaging collaboratively with clinicians in care planning and treatment choices. (Sahlsten et al., 2008; Castro et al., 2016).

Patient empowerment is a broader concept encompassing both a process and an outcome in which patients acquire the knowledge, skills, confidence, and authority to manage their health and healthcare decisions, shifting the balance of power toward patients and enabling autonomous, informed action (Bravo et al., 2015; Hickmann et al., 2022).

In light of these considerations, this research aims to answer the following question: which enabling technologies are currently in use, and how can they strengthen the human dimension of the healthcare system, promoting a truly person-centred model of care?

Specifically, we will analyse the role of enabling technologies in the two dimensions of humanisation and patient participation/empowerment.

Through a systematic review of the literature and a content analysis of the selected papers, we present the initial results and highlight the main implications for the topic.

2. Methodology

The research (work in progress) is based on a systematic review of the literature (Tranfield et al., 2003; Macpherson and Holt, 2007; Deng, 2012). This methodology allowed us to extract, using a rigorous and replicable approach, the main contributions in the literature on I5.0, Healthcare, and patient management. The Scopus database was selected for the bibliographic analysis as it represents the most commonly used sources in management studies (Newbert, 2007; Merli et al., 2018; Sassanelli et al., 2019). Scopus was chosen because of its role as the world's leading archive of peer-reviewed publications (de la Cruz-Lovera et al., 2019).

The selection of papers was conducted through a series of screening steps. The keywords searched were “Industry 5.0”, “Healthcare” (and/or) “patient”. The analysis returned 3,042 articles.

In the second phase, papers on “Business, management and accounting” were selected using a thematic filter in the Scopus database, yielding 89 papers. Subsequently, it was decided to choose only articles and reviews from double-blind peer-reviewed journals to increase the robustness and reliability of the contributions under analysis, resulting in a sample of 34 articles.

The final stage involved reviewing the abstracts to determine which studies to include or exclude based on their relevance to the research question and the topics addressed. The final sample consisted of 21 papers.

Through a content analysis process (Mayring et al., 2004), the enabling technologies in the sample of papers were identified. Each article was then classified according to its main contribution in the two areas of reference (humanisation, participation and empowerment). The research results were collected and organised in a database to facilitate subsequent analysis and any comparisons between variables.

3. Results

The analysis of the papers identified recurring enabling technologies and their contributions to patient empowerment, participation and humanisation. As shown in Table 1, Augmented/Virtual Reality (AR/VR) is the most cited technology, followed by Artificial Intelligence (AI). Blockchain, Cloud, and others have fewer applications. The technologies are often presented together and/or analysed separately in the same paper.

Enabling technology	**Occurrence in papers**	**%**
AR/VR	12	38%
AI	10	32%
Blockchain	4	13%
5G	1	3%
6G	1	3%
Cloud	1	3%
Digital Twin	1	3%
IoT	1	3%
Wearable Devices	1	3%

Table 1. Enabling technologies emerging from the literature

The most commonly used technologies (AR/VR and AI) appear to be capable of guiding management towards I5.0 principles (Maddikunta et al., 2022; Ríos et al., 2024), helping to change and improve the relationship with the patient.

Analysis of the papers also revealed the areas these technologies can support, distinguishing between empowerment and participation and the humanisation of the patient. Table 2 presents the results on recurrence across the papers.

Contributions	**Number of articles**	**%**
Empowerment and participation	9	43%
Humanisation	3	14%
Not evident	9	43%
Total	21	100%

Table 2. Contributions emerging from the analysis

Empowerment and participation are the outcomes that technologies seem to support most frequently (9 studies, equal to 43% of the sample). Also, a small percentage of articles also highlights the contribution to humanisation achieved through the direct or indirect application of enabling technologies (14% of the sample). It also emerges that a large proportion of the articles (43% of the sample) do not identify any implications and/or impact of technologies in the areas observed. (i.e. Agrawal et al., 2025; Satpayeva et al., 2025; Abdel-Basset et al., 2021; Beauvais et al., 2021).

Finally, the analysis made it possible trace and link individual technologies to different contributions in order to verify which ones contribute most and to what extent, and support the two contributions. The link does not always emerge clearly from the research and is not always explicitly stated by the authors; it often derives from a general assessment and analysis of the technology.

Table 3 shows the results.

Contributions	**Enabling technology**	**Number of articles**	**%**
Empowerment and participation	AI	8	35%
	AR/VR	6	26%
	Blockchain	4	17%
	5G	1	4%
	Wearable devices	1	4%
	Digital Twin	1	4%
	Iot	1	4%
	Cloud	1	4%
Humanisation	AR/VR	3	100%

Table 3. Details of the technologies supporting the contributions

The results show that, for the first dimension, empowerment and participation, AI is considered the most influential and driving technology, followed by AR/VR and Blockchain. Others enabling play only a marginal role. Regarding humanisation, AR/VR emerges as the most prevalent technology.

4. Discussion

The results show how enabling technologies have begun to contribute to and guide healthcare management towards the guiding principles of I5.0. Analysis of the literature reveals an apparent involvement of certain technologies across the various dimensions investigated. First and foremost, AR/VR appears in both the general analysis (Table 1) and the study of individual dimensions (Table 3). These technologies support the patient relationship by creating interactive and personalised experiences, helping build rapport and trust with the healthcare system, not only with healthcare professionals (Pillai et al., 2019; Basulo-Ribeiro et al., 2024; Narkhede et al., 2025; Manayath et al.,2024).

At the same time, AI also provides valuable support, especially in data analysis (think of the development of Big Data use in the healthcare sector) and predictive modelling (Ghobakhloo et al., 2025; Tandel et al., 2024), contributing, in this case, too, to the personalisation of patient care.

According to the literature review, other technologies, although they interact to a lesser extent, help create and develop the background necessary for the proper functioning of the former. Blockchain, cloud computing, and 5G support the collection, analysis, and sharing of data, contributing to security and ensuring the privacy of sensitive data (Sabuncu & Bilgehan, 2024; Gaur et al., 2024; Visvizi et al., 2025; Murmu, et al., 2025). Wearable devices and digital twin represent additional tools which, by interacting more directly with patients, can contribute to better interaction with healthcare professionals and the healthcare system (Manayath et al., 2024; Taj et al., 2022).

At the same time, these technologies play a role in supporting the two contributions investigated by the analysis: empowerment and participation, and humanisation, even if there is no strong, concrete and measurable link.

Empowerment and participation —the significant contribution that emerged from the analysis —are translated through various uses of technology. First of all, the direct involvement of the patient in decision-making processes (Gaur et al., 2025). This allows the patient to actively participate in managing their relationship with the healthcare system, increasing involvement and empathy, shifting from a passive to an active role (Verma et al., 2023; Kumar and Mallipeddi, 2022; Taj and Jhanjhi, 2022). This increases patient confidence, which is also fuelled by the rigour and transparency of the data (i.e. Visvizi et al., 2025; Ghobakhloo et al., 2025; Murmu et al., 2025). Cloud, Blockchain and 5G are the technologies directly involved in this specific aspect, contributing to improving the reliability and sharing of data not only within the healthcare system itself, but also and above all concerning the patient (i.e. Sabuncu & Bilgehan, 2024; Visvizi et al.,2025).

Therefore, empowerment and participation are based on the patient's immersive involvement in the healthcare process, supported in part by tools such as AR/VR (Gaur et al., 2025).

As regards humanisation, simulations and immersive experiences also convey a new relationship and a greater level of interaction and empathy with the healthcare professional, contributing to greater patient awareness and certainty regarding treatment and the care pathway (Narkhede et al., 2025). The patient's emotional involvement and close relationship (Khan et al., 2024; Manayath et al., 2024; Sharma et al., 2024) are also highlighted.

As evidenced by the results, we can hypothesise a link between enabling technologies, contributions in terms of empowerment, participation and humanisation in the I5.0 scenario. However, it should be noted that several studies do not directly highlight the contributions of

technologies but instead focus on mere digitisation and the technical and structural aspects of the healthcare system in general (Satpayeva et al., 2025; Abdel-Basset et al., 2021; Beauvais et al., 2021) or specific as for instance the supply chain (Agrawal et al., 2025; Chakraborty et al., 2025; Fares et al., 2025).

5. Implications

Although still in its early stages, the analysis conducted allows for the formulation of both theoretical and managerial implications.

From a theoretical point of view, the paper addresses a gap in the literature that calls for further studies, not only theoretical but, above all, empirical. The paper therefore seeks to contribute to the debate by providing some theoretical food for thought, emerging from the analysis of the system, which will guide future research into a more in-depth and targeted study of I5.0, enabling technologies and contributions for patients, not only in terms of empowerment, participation and humanisation, but also in general as an improvement and support for the patient-healthcare system relationship.

From a managerial point of view, the implications lie in the potential of technological and innovative tools to support the healthcare system, both overall and in the specific patient relationship.

This is primarily for managers, who can see early evidence of innovation's contribution to outlining new human-centred management models aligned with the I5.0 vision. Managers can draw numerous conclusions regarding management, organisation and leadership to steer healthcare and relationships towards new, more participatory, humanised and transparent scenarios.

But that's not all. The implications may also affect policymakers in defining guidelines and rules that support the transition to the new dictates of I5.0 and raise awareness of this new industrial revolution, which is known but not yet concretely applied in various fields.

6. Conclusions

Based on this initial, partial analysis, it is possible to outline a preliminary scenario and some summary considerations. I5.0 represents an innovation and evolution compared beyond the previous I4.0 framework, which is not yet fully understood or applied. The analysis reveals only a partial awareness and implementation of I5.0's guidelines and objectives, particularly within the healthcare sector.

Digitalisation has permeated all sectors and is now firmly established. However, there is still a lack of clear and structured management of its processes and tools, and their positive effects are often not fully appreciated.

Although I5.0 is not widely known, its technologies have practical applications within the healthcare sector. Analysis shows that there are some tools that are integrated into the healthcare system, with contributes in terms of empowerment, participation and humanisation. Enabling technologies such as AR/VR and AI are the main drivers of this revolutionary wave, capable of supporting the patient relationship and helping build a system centred on people and their needs.

Similarly, they support data transparency and reliability as well as data management. At the same time, it is important to emphasise that no close and, above all, objectively assessable link between the various technologies and the dimensions analysed can be identified as yet.

Although the study provides some preliminary considerations, the paper's main limitations should be noted. Some limitations are methodological. The systematic review of the literature, as mentioned in the relevant section, is the result of choices and selections made by the authors, which may have limited the composition of the sample (e.g., by selecting a single database and applying various thematic filters).

Furthermore, the lack of empirical application limits the generalisation of the results.

This work should therefore be regarded as a work in progress, which will subsequently be developed by first expanding the methodological features of the system to provide a broader basis for evaluation. The results will then be integrated and compared with an empirical test based on interviews to analyse the current state of technology implementation in the healthcare sector. This dual comparison, both theoretical and empirical, will enable an evaluation of the state of the art in the literature and, simultaneously, in practice. Such a comparison may support the development of business models and management practices aimed at achieving, from an I5.0 perspective, the objectives of empowerment, participation and humanisation. A further interesting direction for future research is the development of metrics and indicators capable of objectively and unambiguously assessing the contribution of technologies both to the analysed areas and to the objectives of Industry 5.0.

Keywords: Industry 5.0; healthcare; patient; enabling technologies; humanisation; participation; empowerment

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Verso un sistema di indicatori di performance per la Supply Chain ospedaliera: evidenze da un'analisi multi-caso

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1. Introduzione

Nel contesto sanitario, il termine Supply Chain Management (SCM) indica l'insieme di informazioni, forniture e risorse finanziarie impiegate per l'acquisizione e la movimentazione di beni dal fornitore all'utilizzatore finale, con l'obiettivo di migliorare gli esiti clinici e, al contempo, contenere i costi (De Vries et al., 2011; Moons et al., 2019). Il processo di Supply Chain interna delle aziende sanitarie si caratterizza per tre macro-fasi: (i) acquisti e gestione degli ordini, (ii) gestione dei magazzini e (iii) distribuzione e consumo a livello di reparto (Villa, 2010; Moons et al., 2019). La gestione della Supply Chain pone una forte enfasi sull'integrazione dei processi: la logica di fondo si basa sulla convinzione che il coordinamento e l'integrazione rappresentino driver essenziali per il miglioramento complessivo delle performance (De Vries & Huijsman, 2011).

Tuttavia, considerando la limitatezza delle risorse disponibili (personale medico e infermieristico, spazi di stoccaggio, forniture, ecc.) e l'elevata variabilità dei processi, legata sia alle caratteristiche dei pazienti sia alle preferenze dei medici, una delle sfide principali nella gestione della Supply Chain sanitaria consiste nel promuovere la cooperazione tra stakeholder diversi, spesso portatori di interessi eterogenei e potenzialmente divergenti (Moons et al., 2019). Tale complessità risulta ancora più evidente se si considera che l'integrazione della Supply Chain, pur essendo riconosciuta come leva strategica, incontra barriere organizzative, tecnologiche e regolatorie che ne limitano l'effettiva implementazione.

Ad esempio, Belvedere e colleghi (2022), suggeriscono come, nonostante le aziende sanitarie italiane presentino un elevato livello di maturità rispetto ai progetti di integrazione, questi ultimi rimangano concentrati prevalentemente sui beni più complessi e costosi, come dispositivi medici e materiali per sala operatoria. Le pratiche di integrazione più adottate includono approcci come Just in Time, pianificazione collaborativa e conto deposito, evidenziando come le aziende cerchino partner in grado di garantire elevati standard di affidabilità e tempestività dei servizi logistici. Allo stesso tempo, lo studio sottolinea come la standardizzazione dei processi, il commitment del top management e la rilevanza strategica attribuita alla funzione logistica rappresentino condizioni abilitanti fondamentali, mentre permangono barriere significative legate ai costi tecnologici e alla difficoltà di integrazione dei sistemi informativi con quelli dei fornitori (Belvedere et al., 2022).

Facendo riferimento al modello di valutazione delle performance della Supply Chain nelle aziende sanitarie pubbliche sviluppato da Lega et al. (2013), è possibile individuare tre dimensioni fondamentali di performance della Supply Chain interna: standard di servizio, efficienza nella

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gestione delle scorte e costi operativi (Figura 1). La complessità operativa e la frammentazione dei dati rendono tuttavia difficile individuare indicatori di performance (Key Performance Indicators, KPI) universalmente applicabili e in grado di misurare in modo efficace le prestazioni relative a queste tre dimensioni. In linea con questa osservazione, studi recenti evidenziano come la letteratura manchi ancora di un approccio metodologico consolidato per la selezione di KPI specifici per la Supply Chain interna delle aziende sanitarie, invitando pertanto la comunità scientifica a sviluppare modelli generali per la misurazione delle performance (Moons et al., 2019). In questo quadro si inserisce anche il contributo di Belvedere et al. (2022), che mostra come la capacità stessa di percepire benefici e barriere ai progetti di integrazione dipenda dall'esperienza maturata dalle aziende nei progetti implementati, suggerendo la necessità di strumenti di misurazione più sistematici e comparabili.

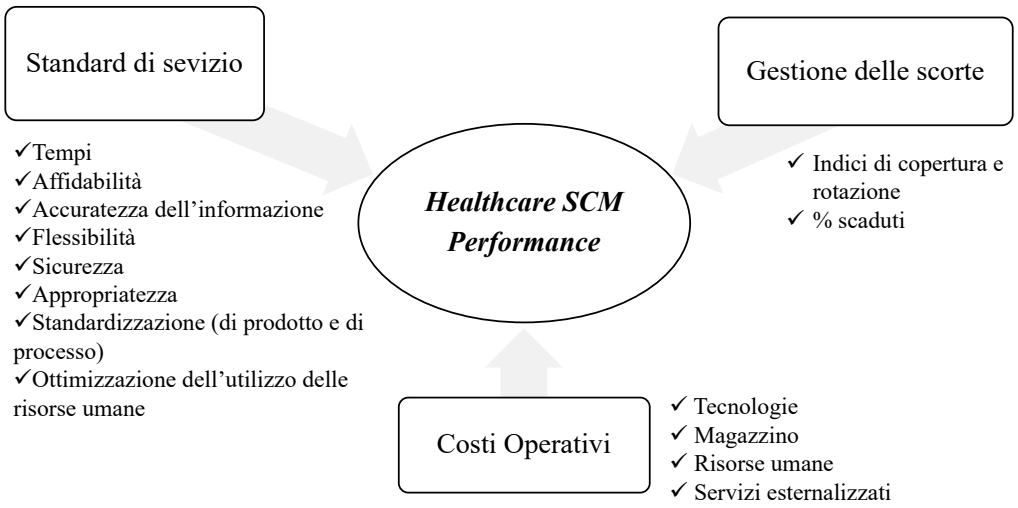


Figura 1. Dimensioni di performance nella Supply Chain interna alle strutture sanitarie, fonte: adattato da Lega, Marsilio, Villa (2013)

2. Obiettivi e metodologia

Alla luce di queste criticità, il presente studio si propone di definire un set di KPI per la Supply Chain interna di aziende sanitarie, utilizzando un approccio multicaso. Sono state analizzate quattro aziende sanitarie italiane, attraverso un protocollo di ricerca articolato in quattro fasi principali:

- Revisione della letteratura
- Validazione degli indicatori con focus group con esperti
- Misurazione degli indicatori
- Questionario

Nella prima fase, è stata condotta una revisione sistematica della letteratura, finalizzata a individuare un elenco preliminare di indicatori, classificati in relazione alle tre macrofasi del processo di Supply Chain Management: (i) gestione degli acquisti e degli ordini; (ii) gestione dei magazzini; (iii) attività a livello di reparto.

La seconda fase ha previsto la validazione dell'elenco di KPI tramite il contributo di tre esperti qualificati: il Direttore della Logistica e della Gestione Magazzini di un'Azienda Sanitaria Locale, il Direttore delle Operations e della Supply Chain di un ospedale pubblico universitario e il Direttore della Supply Chain Management di un gruppo ospedaliero privato.

Nel corso della terza fase, ciascuna azienda ha applicato i KPI validati ai propri dati interni. I risultati ottenuti sono stati successivamente discussi nel corso di quattro incontri, svoltisi nell'arco di otto mesi, con l'obiettivo di riflettere collettivamente sull'applicabilità e sulla rilevanza operativa degli indicatori individuati.

La quarta fase ha previsto la somministrazione di un questionario ai responsabili della logistica delle aziende partecipanti, con un duplice obiettivo: da un lato, valutare la rilevanza strategica delle tre dimensioni ritenute determinanti per le performance della Supply Chain ospedaliera interna (standard di servizio, efficienza nella gestione delle scorte, controllo dei costi operativi); dall'altro, stimare i livelli di validità, misurabilità, rilevanza e operatività dei KPI emersi nelle fasi precedenti.

I dati raccolti tramite questionario sono stati successivamente confrontati con le evidenze emerse nelle prime tre fasi del protocollo (revisione della letteratura, validazione degli esperti e misurazione degli indicatori). Tale confronto ha consentito di verificare la coerenza tra gli indicatori ritenuti prioritari dai rispondenti e quelli effettivamente misurati dalle aziende analizzate. Sulla base di questa triangolazione è stato costruito il cruscotto finale dei KPI, costituito dagli indicatori che presentano i punteggi più elevati in termini di validità, misurabilità, rilevanza strategica e operatività.

3. Risultati

L'analisi dei dati raccolti tramite il questionario mostra una chiara predominanza di indicatori afferenti alla gestione delle scorte rispetto a quelli relativi al monitoraggio della qualità del servizio erogato ai reparti. In particolare, gli esperti di supply chain coinvolti nello studio attribuiscono valori elevati di validità, misurabilità, rilevanza e operatività agli indicatori relativi alla gestione delle scorte, mentre assegnano punteggi significativamente inferiori agli indicatori orientati alla valutazione degli standard di servizio. Ciò suggerisce che, a livello operativo, la dimensione di gestione delle scorte risulta misurata in modo più sistematico e strutturato rispetto alla dimensione di servizio a reparto.

La Tabella 1 presenta la graduatoria degli indicatori di performance sulla base del valore sintetico ottenuto dalla combinazione (tramite prodotto) dei punteggi attribuiti alle quattro dimensioni valutative, ciascuna misurata su scala Likert 1–5. L'esame della graduatoria evidenzia come le prime posizioni siano occupate da indicatori direttamente collegati all'efficienza delle attività di magazzino, confermando la centralità operativa attribuita ai processi di gestione delle scorte.

Graduatoria	Indicatore	Punteggio
1°	Tasso di copertura prodotti a scorta	306
2°	Indice di rotazione	297
3°	Numero referenze gestite a scorta	296
4°	Valore medio di inventario di magazzino (Euro)	272
5°	Valore referenze gestite a scorta (Euro)	256
6°	Numero di richieste da evadere al gg	232
7°	Numero medio giornaliero richieste da CDC di prodotti a scorta	204
8°	Numero di linee (righe) di ordine (valore settimanale)	198
9°	Frequenza media consegna a reparto	196

10°	Tempo medio consegna materiali da ordine a fornitore per prodotti a scorta (lead time)	176
11°	Numero medio giornaliero referenze contenute in richiesta da reparto	167
12°	Numero medio ordini a fornitori emessi quotidianamente	166
13°	Numero medio giornaliero richieste da CDC di prodotti a transito	161
14°	% richieste urgenti di acquisto	149

Tabella 1. Graduatoria degli indicatori della Supply Chain interna sulla base del valore di sintesi

I punteggi relativamente bassi attribuiti alla misurabilità degli indicatori orientati alle attività di reparto contribuiscono a spiegare la marginalità di questi ultimi nella graduatoria. Tra gli indicatori meno misurabili figurano: il consumo settimanale dipartimentale (2,4/5), i ritardi nella distribuzione ai reparti clinici (3,6/5), la percentuale di richieste urgenti (3,4/5) e il numero di eventi di stock-out a livello di reparto (3,0/5).

Tuttavia, l'analisi delle valutazioni riguardanti le dimensioni di performance rivela un orientamento differente. Come sintetizzato nella Tabella 2, i rispondenti attribuiscono valori medi elevati alla rilevanza strategica degli standard di servizio, in particolare ai tempi (4,13), all'affidabilità e completezza delle forniture (4,38) e all'accuratezza delle informazioni logistiche e cliniche (4,38). La rilevanza attribuita alla dimensione dell'efficientamento nella gestione delle scorte (4,0) risulta anch'essa elevata, mentre le dimensioni connesse ai costi operativi presentano maggiore eterogeneità.

Il confronto tra le due analisi rivela un elemento di rilievo: nonostante gli standard di servizio siano riconosciuti come dimensione strategicamente prioritaria, gli indicatori deputati a misurarli presentano livelli di misurabilità sensibilmente inferiori rispetto agli indicatori di gestione delle scorte. Tale discrepanza indica un disallineamento tra priorità dichiarate e capacità effettive di monitoraggio, evidenziando come le aziende ospedaliere dispongano di sistemi informativi e processi maturi per la misurazione delle performance di magazzino, ma non per una valutazione altrettanto sistematica della qualità del servizio erogato ai reparti.

Questa evidenza risulta coerente anche con la tipologia dei progetti di miglioramento attualmente in corso nelle quattro aziende sanitarie coinvolte, che si concentrano prevalentemente su iniziative legate alla gestione delle scorte, quali:

- ottimizzazione degli spazi di magazzino;
- miglioramento della pianificazione e delle capacità previsionali;
- consolidamento delle partnership con i fornitori;
- automazione dei processi logistici;
- standardizzazione delle referenze.

Nel complesso, i risultati emersi evidenziano un divario strutturale tra la rilevanza strategica attribuita agli standard di servizio e la loro effettiva misurazione all'interno dei sistemi di performance management della supply chain ospedaliera. Tale gap rappresenta un nodo critico per l'evoluzione dei modelli di monitoraggio e per l'allineamento tra obiettivi strategici e prassi operative.

Dimensioni di performance	**Valore medio**
Standard di servizio	
Tempi	4,13
Affidabilità/completezza	4,38

Accuratezza dell'informazione logistica e clinica	4,38
Flessibilità	3,5
Semplificazione di prodotto (e.g. # referenze)	3,63
Ottimizzazione delle attività logistiche di reparto	3,75
Efficientamento nella gestione delle scorte	
Efficientamento nella gestione delle scorte	4
Costi operativi	
Tecnologie	3,5
Valore dello scaduto	4
Costo del magazzino	3,13
Risorse umane	3,88
Trasporto	3,5

Tabella 2. Valutazione della rilevanza strategica delle dimensioni di performance Supply Chain interna alle strutture sanitarie (scala 1–5)

Il confronto tra le due analisi rivela un elemento di rilievo: nonostante gli standard di servizio siano riconosciuti come dimensione strategicamente prioritaria, gli indicatori deputati a misurarli presentano livelli di misurabilità sensibilmente inferiori rispetto agli indicatori di gestione delle scorte. Tale discrepanza indica un disallineamento tra priorità dichiarate e capacità effettive di monitoraggio, evidenziando come le aziende ospedaliere dispongano di sistemi informativi e processi maturi per la misurazione delle performance di magazzino, ma non per una valutazione altrettanto sistematica della qualità del servizio erogato ai reparti.

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3. Discussione

La letteratura disponibile sui Key Performance Indicators (KPI) applicabili alla Supply Chain ospedaliera interna, sebbene in progressivo ampliamento, rimane caratterizzata da una significativa eterogeneità metodologica e da un livello ancora limitato di consolidamento empirico (Si et al., 2017; Langarizadeh et al., 2024). Numerosi contributi si concentrano sull'identificazione di liste di indicatori potenzialmente rilevanti, ma raramente forniscono un'evidenza sistematica riguardo alla loro effettiva applicabilità operativa o alla loro misurabilità all'interno dei diversi sistemi informativi ospedalieri. Una criticità ricorrente riguarda, inoltre, la definizione di metodologie condivise per la selezione degli indicatori e per la valutazione delle

dimensioni sottostanti, incluse validità, rilevanza, misurabilità e operatività (Langarizadeh et al., 2024).

Il presente studio si propone di indagare la rilevanza strategica delle dimensioni di performance della Supply Chain interna alle aziende sanitarie e la validità, misurabilità, rilevanza e operatività degli indicatori utilizzati per misurarle. I risultati mettono in luce una dinamica particolarmente significativa: gli indicatori relativi alla gestione delle scorte ottengono sistematicamente punteggi elevati in tutte le dimensioni valutative (validità, misurabilità, rilevanza e operatività), mentre gli indicatori riferiti agli standard di servizio a reparto risultano caratterizzati da una misurabilità sensibilmente inferiore. Tale evidenza ha conseguenze rilevanti. In primo luogo, essa contribuisce a spiegare perché le pratiche di monitoraggio e i progetti di miglioramento nei quattro ospedali analizzati si concentrino prevalentemente sulle attività di magazzino: la disponibilità di dati affidabili per tale ambito è infatti maggiore, mentre il monitoraggio sistematico dei processi a livello di reparto risulta ostacolato da limiti informativi e da una minore integrazione tra i sistemi clinici e logistici.

Parallelamente, il questionario somministrato agli esperti evidenzia come la dimensione ritenuta strategicamente prioritaria sia quella degli standard di servizio. I punteggi molto elevati attribuiti a variabili quali tempi di servizio, affidabilità e accuratezza informativa dimostrano una consapevolezza diffusa dell'importanza del contributo logistico alla qualità dell'assistenza clinica. Tuttavia, il divario tra tale rilevanza strategica percepita e ciò che viene effettivamente misurato indica l'esistenza di un disallineamento strutturale tra aspettative e capacità operative.

Le implicazioni di questo disallineamento sono molteplici. Da un lato, l'assenza di indicatori robusti e tempestivamente disponibili per i servizi a reparto può limitare la possibilità di valutare l'impatto dei processi logistici sugli esiti clinici. Dall'altro, essa può contribuire a mantenere un orientamento gestionale e investimenti tecnologici concentrati sulla sola efficienza delle scorte, trascurando dimensioni cruciali quali l'affidabilità del servizio ai reparti, la puntualità delle consegne o la flessibilità nelle risposte logistico-cliniche. In questo senso, lo studio mette in evidenza la necessità di rafforzare gli strumenti di misurazione orientati al servizio, promuovendo sistemi informativi più integrati e una maggiore collaborazione tra funzione logistica e funzioni cliniche.

4. Conclusioni

Le evidenze emerse dal presente studio mostrano in modo chiaro l'esistenza di un disallineamento tra gli obiettivi strategici dichiarati dalle aziende sanitarie e le pratiche di misurazione effettivamente implementate. Sebbene i responsabili della Supply Chain attribuiscano la massima rilevanza strategica agli standard di servizio erogati ai reparti, gli indicatori più maturi, misurabili e utilizzati nella pratica riguardano prevalentemente l'efficienza della gestione delle scorte. Tale risultato suggerisce che le capacità di monitoraggio delle performance sono influenzate, in misura significativa, dalla disponibilità e dalla qualità dei dati presenti nei sistemi informativi, i quali risultano maggiormente sviluppati per i processi di magazzino rispetto ai processi prossimi all'attività clinica.

Questo disallineamento indica la necessità di avviare interventi di riprogettazione dei sistemi di Supply Chain ospedaliera orientati a migliorare l'integrazione dei dati, la trasparenza informativa e la capacità di misurare in maniera sistematica gli effetti logistici sui processi clinici. In particolare, emergono tre direttrici di intervento:

- Potenziamento dell'interconnessione tra sistemi informativi, al fine di integrare i dati clinici e logistici e supportare indicatori focalizzati sul livello di servizio.
- Allineamento tra attività di magazzino e processi di reparto, con l'obiettivo di rendere la performance logistica maggiormente aderente ai bisogni operativi delle unità cliniche.
- Integrazione tra processi logistici e gestione dei flussi dei pazienti, nell'ottica di rafforzare la coerenza complessiva tra organizzazione dei servizi, esigenze cliniche e disponibilità di risorse.

Nel contesto del sistema sanitario italiano, tali interventi richiedono un ruolo attivo dei livelli istituzionali regionali, responsabili del coordinamento degli ospedali e della promozione di sistemi di monitoraggio standardizzati. Un approccio integrato alla misurazione delle performance della Supply Chain rappresenta infatti una leva fondamentale per migliorare l'efficienza operativa, la qualità del servizio offerto ai reparti e, in ultima analisi, il valore complessivo generato per i pazienti.

Parole chiave: Supply chain management; indicatori di performance; aziende sanitarie

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Il cuore green della sanità: la sfida dell'eco-innovazione per i middle managers

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1. Introduzione

Il settore sanitario è riconosciuto quale ambito caratterizzato da un rilevante impatto ambientale, annoverando la responsabilità del 5,2% delle emissioni globali di gas serra (GHG). Nello specifico, le attività che presentano la più elevata impronta carbonica sono le operazioni ad alta intensità energetica, quali il condizionamento degli ambienti, l'illuminazione e l'utilizzo di apparecchiature mediche, nonché i cicli di produzione e smaltimento di farmaci, dispositivi medici e materiali monouso (Dolcini et al., 2025). Le attività sanitarie danno, pertanto, origine a un vero e proprio "paradosso ambientale" (Mousa, Fernandez-Crehuet, et al., 2025-b): il settore, sebbene abbia il mandato istituzionale di tutelare e promuovere la salute, si configura al contempo come un rilevante agente inquinante, il cui impatto ambientale compromette in maniera sistematica gli stessi esiti di salute che esso si prefigge di garantire.

In risposta a questa criticità, a partire dall'ultimo decennio si osserva un crescente impegno da parte delle organizzazioni sanitarie sia europee che americane verso la riduzione della propria carbon footprint. Tale impegno, volto al conseguimento di obiettivi di sostenibilità ambientale, si concretizza nello sforzo di implementare eco-innovazioni (Mousa et al., 2025-a). Queste ultime costituiscono un fenomeno multidimensionale che si manifesta attraverso lo sviluppo di nuovi servizi e tecnologie di processo, unitamente al miglioramento delle strutture organizzative e dei sistemi amministrativi. Essa integra, inoltre, interventi strategici finalizzati a orientare il comportamento organizzativo verso pratiche quali l'adozione di principi di sostenibilità, la riduzione delle emissioni, l'ottimizzazione dell'uso di materiali e risorse, e il ricorso a materie prime ecologiche (Romano et al., 2024).

La letteratura di ambito manageriale evidenzia come il coinvolgimento attivo e l'impegno visibile degli organi di vertice e del top management unitamente al loro sostegno inequivocabile rappresentano fattori cruciali per l'implementazione di tali innovazioni all'interno delle aziende sanitarie (Chiarini & Vagnoni, 2016). Tale dinamica è ulteriormente potenziata da alcune specifiche caratteristiche di leadership, in particolare la leadership etica (che riesce ad orientare i processi decisionali verso principi di integrità e responsabilità) e la leadership per il cambiamento culturale, fondamentale per guidare l'evoluzione dei valori e dei comportamenti organizzativi verso nuovi paradigmi (Cavicchi & Vagnoni, 2017). In parallelo, la letteratura evidenzia come la diversità delle competenze, dei background e delle prospettive all'interno del top management team, quando combinata con una progettazione organica e articolata dei sistemi di controllo direzionale, eserciti un influsso significativo sul successo delle iniziative di sostenibilità (van Schie, 2024). Tale sinergia favorisce infatti una visione multidimensionale delle sfide e delle opportunità, consentendo di integrare gli obiettivi di performance ambientale con le performance

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cliniche ed economico-finanziarie, con un orientamento al conseguimento di risultati di lungo periodo (Mousa, Fernandez-Crehuet, et al., 2025 -a). In questo contesto, sebbene la letteratura abbia dedicato ampio spazio al ruolo del top management, è stata riservata limitata considerazione alla funzione del middle management quale driver per l'implementazione di eco-innovazioni. Ciononostante, il middle manager esercita un ruolo determinante nel tessuto organizzativo delle aziende sanitarie. Nel loro percorso di sviluppo, queste ultime si sono evolute verso quella che Mintzberg (1980) denomina "burocrazia professionale", ossia un tipo di configurazione organizzativa caratterizzata dalla presenza di un nucleo operativo consistente, composto in larga parte da professionisti, in cui il coordinamento avviene tramite la condivisione di standard predeterminati e l'autorità si basa non sulla gerarchia, ma sul potere della competenza. Pertanto, le aziende che operano nel settore sanitario sono fisiologicamente organizzazioni «piatte» (con una gerarchia molto corta), in cui lo sviluppo di (eco-) innovazioni non può prescindere dal coinvolgimento e dalla responsabilità dei middle manager (Currie & Procter, 2005; Gullmark et al., 2025). Sotto il profilo delle attività svolte, il middle management esercita una duplice funzione. Con riferimento alle attività top-down, esso assolve al ruolo di tradurre operativamente le decisioni del top management, mediando tra la visione strategica e la sua implementazione nei processi clinico-organizzativi mediante l'adattamento contestuale delle decisioni, la sensibilizzazione del personale e l'integrazione dei criteri ambientali nelle routine operative (Tarakci et al., 2023). Parallelamente, in ottica bottom-up, le attività ascendenti (upwards) si distinguono in due fondamentali processi: la sintesi informativa, e la promozione attiva di alternative innovative (Chen et al., 2017), ampliando lo spettro decisionale a disposizione del top management.

Nella più recente analisi comparativa condotta da Bobini et al. (2024) emerge come la sostenibilità stia assumendo un ruolo sempre più strutturale nei modelli di governance delle aziende sanitarie. Tale evoluzione riflette un progressivo passaggio da approcci frammentati a una visione sistemica, in cui le dimensioni strategiche, organizzative e culturali risultano integrate in un quadro coerente di orientamento alla sostenibilità. Il presente studio, quindi, si colloca nel più ampio alveo di questa riflessione, approfondendo il ruolo dei middle manager nella traduzione operativa dei principi di sostenibilità e ponendosi, quindi, l'obiettivo di rispondere alla seguente domanda di ricerca: come può il middle management favorire i processi di eco-innovazione all'interno delle aziende sanitarie?

Si procede, di seguito, con la presentazione della metodologia, dei risultati, della loro discussione e delle riflessioni conclusive.

2. Metodologia

Attraverso un approccio qualitativo, lo studio si pone l'obiettivo di esplorare in profondità il ruolo dei middle manager nella promozione delle pratiche di eco-innovazione nelle aziende sanitarie pubbliche. In linea con la prospettiva interpretativa (Gioia et al., 2013), la ricerca si è fondata sull'analisi di quattordici interviste semi-strutturate condotte con middle managers operanti in differenti funzioni organizzative, selezionati attraverso l'approccio del purposeful sampling per la loro esperienza diretta nella gestione di processi innovativi (Patton, 2002).

In fase preliminare è stato costruito, quindi, un protocollo di intervista al fine di garantire coerenza metodologica e comparabilità tra le interviste. L'elaborazione del protocollo ha seguito un processo graduale di definizione teorica e operativa. In dettaglio, è stata dapprima condotta una revisione della letteratura sui temi dell'eco-innovazione, della leadership per i middle managers e del cambiamento organizzativo in ambito sanitario, con l'obiettivo di individuare le dimensioni concettuali più rilevanti per l'indagine. Da questa analisi sono emerse tre aree tematiche principali: (i) la propensione individuale al cambiamento e le rappresentazioni del proprio ruolo manageriale (Currie & Procter, 2005); (ii) le pratiche, iniziative e le modalità con cui vengono sviluppate, comunicate e legittimate all'interno delle strutture (Mousa et al, 2025)

(iii) le condizioni organizzative e culturali che possono abilitare o ostacolare la diffusione di comportamenti (Cavicchi & Vagnoni, 2017).

Partendo da queste basi, è stato elaborato un questionario composto da domande aperte. Tale strumento è stato suddiviso in segmenti che riflettono le tre aree tematiche stabilite in precedenza ed è stato concepito con una struttura adattabile, in modo da rispecchiare il lessico e il vissuto di ciascun partecipante all'intervista. Ciascun segmento includeva sia inviti alla narrazione (Es. "Qual è stato il momento più significativo della sua carriera fino ad oggi?") sia domande di approfondimento (Es. "Qual è, secondo lei, il ruolo della sostenibilità nel futuro della sanità?"), pensate per stimolare una discussione ponderata e portare alla luce casi concreti tratti dalla loro esperienza professionale quotidiana.

Il metodo d'indagine è stato sottoposto a una validazione interna, attraverso sessioni di confronto tra il gruppo di ricerca, finalizzate ad accertare la chiarezza e la congruenza concettuale. Successivamente, due interviste sperimentali (pilota) hanno permesso di affinare l'esposizione dei quesiti, eliminando la terminologia troppo specialistica e incoraggiando risposte più dettagliate.

Lo strumento finale ha permesso di ottenere una raccolta dati uniforme, assicurando contemporaneamente ai soggetti intervistati la libertà di esprimersi, un elemento che ha favorito l'emersione di interpretazioni e punti di vista diversi in relazione ai temi dell'innovazione e della sostenibilità nel contesto sanitario. Le interviste sono state condotte tra aprile e ottobre 2025 e la durata media è stata di circa 50 minuti, come riportato in tabella 1.

N. intervistato	**Genere**	**Durata intervista** *(min)*
1	Uomo	42
2	Uomo	39
3	Uomo	38
4	Uomo	37
5	Uomo	37
6	Uomo	51
7	Donna	44
8	Donna	59
9	Uomo	38
10	Uomo	74
11	Donna	40
12	Donna	30

13	Donna	35
14	Uomo	47

Tabella 1. Elenco delle interviste

Le interviste sono state registrate e integralmente trascritte, preservando il lessico originale per non alterare le sfumature linguistiche e concettuali.

Le trascrizioni sono poi state analizzate secondo il metodo Gioia (Gioia et al., 2013). In un primo passaggio, le interviste sono state lette e codificate indipendentemente da più ricercatori, al fine di identificare concetti di primo ordine, derivati direttamente dal linguaggio degli intervistati. In una seconda fase, i concetti affini sono stati raggruppati in categorie di secondo ordine, più astratte e interpretative. Attraverso un processo abduttivo e iterativo, l'analisi è evoluta verso la definizione di temi aggregati in grado di rappresentare i meccanismi attraverso cui i middle manager interpretano, traducono e implementano le logiche di innovazione e sostenibilità nei loro contesti organizzativi.

Il confronto costante tra dati e teoria ha permesso di affinare progressivamente la struttura concettuale e di garantire la coerenza interna dell'analisi, contribuendo a ridurre la soggettività interpretativa e rafforzando la consistenza dei risultati (De Villiers et al., 2019).

3. Risultati

L'analisi empirica ha permesso di approfondire il ruolo dei middle manager nel favorire l'adozione di pratiche di eco-innovazione all'interno delle aziende sanitarie pubbliche. A fronte di una maggiore attenzione verso la sostenibilità nel sistema sanitario, l'obiettivo dell'indagine è stato comprendere come questi attori, collocati nella fascia intermedia della struttura organizzativa, possano contribuire alla diffusione di comportamenti e soluzioni orientati alla sostenibilità ambientale. Come anticipato nella sezione metodologica, le interviste hanno esplorato il loro approccio al cambiamento, la sensibilità personale rispetto ai temi ambientali e le modalità attraverso cui tali orientamenti si traducono – o meno – in azioni concrete.

L'analisi ha messo in luce come il middle management possa costituire un nodo strategico nei processi di transizione verso modelli organizzativi più sostenibili. In virtù della loro posizione intermedia, questi attori si trovano in una condizione privilegiata per tradurre gli indirizzi strategici in pratiche operative, ma anche per far emergere dal basso soluzioni innovative che possono essere successivamente captate e istituzionalizzate dal top management. Diversi intervistati hanno sottolineato come le idee di miglioramento nascano spesso nei reparti, "dove si vedono gli sprechi ogni giorno e si può intervenire subito" (intervistato 9), e come la possibilità di sperimentare anche piccole modifiche nelle procedure possa produrre effetti duraturi sull'organizzazione. In questo senso, il middle management si configura come un potenziale abilitatore di eco-innovazione, capace di proporre e modellare comportamenti sostenibili che, una volta legittimati, possono essere diffusi e standardizzati nei diversi contesti aziendali.

La capacità di orientare l'organizzazione verso la sostenibilità dipende tuttavia dall'approccio che i middle manager adottano nei confronti del cambiamento e dalla loro sensibilità al tema ambientale. I manager più innovativi interpretano il proprio ruolo come un percorso evolutivo e aperto all'apprendimento. Come afferma un intervistato, "ritengo il cambiamento importante perché non possiamo pensare che le cose restino sempre uguali" (intervistato 4). Al contrario, nei contesti in cui prevale una visione più statica e conservativa, il cambiamento tende a essere percepito non come una leva di apprendimento, ma come un'imposizione esterna o un adempimento tecnico, spesso vissuto con cautela. In queste situazioni, l'innovazione è associata più alla necessità di adeguarsi che al desiderio di migliorare.

Anche la sensibilità ambientale emerge come una variabile discriminante. Un intervistato ci propone il suo leitmotiv ovvero "curare meglio, sprecando meno" (intervistato 10) mostrando come la sostenibilità possa essere concepita non come un obiettivo a sé ma come un principio guida che orienta in modo naturale scelte e priorità operative. Al contrario, se percepita come qualcosa di distante dalla pratica clinica e quotidiana, assume un ruolo marginale, difficile da tradurre in azioni concrete.

Volgendo l'attenzione al modo con cui i diversi middle managers intervistati hanno affrontato il tema della sostenibilità e dell'innovazione nelle interviste, è possibile individuare almeno tre profili ricorrenti, distinti per il loro grado di apertura al cambiamento e per il livello di consapevolezza nei confronti della sostenibilità ambientale.

Il primo gruppo è rappresentato dai manager adattivi, ovvero manager con una propensione limitata all'innovazione e un atteggiamento perlopiù reattivo: si adeguano ai cambiamenti solo quando questi sono richiesti dalla direzione o comunque imposti, senza però farsi promotori di iniziative proprie. Sembra quindi prevalere una mentalità conservatrice ed orientata a garantire la continuità operativa piuttosto che sperimentare nuovi approcci, come ad esempio: "Il green è importante, ma nella nostra realtà è difficile capire come applicarlo davvero" (intervistato 5) e "Il cambiamento deve essere ragionato e condiviso, altrimenti crea solo confusione" (intervistato 6).

Pur riconoscendo l'importanza della sostenibilità, questi manager la interpretano come un compito aggiuntivo rispetto alle loro responsabilità giornaliere, invece di considerarla una leva strategica per ottimizzare i processi. L'innovazione, quindi, è ricevuta passivamente e solo raramente si traduce in iniziative che nascono spontaneamente o sono promosse a livello condiviso.

La seconda categoria è rappresentata dai manager innovativi non-green, i quali esibiscono una marcata propensione al cambiamento e un chiaro focus sull'efficienza organizzativa, ma dimostrano una sensibilità ambientale ancora moderata. Questi profili si distinguono per la loro capacità di introdurre soluzioni gestionali o tecnologiche che mirano primariamente a migliorare la performance economica e operativa – ad esempio riducendo i costi, i tempi di esecuzione o le inefficienze – anziché focalizzarsi sulla mitigazione dell'impatto ambientale. Come afferma un intervistato, "L'innovazione serve a migliorare i processi, poi il green viene dopo" (intervistato 7). Un altro precisa che "la sostenibilità è importante, ma io mi concentro sulla qualità e sulla sicurezza, poi se questo riduce anche gli sprechi, tanto meglio" (intervistato 8). Appare evidente come l'innovazione sia orientata soprattutto all'efficienza e al miglioramento continuo, ma senza un collegamento con la sostenibilità ambientale. La sensibilità "ecologica", se così possiamo dire (quando presente), emerge in modo indiretto, quasi come un effetto collaterale della buona gestione e non come un obiettivo consapevolmente perseguito.

Cosa diversa, invece, per l'ultimo gruppo, più ristretto, di eco-innovatori, ovvero manager che uniscono una forte propensione al cambiamento dei processi a una profonda consapevolezza ambientale, trasformando la loro attenzione ecologica in iniziative concrete, spesso nate spontaneamente e indipendenti da direttive formali.

Le loro iniziative riguardano il riutilizzo di materiali sanitari, la progettazione di circuiti di riciclo con i fornitori o la promozione di comportamenti sostenibili tra i professionisti. Un intervistato racconta: "Cerchiamo sempre di far girare meno il materiale, meno rifiuti, meno sprechi, lo condivido pienamente" (intervistato 9). Un altro sottolinea la dimensione culturale di questo impegno: "convincere il personale che non è solo una questione di rifiuti, ma di rispetto per ciò che facciamo e per l'ambiente in cui lavoriamo" (intervistato 10). Gli eco-innovatori non percepiscono la sostenibilità come un vincolo esterno, ma la considerano parte integrante della propria missione professionale. In questo modo, agiscono come veri trasformatori unendo competenze tecniche, autonomia decisionale e motivazione che permettono di tradurre l'impegno personale in azioni organizzative concrete.

Andando più in profondità rispetto ai fattori individuali e organizzativi che abilitano la propensione ad eco-innovare è emerso come elemento caratterizzante la sensibilità personale,

nonché l'esperienza personale maturata in contesti attenti ai temi ambientali (es. di vita privata, di comunità). Sul tema, gli intervistati affermano "Mi sento spinto più da una responsabilità verso la comunità che da un obbligo formale" (intervistato 10) e "la motivazione personale è fondamentale: se non ci credi tu, non puoi trasmetterlo agli altri" (intervistato 12), sottolineando come l'adesione valoriale sia il principale motore del cambiamento. Volgendo l'attenzione al piano organizzativo, invece, appaiono come determinanti l'autonomia operativa, la legittimazione interna e la presenza di reti relazionali solide, che favoriscono la diffusione delle pratiche green e aiutano a superare le rigidità burocratiche. Tuttavia, il contesto istituzionale appare ancora poco orientato a promuovere la sostenibilità in modo sistematico: la formazione è limitata, i sistemi di valutazione raramente considerano criteri ambientali e molte iniziative restano affidate alla sensibilità dei singoli: difatti, come commenta un intervistato, "mi informo come posso, ma è più una curiosità personale che qualcosa di istituzionale" (intervistato 14).

Il panorama che emerge dall'analisi mostra un sistema ancora in fase di definizione, dove la transizione green procede più per impulso individuale che attraverso strategie concepite e strutturate intenzionalmente. Nonostante ciò, il middle management si rivela un attore cruciale per la traduzione della sostenibilità da principio astratto a pratica organizzativa. Attraverso la loro azione quotidiana, i middle manager fungono da ponte tra strategia e operatività, favorendo la sperimentazione, la legittimazione e la diffusione di soluzioni che possono orientare le strutture sanitarie verso modelli di gestione più consapevoli e sostenibili.

3. Discussione dei risultati

L'analisi condotta permette di osservare come il middle management rappresenti uno snodo cruciale nei processi di eco-innovazione nelle aziende sanitarie pubbliche. Coerentemente con quanto declinato da Bobini et al. (2024), dove la sostenibilità è letta come processo sistemico che richiede governance multilivello e strumenti di misurazione condivisi, anche le nostre evidenze confermano l'importanza delle condizioni organizzative — autonomia, legittimazione e reti — come prerequisiti per un'eco-innovazione effettiva. Infatti, in linea con la letteratura sui middle managers nelle organizzazioni complesse (Currie & Procter, 2005; Floyd & Wooldridge, 1997; Tarakci et al., 2023), l'analisi mette in evidenza come i middle manager agiscono come attori-ponte, capaci di tradurre, adattare e reinterpretare gli indirizzi strategici in pratiche operative coerenti con i valori, le routine e i vincoli del contesto sanitario. La funzione di mediazione dei middle manager si esprime attraverso un duplice movimento organizzativo. I middle manager, da un lato, hanno il compito di trasmettere la visione strategica definita dal top management ai livelli operativi, convertendo i princìpi di sostenibilità in comportamenti giornalieri che siano coerenti con le pratiche cliniche e gestionali in uso. Dall'altro, essi indirizzano verso i livelli superiori le innovazioni che nascono spontaneamente all'interno dei reparti, dando valore a esperienze e soluzioni che spesso costituiscono le prime forme di sperimentazione della sostenibilità. Questa interazione bidirezionale ne conferma il ruolo di snodo cognitivo e relazionale (Nonaka & Takeuchi, 1995), rendendola capace di fungere simultaneamente da strumento di attuazione e da catalizzatore di innovazione. L'analisi qualitativa, tuttavia, mette in luce come l'eco-innovazione nel contesto sanitario non possa essere ridotta unicamente a un processo di natura tecnica o gestionale. Essa include una componente cognitiva e valoriale, che si basa sull'abilità dei middle manager di esaminare criticamente le consuete routine e di identificare quelle che possono essere definite come "zone grigie" di inefficienza, spreco o incoerenza rispetto ai criteri di sostenibilità. L'innovazione ambientale sembra scaturire proprio da questa consapevolezza riflessiva manifestata dalla disponibilità a mettere in discussione procedure consolidate e a rielaborarle in un'ottica ecologica.

Questo livello di consapevolezza si manifesta attraverso la curiosità e la volontà di progredire, qualità che trasformano la semplice propensione al cambiamento in una vera e propria competenza organizzativa. In questo senso, le evidenze raccolte ampliano la prospettiva di Mousa

et al. (2025), secondo cui il middle management esercita una leadership etica nel promuovere la sostenibilità: accanto alla dimensione morale, emerge la necessità di una curiosità riflessiva che consente di trasformare la sensibilità etica in pratica operativa.

Un ulteriore elemento che emerge dall'analisi riguarda la capacità di problematizzare le pratiche quotidiane, intesa come competenza cognitiva e riflessiva che consente ai middle manager di riconoscere le criticità implicite nei processi organizzativi. La messa in discussione dei problemi (problematizzazione) rappresenta l'avvio fondamentale del processo di innovazione: è grazie all'abilità di interrogare ciò che appare come consuetudinario o ineluttabile che si aprono le possibilità per il cambiamento. Ciò nonostante, i dati raccolti indicano che tale competenza diviene effettivamente produttiva solo nel momento in cui si fonde con una specifica sensibilità individuale nei confronti della sostenibilità ambientale. La capacità di avere spirito critico nelle riflessioni è sicuramente un fattore abilitante che può far nascere un'innovazione, ma intercetta il tema della sostenibilità solo quando si accompagna a un orientamento valoriale che aiuta a dare senso ai problemi. Nei casi osservati, la combinazione tra consapevolezza e sensibilità ambientale si traduce in pratiche concrete: per citare un esempio, accorgersi di uno spreco di materiali può diventare lo spunto per provare procedure diverse coinvolgendo colleghi o fornitori. Lo spirito critico, unito alla sensibilità, può permettere ai middle-manager di trasformare l'osservazione critica in azioni mirate, dando vita a piccole innovazioni sostenibili che, anche se nate in modo locale, possono diffondersi e generare effetti più ampi.

Nel complesso, i risultati mostrano che la sostenibilità in sanità non si impone dall'alto né nasce solo da vincoli normativi. Può invece emergere dal basso, come un processo riflessivo diffuso, messo in moto da professionisti capaci di guardare con occhio critico le routine e di tradurre questa consapevolezza in pratiche coerenti con i propri valori.

In questo senso, la capacità di problematizzare costituisce il presupposto cognitivo dell'eco-innovazione (la capacità di intercettare un problema e, quindi, un'opportunità), mentre la sensibilità personale ne rappresenta la condizione etica e motivazionale.

Nel contesto sanitario, tale dimensione assume un rilievo particolare. Sul piano organizzativo, le aziende sanitarie sono descritte come burocrazie professionali (Mintzberg, 1980), dove il sapere tecnico pesa più della gerarchia e l'autorevolezza nasce dalla competenza. In tali configurazioni organizzative, il cambiamento raramente arriva per imposizione: prende piuttosto forma attraverso percorsi di legittimazione culturale che si sviluppano nei livelli intermedi dell'organizzazione.

È qui che i middle manager assumono un ruolo chiave. Agiscono come mediatori culturali (Balogun & Johnson, 2004), capaci di tradurre i principi della sostenibilità nel linguaggio e nei valori della professione sanitaria. In questo modo riescono a mantenere saldo il riferimento all'etica della cura, ma al tempo stesso a trasformare le idee sull'ambiente in pratiche concrete e compatibili con la realtà operativa dei reparti.

L'eco-innovazione in sanità sembra emergere, quindi, come un processo di co-evoluzione tra struttura, cultura e agenti, in cui il middle management rappresenta il punto di raccordo tra strategia e operatività quotidiana.

I risultati consentono di precisare le condizioni che rendono i middle manager abilitatori o, al contrario, freni alla transizione verde. La prima condizione riguarda l'apertura al cambiamento, che emerge come base cognitiva dell'eco-innovazione. I manager attivi, curiosi e aperti a imparare dall'esperienza, riescono più facilmente a individuare dove i processi possono essere migliorati. Questo risultato sembra in linea con quanto evidenziato da Cavicchi e Vagnoni (2017) secondo cui la transizione verso la sostenibilità richiede un contesto organizzativo che favorisca curiosità, sperimentazione e apprendimento continuo. Gli intervistati hanno mostrato come questa apertura si traduce nella disponibilità a mettere in discussione le abitudini consolidate (dalla gestione delle risorse alla logistica dei rifiuti, fino all'uso dell'energia) e a introdurre modifiche graduali che, nel tempo, producono miglioramenti concreti. È importante considerare anche la traduzione della

sensibilità ambientale in azioni concrete, un passaggio tutt'altro che immediato anche per chi possiede una solida consapevolezza "green".

Dalle interviste emerge che la capacità di agire si sviluppa dall'intreccio tra fattori personali e condizioni organizzative.

Sul piano individuale, motivazione e senso di responsabilità verso la collettività spingono i manager a migliorare la qualità dei servizi, riducendo al tempo stesso l'impatto ambientale. Sul versante organizzativo, contano invece l'autonomia decisionale, la legittimazione interna e la solidità delle reti relazionali. L'autonomia consente di sperimentare anche in assenza di direttive formali, la legittimazione – fondata sulla credibilità professionale – favorisce fiducia e sostegno da parte dei colleghi e dei superiori, mentre le reti orizzontali permettono di diffondere le buone pratiche oltre i confini dei singoli reparti, alimentando processi di apprendimento collettivo.

Queste dinamiche richiamano la logica delle dynamic capabilities (Gullmark et al., 2025), secondo cui l'innovazione sostenibile nasce dalla capacità delle organizzazioni di apprendere, adattarsi e riallocare le proprie risorse in funzione di nuovi obiettivi condivisi.

La distinzione tra manager adattivi, innovativi non-green ed eco-innovatori consente di comprendere la varietà dei comportamenti osservati e la natura distribuita e relazionale dell'eco-innovazione in sanità. Abbiamo quindi delineato tre principali profili di middle manager. I più cauti, definiti adattivi, tendono a seguire le direttive senza metterle in discussione, mantenendo un atteggiamento prudente e orientato alla continuità. Gli innovativi non-green, invece, mostrano curiosità e propensione al cambiamento, ma concentrano i propri sforzi sull'efficienza e sui risultati, senza ancora integrare pienamente la sostenibilità nei loro obiettivi. Infine, gli eco-innovatori rappresentano una minoranza più visionaria: uniscono riflessività, consapevolezza ambientale e competenze operative, traducendo la sostenibilità in azioni e progetti concreti.

Quest'ulrima tipologia suggerisce che l'innovazione sostenibile non nasce per automatismo dalle politiche aziendali, ma dall'incontro tra motivazioni personali e necessità di innovazione. L'eco-innovazione, quindi, si sviluppa dal basso, nell'azione quotidiana dei manager, e si consolida attraverso l'apprendimento e la condivisione di esperienze. Il middle management, quindi, non svolge solo una funzione operativa, ma anche culturale: è nei livelli intermedi che la sostenibilità può prendere forma concreta, passando da valore dichiarato a pratica condivisa.

4. Riflessioni conclusive

Lo studio ha approfondito il ruolo del middle management nei processi di eco-innovazione all'interno delle aziende sanitarie pubbliche, esplorando come questi attori possano contribuire alla transizione verso modelli organizzativi più sostenibili. L'analisi ha evidenziato, infatti, la natura strategica, riflessiva e relazionale del ruolo del middle manager. I risultati mostrano che la sostenibilità non si diffonde soltanto attraverso direttive o piani operativi, ma si costruisce progressivamente nella quotidianità organizzativa, grazie alla capacità dei middle manager di tradurre principi astratti in pratiche contestuali, di stimolare l'apprendimento collettivo e di legittimare nuovi modelli di comportamento.

Inoltre, affinché le pratiche di sostenibilità possano concretamente emergere e diffondersi nel contesto organizzativo, è condizione necessaria ma non sufficiente una forte apertura al cambiamento che, per abbracciare il tema green, deve essere accompagnata da un approccio valoriale personale e da una sensibilità alle tematiche ambientali.

Sul piano teorico, il contributo principale dello studio risiede nell'ampliare la comprensione del middle management come attore cognitivo e istituzionale nei processi di eco-innovazione. La letteratura ha tradizionalmente descritto i middle manager come "semplici" mediatori delle strategie definite dal vertice, incaricati di tradurre la visione strategica in azione operativa (Floyd & Wooldridge, 1997; Currie & Procter, 2005). I risultati di questo studio mostrano invece che, nei contesti sanitari, il middle management non si limita a svolgere un ruolo di mediazione, ma assume una funzione di interpretazione attiva e rielaborazione valoriale. L'eco-innovazione può

essere letta come un processo diffuso, nel quale i middle manager individuano problemi, reinterpretano pratiche consolidate e ne promuovono l'adattamento in chiave sostenibile. Questa prospettiva amplia la visione tradizionale del middle manager, includendo una dimensione personale e culturale legata ai valori, alla sensibilità ambientale e alla capacità di mettere in discussione le abitudini organizzative.

Lo studio contribuisce a chiarire i meccanismi che sostengono la transizione sostenibile nelle aziende sanitarie. La distinzione tra manager adattivi, innovativi non-green ed eco-innovatori aiuta a comprendere la varietà interna del middle management e mostra come la propensione al cambiamento derivi dall'interazione tra motivazioni individuali e condizioni istituzionali. In questa prospettiva, l'eco-innovazione non è un evento isolato ma un percorso di apprendimento progressivo, che si alimenta di sperimentazione, riflessione e pratiche quotidiane.

La ricerca, inoltre, aiuta a comprendere meglio il dibattito sull'innovazione sostenibile in sanità mostrando come la struttura professionale e burocratica del settore condizioni profondamente i processi di cambiamento. In contesti dove la competenza tecnica e l'identità professionale dei clinici sono fortemente radicate, la sostenibilità non può essere imposta dall'alto. Si afferma, piuttosto, attraverso un lento processo di legittimazione culturale e di negoziazione del significato (Bobini et al., 2024). In questo percorso, i middle manager assumono un ruolo di mediazione interpretativa, traducendo i principi strategici in pratiche concrete e cercando un equilibrio tra logiche gestionali e valori professionali. La sostenibilità, in questo senso, nasce dall'incontro continuo tra visione e pratica quotidiana.

Oltre al contributo teorico, lo studio offre indicazioni utili per chi governa le aziende sanitarie e per le politiche pubbliche che mirano a integrare la sostenibilità nei processi di gestione. I risultati mostrano che le strategie "green" funzionano solo se coinvolgono attivamente i middle managers, che rappresentano l'anello di congiunzione tra la pianificazione e l'operatività. Riconoscere e sostenere la loro iniziativa significa creare contesti che favoriscano autonomia, sperimentazione e condivisione delle esperienze, evitando che le innovazioni restino episodi isolati.

La legittimazione istituzionale assume un ruolo chiave: senza un riconoscimento formale del contributo dei middle manager, i tentativi di innovazione rischiano di disperdersi. Allo stesso modo, la formazione sulla sostenibilità dovrebbe diventare parte dei percorsi di sviluppo professionale, combinando saperi tecnici, ambientali e gestionali, così da trasformare la sensibilità personale in competenza organizzativa.

Un ulteriore passo riguarda i sistemi di valutazione, che dovrebbero includere indicatori ambientali e dare visibilità a chi riesce a tradurre la sostenibilità in risultati misurabili, come la riduzione degli sprechi o il miglioramento dei processi. La creazione di reti trasversali e comunità di pratica, infine, può favorire la circolazione delle esperienze più efficaci, riducendo l'isolamento dei manager più attivi e rendendo replicabili le innovazioni locali.

Come ricordano Bobini et al. (2024), il cammino verso una sanità sostenibile non dipende solo da strumenti e policy, ma da una cultura manageriale capace di incorporare la sostenibilità nelle pratiche di ogni giorno. In questo scenario, la sostenibilità non è un compito delegabile ma un processo collettivo che richiede il contributo diffuso di chi lavora a diversi livelli dell'organizzazione. I middle manager, in particolare, non sono semplici esecutori, ma coideatori delle strategie, perché operano nello spazio dove le idee diventano azioni e le innovazioni si radicano nella pratica.

Lo studio presenta alcuni limiti. Il numero contenuto di interviste non consente ovviamente di estendere i risultati a tutto il sistema sanitario e la natura trasversale dell'indagine fotografa un momento specifico del cambiamento, senza coglierne l'evoluzione nel tempo. Inoltre, la scelta di concentrarsi sui middle manager lascia in secondo piano la prospettiva dei vertici e del personale clinico, che potrebbero offrire letture complementari.

Questi elementi aprono la strada a nuovi approfondimenti. Futuri studi potranno combinare metodi qualitativi e quantitativi per misurare la diffusione delle pratiche green e il loro impatto

organizzativo. Analisi longitudinali potranno invece osservare come cambiano nel tempo competenze e atteggiamenti, mentre confronti con contesti privati o internazionali aiuteranno a valutarne la trasferibilità. Infine, esplorare le relazioni tra top management, middle management e operatori sanitari potrà chiarire come si costruisce la coerenza tra la visione strategica e la pratica quotidiana, e in che modo forme di leadership distribuita possono sostenere una transizione più solida verso la sostenibilità.

Parole chiave: Middle management; sanità; innovazione green

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Verso un modello integrato di Patient Blood Management: gli impatti di un percorso ospedale-territorio

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1. Introduzione

Negli ultimi anni, il sistema sanitario italiano ha intrapreso un profondo processo di trasformazione che mira a superare la tradizionale frammentazione tra ospedale e territorio, orientandosi verso un modello di gestione per processi integrati. Tale approccio, consolidato anche a livello normativo dal Decreto Ministeriale n. 77/2022 promuove una visione della cura come continuum assistenziale, in cui la presa in carico del paziente si articola in modo coerente e coordinato nei diversi setting di cura. All'interno di questa prospettiva, la gestione per processi diventa non solo una modalità organizzativa, ma anche un paradigma interpretativo che consente di ripensare l'intera filiera assistenziale in termini di valore creato per il paziente, di efficienza nell'uso delle risorse e di sostenibilità del sistema pubblico (Borgonovi, 2018; Noto et al., 2023). Gli studi di gestione sanitaria hanno evidenziato come i modelli tradizionali di controllo per strutture verticali siano oggi inadeguati a rappresentare la complessità dei percorsi di cura e la natura interdipendente delle attività cliniche. L'attenzione si è progressivamente spostata verso logiche di controllo e misurazione per processi orizzontali, capaci di superare i confini organizzativi e professionali (Vinci et al., 2022). Ciò ha implicato un profondo rinnovamento dei sistemi di accountability e di allocazione delle risorse, in cui il focus non è più sul singolo reparto o servizio, bensì sull'intero percorso del paziente. In questa prospettiva, i Percorsi Diagnostico-Terapeutico-Assistenziali (PDTA) si configurano come strumenti operativi e cognitivi per realizzare l'integrazione tra livelli di cura, orientando i processi decisionali e gestionali verso obiettivi condivisi di efficacia clinica, qualità e sostenibilità (Rosa et al., 2024; Taddeini et al., 2024).

Parallelamente, gli studi di controllo di gestione nell'ambito sanitario hanno proposto metodi di analisi dei costi in grado di cogliere la dimensione longitudinale del percorso assistenziale. La misurazione dei costi per livelli di assistenza e per fattori produttivi (Cislaghi et al., 2014) e l'applicazione del Time-Driven Activity-Based Costing in ambito sanitario (e.g., Campanale et al., 2015; Landi et al., 2025) hanno consentito di stimare in modo più accurato il consumo di risorse lungo l'intero processo di cura, superando la visione parziale legata alle singole strutture. Questi strumenti rappresentano oggi un supporto essenziale per i decisori pubblici nella definizione di politiche basate sul valore (value-based healthcare - Møberg & Malmmose, 2025), in cui la sostenibilità economica è strettamente connessa alla capacità di generare outcome di salute rilevanti per il paziente.

All'interno di tale cornice teorica, il Patient Blood Management (PBM) rappresenta un campo di applicazione particolarmente significativo dei principi di gestione per processi. Il concetto di PBM, introdotto in letteratura nei primi anni 2000 (Isbister, 2015), è stato successivamente riconosciuto e promosso a livello internazionale. Nel 2010, l'Organizzazione Mondiale della Sanità (OMS), con la risoluzione WHA63.12, ha esortato tutti gli Stati membri a

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implementareprogrammi nazionali di PBM, riconoscendone il potenziale in termini di miglioramento degli esiti clinici e di sostenibilità dei sistemi sanitari. Tale prospettiva è ulteriormente rafforzata in un documento recente dell'OMS (WHO, 2024), che inquadra il PBM non solo come insieme di pratiche cliniche, ma anche come modello organizzativo e di sanità pubblica, fondato su strutture di governance multilivello, sistemi di raccolta dei dati, riallocazione delle risorse e gestione del cambiamento culturale all'interno delle organizzazioni sanitarie. In Italia, il PBM è stato citato per la prima volta nel "Programma di autosufficienza nazionale del sangue" (Decreto 4 settembre 2012 – GU n. 241 del 15/10/2012) come strumento utile a perseguire l'autosufficienza nazionale. Tuttavia, a distanza di quindici anni, l'implementazione di tali programmi è risultata inferiore alle aspettative, tanto che nel 2021 l'OMS ha pubblicato una policy brief per sollecitare la piena adozione del PBM da parte dei Paesi membri, evidenziandone l'urgenza come standard globale di cura (WHO, 2021).

L'esperienza pionieristica della Western Australia, documentata in uno studio retrospettivo su oltre seicentomila pazienti ricoverati tra il 2008 e il 2014, ha mostrato come l'implementazione sistemica del PBM possa tradursi in un miglioramento significativo degli esiti clinici e in un risparmio economico rilevante. In quel contesto, il percorso ha determinato una riduzione del 41% delle unità di sangue trasfuse, un calo della mortalità ospedaliera del 28% e della durata media di degenza del 15%, con risparmi diretti e indiretti stimati tra 80 e 100 milioni di dollari australiani (Leahy et al., 2017). Tali risultati dimostrano come il PBM sia al tempo stesso una pratica clinica e una strategia di governance: un modello di gestione per processi che integra le dimensioni cliniche, organizzative ed economico-gestionali, producendo valore per il paziente e per il sistema sanitario.

L'approccio promosso dall'OMS evidenzia inoltre che il PBM, per essere efficace, deve essere concepito come un programma di salute pubblica e non come un intervento confinato all'ambito ospedaliero. La sua riuscita dipende dalla capacità di costruire una rete multiprofessionale e interistituzionale che connetta ospedale, territorio e medicina di base. La gestione ottimale del sangue del paziente implica infatti la diagnosi precoce dell'anemia, la correzione delle carenze marziali, la riduzione delle perdite ematiche intraoperatorie e il follow-up post-dimissione: un insieme di azioni che attraversano in modo trasversale l'intero percorso assistenziale e richiedono un coordinamento costante tra diversi attori e livelli di cura.

Come evidenziato anche dall'OMS, nonostante il crescente riconoscimento normativo e scientifico del PBM, la sua implementazione sistematica nei sistemi sanitari pubblici rimane limitata, in particolare per la complessità organizzativa richiesta e per la difficoltà di valutarne gli impatti economici lungo l'intero percorso assistenziale. La letteratura esistente si è prevalentemente focalizzata sugli esiti clinici del PBM (Agostini et al., 2025; Ercolani et al., 2023), mentre le sue potenzialità come leva di governance e di integrazione ospedale-territorio risultano ancora poco esplorate. Il presente contributo intende colmare tale gap analizzando il PBM come modello di gestione per processi, capace di supportare l'integrazione tra livelli di cura e di orientare il controllo di gestione verso una logica value-based.

2. Caso di studio

Il single case study in esame, sviluppato presso l'ASST Papa Giovanni XXIII di Bergamo, costituisce un esempio concreto di valutazione della fattibilità organizzativa ed economica dell'implementazione di un percorso di PBM integrato ospedale-territorio, prima dell'avvio operativo. Dal punto di vista metodologico, lo studio si configura come un proof of concept basato su un'analisi del contesto e su una valutazione ex ante degli impatti attesi. L'impostazione è coerente con l'approccio raccomandato dall'OMS, che identifica i programmi di PBM come interventi complessi da avviare attraverso progetti pilota e valutazioni preliminari di fattibilità, prima di una diffusione sistemica a livello aziendale o territoriale (WHO, 2024). L'iniziativa, coordinata dal Servizio di Immunoematologia e Medicina Trasfusionale (SIMT) in collaborazione

con la Direzione Aziendale, il Dipartimento di Anestesia e Rianimazione, il Laboratorio di Patologia Clinica e la Struttura Complessa di Ortopedia, è rivolta ai pazienti candidati a interventi ortopedici di maggiore complessità e nasce dall'esigenza di ridurre la prevalenza di anemia preoperatoria e la conseguente esposizione al rischio trasfusionale.

Il percorso proposto prevede l'identificazione precoce dei pazienti anemici mediante uno screening laboratoristico preoperatorio e la somministrazione di ferro endovenoso per la correzione della sideropenia. La peculiarità del modello risiede nell'estensione del trattamento al di fuori dell'ambito ospedaliero: la terapia potrà infatti essere somministrata non solo negli ambulatori del SIMT, ma anche nel polo territoriale, con il coinvolgimento attivo dei professionisti che operano nelle Case di Comunità. Questa integrazione sarà resa possibile grazie al supporto degli specialisti del SIMT, attraverso strumenti di teleconsulto e televisita, che consentiranno di supervisionare i trattamenti territoriali e di garantire la continuità clinica. Una volta normalizzato il bilancio marziale, il paziente sarà sottoposto all'intervento chirurgico e, successivamente, rivalutato in fase post-operatoria, con eventuale somministrazione aggiuntiva di ferro endovenoso per compensare le perdite intraoperatorie. Il percorso si concluderà con un follow-up a quaranta-cinque giorni dalla dimissione, gestito in collaborazione tra il medico di medicina generale e il SIMT, con possibilità di rivalutazione specialistica, se necessario.

L'inserimento delle Case di Comunità nel percorso PBM rappresenta un elemento innovativo che consente di tradurre operativamente il principio di prossimità promosso dal DM 77. In questo modo, il processo assistenziale si articola lungo un continuum che unisce ospedale e territorio, favorendo una presa in carico multidimensionale e riducendo la frammentazione tipica dei modelli tradizionali. L'utilizzo del teleconsulto rafforza la rete clinica, consentendo la supervisione specialistica dei trattamenti territoriali e consolidando la collaborazione interprofessionale. Tale strutturazione organizzativa configura un vero e proprio PDTA dell'anemia chirurgica, integrato e dinamico, capace di coniugare l'appropriatezza clinica, la sostenibilità economica e il miglioramento dell'esperienza del paziente.

Le stime derivanti dall'analisi di contesto condotta sull'attività 2024 della Struttura Complessa di Ortopedia, relativa ai pazienti candidati a chirurgia ortopedica maggiore (sostituzione protesica di anca e ginocchio), evidenziano i potenziali risultati attesi dall'avvio (imminente) del PBM. Circa il 23% dei pazienti del campione presentava anemia preoperatoria, con un consumo di 100 unità di sangue e una degenza media superiore di un giorno rispetto ai pazienti non anemici. La correzione preoperatoria dell'anemia avrebbe potuto prevenire 84 trasfusioni e generare un risparmio complessivo di circa 91 mila euro l'anno, a fronte di un costo di implementazione inferiore a 18 mila euro (Verzeroli et al., 2025). Tali stime, coerenti con le esperienze internazionali, consentono di simulare gli effetti potenziali dell'introduzione del PBM in termini non solo di miglioramento degli esiti post-operatori, ma soprattutto di riduzione delle trasfusioni, contenimento delle giornate di degenza e ottimizzazione dei costi, configurando il PBM come leva di integrazione dei processi clinico-assistenziali.

Dal punto di vista organizzativo, l'attivazione del PBM presso l'ASST Papa Giovanni XXIII ha favorito la costituzione di un gruppo di lavoro multiprofessionale e multidisciplinare, composto da medici, biologi, tecnici sanitari di laboratorio biomedico e infermieri, sia del Polo Ospedaliero che del Polo Territoriale, afferenti alla Medicina Trasfusionale, Medicina di Laboratorio, Anestesia e Rianimazione, Ortopedia, Cure Primarie, Direzione delle Professioni Sanitarie e Sociali, Direzione Sanitaria e Direzione Socio-Sanitaria. Tale configurazione rispecchia la logica della governance per processi clinici, in cui la responsabilità del percorso è condivisa tra più attori e la qualità dell'assistenza dipende dalla loro capacità di coordinamento. La collaborazione interprofessionale, sostenuta da sistemi informativi integrati, consente di monitorare l'intero ciclo assistenziale, standardizzare le procedure e generare conoscenza organizzativa utile al miglioramento continuo. Inoltre, l'estensione del PBM al polo territoriale contribuisce a ridisegnare le relazioni tra i diversi livelli di assistenza, introducendo un modello di integrazione basato sulla condivisione di competenze, responsabilità e informazioni. La

possibilità di gestire l'anemia preoperatoria a livello territoriale consente di anticipare la cura, migliorare l'aderenza terapeutica e ridurre il carico sulle strutture ospedaliere. Inoltre, la valorizzazione del ruolo del personale sanitario territoriale rafforza la capacità del sistema di intercettare precocemente i bisogni di salute e di offrire risposte coordinate e personalizzate.

L'esperienza bergamasca offre inoltre un'interessante prospettiva sulla dimensione economico-gestionale dei percorsi integrati. L'utilizzo di modalità di costing per processi, come il TDABC, consente di misurare con precisione il consumo di risorse lungo le diverse fasi del PBM, dalla diagnosi alla terapia e al follow-up, stimando il costo per paziente trattato e il risparmio derivante dalla riduzione delle trasfusioni e della degenza. In questo senso, il PBM può essere considerato un esempio concreto di value-based process management, in cui l'uso appropriato delle risorse coincide con il miglioramento degli outcome clinici e la riduzione del rischio per il paziente.

3. Conclusioni

In conclusione, l'esperienza del PBM presso l'ASST Papa Giovanni XXIII mostra come la gestione per processi possa tradursi in un approccio concreto di innovazione clinico-organizzativa e di integrazione ospedale-territorio. L'applicazione del PBM in un contesto che coinvolge contemporaneamente i livelli ospedaliero e territoriale dimostra la possibilità di generare outcome su tre dimensioni complementari: clinica, attraverso la riduzione dell'anemia preoperatoria e dell'esposizione trasfusionale; organizzativa, mediante il rafforzamento della collaborazione multiprofessionale e dell'integrazione ospedale-territorio; economico-gestionale, grazie alla possibilità di analizzare e governare i costi lungo il processo di cura anziché per singole unità organizzative.

Il progetto, ancora in fase di implementazione, si propone di contribuire alla letteratura e alla pratica manageriale offrendo un esempio di come i principi teorici della gestione per processi, dell'analisi dei costi e del value-based healthcare possano essere declinati operativamente in un percorso concreto di cura integrata. In particolare, da un punto di vista teorico, in continuità con il dibattito sulla gestione per processi e sui PDTA integrati ospedale-territorio, lo studio propone una lettura del PBM non solo come buona pratica clinica, ma come leva organizzativa trasversale che richiede collaborazione multidisciplinare, riallocazione delle risorse e strumenti di misurazione dei costi per processo, superando i tradizionali assetti per reparto.

In termini di implicazioni pratiche, il caso analizzato suggerisce come il PBM possa fungere da modello replicabile per policy maker e manager sanitari interessati a sviluppare percorsi integrati coerenti con il DM 77/2022. In particolare, l'estensione del PBM alle Case di Comunità e alla medicina generale evidenzia il potenziale del modello nel rafforzare la sanità di prossimità, migliorare l'appropriatezza clinica e supportare decisioni di allocazione delle risorse basate sul valore.

Più in generale, in un contesto caratterizzato dall'invecchiamento della popolazione e dall'aumento della domanda di interventi chirurgici, il PBM assume una valenza strategica, non solo per la gestione clinica del singolo paziente, ma anche per la sostenibilità complessiva del sistema sanitario. L'adozione di pratiche di gestione integrata consente di ridurre la domanda di trasfusioni, di ottimizzare l'uso delle scorte ematiche e di garantire una maggiore resilienza dei servizi in situazioni di carenza di risorse, come quelle registrate durante la pandemia da COVID-19.

La prospettiva offerta dal PBM si inserisce pienamente nella logica della sanità di iniziativa e del value-based healthcare, in cui l'obiettivo non è solo l'efficienza operativa, ma anche la creazione di valore per il paziente e per la comunità. In questo senso, la collaborazione tra il polo ospedaliero e il polo territoriale rappresenta una leva fondamentale per la costruzione di percorsi di cura sostenibili e orientati agli esiti. Il PBM, attraverso la sua struttura multiprofessionale e l'integrazione dei processi, può fungere da modello replicabile per altri percorsi, come quelli

dedicati alla gestione delle cronicità o delle fragilità, contribuendo alla diffusione di una cultura organizzativa basata sulla collaborazione e sulla responsabilità condivisa. Lo studio apre inoltre a future linee di ricerca orientate alla valutazione ex post degli esiti clinici ed economici del processo una volta implementato, nonché all'analisi della trasferibilità del modello ad altri contesti clinici e territoriali.

Parole chiave: Patient Blood Management; PDTA; ospedale-territorio; activity-based costing; value-based healthcare

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La valutazione multidimensionale dei servizi sanitari territoriali nella prospettiva "Citizen Care in Community"

Claudio Travaglini[1]

1. La valutazione delle cure territoriali

Il contributo propone considerazioni per un modello di gestione e valutazione multidimensionale per le cure primarie come "l'erogazione di servizi universalmente accessibili integrati, centrati sulla persona" con approccio applicabile anche alle cure intermedie ed ospedaliere: metteremo al centro il cittadino e configureremo attorno a lui il Piano di Salute Personale, espressione dell'ecosistema della cura

Proporremo un modello multidimensionale di valutazione degli interventi aggiungendo alle dimensioni di efficacia clinica e costo quelle di autonomia, soddisfazione, impatto sociale, impatto ambientale ed equità sociale complessiva.

La valutazione della performance dei servizi sanitari ha per oggetto tipicamente servizi erogati in ambiente (ospedaliero od ambulatoriale) specifico, controllato dall'erogatore in un punto preciso del territorio, a cui accede il cittadino. Utilizzeremo l'espressione cittadino evitando quelle di paziente, assistito od utente per sottolineare come stiamo parlando di una persona titolare di diritti e non

solo di necessità e che agisca per la tutela ed il recupero della propria salute.

Ciò deriva da un modello di separazione per cui il cittadino conduce la sua vita "normale" nelle comunità (famiglia, scuola, lavoro) e, se necessita di prestazioni di diagnosi, cura o riabilitazione, si rivolge ai servizi sanitari specifici e separati.

L'interazione del cittadino con il sistema di cura è interpretata con il concetto di "coproduzione", attivata nella relazione tra il servizio sanitario ed il cittadino, oggetto di crescente attenzione dalle discipline aziendali.

Introdurremo la "coproduzione estesa" non limitata alla collaborazione tra cittadino, famiglia ed equipe curante ma riferita alla "comunità curante" che rappresenta l'interpretazione operativa del "welfare di comunità".

In questo quadro il ricorso ai servizi ospedalieri di ricovero è da escludersi per le patologie croniche e rappresenta ipotesi residuale in cui si chiede al cittadino di "mettere in pausa" le proprie attività per dedicarsi esclusivamente alla cura della salute, non potendo provvedervi in altro modo.

All'organizzazione dei servizi sanitari pubblici è richiesto di "mettersi dalla parte dei cittadini" riducendo al massimo il proprio impatto socioeconomico su persone e famiglie attraverso la conciliazione di modelli e modalità di accesso.

L'attività delle cure primarie riguarda la popolazione su un territorio, deve adeguarsi alle caratteristiche geografiche, economiche e sociali quali densità di popolazione, condizioni dei trasporti, presenza di aree montane e periferiche, varietà di culture delle comunità e delle persone che ivi vivono e lavorano.

I professionisti trattano i cittadini secondo Piani Diagnostici Terapeutico

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Assistenziali (PDTA) ossia "sequenze standardizzate di prestazioni e attività sanitarie che coordinano il processo di cura per specifiche patologie, basato su evidenze scientifiche e adattato al contesto locale".

Il PDTA colloca nel tempo e suddivide le prestazioni per modalità di erogazione (ospedaliere, ambulatoriali, domiciliari) e tipologia di centro erogatore.

La traduzione del PDTA in un Piano Assistenziale Individualizzato (PAI) viene operata dal professionista di riferimento o dal "case manager" e concordata con il cittadino coproduttore che svolge un ruolo attivo (e non semplicisticamente "prescritto" ad un paziente passivo) con la famiglia ed il caregiver.

2. Profilo di Salute, Profilo di Risorse ed Ecosistema di Cura

Il mutamento dell'oggetto di riferimento (dal singolo assistito alla comunità) comporta l'adozione del Profilo di Salute, "una descrizione quantitativa e qualitativa della salute dei cittadini e dei fattori che la influenzano: identifica problemi, propone aree d'intervento e stimola l'azione»: se il profilo di salute rappresenta la diagnosi, della comunità il "progetto di salute" ne rappresenta l'ipotesi terapeutica.

Il progetto di salute è "strumento di programmazione, gestione e verifica che associa la stratificazione della popolazione alla classificazione del bisogno di salute identificando gli standard essenziali delle risposte cliniche e socioassistenziali, diagnostiche, riabilitative e di prevenzione".

Ma una comunità non è solo un insieme di bisogni: lo stesso sistema sociale presenta un sistema di risorse sanitarie e sociali, pubbliche e private, professionali e familiari, economiche e volontarie, formali ed informali, che provvedono ogni giorno ad offrire risposte ai bisogni sanitari e sociali delle persone.

Per ogni comunità (popolazione, territorio, struttura sociale) avremo un "Profilo delle Risorse" (non solo sociosanitarie) contrapposto al "Profilo di salute"

I sistemi di profili di salute e risorse, originano l'Ecosistema Globale della Cura, oggetto di analisi con cui co-produttore e case-manager devono confrontarsi.

Il rapporto di coproduzione tra cittadino e professionisti nel nostro approccio si trasforma in "coproduzione estesa" non limitata alla sola collaborazione tra singolo cittadino, famiglia ed equipe curante ma riferita alla comunità "curante".

La coproduzione estesa rappresenta l'interpretazione operativa del "welfare di comunità", un'aggregazione di risorse operante nello svolgersi della vita sociale della comunità che può esitare in una procedura formale di (co)progettazione.

Il posizionamento del cittadino sul territorio e nella comunità locale riconfigura l'ecosistema delle risorse: sviluppando l'approccio, "Citizen in Community Care" (CCC) intendendo non la cura non del "paziente" ma del "cittadino nella comunità".

L'approccio è applicabile a tutti i programmi di cura ma particolarmente adatto alla presa in carico territoriale domiciliare dei cittadini con patologie croniche per le quali le relazioni con l'ambiente sono più rilevanti e con maggiori effetti.

Disegniamo l'Ecosistema Personale della Cura attorno al cittadino: attraverso il Piano Assistenziale Individualizzato otteniamo il Piano di Salute Personale (PSP).

Parliamo di ecosistema poiché dobbiamo considerare tutti i soggetti sociali e comporli a sistema: essi non sono statici ed isolati ma interagiscono tra loro.

Il Piano di Salute Personale ricompone i percorsi di prevenzione, cura e riabilitazione, comprendendo la prevenzione secondaria e la riabilitazione che rappresentano il completamento dei segmenti in un unico Percorso.

3. Gli elementi dell'ecosistema della cura

Rappresentiamo gli elementi dell'ecosistema globale della cura con il cittadino al centro e per ogni cittadino i diversi ecosistemi personali tra loro connessi composti di elementi visti secondo prossimità, natura giuridica, livello di controllo.

Rappresentando l'ecosistema personale con al centro il cittadino, collochiamo successivamente in ordine decrescente di vicinanza logica i soggetti sul territorio:

1. la famiglia e/o i conviventi;
2. il caregiver professionale convivente o no;
3. gli amici e vicini prossimi.
4. Medici di Medicina Generale, Pediatri di Libera Scelta e Farmacie;
5. servizi sanitari pubblici territoriali (es. Case della Comunità);
6. servizi sanitari pubblici domiciliari (Assistenza Domiciliare Integrata);
7. servizi di telemedicina attivabili a domicilio del cittadino;
8. servizi di Assistenza Domiciliare (SAD) di enti locali pubblici o convenzionati;
9. Ospedali di Comunità;
10. Servizi ospedalieri.
11. Servizi sanitari territoriali privati;
12. Servizi sociosanitari di ricovero con componente di assistenza sanitaria;
13. presidi sanitari privati territoriali non convenzionati.
14. Enti locali ed altri enti pubblici rapporto con i cittadini.
15. soggetti formalizzati di terzo settore che svolgono attività sociali;
16. soggetti informali di terzo settore (gruppi spontanei).
17. altri soggetti privati (bar, negozi ed altri esercizi aperti al pubblico).

Nell'ecosistema personale gli elementi sono legati da relazioni sociali:

- affettive e familiari (il cittadino con la famiglia e gli amici);
- di coproduzione (il cittadino con il caregiver, l'ambiente ed i servizi);
- professionali (il cittadino con MMG, Infermiere, Farmacista, altri professionisti);
- organizzative (i servizi con la direzione);
- di collaborazione istituzionale (tra enti pubblici);
- economiche (il cittadino con i servizi privati);
- di condivisione sociale (il cittadino con aggregazioni non-profit);

che si incrociano e sovrappongono (il rapporto con i soggetti non-profit ha aspetti economici e quello con il Farmacista ha aspetti economici e professionali).

Una relazione sia alternativa che sovrapponibile a quelle sopra elencate è rappresentata da quella sulle reti sociali in cui cittadini interagiscono tra loro e con i professionisti per acquisire o trasmettere informazioni.

La gestione della multicanalità (in presenza, telefonica, nelle reti sociali) della comunicazione nella relazione tra professionisti ed unità organizzative non è sempre consapevole determinando l'assenza di una strategia di comunicazione.

Per interpretare le relazioni nei sistemi sociali si utilizza il concetto di "Capitale Sociale" come "l'insieme di reti di relazioni interpersonali, norme sociali e fiducia che permettono alle persone di agire collettivamente per il raggiungimento di obiettivi condivisi"; nel nostro contesto esso è il sistema di legami dell'ecosistema territoriale globale della cura che influenza processi e risultati di salute.

Nell'osservazione del capitale sociale distinguiamo:

- capitale sociale coesivo o esclusivo (bonding social capital);
- capitale sociale congiungente o inclusivo (bridging social capital);
- capitale sociale istituzionale (linking social capital).

Il capitale coesivo ed inclusivo è costituito da legami forti come il nucleo familiare o gli amici più stretti, con apporti di solida fiducia e chiusura della rete; esso provvede il supporto emotivo e pratico immediato per la vita quotidiana. Esso assicura il supporto principale ai cittadini

non autosufficienti o cronici e dipende in gran parte da composizione familiare e prossimità spaziale dei familiari.

Il capitale sociale congiungente o inclusivo è costituito da legami formali o informali deboli tra individui appartenenti a cerchie sociali diverse, caratterizzato da fiducia sottile e connessioni che colmano le lacune strutturali tra gruppi.

La dotazione di capitale congiungente è presente in varia misura nelle relazioni tra cittadini e corpi sociali intermedi (circoli, gruppi sportivi, parrocchie, comunità religiose e nazionali, organismi associativi e di volontariato, pro-loco).

Esso, collegando ambienti sociali diversi, potenzia la dotazione delle reti riguardo alla disponibilità di informazioni e facilita la fruizione dei servizi pubblici.

In assenza di forti reti familiari, se il cittadino non ha il supporto quotidiano della famiglia, la presenza di una rete collaborativa extrafamiliare (di paese, di parrocchia, di comunità in genere) permette di mantenere il cittadino nel proprio ambiente evitando ricoveri in strutture residenziali. Per supportare queste persone "isolate" in continuo aumento è necessario coltivare il capitale sociale congiungente nella relazione tra cittadini, servizi pubblici e aggregazioni sociali intermedie.

Assieme al capitale sociale congiungente il capitale istituzionale connette singoli, gruppi e strutture istituzionali (esplicitandosi in rapporti di fiducia tra cittadini e sistema pubblico inclusi Scuole, Aziende Sanitarie o Comuni).

Gli ecosistemi utilizzano il capitale sociale delle comunità per circondare di cure il cittadino, ed allo stesso tempo lo riproducono attivando relazioni di cura e collaborazione tra persone e soggetti sociali ed erogando servizi pubblici.

4. La valutazione multidimensionale del Piano di Salute Personale

Se il Piano di Salute Personale si sviluppa nella comunità la sua valutazione non si limita all'efficacia sanitaria ma deve essere considerata secondo:

a) efficacia sanitaria;
b) autonomia personale;
c) costo dell'intervento;
d) impatto socioeconomico;
e) soddisfazione percepita;
f) impatto ambientale.

La valutazione dell'efficacia sanitaria misura la modifica dello stato clinico-sanitario del cittadino basandosi su indicatori specifici riferiti alle varie patologie.

Il recupero o mantenimento del massimo livello di autonomia personale è importante specie per gli anziani, per cui l'autonomia evita il ricorso a soluzioni di ricovero peggioranti la qualità della vita e più onerose per famiglia e sistema.

Una terza dimensione di valutazione è rappresentata dal costo, raramente considerato per il trattamento complessivo di cura come il PSP.

Una quarta dimensione raramente quantificata è l'impatto socioeconomico sulla vita del cittadino con valutazioni complesse e senza una metodologia univoca.

Possiamo approcciare l'impatto identificando costi ed oneri in termini di tempi di vita e di lavoro indotti su cittadino e famiglia dalle scelte di attuazione del PSP.

La minimizzazione dell'impatto socioeconomico negativo su cittadino e famiglia è la declinazione operativa del principio secondo cui le cure primarie vanno erogate "nelle condizioni di vita" del cittadino, ossia nel suo ecosistema.

La quinta dimensione è la soddisfazione del cittadino e della sua famiglia, valutata attraverso questionari appositi, nonché la rilevazione dei risultati soggettivamente percepiti dell'esperienza del PSP tipicamente rilevati attraverso la rilevazione di PREMs e PROMs. La rilevazione

sistematica di soddisfazione e suggerimenti del cittadino permette di permettere un adattamento continuo.

La sesta dimensione di valutazione del Piano di Salute Personale è quella dell'impronta ambientale, ossia dell'effetto (tipicamente di maggiore inquinamento) determinato dalla realizzazione del piano sull'ambiente circostante

Se consideriamo non tanto il singolo PSP ma un aggregato territoriale di essi possiamo (e in un servizio sanitario pubblico e universalistico dobbiamo) valutare l'equità di accesso dei cittadini ai servizi sanitari, stimando se le diverse "popolazioni" (suddivise per territorio, provenienza, istruzione e reddito) abbiano la stessa possibilità di accesso ai servizi.

Le valutazioni sono applicabili a singoli interventi mentre la dimensione di equità sociale nell'accesso agli interventi dei servizi è applicabile al loro complesso.

5. Prime riflessioni

L'attuazione del nuovo modello di cure primarie per l'assistenza al cittadino "nel suo ambiente di vita e di lavoro" delineato dal DM 77, reso ancor più necessario dall'invecchiamento della popolazione e dalla maggiore incidenza delle cronicità richiede di riprogettare il sistema della cura ponendo al centro il cittadino.

Tale riprogettazione deve prevedere una valutazione multidimensionale degli interventi che accompagni alle valutazioni di efficacia clinica e costo degli interventi il monitoraggio di autonomia personale, impatto socioeconomico, soddisfazione dei cittadini e impronta ambientale.

Per verificare l'utilità del modello concettuale esso deve essere accompagnato dallo sviluppo degli strumenti operativi e da una prima applicazione sperimentale

Parole chiave: Cure Primarie; coproduzione; presa in carico comunitaria; valutazione multidimensionale

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Le preferenze di clinici, manager ibridi e amministrativi nelle scelte di adozione dell'innovazione in sanità

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1. Sviluppo concettuale

L'innovazione rappresenta da tempo un tema centrale nella definizione delle politiche, nella ricerca e nel governo della pubblica amministrazione, in quanto è considerata uno strumento fondamentale per mantenere e migliorare l'erogazione dei servizi pubblici (Chen et al., 2020; Walker, 2006). In tale prospettiva, i risultati delle ricerche che evidenziano un impatto positivo dell'innovazione sulla performance del settore pubblico continuano a suscitare l'interesse dei manager e ad influenzare le direttrici della ricerca (De Vries et al., 2016; Kaul, 1997; Walker et al., 2002). Tuttavia, nell'ambito della sanità pubblica, sebbene le innovazioni tecnologiche svolgano un ruolo cruciale nel miglioramento delle cure, esse comportano un aumento dei costi e delle difficoltà di adozione, compromettendo l'accessibilità e la sostenibilità economica (Cinaroglu & Baser, 2018; Mele et al., 2014; Moreira et al., 2017). Inoltre, i responsabili delle decisioni nella pubblica amministrazione devono affrontare ostacoli specifici per l'adozione e l'implementazione delle innovazioni, tra cui incentivi, sostegno e finanziamenti inadeguati, nonché vincoli di tempo, e resistenza organizzativa (Cinar et al., 2019). La complessità del processo decisionale in ambito sanitario è spesso esacerbata dal fatto che tali decisioni devono essere adottate in scenari incerti, caratterizzati da evidenze scientifiche limitate. In tali circostanze, il ruolo del decisore assume una rilevanza centrale. Ciò è particolarmente rilevante nel contesto sanitario, dove i decisori provengono da contesti multidisciplinari e presentano un'ampia varietà di background professionali, formativi ed esperienziali che possono farli divergere nelle scelte da adottare con implicazioni pratiche nella performance aziendale (Heyden et al., 2018; Smith et al., 2019; Verhoest et al., 2024).

All'interno delle organizzazioni sanitarie pubbliche, generalmente considerate come burocrazie professionali (Mintzberg, 1980), si identificano numerosi attori che, nel contesto della gestione delle strutture, si rivelano reciprocamente indispensabili. Il Capitale Umano presente all'interno delle strutture sanitarie può pertanto essere ascritto a tre principali categorie. All'interno di tali organizzazioni, si delineano due gerarchie direzionali parallele: la prima riguarda i professionisti sanitari con competenze cliniche specialistiche, mentre la seconda riguarda la componente tecnica con funzioni gestionali e di supporto (definite da Mintzberg tecnostruttura e staff di supporto). Analizzando in modo più approfondito, il gruppo di coloro che nelle aziende sanitarie hanno competenze tecniche di supporto, questo include coloro che non svolgono un ruolo diretto nell'erogazione delle cure e non possiedono una formazione sanitaria specifica, come il personale amministrativo. Tuttavia, questi soggetti esercitano un impatto diretto sulle decisioni di adozione dell'innovazione attraverso la gestione delle risorse finanziarie e tecniche. Il secondo gruppo è costituito dai professionisti sanitari, come i medici, che operano

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direttamente nell'assistenza e utilizzano personalmente le innovazioni sanitarie, beneficiando delle nuove soluzioni. In tale dicotomia, la letteratura scientifica ha nel tempo offerto crescenti opportunità di approfondimento introducendo la figura dei manager ibridi, ovvero medici deputati alla riconciliazione tra i valori e le priorità delle due funzioni menzionate in precedenza, mediante la gestione delle risorse umane, tecnologiche e finanziarie, nonché del mantenimento di responsabilità sugli aspetti clinici (Sartirana, 2019). I manager ibridi sono professionisti sanitari che, nel corso della loro carriera, acquisiscono anche competenze manageriali, ad esempio medici con incarichi di direzione di struttura o, in generale, incarichi di responsabilità organizzativa (Sarto et al., 2019). Gli ibridi sono stati considerati un modo per ridurre l'attrito tra i tradizionali valori professionali e i nuovi paradigmi organizzativi.

La letteratura suggerisce che, oltre alle proprietà tecniche delle innovazioni, anche le caratteristiche relative al background e alle caratteristiche personali dei decisori influenzano l'adozione delle tecnologie (Cinar et al., 2019; Damanpour & Schneider, 2009; Jones & Fulop, 2021). Infatti, i decisori in sanità svolgono un ruolo strategico nel processo decisionale all'interno delle loro organizzazioni grazie alla posizione autorevole che rivestono e al coinvolgimento diretto nell'allocazione delle risorse che viene a loro demandato (Daellenbach et al., 1999; Helfat & Martin, 2015). Aspetti come il capitale umano dei decisori, il loro livello di sensibilità verso l'innovazione, la singola propensione al rischio, nonché gli interessi verso l'equilibrio tra risultati a breve termine e sviluppi futuri sono tra gli aspetti che sono stati studiati in relazione all'adozione di innovazione tecnologica (Becker, 1962). In relazione a ciò, i ricercatori hanno sviluppato modelli teorici che suggeriscono come l'operato dei decisori si fondi su una gerarchia complessa di competenze. Tali competenze includono conoscenze generali, utili in vari contesti professionali, anche in settori molto distanti tra loro, competenze specifiche, trasferibili all'interno degli stessi settori, e competenze specifiche dell'azienda, radicate nella cultura unica e nella conoscenza operativa di una singola organizzazione (Castanias & Helfat, 2001). Inoltre, un'altra parte della letteratura esistente ha esaminato la distinzione tra un tipo di decisore generalista e uno specialista (Datta & Iskandar-Datta, 2014), intendendo per generalista il decisore a cui sono state trasmesse delle competenze manageriali, ad esempio, attraverso dei Master in Amministrazione Aziendale e per specialista colui che ha definito le sue competenze manageriali all'interno di percorsi di studio verticali in aree funzionali, come, ad esempio, la contabilità aziendale. Questi filoni di ricerca rientrano nell'ambito della teoria del Capitale Umano, che può offrire una lente utile attraverso la quale esplorare come le preferenze individuali derivate dal retaggio personale o professionale influenzino i risultati del processo decisionale relativo all'adozione dell'innovazione (Damanpour & Schneider, 2009; Kor & Sundaramurthy, 2009; Nasirov et al., 2021).

2. Obiettivi

Sulla base dei filoni di ricerca delineati precedentemente, è possibile formulare l'ipotesi che le diverse caratteristiche personali e professionali dei decisori, attribuibili al Capitale Umano, generino profili decisionali distinti, con impatti sulle scelte di adozione delle innovazioni nel settore sanitario. In tale contesto teorico, la ricerca si propone di esaminare l'impatto del capitale umano dei numerosi decisori operanti nel settore sanitario sulle loro preferenze in merito all'interesse verso l'adozione di un'innovazione tecnologica in fase di sviluppo. Più precisamente, lo studio si prefigge di indagare empiricamente se il diverso capitale umano dei decisori conduca a preferenze differenziate riguardo all'adozione dell'innovazione nel settore sanitario.

Al fine di esaminare il processo decisionale degli stakeholder in materia di innovazione nel settore sanitario, è stato implementato un esperimento a scelta discreta (DCE), utilizzando un caso di studio simulato che coinvolge una tecnologia medica robotica integrata di Intelligenza Artificiale in fase di sviluppo e non ancora immessa nel mercato. Il disegno in esame consente di esaminare empiricamente come molteplici categorie di decisori prioritizzano le caratteristiche di

un'innovazione sanitaria, identificandone le diverse preferenze che guidano la scelta. I risultati empirici derivanti da tale ricerca si pongono l'obiettivo di informare sia la pratica manageriale che la ricerca accademica, offrendo contributi aggiornati sulla comprensione del ruolo del Capitale Umano nelle scelte di adozione di un'innovazione sanitaria.

3. Quadro metodologico

Per rispondere alla domanda di ricerca, è stato impiegato un esperimento di scelta discreta (DCE), un metodo di preferenza dichiarata ampiamente utilizzato nel marketing e nell'economia applicata, che sta conoscendo un'espansione sempre maggiore anche nel settore sanitario (De Bekker-Grob et al., 2012; Mühlbacher & Johnson, 2016; Soekhai et al., 2019). Più di recente, l'impiego del DCE si è esteso anche al settore della gestione pubblica, dove tale strumento viene utilizzato per analizzare le preferenze degli amministratori e supportare il processo decisionale in contesti e questioni gestionali complesse (Østergaard-Nielsen, 2025; van der Voet & Lerusse, 2024; Van Puyvelde et al., 2016). Nei DCE, ai partecipanti vengono presentate una serie di scenari decisionali ipotetici che includono alternative di acquisto caratterizzate da attributi e livelli di attributi diversi, tra cui il prezzo. In ogni scenario di scelta, agli individui viene quindi richiesto di trovare un compromesso tra le opzioni di risposta a disposizione e un'alternativa di rinuncia. Questo strumento di ricerca simula il processo decisionale degli individui in contesti di acquisto reali.

3.1. Contesto di ricerca

Lo studio si inserisce in un caso di studio relativo a un'innovazione nel settore dell'urologia (Robiopsy - EIC 101112739), che mira ad integrare su un dispositivo robotico un software di intelligenza artificiale progettato per migliorare l'accuratezza della diagnosi del carcinoma prostatico. Tale problema riveste un'importanza significativa per la popolazione generale, in quanto rappresenta il secondo tumore più comune negli uomini, con un tasso di mortalità che supera le 350.000 unità annue (Culp et al., 2020). La gestione della tecnologia nel settore sanitario è soggetta ad una regolamentazione attraverso strumenti riconosciuti come l'Health Technology Assessment (HTA) (Ijzerman et al., 2017). A tale processo, nell'ambito della pratica quotidiana, contribuiscono i clinici promuovendo i benefici delle tecnologie per i pazienti che assistono nella quotidianità. Le procedure di adozione sono successivamente sponsorizzate dai manager ibridi che contribuiscono attivamente all'inoltro di tali domande agli apparati amministrativi delle aziende sanitarie.

Tali richieste vengono poi vagliate da personale non sanitario che le amministra in armonia con i vincoli gestionali dell'azienda.

Lo studio si concentra sul processo decisionale di tre categorie di capitale umano. Quello dei clinici (urologi in formazione specialistica e strutturati), dei direttori dei reparti clinici (manager ibridi), e del personale tecnico-amministrativo (ad esempio, ingegneri clinici, personale dell'amministrazione, direttori amministrativi). Come descritto nella sezione precedente, ciascuno di questi decisori rappresenta un diverso incrocio di competenze cliniche e amministrative. Sebbene all'interno delle aziende sanitarie i ruoli manageriali siano formalmente responsabili del processo decisionale, il personale clinico in prima linea li supporta e li influenza nelle loro scelte quotidiane, promuovendo le decisioni in base alle esigenze dei pazienti e alle caratteristiche tecniche. Le variabili di capitale umano sono state operazionalizzate attraverso le caratteristiche auto-dichiarate raccolte tramite un sondaggio online in un disegno cross-sectional avvenuto nel corso del 2025 e distribuito tramite associazioni scientifiche, dati disponibili online e contatti personali alle figure di interesse sopra descritte.

3.2. Il disegno di ricerca

Le preferenze dei tre gruppi di decisori dai diversi profili di capitale umano sono state valutate attraverso un DCE preregistrato sul sito web AsPredicted (De Bekker-Grob et al., 2012). Il DCE si è servito di uno scenario ipotetico, ma realistico all'interno del quale analizzare le microfondamenta delle scelte dei decisori operanti nella pubblica amministrazione. Ai partecipanti, dopo essere stati esposti a un cheap talk come approccio ex ante per mitigare possibili bias ipotetici che potrebbero influenzare gli studi sulle preferenze dichiarate, è stato richiesto di prendere una decisione riguardo a una scelta di acquisto di una tecnologia medica (Asioli et al., 2022).

Il DCE è stato preceduto da una revisione della letteratura che ha rivelato le caratteristiche principali da attenzionare per introdurre un'innovazione sanitaria (Smith et al., 2019). Queste sono state operazionalizzate in dimensioni concrete e rilevanti per il processo decisionale nel caso adottato: accuratezza tecnologica e supporto alla terapia (nell'ambito della valutazione della conformità); curva di apprendimento e compatibilità utente-sistema (nell'ambito della risoluzione dei problemi basata sulle esigenze); riduzione dei prezzi e della durata delle procedure (nell'ambito della valutazione economica) (Tabella 1). La selezione di tali attributi è stata perfezionata mediante consultazioni ed interviste semi-strutturate con esperti del settore, al fine di garantirne la rilevanza pratica e l'allineamento con il processo decisionale relativo all'acquisto di innovazioni nel settore sanitario. Infine, nel 2025, il sondaggio che includeva il DCE è stato distribuito tramite e-mail ad un campione di convenienza, utilizzando la piattaforma Qualtrics.

Nel disegno di ricerca sono state incluse 24 coppie di scelta, suddivise in tre blocchi. A ciascun rispondente veniva assegnato in modo casuale uno dei blocchi, composto da otto scenari decisionali. Ogni scenario presentava due alternative di dispositivi tecnologici da acquistare (alternativa A e alternativa B), ciascuna delle quali differiva per sei attributi (di cui quattro con due livelli e due con quattro livelli), oltre a una terza opzione di "opt-out" (Ryan et al., 2012).

Attributi	**Livelli**
Accuratezza tecnologica	Il robot compensa i movimenti del paziente
	Il robot non compensa i movimenti del paziente
Informazioni sulla curva di apprendimento	Entro 30 casi
	Assenza di informazioni
Durata della procedura	Status quo
	5' in meno dell'attuale durata media
	10' in meno dell'attuale durata media
	15' in meno dell'attuale durata media
Compatibilità con altri sistemi	Compatibile con altri sistemi di ultrasuoni già disponibili presso l'azienda sanitaria
	Incompatibile con altri sistemi di ultrasuoni già disponibili presso l'azienda sanitaria

Supporto per la terapia	Compatibile con la terapia focale
	Incompatibile con la terapia focale
Prezzo	80.000 €
	120.000 €
	160.000 €
	200.000 €

Tabella 1. Attributi e livelli delle caratteristiche dell'innovazione inseriti nel DCE

Incorporando un attributo relativo al prezzo del dispositivo sanitario nel DCE, l'impostazione sperimentale consente di stimare la disponibilità a pagare (WTP) dei decisori per ogni specifico attributo dell'innovazione studiato. Il DCE finale è stato modellato mediante un approccio bayesiano basato su un precedente disegno sperimentale fattoriale frazionario ortogonale eseguito in uno studio pilota su un campione di 44 intervistati. I risultati dello studio pilota sono stati analizzati mediante un modello logit multinomiale (MNL), le cui stime sono state impiegate per generare un disegno bayesiano finale (Bliemer & Collins, 2016). Entrambi i disegni hanno condotto alla generazione di 24 set di scelta mediante l'impiego del software Ngene 1.2.

3.3. Analisi dei dati

Le risposte raccolte al DCE, che è ancora in corso, sono state pre-analizzate utilizzando modelli di scelta discreta coerenti con la teoria dell'utilità casuale (McFadden, 1974) e con la teoria economica del comportamento dei consumatori di Lancaster (Lancaster, 1966). Secondo la teoria dell'utilità casuale, gli individui prendono decisioni per massimizzare la loro utilità in base a vincoli reali (come i limiti di budget) e le scelte possono essere modellate confrontando una componente casuale nella funzione di utilità e analizzando la probabilità di scelta tra le alternative. La teoria di Lancaster, d'altra parte, postula che l'utilità totale di un bene possa essere suddivisa in utilità parziali derivanti dai diversi attributi del bene stesso. Per quanto detto, il modello secondo la teoria dell'utilità casuale prevede che l'individuo n scelga l'alternativa j ottenendo che l'utilità sia:

$$U_{njt} = \beta_n' x_{njt} + \varepsilon_{njt} \quad (1)$$

dove x_{njt} è un vettore delle variabili osservate relative all'alternativa j e all'individuo n, β_n' è un vettore dei parametri strutturali di preferenza che caratterizzano le scelte, e ε_{njt} è il termine di errore non osservato, che si presume indipendente da β e x. In base alla teoria di Lancaster, la presente analisi si basa sull'ipotesi che l'utilità (U) che l'individuo n ricava scegliendo l'alternativa j della tecnologia robotica nel compito di scelta t possa essere specificata come segue:

$$U_{njt} = NOBUY + \beta_1 PRICE_{njt} + \beta_2 ACCURACY_{njt} + \beta_3 DURATION_{njt} + \beta_4 COMPATIBILITY_{njt} + \beta_5 LC_{njt} + \beta_6 THERAPY_{njt} + \varepsilon_{njt} \quad (2)$$

In tale contesto, i coefficienti $\beta_1 - \beta_6$ rappresentano l'utilità marginale associata a ciascun attributo, catturando la direzione e la forza delle preferenze dei rispondenti al modello del DCE. Nell'equazione (2), $NOBUY$ rappresenta la costante specifica dell'alternativa (ASC), assumendo

il valore 1 per l'alternativa "nessun acquisto" e 0 altrimenti. $PRICE$ rappresenta una variabile continua costituita da quattro livelli di prezzo (80.000 €, 120.000 €, 160.000 € e 200.000 €), mentre $DURATION$, ovvero la riduzione della durata della procedura, è una variabile discreta che incorpora quattro livelli sperimentali (lo status quo, 5', 10' e 15' in meno rispetto alla durata media attuale). Variabili non legate al prezzo, quali l'accuratezza della tecnologia ($ACCURACY$), la compatibilità con più dispositivi a ultrasuoni ($COMPARABILITY$) e il supporto alla terapia ($THERAPY$), sono variabili codificate mediante variabili dicotomiche. Tali variabili assumono il valore 1 in caso di compatibilità con la caratteristica, mentre assumono il valore 0 in caso di incompatibilità. Similmente, le informazioni relative alla curva di apprendimento (LC) sono codificate mediante variabili binarie, assumendo il valore 1 in presenza di informazioni disponibili (entro 30 casi) e 0 in assenza di informazioni sull'attributo. Il termine εnjt rappresenta il valore casuale non osservato, la cui distribuzione segue una curva di tipo I, con i valori estremi distribuiti sulle alternative. Infine, le differenze nel processo decisionale e nelle soglie di disponibilità a pagare relative alla scelta di acquisto globale per l'innovazione tra diversi profili di capitale umano sono stimate utilizzando un modello di regressione lineare basato sulle variabili del capitale umano.

4. Risultati preliminari

Il DCE completo è attualmente in corso; tuttavia, i risultati preliminari dello studio pilota evidenziano differenze nelle preferenze relative all'adozione dell'innovazione in base al capitale umano degli intervistati. I rispondenti al sondaggio sono principalmente uomini con un'età media di 45 anni. La maggioranza dei soggetti esaminati, cioè il 39%, appartiene alla categoria dei clinici, mentre il 38% è composto da amministrativi e il 23% da manager ibridi. La Tabella 2 illustra le caratteristiche del capitale umano selezionato nel campione di rispondenti esaminati.

Sample characteristics (N=87)			**Missing values (n)**
Age (years), mean (SD)		44.74 (13.07)	3
Gender, n (%)	*Female*	24 (28.24)	2
	Male	61 (71.76)	
Subgroups, n (%)	*Specialist*	34 (39.08)	
	Hybrid	20 (22.99)	
	Generalist	33 (37.93)	
Tenure in the current sector (years), mean (SD)		16.14 (12.10)	
Tenure in the current organization (years), mean (SD)		9.85 (9.93)	
Tenure in the current role (years), mean (SD)		6.57 (6.66)	

Organization size, n (%)	*No beds*	8 (9.20)
	Small	7 (8.05)
	Medium	30 (34.48)
	Large	42 (48.28)
Managerial education, n (%)	*Yes*	23 (26.44)
	No	63 (73.56)
Academic publication in the last three years, n (%)	*Yes*	51 (58.62)
	No	36 (41.38)
PhD	*Yes*	10 (11.49)
	No	77 (88.51)

Tabella 2. Caratteristiche demografiche e di background dei rispondenti alla survey

La Tabella 3 illustra i risultati preliminari del modello mixed logit. Tutti gli attributi inclusi nel disegno di studio sono risultati statisticamente significativi. Si nota che l'effetto più forte è quello legato all'accuratezza diagnostica (1.395, p< 0.01), seguito dalla compatibilità con altri dispositivi (1.336, p< 0.01) e dalla riduzione del tempo della procedura di 10' (1.037, p< 0.01). La riduzione del prezzo ha un effetto negativo (-0.0126, p< 0.01). Questo indica che, all'aumentare del prezzo del dispositivo, la disponibilità all'acquisto diminuisce. La significatività statistica della deviazione standard in molti degli attributi indica la presenza di variabilità interna agli attributi stessi rispetto alle preferenze dei rispondenti.

	Mean	**Choice**	**SD**
Price	-0.0126***		
	(0.00213)		
Nobuy (ASC)	-0.475		
	(0.309)		
Technological accuracy	1.395***		1.457***
	(0.271)		(0.216)
Reduction in procedure duration by 5	0.765**		-1.379***
minutes	(0.353)		(0.446)
Reduction in procedure duration by 10 minutes	1.037***		0.740*
	(0.330)		(0.442)
Reduction in procedure duration by 15 minutes	0.575**		1.159***
	(0.266)		(0.345)
Compatibility with other devices	1.136***		0.966***
	(0.213)		(0.200)
Learning curve	-0.222		0.898***
	(0.182)		(0.206)
Therapy support	0.873***		1.017***

	(0.219)	(0.222)
N	*2088*	

*Tabella 3. Risultati del modello mixed logit. Standard errors tra parentesi. * p< 0.10, ** p< 0.05, *** p< 0.01*

La Tabella 4 riporta i tre modelli utilizzati nell'analisi preliminare sulla disponibilità ad acquistare globale (valori espressi per 100 €). Il modello 3 con le interazioni evidenzia che gli amministrativi tendono ad avere valori di disponibilità a comparare più alti rispetto ai clinici, ma che all'aumentare dell'esperienza nel ruolo ricoperto, tale disponibilità all'acquisto diminuisce in modo significativo.

		(1)	(2)	(3)
VARIABLES	**Baseline**		**+ Role Tenure**	**+ Interactions**
Male		28.401	32.653	35.547
	(53.193)		(55.460)	(54.419)
Age (years)		-1.416	-2.076	-2.083
		(2.001)	(3.028)	(2.969)
Hybrids		13.342	27.939	45.997
	(64.675)		(82.074)	(119.888)
Generalists		4.904	13.455	126.680*
	(53.784)		(61.535)	(75.560)
Role tenure (years)			1.415	5.844
			(4.848)	(5.241)
Hybrids#Role tenure				-1.317
				(12.912)
Generalists#Role tenure				-19.290**
				(7.583)
Constant	449.709***		456.129***	413.816***
	(114.322)		(117.093)	(115.446)
Observations		82	82	82
R-squared		0.009	0.010	0.091

*Tabella 4. Risultati di tre modelli di regressioni. Standard errors tra parentesi. * p< 0.10, ** p< 0.05, *** p< 0.01. Il gruppo di riferimento è quello dei clinici*

5. Conclusioni potenziali

Nonostante i risultati finali non siano ancora disponibili, in quanto la raccolta dati è ancora in corso, le prime indicazioni contribuiscono alla letteratura in ambito aziendale, evidenziando come i diversi profili di capitale umano dei decisori presenti nel settore sanitario influenzino il processo decisionale che conduce alle scelte di adozione dell'innovazione (Huang & Villadsen, 2023). L'assistenza sanitaria, infatti, è costituita da aggregazioni professionali che storicamente hanno sempre goduto di un processo decisionale autonomo (Denis et al., 2022), e che sono arricchite da un capitale umano diversificato e altamente specializzato, derivante da molteplici conoscenze, ruoli e una vasta esperienza professionale. Tuttavia, l'emergere rapido di tecnologie in continua evoluzione sta erodendo questa centralità (Susskind & Susskind, 2022), rendendo necessario un confronto tra i decisori con diversi capitali umani presenti nelle aziende sanitarie per affrontare ciò che alcuni percepiscono come una crescente "minaccia tecnologica" (Kirkpatrick et al., 2023; Muzio et al., 2019).

Nel contesto sanitario, questo DCE rappresenta uno dei primi tentativi empirici di esplorare le preferenze verso l'adozione di innovazione esaminando il ruolo del capitale umano dei decisori all'interno della pubblica amministrazione. I risultati consolidati forniranno informazioni utili sia per le politiche che per la pratica manageriale all'interno delle aziende sanitarie, in particolare nel settore della governance dell'innovazione tecnologica.

Parole chiave: Innovazione tecnologica; HTA; capitale umano; DCE

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Beyond Adoption: Artificial Intelligence and Organizational Transformation. An Empirical Study

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1. Contextual background

Healthcare systems worldwide are currently strained by complex phenomena such as population growth, the spread of serious diseases like cancer or chronic illnesses, and a significant shortage of healthcare personnel (Ho et al., 2023).

These issues emerged with greater disruptiveness during the Covid-19 pandemic, making the healthcare landscape more fragile and vulnerable. In fact, during this period, medical staff, who were already previously burdened by excessive workloads, showed difficulty in managing the unexpected demand for assistance required by the emergency (Dicuonzo et al., 2023).
In a scenario like this, the implementation of Artificial Intelligence (AI) represents the strategic choice to focus on, as it offers the possibility of enhancing the value creation process for the healthcare system.

This perspective is evidenced by the countless advances being achieved in the medical and clinical fields following its use, which have been suitably mapped by scientific literature.

Consider the field of medical imaging, where the evolution and refinement of deep neural networks have made new instrumentation capable of detecting lesions that human observation alone would not be able to identify with the same precision (Davenport & Kalakota, 2019). Furthermore, consider the revolutionary possibility of performing remote surgery and providing specialist consultation and continuous clinical monitoring of patients through the innovative services offered by telemedicine (Cannavacciuolo et al., 2023).
Finally, a further example of success is given by Watson, the tool implemented by IBM, which succeeded in identifying the exact number of RNA-binding proteins involved in amyotrophic lateral sclerosis (Bakkar et al., 2017).

All these technological advancements translate, in most cases, into a clear and tangible improvement in diagnostic processes (Bhagat & Kanyal, 2024; Ali et al., 2023) and a superior therapeutic quality provided to patients (Mohammed et al., 2022).

From all this, it is unequivocally clear how the integration of Artificial Intelligence in healthcare is realizing what Leroy Hood (2013) defined as "4P Medicine": Predictive, Preventive, Personalized, and Participatory. Therefore, a change in perspective is urgent and can no longer be postponed: Artificial Intelligence should no longer be considered an optional technology; rather, it must be seen as an indispensable technology (Chung, 2025) for the progress and well-being of the entire community and for the sustainability of healthcare systems.

2. Problem and research gap

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However, it is essential and crucial to recognize that the disruptive digital innovation brings with it an inevitable series of new responsibilities and the urgent need to reflect on the resulting obligations. In fact, the need arises for all modern healthcare systems to establish and develop organizational structures capable of best administering and managing the new technology (Sun & Medaglia, 2019). In parallel, an update of the skill set required for healthcare professionals who are interacting daily with Artificial Intelligence becomes necessary. This update is considered of vital importance in order to promote collaborative intelligence, based on the synergistic interaction between humans and AI systems (Bhatt & Bae, 2023).

This complex transformation should have the ultimate goal of creating a new and efficient healthcare business model (Kraus et al., 2021), where two main elements are fundamental: collaboration among the various actors in the healthcare system and the absolute centrality of the patient in every care process (Schiavone et al., 2022). Through the rigorous implementation of this new model, operational efficiency can truly be achieved, which presupposes an extremely effective management of time, available personnel, and economic and material resources (Sharabati et al., 2024).

Furthermore, in a context characterized by uncertainty and rapid changes, dynamic capabilities are of vital importance, meaning all the intrinsic competencies of any enterprise to combine, develop, and adapt every skill useful for successfully facing challenges imposed by rapidly changing environments (Teece et al., 1997). The final goal is for these capabilities to support and guide a genuine cultural and operational evolution of the entire healthcare sector (Bohr & Memarzadeh, 2020). The World Health Organization (2021) has acknowledged and affirmed that if the global healthcare system is adequately supported by all these elements, it has the revolutionary potential to change medical outcomes.

However, it must be recognized that a complete implementation and effective integration of Artificial Intelligence within the complex healthcare landscape is by no means a simple process: there is an urgent need to know how to manage it proactively (Kim et al., 2025). Ultimately, in order to maximize operational and clinical benefits while minimizing potential risks, a profound modification of the existing organizational culture is required.

This includes the acquisition of new and specific professional competencies by healthcare personnel and the readjustment and reconfiguration of internal operational processes (Petersson et al., 2022; Topol, 2019).

Studies conducted by Sendak et al. (2020) and Morales et al. (2021) highlight how professionals involved in digital innovation widely lament the lack of clear and standardized guidelines that could accompany and facilitate the difficult process of integrating Artificial Intelligence into their clinical routines.

This lack exposes the new AI technology to a dual and significant risk: on the one hand, the absence of key directives could seriously compromise the effectiveness and safety of operational processes; on the other hand, in the worst-case scenario, its incorrect implementation could invalidate patients' clinical outcomes.

Although studies on this topic in the literature are numerous and continuously growing, notable gaps and areas of uncertainty persist. There is a recognized urgent and strategic need to deeply investigate how healthcare organizations are managing the structural changes introduced into their operational processes by the new technology (Kulkov et al., 2024). At the same time, it is not yet entirely clear whether Artificial Intelligence truly succeeds, specifically, in improving diagnostic quality and reducing staff workload. More generally, it is not entirely certain whether AI can bring real benefits in terms of efficiency (Wenderott et al., 2024). Furthermore, many studies conducted to date tend to examine the phenomenon of new technology adoption almost exclusively in its initial stages. However, these studies often end up neglecting the phases after its implementation (Roppelt et al., 2024).

This omission creates a critical gap that must be absolutely filled to understand the lifecycle of Artificial Intelligence once it is integrated into operational processes.

3. Aim and research question

Given all these contextual premises and the identified scientific gaps, the primary objective of the following empirical study is to deeply investigate how healthcare organizations are managing the complex changes induced by the implementation and integration of Artificial Intelligence into their operational processes. In this regard, particular attention will be paid to analyzing the phases following its adoption.
From these premises, the following research question arises:

RQ: How are healthcare facilities concretely tackling the organizational changes imposed by the implementation of Artificial Intelligence?

4. Methodology

The exploratory nature of the research question requires the adoption of a qualitative approach, based on the Multiple Case Study methodology (Eisenhardt, 1989), which is considered fundamental for effectively and systematically comparing multiple organizational structures that differ from each other. The choice of this approach is further supported by the recognized need to investigate and understand the complexity of all those contexts that are characterized by countless and rapid changes, which, in turn, generate further challenges (Halineen & Tornroos, 2005). Healthcare organizations currently implementing and integrating Artificial Intelligence into their operational processes fall perfectly into this category of high-dynamism contexts.
For the identification of the facilities, purposive sampling (Patton, 2002) was used. This technique allowed for the selection of healthcare facilities that could offer useful and significant information for the purposes of the proposed research question. In this way, the intrinsic nature of the phenomenon under investigation could be best explored, maximizing the relevance of the data collected.

The Purposive Sampling followed a precise methodological protocol. Initially, a detailed and complete analysis of the entire national territory was conducted, leading to the identification of all healthcare organizations that had already implemented, integrated, and made AI technology operational in their routines. Subsequently, the sampling strategy aimed to explore hospital realities belonging to different medical fields and, consequently, clinical specialties. This diversification was essential as it allowed for the acquisition of information and insights related to diverse experiences. Through this sampling process, a total of ten hospital organizations distributed across the national territory were selected. The primary data necessary for the study were collected through the administration of in-depth interviews. This methodological choice was dictated by the need to better understand the relational and operational dynamics, often implicit, present in real clinical settings. The in-depth interviews also had the merit of capturing the expectations, concerns, and subjective perceptions of the interviewees regarding Artificial Intelligence. The set of questions presented to the participants, previously validated in the literature, was specially created to be adapted to a flexible protocol. In this way, flexibility allowed the same set of questions to be administered to all interviewees, even though they belonged to different medical fields. The interviews were primarily conducted remotely, utilizing the Google Meet platform. Only one interview was conducted in person. In both cases, however, the temporal duration of each interview was consistently estimated to be between 40 and 60 minutes.

To establish a solid and coherent relationship between the research subject, the chosen methods, and the reference theory, an abductive methodology was applied, based on the systematic combination of empirical data (Dubois & Gadde, 2002).
All data collected from the in-depth interviews were subsequently codified and made analyzable through their manual and faithful transcription. Finally, the systematic analysis of the data

followed two main phases. The first focused on the internal and in-depth analysis of the case and allowed for detailed coding.
The second phase focused on the cross-case analysis and is what allowed for the detection of analogies and differences among the diverse experiences (Lindgreen et al., 2021) of Artificial Intelligence implementation.

5. Expected Results

The proposed empirical study aims to fill the critical gap identified in the literature, which recognizes a lack of analysis regarding the post-implementation phase of Artificial Intelligence within healthcare contexts. It is hoped that the results obtained will offer the possibility to concretely examine how healthcare organizations, involved in the disruptive digital innovation, are effectively changing and evolving. For this reason, the results aim to analyze how they are reconfiguring their internal processes so that the new technology can be adopted in an effective, safe, responsible, and sustainable way in healthcare. Furthermore, significant contributions to literature are expected, particularly concerning the human-machine relationship and collaboration. By investigating how healthcare professionals interact daily with AI systems and machines in real clinical contexts, the Multiple Case Study will allow for a deeper understanding of how different types of intelligence, human and artificial, can actively collaborate, creating a unique and innovative synergy with the potential to give rise to new and efficient organizational models.

In this way, it will be possible to explore how human professional intelligence is evolving alongside technological innovations, contributing to an evolution of human capital in the healthcare sector.
It is also hoped to identify a set of best practices that have proven effective in maximizing operational efficiency when Artificial Intelligence has been integrated into clinical routines.

Finally, the study seeks to offer valuable insights to policymakers that can help them draft useful guidelines to be provided to clinicians, accompanying and guiding the integration of the new technology into the healthcare landscape, thereby closing the gap identified by Sendak et al. (2020) and Morales et al. (2021).

6. Limitations and Future Research

Although this study represents an empirical analysis conducted in real clinical contexts, it recognizes important limitations that open new research perspectives.
Firstly, the results are recognized to have poor generalizability as they are limited to the Italian territory. In this regard, further comparative studies could be conducted in other contexts to compare the results obtained.

A further limitation concerns the profession of the interviewees: the in-depth interviews were administered only to physicians. Other professional figures involved in the transformative process induced by Artificial Intelligence, such as nurses, managers, and various stakeholders, were not examined. Future research could integrate the perceptions and perspectives of these figures, thereby contributing to an even more detailed exploration of the multidimensional complexity of the phenomenon under examination. To gain a more complete understanding of the phenomenon, integrating the patients' opinion could be considered. Finally, the proposed analysis represents the foundation for proposing longitudinal studies that track the evolution of organizational changes proving effective in managing the shifts introduced by Artificial Intelligence.

Keywords: Artificial intelligence in Healthcare; organizational transformation; collaborative intelligence

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Benessere e Accountability: Determinanti della Disclosure sull'SDG 3 nei PIAO Ospedalieri

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1. Background

Negli ultimi anni, il concetto di sviluppo sostenibile ha assunto un ruolo centrale nel dibattito scientifico, economico e istituzionale, affermandosi come paradigma imprescindibile per la trasformazione dei modelli di governance e dei sistemi produttivi a livello globale (Marrone *et al.*, 2024b). In tale prospettiva, la crescente pressione esercitata dalle sfide ambientali, dall'ampliamento delle disuguaglianze sociali, dalle ricorrenti crisi sanitarie e dai segnali di insostenibilità economica ha rafforzato la domanda di istituti capaci di generare valore pubblico, promuovere resilienza sistemica e favorire modelli inclusivi ed equi (Zampone *et al.*, 2024). Tali istituzioni, attraverso la propria capacità regolativa, allocativa e di coordinamento, risultano determinanti nel contribuire al beneficio comune dell'intero sistema Paese, orientando le politiche e gli interventi verso traiettorie di sviluppo coerenti con gli obiettivi della sostenibilità (Esposito et al., 2024; Marrone et al., 2024b).

In risposta a tali istanze, l'Agenda 2030 delle Nazioni Unite, adottata nel 2015, ha delineato 17 Obiettivi di Sviluppo Sostenibile (Sustainable Development Goals, SDGs) e 169 target, configurandosi come un framework condiviso volto a orientare le politiche pubbliche e private verso uno sviluppo sostenibile ed equilibrato e rappresentando, al contempo, un rilevante punto di svolta nell'ecosistema globale (Ricciardelli *et al.*, 2018; Mukhi & Quental, 2019; Pizzi *et al.*, 2020; Zampone *et al.*, 2024).

Tuttavia, il conseguimento degli SDGs richiede il coinvolgimento sinergico di una pluralità di attori, tra cui imprese, enti pubblici e organizzazioni non governative, il cui contributo risulta imprescindibile per l'attuazione dell'Agenda (Bebbington & Unerman, 2018). Sebbene le imprese private, in particolare, siano state riconosciute per la loro capacità di generare innovazione, mobilitare risorse e produrre impatti su larga scala (Zampone et al., 2024; Pontrelli et al., 2025), si sta progressivamente affermando il paradigma secondo cui il settore pubblico riveste un ruolo altrettanto strategico, soprattutto in ambiti ad elevata rilevanza sociale quali la sanità, l'istruzione e la sicurezza pubblica (Erin et al., 2024). In tali contesti, la capacità delle amministrazioni pubbliche di rendicontare in modo trasparente e sistemico i propri impatti sociali, ambientali ed economici risulta determinante per l'efficacia dell'azione pubblica (Monfardini et al., 2013; Fusco & Ricci, 2019).

Nel contesto italiano, il Servizio Sanitario Nazionale (SSN) rappresenta l'infrastruttura centrale per l'attuazione dell'SDG3"Assicurare la salute e il benessere per tutti e per tutte le età", assicurando servizi universalistici, gratuiti e orientati all'equità (Pizzi et al., 2020). Con un finanziamento annuo di circa 140 miliardi di euro, pari al 75 % della spesa pubblica destinata ai servizi essenziali (Commissione Europea, 2016; ISTAT, 2017), il SSN si configura come un

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pilastro imprescindibile del sistema di welfare nazionale; i suoi risultati, tra cui la riduzione della mortalità, degli incidenti e dei parti cesarei, hanno contribuito al parziale raggiungimento dei target dell'SDG3 (ASviS, 2018).

Nonostante ciò, permangono criticità strutturali di rilievo: disuguaglianze geografiche e sociali nell'accesso alle prestazioni, lunghe liste d'attesa, disparità nella spesa pro capite e livelli di trasparenza ancora inadeguati (Berta et al., 2016). Tale contesto solleva, inoltre, la questione del ruolo delle aziende sanitarie pubbliche, chiamate a operare in scenari istituzionali complessi e a perseguire una missione orientata alla creazione di valore pubblico, promuovendo salute collettiva e inclusione sociale in un'ottica di beneficio comune (Habersam & Piber, 2003; Carlucci & Schiuma, 2012; Mazzotta, 2018; Nicolò et al., 2023). In questo quadro, l'integrazione tra performance sanitaria e misurazione dell'impatto emerge come un fattore abilitante per rafforzare il contributo del settore allo sviluppo sostenibile e, dunque, alla promozione del bene comune, generando fiducia e legittimità attraverso pratiche di disclosure evidence-based (Gravili et al., 2021; Raimo et al., 2023). Tuttavia, il livello di accountability di tali istituti, resta insufficiente: molte aziende adottano modelli di rendicontazione formali, disomogenei e sostanzialmente superficiali (Pizzi et al., 2020; Garzoni et al., 2023; Marrone et al., 2024a), limitando l'interazione ai soli stakeholder interni e determinando un marcato deficit di trasparenza verso la cittadinanza (Farneti & Guthrie, 2009).

In risposta a tali criticità, la Legge n. 113/2021 ha introdotto il Piano Integrato di Attività e Organizzazione (PIAO), concepito come strumento di pianificazione e controllo volto a razionalizzare e integrare gli assetti gestionali delle pubbliche amministrazioni. In tale ottica, il PIAO si propone esplicitamente di favorire una governance trasparente, partecipativa e orientata agli stakeholder, richiamando in modo chiaro i riferimenti strategici dell'Agenda 2030 (De Nicola & Fratini, 2024). Oltre a costituire un meccanismo di razionalizzazione amministrativa, il PIAO può essere interpretato come una vera e propria innovazione di governance, nella misura in cui accorpa in un unico documento funzioni di pianificazione strategica, misurazione della performance e rendicontazione, superando la frammentazione che ha tradizionalmente caratterizzato gli strumenti di programmazione del settore pubblico. In confronto a dispositivi quali i piani della performance o i report sociali, esso si distingue infatti per la capacità di incorporare obiettivi di sostenibilità e accountability all'interno di una logica sistemica e trasversale, rafforzando il coordinamento tra strategia, organizzazione e disclosure. Nel contesto sanitario, tale impostazione assume una rilevanza particolarmente significativa, poiché il PIAO offre l'opportunità di formalizzare in modo sistematico gli impatti organizzativi e sociali delle aziende sanitarie pubbliche, contribuendo a migliorare la rendicontazione del loro apporto al conseguimento dell'SDG 3. In questo senso, l'adozione di indicatori dedicati(e.g. la qualità dei servizi erogati, i livelli di innovazione digitale, il grado di soddisfazione dell'utenza e la sostenibilità economico-finanziaria degli interventi) non solo rafforza l'allineamento con gli Obiettivi di Sviluppo Sostenibile, ma consente anche di colmare le lacune di trasparenza e accountability finora riscontrate, promuovendo un dialogo più strutturato e significativo con l'insieme degli stakeholder. In tale prospettiva, il PIAO non si limita a soddisfare obblighi formali di pianificazione, ma assume il ruolo di vera e propria infrastruttura informativa a supporto dei processi di accountability pubblica, contribuendo alla costruzione di legittimità istituzionale e al consolidamento di relazioni di fiducia con gli stakeholder.

Nonostante la crescente centralità attribuita alla sostenibilità e al ruolo strategico, in particolare nel contesto italiano, degli ospedali nel conseguimento degli SDG dell'Agenda 2030, la riflessione accademica sulle aziende sanitarie pubbliche resta parzialmente esplorata (Bebbington & Unerman, 2018; Buhmann *et al.*, 2019; Pineda Escobar, 2019), con scarsa attenzione alla disclosure di sostenibilità in ambito ospedaliero e un'assenza quasi totale di indagini dedicate al PIAO.

Tra i contributi esistenti, Monfardini *et al.* (2013) evidenziano in un caso di studio italiano l'uso simbolico del bilancio sociale, finalizzato più alla legittimazione che all'informazione sui

risultati; Marasca *et al.* (2020) sottolineano, nello studio sul bilancio integrato di alcune strutture, l'attenzione al valore per il paziente ma anche l'insufficiente capacità di soddisfare i bisogni informativi della cittadinanza. Bonollo (2015) rileva che i bilanci sociali ospedalieri tendono a enfatizzare quantità e tipologia dei servizi erogati, trascurando l'engagement degli stakeholder e la coerenza tra obiettivi e performance, mentre Pizzi *et al.* (2020) ne denunciano la scarsa diffusione e l'assenza di standardizzazione.

Estendendo lo sguardo all'estero, Andrades Peña *et al.* (2020) attribuiscono la variabilità nella quantità di informazioni di sostenibilità a fattori interni (dimensione organizzativa) ed esterni (accesso a Internet, ideologia politica locale, posizionamento nei ranking di trasparenza); Andrades *et al.* (2021) identificano nella ricerca di legittimazione la motivazione principale per la comunicazione online delle iniziative sostenibili. Infine, Garzoni *et al.* (2023) mettono in luce, in un campione di ospedali mondiali, come dimensione, natura pubblica e status universitario favoriscano livelli più elevati di disclosure, nonostante la carenza di pressioni regolatorie.

Nel complesso, la letteratura restituisce un quadro eterogeneo e ancora poco maturo: la disclosure di sostenibilità nel settore ospedaliero è caratterizzata da una debole cultura manageriale, dall'assenza di standard condivisi e da un approccio volontario e simbolico. Nonostante il potenziale contributo degli ospedali al raggiungimento dell'SDG3, nessuno studio ha finora esaminato in modo sistematico i contenuti dei PIAO nel contesto sanitario italiano né indagato le determinanti della disclosure riferita all'SDG3. Tale vuoto rappresenta un'importante lacuna di conoscenza, soprattutto in un'epoca in cui la sanità pubblica è chiamata a misurare e rendicontare in modo continuo il proprio impatto.

Alla luce di questo gap, il presente studio si propone di analizzare la disclosure di sostenibilità relativa all'SDG3 all'interno dei PIAO nel contesto ospedaliero, con due obiettivi principali: valutare se e in che misura gli ospedali rendicontano il loro contributo alla promozione della salute e del benessere collettivo, e identificare le determinanti che ne influenzano la comunicazione.

A supporto dell'analisi si adotta la stakeholder theory (Freeman, 1984), un approccio teorico ampiamente consolidato che interpreta l'organizzazione come un sistema aperto e relazionale, in cui il successo e la sopravvivenza dipendono dalla capacità di rispondere alle esigenze e alle aspettative di molteplici portatori di interesse. Secondo Donaldson e Preston (1995), tale prospettiva possiede una triplice valenza descrittiva in quanto riflette la complessità delle relazioni organizzative, normativa poiché riconosce il valore intrinseco di tutti gli stakeholder, e strumentale in quanto legittima l'adozione di pratiche di gestione e comunicazione orientate all'inclusione e alla fiducia. Nel contesto ospedaliero, tale impostazione risulta particolarmente adeguata per almeno tre motivi. In primo luogo, gli ospedali operano in ambienti ad alta intensità relazionale, in cui si intrecciano aspettative e pressioni provenienti da pazienti, famiglie, comunità locali, enti regolatori, professionisti e cittadini. In secondo luogo, la disclosure di sostenibilità, specialmente quando volontaria e priva di standard vincolanti, assume la forma di un meccanismo di legittimazione sociale, attraverso il quale l'organizzazione comunica la propria adesione a valori pubblici condivisi come l'equità, la trasparenza e il benessere collettivo. In terzo luogo, le pressioni istituzionali, reputazionali e relazionali possono condizionare in modo significativo la quantità e la qualità delle informazioni divulgate, richiedendo un quadro interpretativo capace di integrare dinamiche ambientali e scelte gestionali.

In questo scenario, la stakeholder theory consente di leggere la disclosure di sostenibilità non solo come strumento informativo, ma come pratica sociale e simbolica, in cui gli ospedali si posizionano rispetto agli stakeholder, costruendo relazioni di fiducia e rafforzando la propria identità istituzionale. L'integrazione dell'SDG3 all'interno dei PIAO si configura dunque come un atto di accountability orientato al valore pubblico, che supera la logica dell'adempimento formale per abbracciare un approccio partecipativo, relazionale e orientato al lungo termine.

L'adozione della stakeholder theory permette infine di interpretare le pratiche di disclosure nei PIAO alla luce di una pluralità di determinanti, offrendo un framework coerente per

comprendere le ragioni che spingono gli ospedali a comunicare, in modo più o meno esteso, il proprio contributo alla sostenibilità e al benessere collettivo.

Sulla base di tale impostazione teorica, vengono formulate quattro ipotesi di ricerca che riflettono variabili organizzative ritenute influenti nella letteratura sulla disclosure volontaria. In particolare, si assume che dimensioni quali la dimensione, la collocazione geografica, la complessità organizzativa e la seniority dell'organizzazione possano condizionare l'estensione e la qualità della disclosure, anche nel settore sanitario. Nel dettaglio:

H1: La grandezza dell'ospedale impatta positivamente sulla disclosure relativa all'SDG3 all'interno dei PIAO ospedalieri.

H2: La collocazione territoriale dell'ospedale influisce positivamente sulla disclosure relativa all'SDG3 all'interno dei PIAO ospedalieri.

H3: La complessità organizzativa dell'ospedale ha un impatto positivo sulla disclosure relativa all'SDG3 all'interno dei PIAO ospedalieri.

H4: La seniority dell'ospedale ha un impatto negativo sulla disclosure relativa all'SDG3 all'interno dei PIAO ospedalieri.

2. Metodologia

Per testare le quattro ipotesi appena delineate, lo studio adotta un modello di regressione lineare di tipo cross-sectional, finalizzato a esplorare le determinanti della disclosure di sostenibilità relativa all'SDG3 nei PIAO nel contesto ospedaliero italiano. Tutti i dati utilizzati riferiscono all'anno 2024.

Il campione oggetto di analisi è costituito da 115 ospedali italiani, individuati sulla base della classifica dei migliori ospedali d'Italia pubblicata da Newsweek nel 2024. La graduatoria include sia strutture ospedaliere generali sia specialistiche, selezionate in funzione di criteri quali le raccomandazioni dei professionisti sanitari, l'esperienza dei pazienti e specifici indicatori clinici. Tale scelta consente di selezionare organizzazioni caratterizzate da un'elevata visibilità istituzionale e da un adeguato livello di comparabilità informativa, in quanto fondata su criteri standardizzati e replicabili. Dal dataset originario, composto da 131 ospedali generali e 9 specializzati, sono stati esclusi tutti gli ospedali privati in quanto non soggetti all'obbligo normativo di redazione e pubblicazione del PIAO, documento oggetto dell'indagine. Il campione finale comprende, pertanto, unicamente ospedali pubblici, per un totale di 115 unità di analisi.

Il modello impiega otto variabili in totale: una dipendente, quattro indipendenti e tre di controllo. La variabile dipendente *SDG3_DISC* misura il livello di disclosure relativa all'SDG3 nei documenti PIAO analizzati ed è costruita come media aritmetica di due indicatori complementari. Il primo, *SDG3_QNT*, cattura la copertura quantitativa dei 13 target dell'SDG3 attribuendo un punteggio di 1 per ogni target menzionato e 0 in caso contrario, e calcolando il rapporto tra i target trattati e il totale previsto. Il secondo, *SDG3_QL*, si basa su un sistema di scoring da 0 a 4 per ciascun target: 0 indica l'assenza di contenuti, 1 una menzione vaga, 2 un riferimento generico, 3 una trattazione qualitativa dettagliata e 4 un'informazione supportata da dati quantitativi. L'indice composito *SDG3_DISC, sviluppato a partire dal contributo di Pizzi et al. (2020), consente di cogliere in modo integrato sia l'ampiezza sia la profondità della rendicontazione relativa ai temi della salute pubblica.*

Per quanto riguarda le variabili esplicative, sono considerate quattro variabili indipendenti che riflettono caratteristiche strutturali e organizzative rilevanti. La prima è la grandezza dell'ospedale (SIZE), misurata attraverso il logaritmo naturale del numero di posti letto (Peña et al., 2020; Nicolò et al., 2023; Garzoni et al., 2023). La seconda è la collocazione geografica (GEO), operazionalizzata come variabile dicotomica che assume valore 1 per le strutture situate nel Nord Italia e 0 per quelle nel Centro e Sud (Pizzi et al., 2020). La terza è la complessità organizzativa (COMP), misurata in base al numero di prestazioni effettivamente erogate, calcolate sulla base di 58 indicatori clinici selezionati all'interno del Programma Nazionale Esiti

2024. Sono state escluse le prestazioni con volumi annui inferiori a dieci, considerate non rappresentative, e rimosse eventuali ridondanze tra indicatori. Infine, la seniority dell'ospedale (AGE) viene definita come la differenza tra il 2024, anno di analisi, e l'anno di istituzione della struttura (Garzoni *et al*., 2023).

Al fine di controllare possibili effetti distorsivi, sono state incluse tre variabili di controllo. La trasparenza (TRASP) è definita come la disponibilità del PIAO sul sito istituzionale dell'ente, rilevata tramite una variabile dicotomica che assume valore 1 se il documento è pubblicato e 0 in caso contrario. La visibilità online (ONLV) è misurata mediante il logaritmo naturale del numero di risultati restituiti dal motore di ricerca Google alla digitazione del nome dell'ospedale, utilizzata come proxy dell'esposizione informativa (Garzoni et al., 2023; Raimo et al., 2023). La terza variabile di controllo è la natura universitaria della struttura (UNIV), che assume valore 1 qualora l'ospedale risulti integrato con un ateneo, e 0 in caso contrario.

Il modello econometrico adottato è specificato come segue:

$$SDG3_DISC = \beta0 + \beta1\ SIZE + \beta2\ GEO + \beta3\ COMP + \beta4\ AGE + \beta5\ TRASP + \beta6\ ONLV + \beta7\ UNIV + \varepsilon$$

3. Risultati preliminari

I risultati preliminari sono riassunti nella tabella 1.

Variabile	Coefficiente	Errore Standard	p-value	Sign.
Cons	0.744	6.263	0.906	
SIZE	1.831	0.989	0.067	*
GEO	3.28	0.967	0.001	***
COMP	-0.07	0.054	0.199	-
AGE	0.04	0.024	0.106	-
TRASP	2.472	1.22	0.045	**
ONLV	-0.182	0.258	0.483	-
UNIV	1.972	1.104	0.077	*
Note: n = 115 R^2 adj = 0.2100 *** Significatività a livello 1%; ** Significatività a livello 5%; * Significatività a livello 10%				

Tabella 1. Risultati preliminari

I risultati preliminari dell'analisi empirica mostrano un valore di R^2 aggiustato pari a 0.2100, indicando che il modello spiega circa il 21% della varianza nella variabile dipendente (SDG3_DISC). Sebbene il valore non sia particolarmente elevato, esso risulta coerente con quanto osservato in altri studi sulla disclosure di sostenibilità nel settore sanitario, dove la varietà dei comportamenti informativi è spesso legata a fattori non osservabili o istituzionali.

I risultati preliminari supportano l'ipotesi H1. La dimensione dell'ospedale (SIZE) è positivamente e significativamente associata al livello di disclosure riferito all'SDG3 (p = 0.067). Le strutture più grandi sembrano più attrezzate, sia in termini di risorse umane che organizzative, nel predisporre documenti più articolati e completi. Ciò è coerente con precedenti evidenze empiriche che collegano le dimensioni organizzative a una maggiore propensione alla rendicontazione (Peña et al., 2020; Garzoni et al., 2023; Nicolò et al., 2023), anche in ragione dell'esposizione reputazionale a cui sono soggette le grandi strutture ospedaliere.

I risultati preliminari supportano l'ipotesi H2. La collocazione territoriale dell'ospedale (GEO) mostra una relazione positiva e statisticamente significativa con la disclosure (p = 0.001), evidenziando come gli ospedali situati nel Nord Italia tendono a fornire livelli informativi

superiori rispetto a quelli localizzati nel Centro e Sud del Paese. Tale risultato è coerente con la letteratura sulle disuguaglianze territoriali in ambito sanitario (Pizzi et al., 2020) e conferma che il divario Nord-Sud si riflette anche nella qualità e nella quantità della rendicontazione non finanziaria nei PIAO.

I risultati preliminari non supportano l'ipotesi H3. La complessità organizzativa (COMP), misurata sulla base del numero di prestazioni cliniche erogate, presenta un coefficiente negativo e non significativo ($p = 0.199$). Contrariamente alle attese, livelli più elevati di complessità non risultano associati a una maggiore propensione alla disclosure. È plausibile che le organizzazioni caratterizzate da assetti più articolati tendano a concentrare le proprie risorse sugli aspetti operativi e assistenziali, riservando un'attenzione limitata alla rendicontazione strategica o incontrando difficoltà nel ricondurla in modo sistematico all'interno dei documenti ufficiali. In tale prospettiva, l'aumento della complessità gestionale può determinare forme di sovraccarico amministrativo, inducendo il management a privilegiare l'erogazione dei servizi rispetto alle attività di reporting strategico. Inoltre, in contesti fortemente regolati, come quello della sanità pubblica, le pratiche di disclosure possono essere prevalentemente guidate da logiche di isomorfismo istituzionale, riducendo l'incidenza delle differenze organizzative interne.

I risultati preliminari non supportano l'ipotesi H4. La seniority dell'ospedale (AGE) mostra un'associazione positiva ma non significativa con la disclosure ($p = 0.106$). Questo suggerisce che la storicità della struttura, intesa come seniority organizzativa, non rappresenta un fattore discriminante per la qualità o quantità delle informazioni rendicontate nei PIAO. È plausibile che la presenza di un quadro normativo fortemente uniformante, unitamente alle recenti riforme del sistema sanitario, abbia attenuato l'incidenza del fattore storico. In una prospettiva riconducibile alla stakeholder theory, la seniority organizzativa può infatti generare effetti ambivalenti: da un lato, la sedimentazione di routine operative e lo sviluppo di competenze amministrative; dall'altro, fenomeni di inerzia organizzativa e una ridotta propensione all'innovazione informativa. L'assenza di evidenze statisticamente significative suggerisce, pertanto, che l'introduzione del PIAO possa aver limitato, almeno nel breve periodo, la capacità dell'età dell'organizzazione di discriminare i comportamenti di disclosure.

4. Conclusioni preliminari e future fasi di ricerca

Questo studio preliminare intende offrire importanti spunti per il rafforzamento del dibattito accademico e istituzionale sul ruolo degli ospedali nel promuovere accountability e sostenibilità attraverso strumenti di pianificazione integrata come il PIAO.

In particolare, i risultati contribuiscono a consolidare il valore esplicativo della stakeholder theory nell'interpretare le dinamiche di disclosure volontaria nel settore sanitario, evidenziando come la trasparenza nei confronti degli stakeholder non sia solo il risultato di obblighi normativi, ma anche di condizioni organizzative e relazionali specifiche. Inoltre, il presente studio apporta un contributo teorico originale introducendo i PIAO come nuovo contesto di analisi per la disclosure di sostenibilità e individuando le determinanti organizzative e istituzionali che ne influenzano la qualità informativa, ampliando così il modello esplicativo della stakeholder theory nel settore sanitario pubblico.

Dal punto di vista operativo e manageriale, le evidenze empiriche emerse indicano la necessità di potenziare la capacità delle strutture ospedaliere di comunicare in modo sistemico e coerente il proprio contributo alla salute collettiva. La marcata eterogeneità riscontrata nei livelli di disclosure segnala l'esistenza di ampi margini di miglioramento, sia in termini di contenuto informativo sia con riferimento alla qualità del reporting e alla standardizzazione dei formati adottati. In tale prospettiva, i risultati offrono indicazioni rilevanti per le amministrazioni centrali e regionali, chiamate a sostenere le aziende sanitarie nel rafforzamento dei meccanismi di accountability, anche attraverso la definizione di linee guida operative e l'implementazione di sistemi di monitoraggio condivisi.

Sul piano delle politiche pubbliche, le evidenze suggeriscono che il PIAO possa essere ulteriormente valorizzato quale strumento di armonizzazione e coordinamento delle pratiche di disclosure nel settore sanitario. In particolare, le autorità nazionali e regionali potrebbero individuare un set minimo di indicatori di disclosure, coerenti con il PIAO e riferiti all'SDG 3, al fine di promuovere comparabilità informativa e livelli minimi di rendicontazione. Tali indicatori potrebbero, inoltre, supportare esercizi di benchmarking inter-aziendale, favorendo processi di apprendimento istituzionale e la diffusione di buone pratiche in materia di accountability.

Lo studio presenta tuttavia alcune limitazioni che suggeriscono una lettura prudente dei risultati. In particolare, la selezione del campione, limitata agli ospedali pubblici inclusi nella classifica Newsweek 2024, potrebbe aver determinato una sovrarappresentazione di strutture caratterizzate da maggiore visibilità e performance, con possibili implicazioni in termini di generalizzabilità dei risultati. Al contempo, alcuni criteri alla base del ranking, quali la reputazione professionale e l'esperienza del paziente, potrebbero risultare indirettamente associati a una maggiore attenzione verso la trasparenza e la qualità della disclosure. Tale circostanza potrebbe aver contribuito a includere nel campione ospedali maggiormente esposti a pressioni reputazionali e orientate agli stakeholder, influenzando i livelli di disclosure osservati.

Inoltre, l'adozione di un disegno cross-sectional limita la possibilità di cogliere evoluzioni dinamiche nella disclosure e nelle pratiche gestionali. Anche la scelta delle variabili indipendenti, per quanto fondata su letteratura consolidata, non esaurisce la complessità dei fattori potenzialmente rilevanti, trascurando dimensioni quali la cultura organizzativa, la pressione istituzionale o la leadership.

Sviluppi futuri potrebbero considerare l'estensione del campione a strutture di diversa natura e collocazione istituzionale, l'adozione di approcci longitudinali in grado di cogliere le variazioni nel tempo, nonché l'integrazione di metodi qualitativi finalizzati a esplorare in profondità le logiche decisionali sottostanti alle pratiche di disclosure. Tali prospettive consentirebbero di affinare ulteriormente la comprensione dei meccanismi che regolano la trasparenza e la responsabilità nel contesto ospedaliero, contribuendo allo sviluppo di modelli di governance pubblica più sostenibili, inclusivi e orientati alla creazione di valore. Inoltre, ricerche future potrebbero esaminare ulteriori e/o differenti strumenti di disclosure, quali, ad esempio, i bilanci di sostenibilità, nonché valutare la stabilità dei risultati attraverso test di robustezza e specificazioni alternative del modello. In tale ambito, l'introduzione di proxy alternative della complessità organizzativa e della localizzazione territoriale potrebbe offrire evidenze aggiuntive sulla solidità delle relazioni osservate.

Keywords: SDG 3; accountability ospedali pubblici; PIAO; stakeholder theory; rendicontazione; sostenibilità

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Progettazione di un modello di riferimento per l'implementazione di soluzioni digitali innovative e sostenibili nell'attuale sistema della Salute

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1. Introduzione, obiettivi e sviluppo concettuale del lavoro

Il presente extended abstract descrive l'attività in progress di un gruppo di studio e di ricerca multidisciplinare impegnato su uno specifico Work Package (WP) di un progetto di ricerca nazionale dal titolo "Digital Health Solutions in Community Medicine" (DHEAL-com), Ministero della Salute - Piano Nazionale Complementare (PNC - "Ecosistema Innovativo della Salute"), nel quadro del Piano Nazionale di Ripresa e Resilienza (PNRR).

DHEAL-com è un progetto multidisciplinare che coinvolge diverse Istituzioni tra le quali l'IRCCS INRCA di Ancona, l'Università degli Studi di Napoli Federico II, l'Università di Pavia, e l'Università di Genova, quali Spoke di I livello; l'Università degli Studi di Salerno, la Fondazione Bruno Kessler di Trento e l'Azienda Ospedaliera Universitaria Meyer di Firenze, quali Spoke di II livello.

Obiettivo generale del progetto DHEAL-COM è la costituzione di un Life Science Hub a livello nazionale (DHEAL-COM HUB), quale modello di riferimento per lo sviluppo e il rafforzamento di tecnologie digitali per la medicina di comunità. Obiettivo specifico è il miglioramento della gestione dei servizi sociosanitari e dell'assistenza e monitoraggio degli utenti/pazienti lungo il loro ciclo di vita (life course), sviluppando attività di prevenzione e cura attraverso l'uso di soluzioni digitali innovative e sostenibili in un sistema Salute integrato.

Pertanto, notevole rilevanza è data alla centralità degli utenti/pazienti, dei loro bisogni, dei loro caregiver e dei nuovi professionisti ed attori del settore, con attenzione ai territori e alle comunità, da valorizzare secondo le specificità e le problematiche locali.

Il progetto DHEAL-COM, dunque, attraverso otto Work Packages (WPs), (Figura1), mira a generare innovazione per l'introduzione e l'uso di nuove tecnologie digitali nell'ambito del sistema sociosanitario.

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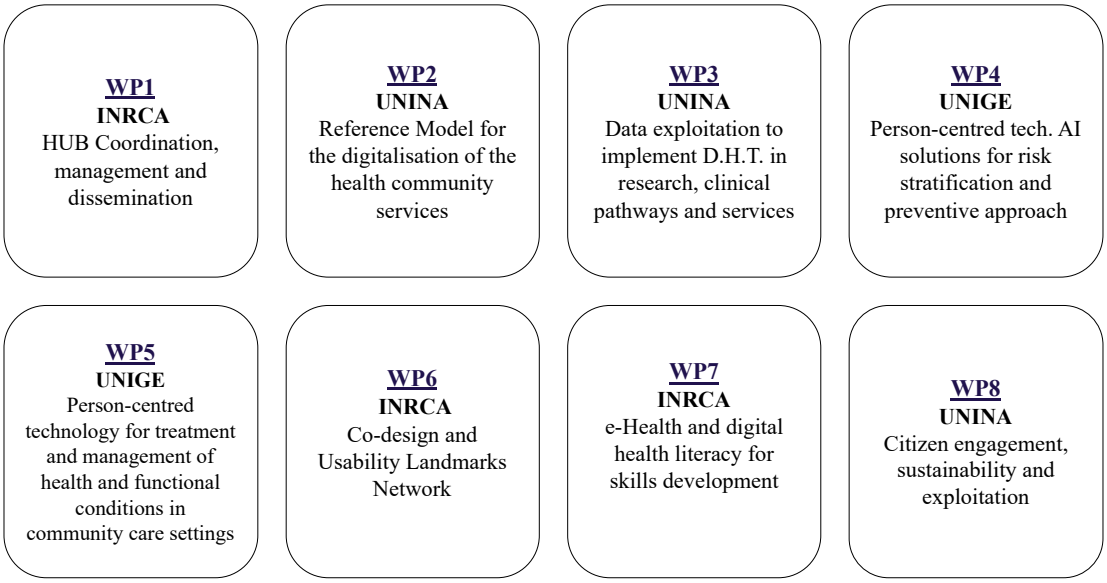


Figura 1. Dheal-com Work Packages

Il gruppo di ricerca è impegnato nel Work Package 8 ed è focalizzato su un task specifico (Task 8.3).

Il WP8 "Citizen engagement, sustainability and exploitation" è un WP trasversale, coordinato dall'Università di Napoli Federico II, i cui obiettivi principali sono la creazione di un Open Platform DHEAL-COM, volta alla condivisione di dati, informazioni, conoscenze, e di un Living Lab (LL) di progetto nella digital health per garantire continuità delle cure.

Inoltre, il WP mira a implementare modelli gestionali e di governance, adatti a specifiche innovazioni di servizio, tenendo conto degli elementi socio-culturali della popolazione target, per personalizzare l'adattamento e l'adozione delle soluzioni digitali per l'assistenza e i servizi alla comunità. La disponibilità della piattaforma aperta e del Living Lab sosterrà l'uso delle tecnologie digitali e la digitalizzazione dei servizi sanitari di comunità.

Il WP8 mira a creare una rete di servizi di assistenza di prossimità che collaborino con l'Hub nazionale per testare soluzioni digitali innovative sviluppate nei servizi integrati di comunità. La Task 8.3 del WP8: "Economic viability, reimbursement models and sustainability" si occupa di progettare un modello di riferimento (organizzativo-gestionale) che tenga conto della ricerca epidemiologica sulla domanda e dei bisogni specifici della popolazione, per facilitare i processi di innovazione e digitalizzazione nei servizi socio- sanitari.

Inoltre, tra gli obiettivi progettuali rientra lo studio e l'individuazione di modelli di rimborso, applicabili e sostenibili, che garantiscano il mantenimento dei risultati della ricerca e promuovano politiche nazionali di innovazione, strategie di exploitation basate sulle buone pratiche emergenti. In tal modo, è garantita anche la continuità dei risultati del progetto e viene consentito alle politiche nazionali di promuovere e sostenere un ulteriore ampliamento.

La sostenibilità a lungo termine passerà da una strategia di ampliamento basata su buone pratiche emergenti che saranno testate attraverso casi di uso specifici, in contesti specifici. L'obiettivo della Task 8.3. è, infatti, sviluppare e validare modelli economico-gestionali di sostenibilità e di creazione di valore basati su evidenze empiriche, garantendo la fattibilità e la replicabilità delle soluzioni digitali in diversi contesti sanitari, regionali e nazionali.

Obiettivo è la creazione di un modello di implementazione dell'innovazione nei servizi sociosanitari utilizzando tecnologie digitali volte a progettare e riorganizzare i servizi creando

anche un'integrazione territorio-ospedale e coinvolgendo diversi professionisti e attori per migliorare la salute del cittadino e non solo del paziente.

Inoltre, il progetto con l'introduzione di tecnologie digitali innovative vuole migliorare la catena del valore, non solo l'outcome di salute, ma anche l'esperienza del paziente tenendo conto dei costi che la struttura deve sostenere per erogare la prestazione. Pertanto, il lavoro risponde alle seguenti domande di ricerca:

- RQ1: Qual è il valore creato dall'implementazione delle innovazioni e tecnologie digitali?
- RQ2: Quale modello integrato è necessario per implementare queste tecnologie?

Innovazione integrata significa creare valore in un servizio erogato, oppure in un processo, in ambito sanitario e sociosanitario per migliorare la salute dei cittadini in un'epoca di cambiamento demografico, di necessità di risolvere i temi della cronicità e fragilità e dell'invecchiamento della popolazione attraverso la trasformazione digitale.

2. Metodologia

Per rispondere alle domande di ricerca, il progetto, e in particolare il WP8, mira a sviluppare casi d'uso (use case) per il trattamento e la prevenzione di alcune patologie, in particolare quelle croniche, in un'ottica di creazione di valore, al fine di creare modelli che possano portare innovazione nei servizi. Obiettivo è individuare la migliore strategia per implementare un modello integrato che crei valore per tutti gli stakeholder coinvolti nel sistema (paziente, cittadino, caregiver, volontari, imprese, centri di ricerca e istituzioni, professionisti della salute).

Questo approccio, basato sugli use case, utilizza metodi misti radicati nella ricerca di management sanitario e di accounting. Viene utilizzata la metodologia Time-Driven Activity-Based Costing (TDABC) per analizzare e confrontare i percorsi di cura prima e dopo l'introduzione delle soluzioni digitali, lungo l'intero ciclo di cura.

Il framework analitico integra: - la mappatura dei processi assistenziali e dei patient journey; - l'identificazione degli attori coinvolti nell'erogazione dei servizi; - la misurazione del consumo di risorse e dei cost driver attraverso i confini organizzativi; - la valutazione dei costi evitati, degli effetti di coordinamento e delle riconfigurazioni organizzative abilitate dalle tecnologie digitali; - l'analisi comparativa dei modelli di rimborso per i servizi di sanità digitale, inclusi confronti internazionali con Paesi europei selezionati.

Questo approccio consente una comprensione articolata di come l'innovazione digitale interagisca con le strutture organizzative, i ruoli professionali e i meccanismi di governance, andando oltre le valutazioni puramente tecnologiche o cliniche.

L'analisi dei costi effettuata evidenzia quali sono i costi attuali di un processo di use case e quelli che si sviluppano con l'introduzione delle nuove soluzioni digitali. Il tutto ovviamente dopo aver mappato i processi e il patient journey, come indicato sopra. Di grande impatto è individuare i costi evitati, con l'uso delle soluzioni digitali innovative. Inoltre, verranno esplorati i modelli di rimborso delle prestazioni sanitarie digitali anche confrontandoli con strategie di rimborso adottate in altri Paesi Europei, per superare il sistema di rimborso dei DRG (ospedale centrico) e finanziare percorsi di cura digitali che coinvolgano i MMG, gli infermieri di famiglia e comunità e i sistemi di telemonitoraggio.

3. I Casi d'Uso

3.1. USE CASE 1: "Fabry disease"

Il primo caso d'uso si focalizza sulla malattia di Fabry (Fabry Disease - FD) che è una malattia genetica rara, cronica e multisistemica che fa parte del gruppo delle malattie da accumulo lisosomiale. La terapia utilizza un approccio combinato di trattamenti specifici per la malattia e cure di supporto.

La natura complessa della FD richiede un approccio basato sul lavoro di squadra che integri le competenze di nefrologi, cardiologi, neurologi, gastroenterologi, oftalmologi, dermatologi, psicologi e infermier,i per tutta la vita.

La FD è un esempio lampante delle sfide economiche ed organizzative nella gestione delle malattie rare, che rappresenta una piccola coorte complessiva di pazienti che necessita di cure intensive ed economicamente onerose, e per i quali i trattamenti farmacologici costituiscono il principale fattore di costo. I dati raccolti nell'ambito di questo studio (170 pazienti) mostrano che il costo medio annuo della sola terapia farmacologica è superiore a 177.000 euro per paziente, pari a oltre il 99% della spesa totale. Al contrario, l'intero percorso assistenziale organizzativo rappresenta solo lo 0,09%.

Il Servizio Sanitario Nazionale copre i costi elevati per conto dei pazienti tramite il Codice di Esenzione per le Malattie Rare; tuttavia, ciò non allevia la sfida poiché il numero di aziende che detengono brevetti su questi farmaci salvavita è relativamente limitato, e ciò è inversamente correlato al potere negoziale dei sistemi pubblici. Al di là della dimensione economica, l'organizzazione frammentata e inefficiente dell'assistenza sanitaria rappresenta un problema rilevante. I pazienti sono spesso costretti a gestire diversi appuntamenti con vari specialisti e anche le pratiche amministrative sono ancora prevalentemente cartacee; la mancanza di una cartella clinica elettronica unificata ostacola una comunicazione efficace e aumenta le possibilità di errori amministrativi o clinici. Inoltre, le disparità regionali sono evidenti: alcune aree forniscono terapie domiciliari supportate da servizi infermieristici privati, mentre in altre aree i pazienti sono costretti a recarsi regolarmente in ospedale per le infusioni.

Questo use case ha applicato la metodologia TDABC per mappare e quantificare il consumo di risorse e i costi associati al percorso di cura dei pazienti affetti da FD presso un'azienda ospedaliera universitaria. L'analisi ha riguardato l'intera coorte di 170 pazienti, con una distribuzione equa tra i sessi e una combinazione di tipi di terapia e complessità cliniche. I risultati sono presentati in quattro aree chiave: la distribuzione dei costi delle attività del percorso di cura, l'impatto della complessità dei pazienti, gli elevati costi farmaceutici e l'allocazione di risorse specifiche.

Si evidenzia che per le malattie rare e croniche che richiedono trattamenti costosi come la Fabry Disease, lo studio sposta il dibattito di policy da un'attenzione irrisolvibile sui prezzi dei farmaci a un programma attuabile di ottimizzazione del sistema di erogazione delle cure stesso (costi nascosti legati al processo amministrativo cartaceo e alla frammentazione del coordinamento) che migliori la continuità assistenziale.

3.2. USE CASE 2: Paziente anziano multimorbido

Per il secondo caso d'uso, che è in fase di analisi, verranno utilizzate le stesse metodologie del caso precedente.

Risulta però necessaria una fase di clusterizzazione dei pazienti, in quanto la multimorbidità è una condizione generica che si specifica poi nelle caratteristiche delle diverse patologie con le quali il paziente convive (Steell et al., 2025; Marengoni, A., Triolo, F., & Zucchelli, A., 2025.).

In questo contesto, quindi, i processi assistenziali attivati per la presa in carico sono necessariamente diversi. Da quello che emerge in questa prima fase, la generazione dei costi sposta il focus sugli effetti della necessaria multidisciplinarietà e sul coordinamento tra diversi attori (MMG, specialisti, assistenti sociali).

4. Risultati attesi

I risultati attesi rientrano nell'obiettivo più generale del progetto Dheal-com di utilizzare l'innovazione digitale per creare percorsi più connessi, efficienti ed efficaci, incentrati sul paziente.

Lo studio offre un contributo teorico e metodologico al management e all'organizzazione sanitaria integrando prospettive di innovazione multidisciplinare e integrata e metodi avanzati di costing e di rimborso all'interno di un quadro analitico strutturato.

Da un punto di vista pratico, fornisce ai decisori strumenti per valutare gli investimenti in sanità digitale non solo in termini di risparmi immediati, ma rispetto a dimensioni più ampie di valore, tra cui l'esperienza del paziente, il coordinamento professionale, la sostenibilità ambientale e la resilienza di lungo periodo del sistema.

In particolare, i risultati suggeriscono che il successo della trasformazione digitale in sanità dipende dalla capacità di ripensare i meccanismi di governance, rimborso e valutazione, riconoscendo i ruoli interconnessi degli attori nella creazione di valore.

La scelta metodologica dell'uso dell'analisi degli use case è orientata ad individuare una valida giustificazione economica per la trasformazione digitale nel sistema salute e a definire un modello per la riprogettazione organizzativo-gestionale necessaria nei processi di innovazione (Figura 2).

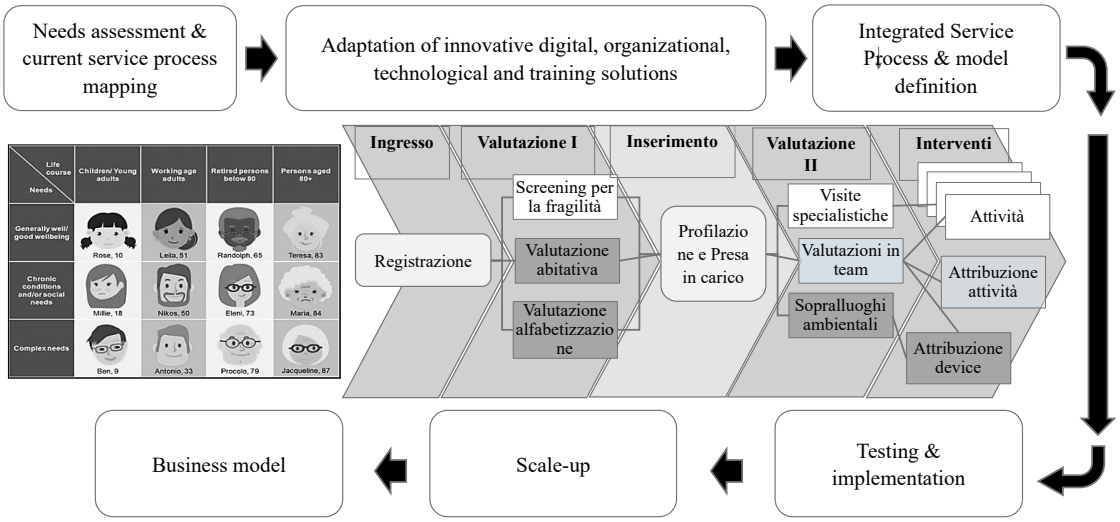


Figura 2. Il processo di innovazione che parte dai casi d'uso

Investire in piattaforme digitali integrate, modelli di riferimento standardizzati e percorsi di cura sviluppati in collaborazione con tutte le parti interessate è, quindi, una necessità.

L'efficienza non dovrebbe essere misurata in base ai risparmi diretti sui costi derivanti dal percorso di cura, ma in base al valore aggiunto ottenuto grazie a un migliore coordinamento, a un minor carico amministrativo, ad una migliore gestione e, soprattutto, ad una migliore qualità della vita (QoL) dei pazienti. Questo studio ipotizza, quindi, che il valore si realizzi attraverso l'ottimizzazione del percorso organizzativo, la componente variabile e ottimizzabile dell'assistenza, con il passaggio dell'endpoint primario dalla riduzione dei costi al miglioramento della qualità della vita dei pazienti.

5. Conclusioni

Riformulare l'assistenza sanitaria attraverso una prospettiva multidisciplinare ed integrata richiede di andare oltre le tradizionali strutture di potere e le logiche contabili. Questo studio dimostra che metodologie come il TDABC possono svolgere un ruolo fondamentale nel rendere visibili le dinamiche organizzative, gestionali ed economiche dell'innovazione digitale, sostenendo così sistemi sanitari più inclusivi, sostenibili e orientati al valore.

Ancorando i cambiamenti paradigmatici astratti all'analisi empirica, il contributo di questa fase del progetto risponde direttamente alle richieste contemporanee di ripensare il management e l'organizzazione della sanità in un'epoca di trasformazione digitale, urgenza ecologica e crescente complessità sociale.

In conclusione, emerge dalla prima fase di analisi, che un modello di implementazione delle innovazioni e delle tecnologie digitali debba prevedere l'uso fondamentale di metodologie di determinazione dei costi, come ad esempio il TDABC, per aumentare la precisione e l'adattamento delle soluzioni digitali disponibili nei contesti reali.

Si intende verificare in quale modo il modello debba essere adattabile al fine di creare uno schema di riferimento che possa fornire un set di soluzioni utilizzabili negli specifici setting d'innovazione.

Parole chiave: Digital health; medicina di comunità; ecosistemi d'innovazione; innovazione; sostenibilità economica; costi; sostenibilità sociale e ambientale

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Performance, Governance e Capitale Umano: Una Analisi Integrata della Sanità Calabrese

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1. Introduzione

Il Negli ultimi anni il Servizio Sanitario Nazionale (SSN) sta vivendo una fase di crescente tensione sistemica, nella quale la sostenibilità operativa dipende dalla capacità del sistema di trasformare risorse limitate in prestazioni accessibili, appropriate e tempestive. La dinamica del finanziamento pubblico incide direttamente sull'organizzazione dei servizi: la contrazione delle risorse disponibili si riflette sui tempi di attesa, sulla saturazione delle strutture ospedaliere, sulla riduzione dell'offerta e sulla continuità assistenziale, con effetti rilevanti sull'equità di accesso e sulla fiducia dei cittadini nelle istituzioni sanitarie.

L'interconnessione tra finanziamento, organizzazione e capacità produttiva del sistema è ampiamente documentata nella letteratura (Borgonovi,2002). Si evidenzia, infatti, come i sistemi sanitari pubblici richiedano un costante allineamento tra risorse, assetti organizzativi e bisogni collettivi, poiché la sanità rappresenta un settore ad alta rigidità strutturale, nel quale le variazioni di spesa producono effetti immediati sulla capacità di erogazione dei servizi. La performance delle aziende sanitarie dipende quindi dalla coerenza tra programmazione, dotazioni professionali, infrastrutture e modelli organizzativi (Lega, 2023). I dati di sistema forniscono una cornice empirica di forte evidenza, l'8° Rapporto sul Servizio Sanitario Nazionale, curato dalla Fondazione GIMBE e presentato l'8 ottobre 2025, riporta che negli ultimi tre anni (2022–2025) la sanità pubblica italiana ha subito una riduzione di risorse pari a circa 13,1 miliardi di euro. Nel medesimo periodo, il rapporto segnala che la rinuncia alle cure ha coinvolto circa una persona su dieci, e che circa 41,3 miliardi di spesa sanitaria sono stati sostenuti direttamente dalle famiglie, con un peso crescente delle uscite fuori dai percorsi di finanziamento pubblico.

Queste evidenze quantitativamente documentate collocano l'Italia in una posizione di disallineamento rispetto ai principali paesi OCSE: la spesa sanitaria pubblica, in rapporto al PIL, risulta inferiore alla media europea e ai livelli richiesti per mantenere la piena erogazione dei Livelli Essenziali di Assistenza (LEA).

Sul piano organizzativo, questo disomogeneità tra fabbisogni assistenziali e risorse disponibili produce una tensione crescente alla capacità produttiva del sistema. Le strutture sanitarie sono chiamate a garantire volumi di prestazioni elevati in presenza di dotazioni di personale e di tecnologie insufficienti, determinando un'intensificazione strutturale dei carichi di lavoro e una gestione ordinaria in condizioni di costante emergenza operativa.

Nella presente ricerca, l'interesse teorico riguarda le conseguenze professionali e organizzative che emergono quando il sistema sanitario opera in condizioni di disallineamento tra risorse disponibili, assetti organizzativi e bisogni collettivi (Borgonovi, 2002). In tali condizioni, la carenza di personale, la limitata disponibilità di tecnologie (Comite,2025), materiali e la

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difficoltà di garantire supporti organizzativi adeguati comprimono l'appropriatezza e la sicurezza dell'attività clinica, rendendo più fragile la capacità operativa delle strutture.

Questo nodo diventa particolarmente rilevante rispetto alla riforma delineata dal DM 77/2022, che presuppone integrazione multiprofessionale, prossimità e presa in carico continuativa: obiettivi che richiedono capitale umano sufficiente, coordinamento tra professioni e condizioni organizzative coerenti con il modello territoriale (Lega, 2023).

All'interno di tale scenario, la carenza di condizioni materiali e organizzative produce una frattura professionale: la competenza resta formalmente presente, mentre il suo pieno esercizio viene vincolato dalla mancanza di risorse, strumenti e supporti operativi, con effetti sull'identità professionale e sulla qualità del lavoro (Freidson, 1994/2001). A questa frattura si affianca una frattura economica, legata al disequilibrio tra intensità lavorativa e remunerazione, che accentua la percezione di insostenibilità del lavoro nel settore pubblico.

L'interazione tra frattura professionale e frattura economica alimenta un driver strutturale di mobilità dal pubblico al privato, riconducibile alle dinamiche di public-to-private shift osservate in letteratura, specialmente nei sistemi in cui il settore privato risulta più attrattivo in termini di condizioni organizzative e ritorni economici (Socha & Bech, 2011). La perdita di capitale professionale incide così sulle dimensioni tecniche, relazionali e organizzative che permettono al sistema di generare valore pubblico, compromettendo la capacità di realizzare riforme complesse e di sostenere performance coerenti con i bisogni collettivi (Cepiku & Mastrodascio, 2018). Su questo terreno, le implicazioni di governance si orientano verso politiche di retention e rafforzamento della sostenibilità organizzativa del lavoro sanitario (Pfeffer, 1994).

Il capitale umano rappresenta l'infrastruttura cognitiva e relazionale attraverso cui il sistema sanitario genera qualità delle cure, sicurezza clinica e continuità assistenziale. Quando le condizioni di esercizio della professionalità risultano compromesse da vincoli organizzativi e materiali, la permanenza nel settore pubblico perde progressivamente attrattività, alimentando dinamiche strutturali di public-to-private shift che incidono direttamente sulla sostenibilità del Servizio Sanitario Nazionale e sulla capacità di attuare riforme di sistema.

È in questo quadro che si colloca la principale traiettoria istituzionale di riforma del sistema sanitario italiano, rappresentata dallo sviluppo dell'assistenza territoriale formalizzato dal DM 77/2022 del Ministero della Salute, che definisce modelli e standard organizzativi per strutture e funzioni quali Case della Comunità, Ospedali di Comunità e Centrali Operative Territoriali, orientate all'integrazione multiprofessionale e alla continuità della presa in carico.

In chiave teorico-manageriale, il DM 77/2022 rappresenta un disegno di governance orientato a riconfigurare il sistema operativo del Servizio Sanitario Nazionale, spostando il baricentro dell'assistenza da un paradigma prevalentemente ospedalocentrico a un modello di prossimità territoriale, nel quale la performance dipende dalla cooperazione tra professionalità, dalla qualità dei processi di coordinamento e dalla capacità di integrazione tra livelli di cura.

L'impianto della riforma presuppone condizioni abilitanti di natura organizzativa, tecnologica e professionale. L'integrazione territoriale si configura come un processo complesso che richiede disponibilità di capitale professionale adeguato, dotazioni infrastrutturali coerenti, chiarezza dei ruoli e capacità di gestione del cambiamento. In assenza di tali presupposti, si determina una distanza strutturale tra l'architettura formale del modello e la capacità reale di attuazione, con il rischio che gli standard normativi restino privi di un corrispondente supporto operativo in termini di risorse, competenze e assetti organizzativi.

Alla luce di quanto scritto, la regione Calabria rappresenta un contesto di osservazione particolarmente informativo per analizzare le condizioni di implementazione del modello territoriale delineato dal DM 77/2022 e le sue implicazioni in termini di performance, governance e capitale umano. Alla complessità ordinaria dei sistemi sanitari regionali si affianca, infatti, una condizione di governo straordinario che incide strutturalmente sull'assetto del Servizio Sanitario Regionale: la gestione commissariale per l'attuazione del Piano di rientro dai disavanzi sanitari.

La sanità calabrese è sottoposta a commissariamento a partire dal 2009, a seguito delle criticità economico-finanziarie e organizzative che hanno condotto il Governo centrale ad attivare la procedura prevista per le regioni in disavanzo sanitario. La gestione straordinaria è stata successivamente confermata e rinnovata nel tempo, fino alla nomina del Commissario ad acta con DPCM 4 novembre 2021, pubblicato anche sui canali istituzionali della Regione Calabria, che attribuisce al Commissario i poteri necessari per l'attuazione del Piano di rientro e per la riorganizzazione della rete sanitaria regionale (Regione Calabria, Dipartimento Tutela della Salute).

Il commissariamento rappresenta un dispositivo di governance che modifica in modo profondo gli assetti decisionali, le priorità di intervento e le traiettorie di investimento del sistema sanitario regionale. La gestione straordinaria orienta l'azione amministrativa verso obiettivi di riequilibrio economico-finanziario, riorganizzazione della rete assistenziale e controllo della spesa, incidendo direttamente sull'organizzazione dei servizi, sulla programmazione delle risorse professionali e sulle condizioni di esercizio della professionalità sanitaria. Infatti, le politiche di sviluppo del capitale umano, il rafforzamento delle dotazioni tecnologiche e l'innovazione organizzativa si collocano entro vincoli stringenti che condizionano la capacità operativa del sistema e la sostenibilità dei carichi di lavoro.

Il contesto calabrese consente dunque di osservare con particolare chiarezza la distanza che può generarsi tra l'architettura formale delle riforme nazionali e la capacità reale di attuazione a livello territoriale. Il modello di assistenza di prossimità previsto dal DM 77/2022 presuppone condizioni abilitanti che includono disponibilità di personale adeguatamente formato, infrastrutture coerenti con i nuovi modelli organizzativi, sistemi informativi integrati, chiarezza dei ruoli professionali e capacità di coordinamento interistituzionale. In una regione caratterizzata da persistenti criticità strutturali e da una governance straordinaria di lungo periodo, tali presupposti diventano variabili decisive per comprendere la tenuta del sistema e le dinamiche di permanenza o fuoriuscita dei professionisti dal settore pubblico.

All'interno di questo quadro regionale, la scelta empirica di concentrare la fase iniziale della ricerca sulla provincia di Cosenza risponde a criteri di rappresentatività demografica e professionale. La provincia di Cosenza costituisce il bacino territoriale più ampio della regione in termini di popolazione residente, come attestato dalle statistiche ufficiali ISTAT sulla popolazione provinciale, e concentra una quota rilevante delle principali professioni sanitarie, come documentato dalle rilevazioni ordinistiche.

La dimensione del bacino e la consistenza della base professionale rendono Cosenza un punto di osservazione privilegiato per cogliere dinamiche organizzative e professionali che attraversano l'intero sistema sanitario regionale. In questa prospettiva, il caso calabrese e il bacino provinciale cosentino consentono di analizzare in modo integrato il rapporto tra vincoli di governance, capacità organizzativa e sostenibilità del lavoro sanitario, offrendo un contesto empirico idoneo a studiare le condizioni che favoriscono o ostacolano l'attuazione del modello territoriale e che orientano le scelte professionali tra settore pubblico e settore privato. L'assetto istituzionale e organizzativo che caratterizza il sistema sanitario calabrese consente di osservare con particolare evidenza una tensione strutturale che attraversa oggi la professione sanitaria. Tale tensione si manifesta nella forma di una duplice frattura: una frattura professionale, legata alla difficoltà di esercitare pienamente le competenze secondo standard clinici, tecnici ed etici adeguati, e una frattura economica, connessa allo squilibrio tra intensità lavorativa, responsabilità assunte e livelli di riconoscimento retributivo e organizzativo.

Questa condizione rinvia ad un problema strutturale di regolazione del lavoro professionale nei sistemi sanitari complessi e richiede una lettura teorica capace di cogliere il nesso tra competenza, condizioni di esercizio e assetti istituzionali. La teoria del professionalismo elaborata da Eliot Freidson (2001) fornisce una chiave interpretativa particolarmente adeguata per analizzare le trasformazioni in atto nel lavoro sanitario pubblico e per comprendere le dinamiche di progressivo indebolimento delle condizioni di esercizio della professionalità. Il suo contributo

risulta centrale nell'impianto analitico del presente lavoro poiché consente di leggere le criticità organizzative del sistema sanitario come fattori che incidono direttamente sulla struttura stessa della professionalità sanitaria. Freidson interpreta il professionalismo come una modalità specifica di organizzazione del lavoro che si applica in modo diretto alle professioni sanitarie, caratterizzate da elevata complessità tecnica, responsabilità clinica e necessità di prendere decisioni in condizioni di incertezza. In questo tipo di lavoro, la prestazione non può essere regolata esclusivamente attraverso meccanismi di mercato, basati su logiche di scambio e prezzo, né attraverso modelli burocratico-manageriali fondati su procedure standard e controllo gerarchico.

Nelle professioni sanitarie, la qualità della prestazione dipende in larga misura dalla capacità del professionista di esercitare il proprio giudizio tecnico in modo autonomo e responsabile, all'interno di un sistema di standard condivisi e di regole professionali. Per questo motivo, la professionalità non coincide con solo nel possesso di competenze specialistiche, ma richiede condizioni organizzative che consentano di utilizzare tali competenze in modo appropriato: disponibilità di strumenti e tecnologie, adeguate dotazioni di personale, assetti organizzativi funzionali, processi logistici affidabili e tempi di lavoro compatibili con la complessità dell'attività svolta.

Nel contesto sanitario pubblico, questa impostazione consente di leggere le carenze strutturali di personale, le insufficienze infrastrutturali e le rigidità organizzative come fattori che incidono direttamente sulla qualità del lavoro professionale e sulla possibilità di operare secondo standard clinici e tecnici adeguati. In tale configurazione, la crisi del lavoro sanitario si traduce in una difficoltà concreta di esercitare la professionalità nelle condizioni richieste dalla natura stessa dell'attività clinica e assistenziale.

Applicata al campo sanitario, questa teoria consente di interpretare le carenze di personale, le insufficienze infrastrutturali, le criticità tecnologiche e le rigidità organizzative come fattori che non incidono soltanto sull'efficienza del sistema, ma compromettono la possibilità concreta di esercitare la professionalità secondo i principi che ne legittimano socialmente il ruolo. In tale configurazione, la frattura professionale che attraversa oggi il lavoro sanitario può essere letta come una crisi delle condizioni istituzionali che rendono possibile il professionalismo, più che come una crisi delle competenze in senso stretto.

In questa cornice, le condizioni materiali e organizzative assumono una funzione strutturale. Dotazioni tecnologiche adeguate, personale di supporto sufficiente, infrastrutture funzionali, processi logistici affidabili e assetti organizzativi stabili rappresentano presupposti indispensabili per garantire sicurezza delle cure, appropriatezza clinica e responsabilità etica. Quando tali presupposti vengono meno, la competenza professionale resta formalmente intatta, ma risulta progressivamente compressa nella sua possibilità di espressione concreta. Si produce così una forma di deprofessionalizzazione pratica, nella quale il sapere specialistico non trova un ambiente organizzativo capace di sostenerne l'esercizio secondo standard professionali.

Sul piano manageriale, questa frattura si traduce in una criticità strutturale di performance. L'impossibilità di operare in condizioni organizzative adeguate accresce l'esposizione al rischio clinico, alimenta inefficienze operative, intensifica il carico cognitivo ed emotivo, accresce lo stress organizzativo e riduce la qualità percepita del lavoro. La dimensione economica della frattura investe, inoltre, l'equità percepita, il riconoscimento istituzionale, la sostenibilità dei carichi di lavoro e la coerenza tra responsabilità esercitate e strumenti disponibili, configurandosi come una leva centrale nella gestione delle risorse umane nei sistemi ad alta intensità di conoscenza.

La frattura professionale ed economica assume i tratti di una tensione sistemica tra competenza, responsabilità e condizioni di esercizio, che incide direttamente sull'identità professionale e sulla capacità del sistema sanitario di trattenere capitale umano qualificato. In tale prospettiva, il lavoro sanitario emerge come uno spazio di regolazione complesso, nel quale le logiche istituzionali, organizzative ed economiche concorrono a definire la sostenibilità della

professionalità nel lungo periodo. All'interno della frattura professionale ed economica che attraversa il lavoro sanitario, l'attrattività del settore privato e delle strutture accreditate emerge come esito coerente degli assetti incentivanti che regolano il mercato del lavoro sanitario. In presenza di differenziali retributivi significativi, di condizioni organizzative più sostenibili e di una maggiore disponibilità di risorse tecnologiche e infrastrutturali, il passaggio dal settore pubblico al settore privato si configura come una scelta razionale di riallocazione del capitale professionale.

La letteratura sulla dual practice e sulle transizioni pubblico-privato interpreta tali dinamiche come fenomeni strutturali dei sistemi sanitari caratterizzati da segmentazione istituzionale e da regimi di regolazione differenziati. In questo filone di ricerca, la compresenza di opportunità professionali nel settore pubblico e in quello privato genera un sistema di incentivi asimmetrici che orienta le scelte individuali dei professionisti verso contesti percepiti come più sostenibili dal punto di vista economico e organizzativo (Socha & Bech, 2011). La mobilità verso il privato assume i tratti di una strategia individuale prevedibile all'interno di un assetto istituzionale che produce disallineamenti persistenti tra responsabilità esercitate, condizioni di lavoro e livelli di riconoscimento. Il passaggio al settore privato si colloca, dunque, come risposta razionale a un sistema che fatica a garantire condizioni di esercizio coerenti con la natura e la complessità del lavoro sanitario.

Nel quadro analitico del presente studio, questa dinamica assume un rilievo centrale poiché consente di collegare il livello micro delle condizioni operative quotidiane con il livello macro delle traiettorie di sostenibilità del sistema sanitario. Le carenze organizzative e infrastrutturali, insieme alla pressione sui carichi di lavoro, si traducono in perdita di capitale professionale, che a sua volta indebolisce la capacità del sistema di garantire continuità assistenziale, qualità delle prestazioni e attuazione delle riforme organizzative.

La perdita di capitale professionale che deriva dal public-to-private shift investe direttamente la capacità istituzionale del sistema sanitario di generare valore pubblico. In questa prospettiva, la tenuta del Servizio Sanitario Nazionale dipende dalla capacità di preservare e sviluppare quell'insieme di risorse cognitive, relazionali e organizzative che rendono possibile l'erogazione di servizi sanitari equi, appropriati e accessibili.

Il concetto di valore pubblico consente di inquadrare tali dinamiche all'interno di una visione sistemica della performance istituzionale. La generazione di valore pubblico richiede competenze tecniche, capacità di coordinamento interprofessionale, continuità organizzativa, fiducia tra attori, legittimazione istituzionale e stabilità delle routine operative. In questa prospettiva, la perdita di professionisti impoverisce l'intelligenza organizzativa del sistema, intesa come patrimonio collettivo di saperi taciti, pratiche efficaci e capacità di cooperazione che sostiene il funzionamento quotidiano dei servizi (Cepiku & Mastrodascio, 2018). Sul piano della governance, la tenuta del capitale professionale si colloca come una leva strategica per la sostenibilità del sistema sanitario. In tale direzione, la letteratura sottolinea il ruolo delle politiche di retention come strumenti fondamentali per la stabilità organizzativa nei sistemi ad alta intensità di conoscenza. La capacità competitiva delle organizzazioni dipende dall'investimento sulle persone e dalla costruzione di contesti di lavoro capaci di rendere sostenibile l'impegno professionale nel lungo periodo (Pfeffer, 1994). Applicata al settore sanitario pubblico, questa impostazione implica che le politiche di retention includano il ridisegno dei processi organizzativi, il rafforzamento delle dotazioni tecnologiche, il potenziamento delle strutture di supporto, la governance dei carichi di lavoro e il ripristino di condizioni di esercizio professionale coerenti con la natura dell'attività sanitaria.

La gestione del capitale umano diventa una componente strutturale delle politiche di governance del Servizio Sanitario Nazionale. La capacità di trattenere competenze qualificate, di preservare l'intelligenza organizzativa e di garantire condizioni di lavoro sostenibili costituisce un presupposto essenziale per la realizzazione delle riforme in corso e per la salvaguardia della funzione pubblica del sistema sanitario nel lungo periodo.

Alla luce del quadro teorico sin qui sviluppato, la ricerca empirica si propone di analizzare tali dinamiche attraverso un'indagine qualitativa basata su interviste semi-strutturate ai Presidenti degli Ordini delle professioni sanitarie, al fine di ricostruire, dal punto di vista degli attori istituzionali e professionali, le condizioni organizzative, economiche e operative che orientano le scelte di permanenza o di uscita dal settore pubblico.

2. Raccolta dati

Per garantire La ricerca ha adottato una metodologia qualitativa basata su interviste semi-strutturate (Qu & Dumay, 2011) rivolte ai Presidenti degli Ordini delle professioni sanitarie operanti nella Regione Calabria, selezionati in qualità di key informants istituzionali e osservatori privilegiati delle dinamiche organizzative, professionali ed economiche del sistema sanitario regionale, nonché delle traiettorie occupazionali e delle condizioni di esercizio della professionalità sanitaria.

È stata predisposta una guida per interviste semi-strutturate articolata in sezioni tematiche coerenti con il quadro teorico della ricerca e con gli obiettivi dello studio, finalizzate ad esplorare in modo sistemico:

- l'esistenza e la natura del fenomeno di fuoriuscita dei professionisti dal settore pubblico;
- le condizioni di esercizio della professionalità sanitaria;
- i fattori organizzativi, tecnologici ed economici che influenzano la performance clinico-assistenziale;
- le determinanti della mobilità verso il settore privato;
- le implicazioni sistemiche per la governance del sistema sanitario regionale e per l'attuazione del modello territoriale previsto dal DM 77/2022.

Le domande sono state formulate in forma aperta al fine di favorire una narrazione libera e approfondita delle esperienze, delle percezioni e delle valutazioni istituzionali degli intervistati. Le domande principali sono state integrate, ove necessario, da richieste di chiarimento e approfondimento, con l'obiettivo di cogliere esempi concreti, dinamiche operative e traiettorie professionali.

La guida per le interviste è stata strutturata attorno alle seguenti dieci domande:

Esistenza e natura del fenomeno

1) Dal suo punto di osservazione istituzionale, ha rilevato negli ultimi anni una tendenza alla fuoriuscita dei professionisti della sua categoria dal settore pubblico? In che modo questo fenomeno si manifesta concretamente?

2) Secondo la sua esperienza, tale fenomeno riguarda specifici profili professionali, fasce di età o livelli di esperienza, oppure appare diffuso e trasversale all'interno della categoria?

Condizioni di esercizio della professionalità (frattura professionale)

3) Ritiene che, nel contesto attuale del sistema sanitario pubblico regionale, i professionisti riescano a esercitare pienamente la propria competenza clinica e tecnico-assistenziale? Quali sono, a suo avviso, i principali fattori organizzativi o strutturali che ostacolano il pieno esercizio della professionalità nel settore pubblico?

4) In che misura la disponibilità di attrezzature, tecnologie, farmaci, materiali sanitari e personale di supporto incide sulla qualità e sull'appropriatezza dell'attività professionale quotidiana?

5) Secondo lei, queste condizioni influenzano il senso di identità professionale, di riconoscimento del ruolo e di appartenenza al sistema pubblico? In che modo?

Carico di lavoro, responsabilità e riconoscimento economico (frattura economica)

6) Come descriverebbe il rapporto tra carico di lavoro, livello di responsabilità professionale e riconoscimento economico nel settore pubblico regionale?

Meccanismo di uscita e public-to-private shift

7) Secondo lei, quali differenze principali riscontrano i professionisti che decidono di passare dal settore pubblico a quello privato o alle strutture accreditate, in termini di condizioni di lavoro e possibilità di esercizio della professione? A suo avviso, il passaggio al settore privato rappresenta prevalentemente una scelta temporanea o una vera e propria alternativa strutturale al lavoro nel settore pubblico? Perché?

Effetti sistemici della perdita di capitale professionale

8) Quali conseguenze produce, secondo lei, la perdita di professionisti esperti sulla capacità del sistema sanitario pubblico di garantire continuità assistenziale, integrazione multiprofessionale e qualità delle cure? In che modo questa fuoriuscita incide sull'organizzazione dei servizi e sulla tenuta complessiva del sistema sanitario regionale?

Governance, DM 77 e prospettive di intervento

9) Secondo lei, quanto le attuali condizioni organizzative del sistema sanitario regionale consentono di realizzare concretamente il modello territoriale e integrato previsto dal DM 77? Quali criticità legate alla disponibilità e alla gestione del capitale umano rischiano di compromettere l'attuazione di tale modello?

10) Quali condizioni dovrebbero essere garantite affinché il settore pubblico torni a essere percepito come uno spazio attrattivo e sostenibile per l'esercizio della professione sanitaria?

Le interviste sono state condotte tra dicembre 2025 e gennaio 2026 in modalità telefonica. Tutti i colloqui sono stati audioregistrati previo consenso informato degli intervistati.

Nella fase attuale della ricerca sono stati intervistati due Presidenti di Ordini professionali della provincia di Cosenza:

- il Presidente dell'Ordine delle Professioni Infermieristiche (OPI);
- il Presidente dell'Ordine TSRM-PSTRP.
- Le interviste hanno avuto una durata media di circa 30 minuti ciascuna.
- Le registrazioni audio sono state successivamente trascritte integralmente mediante uno strumento di intelligenza artificiale per la trascrizione automatica del parlato, che ha restituito una trascrizione parola per parola. Le trascrizioni sono state successivamente revisionate dall'autrice per garantire accuratezza, coerenza semantica e fedeltà al contenuto originale.

Al momento della stesura del presente contributo, la ricerca è in corso. Oltre agli Ordini già intervistati, sono programmate ulteriori interviste con i Presidenti degli Ordini dei medici, dei fisioterapisti e delle ostetriche, al fine di ampliare il perimetro empirico dell'analisi e rafforzare la validità sistemica dei risultati.

Pertanto, i risultati presentati devono essere interpretati come evidenze preliminari di una ricerca in divenire, orientata alla costruzione di una lettura integrata delle dinamiche di performance, governance e capitale umano nel sistema sanitario calabrese.

3. Analisi empirica e risultati

La presente analisi qualitativa si concentra sulla provincia di Cosenza, individuata quale contesto territoriale di riferimento in virtù della sua rilevanza demografica e organizzativa all'interno del sistema sanitario calabrese. La provincia di Cosenza rappresenta il bacino territoriale più esteso della regione per popolazione residente, numero di comuni e articolazione delle strutture sanitarie, configurandosi come snodo centrale dell'erogazione assistenziale regionale.

In tale contesto operano i principali presìdi ospedalieri hub della regione (Annunziata di Cosenza, spoke di Castrovillari, Corigliano-Rossano, Paola-Cetraro), nonché la più ampia rete territoriale di servizi distrettuali. Ne deriva che le dinamiche professionali, organizzative ed economiche che attraversano la sanità cosentina risultano altamente rappresentative delle criticità strutturali dell'intero Servizio Sanitario Regionale.

L'analisi si fonda su due interviste semi-strutturate realizzate con:

- il Presidente dell'Ordine delle Professioni Infermieristiche (OPI) della provincia di Cosenza;
- il Presidente dell'Ordine TSRM-PSTRP della provincia di Cosenza, che rappresenta circa 1.400 professionisti appartenenti a 18 profili sanitari.

Entrambi rivestono il ruolo di key informants istituzionali e osservatori privilegiati dell'ecosistema sanitario territoriale.

Entrambi gli intervistati convergono nel descrivere un fenomeno strutturale di progressiva fuoriuscita dei professionisti sanitari dal settore pubblico verso il settore privato e le strutture accreditate.

Il Presidente dell'Ordine TSRM-PSTRP evidenzia come tale orientamento riguardi in modo particolare i professionisti più giovani:

«Oggi c'è la predisposizione dei colleghi più giovani ad orientarsi più nel privato, perché è più appetibile e perché oggi c'è una condizione economica migliore.»

Il fenomeno non viene interpretato come una scelta transitoria, ma come una vera e propria strategia professionale di medio-lungo periodo.

Analogamente, il Presidente dell'Ordine delle Professioni Infermieristiche sottolinea come sempre più infermieri scelgano di lasciare il servizio pubblico per approdare stabilmente nel privato, nelle cliniche accreditate o nel lavoro autonomo:

«Sempre più colleghi valutano di andare via dal pubblico perché le condizioni non sono più sostenibili, né sul piano organizzativo né su quello personale.»

Il passaggio al privato viene descritto come una scelta razionale, fondata su una valutazione comparativa delle condizioni di lavoro, dei carichi assistenziali e della qualità della vita professionale.

Dalle interviste emerge una profonda frattura professionale che incide direttamente sulla possibilità dei professionisti di esercitare pienamente la propria competenza clinica e tecnico-assistenziale.

In particolar modo, il Presidente dell'Ordine delle Professioni Infermieristiche descrive una condizione di sofferenza strutturale dei reparti ospedalieri, caratterizzata da:

- cronica carenza di personale;
- sovraccarico assistenziale;
- impossibilità di garantire standard adeguati di presa in carico.

Secondo l'intervistato, la carenza di organico non consente più di lavorare secondo i modelli organizzativi previsti dalle linee guida nazionali e internazionali:

«Oggi in molti reparti lavoriamo sotto organico, con turni massacranti e carichi assistenziali che non permettono più di garantire un'assistenza realmente personalizzata.»

Il problema non è solo quantitativo, ma qualitativo: la mancanza di personale compromette la possibilità di esercitare pienamente la professione infermieristica secondo il suo profilo avanzato, fondato sulla presa in carico globale del paziente, sulla continuità assistenziale e sulla relazione di cura.

«L'infermiere oggi è costretto spesso a rincorrere l'urgenza, a lavorare in emergenza continua. Questo non è il modello professionale che la riforma vorrebbe realizzare.»

Ne deriva una progressiva perdita di senso del lavoro, con effetti diretti sulla motivazione, sull'identità professionale e sulla fidelizzazione al sistema pubblico.

Il Presidente dell'Ordine TSRM-PSTRP richiama invece il ruolo del commissariamento regionale e della carenza di personale medico e tecnico come fattori che limitano fortemente l'operatività dei servizi:

«La Regione Calabria è una regione ancora commissariata e c'è una carenza organica, anche per quanto riguarda la radiologia. I medici radiologi sono pochi e di conseguenza si ha poca possibilità di avere una crescita.»

In alcune strutture, la carenza di specialisti determina una riduzione delle attività diagnostiche:

«In alcune strutture, non essendoci la presenza del medico radiologo, si ha una riduzione delle attività e il personale è poco motivato.»

Questa condizione genera un appiattimento delle traiettorie professionali e una percezione di stagnazione organizzativa:

«Non avendo opportunità di crescita si ha una tendenza a un appiattimento dei profili professionali.»

Accanto alla frattura professionale, emerge con forza una frattura economica legata al disequilibrio strutturale tra intensità lavorativa, responsabilità e riconoscimento economico.

Il Presidente dell'Ordine TSRM-PSTRP sottolinea l'elevato livello di responsabilità giuridica e professionale, in particolare nei pronto soccorso:

«I carichi di lavoro aumentano tanto all'interno del prontosoccorso, c'è un rischio elevato e ogni operatore ogni giorno rischia anche di essere denunciato.»

A fronte di tali responsabilità, la remunerazione viene percepita come inadeguata:

«Nel privato il professionista sceglie addirittura quanto deve essere pagato.»

Il Presidente dell'Ordine delle Professioni Infermieristiche conferma la stessa dinamica, sottolineando come l'incremento dei carichi assistenziali non sia stato accompagnato da un adeguato riconoscimento economico:

«Gli stipendi degli infermieri non sono più proporzionati alle responsabilità che ci vengono attribuite, soprattutto nei reparti ad alta intensità di cura.»

Ne deriva una crescente percezione di ingiustizia organizzativa che alimenta la scelta di uscita dal settore pubblico.

Dall'analisi congiunta delle due interviste emerge una traiettoria causale ricorrente:

carenze strutturali → impossibilità di lavorare secondo standard professionali → demotivazione → scelta di uscita verso il privato

Il Presidente TSRM-PSTRP sintetizza chiaramente questo meccanismo:

«Oggi si va nel privato esclusivamente per un fattore economico.»

Il Presidente OPI aggiunge che il privato offre condizioni organizzative più sostenibili:

«Nel privato spesso trovi turni più regolari, meno pressione, più possibilità di gestire il tempo di lavoro.»

Il passaggio al settore privato viene quindi interpretato come risposta razionale a una crisi di sostenibilità del lavoro pubblico.

Entrambi gli intervistati sottolineano come la carenza di personale comprometta:

- la continuità assistenziale,
- l'integrazione multiprofessionale
- la qualità complessiva delle cure.

Il Presidente OPI evidenzia come la carenza infermieristica renda impossibile realizzare il modello territoriale previsto dal DM 77/2022:

«Se non c'è personale, le Case della Comunità restano scatole vuote. Senza infermieri non esiste assistenza territoriale.»

Il Presidente TSRM-PSTRP richiama invece il tema della sostenibilità tecnologica:

«Le tecnologie ci sono, ma senza personale formato e senza specialisti restano inutilizzate.»

La perdita progressiva di capitale professionale erode le dimensioni tecniche, relazionali e organizzative dell'intelligenza aziendale necessaria per generare valore pubblico.

Nel loro insieme, le due interviste restituiscono una rappresentazione coerente della crisi del sistema sanitario pubblico calabrese, letta attraverso le categorie di performance, governance e capitale umano. La provincia di Cosenza, in quanto principale bacino demografico e professionale della regione, si configura come osservatorio privilegiato delle dinamiche di erosione del capitale professionale e del progressivo spostamento verso il settore privato.

L'analisi empirica conferma pienamente il modello teorico del paper:

la compresenza di una frattura professionale e di una frattura economica costituisce il driver strutturale del public-to-private shift, compromettendo la capacità del sistema di generare valore pubblico e di realizzare il modello territoriale previsto dal DM 77/2022.

4. Discussione

Lo scopo di questo studio è analizzare, attraverso un approccio qualitativo, le condizioni organizzative e professionali che caratterizzano il lavoro sanitario nel contesto calabrese e che orientano le scelte di permanenza o di fuoriuscita dal settore pubblico. In questa fase preliminare, l'analisi si fonda su due interviste condotte con i Presidenti dell'Ordine delle Professioni Infermieristiche e dell'Ordine TSRM-PSTRP della provincia di Cosenza, in qualità di osservatori istituzionali privilegiati dell'ecosistema sanitario territoriale.

I risultati mettono in evidenza una rappresentazione convergente delle criticità strutturali che attraversano il sistema sanitario pubblico regionale. Entrambi gli intervistati descrivono un contesto caratterizzato da carenze di personale, sovraccarico assistenziale, difficoltà operative e limitata capacità di garantire continuità e appropriatezza delle cure. In particolare, emerge una condizione di pressione organizzativa permanente che incide sulla qualità del lavoro quotidiano e sulla possibilità di esercitare pienamente le competenze professionali.

Nel settore infermieristico, pur in presenza di una diffusione del fenomeno ancora contenuta, viene segnalata una crescente insostenibilità delle condizioni di lavoro, legata all'intensificazione dei carichi assistenziali, alla carenza di organico e alla difficoltà di operare secondo modelli assistenziali coerenti con le linee guida nazionali. Nel settore TSRM-PSTRP, il fenomeno della mobilità verso il privato appare invece più strutturato, soprattutto tra i professionisti più giovani, che orientano le proprie scelte sulla base di una valutazione comparativa delle condizioni economiche e organizzative.

Le interviste mostrano come il passaggio verso il settore privato venga percepito come una strategia professionale razionale, fondata su tre dimensioni principali: sostenibilità dei carichi di lavoro, qualità dell'organizzazione e riconoscimento economico. In entrambi i casi, il privato viene descritto come un contesto nel quale è possibile esercitare la professione in condizioni operative più stabili, con una maggiore possibilità di gestione del tempo di lavoro e con un ritorno economico ritenuto più coerente con le responsabilità assunte.

Un elemento particolarmente rilevante riguarda il ruolo del commissariamento regionale, richiamato esplicitamente dal Presidente dell'Ordine TSRM-PSTRP come fattore che incide sulla capacità di sviluppo dei servizi e sulle opportunità di crescita professionale. La gestione straordinaria viene percepita come un vincolo strutturale che limita la programmazione del personale, rallenta i processi di riorganizzazione e contribuisce a una percezione di stagnazione organizzativa, con effetti diretti sulla motivazione e sulle prospettive professionali.

Nel loro insieme, le interviste restituiscono una rappresentazione coerente della crisi di sostenibilità del lavoro sanitario pubblico in Calabria, letta attraverso le categorie di carico assistenziale, condizioni organizzative, riconoscimento economico e prospettive di sviluppo. La provincia di Cosenza, in quanto principale bacino demografico e professionale della regione, emerge come un osservatorio privilegiato delle dinamiche di erosione del capitale professionale e del progressivo spostamento verso il settore privato.

Questi risultati preliminari risultano coerenti con quanto documentato a livello nazionale dal Rapporto GIMBE (2025) in relazione alla compressione delle risorse pubbliche, all'aumento della pressione sui servizi e alla crescita dell'area di bisogno non soddisfatto. Allo stesso tempo, essi si inseriscono nel solco della letteratura sulla dual practice e sulle transizioni pubblico-privato, che interpreta tali dinamiche come esito strutturale di regimi di regolazione differenziati e di incentivi asimmetrici (Socha & Bech, 2011).

Il contributo empirico di questo studio risiede nella capacità di restituire una lettura istituzionale e professionale delle trasformazioni in atto, fondata sulle testimonianze di attori che

operano quotidianamente all'intersezione tra governance regionale, organizzazione dei servizi e rappresentanza professionale. L'analisi consente di mettere in luce come le criticità organizzative e finanziarie del sistema sanitario calabrese si traducano operativamente in scelte professionali orientate alla ricerca di contesti lavorativi più sostenibili.

Alla luce della natura preliminare della ricerca, i risultati devono essere interpretati come prime evidenze esplorative. Il proseguimento dell'indagine, attraverso il coinvolgimento degli Ordini dei medici, dei fisioterapisti e delle ostetriche, consentirà di ampliare il perimetro empirico dell'analisi e di rafforzare la validità sistemica delle conclusioni.

5. Conclusioni e limiti

Il presente contributo presenta risultati preliminari di una ricerca qualitativa in corso sulle condizioni organizzative e professionali del lavoro sanitario nel contesto calabrese. L'analisi si basa, nella fase attuale, sulle interviste ai Presidenti dell'Ordine delle Professioni Infermieristiche e dell'Ordine TSRM-PSTRP della provincia di Cosenza.

Le evidenze emerse consentono di delineare una prima rappresentazione istituzionale delle criticità che attraversano il sistema sanitario regionale, mettendo in luce il ruolo delle condizioni organizzative, dei carichi di lavoro e delle prospettive professionali nelle scelte di permanenza o di mobilità verso il settore privato. Tali risultati vanno interpretati come indicazioni esplorative utili a orientare l'analisi, ma non come conclusioni definitive.

Il principale limite dello studio risiede nel carattere ancora parziale del disegno empirico. La ricerca prevede l'estensione dell'indagine ai Presidenti degli Ordini dei medici, dei fisioterapisti e delle ostetriche, al fine di ampliare il campo di osservazione e costruire una lettura sistemica delle dinamiche di performance, governance e capitale umano nel Servizio Sanitario Regionale.

Il contributo si configura pertanto come una prima tappa di un percorso di ricerca volto a comprendere le trasformazioni in atto nel lavoro sanitario calabrese e le loro implicazioni per la sostenibilità del sistema pubblico.

Parole chiave: Public-to-private shift; healthcare governance; human capital

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Tecnostress nella medicina generale: impatti delle tecnologie cliniche e amministrative sulla performance dei MMG

Alessandra Pernice[1], Francesca De Domenico[2]

1. Introduzione

La trasformazione digitale nel settore sanitario ha migliorato l'efficienza operativa e la qualità dell'assistenza, ma ha anche introdotto nuove forme di pressione legate all'uso intensivo delle tecnologie informatiche, spesso ricondotte al tecnostress (Luo et al., 2024). In questo scenario, i medici di medicina generale (MMG) occupano una posizione particolarmente esposta, poiché devono bilanciare responsabilità cliniche e incombenze amministrative in un contesto in cui strumenti digitali come i sistemi di supporto alle decisioni cliniche per la prescrizione e il Fascicolo Sanitario Elettronico (FSE) sono diventati imprescindibili per l'erogazione delle cure e per il rispetto dei protocolli normativi. In quanto professionisti ibridi, i MMG agiscono come "finestre bidirezionali" tra bisogni clinici e requisiti informativi (Llewellyn, 2001), chiamati a gestire un duplice ruolo che richiede l'integrazione armonica di dimensioni cliniche, documentali e gestionali.

La pressione derivante dall'introduzione massiva delle tecnologie non riguarda soltanto l'adozione di nuovi strumenti, ma la ridefinizione dei processi di lavoro, delle aspettative organizzative e della relazione medico-paziente. In molti casi, i MMG percepiscono la digitalizzazione come un cambiamento non negoziabile che si sovrappone a carichi già elevati, con il rischio di ridurre il tempo dedicato al paziente a favore di attività di documentazione. Questo fenomeno, spesso definito come "spostamento del baricentro professionale", genera tensioni identitarie che si sommano agli stressor tecnologici.

Il presente studio adotta il modello di risposta affettiva (Affective Response Model, ARM) di Agogo e Hess (2018) per analizzare i fattori che contribuiscono al tecnostress nei MMG e comprendere come esso influenzi la performance prescrittiva e l'aderenza alla documentazione digitale. Sebbene l'ARM offra una cornice teorica articolata per interpretare le risposte emotive innescate dalla tecnologia, la letteratura presenta ancora una limitata evidenza empirica sulla relazione tra tali risposte e gli esiti concreti del lavoro clinico. Il lavoro si propone quindi di contribuire al dibattito attraverso un'analisi qualitativa basata su interviste semi-strutturate a MMG di diverse regioni italiane, esplorando come essi affrontino le sfide generate dalle tecnologie cliniche e amministrative e con quali ricadute sulla pratica quotidiana.

2. Contesto teorico

La crescente digitalizzazione dei sistemi sanitari sta ridefinendo modalità di lavoro, modelli organizzativi e pratiche di cura. La digital innovation è stata concettualizzata come l'introduzione di prodotti, processi e modelli di business percepiti come nuovi e tali da richiedere cambiamenti significativi (Fichman et al., 2014). La distinzione tra digitization e digitalization (Brennen e Kreiss, 2016) aiuta a comprendere come la trasformazione non riguardi solo la conversione tecnica di dati, ma anche la riorganizzazione delle attività e delle relazioni tra gli attori coinvolti.

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In sanità, la digital health e l'approccio Health 4.0 integrano sistemi informativi, telemedicina, Internet of Things, big data e intelligenza artificiale per migliorare la prevenzione, la diagnosi e la gestione delle patologie (Yeung et al., 2023; Monteiro et al., 2018). La pandemia da Covid-19 ha accelerato questo processo, rendendo ancora più evidente la centralità delle tecnologie digitali.

Nell'ambito della medicina generale, è utile distinguere tra tecnologie cliniche e tecnologie amministrative. Le prime supportano direttamente la diagnosi e il trattamento e sono generalmente percepite come coerenti con l'identità professionale del medico. Le seconde includono sistemi informativi sanitari, fascicoli elettronici, piattaforme di rendicontazione e prescrizione, e richiedono attività documentali aggiuntive non sempre percepite come strettamente cliniche. Gli studi mostrano come tali strumenti possano migliorare la trasparenza e la tracciabilità, ma anche generare un aumento del carico burocratico e modificare in modo significativo il flusso di lavoro (Porterfield et al., 2014; Qureshi et al., 2015).

La letteratura recente sulla professione medica sta ponendo crescente attenzione al concetto di "professionalismo ibrido" (Noordegraaf, 2007; Giacomelli, 2020), che descrive l'integrazione di logiche cliniche e manageriali nelle pratiche quotidiane. I MMG, più di altre figure professionali, devono conciliare obiettivi di appropriatezza, efficienza, accountability e adempimenti normativi, con effetti diretti sulla loro identità professionale. Questa ibridazione, se non adeguatamente sostenuta, può amplificare le risposte affettive negative verso le tecnologie percepite come estranee al nucleo clinico.

Proprio l'impatto soggettivo delle tecnologie ha alimentato un crescente filone di studi sul tecnostress, definito come lo stress sperimentato nell'uso intensivo delle tecnologie digitali (Tarafdar et al., 2007). La letteratura ha individuato stressor quali sovraccarico informativo, complessità percepita, invasività e insicurezza, con effetti negativi sul benessere e sulla performance. Nel settore sanitario tali dinamiche appaiono amplificate, poiché i professionisti della salute devono impiegare quotidianamente sistemi che condizionano non solo la produttività, ma anche la qualità dell'assistenza.

All'interno di questo quadro teorico si colloca il modello ARM, che propone una lettura triadica delle reazioni alla tecnologia: gli stressor tecnologici generano risposte affettive negative – tra cui frustrazione, irritazione e ansia indotta dalla tecnologia (TISA) – che a loro volta influenzano i comportamenti d'uso e la performance dell'utente (Agogo e Hess, 2018). Tale modello offre quindi una lente particolarmente adatta per comprendere come i MMG si relazionino a tecnologie che possono risultare più o meno allineate al proprio ruolo professionale.

3. Obiettivi della ricerca

La ricerca intende esplorare come i MMG interpretino e gestiscano i diversi tipi di tecnologia, distinguendo tra strumenti clinici e amministrativi, e con quali ricadute sulle loro risposte affettive, sul tecnostress percepito e sulla performance. L'attenzione è rivolta in particolare al ruolo delle competenze digitali e dell'identità professionale nell'influenzare tali dinamiche, con l'obiettivo di contribuire allo sviluppo di strategie in grado di ridurre il carico tecnologico e favorire un uso più consapevole ed efficiente dei sistemi digitali nelle cure primarie.

Un ulteriore obiettivo è comprendere come le differenti configurazioni regionali dei sistemi informativi sanitari influenzino il modo in cui i MMG percepiscono il carico digitale. Le regioni italiane presentano livelli molto eterogenei di maturità digitale, sia in termini di integrazione dei sistemi sia di qualità degli strumenti software messi a disposizione dei medici: analizzare queste differenze consente di valutare come vari contesti istituzionali plasmino le emozioni e i comportamenti dei professionisti.

4. Metodologia

Lo studio adotta un approccio qualitativo esplorativo fondato su interviste semi-strutturate realizzate con MMG di diverse regioni italiane. Il campione è composto da tredici professionisti operanti in Lombardia, Veneto, Lazio, Toscana e Sicilia, selezionati sulla base della variabilità dei contesti tecnologici regionali, della differente esperienza nell'uso dei sistemi digitali e della diversificazione delle competenze digitali possedute.

La scelta di una metodologia qualitativa risponde all'esigenza di approfondire la dimensione vissuta del tecnostress, difficilmente catturabile attraverso strumenti quantitativi. Le interviste hanno consentito di ricostruire il vissuto emotivo dei professionisti, dando voce alle strategie individuali di adattamento e alle modalità con cui essi negoziano l'uso della tecnologia nei propri flussi di lavoro.

Le interviste, della durata compresa tra 45 e 75 minuti, hanno approfondito le percezioni dei MMG circa le tecnologie cliniche e amministrative, le esperienze di sovraccarico digitale e complessità, la gestione della messaggistica e delle richieste asincrone, le manifestazioni di ansia tecnologica, l'impatto sulla performance prescrittiva e documentale e le strategie di adattamento adottate. Le trascrizioni sono state analizzate mediante NVivo seguendo una procedura di codifica tematica articolata in tre fasi: codifica aperta, identificazione di categorie assiali e integrazione dei risultati attraverso confronto costante tra casi e contesti regionali. Lo studio si configura come work in progress, in linea con le indicazioni della Call AIDEA.

5. Risultati preliminari

L'analisi evidenzia come il tecnostress dei MMG sia influenzato da una molteplicità di fattori riconducibili sia alle caratteristiche delle tecnologie sia alle dinamiche organizzative regionali. Le differenze nella maturità digitale dei sistemi sanitari regionali rappresentano uno dei principali elementi di variabilità. In contesti come la Toscana e la Lombardia, dove sono disponibili piattaforme più integrate e sistemi di filtraggio digitale delle comunicazioni, i MMG riportano un uso più fluido dei sistemi informativi e una minore percezione di sovraccarico. Al contrario, nelle regioni con infrastrutture digitali frammentate, come la Sicilia, l'assenza o l'inefficacia dell'FSE, la duplicazione delle informazioni e i frequenti malfunzionamenti dei portali generano frustrazione, perdita di tempo e un acuto senso di inefficienza.

Diversi MMG intervistati riportano episodi concreti che mettono in evidenza tali differenze: in Lombardia, ad esempio, i sistemi di prenotazione, prescrizione e consultazione sono percepiti come relativamente coordinati, mentre in Sicilia la molteplicità di portali richiede continui passaggi tra piattaforme, aumentando la complessità percepita. In una delle interviste, un medico racconta di dover ripetere la stessa operazione su due portali diversi per poter generare una singola prescrizione, evidenziando l'impatto diretto del disallineamento tecnologico sulla performance quotidiana.

Un secondo risultato riguarda la netta distinzione tra l'impatto delle tecnologie cliniche e quello delle tecnologie amministrative. Le prime vengono descritte come strumenti che potenziano la capacità clinica, migliorano la qualità delle decisioni e favoriscono una gestione più tempestiva dei pazienti. Le seconde, al contrario, sono percepite come una fonte primaria di stress, poiché introducono procedure aggiuntive, frammentano il flusso di lavoro e appaiono spesso disallineate rispetto al ruolo clinico. In molti casi, i MMG tendono a utilizzare tali strumenti solo per adempiere a obblighi regolatori, limitandosi al minimo indispensabile.

Questa distinzione emerge chiaramente anche in relazione al sistema di supporto alle decisioni cliniche, considerato utile e a volte persino rassicurante, mentre il FSE è spesso descritto come un "contenitore obbligatorio" con scarsa utilità operativa. Alcuni MMG sottolineano che la compilazione del FSE richiede tempo che preferirebbero dedicare all'attività clinica, contribuendo a sentimenti di frustrazione e inefficienza.

Un ulteriore elemento critico è rappresentato dalla crescente pressione comunicativa derivante dall'uso della messaggistica istantanea, che si configura come un tecnostressor

emergente non ancora adeguatamente considerato dalla letteratura. La ricezione continua di messaggi tramite WhatsApp, anche in orari non lavorativi, genera ansia di reperibilità, ipervigilanza e intrusioni nella dimensione privata, con importanti ricadute sull'equilibrio emotivo dei professionisti. Alcuni MMG riportano di aver introdotto sistemi di triage digitale o centralini automatici per contenere tale pressione, mentre altri riconoscono che la mancanza di regolamentazione delle comunicazioni rappresenta una delle principali criticità del loro lavoro quotidiano.

Una MMG intervistata racconta di aver ricevuto messaggi vocali alle tre di notte per richieste non urgenti, sviluppando una forma di ansia anticipatoria che la porta a controllare costantemente il telefono. Un altro medico, al contrario, descrive l'introduzione di un sistema automatico di gestione delle richieste come una "svolta psicologica" che ha ridotto l'invadenza digitale e migliorato la qualità della vita lavorativa.

Le competenze digitali si configurano come un fattore cruciale di moderazione del tecnostress. I MMG con maggiore familiarità con le tecnologie riescono a sfruttare software di automazione, strumenti di supporto basati su intelligenza artificiale e sistemi di gestione delle comunicazioni, ottenendo un significativo alleggerimento del carico di lavoro. Al contrario, coloro che possiedono competenze digitali limitate sperimentano con maggiore frequenza stress emotivo, senso di inadeguatezza e comportamenti di evitamento delle tecnologie. In alcuni casi estremi, l'accumulo di stress tecnologico è percepito come uno dei fattori che contribuiscono alla decisione di lasciare la professione.

L'analisi delle interviste mostra come la digital literacy non influisca solo sulla capacità di utilizzare le tecnologie, ma anche sul vissuto emotivo associato ad esse: i medici più esperti riferiscono di "dialogare" con i sistemi informativi, mentre i colleghi meno esperti parlano di "dover lottare" con essi. Questa differenza interpretativa sembra incidere sulla resilienza emotiva e sulla capacità di adattamento.

Infine, la performance prescrittiva appare influenzata sia dalla qualità dei sistemi digitali sia dal livello di tecnostress percepito. Nei contesti tecnologicamente avanzati, i flussi prescrittivi risultano più snelli e la gestione dei pazienti cronici è semplificata; nelle regioni meno digitalizzate, invece, il doppio inserimento dei dati e i frequenti disservizi determinano rallentamenti significativi e una riduzione della precisione documentale.

6. Discussione

I risultati preliminari confermano le previsioni dell'Affective Response Model, mostrando come gli stressor tecnologici attivino risposte affettive negative che, a loro volta, incidono in modo sostanziale sulla performance dei MMG. In particolare, l'overload documentale, la frammentazione dei sistemi, l'imprevedibilità tecnologica e l'invasività della messaggistica contribuiscono alla generazione di stati di ansia tecnologica (TISA), frustrazione e irritazione.

Particolarmente rilevante è il ruolo della percezione di controllo: il modello ARM suggerisce che la perdita di controllo percepita sulle tecnologie aumenta la probabilità di risposte affettive negative. Questa dinamica è confermata dalle testimonianze dei MMG, che riportano maggiore stress quando i sistemi non rispondono ai comandi, presentano down-time, oppure richiedono operazioni ridondanti non spiegate. La mancanza di trasparenza e prevedibilità dei sistemi digitali sembra quindi rappresentare un fattore centrale nel generare TISA.

Le tecnologie cliniche, percepite come coerenti con il ruolo professionale, tendono a generare emozioni neutre o positive, mentre quelle amministrative sono più frequentemente associate a vissuti negativi e comportamenti di evitamento. La digital literacy emerge come un elemento chiave nella capacità dei MMG di modulare tali risposte affettive e di integrare efficacemente la tecnologia nel proprio lavoro.

Un altro elemento che emerge è la tensione tra logiche professionali e logiche manageriali: quando le tecnologie sono percepite come strumenti per migliorare la cura, il loro uso è

accompagnato da un senso di efficacia; quando, al contrario, sono viste come mezzi di controllo o adempimento, attivano risposte affettive negative. Questa dinamica è ampiamente discussa nella letteratura sui professionisti ibridi e trova riscontro diretto nei dati raccolti.

7. Contributi attesi

Lo studio contribuisce alla comprensione del tecnostress in medicina generale e si inserisce nel dibattito della Track 11 evidenziando come l'introduzione di tecnologie sanitarie debba essere accompagnata non solo da investimenti tecnici, ma anche da una riflessione sulle dimensioni affettive, identitarie e organizzative che condizionano il modo in cui i professionisti vivono l'innovazione.

Il lavoro mette inoltre in luce l'importanza delle politiche regionali nella determinazione del carico tecnologico percepito dai MMG: sistemi informativi integrati, formazione adeguata e strumenti di supporto all'adozione possono ridurre significativamente il tecnostress e migliorare la qualità del lavoro. Inoltre, i risultati suggeriscono che il design dei sistemi digitali dovrebbe essere maggiormente user-centered, includendo i MMG nei processi decisionali e valutando l'impatto delle tecnologie non solo sulla produttività, ma anche sulle emozioni dei professionisti.

Una migliore governance digitale, una maggiore attenzione alle competenze digitali e una progettazione più user-centered dei sistemi possono favorire una riduzione del carico tecnologico e creare condizioni di lavoro più sostenibili per i MMG.

Parole chiave: Tecnostress; performance; medici di medicina generale; trasformazione digitale; tecnologie cliniche e amministrative

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Innovazioni tecnologiche e Medicina di Genere: verso modelli personalizzati di assistenza sanitaria

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1. Introduzione

Le innovazioni tecnologiche come l'intelligenza artificiale (IA) e la telemedicina sono in rapida e costante evoluzione e stanno trasformando profondamente diversi ambiti, tra cui quello medico. In particolare, i sistemi di IA comprendono tutte le tecnologie studiate per imitare l'intelligenza umana, replicando il comportamento dell'uomo: sistemi di machine learning, deep learning, robotica, ecc. (Haenlein e Kaplan, 2019; Bobini et al., 2022).

In campo sanitario, l'IA supporta decisioni fondamentali per la pratica clinica che incidono profondamente sulle varie attività e sugli esiti di salute, generando un vero e proprio cambiamento nella definizione della diagnosi, terapia, prognosi e gestione del paziente. L'incremento dei casi di malattie oncologiche e cronico-degenerative ha acuito la necessità di diagnosi sempre più precise e tempestive, accelerando il processo di adozione di strumenti di IA. La possibilità di intercettare il manifestarsi delle patologie in fase iniziale riduce disabilità e mortalità, incidendo anche su una riduzione dei costi di gestione del singolo paziente, ma, al contempo, rende indispensabile l'analisi di un numero molto elevato di dati clinici e immagini medicali. Al trend di crescita delle malattie citate si accompagna la necessità, sempre più avvertita, di personalizzazione delle cure al fine di ottimizzare la diagnosi, la prevenzione e il trattamento dei singoli pazienti (Shai et al., 2021).

L'utilizzo dell'IA in medicina è oramai pervasivo in ogni ambito della pratica clinica e sta favorendo l'applicazione dei principi della medicina di genere attraverso l'identificazione di differenze cliniche, biologiche e di risposta ai trattamenti tra uomini e donne. La medicina di genere (MdG) analizza come le differenze biologiche e socio-culturali tra uomini e donne influiscano sulla salute, sulle malattie e sulla risposta terapeutica ai trattamenti (Giovagnoni et al., 2021; Goetz et al., 2022). La rilevanza della tematica ha portato il legislatore ad emanare la Legge 3/2018 nella quale, per la prima volta in Europa, viene considerato il genere nella definizione dei percorsi diagnostici e terapeutici, nella ricerca scientifica, nella comunicazione ai cittadini, nella formazione degli studenti e nell'aggiornamento dei professionisti della salute.

Partendo da tali premesse, il lavoro mira a comprendere le modalità con le quali il management gestisce i processi di implementazione delle innovazioni tecnologiche (tra le quali l'IA) introdotte all'interno delle aziende sanitarie pubbliche, quali sono i principali fattori che favoriscono o rallentano i processi di adozione delle tecnologie e come tali dinamiche si intersecano con le esigenze e le prospettive della medicina di genere. Per raggiungere tali obiettivi, è stata adottata la metodologia del case study ed è stato utilizzato il framework di Implementation Science denominato Consolidated Framework for Implementation Research.

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2. Analisi della letteratura

L'IA si occupa dello studio dei processi cognitivi mediante modelli computazionali e algoritmi in grado di simulare capacità umane come percepire, ragionare e agire (Charniak e McDermott, 1985; Winston, 1992). I sistemi di IA comprendono diverse tecnologie, tra cui machine learning, deep learning, reti neurali e robotica, che mirano a replicare il comportamento umano e a supportare decisioni complesse, sia in ambito clinico che manageriale (Haenlein e Kaplan, 2019; Bobini et al., 2022).

L'IA riveste un ruolo fondamentale poiché produce vantaggi per pazienti, operatori sanitari, organizzazioni ma anche per l'intero settore sanitario (Ali et al., 2023). Gli strumenti algoritmici sofisticati di cui si avvale sono in grado di accelerare la scoperta di informazioni di importanza clinica all'interno di grandi volumi di dati, agevolando i processi di decision-making e problem solving degli operatori, con benefici concreti per la salute dei pazienti (Secinaro et al., 2021). I processi decisionali relativi alla diagnosi necessitano di tempo e risorse che i sistemi di IA consentono di ridurre, con una conseguente ottimizzazione dei flussi di lavoro e una riduzione dei costi, migliorando la qualità dell'assistenza.

Le applicazioni di IA permettono di passare da un approccio sanitario reattivo a uno proattivo: identificando tempestivamente rischi clinici e patologie, queste tecnologie consentono interventi precoci e ottimizzano la programmazione delle risorse sanitarie (Fyhr et al., 2017; Bag et al., 2023). Inoltre, grazie alla capacità di analizzare grandi quantità di dati clinici stratificati in base a caratteristiche individuali, l'IA favorisce l'adozione di pratiche di medicina di genere, permettendo trattamenti maggiormente personalizzati e attenti alle differenze biologiche e sociali tra pazienti (Fanizzi et al., 2025).

Dal punto di vista organizzativo, l'implementazione di IA richiede team multidisciplinari, integrando competenze cliniche, ingegneristiche, informatiche e manageriali, per favorire la collaborazione, il knowledge sharing e il coordinamento interno ed esterno (Bobini et al., 2022). La formazione di nuove competenze tecnologiche, il coinvolgimento attivo del personale clinico e la cultura organizzativa favorevole al cambiamento risultano determinanti per il successo dei progetti. L'inclusione di esperti in medicina di genere all'interno dei team multidisciplinari può garantire che lo sviluppo e l'implementazione delle applicazioni di IA rispondano in modo efficace alle esigenze specifiche di diversi gruppi di pazienti (Alami et al., 2021; Golden, 2006).

Partendo da tali premesse, il presente studio si pone la seguente domanda di ricerca: "In che modo le aziende sanitarie gestiscono l'implementazione di innovazioni tecnologiche, tra cui l'intelligenza artificiale, integrando le esigenze della medicina di genere e quali fattori facilitano o ostacolano questi processi?"

3. Metodologia di ricerca

Per rispondere alla domanda di ricerca, è stata adottata la metodologia del case study, che costituisce un approccio qualitativo idoneo all'analisi di un fenomeno contemporaneo entro il suo contesto di vita reale, in particolare quando i confini tra fenomeno e contesto non risultano chiaramente definiti (Yin, 2014). Tale impostazione metodologica permette al ricercatore di cogliere la complessità del fenomeno, osservandone le molteplici dimensioni e avvalendosi di più fonti – quali documentazione interna, evidenze empiriche, interviste e osservazioni dirette.

Il caso oggetto di studio è stato selezionato secondo il principio del campionamento teorico (Eisenhardt, 1989), individuando un'azienda che presentasse caratteristiche coerenti con il fenomeno investigato e un processo di innovazione tecnologica sufficientemente chiaro, trasparente e osservabile (Pettigrew, 1988).

Nella fase di raccolta dei dati sono state definite due modalità di reperimento: 1) interviste semi-strutturate con il Direttore generale, il Dirigente Servizio Ingegneria Clinica e Sistemi Informativi e il responsabile del progetto di IA della durata di circa 60 minuti ciascuna; 2) consultazione di documenti aziendali (dati secondari), tra cui il Piano Integrato di Attività e

Organizzazione 2024-2026 e 2025-2027, atti deliberativi relativi alla formazione dei team di lavoro e delle loro funzioni, programmi di ricerca dei team multidisciplinari.

Le tracce delle interviste semi-strutturate sono state elaborate a partire dalla letteratura di riferimento e dal framework di Implementation Science noto come Consolidated Framework for Implementation Research (CFIR) (Damschroder et al., 2009; Kirk et al., 2016), che si articola in 33 costrutti raggruppati in cinque domini: caratteristiche dell'innovazione; ambiente esterno; ambiente interno; persone coinvolte nell'implementazione; processo di implementazione (Damschroder et al., 2009).

Il caso esaminato è un ente pubblico dotato di autonomia organizzativa e gestionale, specializzato nella cura delle malattie oncologiche, che ha conseguito la certificazione di Clinical Cancer Center in conformità alle disposizioni dell'Organizzazione degli Istituti del Cancer Europe. La ricerca si focalizza sull'implementazione, all'interno dell'unità operativa di ematologia, di sistemi di supporto alle decisioni (CDSS) basati su algoritmi di machine learning che indirizzano il personale medico nella formulazione di diagnosi tumorali, tenendo conto delle differenze di genere per personalizzare i percorsi diagnostico-terapeutici.

4. Risultati della ricerca

Si presentano di seguito i preliminari risultati dell'analisi del caso studio suddivisi per dominio e costrutto del Consolidated Framework for Implementation Research (adjusted).

i) Caratteristiche dell'innovazione

L'innovazione analizzata riguarda un sistema di supporto alle decisioni basato su algoritmi di machine learning in ambito ematologico, progettato per supportare il personale medico nella formulazione di diagnosi di alcune tipologie di linfomi. L'obiettivo strategico del sistema è quello di ridurre i tempi relativi alle attività diagnostiche, attraverso l'identificazione probabilistica del tipo di patologia tumorale. La base scientifica comprende studi internazionali e ricerche dell'ente che evidenziano come la risposta ai trattamenti e i profili di diagnosi possano differire in base alle caratteristiche di genere. L'adattabilità tecnologica consente di integrare nel tempo nuove variabili cliniche, incluse quelle correlate al genere, rendendo il sistema idoneo a costruire modelli più accurati e sensibili alle peculiarità del singolo individuo.

ii) Ambiente esterno

Le variabili politiche e normative hanno influito positivamente sul processo di implementazione dei sistemi di IA. Le attuali aree strategiche di intervento sia a livello europeo che nazionale incoraggiano lo sviluppo di tecnologie che favoriscano percorsi di cura personalizzati, anche nella prospettiva della medicina di genere. Un importante contributo è stato offerto dal PNRR e dalla ricerca finalizzata che hanno sostenuto finanziariamente gli studi orientati alla costruzione di sistemi di IA per la personalizzazione terapeutica avanzata.

iii) Ambiente interno

La struttura multidisciplinare del team (clinici, matematici, fisici, bioinformatici) favorisce un approccio integrato che consente di arricchire i modelli predittivi con variabili cliniche specifiche, incluse quelle legate al genere. La cultura aziendale orientata alla ricerca ha facilitato l'inserimento della dimensione di genere nei percorsi innovativi e ha promosso l'adozione di pratiche finalizzate alla personalizzazione delle cure. Nella unità operativa di ematologia, l'algoritmo è stato integrato rapidamente nelle routine cliniche, incrementando la capacità di proporre scelte diagnostiche e terapeutiche personalizzate e gender-sensitive.

iv) Le persone coinvolte

La multidisciplinarietà dei team consente di identificare e mitigare bias algoritmici, inclusi quelli di genere, e di costruire sistemi che favoriscano la personalizzazione clinica. La formazione mirata rafforza la capacità dei professionisti di interpretare gli output e di integrare decisioni sensibili alle differenze individuali e di genere.

v) Processo di implementazione

L'approccio bottom-up ha garantito che la pianificazione fosse aderente alle esigenze cliniche reali, incluse quelle relative alla personalizzazione del trattamento e alla sensibilità di genere. Le sperimentazioni avviate nelle linee di ricerca sull'IA costituiscono un contesto ideale per sviluppare modelli predittivi capaci di proporre percorsi individualizzati e gender-sensitive.

5. Conclusioni preliminari

Le analisi del caso studio sono ancora in corso. L'implementazione dell'innovazione nell'azienda esaminata documenta il percorso di introduzione di un sistema di machine learning a supporto delle diagnosi tumorali in ambito ematologico. Ciò che emerge con chiarezza è la centralità dell'integrazione nei processi, della trasparenza, della formazione e della governance dei dati come condizioni abilitanti. I principali benefici che emergono dall'implementazione dell'innovazione tecnologica sono: maggiore accuratezza diagnostica, riduzione di errori diagnostici, supporto al decision making clinico, possibilità di modelli predittivi anche basati su differenze di genere.

Il processo di implementazione delle innovazioni è stato caratterizzato da un approccio di tipo bottom-up: l'iniziativa è stata originata da un gruppo di professionisti composto da personale medico e ricercatori operanti all'interno dell'unità operativa di ematologia. La letteratura sottolinea come strategie bottom-up risultino efficaci nel limitare la comparsa di resistenze al cambiamento, riducendo potenziali conflitti sia verticali (tra manager e clinici) sia orizzontali all'interno dei team operativi (Alami et al., 2021; Golden, 2006).

Il ruolo dei team multidisciplinari si conferma centrale, evidenziando come la collaborazione tra professionisti con competenze diversificate costituisca un fattore chiave per lo sviluppo di soluzioni innovative che non solo potenziano i servizi e migliorano la qualità dei processi clinico-assistenziali, ma favoriscono anche una gestione più efficiente delle risorse impiegate (Bobini et al., 2022). L'integrazione della medicina di genere nei sistemi di IA ha permesso di considerare differenze biologiche e cliniche tra pazienti, contribuendo a decisioni più precise, appropriate ed eque, in grado di adattarsi alle caratteristiche individuali dei singoli pazienti.

Parole chiave: Intelligenza artificiale; medicina di genere; innovazione sanitaria; case study; implementation science

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Track 12: STRATEGIA, GOVERNANCE, ORGANIZZAZIONE, LEADERSHIP PER L'IMPRENDITORIALITÀ E LE INNOVAZIONI

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Growth and innovation strategies in family businesses: emerging models between governance, continuity, and digital transformation

Michele Modina[1], Anna Vittoria Formisano[2], Ilaria Nunzia Nigro[3], Marilena Bredice[4]

1. Introduction

Family businesses represent one of the most important players in European economic systems, accounting for over 70% of businesses and contributing substantially to job creation, innovation, and social value (Basco, 2015; Rovelli et al., 2022). Their resilience and ability to adapt to changing contexts are often attributed to specific structural characteristics: a long-term orientation, a strong value identity, attention to reputation, and intergenerational cohesion (De Massis et al., 2018). However, these same traits can translate into strategic rigidity, limiting the propensity to pursue non-traditional growth paths or undertake radical innovation processes (Chrisman et al., 2015; Hernández-Perlines et al., 2023).

In recent years, three trends have redefined the competitive trajectory of family businesses. Firstly, the growing turbulence in global markets, characterized by volatility in demand and geopolitical instability, requires more dynamic diversification and internationalization strategies (Benito et al, 2022). Secondly, post-pandemic digital transformation has accelerated the adoption of advanced technologies, such as artificial intelligence (AI), blockchain, and big data analytics, opening new opportunities for development but requiring a profound cultural change (Worek, 2025). Finally, the push towards economic, social, and environmental sustainability has introduced new approaches to governance and performance management (De Souza Barbosa et al., 2023). In particular, the COVID-19 pandemic represented a turning point: the crisis forced family businesses to adopt new technologies and organizational methods to ensure business continuity, accelerating adaptation processes that had previously developed more gradually (De Massis et al., 2022).

International literature has recognized that family businesses possess distinctive resources, such as relational capital, tacit knowledge, long-term identity, and intergenerational cohesion, which can be important enablers of innovation and growth (Genc, 2024; López-Nicolás et al., 2024). However, the fragmentation of studies has hindered an integrated understanding of these dynamics.

This paper aims to fill this gap by proposing a unified perspective that analyzes the relationship between growth strategies, family governance, and digital innovation in family businesses. The overall objective is to construct an integrated theoretical model capable of explaining how the combination of family values, governance structures, and digital skills can foster sustainable growth paths consistent with the intergenerational mission of the business.

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2. Theoretical framework

2.1. Growth strategies in family businesses

The analysis of growth strategies for family businesses has long been a diverse strand of management and family business literature. Already in the contributions of Habbershon and Williams (1999), growth is understood as a process that serves to perpetuate the business and the family, rather than as an end in itself. The resource-based approach (RBV) and the "familiness" approach have emphasized the unique combination of tangible and intangible resources specific to family businesses, highlighting how these resources, if properly developed, can constitute a sustainable competitive advantage (Gorovaia & Pfahnl, 2024).

In the most recent developments in research, the theme of growth has been reinterpreted in a strategic-dynamic key. Family firms, in fact, no longer limit themselves to preserving family capital, but seek to enhance it through processes of innovation, diversification, and internationalization (De Massis et al., 2018). Literature distinguishes between different trajectories: organic expansion, mergers and acquisitions, sector diversification, and internationalization.

Palm (2024) shows that M&A transactions have increasingly become a proactive tool for acquiring technological expertise and innovative capabilities, especially in second- or third-generation family businesses. From this perspective, growth is no longer just a goal of expansion in size but a strategy of competitive adaptation. Similarly, diversification is interpreted as a mechanism for mitigating risk and exploring new market opportunities consistent with family values and the relational capital structure of the business.

The most recent literature proposes a distinction between incrementalist and transformative growth strategies. The former, more traditional, aim to consolidate competitive position through gradual and controlled investments, consistent with the long-term orientation typical of family businesses (Schweiger et al., 2024). The latter, on the other hand, involve a greater propensity for risk and openness to new business areas or external partnerships (López-Nicolás et al., 2024). This distinction reflects the dualism between the desire to maintain control and the need to adapt to rapidly changing markets (Akram et al., 2022; López-Nicolás et al., 2024; Schweiger et al., 2024).

Internationalization represents a form of "learning growth," in which family businesses develop new skills and expand their networks through exposure to external contexts. Collaboration with institutional actors, industrial partners, and support organizations allows for increased innovative capacity (Stam, 2015; Cavallo et al., 2018).

In summary, the literature shows that growth strategies in family businesses derive from a dynamic balance between continuity and change. The goal is not simply to increase the size of the business, but to build sustainable development models capable of integrating family aspirations with the competitive demands of the global market (López-Nicolás et al., 2024).

2.2. Family governance and socioemotional wealth (SEW)

In this context, corporate governance determines the ability of a family business to implement growth and innovation strategies (D'Allura & Faraci, 2018). Structural characteristics such as ownership concentration, the presence of family members on the board of directors and in management, and intergenerational succession mechanisms profoundly influence risk appetite, decision-making speed, and willingness to collaborate with external actors (Chrisman & Patel, 2012; Kotlar et al., 2023).

One of the most established theoretical paradigms for understanding these dynamics is that of socioemotional wealth (SEW) (Berrone et al., 2012). SEW represents the set of non-economic benefits that the family derives from owning and controlling the business: the perpetuation of

values, the prestige of the name, the identification of members with the company, and the ability to pass on the family heritage to future generations.

Traditionally, SEW has been associated with conservative behaviors, such as risk aversion or reluctance to dilute family ownership (Gómez-Mejia & Herreo, 2022). However, more recent studies have introduced an evolutionary and dynamic view of the concept. According to Flen Rossi and Rojas-Vallejos (2024), SEW can become a lever for innovation and adaptation when the family interprets growth and technological transformation as tools for preserving and strengthening its identity over time.

The dynamic approach to SEW explains why some family businesses manage to reconcile traditional values with processes of radical renewal (Flen Rossi & Rojas-Vallejos, 2024; Chirico et al, 2025). In these cases, growth becomes a form of "continuity through change" and the family acts as an agent of transformation rather than inertia (Genc, 2024).

At the same time, the composition of boards plays a decisive role. The presence of external directors, the entry of new generations, and the diversification of managerial skills increase the propensity for radical innovation, while reducing the risk of family conflicts. Family governance, therefore, should not be interpreted as a static structure, but as a dynamic mechanism that constantly mediates between identity and adaptation (Gonzales-Bustos et al., 2020; Turrent et al., 2023; Fiorillo et al., 2025).

2.3. Innovation and digital transformation

Innovation has long been a controversial topic for family businesses. While several studies have highlighted their tendency toward conservatism (Nieto et al., 2015), others have emphasized their resilience and ability to innovate in a sustainable manner (Duran et al., 2016). The COVID-19 pandemic represented a significant turning point, forcing many family businesses to accelerate digitalization to ensure business continuity.

De Massis et al. (2022) showed how the pandemic crisis has fostered a process of "forced innovation," pushing even the most traditional businesses to adopt digital technologies, e-commerce platforms, smart working solutions, and data analysis systems. However, only some of these businesses have managed to turn technology adoption into a real competitive advantage, due to a lack of managerial skills and flexible organizational structures.

The integration of artificial intelligence and blockchain-based tools requires a profound rethinking of governance, decision-making processes, and intergenerational relationships (Atienza-Barba et al., 2025; Kumar, 2025). Effective technology adoption depends, in fact, on the ability to combine tacit and relational knowledge accumulated over time with new digital skills (Belkhodja, 2022; Nieto et al., 2023).

In this context, digital transformation is not just a technological phenomenon, but a process that redefines family interactions, decision-making mechanisms, and the intergenerational transfer of skills (Porfirio et al., 2024). Recent studies show that digital transformation can only have a positive effect on performance when accompanied by cultural renewal and openness to collaboration with external actors, such as universities, startups, and technology providers (López-Nicolás et al., 2024).

The integration of family values and technological skills is now the new frontier for family businesses: companies that have been able to transform digitalization into a factor of identity strengthening in the post-pandemic phase are those that have shown the greatest success and resilience (Nieto et al., 2023; Zapata-Cantu et al., 2023). According to Genc (2024), the coexistence of a long-term perspective and an innovation-oriented culture encourages family businesses to adopt an 'ambidextrous' approach, aimed at balancing the exploitation of existing skills with the exploration of new growth opportunities.

Zhou (2025) shows how digital internationalization allows family businesses to overcome traditional geographical limitations while maintaining the centrality of the family in governance.

From this perspective, technology becomes a bridge between the local and the global, between tradition and modernity.

López-Nicolás et al. (2024) suggest that sustainable innovation in family businesses emerges from the alignment of digital strategies with principles of social and environmental responsibility. This approach reflects the growing trend among family businesses to consider social impact as an integral part of their long-term mission.

Finally, the bibliometric results of the analyses confirm that research is converging towards an integrated paradigm, in which growth, innovation, and sustainability are interpreted as interdependent dimensions. Thanks to their value structure and adaptability, family businesses can become laboratories of responsible transformation, capable of combining economic performance and social cohesion.

3. Methodology

To achieve the research objectives, a bibliometric methodology was adopted, which is currently considered one of the most effective tools for analyzing, systematizing, and mapping a large body of scientific knowledge in a given field of study (Verbeek et al., 2002; Khan et al., 2022). The appeal of bibliometric analysis lies in its ability to process large amounts of scientific data, facilitating an accurate and visual representation of the connections between authors, institutions, keywords, and research areas. The use of dedicated software, such as VOSviewer (Van Eck & Waltman, 2010), and complementary tools such as Bibliometrix (Aria & Cuccurullo, 2017), allows the generation of thematic maps and co-occurrence networks that can graphically represent the conceptual structures underlying academic production.

However, the validity of a bibliometric analysis depends on the quality and reliability of the sources used. For this reason, this research was based exclusively on Scopus, one of the most internationally accredited multidisciplinary databases, capable of guaranteeing the coverage and relevance of the contributions analyzed (Zupic & Čater, 2015; Donthu et al., 2021). The analysis focused exclusively on articles in English, without imposing any time limits, in order to include all relevant scientific publications.

The selection was limited to the categories “Business, Management, and Accounting” and “Economics, Econometrics and Finance” with the aim of outlining a picture consistent with the managerial and strategic perspectives of the topic. However, to obtain a more complete view, gray literature sources such as conference proceedings, books, chapters, and review articles were also considered, in line with the recommendations of Adams et al. (2017), Hiebl (2023), and Linnenluecke et al. (2020).

The keywords used in the Scopus search were as follows: (“family firm*” OR “family business*” OR “family company*” OR “family enterprise*”) AND (“growth strategy” OR “innovation” OR “digital transformation” OR “artificial intelligence” OR “AI”) AND (“socioemotional wealth” OR “socio-emotional wealth” OR ‘SEW’ OR “governance”).

The queries returned a total of 305 results. After an initial relevance analysis and the removal of duplicates, the contributions underwent a systematic selection process based on the PRISMA 2020 (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) model, which represents the most advanced methodological benchmark for the selection and validation of content in systematic reviews and meta-analyses (Moher et al., 2021; Page et al., 2021).

This approach ensured high transparency, replicability, and reliability of the analysis process, in line with the suggestions of Gutiérrez-Salcedo et al. (2018) and Fusco et al. (2020). The final sample, consisting of 275 contributions in the “Management” and “Finance” areas, was subjected to bibliometric analysis using two complementary techniques: performance analysis and scientific mapping (Cobo et al., 2011; Baker et al., 2020). Performance analysis was used to assess the productivity and scientific impact of authors, institutions, countries, and journals, providing insights into the distribution and evolution of academic production over time. This phase made it

possible to identify centers of excellence in research on growth and innovation in family businesses and to analyze their influence on the development of the main theoretical lines.

At the same time, scientific mapping has made it possible to explore the conceptual structure of the field of study, identifying the interrelationships between the different thematic dimensions through the analysis of keyword co-occurrences, co-citations, and co-authorship. The use of VOSviewer software has made it possible to graphically represent these relationships, constructing co-authorship maps (Acedo et al., 2006), co-occurrence networks, and co-citation networks (White & Griffith, 1981).

The co-authorship analysis highlighted the density of collaborations between authors and institutions, allowing us to identify the most active research clusters and emerging scientific networks. Co-occurrence analysis, on the other hand, has made it possible to identify the semantic structure of the field, determining the frequency and strength of association between key concepts related to "family firms," "innovation," "growth strategies," and "digital transformation." Finally, co-citation, based on the assumption that two articles frequently cited together deal with related topics, made it possible to outline the cognitive configuration of the discipline (Van Eck & Waltman, 2010).

The methodological process adopted therefore follows a sequential logic of identification, screening, and selection, ensuring a consistent and integrated reading of scientific production. This approach has made it possible to define a comprehensive picture of the state of the art and to identify the main trajectories of development of research on growth strategies and innovation in family businesses.

4. Expected results

Performance analysis provides an overview of scientific developments in the field of growth strategies and innovation in family businesses, highlighting the main trends over time, authors, countries, and sources of publication.

The trend over time in publications (Figure 1) shows growing and constant interest, with an initial phase of exploration in the 2000s and a significant acceleration since 2015. The most recent peak, in the two-year period 2023–2024, confirms that the topic is booming and has not yet reached maturity. This dynamic reflects the growing attention to digital transformation and sustainability as new strategic levers for family firms.

Analysis of the main authors shows the formation of a consolidated scientific core, including De Massis, Kraus, Kotlar, Lazzarotti, and Martínez-Romero, which constitutes the theoretical reference for studies on growth, innovation, and governance in family businesses. The relative homogeneity in the distribution of publications suggests a consolidating field, characterized by a high degree of collaboration and interdisciplinary openness.

From a geographical perspective, production is dominated by China, Italy, and Spain, followed by the United States and the United Kingdom. The strong presence of European countries reflects the importance of family businesses in the continent's productive fabric, while China's rise indicates growing international attention to family models of growth and innovation in emerging markets.

Finally, publication sources confirm the relevance of the topic within leading management and innovation journals, such as the Journal of Family Business Strategy, the Journal of Family Business Management, and the Journal of Business Research. The balanced distribution between specialist and generalist journals signals the cross-cutting nature of the topic and its progressive integration into broader debates on strategy and sustainability.

Overall, the results of the performance analysis show a rapidly growing thematic domain, supported by a cohesive and geographically diverse scientific community, confirming the centrality of family businesses as a privileged laboratory for studying the interaction between innovation, governance, and sustainable growth.

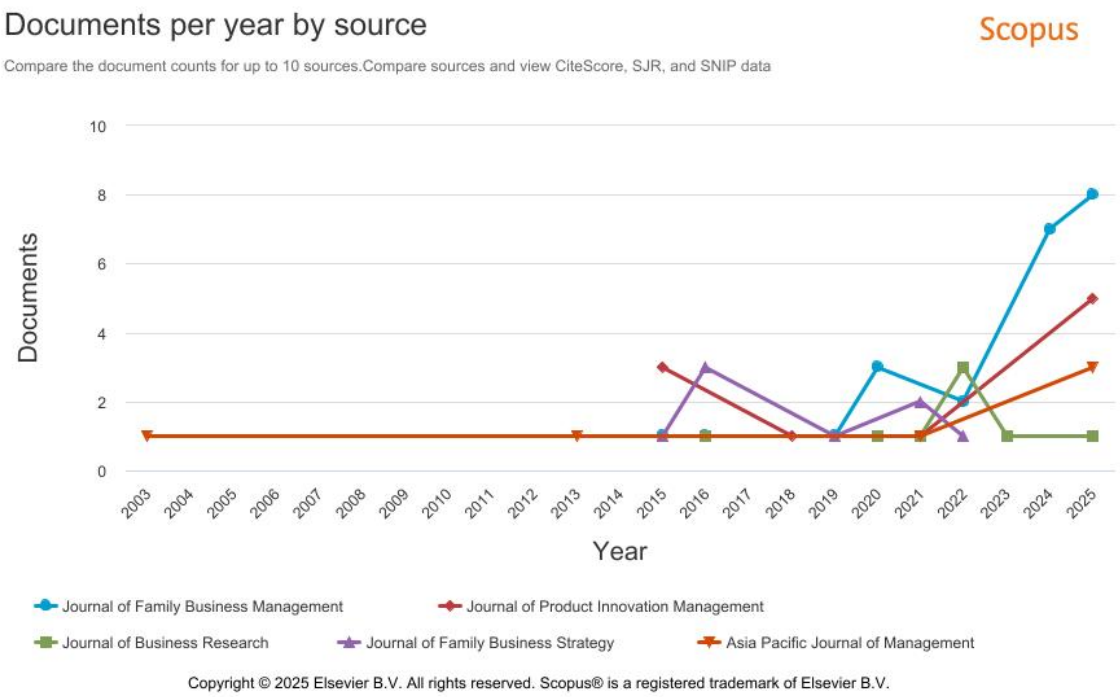


Figure 1. Documents by year by source

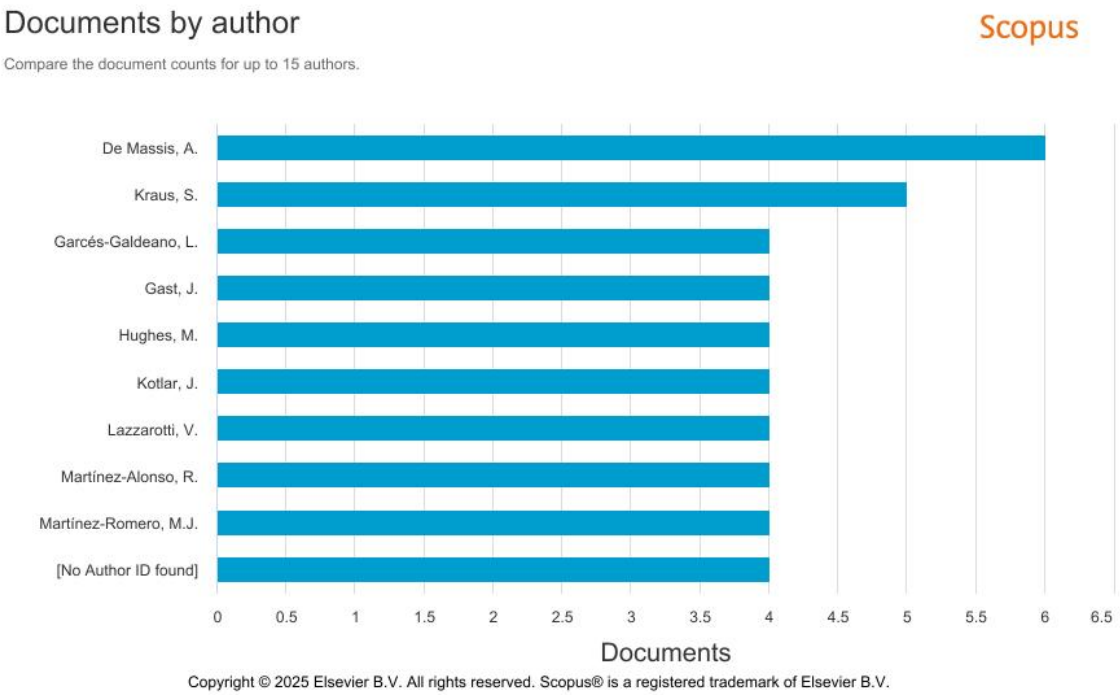


Figure 2. Documents by author

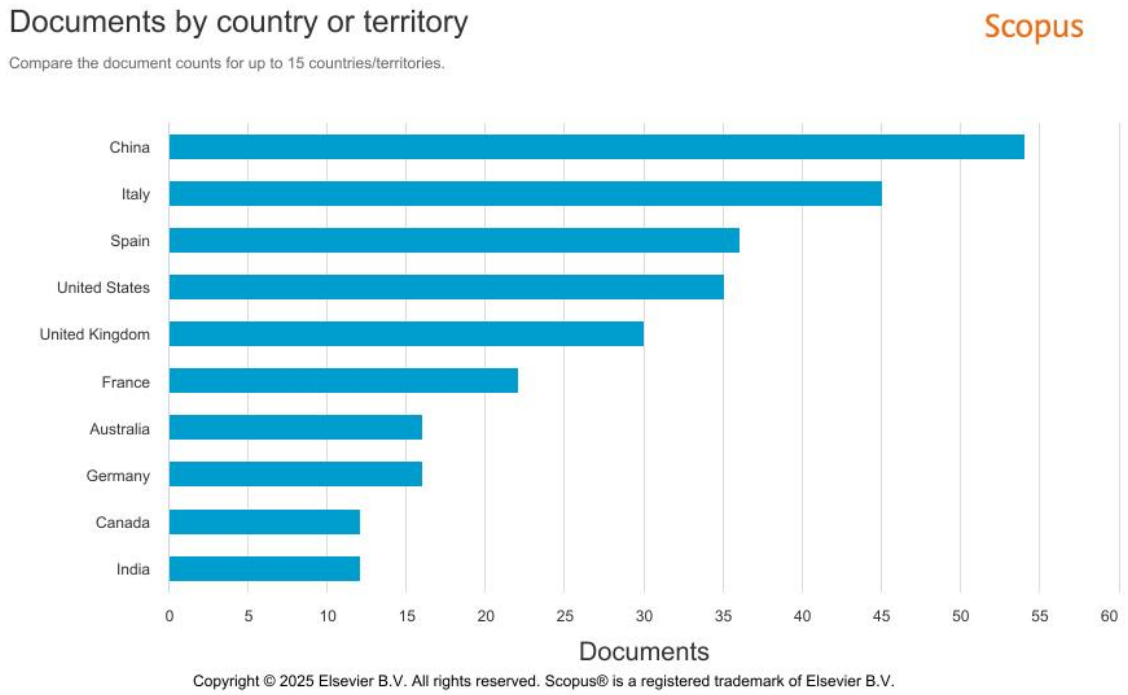


Figure 3. Documents by country or territory

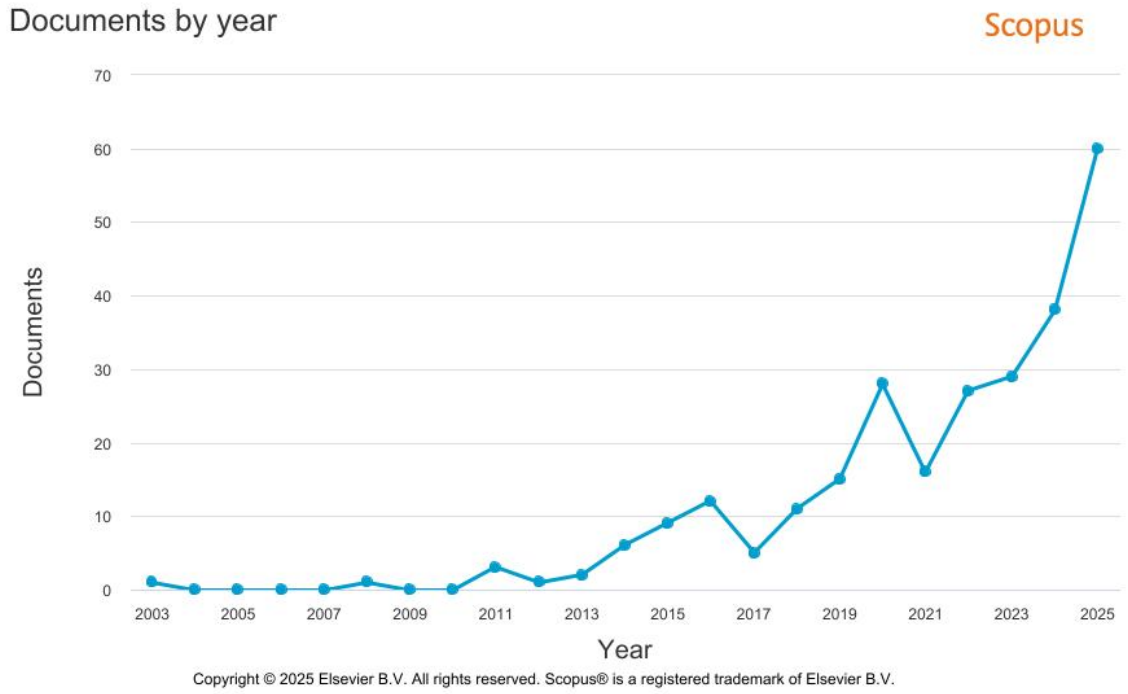


Figure 4. Documents by year

The research, which is still ongoing, is expected to achieve significant results in terms of theory and application. Firstly, it is expected to outline an integrated mapping of the literature on growth strategies and innovation in family businesses. A conceptual evolution is expected to

emerge from the traditional view of growth, based on continuity and control, towards a "hybrid" perspective, in which digitalization and innovation represent tools for protecting the SEW and not factors of threat.

Secondly, bibliometric analysis should confirm the centrality of governance as a mechanism connecting family values and innovation capacity. Family businesses with more diversified and professionalized boards are expected to show a greater propensity to combine external growth strategies with internal innovation processes, in line with the latest research.

A third expected result concerns the construction of an integrated conceptual model linking family governance, dynamic SEW, and digital transformation as joint determinants of growth. This model, which will form the basis for future empirical investigations, aims to explain how entrepreneurial families can transform their identity values into a sustainable competitive advantage through the selective adoption of digital technologies and openness strategies.

Finally, we expect to identify the most relevant research gaps, particularly those relating to the impact of artificial intelligence on family decision-making practices, the role of new generations in the diffusion of innovation, and the interactions between territorial ecosystems and the performance of family businesses.

5. Conclusions and implications

This study contributes to advancing knowledge about family businesses by providing a unified view of the relationships between growth, innovation, and governance. Its main contribution lies in proposing a theory of adaptive growth, in which the capacity for innovation derives from the dynamic interaction between family values and digital skills. Far from being a constraint, SEW is a strategic resource capable of guiding innovation in a responsible manner consistent with family identity.

The managerial implications suggest the need to promote more open and inclusive governance models that encourage the participation of new generations and the entry of digital skills into boards. Digital transformation must be interpreted as a process of evolutionary continuity, capable of strengthening the reputation and sustainability of family businesses in the long term. Finally, the policy implications concern the need for public programs to accompany digitization and incentives for management training, in order to support the competitiveness of the European family business fabric.

Keywords: Family businesses; growth strategies; innovation; socioemotional wealth; governance; digital transformation; bibliometric analysis

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Leader nell'era degli algoritmi: leadership e percezioni dell'intelligenza artificiale nella PA

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1. Introduzione

L'intelligenza artificiale (IA) sta progressivamente occupando un ruolo sempre più rilevante nelle scelte gestionali e nelle pratiche organizzative, trasformando sia il settore privato (Davenport & Ronanki, 2018) sia quello pubblico (Mergel et al., 2023; Tangi et al., 2024).

Nonostante la crescente attenzione verso l'IA nelle amministrazioni pubbliche, la letteratura presenta un gap significativo: mentre numerosi studi hanno analizzato il ruolo della leadership nell'accettazione tecnologica nel settore privato (Aziz et al., 2020; Hasija & Esper, 2022; Molino et al., 2021; Schepers et al., 2005; Smothers et al., 2024; Yuniawan et al., 2025; Zhang et al., 2025), nel settore pubblico le ricerche si sono concentrate soprattutto sulle percezioni dei cittadini (Aoki, 2020; Araujo et al., 2020; Gesk & Leyer, 2022; Schiff et al., 2025), o sugli atteggiamenti generali dei dipendenti verso l'IA (Ahn & Chen, 2022; Giraldi et al., 2024; Haesevoets et al., 2025), trascurando il contributo della leadership nel modellare la propensione verso queste evoluzioni tecnologiche.

Il presente lavoro mira a colmare tale lacuna, esplorando in quale modo la leadership possa efficacemente sostenere l'adozione di tecnologie legate all'IA nel settore pubblico. In particolare, l'analisi indaga come la leadership trasformazionale (Bass & Avolio, 1994) e lo scambio leader-membro (LMX) (Bauer & Green, 1996) possano influenzare le attitudini legate all'accettazione dell'IA da parte dei dipendenti pubblici. Tale scelta mira ad approfondire l'evidenza che la leadership possa plasmare non solo il contesto organizzativo, ma anche i significati attribuiti all'innovazione, incidendo sull'accettazione dell'innovazione tecnologica e, in ultimo, sull'utilizzo ottimale della stessa (Ajzen & Fishbein, 2000; Schepers et al., 2005; Zare & Flinchbaugh, 2025).

Muovendo dalla centralità delle percezioni individuali nei modelli di accettazione tecnologica (Ajzen, 1985; Davis, 1989) e dalle evidenze che collegano atteggiamenti favorevoli a una maggiore propensione all'uso dell'IA (Choung et al., 2023; Grassini, 2023; Lichtenthaler, 2019), il presente studio risponde a due domande di ricerca: (1) in che modo differenti forme di leadership influenzano la propensione dei dipendenti pubblici ad adottare l'IA? e (2) tale relazione è mediata dal valore organizzativo percepito?

Trattandosi di un lavoro in corso, le analisi presentate costituiscono risultati preliminari suscettibili di ulteriori approfondimenti e verifiche nelle fasi successive della ricerca. Ciononostante, utilizzando un modello di equazioni strutturali (SEM) su un campione di 809 dipendenti di enti locali italiani, emergono spunti interessanti. La presenza di leadership trasformazionale incide indirettamente sulla propensione ad adottare l'IA attraverso il valore organizzativo percepito. Al contrario, lo scambio leader-membro non presenta alcuna influenza

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significativa. Coerentemente con la letteratura esistente, caratteristiche individuali e organizzative contribuiscono ulteriormente a modellare tali percezioni.

2. Quadro teorico e ipotesi

Nei processi di cambiamento organizzativo, è ampiamente riconosciuto che le persone abbiano un ruolo centrale (Choi, 2011). Le percezioni e le attitudini individuali rappresentano, infatti, determinanti cruciali dei comportamenti, inclusi quelli legati all'adozione delle innovazioni tecnologiche (Ajzen & Fishbein, 2000; Choung et al., 2023; Venkatesh et al., 2003). Nel settore pubblico, l'adozione dell'intelligenza artificiale costituisce una trasformazione particolarmente rilevante, poiché introduce modalità decisionali e operative nuove, potenzialmente in grado di modificare ruoli, competenze e confini professionali (Giacomini & Grandi, 2025). Analizzare le attitudini dei dipendenti verso tali tecnologie risulta dunque fondamentale per comprendere i meccanismi di accettazione e resistenza, nonché per prevedere l'utilizzo ottimale dell'IA nel lavoro amministrativo (Araujo et al., 2020; Grimmelikhuijsen & Tangi, 2024; Lichtenthaler, 2019). Il celebre modello di accettazione della tecnologia (Technology Acceptance Model, TAM), fornisce un quadro teorico solido per interpretare tali dinamiche, evidenziando le percezioni individuali come i principali antecedenti dell'adozione e utilizzo di una tecnologia (Davis, 1989; Venkatesh, 2022). Un ulteriore riferimento teorico rilevante è rappresentato dalla teoria della Diffusione dell'Innovazione (Diffusion of Innovation, DOI), secondo la quale uno dei principali determinanti dell'adozione e della successiva diffusione di un'innovazione tecnologica risiede nel vantaggio relativo percepito dagli utilizzatori. Evidenze più recenti confermano inoltre che il successo nell'adozione delle tecnologie basate sull'intelligenza artificiale non dipende esclusivamente dalle caratteristiche intrinseche della tecnologia, dalle risorse organizzative disponibili o dalle pressioni normative esterne, ma è significativamente influenzato anche dalle predisposizioni individuali e dal livello di accettazione da parte dei dipendenti pubblici (Haesevoets et al., 2025). Tali valutazioni a livello micro plasmano le risposte comportamentali all'innovazione e, se aggregate, influenzano i percorsi di adozione organizzativa e il successo dell'implementazione (Puranam, 2018).

Recenti evidenze empiriche nell'ambito della pubblica amministrazione corroborano tale prospettiva, mostrando come il valore organizzativo percepito costituisca un significativo predittore della predisposizione individuale all'adozione dell'intelligenza artificiale (Grimmelikhuijsen & Tangi, 2024). Ad esempio, Ahn e Chen (2022) evidenziano come le percezioni individuali svolgano un ruolo determinante nel plasmare la disponibilità a sostenere l'adozione dell'intelligenza artificiale nelle organizzazioni pubbliche. In particolare, tale disponibilità risulta fortemente influenzata dai benefici organizzativi attribuiti all'impiego della tecnologia, quali il miglioramento della qualità dei servizi erogati e il rafforzamento dei processi decisionali. Gli autori mostrano come la percezione del contributo dell'IA alle prestazioni organizzative, in termini di efficienza, efficacia e creazione di valore pubblico, assuma un peso maggiore rispetto a fattori quali l'incremento della produttività individuale o gli atteggiamenti personali nei confronti della tecnologia, configurandosi come un elemento chiave nel sostegno alla sua implementazione e al suo utilizzo. In tale prospettiva, e alla luce dei principali contributi delle teorie tradizionali, il presente lavoro ipotizza che il valore organizzativo derivante dall'adozione della nuova tecnologia, così come percepito dal dipendente pubblico, rappresenti un fattore determinante nel modellare le percezioni individuali nei confronti della tecnologia e, conseguentemente, la propensione o la resistenza al suo utilizzo.

La centralità delle attitudini individuali richiama l'attenzione sul ruolo della leadership, la quale può modellare tali rappresentazioni, influenzando il modo in cui i dipendenti comprendono e valutano il cambiamento tecnologico (Rodriguez Müller et al., 2025). Comune a molte definizioni di leadership è, infatti, l'enfasi sul processo di influenza sociale che essa implica, attraverso il quale vengono facilitati gli sforzi per raggiungere obiettivi condivisi (Oreg & Berson,

2019), e che influenza le attitudini e i comportamenti dei follower (Backhaus & Vogel, 2022). La relazione con i follower consiste, infatti, in uno scambio reciproco, in cui l'impegno, la fiducia e il sostegno emotivo del leader vengono ripagati attraverso impegno, lealtà e apertura al cambiamento (Cropanzano & Mitchell, 2005; Oreg & Berson, 2011; Zhang et al., 2025).

Nel contesto dell'adozione dell'IA, quindi, l'influenza sociale della leadership risulta particolarmente rilevante. L'introduzione di tecnologie avanzate può generare tra i follower incertezza, resistenza o timori legati alla sostituzione di competenze e ruoli, che possono essere superate grazie al supporto del leader (Oreg & Berson, 2019; Schepers et al., 2005). Inoltre, la leadership può influire direttamente sulle percezioni individuali, favorendo una valutazione più positiva dei benefici dell'IA e aumentando quindi la probabilità di utilizzo, in linea con i meccanismi proposti dal TAM (Aziz et al., 2020; Lichtenthaler, 2019).

L'ipotesi di fondo del lavoro è che i leader nella pubblica amministrazione, alla luce della progressiva adozione dell'IA (Grimmelikhuijsen & Tangi, 2024), mostrino una maggiore propensione verso l'adozione di tale innovazione (Haesevoets et al., 2025) e, di conseguenza, abbiano interesse a promuoverne l'accettazione anche tra i dipendenti dell'organizzazione (Attard-Frost et al., 2024; Kelly, 2025; Osborne & Nasi, 2024; Tangi et al., 2022). Al contempo, come illustrato, le percezioni individuali relative ai benefici organizzativi derivanti dall'utilizzo delle innovazioni tecnologiche sono fattori chiave per l'accettazione, il supporto e l'utilizzo ottimale delle medesime. L'adozione efficace dell'IA nelle organizzazioni dipende, infatti, dalla propensione individuale all'utilizzo, la quale è a sua volta condizionata dalla percezione, da parte degli individui, del valore che tale tecnologia può apportare al conseguimento degli obiettivi organizzativi.

In tale prospettiva, diverse forme di leadership possono essere comprese come configurazioni differenti di risorse simboliche, motivazionali e relazionali offerte ai follower, che incidono sulle percezioni individuali e sulla conseguente disponibilità all'adozione e all'utilizzo dell'IA. Per il loro potenziale, il lavoro analizza l'influenza di leadership trasformazionale e LMX (Jeong & Jeong, 2025; Martin et al., 2016). È necessario notare che, che, sebbene la letteratura talvolta li sovrapponga, i due costrutti sono concettualmente distinti e implicano meccanismi di influenza differenti (Zare & Flinchbaugh, 2025). Muovendo da tali premesse teoriche, è possibile articolare in modo più specifico come differenti stili di leadership si traducano in meccanismi capaci di influenzare le percezioni e i comportamenti dei dipendenti rispetto all'IA.

La leadership trasformazionale si caratterizza per i quattro elementi di influenza idealizzata, motivazione ispiratrice, stimolazione intellettuale e considerazione individualizzata (Avolio et al., 1991; Avolio & Yammarino, 2013; Bass & Avolio, 1994). I leader trasformazionali ispirano e guidano i follower mediante una visione motivante, promuovono l'apertura al cambiamento e favoriscono l'apprendimento organizzativo (Wright et al., 2012). In tal modo, possono migliorare la percezione del valore derivante dalle nuove tecnologie, come evidenziato da studi condotti in organizzazioni private (Jeong & Jeong, 2025; Quaquebeke & Gerpott, 2023; Schepers et al., 2005). Seguendo la logica del quadro teorico proposto, è plausibile che tale influenza operi proprio attraverso il beneficio organizzativo dell'IA per la pubblica amministrazione. Quindi, si può ipotizzare quanto segue:

- HP1.1. La leadership trasformazionale ha un effetto positivo sulla propensione ad adottare l'AI.
- HP1.2. Il valore organizzativo percepito media la relazione tra leadership trasformazionale e propensione ad adottare l'IA.

Il costrutto del LMX si concentra, invece, sulla qualità della relazione diadica tra leader e follower, nel quale il leader costruisce un rapporto personalizzato a seconda del follower con il quale si interfaccia (Wright et al., 2012). Lo scambio leader-membro è concettualmente radicato nella teoria dello scambio sociale, poiché descrive come le relazioni basate su fiducia, rispetto e reciprocità producano benefici reciproci (Cropanzano & Mitchell, 2005; Tummers & Knies, 2013). Un LMX di alta qualità genera maggiore coinvolgimento, lealtà e disponibilità dei

dipendenti, con effetti positivi su diversi esiti individuali e organizzativi (Martin et al., 2016). In contesti di innovazione tecnologica, relazioni di questo genere hanno solitamente un'influenza positiva e possono favorire atteggiamenti più aperti e cooperativi verso l'adozione di strumenti innovativi (Smothers et al., 2024). Anche per il LMX, coerentemente con la prospettiva teorica proposta, è plausibile che l'effetto si manifesti attraverso il beneficio organizzativo percepito.

- HP2.1. La presenza di LMX ha un effetto positivo sulla propensione ad adottare l'AI.
- HP2.2. Il valore organizzativo percepito media la relazione tra LMX e propensione ad adottare l'IA.

Nel complesso, entrambe le prospettive teoriche convergono nel riconoscere alla leadership un ruolo centrale nel promuovere fiducia, reciprocità e allineamento dei follower rispetto agli obiettivi organizzativi. Attraverso tali meccanismi, la leadership è in grado di influenzare in modo significativo i processi interpretativi e valutativi mediante i quali gli individui attribuiscono valore all'introduzione di tecnologie emergenti, orientandone la percezione del contributo alla creazione di valore organizzativo. In questa prospettiva, il comportamento e lo stile relazionale dei leader non si limitano a plasmare la cultura e il clima organizzativo, ma incidono anche sulle percezioni individuali relative al valore, all'affidabilità e alle potenzialità delle tecnologie emergenti. Il valore organizzativo percepito si configura pertanto come una leva strategica attivabile dalla leadership per favorire una maggiore disponibilità all'adozione dell'intelligenza artificiale e, più in generale, per sostenere la propensione, prima individuale e poi organizzativa, all'innovazione.

3. Misure e metodologie

Il modello proposto utilizza scale validate per la misurazione dei costrutti di interesse. I due tipi di leadership sono operazionalizzati mediante scale derivate rispettivamente da Wright et al. (2012) e Bauer & Green (1996). Il valore organizzativo dell'IA per la pubblica amministrazione consiste in una scala sviluppata e validata dagli autori[4]. La propensione all'adozione di IA è misurata tramite la scala di Grassini (2023), la quale valuta le attitudini generali verso l'IA. La scala viene qui utilizzata come proxy della propensione all'adozione, in quanto sviluppata nell'alveo concettuale del TAM. Tutte le variabili sono state misurate tramite item a risposta su scala Likert a 5 punti (da 1 = "fortemente in disaccordo" a 5 = "fortemente d'accordo").

Le variabili di controllo incluse nel modello sono: età, genere, ruolo, anni di esperienza lavorativa dell'individuo e dimensione (numero di abitanti serviti) e sede (area geografica) dell'amministrazione, caratteristiche rivelatesi influenti in modelli analoghi (Ahn & Chen, 2022; Araujo et al., 2020; Giraldi et al., 2024).

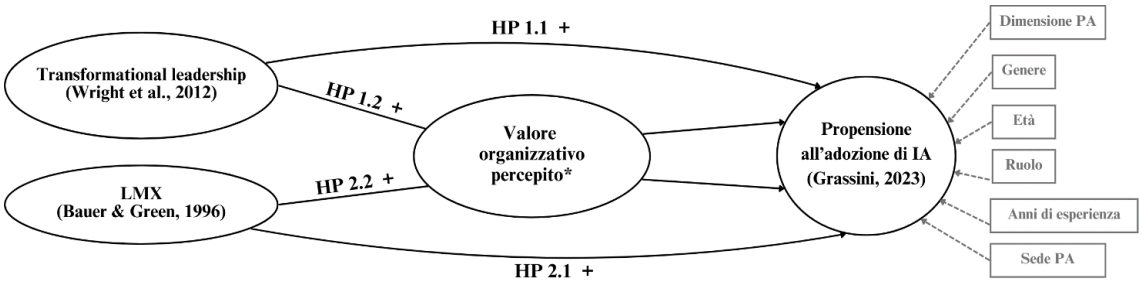


Figura 1. Illustrazione del modello proposto

[4] L'articolo di validazione del costrutto è in fase di review.

I dati sono stati raccolti mediante un questionario somministrato a un campione di dipendenti degli enti locali italiani, utilizzando una strategia di snowball sampling. Dopo le procedure di data cleaning, il campione finale risulta composto da 809 rispondenti. La raccolta si è concentrata sulle amministrazioni locali, poiché rappresentano il livello amministrativo più vicino ai cittadini e sono responsabili dell'erogazione di un'ampia gamma di servizi pubblici. Il campione è costituito prevalentemente da donne (n= 501), seguite da uomini (n= 306) e da persone non binarie (n= 2). In linea con i dati forniti dall'Osservatorio INPS, che sottolinea come il 76,6% dei lavoratori pubblici abbia almeno 40 anni (INPS, 2025), la maggioranza relativa dei rispondenti ha più di 49 anni (n= 399), seguita dalla fascia 30-49 anni (n= 372) e infine da quella sotto i 30 anni (n= 38). In termini territoriali, il 37.5% proviene da amministrazioni del Nord Italia (n= 304), il 59% dal Sud (n= 477) e il 3.5% dal Centro (n= 28). Quanto ai ruoli, la maggioranza è composta da funzionari o impiegati (n= 725), seguiti da dirigenti o segretari comunali (n= 54) e da personale con mansioni operative (n= 30).

L'analisi dei dati si è articolata in più fasi, dalla verifica preliminare della validità delle misure fino alla stima del modello strutturale. Poiché tutti i costrutti utilizzati derivano da scale validate, è stata condotta un'analisi fattoriale confermativa (CFA). I caricamenti dei fattori, tranne uno pari a .444, variano tra .613 e .970. Gli indici di adattamento risultanti (CFI = .947; TLI = .939; RMSEA = .078; SRMR = .033) indicano un livello di fit accettabile (Hair et al., 2019). L'affidabilità dei costrutti è risultata soddisfacente: tutti i valori di Cronbach's α e Composite Reliability (CR) superano la soglia di .80, mentre l'Average Variance Extracted (AVE) è superiore a .60, confermando l'adeguatezza della validità convergente e discriminante (Hair et al., 2019) (Appendice – tabella 1).

La Common Method Variance è stata controllata garantendo l'anonimato delle risposte e tramite l'Harman's single-factor test, che ha riportato un valore di varianza spiegata pari a .352, inferiore alla soglia restrittiva di .40.

Successivamente è stato stimato un modello di equazioni strutturali (SEM) utilizzando il pacchetto lavaan per R (Rosseel, 2012), al fine di testare le ipotesi e le relazioni di mediazione secondo l'approccio proposto da Hair et al. (2019). Dopo aver verificato la significatività della relazione tra la variabile mediatrice e la variabile dipendente, sono stati confrontati i modelli mediato e non mediato. Gli indici di adattamento del modello finale risultano soddisfacenti (χ^2 = 1479.708; df = 323; $p < .001$; CFI = .939; TLI = .931; RMSEA = .067; SRMR = .036).

4. Risultati preliminari

Le ipotesi Hp.1.1 e 2.1 non trovano conferma, poiché nessuna delle due tipologie di leadership mostra effetti diretti sulla variabile indipendente, la propensione all'adozione dell'IA. In altre parole, la presenza di leadership, indipendentemente dalla tipologia, non influisce direttamente sulle percezioni individuali e la propensione ad adottare l'intelligenza artificiale.

Nel modello mediato, tuttavia, la leadership trasformazionale (Hp. 1.2) mostra un effetto positivo e significativo sul valore organizzativo percepito (β= 0.271; p<.001) la quale, a sua volta, influenza in modo marcato la propensione ad adottare l'IA (β= 0.799; p<.001). L'analisi dell'effetto indiretto conferma che la leadership trasformazionale incide significativamente sulla propensione all'adozione dell'IA attraverso il valore organizzativo percepito (β= 0.217, p< .001), configurandosi pertanto come un mediatore pieno. Tali risultati confermano evidenze precedenti legate a organizzazioni private, spiegando che ciò avviene grazie alla stimolazione intellettuale generata da tale stile di leadership (Schepers et al., 2005). Contrariamente, la LMX non manifesta alcuna influenza significativa nel modello proposto.

Le variabili di controllo offrono spunti interpretativi aggiuntivi. L'età incide negativamente sul valore organizzativo percepito: i dipendenti pubblici più anziani tendono a percepire meno il valore dell'IA per la pubblica amministrazione. Il genere mostra effetti significativi, con gli

uomini che esprimono percezioni più positive rispetto alle donne, coerentemente con precedenti evidenze empiriche (Araujo et al., 2020; Giraldi et al., 2024; Grassini, 2023).

La dimensione dell'organizzazione pubblica, misurata in base al numero di abitanti serviti, risulta positivamente associata alla percezione del valore: nelle amministrazioni di maggiori dimensioni l'IA tende a essere considerata in modo maggiormente favorevole (Ahn & Chen, 2022). Tale relazione potrebbe derivare dalla maggiore complessità organizzativa e dal più elevato fabbisogno di efficienza dei processi, ambiti nei quali l'IA può offrire un contributo significativo. In alternativa, essa potrebbe riflettere il fatto che i dipendenti delle organizzazioni di più ampia scala dispongono generalmente di opportunità formative più strutturate (Hansson, 2007) e risultano, di conseguenza, maggiormente consapevoli delle potenzialità offerte da queste tecnologie. Infine, il ruolo ricoperto è rilevante, in quanto i dirigenti e i segretari comunali mostrano una percezione più favorevole dell'IA rispetto ai funzionari e agli operai, confermando l'ipotesi secondo cui chi occupa posizioni di leadership tende a riconoscere maggiormente il potenziale dell'IA e a promuoverne l'adozione (Haesevoets et al., 2025).



Figura 2. Illustrazione schematica dei risultati significativi delle analisi.

5. Conclusioni

Complessivamente, il modello proposto spiega una quota significativa della varianza nei costrutti endogeni e mostra che la leadership trasformazionale è in grado di orientare positivamente i dipendenti verso l'IA, agendo attraverso la trasmissione del vantaggio organizzativo derivato dall'utilizzo di tale tecnologia per il settore pubblico. I risultati preliminari indicano, quindi, che tale forma di leadership può rappresentare un fattore abilitante del cambiamento digitale orientato all'adozione delle tecnologie legate all'IA (Valle-Cruz et al., 2024).

Attraverso la capacità di valorizzare i benefici organizzativi associati all'IA, la leadership trasformazionale favorisce percezioni più positive e, di conseguenza, una maggiore propensione all'utilizzo. Il vantaggio organizzativo emerge dunque come un mediatore centrale tra la visione strategica del leader e il comportamento individuale, in linea con il quadro teorico presentato Diversamente, la qualità dello scambio leader–membro non risulta associata alla propensione all'adozione dell'IA, indicando che la qualità della relazione interpersonale con il leader non produce necessariamente un orientamento favorevole verso l'innovazione.

Infine, le variabili di controllo evidenziano differenze sistematiche tra gruppi demografici: età, genere, ruolo gerarchico e dimensione dell'ente influiscono significativamente nel modello, confermando che fattori individuali e organizzativi contribuiscono a modulare le percezioni nei confronti dell'IA.

Parole chiave: Intelligenza artificiale; trasformazione organizzativa; leadership trasformazionale; LMX; leadership pubblica; enti locali

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Appendice

Variabile	AVE	CR	Cronbach α
AIAdoption	0.783	0.935	0.934
AIforPA	0.826	0.959	0.957
LMX	0.603	0.921	0.930
Transformational	0.798	0.952	0.951

Tabella 1. Affidabilità e validità dei costrutti.

	Estimate	SE	z-value	p-value	Std.all
Transformational → AIforPA	**0.271**	**0.048**	**5.652**	**<.001**	**0.233**
Transformational → AIAdoption	-0.006	0.023	-0.239	0.811	-0.005
AIforPA → AIAdoption	**0.799**	**0.026**	**30.906**	**<.001**	**0.893**
LMX → AIforPA	0.006	0.119	0.048	0.962	0.002
LMX → AIAdoption	0.020	0.057	0.343	0.731	0.008

Tabella 2. Effetti diretti.

	Estimate	SE	z-value	p-value	Std.all
Transformational → AIAdoption	**0.217**	**0.039**	**5.580**	**<.001**	**0.208**
LMX → AIAdoption	0.005	0.095	0.048	0.962	0.002

Tabella 3. Effetti diretti.

	Estimate	SE	z-value	p-value	Std.all
Transformational → AIAdoption	**0.211**	**0.046**	**4.593**	**<.001**	**0.203**
LMX → AIAdoption	0.024	0.111	0.218	0.828	0.009

Tabella 4. Effetti totali.

	Estimate	**SE**	**z-value**	**p-value**	**Std.all**
Effetto su AIforPA					
Età	**-0.132**	**0.054**	**-2.431**	**0.015**	**-0.109**
Genere	**0.416**	**0.079**	**5.270**	**<.001**	**0.180**
Esperienza	0.097	0.057	1.707	0.088	0.080
Area geografica	-0.152	0.083	-1.819	0.069	-0.073
N. abitanti serviti	**0.168**	**0.038**	**4.475**	**<.001**	**0.186**
Ruolo	-0.012	0.115	-0.103	0.918	-0.003
Effetto su AIAdoption					
Età	-0.008	0.030	-0.262	0.793	-0.007
Genere	0.050	0.041	1.219	0.223	0.024
Esperienza	0.004	0.032	0.118	0.906	0.003
Area geografica	0.025	0.049	0.521	0.602	0.014
N. abitanti serviti	-0.009	0.019	-0.485	0.627	-0.012
Ruolo	**-0.106**	**0.055**	**-1.932**	**0.053**	**-0.034**

Tabella 5. Effetti delle variabili di controllo.

Entrepreneurial Ecosystems and Organized Crime: Evidence from Italian Regions

Riccardo Campagnolo[1], Francesca Capo[2], Mara Bergamaschi[3]

1. Introduction

The impact of organized crime on the economy is a highly relevant issue for the competitiveness of territories and the development of businesses. In particular, the ability of criminality to infiltrate the economic fabric and influence business dynamics represents a significant challenge for institutions and economic actors. In Italy, the presence of criminal organizations is historically rooted in certain regions, but in recent decades the phenomenon has taken on a national scope, extending even into the more economically developed areas of the country.

This working paper aims to analyze the influence of organized crime on regional business ecosystems, with a particular focus on venture capital and private equity investments, two crucial elements for business growth and innovation. These financing instruments represent an essential lever for strengthening the local business fabric, as they facilitate the development of startups and high-potential companies, accelerating processes of digitization, research and development, and the adoption of new technologies. In particular, complex economies are increasingly relying on innovation ecosystems, meaning networks of interconnected economic and institutional actors (including companies, universities, research centers and policy makers) that foster the development of technological solutions and new business models.

However, the environment in which businesses operate is strongly influenced by institutional stability, the quality of governance and, indeed, the degree of infiltration of organized crime (Operti, 2018). In contexts where the economic system is permeable to crime, market dynamics are distorted, making it difficult for new players to enter and discouraging private investment (Mocetti and Rizzica, 2021).

This ongoing research aims to examine the relationship between organized crime and entrepreneurial development in Italian regions. Specifically, we collected data on the amount of capital invested by private equity and venture capital firms in a region and the number of new businesses emerged, and regress them with the quantity of organized crime activities over a five-years period (2017-2021). Our results show, in line with some research on the topic (Dutta and Sobel, 2016; Mohammad et al., 2024), that the presence of organized crime is a variable influencing local economic dynamics through various channels, both direct and indirect.

This working paper aims to offer useful insights for entrepreneurs, managers, and policymakers, providing inputs for the development of strategies to strengthen the business environment and promote a more investment-attracting environment.

2. Theoretical Background

Entrepreneurial ecosystems, organized crime, and corruption

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Literature has investigated the conditions that foster or constrain entrepreneurial development and allow to create an environment that is favorable to economic competitiveness (Buciuni and Corò, 2023; Florida and Mellander, 2016). In particular, scholars have shown that the synergy between skilled human capital, strong interpersonal relationships and an advanced financial system is the foundation for the development of a successful innovation ecosystem (Stam and Van de Ven, 2021). Only through the integration of these elements is it possible to create a business environment that can compete globally and, at the same time, strengthen local economies through knowledge transfer and shared value creation.

In investigating the factors that allow entrepreneurial ecosystems to emerge and thrive, scholars have also been studying the relationship between corruption and innovation, fueling a debate over two opposing perspectives: the "sanding" perspective and the "greasing" perspective. The "sanding" perspective argues that corruption hinders innovation by increasing costs and creating uncertainty. Firms face unexpected payments for key resources such as licenses, permits, and intellectual property rights, thus discouraging investment in innovative activities (Mohammad et al., 2024). In contrast, the "greasing" perspective suggests that, in contexts with weak institutions and excessive regulations, corruption can act as a "lubricant" to accelerate bureaucratic processes and facilitate entrepreneurial activity. Mohammad et al. (2024) analyze these two perspectives through a systematic review of the literature, showing that the "grease the wheels" effect occurs predominantly in the short run. In bureaucratic environments, paying bribes allows firms to obtain licenses and permits more quickly, overcoming barriers that would otherwise have hindered their operations. However, the authors emphasize that this benefit is contingent on the presence of an inefficient institutional environment and that the positive effects tend to be limited over time. Dutta and Sobel (2016) further elaborate on the concept of "grease the wheels," showing that, in particularly rigid regulatory environments, corruption can temporarily increase entrepreneurial activity by allowing entrepreneurs to "circumvent" administrative obstacles. However, the authors point out that these benefits are only short-lived and do not represent a sustainable solution as the direct positive effects of corruption are quickly outweighed by the indirect negative ones, such as the loss of social trust and an inefficient allocation of resources.

Adding to this discussion, Mirenda, Mocetti, and Rizzica (2019) offer an important perspective on the economic impact of 'ndrangheta infiltration into legal businesses. The authors reveal that, in the short term, mafia infiltrations can produce seemingly positive outcomes for affected businesses. This result is attributed to several factors, including access to low-cost illicit capital, which enables firms to overcome financial difficulties and compete more aggressively in the market. In addition, the oppressive power of the 'ndrangheta ensures favorable business conditions for infiltrated firms, often to the detriment of competitors. These short-term effects, however, should not be read as a real improvement in economic performance. In many cases, the revenues of infiltrated firms are artificially inflated for money laundering activities, and the absence of investment in fixed capital suggests a short-term oriented strategy. Infiltrated firms tend to favor immediate gains rather than building a solid foundation for future growth. In the long run, the negative effects of infiltration far outweigh the transitory benefits.

These findings are closely aligned with the broader debate on the economic effects of organized crime and corruption more generally. In some contexts, as also highlighted by the "grease the wheels" theory, crime can temporarily alleviate bureaucratic inefficiencies or institutional constraints, stimulating apparent economic growth. However, this dynamic is inherently unsustainable: mafia activities distort competition, fuels illegal practices, and undermines long-term economic development potential.

Our research aims at contributing to this stream of research, and investigate what is the impact of organized crime on the entrepreneurial development of specific territories, examining the relationship between the former and both the amount of capital invested by private equity and venture capital firms and the number of new businesses created in Italian regions.

3. Methodology: data collection and analysis

This working paper aims to analyze the impact of organized crime on the entrepreneurial development of Italian regions, based on the analysis of a dataset including 100 observations over a 5-year time period, i.e., between 2017 and 2021. The study considers the entire national territory of Italy, thus its 20 regions. The data structure is panel type, allowing analysis of both temporal variations and spatial differences between Italian regions. The variables considered were selected to represent relevant economic, social and institutional aspects, with particular attention to the role of organized crime and business dynamics. Table 1 below provides a description of variables used, their significance and respective sources.

Type of Variable	Variable Name	Description	Source
Dependent variable	VC PE Investments	The total amount of capital invested by private equity and venture capital firms in a region.	AIFI
Dependent variable	New Businesses	The number of newly registered businesses in a specific year.	Unioncamere
Independent variable	Organized Crime	Sum of organized crime s.o.s and SPIA crimes.	Direzione investigativa antimafia
Control variable	Average Income	The average income per capita within the region.	Istat
Control variable	Total Businesses	The total number of active businesses in the region.	Istat
Control variable	R&D Expenses	Total expenditures on research and development activities within the region.	Istat
Control variable	People Graduates	The total number of individuals with a university degree.	Istat
Control variable	Reg. Crime rate	The number of criminal offenses reported in the region.	Istat
Control variable	S.O.S	Suspicious financial transaction reports (s.o.s.) related to organized crime.	Direzione investigativa antimafia
Control variable	SPIA Crimes	Suspicious reports of crimes deemed most indicative of organized crime.	Direzione investigativa antimafia
Control variable	Unemployment rate	The percentage of the labor force that is unemployed and actively seeking employment.	Istat
Control variable	Employment rate	The percentage of the working-age population currently employed.	Istat
Control variable	Interregional Migration	The number of people moving from one region to another within the country.	Istat
Control variable	Interdiction Measures	The total number of government measures prohibiting businesses linked to criminal activities.	Direzione investigativa antimafia
Control variable	Incidence of Interdiction Measures	The percentage of businesses subject to interdiction measures relative to the total number of businesses.	Direzione investigativa antimafia

Table 1. List of variables used and sources

4. Results

Table 2 presents the results of the correlations among the variables included in the model. In the course of the analysis, it was necessary to exclude some variables from the model due to the presence of multicollinearity, as multiple independent variables are found to be highly correlated with each other. This methodological choice is essential to ensure that the model is robust, interpretable and statistically reliable.

For example, the variable Total Businesses was excluded because it was found to be strongly correlated with New Businesses. Total Businesses, in fact, inherently includes the contribution of New Businesses, making the inclusion of both in the model redundant. Keeping only New Businesses made it possible to focus on the specific phenomenon of new business start-ups, without overlapping with other information. Another significant case concerns the variables S.O.S and SPIA Crimes, which were closely related to Organized Crime, the main independent variable. These variables represent sub-indicators of Organized Crime and did not add additional information to the overall variable. Their inclusion would have introduced collinearity without adding value to the analysis. For this reason, we only kept Organized Crime in the model. Further simplification was applied to the labor market variables, namely Unemployment rate and Employment rate. Since they are inversely correlated by definition (an increase in the employment rate implies a decrease in the unemployment rate), their joint inclusion would have introduced redundancy. Consequently, only one of these variables was retained, ensuring an adequate representation of labor market conditions without compromising the robustness of the model. The exclusion of these variables was guided by statistical analyses, such as the correlation matrix and Variance Inflation Factor (mean VIF equal to 4.76), which highlighted variables with high correlation values or VIFs above the critical threshold.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) VC PE Investments	1.000								
(2) Reg. Crime rate	0.230	1.000							
(3) Average Income	0.102	0.161	1.000						
(4) New Businesses	0.720	0.585	-0.062	1.000					
(5) Year	0.150	-0.272	0.078	-0.052	1.000				
(6) R&D Expenses	0.784	0.516	0.111	0.870	0.021	1.000			
(7) Unemployment rate	-0.290	0.044	-0.576	0.065	-0.146	-0.327	1.000		
(8) Organized Crime	0.638	0.331	-0.045	0.661	0.431	0.609	0.070	1.000	
(9) Incidence of Interdiction Measures	-0.144	-0.184	-0.263	-0.100	0.079	-0.231	0.583	0.002	1.000

Table 2. Correlation matrix

5. Regression models

The results (presented in Table 3) show a significant relationship between VC PE Investments and Organized Crime, with a positive coefficient of 0.001, statistically significant at the 5 percent level (p=0.012). Although the coefficient value is small, its statistical significance indicates that organized crime is a relevant factor to consider in understanding private investment flows. This result suggests the existence of a link between criminal phenomena and economic

dynamics, which may reflect both direct and indirect influences on the ability to attract venture capital.

The time variables provide additional details on investments in different years compared to 2017, which was used as a reference. The years 2018 and 2019 have negative coefficients (-1.258 and -1.575, respectively), but they are not statistically significant. This could indicate a marginal reduction in investment compared to 2017, without clear statistical evidence. The year 2020 shows a more pronounced decrease (-7.544, p=0.146), highlighting a possible impact related to extraordinary factors, such as the COVID-19 pandemic, although the result does not reach the significance threshold. In 2021, the coefficient is positive (0.294), suggesting a slight recovery from 2017, but also not significant, indicating substantial stability over the period analyzed.

From an overall perspective, the model offers a significant explanation for the variability in investment levels, with an R-squared of 0.528, indicating that 52.8 percent of the observed variation in VC PE Investments is explained by the included variables. This result suggests that the model is able to capture a good portion of the economic dynamics analyzed, while leaving room for additional factors not included. The F-test confirms the overall significance of the model (p=0.013), indicating that at least one of the explanatory variables has a significant effect on investments.

VC PE Investments	**Coef.**	**St.Err.**	**t-value**	**p-value**	**[95% Conf**	**Interval]**	**Sig**
Organized Crime	.001	0	2.76	.012	0	.002	**
2017b	0	.	.	.	.	.	
2018	-1.258	1.039	-1.21	.241	-3.434	.917	
2019	-1.575	.964	-1.63	.119	-3.592	.442	
2020	-7.544	4.983	-1.51	.146	-17.973	2.885	
2021	.294	2.173	0.14	.894	-4.254	4.842	
Constant	11.541	2.871	4.02	.001	5.533	17.55	***

Mean dependent var	20.400	SD dependent var	37.536
R-squared	0.528	Number of obs	100
F-test	4.256	Prob > F	0.013
Akaike crit. (AIC)	730.496	Bayesian crit. (BIC)	743.522

*** *p<.01, ** p<.05, * p<.1*

Table 3. Regression Model: Dependent and Independent Variable

Table 4 presents the results of a regression model aimed at examining the relationship between VC PE Investments and the independent variable Organized Crime, plus a range of economic, social and crime-related variables, as well as temporal control variables. The results show, first, a positive and significant effect of the Organized Crime variable. The estimated coefficient is 0.002, with a significance level of 0.1 percent (p=0.004). This result indicates that an increase in the presence of organized crime is associated with an increase in venture capital and private equity investment. Although the value of the coefficient is small, its statistical significance confirms that the phenomenon of organized crime affects investment dynamics.

As for the regional crime rate (Reg. Crime Rate), the coefficient is negative (-0.152) but not statistically significant (p=0.641). This result suggests that, unlike organized crime, the generic crime rate does not exert a significant influence on levels of venture capital investment. The average income (Average Income) is also not significant (p=0.486), with a coefficient of practically zero. This indicates that, at least in the context analyzed, income level is not a direct driver for attracting VC PE investments.

A particularly interesting variable is New Businesses, which has a highly significant positive coefficient (0.006) ($p<0.001$). This result underscores the importance of new business start-ups as a central element in attracting venture capital. The positive and statistically robust relationship highlights how a dynamic business environment is crucial to the functioning of investment ecosystems.

The variable R&D Expenses, despite its theoretical relevance, is not significant in the model, with a coefficient of zero and a p-value of 0.252. This could be due to the multicollinearity with other variables, such as New Businesses, which capture similar innovation-related dynamics. Unemployment rate and Incidence of Interdiction Measures also do not show a statistically significant effect, with p-values of 0.672 and 0.337, respectively, suggesting that these factors do not exert a direct influence on the levels of investment analyzed.

The time variables (dummies for the years 2018-2021) are not significant compared to 2017, except for a slight positive sign for 2020 (5.57, $p=0.106$), which, however, does not reach the significance threshold. This might suggest that there are no substantial changes in investment related to the time factor.

From an overall perspective, the model explains a significant share of the variability in investments, with an R-squared of 0.715, indicating that about 71.5 percent of the variation in VC PE Investments is explained by the included variables. In addition, the overall significance test (F-test, $p<0.001$) confirms that the model is statistically significant.

VC PE Investments	**Coef.**	**St.Err.**	**t-value**	**p-value**	**[95%Conf**	**Interval]**	**Sig**
Organized Crime	.002	.001	3.29	.004	.001	.003	***
Reg. Crime rate	-.152	.32	-0.47	.641	-.822	.519	
Average Income	0	.001	0.71	.486	-.001	.002	
New Businesses	.006	.001	5.80	0	.004	.008	***
R&D Expenses	0	0	-1.18	.252	0	0	
Unemployment rate	.557	1.294	0.43	.672	-2.152	3.265	
Incidence of Interdiction Measures	-73.159	74.311	-0.98	.337	-228.694	82.376	
2017b	0	.	.	.	.	.	
2018	.946	2.668	0.35	.727	-4.638	6.529	
2019	-.374	2.254	-0.17	.87	-5.091	4.343	
2020	5.57	3.281	1.70	.106	-1.297	12.437	
2021	1.321	3.659	0.36	.722	-6.337	8.98	
Constant	-88.161	27.427	-3.21	.005	-145.567	-30.755	***

Mean dependent var	20.400	SD dependent var	37.536
R-squared	0.715	Number of obs	100
F-test	47.639	Prob > F	0.000
Akaike crit. (AIC)	692.081	Bayesian crit. (BIC)	720.738

*** $p<.01$, ** $p<.05$, * $p<.1$

Table 4. Regression Model: Dependent, Independent Variable, and Controls

Table 5 presents a regression model in which the dependent variable is the number of New Businesses. This model differs from previous models in that it focuses on the effect of organized crime and time variables not on VC PE investments, but on a direct measure of entrepreneurial dynamism. The objective is to investigate the determinants of new business creation in Italian regions by exploring how structural and temporal factors influence entrepreneurial activity.

The coefficient of the Organized Crime variable is negative and equal to -0.095, being highly significant (p<0.001). This result shows an inverse relationship between the presence of organized crime and the number of new businesses. Statistical significance confirms that organized crime exerts a major impact on entrepreneurial dynamism, influencing the economic environment in which new businesses are started.

Time variables indicate the effect of years compared to 2017, used as the base year. For the year 2018, the coefficient is -144.266 (p=0.322) and is not statistically significant, suggesting that there is no significant difference from 2017. The year 2019 shows a positive coefficient (189.289, p=0.394), also lacking statistical significance. The year 2020, on the other hand, shows a substantial and significant decline in the number of new businesses (-2012,165, p<0.001), reflecting the impact of extraordinary events such as the COVID-19 pandemic. In 2021, the coefficient is positive (68,861) but not significant (p=0.804), indicating a recovery with no significant change from 2017. From the perspective of model performance, the R-squared is 0.672, indicating that about 67.2 percent of the variability in the number of new firms is explained by the included variables. The overall significance test (F-test, p<0.001) confirms that the model is significant overall.

New Businesses	**Coef.**	**St.Err.**	**t-value**	**p-value**	**[95% Conf**	**Interval]**	**Sig**
Organized Crime	-.116	.017	-6.68	0	-.152	-.079	***
Average Income	.042	.082	.052	.607	-.128	.214	
R&D Expenses	.004	.001	3.15	.005	.001	.006	
Unemployment rate	88.0	133.3	.66	.517	-191.12	367.13	
Reg. Crime rate	-9.85	38.9	-0.25	.803	-91.3	71.5	
2017b	0	.	.	.	.	.	
2018	-338.4	156.7	-2.16	.044	-666.5	-10.2	*
2019	-208.7	331.8	-0.63	.537	-903.2	485.6	
2020	-1904.5	591.5	-3.22	.005	-3142.6	-666.49	***
2021	-42.41	474.8	-.09	.930	-1036.4	951.5	
Constant	10949.2	4046.8	2.71	.014	2479.2	19419.2	**

R-squared	0.68	Number of obs	100
F-test	43.44	Prob > F	0.000

*** *p<.01, ** p<.05, * p<.1*

Table 5. Regression Model: New Businesses as Dependent Variable

6. Discussion

The results from the regression models analyzed show a significant relationship between the presence of organized crime and investments in venture capital and private equity. This result, although counterintuitive, can be interpreted considering some complex dynamics that characterize territories with a high mafia presence.

First, the time factor emerges: in the short term, organized crime has a positive effect on entrepreneurial development. The dataset used in the methodology, in fact, takes into consideration a time interval of five years; therefore, the result obtained from the regression confirms what has been observed. This effect is explained through two main dynamics (Mirenda, Mocetti and Rizzica, 2019): access to cheap illicit capital and the control exerted by the mafia,

which can guarantee more favorable conditions for local business activities by eliminating competition or providing 'protection'. Although these conditions may create a temporarily favorable environment for certain forms of private investment, such as venture capital, they are ultimately distorting and unsustainable in the long run, as criminal influence does not rely on genuine market dynamics but rather on monopolistic control, corruption, and distortion of competition. Over time, this weakens economic resilience, discourages legitimate businesses from entering the market, and increases dependence on illicit financial flows, leading to a stagnation or decline once these distortions become unsustainable.

The findings ultimately challenge the idea that corruption can serve as a permanent catalyst for economic growth or entrepreneurship. Although it may provide short-term relief in environments burdened by heavy institutional constraints, reducing corruption remains essential to promoting lasting economic and entrepreneurial development.

Emphasizing again the positive correlation obtained from the regression model, with VC PE Investments as dependent variable, a further interpretation emerges. In the literature, we have analyzed how the formation of innovative ecosystems and entrepreneurial initiative can have positive leverage in combating organized crime. As the study by McDaniel et al. (2021) points out, well-structured entrepreneurial ecosystems are able to generate positive effects in communities affected by high crime rates, reducing economic marginalization and offering legitimate pathways to success. In this sense, entrepreneurship is not only a victim of organized crime, but also a possible tool to counter it by promoting legitimate economic opportunities that reduce dependence on the criminal system.

The positive correlation between organized crime and venture capital investments can thus also be interpreted as a reflection of the need to finance entrepreneurial and innovative projects in problematic regions, contributing to the construction of an innovative ecosystem capable of transforming local economic dynamics. As explained by Bucioni and Corò (2023), an entrepreneurial and financial approach that encourages risk-taking and supports innovative projects is essential for economic growth, especially in peripheral contexts. The authors point out that economic success in these areas requires advanced financial instruments that go beyond traditional bank credit, such as venture capital, public innovation funds and public-private partnerships. In this context, venture capital and private equity investments can be seen as part of a broader attempt to revive economic and social growth in regions scarred by organized crime. By supporting innovative and technology-intensive initiatives, these investments not only generate economic value, but also help reduce dependency on criminal networks. Indeed, they offer concrete and legitimate opportunities for both local businesses and communities, helping to counter economic marginalization and build a more stable and prosperous future.

The results of the regression model with New Businesses as the dependent variable show a significant negative relationship between the presence of organized crime and the creation of new businesses. The results of the analysis are fully consistent with most empirical studies in the literature. The presence of organized crime and its influence in different economic sectors creates a condition of unsustainability in the long run, as these organizations act by pursuing short-term goals, often through corruption and illegal activities. This creates an unfavorable business environment for entrepreneurs wishing to start new businesses, who find themselves competing with illegal enterprises that benefit from distorted competitive advantages not available to legitimate businesses.

Starting a business requires a perspective of long-term sustainability to ensure its survival and success. However, operating in an environment in which a significant factor such as organized crime negatively affects the economic development of the territory poses a significant challenge to entrepreneurs, making the context unfavorable for starting new businesses.

Also, a crucial element in starting a business is the ability to access credit, which is key to cover the initial investments required by a new business. However, in regions characterized by a

high presence of organized crime, entrepreneurs often face significant barriers in the financial system that hinder them from obtaining the necessary funds.

This dynamic occurs because banks and credit institutions perceive a higher risk in granting loans in territories with high crime. The economic uncertainty generated by the presence of organized crime, including extortion, bribery and other forms of illicit pressure, increases the risk of insolvency for local businesses. Consequently, credit institutions react by tightening the conditions for granting loans, thus reducing the accessibility of financing for small entrepreneurs and further discouraging the establishment of new businesses.

This situation creates a vicious circle: the absence of new entrepreneurial initiatives limits local economic development opportunities, while the domination of organized crime continues to exert a negative influence on the economic and social fabric. Moreover, the lack of access to credit forces many aspiring entrepreneurs to give up or turn to informal sources of finance, which may be linked to illegal circuits, further exacerbating the problem.

7. Implications for entrepreneurs and policy-makers

Organized crime represents a huge barrier to the creation of new businesses, with profound repercussions on the economic development of the affected areas. Entrepreneurs, who should be the engine of change and economic growth, find themselves operating under extremely difficult conditions. They face an environment of constant uncertainty, higher operating costs and unfair competition from companies that, often through illicit connections or corruption, enjoy unfair competitive advantages. The direct consequence is a general slowdown in entrepreneurial dynamism: not only do individual companies suffer, but the entire territory loses its ability to grow and innovate. To meet these challenges and operate in complex environments, entrepreneurs can investing in sectors less vulnerable to organized crime (e.g., technology-intensive industries, digital services, research and development activities), seek strategic partnerships to mitigate risks (collaborating with established companies, trade associations, universities and local institutions), and identify and target regions with sound institutional policies, transparent administration and specific incentives.

For policy makers, this working paper suggests that they may need to play a key role in creating favorable conditions for those who want to do business and invest, especially in those areas where organized crime is an obstacle to economic development. To make the fight against organized crime effective and foster a more dynamic business environment, policy makers can work to develop more effective policies to combat organized crime and can perhaps promote incentives to attract private capital to the most disadvantaged areas (e.g., supporting the creation of technological hubs to foster development and fight organized crime).

8. Limitations and future research

Similarly to any empirical analysis, this working paper has some limitations that have to be taken into account when interpreting the results. One of the main limitations relates to the difficulty of establishing a clear causal relationship between organized crime and venture capital investments or start-ups. Although the analysis shows a positive correlation between these phenomena, it is not possible to exclude the presence of endogeneity, that is, the possibility that unobserved variables are influencing both dynamics.

Another limitation concerns the measurement of organized crime, a phenomenon that is by nature occult and difficult to quantify accurately. By the same measure, venture capital investments may not fully reflect the real allocation of private capital. Investments in start-ups and innovative firms often involve transactions that are not always reported in official datasets, and capital flows may be recorded in regions other than those in which the firms actually operate. Moreover, venture capital develops at different stages, and available data may not capture all

financing dynamics of start-ups. To improve this aspect, future studies could adopt a more detailed approach, including data disaggregated by sector and stage of financing, as well as integrating information from interviews and internal investor reports.

Keywords: Entrepreneurial ecosystem; organized crime; regional development

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The impact of insularity on entrepreneurship: evidence from Italian regions

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1. Introduction

Entrepreneurship plays a central role in shaping regional economic performance, innovation capacity, and long-term development trajectories. In advanced economies, new firms contribute to productivity growth, stimulate competition, and renew the industrial structure by introducing novel business models and technological approaches. However, entrepreneurship is not uniformly distributed across space, and substantial differences persist across regions in terms of start-up creation, survival, and growth. These differences reflect both observable regional characteristics and deeper structural factors embedded in geography and territorial configurations. One of the most distinctive, and understudied, spatial characteristics affecting regional development is insularity. As an extreme form of peripheral location, insularity combines geographical isolation, limited accessibility, smaller markets, and the absence of land-based connectivity to the national core. The resulting structural constraints affect not only transport costs but also patterns of human capital mobility, knowledge diffusion, institutional quality, and social capital formation. While extensive research exists on small island economies and their vulnerabilities, much less attention has been paid to the broader question of how insularity itself, irrespective of island size, shapes entrepreneurial ecosystems; even more so when islands are not organized as independent states but belong to larger states. This ongoing research project addresses this gap by examining the impact of insularity on entrepreneurial dynamics in the Italian context. Italy provides an attractive empirical setting: its two main islands, Sicily and Sardinia, are large territories, structurally different from small island states, yet they remain economically peripheral, demographically challenged, and historically disadvantaged in terms of connectivity and institutional performance. The availability of regional data from ISTAT and the Bank of Italy allowed us to build a specific database already tested to measure the impact of insularity on GDP to conduct an in-depth quantitative analysis over nearly two decades.

The central question guiding this research is whether insularity represents a structural disadvantage for entrepreneurship, and if so, in what specific dimensions. In particular, we assess whether insular regions differ from mainland regions in terms of new firm creation, net entrepreneurial growth, and firm turnover. This distinction is critical because the vitality of an entrepreneurial ecosystem depends not only on the quantity of new firms but also on their capacity to survive and consolidate. A high birth rate combined with weak survival would indicate a fragile entrepreneurial environment one unable to accumulate entrepreneurial capital over time.

Using an original panel dataset for the period 2000–2018, this paper analyzes the relationship between insularity and three key business demography indicators: birth rate, net enrolment rate, and turnover rate. Econometric evidence from random-effects models and instrumental-variable

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specifications shows that while insular regions display significantly higher birth rates, they experience lower turnover rates and weaker net entrepreneurial growth. These results demonstrate that insularity fosters start-up creation but undermines survival, leading to high churn and limited long-term accumulation of entrepreneurial capacity.

By identifying insularity as a structural constraint on entrepreneurial sustainability, this research project contributes to the literature on the external condition for the development of entrepreneurship, on regional and territorial economy, and island studies. It also provides policy-relevant insights, highlighting the need for targeted strategies that address the specific challenges of insular entrepreneurship rather than relying solely on incentives for start-up creation. It can also strengthen and support the literature on the differences between quantity and quality of entrepreneurship measurement and on the different sets of entrepreneurships and their role in value creation.

2. Theoretical background

Determinants of entrepreneurship

Entrepreneurship research identifies a wide range of determinants influencing regional entrepreneurial performance. Classical studies emphasize supply-side factors such as human capital endowments, demographic composition, and skill levels, alongside demand-side elements related to market size, income growth, and industrial structure. More recent contributions highlight institutional quality, social norms, cultural attitudes toward risk-taking, and historical entrepreneurial legacies as critical factors shaping regional differences. Importantly, the literature increasingly distinguishes between quantity and quality of entrepreneurship. High start-up rates are not necessarily indicative of high-growth entrepreneurship or meaningful structural change. Regions with high entry but high exit rates may suffer from a form of "entrepreneurial churn," where numerous micro-firms are created but few scale up, innovate, or survive beyond the initial years. Such dynamics can reflect necessity- based entrepreneurship, structural labor-market rigidities, or weak competitive environments that do not reward innovation.

This distinction becomes crucial when analyzing insular regions. Higher start-up rates may appear to indicate a vibrant entrepreneurial environment, but low survival rates suggest that firms face significant structural constraints that impede long-term consolidation. The results from this study align with this dual interpretation: insular regions show high entry but low survival, pointing to a fragile entrepreneurial ecosystem rather than a robust one.

The spatial dimension of entrepreneurship

Geography is a fundamental determinant of regional entrepreneurship. Spatial proximity facilitates knowledge spillovers, collaboration, and network formation. Regions embedded within dense and well-connected economic systems benefit from agglomeration economies: access to skilled labor, supplier networks, capital markets, and innovation ecosystems. Such factors promote both firm entry and firm success. Peripheral regions, by contrast, face several disadvantages: 1) Limited accessibility hinders the movement of goods, people, and information. 2) Smaller markets reduce the potential returns from innovation and specialization. 3) Weak institutional capacity undermines support for entrepreneurship. 4) Lower human capital attraction restricts the availability of skilled labor. 5) Fewer interregional exchanges limit exposure to new ideas and entrepreneurial role models. 6) Reduced competitive pressure diminishes incentives for innovation and efficiency.

Insularity can be interpreted as an extreme case of peripheral location where these disadvantages are amplified. The absence of land connectivity may reinforce cognitive isolation, impede the diffusion of entrepreneurial norms, and reduce openness to external investors or

partners. These effects compound over time, potentially generating persistent structural barriers to entrepreneurial growth.

Islands as economically vulnerable territories

Research on island economies highlights several structural vulnerabilities associated with insularity:

- Small domestic markets, which prevent firms from achieving economies of scale.
- Geographic remoteness, raising transportation costs for goods and inputs.
- Tourism dependence, leading to seasonality, volatility, and exposure to external shocks.
- Limited labor mobility, which constrains the talent pool and raises hiring costs.
- Concentrated social capital, which reinforces bonding ties but weakens bridging ties essential for innovation.
- Institutional weaknesses, often linked to clientelism, limited administrative capacity, or fragmented policy coordination.

For many islands, the entrepreneurial ecosystem reflects these structural conditions. Studies suggest that entrepreneurs in remote islands perceive their environment as riskier and more uncertain, often relying on government subsidies or fiscal incentives for survival rather than on market-driven innovation. This dependence can reduce autonomy, discourage experimentation, and hinder the emergence of high-growth firms.

The Italian case is particularly interesting: Sicily and Sardinia are not small islands, yet they face many of the vulnerabilities described above. Their geographic isolation, institutional weaknesses, demographic decline, and economic stagnation make them an ideal test case for understanding how insularity affects entrepreneurial performance in a developed-country context.

3. Data and methods

The empirical analysis relies on a strongly balanced self-created panel dataset including all Italian regions (N=21) over the period 2000–2018. The dataset comprises 399 observations, drawing on high-quality sources: ISTAT business demography statistics and Bank of Italy regional financial indicators.

Dependent variables

The study examines three core indicators of entrepreneurial activity: 1. Birth Rate: the number of new enterprises registered each year relative to the existing stock of active firms. 2. Net Enrolment Rate: the net change in firm population (entries minus exits) as a percentage of the stock of registered firms. 3. Turnover Rate: the difference between birth and death rates, reflecting the overall dynamism of the entrepreneurial ecosystem. These indicators allow us to distinguish between entry, survival, and net growth, capturing both the quantity and the structural quality of entrepreneurship.

Independent variables

The key variable of interest is the Island, a dummy variable, equal to 1 for Sicily and Sardinia and 0 otherwise. This captures the structural effect of insularity on entrepreneurial performance. Other control variables include: the log of GDP growth (with two lags to address potential endogeneity); interest rates applied by regional banks a proxy to measure the cost and the risk of doing business; illiteracy rate and tertiary education share to measure the competences and the pool of talent in each region that can result in more enterpreneurs; the median age of population to capture the potential for innovation and entrepreneurship; the R&D expenditure as share of

GDP to measure the level of existing innovation developed by existing firms that can create an ecosystem; Net export normalized by regional GDP to capture the level of openness of the regional economies.

These variables account for economic conditions, financial constraints, human capital endowments, innovation capacity, demographic structures, and trade openness, factors widely recognized as determinants of entrepreneurship.

Econometric Strategy

The empirical approach consists of two main components: 1. Random-effects panel regressions for each dependent variable. 2. Instrumental-variable (IV) random-effects regressions, using two lags of GDP growth as instruments to correct for potential reverse causality between economic performance and entrepreneurial dynamics. The models are estimated with robust standard errors. The IV approach is particularly relevant because regional economic conditions may simultaneously influence entrepreneurship while being affected by entrepreneurial activity.

4. Results

Insularity and the Birth Rate: Higher Entry

The first notable finding is that insularity is associated with a higher firm birth rate. Across specifications, the Island dummy is positive and statistically significant. This suggests that individuals in insular regions start new firms at higher rates than those in mainland regions. Several mechanisms may underlie this pattern: 1) Necessity entrepreneurship, driven by weak wage employment opportunities. 2) Cultural norms favoring self-employment, particularly in regions with limited industrial development; 3) Seasonal opportunities, especially in tourism-related activities. 4) Public incentives for start-ups, which are more common in lagging regions.

However, while higher entry rates can be interpreted as a sign of entrepreneurial vitality, this interpretation changes when we consider firm survival and turnover.

Insularity and Survival: Lower Turnover Rates

The turnover rate represents the difference between firm births and firm deaths. A negative and statistically significant coefficient for the Island dummy indicates that insular regions have structurally lower turnover rates, meaning that firm deaths outweigh the benefits of higher birth rates. This pattern reflects structural fragility: firms are created more often but fail disproportionately. Several explanations are consistent with both the literature and the empirical setting: 1) High operating costs due to remoteness and supply-chain constraints; 2) Small and fragmented markets, which limit firm scalability; 3) Weak institutional quality that foster firm consolidation. 4) Lower innovation capacity, stemming from limited R&D and human-capital inflows. 5) Seasonal business cycles, which make revenue streams volatile. The results reveal that insularity does not prevent firm creation but makes firm survival considerably harder.

Net Enrolment Rate: Weak Net Growth

Although the coefficient on the Island dummy is negative and not always significant, the direction is consistent with the turnover results: insular regions show weaker net firm growth. The combination of high entry and fragile survival means that the entrepreneurial stock does not grow sustainably over time.

Control Variables and Robustness

Several control variables behave as expected with GDP growth which strongly predicts entrepreneurial dynamism in the baseline model. Median age has a consistently negative impact, reflecting the demographic constraints of ageing regions. Interest rates positively correlate with birth rates, possibly because credit expansion coincides with periods of entrepreneurial optimism or because financial institutions in dynamic regions operate with wider margins. Human capital and R&D variables display mixed effects, possibly due to limited regional variation or structural factors overshadowing their influence. The IV models confirm the core results: the negative effect of insularity on turnover remains robust even after correcting for potential endogeneity in economic growth.

5. Discussion

A Dual Pattern: High Entry, Low Survival

The coexistence of high entry rates and low survival rates is central to understanding insular entrepreneurship. This dual pattern suggests that individuals are motivated, or compelled as subsistence entrepreneurs, to start businesses, but structural constraints prevent these ventures from consolidating. From a policy perspective, this indicates that focusing solely on start-up creation is insufficient and the real challenge lies in enhancing firm quality, resilience, and growth potential. This can be obtained by fostering the condition for the creation of an entrepreneurial ecosystem in which more relevant and competent firm can act as an anchor for the creation of firms' clusters.

Insularity as a Structural Constraint

The results affirm that insularity represents a structural barrier to entrepreneurial sustainability. Importantly, this effect persists even though Sicily and Sardinia are not small islands. Insularity, therefore, should not be interpreted only in terms of physical size but in terms of permanent geographical separation and reduced connectivity which affects the cultural and social environment on which firms operate reducing the probability of the creation of a favorable environment for value creation through entrepreneurship. Some of the disadvantages that can be associated to Italian islands are persistent logistical disadvantages, structural dependence on low-value-added sectors such as tourism, a persistent difficulty in attracting external investors or skilled workers. The low institutional quality and administrative barriers are other important structural factors that can limit competitive pressure and producing an insufficient integration into national innovation networks.

These factors collectively undermine firm survival and reduce the long-term accumulation of entrepreneurial capital.

Implications for Policy

Given the evidence, regional policy for insular territories must prioritize: 1) Connectivity: improving transport infrastructure, digital networks, and logistics. 2. Entrepreneurial ecosystem support by fostering the networks between new firms and established one not by economic incentives but creating a favorable regulatory environment based on less regulations and constraints; 3. Innovation networks: linking insular universities with mainland research centers. 4. Human capital attraction and retention: scholarships, mobility programs, remote-work incentives. 5. Financial access: targeted credit lines and venture capital instruments adapted to insular constraints. 6. Managerial training: programs to strengthen entrepreneurial capabilities and firm governance also by mentoring strategies with the participation of more established firms. Policies limited to subsidies or tax incentives may boost entry but not survival. Effective strategies must address deeper structural disadvantages.

6. Conclusion

This research project investigates the relationship between insularity and entrepreneurial activity using a self-built panel of Italian regions from 2000 to 2018. The evidence points to a clear and robust pattern: insular regions display higher birth rates but significantly lower survival rates and lower entrepreneurial turnover. This combination reveals that insular entrepreneurial ecosystems are characterized by high entry but fragile consolidation, leading to weaker long-term growth potential. Insularity emerges not merely as a geographical feature but as a structural constraint that affects entrepreneurial sustainability. The ongoing research project calls for more nuanced policy interventions that focus on improving firm survival, innovation, and growth rather than simply promoting start-up creation.

Future research should explore sectoral differences, integrate social capital indicators, and compare the Italian case with other European islands. Understanding the complex interplay between geography and entrepreneurship remains central for designing effective regional policies in peripheral and insular territories.

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Costruire imprese resilienti: il ruolo dell'imprenditore e della gestione degli stakeholder

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1. Il contesto di riferimento della ricerca

Le performance delle imprese sono sempre più condizionate da eventi esterni imprevedibili, come crisi economiche, terremoti o pandemie (Iftikhar et al., 2021; Linnenluecke, 2017). Per resistere a tali shock esogeni, le imprese devono essere in grado non solo di limitare i possibili danni, ma anche di cogliere - ove possibile - le opportunità generate dalle mutate condizioni di contesto (Conz e Magnani, 2020; Conz et al., 2023). La letteratura di management definisce questa capacità come resilienza. Numerosi studiosi hanno analizzato il tema della resilienza d'impresa, con particolare attenzione al contesto delle piccole e medie imprese (PMI) e delle imprese familiari (Calabrò et al., 2021; Mihotić et al., 2023; Santoro et al., 2021). Queste realtà, infatti, si caratterizzano per una limitata disponibilità di risorse, che ne riduce la capacità di resistere e/o rispondere in modo efficace agli shock esogeni (Iborra et al., 2020; Pal et al., 2014).

Non sorprende che, data l'importanza della resilienza per la stessa sopravvivenza e le performance di lungo periodo delle imprese, risulti cruciale comprendere quali fattori ne alimentano lo sviluppo. In particolare, il ruolo degli imprenditori e della loro resilienza personale (Hedner et al., 2011) è stato ampiamente riconosciuto in letteratura come elemento centrale nel plasmare la resilienza d'impresa (Korber e McNaughton, 2018; Pathak et al., 2024; Su e Junge, 2023). Diversi studi hanno messo in luce come gli imprenditori, grazie alle esperienze pregresse nell'affrontare circostanze imprevedibili e difficili, tendano a sviluppare un'elevata capacità di adattamento che contribuisce a mantenere le piccole imprese resilienti (Branicki et al., 2017; Wall e Bellamy, 2019). Tuttavia, è stato anche sottolineato che la resilienza individuale dell'imprenditore può – ma non necessariamente deve – tradursi in resilienza organizzativa (Su e Junge, 2023).

2. Obiettivo della ricerca

Una questione ancora non sufficientemente esplorata in letteratura riguarda il modo in cui la resilienza individuale degli imprenditori si trasformi in resilienza d'impresa. Pertanto, questo studio intende rispondere alle seguenti domande di ricerca: in che modo la resilienza dell'imprenditore può plasmare la resilienza dell'impresa? Possono fattori contestuali influire in questo processo, e come? In altre parole, l'obiettivo di questo studio, tuttora in fieri, è indagare i processi che sottendono tale dinamica.

Lo studio mette in luce il ruolo dell'imprenditore nella costruzione della resilienza d'impresa, sottolineando anche l'importanza della gestione degli stakeholder nell'intensificare l'impatto della resilienza imprenditoriale sulla resilienza d'impresa. Per indagare i processi attraverso i quali la resilienza dell'imprenditore si traduce in resilienza dell'impresa, è stato analizzato il caso di un'impresa operante nel settore turistico, nello specifico il Four Points by Sheraton Catania Hotel & Conference Center. Data la natura esplorativa della nostra domanda di ricerca, abbiamo

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adottato un approccio qualitativo, che consente un'indagine aperta e favorisce la generazione di teorie (Bluhm et al., 2011; Graebner et al., 2012; Sutton, 1997; Gibbert et al., 2008). La ricerca si basa su un'analisi di caso (Flyvbjerg, 2011; Yin, 2014), di particolare interesse per la decisione coraggiosa e non convenzionale dell'imprenditrice di mantenere aperto l'hotel durante la pandemia di COVID-19, nonostante le restrizioni imposte dal governo italiano alla mobilità delle persone.

3. Background teorico della ricerca

3.1. Profili definitori del concetto di resilienza

Il concetto di resilienza trae origine dalle discipline dell'ingegneria, della fisica e dell'ecologia, ed è stato adottato anche nell'ambito della ricerca economico-aziendale (Gunderson, 2000; Woods, 2015; Aversa et al., 2024). A tal proposito, Conz e Magnani (2020) hanno osservato come il crescente interesse verso il tema della resilienza nel contesto delle imprese abbia portato a una parziale sostituzione del tradizionale mantra della "ricerca del profitto" con quello della "ricerca della resilienza".

Oggi, in letteratura, il concetto di resilienza appare sfaccettato e intrecciato con altri affini, tra cui quelli di robustezza e antifragilità (Muñoz et al., 2022). In questo lavoro, adottiamo la definizione di resilienza come una capacità articolata su tre momenti (Conz e Magnani, 2020). Nella fase proattiva, la resilienza si manifesta nella capacità di anticipare e prepararsi a eventi inattesi, attraverso vigilanza, prontezza e preparazione alla discontinuità. La seconda fase può assumere la forma adattiva, tesa ad apportare tempestivamente cambiamenti interni per mantenere le funzioni operative dopo lo shock (Bhamra et al., 2011), oppure assorbitiva, ovvero maggiormente indirizzata a mantenere la stabilità e il controllo. Infine, nella fase denominata reattiva, le imprese mirano a ristabilire un equilibrio a un livello uguale o superiore rispetto a quello precedente allo shock.

Gli studi sulla resilienza delle imprese si sono sviluppati lungo due principali direttrici. La prima direttrice di ricerca si è focalizzata sulla natura, sulla velocità di comparsa, sulla misurazione e sulla gravità degli eventi avversi (Su e Junge, 2023) che l'impresa deve affrontare, nonché sull'impatto che tali eventi esercitano sulla sopravvivenza organizzativa. La seconda direttrice di ricerca, invece, si concentra sugli antecedenti della resilienza d'impresa. In particolare, la letteratura ha analizzato i fattori determinanti della resilienza a diversi livelli di analisi (Aversa et al., 2024), includendo sia le caratteristiche degli imprenditori sia quelle delle imprese.

3.2. Le caratteristiche degli imprenditori come antecedenti della resilienza d'impresa

Gli studi precedenti hanno messo in luce che le risorse psicologiche – quali adattabilità, fiducia, supporto sociale e determinazione – risultano determinanti per la continuità d'impresa (Chhatwani et al., 2022; Wall e Bellamy, 2019; Branicki et al., 2017). È stato altresì evidenziato come attributi personali quali ingegnosità, tenacia e ottimismo rafforzino la capacità di affrontare le avversità, mentre la formazione imprenditoriale favorisca creatività e coraggio (Ayala e Manzano, 2014; Chadwick e Raver, 2020).

Ulteriori ricerche hanno esaminato come specifici attributi psicologici, quali narcisismo, empatia o hubris, possano influenzare la resilienza organizzativa (Su e Junge, 2023; Picone et al., 2025). In generale, questa letteratura considera la resilienza dell'imprenditore come una forza motivazionale collettiva che guida l'azione di fronte a shock esogeni (Williams e Shepherd, 2016). L'idea sottesa è che le propensioni individuali dell'imprenditore – come la capacità di esplorazione, la perseveranza, la gestione della complessità e il problem solving – si traducano in capacità collettive dell'impresa (Hadjielias et al., 2022). Tale impostazione sottolinea il ruolo delle risposte cognitive e comportamentali degli imprenditori (Lengnick-Hall et al., 2011).

4. Aspetti metodologici della ricerca

Le performance delle imprese sono sempre più condizionate da eventi esterni imprevedibili, come crisi Lo studio si concentra sui processi alla base della resilienza d'impresa, particolarmente rilevanti per imprese familiari e di piccole dimensioni (Hadjielias et al., 2022). È stato scelto di analizzare il caso del Four Points by Sheraton Catania Hotel & Conference Center, situato ad Aci Castello (in provincia di Catania) e gestito dalla famiglia Laneri da oltre quarant'anni. Questo caso, selezionato secondo i principi del campionamento teorico (theoretical sampling), fornisce un contesto significativo per analizzare la transizione dalla resilienza dell'imprenditore a quella d'impresa. La scelta si fonda su diverse motivazioni. Anzitutto, l'impresa opera nel settore turistico, tra i più colpiti dalla pandemia di COVID-19 (Collins-Kreiner e Ram, 2021; Dolnicar e Zare, 2020; Gössling et al., 2020). L'impatto improvviso e senza precedenti della crisi ha lasciato alle imprese scarso margine per fare affidamento su esperienze pregresse e mettere in atto comportamenti adeguati per fronteggiarla. Le restrizioni governative — lockdown, distanziamento sociale e divieti di viaggio — hanno causato un arresto quasi totale delle attività turistiche (Agovino e Musella, 2022). Come evidenziano Chaudhary et al. (2024), la pandemia ha generato tensioni tra obiettivi a breve e lungo termine, efficienza e adattabilità, sicurezza e redditività, imponendo sfide particolarmente severe alle PMI del comparto turistico.

Inoltre, la scelta del caso si è basata sulla possibilità di ottenere una comprensione approfondita e pertinente al fine di rispondere alla nostra domanda di ricerca, piuttosto che sulla rappresentatività statistica del settore turistico. Il Four Points by Sheraton Catania rappresenta, infatti, un caso estremo e particolarmente significativo, essendo uno dei pochissimi hotel del settore a essere rimasto aperto per l'intera durata della pandemia.

Un ulteriore elemento di rilievo è stata la disponibilità dell'imprenditrice a fornire accesso ai documenti interni e a facilitare il contatto con gli attori chiave (dipendenti, fornitori e clienti) consentendo la convergenza di molteplici linee di indagine da diverse prospettive. Tale apertura ha reso possibile una triangolazione solida delle evidenze (Jick, 1979), rafforzando la validità e la robustezza dei risultati. Per analizzare il caso studio, sono stati raccolti dati da fonti primarie, ovvero tramite la conduzione di interviste semi-strutturate, e da fonti secondarie, attraverso la consultazione di social media, siti web e articoli di stampa. Le interviste semi-strutturate sono state condotte con l'imprenditrice e con i diversi tipi di stakeholder dell'impresa. In particolare, tra gli stakeholder interni, sono stati intervistati alcuni manager (ad esempio, direttore generale, business developer manager) e alcuni collaboratori dell'impresa (ad esempio, receptionist, barman, chef); tra gli stakeholder esterni, sono invece stati intervistati un cliente ed alcuni fornitori. L'identificazione dei partecipanti è avvenuta tramite una tecnica di snowball. Le interviste, che sono state condotte nel biennio 2024-2025, hanno avuto una durata media di circa 40 minuti ciascuna.

5. Risultati preliminari

Le interviste con l'imprenditrice hanno mostrato come numerosi eventi avversi e scelte difficili abbiano plasmato la sua resilienza personale e professionale. L'imprenditrice ha affrontato diverse criticità lavorando nell'impresa di famiglia, tra cui problemi relazionali con il padre dal quale faticosamente ha ottenuto fiducia in ambito lavorativo. Le sfide familiari e lavorative affrontate nel tempo hanno formato e temprato l'atteggiamento resiliente dell'imprenditrice, rendendola più forte e pronta a reagire e a gestire eventuali nuove situazioni difficili, alimentando così la sua resilienza proattiva.

Di fronte all'imprevedibilità della crisi pandemica, una decisione particolarmente rischiosa, ma decisiva è stata mantenere operativo l'hotel, manifestando così una resilienza adattiva. Sebbene i fratelli soci dell'imprenditrice considerassero questa scelta azzardata, le hanno dato

piena fiducia. La scelta di mantenere l'hotel aperto è stata spinta dalla percezione di una pressione sociale nei confronti degli stakeholder interni ed esterni, ovvero i dipendenti dell'impresa e i clienti che avevano bisogno di pernottare in albergo per esigenze lavorative, nonostante i rischi per la salute. Ciò ha portato l'imprenditrice a voler prendersi cura del personale dell'albergo, garantendo sicurezza, serenità e stabilità economica. Inoltre, nonostante il numero limitato di ospiti durante il periodo COVID-19, l'imprenditrice mirava a garantire loro un ambiente sicuro in cui si potesse generare un senso di accoglienza e comunità tra il personale e gli ospiti.

La sensibilità e la percezione della pressione sociale verso le persone, alimentata dalle vicende critiche della vita personale e lavorativa dell'imprenditrice, hanno determinato implicazioni anche a livello d'impresa. In generale, riconosciamo la pressione sociale come un costrutto chiave che emerge nel nostro caso, ed è anche ben consolidato nella letteratura di management. Concepiamo la pressione sociale come l'influenza esercitata dagli altri—individui nel caso delle scelte personali di un imprenditore, e stakeholder nel caso delle decisioni d'impresa. Tali pressioni possono essere espresse in modo esplicito, ma sovente sono disomogenee, poiché i decisori possono dare priorità agli interessi di alcuni individui o gruppi di stakeholder rispetto ad altri. A livello d'impresa, la letteratura tende a enfatizzare potere, legittimità e urgenza come dimensioni chiave che modellano la pressione degli stakeholder (Mitchell et al., 1997); tuttavia, queste pressioni possono anche essere emotive, cognitive o professionali, riflettendo preoccupazioni morali, aspettative culturali e standard settoriali.

L'attenzione prioritaria verso la costruzione e la cura delle relazioni con gli stakeholder ha spinto l'imprenditrice a fare in modo di creare un ambiente accogliente e armonioso all'interno dell'hotel, una sorta di bolla di serenità che potesse favorire un senso di comunità tra le persone. Inoltre, nella gestione degli stakeholder, l'imprenditrice ha potuto beneficiare delle relazioni di fiducia costruite nel tempo con gli stakeholder, che hanno permesso di contare sull'impegno dei dipendenti e sulla collaborazione dei partner esterni. Questo risultato è coerente con la letteratura manageriale che sottolinea l'importanza di costruire relazioni come condizione necessaria per accedere alle risorse, non solo prima di uno shock esogeno, ma più in generale per garantire un supporto continuo da parte degli stakeholder dell'impresa (Pfeffer e Salancik, 1978). Tale supporto appare fondamentale per la possibilità dell'impresa di rimanere aperta e sopravvivere. In sintesi, la gestione degli stakeholder si è fondata sull'interazione tra relazioni di fiducia consolidate nel tempo e pressioni sociali, che l'imprenditrice ha saputo mediare e tradurre in decisioni efficaci. Tale approccio ha garantito non solo la sopravvivenza, ma anche il rafforzamento della resilienza organizzativa del Four Points by Sheraton Catania.

Il Four Points by Sheraton Catania ha saputo reagire alla crisi improvvisa, non solo in termini di resilienza proattiva e resilienza adattiva. Infatti, sono state osservate anche forme di resilienza reattiva, legate alla creatività nell'adattare i servizi per garantire la continuità dell'offerta al cliente.

6. Contributi attesi

Il primo contributo di questo studio riguarda la resilienza d'impresa. Studi precedenti hanno evidenziato l'importanza delle risorse potenzialmente utilizzabili, che possono essere riadattate per il raggiungimento degli obiettivi organizzativi (George, 2005). Tali risorse offrono flessibilità, consentendo risposte rapide e creative per fronteggiare circostanze avverse e discontinuità contestuali. Tuttavia, shock esterni possono renderle rapidamente obsolete, riducendone l'efficacia nel sostenere la resilienza. Inoltre, queste risorse producono un servizio potenziale che dipende dal modo in cui vengono gestite, e dunque dalle interazioni e decisioni dei manager (Foss et al., 2008). Di conseguenza, si può dedurre che le caratteristiche individuali degli imprenditori possano rafforzare la resilienza dell'impresa (Kovoor-Misra, 2020; Sommer et al., 2016).

In secondo luogo, evidenziamo il ruolo centrale della gestione degli stakeholder nel rafforzare la resilienza, non soltanto attraverso l'accesso alle risorse, ma anche mediante

l'interazione continuativa con gli stakeholder e la gestione delle pressioni sociali. Una gestione efficace di tali dinamiche combina una dimensione relazionale, fondata su fiducia, collaborazione e capitale sociale, con una dimensione dinamica, nella quale l'imprenditore deve bilanciare richieste eterogenee e rispondere con flessibilità, soprattutto nei periodi di crisi.

Rispetto alla letteratura esistente che evidenzia come l'affrontare eventi avversi alimenti la resilienza imprenditoriale (Bernard e Barbosa, 2016; Prah e Sibiri, 2021), noi riconosciamo non soltanto che tali esperienze favoriscono una resilienza proattiva, intesa come preparazione alle possibili perturbazioni (Conz e Magnani, 2020), ma aggiungiamo che la gestione delle relazioni con gli stakeholder risulta determinante per preservare e amplificare la capacità di resilienza (Bhamra et al., 2011).

Nel complesso, i nostri risultati suggeriscono che la resilienza imprenditoriale può essere interpretata come una capacità latente, che necessita di essere attivata attraverso specifiche condizioni contestuali: da un lato, l'esperienza delle avversità, e dall'altro, una gestione efficace degli stakeholder. Mostriamo infatti come l'impatto della resilienza individuale dell'imprenditore venga amplificato dalla gestione delle relazioni con gli stakeholder, contribuendo così ad approfondire la comprensione dei processi che trasformano la resilienza personale in resilienza organizzativa.

Parole chiave: Resilienza; stakeholders; eventi esogeni; COVID-19; turismo

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The Human Side of Data-Driven New Ventures: How Design Thinking Mindset Enables a Strong Data Culture

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1. Introduction

This paper is part of ongoing research that explores the potential synergy between a human-centered approach—grounded in design thinking—and the development of a data-driven culture in new ventures. While design thinking emphasizes empathy and user engagement to generate meaningful innovations (Liedtka, 2015), a data-driven culture supports decision-making and strategic alignment (Chatterjee et al., 2024). Recently, researchers examined how the implementation of design thinking might relate to organizational-level constructs, such as organizational culture (Elsbach and Stigliani, 2018), to show that design thinking is not just a set of tools but an organizational capability that influences cognitive flexibility, experimentation, and adaptation—key qualities for startups operating under conditions of uncertainty. Additional research shows the value created when human intuition combines with algorithmic reasoning and machine intelligence (Kolbjørnsrud, 2024). The merging of a human-centered approach and data-driven decision-making can unlock innovation processes, enabling new ventures to iterate quickly, respond flexibly to market signals, and promote organizational learning across various contexts (Visvizi et al., 2022; Grimaldi; 2025). This integration indicates a broader shift in innovation management toward combining human-centered strategies with the analytical rigor needed for modern digital environments. New ventures are indeed increasingly challenged to balance creativity with analytical and data-driven rigor (Visvizi et al., 2022) to improve agility and scalability. To further explore this topic, the present work uses a survey of Italian innovative new ventures. The results show that human insight and data analytics are not opposing logics; rather, when entrepreneurs are empathetic and eager to learn, they may be especially inclined to use data to make user insights more accurate, test different solutions, and support a more informed, user-centered innovation process.

2. Literature background

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Recent research highlights that integrating Design Thinking (DT), an approach based on empathy, iterative exploration, and user engagement, with Data-Driven Culture (DDC) is emerging as crucial (Sreenivasan and Suresh, 2024). Scholars have also explored DT not only as an innovation methodology but also as a cognitive frame and decision-making approach, influencing how organizations identify and interpret problems and develop potential solutions (Elsbach & Stigliani, 2018; Glen et al., 2015). DDC refers to shared norms and practices that enable organizations to systematically use data for decision-making. It features high data literacy, broad access to relevant data, analytical maturity, and the integration of data into both strategic and operational processes (Provost & Fawcett, 2013; McAfee et al., 2012).

DT has become a central paradigm for innovation because it prioritizes a deep understanding of user needs and contexts (Brown, 2009; Liedtka, 2014; Liedtka, 2015). According to Brown (2009), DT can be understood as an approach that applies designers' ways of thinking and working to align human needs with technological possibilities and business strategies capable of transforming those possibilities into market opportunities. Overall, DT integrates empathic research and iterative prototyping, ultimately enhancing the capacity to learn from users and to generate solutions that are both feasible and desirable (Magistretti et al., 2022). DT promotes experiential learning (Kolb, 2014) by guiding teams through cycles of hypothesis formation, testing, and sense-making. Uncertainty is embraced as a natural aspect of innovation, and mistakes are seen as essential learning moments within a double-loop learning framework (Argyris & Schön, 1978), where new ventures not only modify their actions based on feedback but also revisit problem framing. Practices frequently used to go beyond personal assumptions and uncover hidden user needs include ethnographic observation, journey mapping, and rapid feedback cycles (Kelley, 2011). Overall, these practices help to reframe problem definition by encouraging practitioners to "look through the eyes of the user," emphasizing empathy and contextual inquiry. This user-focused approach fundamentally influences decision-making by shifting the focus from internal preferences or expert judgments to evidence gathered through interactions with real users. In this way, user-centeredness is not only an approach to problem-solving and innovation but could also become a cultural trait that shapes how new ventures see problems, evaluate opportunities, and allocate resources. In entrepreneurship research, DT is shown to support opportunity creation and iterative learning, as its principles promote reframing, experimentation, and continuous exploration (Carlgren et al., 2016). The literature also indicates that DT not only boosts creativity but also helps develop cultural norms that encourage collaboration, shared problem-solving, and adaptive learning (Elsbach & Stigliani, 2018). Consistent with this perspective, DT might assist entrepreneurs in navigating uncertainty by gaining a deep understanding of user needs and generating innovative solutions through iterative learning (Liedtka, 2015).

DDC is inherently an organizational and cultural phenomenon that facilitates the use of data-based evidence, not solely a technological construct. In literature, DDC is often conceptualized as a key intangible resource and a central component of big data analytics capability (Gupta & George, 2016; Garmaki et al, 2023). Moreover, DDC enhances both exploratory and exploitative innovation, supporting organizational ambidexterity (Mikalef et al., 2019; Ciampi et al., 2021). Empirical studies show that ventures having a DDC outperform their competitors through greater efficiency and more effective innovation processes. However, achieving a DDC requires overcoming barriers such as siloed data, lack of analytical skills, resistance to transparency, and misalignment between data practices and organizational identity.

3. Hypothesis development

Although DT and DDC emerge from different traditions—one human-centered and qualitative, the other analytical and quantitative—they are increasingly recognized as complementary approaches to innovation (Visvizi et al., 2022). DDT is focused on empathy and

emphasizes deep qualitative insights derived from user engagement, while DDC relies on quantitative evidence from digital traces, analytics, and behavioral patterns (Vignoli et al. 2023). Integrating these perspectives offers a more holistic understanding of user behavior and supports more robust innovation and decision-making (Mortati et al., 2023). For example, recent conceptual and empirical studies show that embedding DT into data-intensive projects allows organizations to connect analytics to real user needs, identify more meaningful questions for analysis, and translate complex results into actionable improvements in products and services (Pham et al., 2021)

In new ventures, this orientation closely aligns with the empirical evidence that innovation results not only from technology use but also from how people interact with information and turn data into meaningful insights (Grimaldi et al., 2025). A strong focus on understanding users—empathizing with them—drives the systematic search for accurate, multidimensional information about their behaviors, preferences, and pain points. In innovative new ventures, such insight increasingly comes from structured data sources like behavioral analytics, digital traces, and user feedback (Visvizi et al., 2022). Successful, data-driven ventures combine user-centered discovery practices with systematic data management, helping them reduce bias, improve decision quality, and find behavioral patterns that support product and business model development. Building on this, a strong user-centered mindset is likely to bolster a venture's DDC, as founders and teams rely more on user-related data to deepen their empathetic understanding and guide strategic decisions (An et al., 2024). Therefore, higher levels of user-centeredness and empathy are expected to foster a stronger organizational DDC by embedding the belief that understanding and serving users depends on systematic, data-supported insights rather than subjective judgment. We then propose the following hypothesis.

H1: Empathy (EMP) is positively associated with Data-Driven Culture (DDC)

Learning orientation is a key dimension of the DT mindset, reflecting individuals' eagerness to challenge assumptions, experiment, iterate, and continually deepen their understanding through feedback and reflection (Vignoli et al., 2023). In innovative startups, learning is explicitly connected to how founders and teams work with data: empirical results from startup interviews indicate that organizational learning occurs when teams treat data as a strategic asset, employ iterative testing (e.g., A/B tests), and depend on data to detect failures, improve processes, and refine hypotheses. Data can thus act as a catalyst for this iterative learning process (Vizvivi et al., 2022). In new ventures, individuals with a strong learning orientation are more likely to activate and maintain data-driven behaviors—such as experimentation, evidence-based iteration, and reflective data analysis—thereby fostering a culture that systematically uses data to manage uncertainty and promote innovation. Similarly, research on digital organizational culture confirms that a data-driven mindset grows stronger when organizations encourage ongoing development, knowledge sharing, and routines based on evidence-based improvements (An et al., 2024). In this context, data functions as a catalyst for learning processes that speed up the creation of DDC. We then propose the following hypothesis.

H2: Learning Orientation (LO) is positively associated with Data-Driven Culture (DDC)

4. Methodology

4.1. Data collection and sample

To test the hypotheses of our theoretical model, we conducted a survey on Italian innovative startups. To gather data, we used a questionnaire administered through phone interviews between September and October 2025. The questionnaire is divided into two sections: the first, with items based on a seven-point Likert scale, includes questions about the entrepreneur's design thinking mindset and the firm's data-driven culture; the second section pertains to respondent characteristics, such as gender, age, and educational level, as well as firm characteristics like size, age, industry, and geographical area of operation. On average, the interviews lasted about 30

minutes. The key informant is the startup's founder, typically serving as CEO or a member of the board of directors. The reference population consists of 6,820 Italian startups registered in the official Italian registry of innovative startups founded between 2018 and 2021. Of these, 2,142 companies with contact information (phone number and email) were considered (31.4%). Finally, 305 Italian startups agreed to participate in the study (return rate of 14.2%). The sample provides good representativeness by industry, geographic area, and year of foundation (firm age), as shown in Table 1.

Firm characteristics	**n**	**%**	**Respondent characteristics**	**n**	**%**
Firm size			**Gender**		
0 - 4 employees	242	79.34	Man	237	77.70
5 – 9 employees	36	11.80	Woman	68	22.30
10 – 19 employees	27	8.86			
Firm age			**Age**		
4 years old	98	32.13	≤ 39 years old	80	26.23
5 years old	94	30.82	40 - 49 years old	83	27.21
6 years old	73	23.93	50 – 59 years old	95	31.15
≥ 7 years old	40	13.11	≥ 60 years old	47	15.41
Geographical area			**Educational level**		
Nord-West	100	32.79	High school diploma	87	28.52
Nord-East	47	15.41	Bachelor's & master's degree	156	51.15
Centre	59	19.34	Master's or Ph.D.	62	20.33
South and Islands	99	32.46			
Industry					
Commerce	9	2.95			
Manufacturing	57	18.69			
Services	237	77.70			
Tourism	2	0.66			

Table 1. Sample demographic characteristics

The majority of companies are microenterprises, with almost 80% (79.34%) reporting fewer than 5 employees, consistent with the nature of startups. Geographically, firms are distributed evenly across the North-West (32.79%) and South and Islands (32.46%), with only modest representation from the Centre (19.34%) and North-East (15.41%). This data is consistent with the sampling procedure, which reflects the broader presence of startups in the North-West. Finally, our start-ups are predominantly in the service industry (77.70%), followed by manufacturing (18.69%), while commerce (2.95%) and tourism (0.66%) are minimally represented.

As for the respondent characteristics, the gender distribution (male 77.7%, female 22.3%) reflects a common pattern in the Italian entrepreneurial field. Age-wise, the dataset reveals a diverse range. Individuals aged 50-59 years make up the largest segment (31.15%), followed by those aged 40–49 years (27.21%) and those aged 39 years or younger (26.23%). The proportion of respondents aged 60 or above is comparatively lower (15.41%), consistent with the innovative start-up environment. Most of the respondents have at least a bachelor's or a master's qualification (51.15%), and an additional fifth holds a post-experience master's or a Ph.D. (20.33%).

4.2. Measures

The model constructs that we used were developed on the basis of the existing literature on the data-driven culture and design-thinking mindset and adapted to the current study. As dependent variable, we measure the data-driven culture by using the 5-item Likert scale developed by Gupta and George (2016). Exemplar items are: We consider data a tangible asset; We base our decisions on data rather than on instinct; We continuously coach our employees to make decisions based on data. As independent variable, we measure the design thinking mindset of the entrepreneur, using the scale developed by Vignoli, Dosi and Balboni (2023). Based on our hypotheses, we considered two factors of the multifactor scale: empathy and learning. Empathy is 'the ability to see and experience through another person's eyes, to recognize why people do what they do'. Items for the empathy scale are: During the design activity, I dedicate a considerable amount of time to understand what users need; I can tune into how users feel rapidly and intuitively; I am comfortable seeing problems from the users' point of view; I easily empathize with the concern(s) of other people. Learning is the measure of the 'appetite for learning, the desire to learn, including learning about others, challenging existing frameworks, and seeking new contexts in which to learn something'. The original factor has a 5-item scale, some exemplar items are: I am comfortable seeing a problem as an opportunity to learn; I am comfortable receiving feedback and learn from it.

As control variables, we used the startups' geographical area, the industry, the age of the startups, the entrepreneur's education level, age, and gender.

5. Results

The statistical software used in the analysis was Stata 16. Table 2 illustrates the Spearman's correlations of variables. Considering only the main variables of interest of the model, results show that data driven culture is positively correlated with empathy ($r= 0.242$, $p < 0.001$), learning ($r= 0.320$, $p < 0.001$), and geographical area ($r= 0.133$, $p < 0.05$). While empathy and learning are positively correlated each other ($r= 0.647$, $p < 0.001$).

	1	2	3	4	5	6	7	8	9
1. Data driven culture	1								
2. DT_empathy	0.242***	1							
3. DT_learning	0.320***	0.647***	1						
4. Geographical area	0.133*	0.022	0.054	1					
5. Industry	0.092	0.047	0.002	-0.029	1				
6. SME age	0.018	0.080	0.091	0.215***	0.053	1			

	1	2	3	4	5	6	7	8	9
7. Entr. education	0.047	0.028	-0.005	0.101	0.152**	0.037	1		
8. Entr. age	0.022	0.092	0.095	-0.115*	-0.008	0.075	-0.131*	1	
9. Entr. gender	-0.043	0.092	0.012	-0.006	-0.070	0.069	0.044	-0.146*	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2. Spearman correlation matrix

As these variables describe DT capabilities and they are strongly correlated, they may capture overlapping aspects of the same underlying construct. To avoid this and better assess the distinct influence of each capability, we ran two separate models – one focus on empathy and one on learning – as recommended when theoretically related predictors exhibit high intercorrelations (Hair et al., 2019). Table 3 presents the results of the hierarchical regression analyses. Models 1 reports only the control variables, model 2 adds the empathy variable, and models 3 considers the learning variable.

Our preliminary results show a positive and significant relationship between DDC and empathy ($\beta = 0.161$, $p < 0.001$ – Model 2) and learning ($\beta = 0.124$, $p < 0.001$ – Model 3). Specifically, the higher the empathy and learning, the greater the data driven culture.

	Model 1	Model 2	Model 3
Constant	-0.407	-1.323***	-1.063***
	(0.220)	(0.282)	(0.279)
Control variables			
SME geographical area	0.047*	0.044*	0.047*
	(0.021)	(0.020)	(0.020)
SME industry	0.098	0.099*	0.096
	(0.050)	(0.048)	(0.049)
SME age	-0.006	-0.016	-0.009
	(0.025)	(0.024)	(0.025)
Entr. education	0.031	0.024	0.024
	(0.025)	(0.035)	(0.036)
Entr. age	0.000	-0.001	-0.000
	(0.002)	(0.002)	(0.002)
Entr. gender	-0.037	-0.050	-0.061

	(0.061)	(0.059)	(0.060)
Main variables			
DT_empathy		0.161***	
		(0.033)	
DT_learning			0.124***
			(0.034)
R-squared	0.036	0.079***	0.109***
Adj R-squared	0.017	0.057	0.088
RMSE	0.433	0.424	0.417

Standard errors in parentheses; * p < 0.05, ** p < 0.01, *** p < 0.001

Table 3. Regressions

6. Discussion and conclusion

This study explores how a human-centered DT approach at the entrepreneurial level relates to the emergence of a data-driven culture in startups. By focusing on empathy and learning, two essential dimensions of the DT, we provide empirical evidence that this human-centered approach significantly shapes the development of data-oriented cultural norms. The findings suggest that empathy facilitates the emergence of a data-driven culture, confirming H1. The results support the hypothesis that a strong focus on understanding users and "being in users' shoes" with empathy encourages a more systematic approach to data collection and analysis. In innovative new ventures, this user-centered sensitivity translates into an increasing reliance on structured data sources. Learning orientation also demonstrates a positive association with DDC, confirming H2. Learning orientation move beyond mere accumulation of data and allows for those data to be actively interpreted, reshaped, and used to support iterative experimentation and ongoing improvement. The results confirm the hypothesis that organizational learning emerges when data are considered as a strategic asset and new ventures engage in iterative processes to refine assumptions, improve decision-making, and enhance their solutions. This aligns with the Lean Startup approach (Ries, 2011), where the "build–measure–learn" loop rests on systematic, evidence-driven iteration. Likewise, the literature on organizational ambidexterity (March, 1991; Mikalef et al., 2019) suggests that learning routines enhance both exploratory and exploitative behaviors—reinforcing cultural norms that position data as a fundamental basis for decision-making. Therefore, rather than acting as a bridge between human-centered and data-centered reasoning, these capabilities may help organizations integrate human insight into data-based decision-making processes, thus making data use more context-sensitive and meaningful, especially for new ventures that are increasingly challenged to balance creativity with analytical rigor (Visvizi et al., 2022). Finally, we show that empathy and learning orientation operate through distinct mechanisms: while empathy drives entrepreneurs to seek richer, more accurate information about users, learning orientation shapes how this information is iteratively interpreted, tested, and incorporated into decision-making.

The present study contributes to this debate at the intersection of entrepreneurial and organizational literature. First, we contribute to the DT literature by linking it to a data-oriented organizational outcome. Previous work has mainly discussed how DT shapes creativity,

collaboration, or general organizational culture. Our results show that entrepreneurs who adopt DT – and specifically empathy and learning – are associated with the development of a data-driven culture in their startups. This suggests that DT is not only about generating novel ideas but also about structuring how evidence is gathered, interpreted, and embedded in organizations.

Second, the study advances the debate on integrating human-centered and data-centered approaches to innovation. Our findings empirically support this integrative view: empathy and learning are positively related to a culture that encourages the systematic use of data. Rather than seeing human insight and data analytics as opposing logics, our results suggest that when entrepreneurs are empathic and eager to learn, they may be especially inclined to use data to test alternative solutions and scale successful innovations. When human insight is woven directly into data-based decision-making, data becomes more context-sensitive and actionable, supporting a richer, more informed innovation process.

From a managerial point of view, the findings highlight several implications for startup founders and innovation leaders. First, developing empathy for users can greatly enhance how entrepreneurs interpret data. Empathic founders who regularly engage with users through interviews, shadowing, and co-creation are better at identifying meaningful problems, but they also tend to value structured data (e.g., usage logs, behavioral metrics) to supplement their qualitative insights. This interpretive skill makes data more actionable and relevant to the context. Second, fostering a learning-oriented mindset encourages teams of new ventures to approach innovation through ongoing experimentation rather than relying solely on intuition. When learning is a core part of the process, data naturally becomes integrated into cycles of testing, feedback, and improvement. In the end, this iterative approach helps startups make better decisions and manage uncertainty more effectively. Furthermore, when qualitative exploration—such as user interviews or prototyping—is systematically linked to quantitative analysis, startups can achieve both deeper users understanding and more scalable decision-making. This integration could help startups to build innovation processes that are both analytically rigorous and genuinely human-centered. In uncertain environments, such dual capability may become a key source of adaptability, enabling entrepreneurs not only to innovate but to keep their innovations aligned with the evolving expectations of users and stakeholders.

Like any study, our work has limitations that open doors for future research. First, the paper is a work in progress, offering an initial analysis of an ongoing project that is not yet finished, leaving room for further exploration of the results. Second, while this study focused on empathy and learning, two key aspects of the scale by Vignoli et al. (2023), future research may investigate additional DT dimensions and how they relate to DDC and other performance outcomes, such as product-market fit or the innovation process. Third, comparative studies across countries or innovation ecosystems could help uncover the influence of institutional and cultural contexts. Different cultural attitudes toward uncertainty, learning, or data use may affect how entrepreneurs apply and combine design thinking with data-driven practices. Fourth, qualitative research could provide detailed insights into the microprocesses through which empathy and learning influence data interpretation and decision-making. These approaches would complement quantitative data and deepen understanding of how founders interpret data in real-world settings. Fifth, this study examines Italian innovative startups. Although this setting is relevant, cultural and institutional factors might shape both DT and data practices. Cross-country and cross-ecosystem comparisons could assess whether the relationships observed are consistent across different regulatory, technological, and cultural environments.

Keywords: Design thinking; data-driven culture; innovation; new ventures; organizational learning

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The Governance of Intelligent Technologies: How Board Composition Shapes Ethical AI Adoption. Evidence from Board Structures A cross 2025 Global Firms

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1. Introduzione

L'evoluzione della corporate governance nell'era dell'Intelligenza Artificiale (AI) solleva interrogativi inediti sulla capacità delle imprese di coniugare innovazione tecnologica e responsabilità etica. L'adozione di pratiche formali di AI governance, tra cui le Ethical AI Policies, non rappresenta più un'iniziativa meramente reputazionale, ma si configura come un elemento strutturale della strategia aziendale, segnalando la maturità dell'organizzazione nel governare una tecnologia che modifica processi, rischi e relazioni con gli stakeholder.

In tale prospettiva, l'introduzione di politiche etiche sull'AI può essere interpretata, alla luce della Resource-Based View (Barney, 1991; García et al., 2018), come una manifestazione tangibile di una capability organizzativa avanzata. Governare l'AI non implica soltanto possederne le competenze tecniche, ma richiede capacità più profonde: integrare criteri etici nei processi decisionali, anticipare rischi regolatori e reputazionali, interpretare l'impatto sociale della tecnologia. Queste capacità sono particolarmente coerenti con il paradigma dell'absorptive capacity (Cohen & Levinthal, 1990; Vlačić et al., 2019), secondo cui le imprese dotate di maggiori competenze cognitive e organizzative sono più pronte a riconoscere il valore delle conoscenze emergenti e a trasformarlo in vantaggio competitivo sostenibile.

Parallelamente, la letteratura ESG ha ampiamente documentato come le performance ambientali, sociali e di governance costituiscano leve interne di creazione del valore, correlate a maggiore resilienza, migliori risultati economici e minore rischio (Morea et al., 2025; Deng, 2024; Shin et al., 2023; Bahadir & Akarsu, 2024; Xu & Wan, 2024; Binesh et al., 2024; Farooq & Noor, 2021; Antunes et al., 2023). In tale quadro, la governance etica dell'AI può essere vista come una naturale estensione contemporanea della dimensione "G" dell'ESG: un nuovo dominio attraverso cui il board esercita supervisione strategica, allineando innovazione tecnologica, responsabilità etica e interesse degli stakeholder (Floridi & Cowls, 2019).

2. Review della letteratura e sviluppo delle ipotesi

Il presente studio prende le mosse da un'analisi sistematica della letteratura sull' AI ethics e corporate governance. A tal fine è stato adottato un approccio bibliometrico su dati Web of Science, utilizzando una query mirata che combina le keyword "AI ethics", "responsible AI" e "corporate governance" all'interno dell'area Business & Economics. Il dataset così ottenuto è stato elaborato tramite VOSviewer, mappando le co-occorrenze in titoli e abstract e consentendo di identificare i principali cluster tematici e le aree di maggiore intensità del dibattito.

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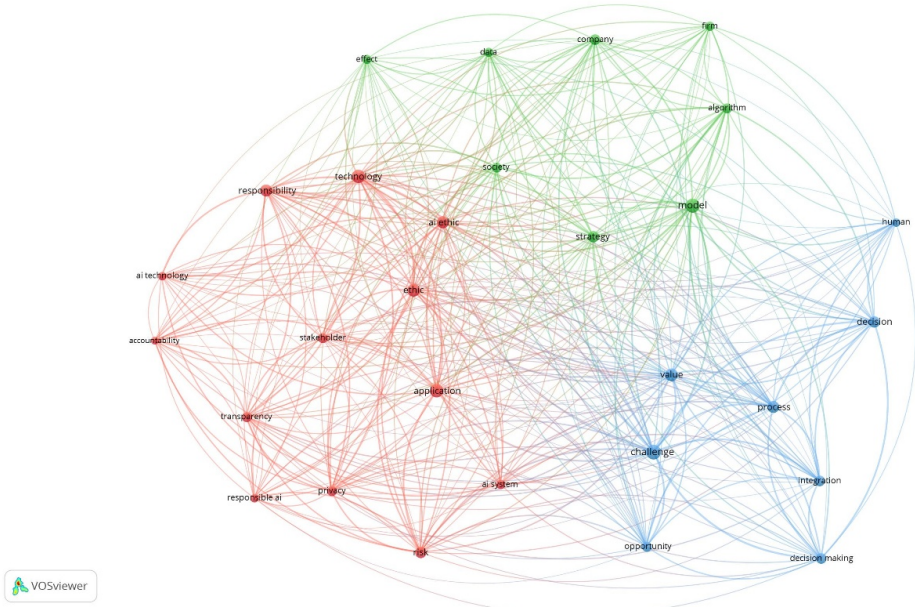


Figura 1. Mappa bibliometrica delle co-occorrenze delle parole chiave nella letteratura su AI Ethics e Corporate Governance

L'analisi delle co-occorrenze evidenzia tre filoni principali: un cluster valoriale, centrato su etica, responsabilità, accountability e trasparenza; un cluster tecnico-organizzativo, focalizzato su impresa, algoritmo, rischio e modelli di business; e un cluster decisionale, legato a processi decisionali, integrazione tecnologica e creazione di valore sostenibile. Nel complesso, la letteratura risulta in rapida espansione ma ancora frammentata e prevalentemente concettuale: sebbene siano ormai ben delineate le intersezioni tra AI, governance ed etica, sono scarse le evidenze empiriche sistematiche sull'adozione effettiva di politiche etiche per l'AI e, soprattutto, sul ruolo che la composizione del board svolge nel favorirne l'introduzione.

È precisamente in questo spazio che si colloca il presente contributo, che mira a colmare tale gap offrendo prime evidenze empiriche su base cross-section circa l'associazione tra struttura del board e l' adozione di AI Ethical Policies.

La letteratura recente evidenzia come l'AI stia ridefinendo ruoli, capacità e processi decisionali del board, introducendo nuove esigenze di supervisione etica e strategica. L'AI potenzia le funzioni informative e di monitoraggio del board, ma richiede al contempo competenze specifiche, meccanismi di controllo dedicati e una governance capace di gestire rischi algoritmici e opacità decisionale (Agnese et al. 2025). La letteratura evidenzia altresì come l'AI stia trasformando capacità e processi decisionali del board, ampliandone le funzioni informative ma introducendo anche vulnerabilità legate alla mancanza di apprendimento senziente e consapevolezza socioculturale (Forsythe, 1993; Kaplan & Haenlein, 2019; Lebovitz et al., 2021). Sebbene particolarmente efficace in contesti stabili, l'AI risulta più esposta a fallimenti estremi rispetto agli agenti umani, il cui ragionamento rimane superiore nella formulazione dei problemi e nella prevenzione degli errori critici (Balasubramanian et al., 2022; Krakowski et al., 2022). A ciò si aggiungono i rischi sociali associati ai sistemi di frontiera, che richiedono architetture dedicate di risk governance, tra cui la progettazione di ethics board con responsabilità, composizione e processi chiaramente definiti (Schuett et al., 2024). In questo scenario, l'adozione dell'AI modifica le fonti della competizione e rende il ruolo del board ancora più centrale nel garantire un'integrazione responsabile e strategicamente orientata delle tecnologie intelligenti.

La composizione del board rappresenta un determinante essenziale della qualità della governance, in particolare attraverso i profili di indipendenza e diversità, che influenzano in modo

significativo la performance organizzativa e la capacità dell'impresa di governare la trasformazione digitale e le tecnologie emergenti. La presenza di amministratori indipendenti è positivamente associata all'efficacia dei meccanismi di controllo e di disclosure del rischio (Mazumder & Hossain, 2022; Adamu & Ivashkovskaya, 2021) e, più in generale, a migliori esiti di responsabilità sociale d'impresa, soprattutto nei contesti caratterizzati da elevata asimmetria informativa (Álvarez & Pucheta-Martínez, 2019; Cucari et al., 2017). Questi contributi evidenziano come board più autonomi siano meglio attrezzati per presidiare rischi complessi, una capacità particolarmente cruciale nelle fasi di adozione e integrazione delle tecnologie digitali (Hasan et al., 2022).

In tale prospettiva, la letteratura mostra che livelli elevati di indipendenza del board favoriscono risultati superiori sia sul piano ambientale e di governance sia nella gestione dei profondi cambiamenti tecnologici legati alla digitalizzazione (Napoli, 2023). L'interazione tra struttura di governance e adozione di tecnologie innovative risulta quindi decisiva: imprese caratterizzate da composizioni consiliari solide ottengono performance migliori in ambito ESG e presentano una maggiore propensione a implementare con successo soluzioni digitali (Grishunin et al., 2022). Parallelamente, la diversità del board – e in particolare quella di genere – contribuisce a ridurre fenomeni di groupthink, promuovendo una cultura di innovazione e capacità adattiva (Esposito et al., 2023). Board eterogenei, grazie alla pluralità di prospettive e competenze, risultano più efficaci nel supervisionare l'adozione di tecnologie emergenti, mitigando i rischi connessi agli investimenti digitali e orientando l'impresa verso strategie di crescita resilienti (Kamalnath, 2018).

Adottando tale prospettiva, appare ragionevole ritenere che l'adozione di una AI Ethical Policy si configura dunque quale una proxy aggiornata della qualità della governance tecnologica dell'impresa, un indicatore sintetico della capacità di integrare innovazione e responsabilità in un assetto decisionale maturo. Essa riflette, contemporaneamente, l'assorbimento organizzativo delle implicazioni dell'AI e la volontà del board di orientare la trasformazione digitale entro confini etici chiari, coerenti e sostenibili.

Alla luce del crescente ruolo delle tecnologie di intelligenza artificiale nei processi decisionali aziendali e delle implicazioni etiche che ne derivano, la presente ricerca si propone di indagare il legame tra governance societaria e adozione di pratiche etiche in ambito AI. In particolare, lo studio affronta la seguente domanda di ricerca:

"In che misura la struttura del board contribuisce a spiegare l'adozione di pratiche etiche relative all'AI?"

A partire da tale interrogativo, vengono formulate due ipotesi di ricerca.

In primo luogo, si ipotizza che la qualità complessiva del consiglio di amministrazione, intesa come configurazione strutturale capace di favorire un'efficace supervisione e un orientamento responsabile delle scelte strategiche, sia associata all'adozione di politiche etiche in ambito AI (H1):

"La qualità complessiva del board è positivamente associata alla probabilità che l'impresa adotti una AI Ethical Policy, a parità di dimensione, performance economica, profilo ESG e struttura dei comitati di governance dell'impresa."

In secondo luogo, lo studio assume che la qualità del board non sia un costrutto monolitico, ma il risultato di specifiche componenti strutturali che possono incidere in modo differenziato sulla capacità dell'impresa di integrare l'AI all'interno di un quadro di governance responsabile. In particolare, l'attenzione viene posta su tre dimensioni chiave del board: indipendenza, diversity e seniority (H2):

"Le componenti strutturali del board – indipendenza, diversity e seniority – presentano effetti differenziati sulla probabilità di adozione di una AI Ethical Policy."

Coerentemente con tali ipotesi, l'analisi empirica è articolata in due modelli distinti: il primo focalizzato sulla qualità complessiva del board, il secondo volto a isolare il contributo specifico delle singole dimensioni strutturali del consiglio di amministrazione.

3. Dati e metodologia

Le analisi empiriche si basano su un dataset originale tratto da Bloomberg, che rappresenta, allo stato attuale, la più ampia popolazione disponibile sulla piattaforma in materia di governance etica dell'intelligenza artificiale. Il campione è costituito da un dataset cross-section riferito all'anno 2025 e comprende 2.048 imprese quotate operanti negli Stati Uniti, in Europa e in Asia. L'analisi si fonda sulla variabile AI_ETH_PLCY_Dumm[4] , una variabile dummy che assume valore pari a 1 qualora l'impresa dichiari l'adozione di linee guida o policy esplicitamente orientate all'impegno etico nell'utilizzo dell'intelligenza artificiale, e 0 altrimenti. Considerata la natura emergente (c.d. early stage) del fenomeno e la conseguente limitata diffusione delle pratiche di disclosure in ambito AI ethics, il processo di campionamento ha seguito un criterio pienamente inclusivo, ricomprendendo tutte le osservazioni censite da Bloomberg per le quali l'informazione risulta disponibile, senza l'applicazione di ulteriori filtri selettivi ex ante. Tale approccio consente di ridurre potenziali bias di selezione e di cogliere in modo più rappresentativo lo stato dell'arte delle pratiche di governance etica dell'AI a livello globale.

Il database è stato successivamente arricchito con un insieme articolato di variabili coerenti con le ipotesi di ricerca e con l'impianto empirico adottato. In primo luogo, con riferimento alla struttura del consiglio di amministrazione, è stato incluso il Board Composition Score[5], un indicatore sintetico che misura la qualità complessiva della composizione del board, integrando dimensioni quali indipendenza, diversity, seniority e configurazione dei ruoli dei consiglieri. Al fine di analizzare in modo più granulare il contributo delle singole componenti strutturali del board, l'analisi considera inoltre il Board Independence Score[6] , il Board Gender Diversity Score[7] e l'età media dei membri del consiglio[8], utilizzata come proxy della seniority demografica del board. Per controllare la presenza di meccanismi formali di supervisione e di presidio delle tematiche etiche e di sostenibilità, il database include una variabile dummy relativa alla presenza di un comitato CSR o di sostenibilità che riporti al consiglio di amministrazione, nonché il numero di membri del comitato di audit, quale indicatore della struttura del sistema di controllo interno[9]. L'analisi tiene inoltre conto di un insieme di caratteristiche economico-finanziarie e di sostenibilità dell'impresa, includendo la dimensione aziendale, misurata come logaritmo del

[4] Bloomberg AI_ETH_PLCY_ indica se la società ha adottato linee guida etiche e/o attività di adeguamento per l'intelligenza artificiale (AI) progettata e sviluppata. 'Y' indica che la società è impegnata in un AI che minimizza i divari e promuove la rappresentazione inclusiva.

[5] Bloomberg Board Composition Score è un indicatore sintetico (0–10) che misura la qualità complessiva della composizione del Consiglio di amministrazione. Il punteggio deriva da una media ponderata dei principali fattori di governance, diversità, indipendenza, ruoli dei direttori e età del board, con pesi determinati sulla base di criteri societari e di mercato.

[6] Bloomberg BOD_INDEPENDENCE_SCORE rappresenta il punteggio (0–10) che misura la rappresentanza femminile nel board e nei ruoli dirigenziali.

[7]Bloomberg BOARD_GENDER_DIVERSITY_SCORE espresso su una scala da 0 a 10, misura la diversità di genere all'interno del Consiglio di amministrazione e nei ruoli dirigenziali.

[8]Bloomberg BOD_AVERAGE_AGE rappresenta l'età media dei membri del consiglio, indicatore sintetico della seniority demografica del board.

[9] Bloomberg Audit Committe misura il numero di membri del consiglio che siedono nel comitato di audit (o equivalente) della società. Include esclusivamente i membri effettivi a tempo pieno, escludendo membri supplenti o alternativi. CSR Committee dummy: variabile dummy che indica se la società dispone di un comitato CSR/sostenibilità (o equivalente) che riporta al Consiglio di amministrazione. Assume valore 1 quando tra le responsabilità del comitato rientrano esplicitamente attività di controllo in materia di responsabilità sociale, sostenibilità, salute e sicurezza e/o efficienza energetica, e 0 altrimenti.

totale dell'attivo[10], la performance operativa, misurata attraverso il logaritmo dell'EBIT[11], e il punteggio ESG complessivo[12], che sintetizza la performance ambientale, sociale e di governance dell'impresa. Infine, al fine di tenere conto dell'eterogeneità strutturale tra imprese operanti in contesti differenti, l'analisi incorpora variabili di controllo relative al settore industriale e all'area geografica di appartenenza dell'impresa.

A completamento della descrizione del campione, la Tabella 1 riporta le statistiche descrittive delle principali variabili considerate nell'analisi. I dati evidenziano come l'adozione di una AI Ethical Policy risulti ancora relativamente contenuta nel campione (circa 8,7% delle imprese), coerentemente con la natura emergente delle pratiche di governance etica dell'AI. Con riferimento alle caratteristiche del board, il Board Composition Score presenta un valore medio pari a 5,53 su una scala 0–10, indicando una qualità complessiva moderata della composizione dei consigli di amministrazione, a fronte di una marcata eterogeneità nelle singole dimensioni strutturali, in particolare in termini di indipendenza e diversity. L'età media dei membri del consiglio si attesta intorno ai 58 anni, mentre la presenza di meccanismi formali di governance, quali il comitato CSR, riguarda circa un terzo delle imprese del campione. Le variabili economico-finanziarie e di sostenibilità mostrano infine un'elevata dispersione, riflettendo la significativa eterogeneità dimensionale, reddituale ed ESG delle imprese analizzate.

Descriptive statistics	**count**	**mean**	**sd**	**min**	**max**
AI_ETH_PLCY_Dumm	1823	0.087	0.281	0.00	1.00
CSR_COMMITTEE_Dum	1915	0.313	0.464	0.00	1.00
N._MEMB_AUD_CMTE	2048	2.747	1.469	0.00	9.00
BOD_COMP_SCORE	2048	5.525	1.490	0.97	9.75
BOD_INDEPE_SCORE	2048	4.410	2.778	0.00	10.00
BOD_AVG_AGE	1690	58.060	6.023	39.71	78.75
BOARD_GEND_DIV_SCORE	2041	4.000	3.065	0.00	10.00
BS_TA_LN	2047	6.686	1.975	-2.17	14.46
EBIT_LN	1467	4.097	2.029	-2.39	11.72
ESG_SCORE	2048	2.776	1.417	0.28	8.72
Observation	*2048*				

Tabella 1. Statistiche descrittive delle variabili utilizzate nell'analisi empirica

A integrazione delle statistiche descrittive, la Figura 1 rappresenta la distribuzione del Board Composition Score distinguendo tra imprese che adottano e imprese che non adottano una AI Ethical Policy. La figura 2 evidenzia uno spostamento verso valori più elevati dell'indicatore di qualità del board per le imprese che dichiarano l'adozione di politiche etiche sull'AI, suggerendo una maggiore qualità media della composizione del consiglio. Tale evidenza grafica fornisce un primo riscontro descrittivo della relazione analizzata, senza implicare alcuna interpretazione di natura causale.

[10] Bloomberg totale dell'attivo da stato patrimoniale, espresso in scala logaritmica.
[11] Bloomberg LTM EBIT è il risultato operativo LTM espresso in scala logaritmica.
[12] Bloomberg ESG è il punteggio che misura la performance ESG complessiva (0-10).

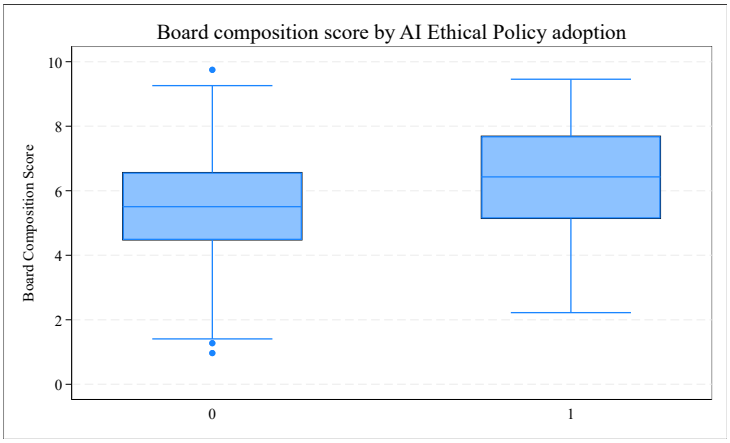


Figura 2. Distribuzione del Board Composition Score in funzione dell'adozione di una AI Ethical Policy

Le analisi empiriche sono condotte su dati cross-section riferiti all'anno 2025. La scelta di un'impostazione trasversale riflette la natura e la disponibilità delle informazioni oggetto di analisi, in particolare con riferimento alla variabile dipendente AI_ETH_PLCY_Dumm, per la quale non risultano attualmente disponibili serie storiche coerenti e comparabili nel tempo. Di conseguenza, l'assenza di una dimensione longitudinale impedisce l'impiego di modelli panel e orienta l'analisi verso un approccio associativo, volto a esplorare le relazioni tra struttura del board e adozione di pratiche etiche relative all'AI. Considerata la natura dicotomica della variabile dipendente, le stime principali sono realizzate mediante modelli di regressione logistica (Logit), che consentono di modellare in modo appropriato la probabilità che un'impresa adotti una AI Ethical Policy in funzione delle caratteristiche del board e di un insieme coerente di variabili di controllo. L'utilizzo del modello Logit permette inoltre di interpretare i coefficienti stimati in termini di odds ratio, facilitando la lettura dei risultati in un contesto di governance e policy disclosure. I risultati sono presentati sia in termini di odds ratio sia, ove rilevante, attraverso average marginal effects, al fine di fornire una misura intuitiva della rilevanza sostantiva delle associazioni stimate.

L'impianto econometrico adottato è incrementale.

Per testare l'ipotesi H1, viene stimato un primo insieme di modelli ("Modello 1") in cui la probabilità di adozione di una AI Ethical Policy è spiegata mediante un indicatore sintetico della qualità complessiva del board, misurato dal Board Composition Score di Bloomberg, includendo un set di controlli relativi alla dimensione aziendale, alla performance operativa, alla performance ESG e alla presenza di presìdi formali di governance (comitato CSR e comitato di audit). L'inclusione di tali variabili consente di isolare l'associazione tra qualità del board e adozione di pratiche etiche sull'AI, a parità delle principali caratteristiche economico-finanziarie e di governance dell'impresa.

Le specificazioni del Modello 1 sono articolate come segue:

"Baseline": $PR\ (AI_{ETH_{PLCY}{dum}_i} = 1)\ = \Lambda\ (\alpha + \beta_i * BOD_{COMP_{Score}{}_i} + X^i\beta)$

"With sector control": $PR\ (AI_{ETH_{PLCY}{dum}_i} = 1)\ = \Lambda\ (\alpha + \beta_i * BOD_{COMP_{Score}{}_i} + X^i\beta + \ + \delta_{s(i)})$

"With continent control": $PR\ (AI_{ETH_{PLCY}{dum}_i} = 1)\ = \Lambda\ (\alpha + \beta_i * BOD_{COMP_{Score}{}_i} + X^i\beta + \ \theta_{c(i)})$

dove $\Lambda(\cdot)$ indica la funzione di distribuzione logistica cumulata, BOD_COMP_Score_i rappresenta l'indicatore sintetico di qualità della governance del board, $X^i\beta$ è il vettore delle

variabili di controllo, $\delta_{s(i)}$ e $\theta_{c(i)}$ catturano rispettivamente effetti settoriali e geografici, ed ε_i rappresenta il termine di errore.

Per testare l'ipotesi H2, l'analisi sostituisce l'indicatore sintetico di board quality con le singole componenti strutturali del consiglio di amministrazione, includendo misure di indipendenza, diversity di genere e seniority demografica, mantenendo invariato il set di controlli e la struttura incrementale delle specificazioni.

Per fini di robustezza, le stesse specificazioni sono state replicate anche mediante modelli di probabilità lineare (OLS) applicati al medesimo set di dati, mantenendo invariate le specificazioni. Tali stime, pur non costituendo il riferimento principale dell'analisi a causa dei limiti noti dell'OLS in presenza di variabili dipendenti dicotomiche, consentono di verificare la stabilità del segno e della significatività delle associazioni osservate nei modelli logit. I risultati OLS sono pertanto interpretati esclusivamente come controllo di robustezza.

4. Risultati

La Tabella 2 riporta i risultati relativi al Modello 1, volto a testare l'ipotesi H1, secondo cui la qualità complessiva del consiglio di amministrazione è positivamente associata all'adozione di pratiche etiche relative all'intelligenza artificiale.

H1 - Modello 1 **AI_ETH_PLCY_Dumm**	**Baseline** Logit (OR)	**Sector controls** Logit (OR)	**Continent controls** Logit (OR)
CSR_COMMITTEE_Dum	0.863	0.925	0.900
	(0.203)	(0.222)	(0.218)
N._MEMB_AUD_CMTE	0.908	0.924	0.900
	(0.077)	(0.080)	(0.076)
BOD_COMP_SCORE	1.364***	1.296***	1.225**
	(0.105)	(0.100)	(0.104)
BS_TA_LN	1.219	1.355**	1.283*
	(0.155)	(0.173)	(0.167)
EBIT_LN	1.233*	1.127	1.208
	(0.148)	(0.132)	(0.148)
ESG_SCORE	1.369***	1.437***	1.320***
	(0.116)	(0.126)	(0.116)
Observations	*1232*	*1232*	*1232*

** p < 0.10, ** p < 0.05, *** p < 0.01*

Tabella 2. Exponentiated coefficients, Standard errors in parentheses

I risultati forniscono un supporto chiaro e coerente all'ipotesi formulata. In tutte le specificazioni considerate, il Board Composition Score risulta positivamente e significativamente associato alla probabilità che l'impresa adotti una AI Ethical Policy, suggerendo che una maggiore qualità complessiva della struttura del board si accompagna a una più elevata propensione a formalizzare principi e linee guida etiche nell'utilizzo delle tecnologie di intelligenza artificiale. L'associazione emerge già nel modello baseline e si mantiene stabile anche includendo controlli per l'eterogeneità settoriale e geografica, indicando che il legame osservato non è riconducibile a specificità industriali o continentali, ma riflette una relazione più generale tra qualità del consiglio di amministrazione e orientamento verso pratiche di governance responsabile. In termini interpretativi, tali evidenze suggeriscono che board caratterizzati da una composizione più solida, in termini di indipendenza, equilibrio dei ruoli, diversity e seniority, appaiono maggiormente in grado di presidiare i rischi etici e reputazionali associati all'adozione dell'AI, traducendo tale attenzione in strumenti formali di indirizzo e supervisione.

Per quanto riguarda le variabili di controllo, i risultati mostrano un quadro nel complesso coerente con la letteratura sulla corporate governance e sulla disclosure volontaria analizzata. La dimensione aziendale, misurata come logaritmo del totale dell'attivo (BS_TA_LN), presenta un'associazione positiva con l'adozione di una AI Ethical Policy, che diventa più marcata e statisticamente significativa una volta controllato per l'eterogeneità settoriale e geografica. Tale andamento suggerisce che l'effetto della dimensione emerge in modo più netto quando si isolano le differenze strutturali tra contesti industriali e territoriali, coerentemente con l'idea che le imprese di maggiori dimensioni siano più esposte a pressioni reputazionali, regolamentari e di accountability. Analogamente, L'effetto positivo e persistente dell'ESG Score indica inoltre che la AI Ethical Policy si inserisce nel solco di una cultura aziendale orientata alla sostenibilità, configurandosi, potenzialmente come una naturale evoluzione della dimensione "G" dell'ESG. Al contrario, la presenza di un comitato CSR e la dimensione del comitato di audit non mostrano associazioni statisticamente significative, suggerendo che l'adozione di policy etiche sull'AI sembra dipendere più dalla qualità complessiva del consiglio di amministrazione che dalla mera esistenza di specifici presìdi organizzativi. La performance operativa, misurata attraverso l'EBIT, presenta infine un'associazione meno robusta, risultando significativa solo nel modello baseline e perdendo rilevanza una volta introdotti i controlli settoriali e geografici; ciò indica che la decisione di adottare una AI Ethical Policy non appare guidata primariamente da considerazioni di breve periodo legate alla redditività, ma piuttosto da fattori strutturali di governance.

Nel complesso, i risultati del Modello 1 indicano che la qualità del board, intesa come capacità del consiglio di amministrazione di esercitare un ruolo efficace di indirizzo e supervisione strategica, rappresenta un fattore rilevante nell'orientare le imprese verso l'adozione di pratiche etiche relative all'intelligenza artificiale. Con riferimento alla variabile di interesse principale, l'entità dell'effetto stimato risulta rilevante anche dal punto di vista sostantivo: in termini di odds ratio, un incremento di un punto nel Board Composition Score è associato a un aumento delle probabilità relative di adozione di una AI Ethical Policy compreso tra circa il 22% e il 36%, a seconda della specificazione considerata. L'analisi degli average marginal effects indica inoltre che un incremento unitario dell'indicatore di qualità del board si traduce, in media, in un aumento di circa 2 punti percentuali nella probabilità di adozione di una AI Ethical Policy, a parità delle altre condizioni. Questo effetto, pur in un contesto caratterizzato da una diffusione ancora limitata delle policy etiche sull'AI, risulta economicamente significativo e rafforza l'interpretazione secondo cui la qualità del consiglio di amministrazione rappresenta un elemento chiave nella capacità dell'impresa di integrare l'intelligenza artificiale all'interno di un quadro di governance responsabile. Come indicato, graficamente in figura 3, la probabilità predetta di adozione di una AI Ethical Policy aumenta in modo progressivo al crescere della qualità complessiva del board.

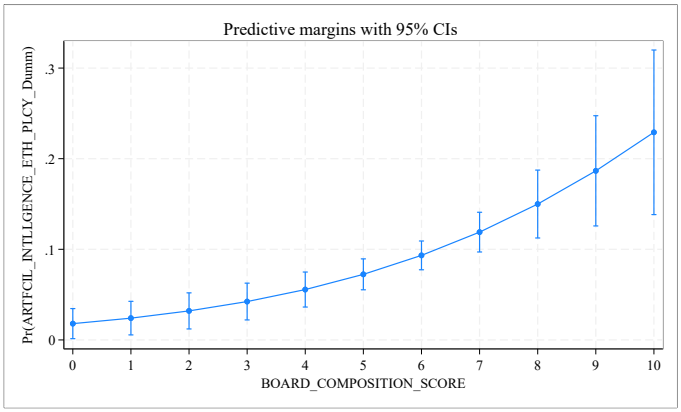


Figura 3. Margini predetti dell'adozione di una AI Ethical Policy al variare del Board Composition Score

Una volta accertata la rilevanza della qualità complessiva del *board*, si è proceduto a scomporre tale indicatore nelle sue principali componenti strutturali, al fine di testare l'ipotesi H2 relativa ai contributi differenziati di indipendenza, *diversity* e *seniority.*

I risultati del "Modello 2" sono di seguito sintetizzati (tabella 3).

H2 - Modello 2 **AI_ETH_PLCY_Dumm**	**Baseline** Logit (OR)	**Sector controls** Logit (OR)	**Continent controls** Logit (OR)
CSR_COMMITTEE_Dum	0.730	0.801	0.877
	(0.198)	(0.221)	(0.246)
N._MEMB_AUD_CMTE	0.862	0.869	0.857
	(0.086)	(0.088)	(0.085)
BOD_INDEPE_SCORE	1.209***	1.167***	1.171**
	(0.064)	(0.063)	(0.072)
BOD_AVG_AGE	0.985	0.984	0.988
	(0.024)	(0.025)	(0.026)
BOARD_GEND_DIV_SCORE	1.077*	1.073	1.010
	(0.047)	(0.047)	(0.051)
BS_TA_LN	1.505***	1.624***	1.565***
	(0.226)	(0.249)	(0.239)
EBIT_LN	1.099	1.043	1.098
	(0.150)	(0.140)	(0.153)
ESG_SCORE	1.319***	1.350***	1.275**
	(0.128)	(0.133)	(0.129)
Observations	*1020*	*1020*	*1020*

** p < 0.10, ** p < 0.05, *** p < 0.01*

Tabella 3. Exponentiated coefficients, Standard errors in parentheses

Coerentemente con l'ipotesi, le evidenze empiriche mostrano una chiara eterogeneità negli effetti associati alle diverse dimensioni del board.

In particolare, il Board Independence Score risulta positivamente e significativamente associato alla probabilità di adozione di una AI Ethical Policy in tutte le specificazioni considerate. L'effetto si mantiene stabile anche includendo controlli settoriali e geografici, suggerendo che l'indipendenza del consiglio rappresenta una componente strutturale particolarmente rilevante nella governance etica dell'AI. Tale risultato è coerente con il ruolo attribuito agli amministratori indipendenti nel rafforzare la funzione di monitoraggio e nel promuovere decisioni orientate alla gestione dei rischi emergenti e alla tutela degli stakeholder nel lungo periodo.

Le evidenze relative alla diversità di genere risultano invece meno robuste. Il Board Gender Diversity Score mostra un'associazione positiva nel modello baseline, che tuttavia perde significatività una volta introdotti i controlli settoriali e geografici, suggerendo un effetto maggiormente condizionato dal contesto istituzionale e industriale. Analogamente, la seniority demografica del board, misurata attraverso l'età media dei consiglieri, non mostra associazioni statisticamente significative, indicando che l'anzianità anagrafica del consiglio, di per sé, non rappresenta un driver sistematico dell'adozione di policy etiche sull'AI.

Per quanto riguarda le variabili di controllo, la dimensione aziendale e il punteggio ESG complessivo risultano positivamente e stabilmente associati all'adozione di una AI Ethical Policy in tutte le specificazioni, mentre la presenza di un comitato CSR, la dimensione del comitato di audit e la performance operativa non mostrano effetti sistematici.

In termini di odds ratio, un incremento di un punto nel Board Independence Score è associato a un aumento delle odds di adozione di una AI Ethical Policy compreso tra circa il 17% e il 21%, a seconda della specificazione considerata. Coerentemente, l'analisi degli average marginal

effects indica che un aumento dell'indipendenza del consiglio si traduce, in media, in un incremento dell'ordine di 1–2 punti percentuali nella probabilità di adozione di una policy etica sull'AI, a parità delle altre condizioni. In figura 4, sono rappresentati i risultati dell'analisi.

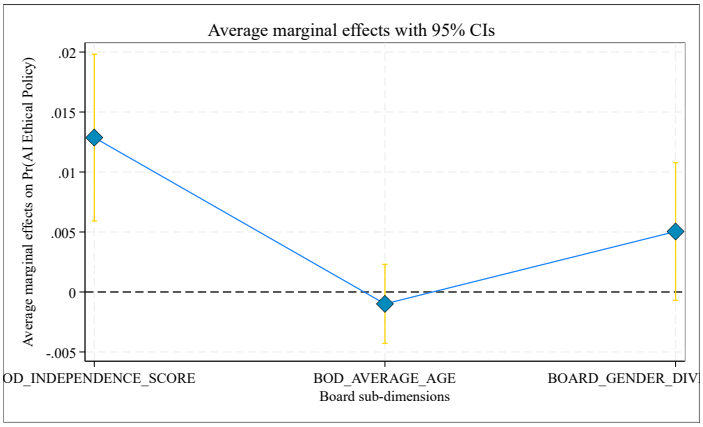


Figura 4. Effetti marginali medi delle dimensioni del consiglio di amministrazione sulla probabilità di adozione di una AI Ethical Policy

A fini di verifica della stabilità dei segni e della coerenza dei risultati, le analisi sono state replicate mediante modelli OLS/LPM su dati cross-section, includendo le medesime specificazioni baseline, con controlli settoriali e geografici. Le evidenze empiriche risultano coerenti tra le diverse specificazioni e metodologie adottate, rafforzando la solidità e l'affidabilità dei risultati presentati.

H1 - Modello 1 (OLS/LPM)	**Baseline**	**Sector controls**	**Continent controls**
	AI_ETH_PLCY_Dum m	AI_ETH_PLCY_Dum m	AI_ETH_PLCY_Dum m
CSR_COMMITTEE_Du m	-0.00581	-0.00365	-0.00569
	(0.0184)	(0.0182)	(0.0185)
N._MEMB_AUD_CMTE	-0.00845	-0.00699	-0.00667
	(0.00603)	(0.00596)	(0.00604)
BOD_COMP_SCORE	0.0235***	0.0186***	0.0143**
	(0.00555)	(0.00556)	(0.00599)
BS_TA_LN	0.0157*	0.0232***	0.0205**
	(0.00868)	(0.00872)	(0.00873)
EBIT_LN	0.0168**	0.0132*	0.0149*
	(0.00801)	(0.00793)	(0.00797)
ESG_SCORE	0.0300***	0.0304***	0.0272***
	(0.00670)	(0.00665)	(0.00682)
_cons	-0.278***	-0.295***	-0.249***
	(0.0438)	(0.0436)	(0.0449)
N	1232	1232	1232

** p < 0.10, ** p < 0.05, *** p < 0.01*

Tabella 4. Standard errors in parentheses

H2 - Modello 2 (OLS/LPM)	**Baseline**	**Sector controls**	**Continent controls**
	AI_ETH_PLCY_Dumm	AI_ETH_PLCY_Dumm	AI_ETH_PLCY_Dumm
CSR_COMMITTEE_Dum	-0.0113	-0.00754	-0.00251
	(0.0202)	(0.0201)	(0.0204)
N._MEMB_AUD_CMTE	-0.0109	-0.00985	-0.00896
	(0.00680)	(0.00675)	(0.00679)
BOD_INDEPE_SCORE	0.0124***	0.00957***	0.00771*
	(0.00367)	(0.00370)	(0.00438)
BOD_AVG_AGE	0.000932	0.00118	0.000408
	(0.00150)	(0.00148)	(0.00155)
BOARD_GEND_DIV	0.00656**	0.00571*	0.00169
	(0.00310)	(0.00309)	(0.00341)
BS_TA_LN	0.0242**	0.0303***	0.0291***
	(0.00952)	(0.00955)	(0.00959)
EBIT_LN	0.0117	0.00924	0.0107
	(0.00871)	(0.00865)	(0.00868)
ESG_SCORE	0.0256***	0.0261***	0.0234***
	(0.00741)	(0.00738)	(0.00755)
_cons	-0.306***	-0.342***	-0.267***
	(0.0945)	(0.0940)	(0.0996)
N	1020	1020	1020

** p < 0.10, ** p < 0.05, *** p < 0.01*

Tabella 5. Standard errors in parentheses

Nel complesso, i risultati forniscono evidenza associativa robusta a supporto dell'idea che la struttura e la qualità del consiglio di amministrazione rappresentino elementi rilevanti nella governance etica dell'intelligenza artificiale. Da un lato, la qualità complessiva del board emerge come un fattore sistematicamente associato all'adozione di una AI Ethical Policy; dall'altro, l'analisi delle singole componenti strutturali mostra che tale relazione è trainata in particolare dal grado di indipendenza del consiglio, mentre diversity e seniority svolgono un ruolo più contingente o dipendente dal contesto. Nel loro insieme, queste evidenze suggeriscono che la capacità dell'impresa di integrare l'AI all'interno di un quadro di governance responsabile dipende in misura significativa dalla funzione strategica esercitata dal board.

5. Conclusioni e discussioni dei risultati

Nel complesso, l'evidenza empirica mostra che l'adozione di una AI Ethical Policy rappresenta un tratto distintivo delle forme più avanzate di corporate governance. Lungi dal configurarsi come un mero adempimento di compliance o come uno strumento reputazionale "nice to have", la presenza di una policy etica sull'AI emerge come un indicatore della capacità del consiglio di amministrazione di esercitare una supervisione strategica consapevole sulle tecnologie intelligenti. Tale risultato appare particolarmente rilevante in un contesto in cui l'intelligenza artificiale sta ridefinendo ruoli, processi decisionali e funzioni del board, ampliandone le capacità informative ma introducendo, al contempo, nuove vulnerabilità legate a rischi algoritmici, opacità decisionale e mancanza di consapevolezza socioculturale (Forsythe, 1993; Kaplan & Haenlein, 2019; Lebovitz et al., 2021; Agnese et al., 2025).

I risultati relativi all'ipotesi H1 confermano che la qualità complessiva del board è positivamente associata alla probabilità di adozione di una AI Ethical Policy, a parità di dimensione, performance economica, profilo ESG e struttura dei comitati di governance. Tale

evidenza è coerente con la Resource-Based View (Barney, 1991), secondo cui le capacità di governo delle tecnologie emergenti costituiscono risorse organizzative difficilmente imitabili, e con il paradigma dell'absorptive capacity (Cohen & Levinthal, 1990), che sottolinea il ruolo delle competenze cognitive e organizzative nel riconoscere, assimilare e governare conoscenze complesse. In questa prospettiva, la governance etica dell'AI può essere interpretata come una manifestazione tangibile di una capability organizzativa avanzata, che consente all'impresa di integrare innovazione tecnologica e responsabilità etica in modo coerente e sostenibile.

L'analisi dell'ipotesi H2 mostra che tale relazione non è monolitica, ma riflette il contributo differenziato delle singole componenti strutturali del consiglio di amministrazione. In particolare, l'indipendenza del board emerge come la dimensione maggiormente associata all'adozione di una AI Ethical Policy, confermando il ruolo centrale degli amministratori indipendenti nel rafforzare la funzione di monitoraggio, nel presidiare rischi complessi e nel promuovere decisioni orientate al lungo periodo (Mazumder & Hossain, 2022; Hasan et al., 2022). Al contrario, le evidenze relative alla diversità di genere e alla seniority demografica risultano meno robuste e più sensibili al contesto, suggerendo che tali dimensioni, pur rilevanti per altri esiti di governance e performance, non si traducono automaticamente in una maggiore propensione all'adozione di policy etiche sull'AI. Questo risultato contribuisce a chiarire il dibattito teorico, indicando che non tutte le caratteristiche del board incidono allo stesso modo sulla governance delle tecnologie intelligenti.

Nel loro insieme, i risultati rafforzano l'interpretazione secondo cui la governance etica dell'AI rappresenta una estensione contemporanea della dimensione "G" dell'ESG attraverso la quale il board esercita una funzione di indirizzo strategico su una tecnologia ad alto impatto sistemico (Floridi & Cowls, 2019),. L'adozione di una AI Ethical Policy può dunque essere letta come una proxy aggiornata della qualità della governance tecnologica dell'impresa e della sua readiness ad affrontare le sfide etiche, operative e reputazionali poste dall'intelligenza artificiale.

Dal punto di vista manageriale, i risultati suggeriscono che l'adozione di un impegno etico nella governance dell'AI non è un esito casuale né puramente simbolico, ma riflette la qualità strutturale del consiglio di amministrazione. Ne discende che le imprese intenzionate a governare responsabilmente le tecnologie intelligenti dovrebbero rafforzare l'indipendenza del board, investire nello sviluppo di competenze specifiche in materia di AI e promuovere una autentica AI literacy consiliare. Inoltre, appare cruciale integrare la governance dell'AI all'interno dei comitati esistenti o istituire presìdi dedicati, collegando formalmente le policy etiche ai processi di gestione del rischio, alle strategie ESG e ai meccanismi di tutela reputazionale. Dal punto di vista delle policy pubbliche, i risultati suggeriscono l'opportunità di introdurre standard minimi di disclosure in materia di AI governance, requisiti di competenza tecnica per i board e architetture di governance in grado di prevenire rischi etici e sociali connessi all'adozione di sistemi intelligenti. Tali interventi potrebbero contribuire a rafforzare un ecosistema di innovazione più trasparente, responsabile e orientato alla sostenibilità tecnologica.

Pur offrendo un contributo originale, lo studio presenta alcune limitazioni che ne circoscrivono la portata interpretativa. In primo luogo, la variabile dipendente è dicotomica e cattura esclusivamente la presenza o assenza di una AI Ethical Policy, senza misurarne contenuto, qualità, grado di enforcement o maturità. Ciò impedisce di distinguere tra approcci meramente dichiarativi e framework effettivamente operativi. In secondo luogo, la natura cross-section dell'analisi, riferita al solo 2025, limita ogni inferenza causale e non consente di analizzare le dinamiche temporali successive all'adozione, lasciando aperti possibili fenomeni di reverse causality. Infine, l'assenza di variabili rilevanti, quali intensità di R&D, capitale umano digitale, AI literacy del board, struttura proprietaria o presenza di competenze tecnologiche dedicate, introduce potenziali bias da variabili omesse.

Tali limiti non attenuano tuttavia il valore esplorativo del contributo, ma indicano direzioni di ricerca future scientificamente promettenti. Studi futuri potrebbero analizzare qualitativamente il contenuto delle AI Ethical Policies, distinguendo tra approcci simbolici e sistemi di governance

effettivi, nonché esaminare il ruolo delle competenze consiliari e delle architetture di governance dedicate nel favorire accountability algoritmica e migliori scelte di design dei sistemi. La disponibilità di dati longitudinali consentirà inoltre di osservare dinamiche di apprendimento, effetti ritardati e percorsi di maturazione della AI governance oggi non identificabili, ma particolarmente rilevanti in un fenomeno che, allo stato attuale, può essere considerato ancora in una fase early-stage.

Parole chiave: AI Ethical Governance; board composition; corporate governance; bloomberg; global firms; digital transformation readiness

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Verso una comprensione multimodale dell'Autenticità d'impresa: prime intuizioni da un caso esplorativo

Alessandra Russo[1], Sonia Quarchioni[2], Pasquale Massimo Picone[3]

1. Contesto di riferimento

Oggi le imprese sono immerse in un mondo sovraccarico di informazioni (Roetzel, 2019) e il ruolo della comunicazione, sia digitale sia fisica, è divenuto estremamente cruciale (Forgues & May, 2017). Proprio per tale ragione, in un recente articolo pubblicato su Forbes (2025, trad. nostra), Michael Shribman, presidente e fondatore di APS Global Partners Inc. e Medias Health Inc., afferma che "L'autenticità nel business è diventata molto più di una tendenza di marketing; […] Influenza ogni punto di contatto—dallo sviluppo del prodotto alle pratiche di assunzione fino al servizio clienti. Le aziende che si impegnano nell'autenticità non sono solo apprezzate—sono amate."

La riflessione sopra riportata trova riscontro anche in un'area emergente della ricerca accademica, che concorda nel riconoscere l'autenticità come una condizione necessaria affinché le imprese possano risultare credibili (Carroll & Wheaton, 2009) nelle proprie relazioni (Carroll & Kovács, 2021) e, di conseguenza, ottenere quella "licenza ad operare" di cui hanno bisogno (Verhaal et al., 2017). Tale considerazione risulta ancor più rilevante per le imprese operanti in settori in cui tradizione, distintività e artigianalità costituiscono elementi centrali (Rondi et al., 2024); in tali settori, l'autenticità rappresenta non solo il "come" le imprese si esprimono ma anche come esse si differenziano (Carroll & Wheaton, 2009). La centralità del tema è ben evidenziata, ad esempio, dal fatto che la più recente edizione della *Guida Winemag 2026* per i vini ha scelto di focalizzarsi proprio sul concetto di "autenticità" (Bortone, 2025).

Alla luce della sua crescente rilevanza, non sorprende che negli ultimi lustri il tema dell'autenticità abbia attirato una considerevole attenzione accademica (Lehman et al., 2019; Sagiv et al., 2019; Voronov et al., 2023). Studi recenti hanno iniziato ad indagare come l'autenticità sia simbolicamente espressa attraverso molteplici elementi organizzativi e modalità comunicative (Cavanaugh & Shankar, 2014; Voronov et al., 2023).

In questo quadro, Carroll e Wheaton (2009), riprendendo la nozione Weberiana di *idealtipo*, individuano diversi tipi di autenticità: tipologica (*type*), artigianale (*craft*), morale (*moral*) e idiosincratica (*idiosyncratic*). Certamente, l'autenticità non può essere considerata semplicemente come un fenomeno che riguarda la singola impresa, bensì essa rappresenta un fenomeno relazionale. Riprendendo la metafora teatrale di Goffman (1959), l'autenticità riguarda la coerenza tra il "retroscena" (back stage) e la "ribalta" (front stage). Nel quadro concettuale di Goffman (1959), l'autenticità è una performance "costruita", plasmata dalle aspettative sociali e dalle norme organizzative. Questa idea di "costruzione" (Peterson, 1997; 2005) suggerisce che le imprese, proprio come gli attori sul palcoscenico, gestiscono e modellano attivamente la propria autenticità per allinearsi alle aspettative dei loro pubblici. In tale prospettiva, l'autenticità d'impresa "emerge dalle pratiche di persuasione e di valutazione" (Voronov et al., 2023, p. 1440,

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trad. nostra). Questa consapevolezza sposta così l'attenzione su come le imprese sviluppano opportunità per "costruire" la propria autenticità (Peterson, 2005).

2. La formulazione del problema di ricerca

Una breve ricognizione panoramica della letteratura sull'autenticità mette in luce due aspetti centrali. Primo, i diversi tipi di autenticità (Newman & Smith, 2016; Lehman et al., 2019) offrono chiavi interpretative alternative, ma complementari, per spiegare come le imprese possano essere percepite come "autentiche" secondo criteri differenti (Carroll & Wheaton, 2009). Gli studiosi riconoscono sempre più che i tipi ideali di autenticità non rappresentano "tipi separati e incompatibili da valutare lungo continuum distinti" (Radoynovska & King, 2019, p. 796, trad. nostra), bensì possono coesistere, alternarsi o evolvere all'interno della stessa impresa (Carroll & Wheaton, 2009; Sagiv et al., 2019). Comprendere tali dinamiche consente di avanzare la teoria sull'autenticità d'impresa, superando una visione statica delle sue tipologie e riconoscendone la natura processuale e relazionale.

Secondo, le strutture organizzative e le pratiche d'impresa sono fondamentali per costruire e sostenere l'autenticità (Carroll & Wheaton, 2009). In questa prospettiva, Peterson (2005) introduce la nozione di authenticity work, intesa come l'insieme degli sforzi deliberati e strategici volti a proiettare rivendicazioni di autenticità credibili. Studi successivi mostrano che l'authenticity work è plasmato da risorse narrative (Beverland, 2005; Jones & Smith, 2005) e dalla coesistenza di risorse narrative e materiali (Dickinson, 2002; Cavanaugh & Shankar, 2014; Demetry, 2019; Voronov et al., 2023). Ad esempio, l'autenticità è sovente rafforzata attraverso artefatti fisici, spazi e riferimenti storici che rendono più plausibili le narrazioni e ne amplificano la risonanza simbolica (Hatch & Schultz, 2017; Ravasi et al., 2019; Voronov et al., 2023). Tuttavia, la nostra comprensione di come l'authenticity work evolva nel tempo e, soprattutto, di come renda possibile l'interazione tra diversi tipi di autenticità, rimane ancora limitata (Sagiv et al., 2019).

La presente ricerca, ancora in fieri, propone un'analisi della costruzione dell'autenticità attraverso la lente della multimodalità, intesa come l'orchestrazione di diverse risorse semiotiche – testi, immagini, odori – organizzate in modalità distinte quali verbale, visiva e olfattiva (Höllerer et al., 2018; 2019). La ricerca sulla multimodalità ha dimostrato il suo potenziale nel modellare i processi di costruzione del significato (Boxenbaum et al., 2018; Quattrone et al., 2021), soprattutto attraverso dimensioni sensoriali legate all'esperienza di un luogo (Giovannoni & Napier, 2023; Dacin et al., 2024) o di un prodotto (Islam et al., 2016). Secondo Voronov et al. (2023), l'authenticity work si configura come un processo narrativo intimamente connesso alla materialità e alla spazialità. A partire da questa intuizione, il presente studio utilizza la prospettiva della multimodalità per indagare le modalità concrete attraverso cui l'autenticità viene costruita nella pratica organizzativa. Il presente studio intende cogliere la natura dinamica dell'authenticity work ed esplorare come le imprese mobilitino differenti modalità comunicative per costruire e sostenere vari tipi di autenticità nel tempo.

3. Quadro teorico della ricerca

3.1. L'autenticità d'impresa: profili definitori

Il tema dell'autenticità attraversa la storia del pensiero umano come risposta alla persistente tensione tra apparenza e realtà (Trilling, 1971). Secondo Trilling (1971, p. 62) la centralità dell'autenticità si rafforza nell'epoca della fioritura del teatro, simbolicamente riassunta nella celebre iscrizione sulle mura del teatro Globe di Shakespeare «Totus mundus agit histrionem», ovvero "Tutto il mondo recita una parte". Lungo i secoli, il tema dell'autenticità è stato al centro di un dibattito continuo poiché diverse tradizioni filosofiche e culturali –come la filosofia classica (Grecia antica), la prospettiva dell'esistenzialismo (Heidegger, Kierkegaard, Sartre) e la

psicologia cognitiva sugli *schemata* (Medin & Smith, 1984)– ne hanno proposto interpretazioni divergenti.

In ambito aziendale, a fronte dei frequenti disallineamenti tra ciò che un'impresa è/fa e ciò che dichiara di essere/fare (Cording et al., 2014), coltivare l'autenticità è necessario per preservare la credibilità organizzativa (Carroll & Wheaton, 2009).

Radicata in una tensione costante tra realtà e apparenza, l'autenticità va intesa come un risultato intenzionalmente fabbricato (Peterson, 2005). Tale "fabbricazione" implica che le imprese, come attori su un palcoscenico, costruiscono attivamente la propria autenticità in linea con le aspettative del pubblico (Goffman, 1959). Sulla base di questa prospettiva, Peterson (2005) definisce l'autenticità come una qualità socialmente costruita (Grayson & Martinec, 2004; Jones & Smith, 2005).

Lehman et al. (2019, p. 1) descrivono l'autenticità come un concetto sfaccettato che può assumere tre distinti significati:

- coerenza tra i valori interni di un'entità e le sue espressioni esterne (Lehman et al., 2019, p. 1). Questo significato di autenticità si riferisce alla coerenza tra le espressioni esteriori di un individuo o di un'impresa e i propri valori e convinzioni interiori;
- conformità di un'entità alle norme della categoria sociale a cui appartiene (Lehman et al., 2019, p. 1). In questo caso, l'autenticità è intesa come l'allineamento di un'entità con la categoria di riferimento o di identificazione;
- connessione tra un'entità e una persona, un luogo o un tempo così come rivendicata (Lehman et al., 2019, p. 1). Questo significato di autenticità può riferirsi alle origini dell'entità, ossia alla sua provenienza. In alternativa, può riguardare una connessione spazio-temporale, definita *transference*, oppure legami di natura simbolica (Lehman et al., 2019).

Mentre Lehman et al. (2019) scandagliano i significati distinti sottesi all'autenticità, Carroll e Wheaton (2009) ne propongono una classificazione dei diversi tipi.

Il primo tipo ideale è l'autenticità tipologica (type), che si riferisce alla misura in cui qualcosa –come un prodotto o un'impresa– soddisfi le aspettative associate alla propria categoria (Carroll & Wheaton, 2009). Secondo gli autori, l'autenticità tipologica nel tempo si evolve in autenticità artigianale (craft), in cui l'enfasi si sposta sulla padronanza della tecnica. In questa prospettiva, qualcosa è autentico quando è realizzato con abilità artigianali e metodi appropriati. Il secondo tipo ideale è l'autenticità morale (moral), che deriva dall'intenzione sincera di agire in coerenza con convinzioni e valori profondamente radicati (Carroll & Wheaton, 2009). Carroll e Wheaton (2009) sostengono che dall'autenticità morale evolve l'autenticità idiosincratica (idiosyncratic), che non si fonda su valori ampiamente condivisi, ma su eccentricità, peculiarità o storie uniche che conferiscono a un prodotto o a un'organizzazione un carattere unico. I tipi di autenticità non sono statici né mutuamente esclusivi (Carroll & Wheaton, 2009); al contrario, possono coesistere, alternarsi o persino fondersi nel corso del tempo (Radoynovska & King, 2019).

A supporto di questa visione dinamica, Hatch e Schultz (2017) mostrano come un manufatto storico possa essere reinterpretato in momenti diversi per generare tipi distinti di autenticità: prima come simbolo di craft authenticity, poi come emblema di moral authenticity. Studi longitudinali confermano tale evoluzione. Rondi et al. (2024, p. 812), indagando i concetti di autenticità, tradizione e unicità, evidenziano la transizione dal lavoro artigianale manuale ("pure craft") a quello tecnico, narrativo ed ecosistemico. Sagiv et al. (2019) mostrano che la costruzione dell'autenticità procede attraverso fasi in cui moral e type authenticity si alternano con lo scopo di decostruire rispettivamente forme e valori e poi coesistono, consentendo la ricombinazione tra forme e valori.

Nonostante gli avanzamenti in letteratura sopra riportati, noi riconosciamo che resta poco esplorato il modo in cui i tipi di autenticità interagiscono nel tempo attraverso specifiche pratiche di costruzione del significato.

Un filone promettente affronta il tema attraverso la nozione di authenticity work (Peterson, 2005), inteso come l'insieme di sforzi materiali e simbolici che rendono credibili le rivendicazioni

di autenticità. Tali pratiche si fondano su risorse linguistiche, materiali e spaziali che non solo persuadono i pubblici, ma funzionano anche come artefatti riflessivi, aiutando l'impresa a dare senso alla propria storia (Hatch & Schultz, 2017).

È d'uopo notare che un recente lavoro di Voronov et al. (2023) ha esplorato il ruolo della narrazione e della materialità nella costruzione dell'autenticità. Secondo gli autori, l'*authenticity work* mira a costruire rivendicazioni di autenticità e si manifesta generalmente attraverso lo sviluppo di specifiche narrazioni. Le narrazioni rappresentano una forma di "impiego linguistico che collega persone, luoghi o cose in una disposizione coerente" (Voronov et al., 2023, p. 1439, trad. nostra) concepita per trasmettere un'immagine chiara e diretta di ciò che l'impresa rappresenta. Tuttavia, le rivendicazioni di autenticità possono risultare più persuasive quando sono connesse alla materialità (Voronov et al., 2023), intesa come "modalità fisica dell'essere" (Faulkner & Runde, 2012) dotata di caratteristiche spaziali distintive (ad esempio, nel loro caso, le caratteristiche del prodotto, l' human embodiment o il design architettonico). Sebbene la letteratura esistente abbia iniziato a esplorare il ruolo della narrazione e della materialità nell'*authenticity work* (Voronov et al., 2023), persiste un significativo divario di comprensione su come le diverse modalità interagiscano all'interno di una strategia di autenticità. Indagare come tali modalità contribuiscano alla costruzione dell'autenticità potrebbe rivelare se esse si rafforzino reciprocamente o si contrappongano.

3.2. Una prospettiva multimodale sull'autenticità

La multimodalità rappresenta "la combinazione e orchestrazione di molteplici modalità negli atti comunicativi" (Höllerer et al., 2018, p. 2, trad. nostra). Il significato dell'atto comunicativo non nasce da una singola modalità, ma emerge dall'interazione tra testi, immagini, suoni, spazi e gesti, che insieme compongono un sistema integrato di segni (Kress & Van Leeuwen, 2001; 2006; Höllerer et al., 2019). Le modalità non si limitano a coesistere, ma si modellano reciprocamente amplificando l'espressività complessiva in complesse "orchestrazioni" (Kress, 2010; Höllerer et al., 2019, p. 7).

Studi recenti hanno mostrato come la combinazione di modalità visive, materiali, sensoriali e verbali influenzi in modo decisivo la costruzione del significato organizzativo (Islam et al., 2016; Boxenbaum et al., 2018; Nathues et al., 2025). Noi crediamo che questa prospettiva risulti particolarmente feconda per analizzare l'authenticity work. Questa idea è supportata da alcuni studi. Ad esempio, Dickinson (2002, p. 16, trad. nostra), nel suo studio del caso Starbucks, mostra che l'autenticità viene costruita attraverso spazio, materialità, elementi visivi, suoni e odori, che insieme danno vita a una retorica "complessa e multimodale" capace di evocare la naturalità del prodotto e l'atmosfera del caffè autentico. In modo analogo, Cavanaugh e Shankar (2014), analizzando un caso di produttori alimentari nel Nord Italia e un caso di Dirigenti pubblicitari asiatico-americani nella città di New York, dimostrano come l'interazione tra modalità linguistiche e materiali (ad esempio, degustazioni, brochure, gesti e rituali) crei un'esperienza sensoriale che rafforza le rivendicazioni di autenticità. Hatch e Schultz (2017) evidenziano come gli artefatti materiali possano funzionare non solo come strumenti di persuasione, ma come promemoria tangibili della storia e dei valori di un'impresa. Infine, Voronov et al. (2023), studiando il settore canadese del whisky, mostrano che l'authenticity work si sviluppa attraverso narrazioni radicate nella materialità e nella spazialità. Nel loro insieme, questi studi dimostrano che la multimodalità rappresenta una lente potente per comprendere come l'authenticity work operi nella pratica.

4. Aspetti metodologici

Questo studio adotta un approccio qualitativo e interpretativo basato su un caso singolo. Il ricorso al case study risulta particolarmente adeguato all'indagine di processi articolati nella loro

manifestazione pratica (Denzin & Lincoln, 2017). Sebbene la ricerca sull'autenticità si sia focalizzata sul livello di settore, diversi contributi hanno messo in evidenza il valore del single case study (Dickinson, 2002; Liedtka, 2008; Hatch & Schultz, 2017; Melewar & Skinner, 2020; Rondi et al., 2024) per comprendere in profondità come l'autenticità si sviluppi nella pratica. In particolare, un caso singolo risulta utile quando l'obiettivo è analizzare il ruolo delle risorse multimodali nei processi organizzativi di costruzione del significato (Siebert et al., 2017; Daymond et al., 2024).

4.1. Selezione del caso

La nostra ricerca, ancora in fase di collezione dei dati, si focalizza su un'impresa familiare di medie dimensioni situata in Sicilia e attiva nel settore vinicolo sin dalla fine del XIX secolo. L'impresa è stata rinominata GoldGrape per ragioni di anonimità; essa opera sia nella produzione di vino sia nell'enoturismo ed è stata selezionata intenzionalmente come contesto ideale per diverse ragioni (Patton, 2002). Primo, GoldGrape appartiene a un settore ampiamente riconosciuto in letteratura per la centralità attribuita all'autenticità (Beverland, 2005, 2006; Negro et al., 2010, 2011; Voronov et al., 2013), così come altri settori affini quali alimentare, ristorazione (Dickinson, 2002; Carroll & Wheaton, 2009; Cavanaugh & Shankar, 2014; Demetry, 2019; Schifeling & Demetry, 2021), birrificazione (Hatch & Schultz, 2017; Melewar & Skinner, 2020) e distillazione (Voronov et al., 2023). In questi settori, usualmente l'autenticità è trasmessa attraverso risorse come gusto, etichette e processi produttivi (Beverland, 2008; Forgues & May, 2017; Voronov et al., 2023), ma anche tramite modalità spaziali e sensoriali, incluse percezioni olfattive e sonore (Dickinson, 2002; Cavanaugh & Shankar, 2014). Più in generale, la natura esperienziale del consumo di vino (Cardinale et al., 2016; Massa & Bédé, 2018; Sthapit et al., 2024) spinge le imprese del settore a ricorrere a un'ampia gamma di risorse multimodali, rendendo questo contesto particolarmente adatto a studiare come tali risorse plasmino i processi di costruzione del significato.

Secondo, GoldGrape opera in un contesto territoriale distintivo, quello del settore vinicolo siciliano, in cui le imprese devono apparire autentiche bilanciando conformità e differenziazione (Voronov et al., 2013). Regolamentazioni istituzionali, disciplinari e sistemi di certificazione rafforzano l'autenticità come principio organizzativo, mentre tendenze emergenti come sostenibilità e turismo esperienziale spingono verso nuove iniziative, tra cui l'enoturismo. In questo scenario, la "fabbricazione" dell'autenticità (Peterson, 1997; 2005) è diventata una priorità strategica, rendendo il contesto particolarmente fertile per analizzare l'authenticity work nella costruzione di diversi tipi di autenticità.

Terzo, la recente evoluzione di GoldGrape offre ulteriore motivazione di interesse. L'impresa ha riorganizzato i propri spazi fisici, enfatizzando l'artigianalità produttiva, la propria storia e i propri valori. Ciò permette di osservare come le risorse multimodali vengano mobilitate per sostenere l'autenticità nel tempo.

Infine, la scelta del caso è stata facilitata dall'elevato livello di accesso ai dati concesso dall'impresa, che ha permesso una raccolta dati approfondita e la possibilità di cogliere la ricchezza delle molteplici modalità con cui GoldGrape costruisce ed esprime la propria autenticità.

4.2. Raccolta dei dati

La raccolta dati ancora in fieri copre il periodo 2014–2025, anche se l'impresa ha una storia molto più lunga. Il 2014 è stato scelto come anno di avvio dell'analisi poiché segna l'inizio di una trasformazione significativa: in quell'anno, la famiglia proprietaria avvia un processo di rinnovamento strategico che ridefinisce il modo in cui GoldGrape costruisce ed esprime l'autenticità.

I dati utilizzati nello studio sono stati raccolti a partire dai primi mesi del 2024 e comprendono una pluralità di fonti. Sebbene non coprano pienamente l'intero arco temporale analizzato, la varietà di tipologie di dati disponibili può consentire di ricostruire in modo approfondito l'evoluzione dell'authenticity work e la costruzione di diversi tipi di autenticità nel tempo. La continuità delle principali figure organizzative, come i proprietari familiari, il responsabile marketing e il responsabile dell'enoturismo, ha permesso di raccogliere narrazioni retrospettive ricche e coerenti (Langley, 1999).

La principale fonte di dati è costituita dalle interviste a proprietari familiari, manager e dipendenti, ciascuna della durata di circa un'ora e mezza. Tutte le interviste sono state condotte dai tre autori insieme; inoltre, le interviste sono state registrate, trascritte e accompagnate da note di ricerca. Inizialmente, le interviste si sono concentrate sulla storia dell'impresa, sulla sua strategia e sugli elementi percepiti come distintivi. Le interviste sono state progressivamente orientate a esplorare in modo più dettagliato l'impiego di risorse semiotiche multiple, con notevole attenzione agli aspetti materiali, spaziali, olfattivi e gustativi, che si sono rivelati particolarmente rilevanti nell'authenticity work di GoldGrape.

Le interviste hanno seguito un approccio multimodal-sensitizing (Dille & Plotnikof, 2020), che mira a catturare la molteplicità delle modalità di produzione di significato osservando anche il linguaggio del corpo, i gesti e il contesto spaziale. In linea con Höllerer et al. (2019), molte delle interviste sono state condotte negli ambienti di lavoro (come l'ufficio storico dei proprietari familiari, ricco di artefatti, o durante passeggiate nella cantina) consentendo ai discorsi sull'autenticità di emergere direttamente dai contesti fisici che li incarnano.

È stata, inoltre, adottata la photo-elicitation interview (Clark-Ibáñez, 2004) con la capofamiglia, invitata a selezionare e commentare fotografie rappresentative dell'autenticità d'impresa. Questa modalità ha permesso di accedere a livelli emotivi di significato spesso invisibili nelle interviste tradizionali. Studi precedenti ne confermano l'efficacia nel suscitare emozioni (Harper, 2002) ed elaborazioni di senso (Warren, 2002; Parker & Warren, 2017; Höllerer et al., 2019), soprattutto nel contesto delle imprese familiari (Smith, 2015).

Ulteriori dati sono stati raccolti tramite visite in loco e osservazioni durante i tour enologici guidati dai proprietari familiari o i dipendenti. I tour, della durata di circa tre ore, hanno consentito di osservare come l'impresa si auto-presenta e quali elementi enfatizza per creare la propria autenticità. Questo tipo di osservazione ha consentito ai ricercatori di sperimentare in prima persona la dimensione multisensoriale dell'autenticità (Keller et al., 2025) e di sviluppare una comprensione più profonda del fenomeno, basata anche sull'esperienza corporea e sensoriale diretta dei materiali e degli spazi (Dacin et al., 2024; Keller et al., 2025).

Durante le visite sono stati adottati i principi del narrative tour method (Tracy, 2013), registrando in documenti scritti la nostra interpretazione della scena, con particolare attenzione alle sensazioni visive, uditive, olfattive, tattili, gustative e al clima emotivo. Foto e video sono stati utilizzati per arricchire e fissare percezioni, emozioni e impressioni (Keller et al., 2025).

Infine, abbiamo avuto accesso a un ampio set di materiali interni ed esterni: immagini, poster e campagne pubblicitarie, brochure, sito web, libri pubblicati, archivi fotografici, video e artefatti storici. Queste fonti hanno permesso di ricostruire la traiettoria storica di GoldGrape e l'evoluzione del suo authenticity work, evidenziando come differenti modalità si siano intrecciate (Nathues et al., 2025) nella costruzione dell'autenticità.

5. Contributi attesi

La nostra ricerca, tuttora in corso, mira a evidenziare come la costruzione dell'autenticità emerga non dall'impiego separato di specifiche risorse semiotiche, bensì dal loro intreccio multimodale e dalla capacità di produrre significati coerenti, esperienzialmente immersivi e simbolicamente pregnanti. In particolare, la nostra ricerca intende mostrare che l'intreccio di risorse verbali, materiali, visive, spaziali e olfattive non solo rafforza la costruzione

dell'autenticità, ma favorisce anche la coesistenza, l'interazione e il rafforzamento tra diversi tipi di autenticità. In tale prospettiva, il primo contributo della ricerca consiste nell'ampliare la comprensione dinamica dell'authenticity work, mostrando come esso si articoli attraverso l'intreccio di risorse multimodali.

Il secondo contributo mira a integrare le prospettive sull'autenticità e sulla multimodalità, evidenziando che l'autenticità non costituisce soltanto un costrutto simbolico o narrativo, ma anche esperienziale, sensoriale e materiale. Più nello specifico, la ricerca si propone di sviluppare un modello concettuale della costruzione multimodale dell'autenticità d'impresa, capace di spiegare come le imprese orchestrino nel tempo risorse semiotiche di diversa natura.

Infine, il terzo contributo, di natura empirica, consiste nell'offrire implicazioni pratiche per le imprese del settore vinicolo, suggerendo come la combinazione strategica di risorse semiotiche narrative, materiali e sensoriali possa essere gestita per sostenere nel tempo la credibilità e l'autenticità d'impresa.

Parole chiave: Autenticità d'impresa; multimodale; single case study

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IA e imprese familiari: disegno di ricerca sul ruolo del mandato del CEO e dei TMT multigenerazionali

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1. Introduzione

L'utilizzo dell'IA rappresenta un tema sempre più centrale per la competitività e la performance delle imprese contemporanee (Davenport e Ronanki, 2018). Per questa ragione, non sorprende che, nel corso dell'ultimo lustro, gli studiosi abbiano dedicato crescente attenzione ai fattori che influenzano l'adozione dell'IA (Mariani et al., 2023; Rizomyliotis et al., 2022; Schwaeke et al., 2025) e alle implicazioni dell'IA sulla performance d'impresa (Krakowski et al., 2023; Prentice et al., 2020; Mikalef e Gupta, 2021). Parallelamente, la ricerca ha esaminato come l'IA rimodelli i processi decisionali e di giudizio all'interno delle imprese (Agrawal et al., 2019; Leyer e Schneider, 2021; Parry et al., 2016; Raisch e Krakowski, 2021; Shrestha et al., 2019; Murtinu e De Massis, 2025). Complessivamente, questi studi collocano l'IA non soltanto come un'innovazione tecnologica, ma come una forza trasformativa che ridefinisce le logiche manageriali, le strutture organizzative e le capacità (Mikalef e Gupta, 2021; Krakowski et al., 2023).

Nel campo delle imprese familiari, studi recenti (Lannon et al., 2024; Karatayev et al., 2024; Soluk et al., 2026) hanno esplorato come queste imprese affrontino le sfide specifiche poste dall'IA. Questi lavori si interrogano su quanto le imprese familiari siano adeguatamente equipaggiate per affrontare le esigenze della quarta rivoluzione industriale, un'era caratterizzata da una rapida digitalizzazione, da processi decisionali guidati dai dati e da una crescente integrazione dell'IA nei processi strategici e operativi (Davenport e Ronanki, 2018). Per le imprese familiari, le cui pratiche e identità sono tipicamente radicate nella tradizione, nell'eredità e nella continuità relazionale (Diaz-Moriana et al., 2020), tali transizioni tecnologiche possono richiedere un distacco profondo da routine consolidate e da logiche gestionali culturalmente radicate. Nonostante la crescente attenzione scientifica, la nostra comprensione di come le imprese familiari affrontino la selezione, l'integrazione e l'adozione delle tecnologie di IA rimane limitata (Lannon et al., 2024).

Evidenze recenti dall'Osservatorio Permanente sull'Adozione e Integrazione dell'IA (2025) indicano che la quota di imprese italiane impegnate in iniziative concrete di IA è salita dal 37% al 67% negli ultimi anni. Questa tendenza riflette un'integrazione strutturale più ampia dell'IA all'interno dei processi d'impresa, segnalando il passaggio dalla sperimentazione all'adozione strategica. Per le imprese familiari, pilastri tanto del sistema imprenditoriale italiano quanto di quello internazionale (Jaskiewicz et al., 2015), questa evoluzione pone considerazioni rilevanti. Le imprese a controllo familiare sono caratterizzate da attributi distintivi quali la ricerca della continuità intergenerazionale (Diaz-Moriana et al., 2020), la preservazione del benessere socio-emotivo familiare (Gómez-Mejía et al., 2007) e una generale propensione alla minimizzazione del rischio (Naldi et al., 2007). Questi tratti possono favorire un orientamento di lungo termine,

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ma possono anche limitare gli investimenti proattivi in tecnologie emergenti come l'IA, soprattutto quando queste sfidano pratiche consolidate o potrebbero essere viste come una minaccia all'identità e ai valori d'impresa.

Questa dualità tra tradizione e innovazione posiziona le imprese familiari come contesti privilegiati per esaminare come le dinamiche di leadership influenzino gli investimenti legati all'IA. Comprendere come le strutture di governance e le configurazioni di leadership tipiche delle imprese familiari modellino gli investimenti in tecnologia offre spunti preziosi per comprendere il più ampio processo di adozione dell'IA.

Il ruolo del CEO e del Top Management Team

La letteratura precedente sottolinea il ruolo centrale del CEO nel plasmare l'orientamento strategico dell'impresa (Hambrick e Fukutomi, 1991). Secondo la teoria del ciclo di vita del CEO, i CEO nelle fasi iniziali del loro mandato affrontano vincoli di legittimazione che limitano la loro capacità di promuovere il cambiamento; l'innovazione tende a raggiungere il picco nella fase intermedia, quando i leader possiedono sia autorità sia ambizione; mentre il conservatorismo tende a prevalere nelle fasi finali, quando i CEO diventano progressivamente ancorati alle routine esistenti (Hambrick e Fukutomi, 1991).

Se da un lato, studi precedenti hanno evidenziato una relazione a U rovesciata tra la durata del mandato del CEO e la propensione imprenditoriale al rischio (Cirillo et al., 2021), altre ricerche (Boling et al., 2016) suggeriscono che la natura familiare della leadership possa rimodellare tale relazione. Nelle imprese familiari, i CEO nelle fasi più avanzate del loro mandato sono meno esposti a pressioni di sostituzione e operano entro un orizzonte di lungo periodo orientato alla continuità. Inoltre, poiché le transizioni di leadership frequentemente coincidono con la successione, i CEO familiari in fase avanzata di mandato possono paradossalmente manifestare una rinnovata apertura all'innovazione (Boling et al., 2016), al fine di salvaguardare la longevità dell'impresa e rafforzare la continuità intergenerazionale. Per questi leader, investire in tecnologie avanzate può rappresentare un atto orientato alla continuità, volto ad assicurare che la generazione successiva erediti un'impresa competitiva e pronta per il futuro.

Tuttavia, concentrarsi esclusivamente sul ruolo del CEO offre una prospettiva limitata sui processi decisionali che determinano la capacità dell'impresa di adottare l'IA. Le iniziative strategiche raramente emergono da una singola visione individuale; al contrario, esse sono l'esito di dinamiche di leadership collettive che coinvolgono il TMT (Cirillo et al., 2021). I TMT multigenerazionali svolgono un ruolo cruciale nel plasmare gli investimenti tecnologici. Integrando membri appartenenti a differenti coorti generazionali, tali gruppi favoriscono eterogeneità della conoscenza e dell'apprendimento (Sciascia et al., 2013; Cirillo et al., 2021). I membri più giovani contribuiscono con familiarità digitale, curiosità tecnologica e apertura all'innovazione, mentre i membri più senior forniscono stabilità strategica, conoscenza contestuale e capitale relazionale di lungo periodo. Questa interazione generazionale può ampliare le capacità di IA dell'impresa in termini di dati, tecnologia, risorse di base e capacità tecniche dei dipendenti (Mikalef e Gupta, 2021).

Tuttavia, come proposto da Cirillo et al. (2021), l'influenza del coinvolgimento generazionale del TMT varia in base alla durata del mandato del CEO: nelle fasi iniziali e intermedie, un elevato coinvolgimento generazionale rafforza la propensione al rischio; nelle fasi avanzate può intensificare la resistenza al cambiamento, poiché i CEO più longevi possono percepire la diversità di conoscenza come una minaccia ai paradigmi consolidati.

Eppure, nell'era dell'IA, tale schema può evolvere. In contesti in cui le generazioni più giovani, nativi digitali e nativi dell'IA (Lannon et al., 2024), partecipano attivamente al top management, la loro familiarità con gli strumenti di IA e la loro capacità tecnologica possono mitigare il conservatorismo tipico delle fasi finali del mandato, favorendo un'apertura continuativa all'innovazione. Ciò suggerisce che i TMT multigenerazionali possano prolungare

la fase del ciclo di vita del CEO in cui il sostegno agli investimenti in IA è più intenso, mantenendolo anche nelle fasi più avanzate del suo mandato.

Sulla scorta di questi argomenti, questa ricerca, ancora in fieri, intende rispondere alla seguente domanda: in che misura la durata del mandato del CEO influenza la capacità di IA nelle imprese familiari, e come il coinvolgimento multigenerazionale del TMT modera tale relazione? Per rispondere a questa domanda, stiamo somministrando un questionario rivolto alle imprese familiari italiane, finalizzato a rilevare come la durata del mandato del CEO e la composizione del TMT influenzino la capacità di IA dell'impresa. Il questionario è stato sottoposto a un test pilota ed è rivolto ai CEO familiari in qualità di informatori privilegiati.

2. Metodologia

Il questionario è stato somministrato a un campione casuale di imprese familiari italiane, comprendente piccole, medie e grandi imprese. I rispondenti al questionario sono stati i CEO di tali imprese, poiché possiedono la visione più ampia dei processi decisionali strategici e dell'allocazione delle risorse.

All'interno di questo campione, le imprese familiari sono state identificate secondo la definizione fornita dall'Associazione Italiana delle Aziende Familiari (AIDAF), in linea con la definizione proposta dalla Commissione Europea. Secondo tale definizione, un'impresa familiare è un'entità legale operante in qualsiasi settore, in cui, da almeno due generazioni:

(a) una famiglia italiana, indipendentemente dal fatto che l'impresa abbia sede in Italia o all'estero, o una famiglia straniera nel caso di un'impresa situata in Italia, detenga direttamente o indirettamente il potere di nominare gli organi di governo dell'impresa; (b) almeno un membro della famiglia sieda in uno degli organi di governo dell'impresa con una posizione esecutiva apicale. Questa operazionalizzazione assicura che la nostra analisi catturi imprese sia di proprietà familiare sia gestite dalla famiglia, riflettendo il duplice influsso della continuità proprietaria e della continuità gestionale.

2.1. Procedure per ridurre i bias da metodo comune

Per affrontare i potenziali bias da metodo comune, sono state applicate diverse misure procedurali e statistiche seguendo le linee guida di Podsakoff et al. (2003). Sulla scorta dell'esempio di Henssen et al. (2014), prima della distribuzione del questionario, tutti gli item sono stati valutati da un panel di studiosi esperti in imprese familiari per garantirne chiarezza concettuale e rilevanza. Considerata la natura tecnica di alcune domande, in particolare quelle riguardanti la capacità di IA in termini di dati, tecnologia, risorse di base e capacità tecniche dei dipendenti, è stato consultato un esperto di IA con ampia esperienza di consulenza presso imprese italiane. Questo esperto ha raffinato gli item più tecnici e ha contribuito a sviluppare definizioni operative per migliorare la comprensione da parte dei rispondenti. Sono state utilizzate esclusivamente scale e item precedentemente validati tratti dalla letteratura esistente. Per garantire l'accuratezza della traduzione, è stato impiegato un processo rigoroso di doppia traduzione: le scale sono state tradotte dall'inglese all'italiano e poi retro-tradotte all'inglese più volte, per mantenere la massima fedeltà ai significati originari.

La versione italiana del questionario è stata pretestata con un gruppo di tre CEO di imprese familiari italiane. Il loro riscontro è stato utilizzato per migliorare la leggibilità e la rilevanza contestuale. Successivamente, il questionario è stato distribuito ai CEO delle imprese familiari italiane attraverso AIDAF e tramite contatti diretti con singole imprese, a seguito di un'e-mail di invito iniziale. È stato garantito l'anonimato dei rispondenti e la partecipazione ha richiesto la lettura di un consenso informato. Una lettera di accompagnamento ha illustrato finalità, tempo richiesto, garanzie di riservatezza e l'opportunità di ricevere un report dei risultati finali.

2.2. Misure

Variabile dipendente: capacità di IA

Abbiamo misurato la capacità di IA delle imprese sulla base dello studio "Artificial intelligence capability: Conceptualization, measurement calibration, and empirical study on its impact on organizational creativity and firm performance" sviluppato da Mikalef e Gupta (2021). Il modello concettualizza la capacità di IA come l'abilità dell'impresa di "selezionare, orchestrare, e sfruttare le proprie risorse specifiche di IA" (Mikalef e Gupta, 2021, p. 4 trad. nostra). Il modello identifica diverse categorie di risorse che determinano la capacità di IA di un'impresa. In questo lavoro, e in linea con la letteratura sull'IA, ci siamo focalizzati sulle risorse tangibili – dati, tecnologia e risorse di base – e su una parte delle risorse umane, ovvero le capacità tecniche dei dipendenti:

- dati: accesso a dati interni ed esterni necessari all'addestramento dei sistemi di IA e al supporto dei processi decisionali;
- tecnologia: sistemi e strumenti necessari per archiviare, elaborare, trasferire e proteggere dati in tutte le fasi, dall'acquisizione all'utilizzo;
- risorse di base: disponibilità di risorse finanziarie e attenzione manageriale dedicate allo sviluppo dei progetti di IA;
- capacità tecniche: competenze tecniche e analitiche dei dipendenti per progettare e operare con i sistemi di IA.

Le suddette risorse sono necessarie perché la natura multidimensionale della capacità di IA richiede non solo aspetti informatici, ma soprattutto lo sviluppo del capitale umano.

Variabile indipendente e moderatore: durata del mandato del CEO e composizione multigenerazionale del TMT

Per misurare l'impatto della durata del mandato del CEO sulla capacità di IA delle imprese, i rispondenti hanno indicato (a) il numero totale di anni trascorsi nell'impresa in qualunque ruolo e (b) il numero di anni trascorsi nel ruolo attuale di CEO. Inoltre, per tener conto della dimensione collettiva del processo decisionale strategico, i rispondenti hanno riportato (c) il numero di membri familiari e non familiari nel TMT e (d) il numero di generazioni rappresentate al suo interno. Questa operazionalizzazione cattura il coinvolgimento multigenerazionale nel TMT come presenza di coorti generazionali multiple, una variabile di diversità intergenerazionale e di eterogeneità di conoscenza.

3. Risultati attesi e contributi

Il focus centrale della nostra ricerca è misurare il livello di capacità di IA nelle imprese familiari italiane. Il nostro modello teorico si basa sulla teoria del ciclo di vita del CEO (Hambrick e Fukutomi, 1991), che integriamo nel contesto dell'IA. L'argomento chiave dello studio è che la durata del mandato del CEO costituisca un antecedente critico della capacità di IA nelle imprese familiari. Riprendendo gli studi che hanno identificato una relazione concava (a U invertita) tra la durata del mandato del CEO e l'orientamento imprenditoriale (Boling et al., 2016), così come tra la durata del mandato del CEO e la propensione al rischio (Cirillo et al., 2021), estendiamo tali intuizioni al contesto dell'IA. In particolare, esaminiamo come la durata del mandato del CEO correli con il livello di capacità di IA dell'impresa in termini di dati, tecnologia, risorse di base e capacità tecniche dei dipendenti. Inoltre, il nostro modello incorpora una variabile moderatrice che cattura l'eterogeneità del processo decisionale strategico: il numero di generazioni rappresentate all'interno del TMT. Questa variabile riflette l'ampiezza della diversità intergenerazionale nella leadership, che riteniamo essere un fattore contestuale rilevante nella definizione dei processi di adozione dell'IA. Ci aspettiamo che i CEO familiari nelle fasi avanzate del loro mandato continuino a mostrare comportamenti innovativi investendo in risorse abilitanti l'IA. Nelle imprese familiari, tali investimenti possono essere interpretati come azioni strategiche orientate alla continuità, volte a salvaguardare il vantaggio competitivo e a garantire continuità di

lungo periodo tra generazioni. Da questa prospettiva, gli investimenti in IA non sono percepiti come una rottura radicale, ma come un veicolo di continuità e rinnovamento, che permette ai leader senior di trasferire ai successori un'impresa tecnologicamente competitiva. Inoltre, ipotizziamo che la presenza di più generazioni all'interno del TMT rafforzi la relazione positiva tra la durata del mandato del CEO e la capacità di IA dell'impresa. Le generazioni più giovani, grazie alla loro maggiore familiarità con le tecnologie digitali e con le tematiche legate all'IA (Lannon et al., 2024), apportano prospettive nuove e alfabetizzazione tecnologica che facilitano gli investimenti. La loro partecipazione attiva al processo decisionale strategico può controbilanciare il conservatorismo tipico delle fasi avanzate del mandato. Di conseguenza, ci aspettiamo che le imprese familiari con TMT multigenerazionali, dove membri più giovani collaborano con leader senior, mostrino livelli più elevati di capacità di IA rispetto a quelle guidate da gruppi più omogenei.

Nel complesso, questa ricerca mira a offrire tre contributi principali alla letteratura. In primo luogo, estende la teoria del ciclo di vita del CEO (Hambrick e Fukutomi, 1991), suggerendo che, nelle imprese familiari, le fasi più avanzate del mandato possano essere associate a una rinnovata apertura verso tecnologie come l'IA, piuttosto che a una contrazione strategica. Tale dinamica si inserisce in un contesto di continuità, in cui questi investimenti possono contribuire a preservare il vantaggio competitivo di lungo periodo dell'impresa anche attraverso le generazioni.

In secondo luogo, contribuisce alla crescente letteratura sull'IA, individuando antecedenti interni del processo di preparazione e adozione tecnologica, in particolare la durata del mandato del CEO e la struttura multigenerazionale del TMT.

Infine, arricchisce la ricerca sul TMT nelle imprese familiari, mostrando come team multigenerazionali, oltre a facilitare lo scambio di conoscenze e a ridurre la resistenza al cambiamento, creino condizioni favorevoli agli investimenti in IA.

Da un punto di vista pratico, i risultati suggeriscono che le fasi avanzate del mandato del CEO possano rappresentare finestre strategiche per l'innovazione e che i TMT bilanciati e multigenerazionali possano agire come catalizzatori dell'adozione dell'IA, combinando competenze digitali con saggezza manageriale accumulata. Riteniamo che la ricerca abbia il potenziale di informare gli operatori d'impresa sull'importanza di valorizzare la continuità di leadership e la diversità generazionale come risorse complementari nel percorso di adozione dell'IA. I CEO familiari nelle fasi avanzate, supportati da leader più giovani con competenze digitali, possono trasformare una potenziale inerzia in lungimiranza strategica, trasformando l'adozione dell'IA in un ponte tra tradizione e innovazione e tra la generazione presente e le generazioni future.

Parole chiave: Intelligenza artificiale; CEO; TMT

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Tra consulenza e tecnologia: indagine delle esigenze delle imprese clienti e del nuovo ruolo del consulente aziendale

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1. Obiettivo della ricerca

L'obiettivo della ricerca è quello di identificare quali siano i servizi degli studi commerciali che le imprese clienti avvertono come più importanti. In tal modo, è possibile comprendere quali siano le attività e quindi i processi della consulenza da migliorare attraverso l'implementazione delle nuove tecnologie.

Inoltre, la ricerca ha lo scopo di indagare sul possibile ruolo del consulente aziendale come intermediario tra le imprese ed i fornitori di tecnologie.

2. Introduzione

Le tecnologie stanno rapidamente trasformando il mondo delle imprese e di conseguenza sono emersi dubbi in merito al ruolo dei consulenti aziendali, di come i loro servizi dovrebbero evolvere al fine di continuare ad apportare valore alle imprese (Bhimani & Willcocks, 2014).

Secondo la letteratura, esistono numerose tecnologie a disposizione e numerosi modi per poterle utilizzare (Sun, 2019-09) (Nelson, Kogan, Srivastava, Vasarhelyi, & Lu, 2000-05) (Goto, 2023-10). Il vantaggio più importante che le tecnologie possono apportare alla consulenza aziendale è l'aumento dell'efficienza e della qualità del lavoro, soprattutto delle attività più ripetitive (Boritz & Stratopoulos, 2023-01) (Almufadda & Almezeini, 2022-09) (Fedyk, Hodson, Khimich, & Fedyk, 2022-09) (Holmes & Douglass, 2022-01) (Almufadda & Almezeini, 2022-09) (Fedyk, Hodson, Khimich, & Fedyk, 2022-09) (Köktener & Tunçalp, 2021).

D'altro canto, la barriera più significativa e diffusa all'implementazione delle tecnologie risulta essere il loro costo (Yang, Blount, & Amrollahi, 2024) (Jackson & Allen, 2024) (Cardinali, Pagano, Carloni, Giovannetti, & Governatori, 2023) (Pajunen, Saastamoinen, Reijonen, Sjögrén, & Syrjä, 2020) (Faulconbridge, Sarwar, & Spring, 2024). Ne consegue che per gli studi professionali di consulenza aziendale (di seguito SPCA) è importante effettuare investimenti mirati, in modo da ottenere i vantaggi desiderati senza disperdere liquidità priva di utilità.

Dato l'alto costo delle tecnologie, gli studi professionali che vogliono innovarsi per migliorare la propria efficienza devono capire quali tecnologie acquistare. Pertanto, è necessario dare priorità ai vari processi di consulenza e capire le attività che conviene migliorare, così da selezionare la tecnologia più adeguata individuando i servizi che i clienti ritengono più utili (Kubr & Prokopenko, 1991).

La prima domanda di ricerca è la seguente:

RQ1: Quali sono i servizi fornibili da uno studio professionale di consulenza aziendale più importanti per le imprese clienti?

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Volendo incentrare la ricerca in particolare sugli SPCA, è necessario indagare le piccole e medie imprese (PMI), in quanto queste rappresentano la clientela maggioritaria degli stessi (R.J. & Robson P.J.A., 1999) (Beck & Fourie, 2025).

Guardando alle PMI, quindi, non si può fare a meno di notare come le innovazioni tecnologiche stiano permettendo alle stesse di semplificare i processi aziendali, espandersi in nuovi mercati (Alam, Setiawan, Toiba, Maulidah, & Rahman, 2025), accrescere la loro resilienza (Hokmabadi, Rezvani, & De Matos, 2024), la loro produttività e la loro competitività (Parra-Sánchez & Talero-Sarmiento, 2024) (Nasution, 2021). Nonostante l'importanza dell'innovazione tecnologica delle PMI sia innegabile, molte di esse faticano a rendersene propriamente conto e tendono perciò a rimanere indietro. Questo è dovuto soprattutto ai costi delle tecnologie ed alla difficoltà delle PMI nella gestione della conoscenza in ambito ICT che impatta sulla loro capacità di assorbire tali innovazioni (Valencia-Arias, Patino-Toro, Coronado, Bernal, & Marquina, 2025) (Ismail, Ghazali, Hamid, Abdullah, & Palil, 2023).

Di fatti, la capacità di una società di innovarsi dipende anche dalla sua capacità di assorbimento della conoscenza, ossia da quanto essa sia in grado di trarre profitto dalla conoscenza esterna. L'abilità di valutare e utilizzare conoscenze provenienti dall'esterno dipende, in larga parte, dal livello di conoscenze pregresse correlate che permettono a chi lavora in una organizzazione di riconoscere il valore delle nuove informazioni diffuse nel mercato, assimilarle e applicarle a fini commerciali (Cohen, 1990).

Parte della letteratura mostra come nelle PMI la capacità di assorbimento e quindi di innovazione sia correlata positivamente alle collaborazioni con società di servizi (Castrogiovanni, 2012) e che la consulenza esterna contribuisce a rafforzare l'impatto positivo delle pratiche di innovazione delle PMI, aumentandone la resilienza (Adam, 2021). Tuttavia, altri studi ritengono che il ricorso a consulenti esterni potrebbe rallentare lo sviluppo delle imprese stesse (Kessler, 2007). In ambito di tale ricerca, ci si chiede se le PMI ritengono il consulente aziendale un partner valido per supportarle nel processo di innovazione.

Pertanto, la seconda domanda di ricerca è la seguente:

RQ2: Il professionista dovrebbe porsi come intermediario tra le imprese clienti ed i fornitori di tecnologie?

3. Contributi teorici e implicazioni pratiche

Vi sono molteplici studi scientifici sulla propensione dei consulenti aziendali verso le innovazioni tecnologiche (Yang, Blount, & Amrollahi, 2024) (Jackson & Allen, 2024) (Cardinali, Pagano, Carloni, Giovannetti, & Governatori, 2023) (Pajunen, Saastamoinen, Reijonen, Sjögrén, & Syrjä, 2020) (Faulconbridge, Sarwar, & Spring, 2024) (Meredith, Blake, Baxter, & Kerr, 2020-12) (Alles & Gray, 2024-09) e altrettanti sull'impatto che le tecnologie hanno su di loro (Moll & Yigitbasioglu, 2019-11) (Boritz & Stratopoulos, 2023-01) (Almufadda & Almezeini, 2022-09) (Fedyk, Hodson, Khimich, & Fedyk, 2022-09) (Holmes & Douglass, 2022-01) (Köktener & Tunçalp, 2021) (Rinta-Kahila, Penttinen, Salovaara, Soliman, & Ruissalo, 2023-01) (Samiolo, Spence, & Toh, 2023-11) (Panda, Pasumarti, & Hiremath, 2023-03) evidenziando le difficoltà percepite e i rischi reali.

Il valore potenziale di tale ricerca, sul lato teorico, risiede nel fornire spunti in merito al dibattito sulla possibilità del consulente aziendale di porsi come intermediario tra le imprese clienti ed i fornitori di tecnologie. Sul lato pratico, invece, risiede nel fornire informazioni utili agli SPCA per la definizione della loro strategia di innovazione tecnologica.

4. Metodologia

L'indagine empirica è stata condotta applicando la case analysis (Ball & Foster, 1982) (Eisenhardt, 1989) (Fattore, 2005) (Rowley, 2002) (Yin, 2009). I dati ottenuti sono stati analizzati attraverso un'analisi quantitativa e qualitativa (Grandis, 2012).

Di seguito si riportano le fasi dell'indagine:

- elaborazione delle domande dell'intervista;
- definizione del campione analizzato;
- somministrazione dell'intervista al campione;
- elaborazione quantitativa dei dati ottenuti;
- analisi qualitativa dei risultati ottenuti.

4.1. Elaborazione delle domande dell'intervista

L'intervista è stata elaborata semi-strutturata (Kubr & Prokopenko, 1991) ed è stata suddivisa in due diverse sezioni.

Prima sezione

La prima sezione mira ad indagare quali siano i servizi erogabili da uno SPCA considerati più importanti dai clienti. In questo modo, gli SPCA possono individuare quali siano i servizi più cruciali e valutare se effettuare un investimento in nuove tecnologie per migliorarli.

A tal fine, è stato elaborato un elenco di attività sulla guida dei documenti riportanti le tariffe professionali consigliate dall'Associazione Nazionale Commercialisti (ANC) e l'Ordine dei Dottori Commercialisti ed Esperti Contabili (ODCEC) di Roma.

Pertanto, sono state identificate le seguenti attività, alcune di esse obbligatorie per le imprese ed altre facoltative:

- Tenuta della contabilità
- Dichiarazioni fiscali
- Bilancio
- Segreteria societaria
- Sostenibilità
- Diritto commerciale
- Aggiornamento/formazione del personale
- Finanza agevolata
- Controllo di gestione
- Pianificazione strategia

Nell'ambito dell'intervista, queste attività sono state affrontate una alla volta e, per ciascuna di esse, sono state poste domande diverse in funzione del fatto che esse vengano effettuate o non effettuate. Pertanto, in merito alle attività facoltative è stata preventivamente posta tale domanda:

Q1. L'Attività facoltativa viene effettuata?

Qualora l'attività fosse effettuata, sono state poste le seguenti domande:

Q2. L'Attività viene effettuate internamente o è stata esternalizzata?

Solo per le Attività esternalizzate:

Q3. Quale figura professionale svolge l'Attività?

Solo per le Attività svolte internamente, sono state poste altre domande.

Q4. Su una scala da 0 a 10 (Kubr & Prokopenko, 1991), di quanta consulenza professionale esterna necessita la società per fare in modo che l'Attività sia efficace?

Q5. Qualora fosse stata indicata un'utilità superiore allo zero, quale pensa possa essere la figura professionale più adeguata a supportare la Società in tale Attività?

Q6. Dato il livello di bisogno percepito, la Società quanto sarebbe disposta ad investire sulla consulenza per migliorare l'Attività?

Qualora, invece, l'Attività non venisse effettuata sono state poste le seguenti domande.

Q7. Su una scala da 0 a 10 (Kubr & Prokopenko, 1991), quanto pensa possa essere utile per la Società iniziare ad effettuare tale Attività?

Q8. Qualora fosse stata indicata un'utilità superiore allo zero, quale pensa possa essere la figura professionale più adeguata al suo svolgimento?

Q9. Dato il livello di utilità percepito, la Società quanto sarebbe disposta ad investire per effettuarla?

Seconda sezione

La seconda sezione ha, invece, l'obiettivo di comprendere l'attuale maturità tecnologica delle imprese e le loro necessità. In questo modo, il professionista potrebbe aiutare le imprese in questo percorso di innovazione ponendosi come intermediario tra le stesse ed i fornitori di strumenti tecnologici.

Anche in questa sezione, le domande sono state differenziate per indagare le tecnologie attualmente adottate e quelle che invece si vorrebbero implementare.

In merito alle tecnologie che vengono utilizzate, sono state poste le seguenti domande.

Q10. Quali tecnologie utilizzate e per quali attività?

Q11. La tecnologia adottata è stata sviluppata internamente o è stata acquistata?

Q12. La tecnologia adottata è stata sviluppata su misura per la Società o è stata acquistata una soluzione prefabbricata?

Se la tecnologia è stata sviluppata su misura, a prescindere dal fatto che sia stata sviluppata internamente o acquistata, sono state poste le seguenti domande.

Q13. Quale figura professionale ha sviluppato tale tecnologia?

Q14. Avete avuto difficoltà nell'interfacciarvi con gli sviluppatori?

Q15. In questo processo di sviluppo, su una scala da 0 a 10 (Kubr & Prokopenko, 1991), quanto pensa avrebbe potuto essere utile un consulente aziendale che intermediasse tra le sue necessità e gli sviluppatori, in modo da migliorare l'efficacia del flusso informativo?

Per quanto concerne le tecnologie che si vorrebbero implementare, sono state poste le seguenti domande.

Q16. Vi sono delle tecnologie che vorreste implementare?

Q17. Si ha intenzione di sviluppare tale tecnologia internamente o di acquistarla?

Q18. Si è orientati ad una tecnologia su misura oppure ad una soluzione prefabbricata?

Se si ha l'intenzione di sviluppare la tecnologia su misura, a prescindere dal fatto che la si voglia sviluppare internamente o acquistarla, sono state poste le seguenti domande.

Q19. Su una scala da 0 a 10 (Kubr & Prokopenko, 1991), quanto pensa che la tecnologia che si vuole implementare possa essere utile per la Società?

Q20. A quale figura professionale si rivolgerebbe?

Q21. Su una scala da 0 a 10 (Kubr & Prokopenko, 1991), quanto pensa potrebbe essere utile un consulente aziendale che intermedi tra le sue necessità e gli sviluppatori, in modo da rendere efficace il flusso informativo?

4.2. Definizione del campione analizzato

Volendo indagare la clientela tipo di uno SPCA, il campione è stato scelto tra la clientela di uno studio professionale.

Pertanto, è stato selezionato un campione di 41 imprese tra la clientela di uno SPCA di Roma, a cui è stata preventivamente mandata una mail di richiesta di partecipazione.

La mail conteneva la presentazione del progetto di ricerca, gli obiettivi, le modalità di svolgimento e una scheda con le domande che sarebbero state poste durante l'intervista. Tale

scheda aveva finalità meramente informativa e non vincolante per lo svolgimento dell'intervista e l'elaborazione dei dati.

Delle 41 imprese contattate, 18 hanno aderito al progetto formando il campione analizzato. Nella tabella n.1 si riportano i profili degli intervistati e delle relative Società. I seguenti dati anagrafici del campione sono stati acquisiti dalle visure e dai bilanci depositati presso la Camera di Commercio e confermati dagli intervistati durante l'indagine.

Intervista	**Ruolo dell'intervistato**	**Forma giuridica**	**Codice ATECORI 2025**	**N. amministratori**	**Età media amministratori**
1	Amministratore	SRL	47.74.09	1	64
2	Amministratore	SRL	68.31.00	1	51
3	Amministratore	SRL	46.45.00	1	52
4	Amministratore delegato	SPA	58.12.00	5	49
5	Direttore	SRL	47.83.10	1	65
6	Amministratore	SNC	47.73.10	2	75
7	Responsabile amministrativo	SRL	52.26.0	5	50
8	Direttore	SRL	82.99.99	1	65
9	Amministratore	SRL	86.99.09	1	31
10	Amministratore	SRL	46.50.10	1	63
11	Amministratore	SRL	47.74.01	1	50
12	Amministratore	SRL	70.10.00	1	54
13	Responsabile Amministrazione	SRL	96.99.93	2	41
14	Responsabile Amministrazione	SRL	47.77.00	1	28
15	Responsabile Amministrazione	SPA	66.19.22	3	54
16	Responsabile Amministrazione	SRL	33.20.02	1	51

17	Amministratore	SPA	46.45.00	2	57
18	Direttore	SRL	47.81.10	1	53

Tabella 1. Il campione

4.3. Somministrazione dell'intervista al campione

L'indagine è stata effettuata nel periodo dal 22 maggio 2025 al 8 agosto 2025.

Ciascuna impresa del campione è stata contattata telefonicamente al fine di fissare un appuntamento per lo svolgimento dell'intervista.

Le interviste si sono svolte preferenzialmente in modalità video-conferenza tramite la piattaforma Microsoft Teams. In alternativa, qualora la connessione internet non risultasse adeguata, per via telefonica. In ogni caso, sono state tutte registrate e trascritte.

Tutti gli intervistati sono stati informati sulle modalità e concordi con le stesse.

Le interviste hanno avuto una durata media di 34 minuti.

4.4. Elaborazione quantitativa dei dati ottenuti

Le interviste sono state trascritte in file word. Essendo interviste semi-strutturate, è stato possibile riportare i dati su un file excel con il quale è stata fatta una prima analisi quantitativa (Grandis, 2012).

4.5. Analisi qualitativa dei risultati ottenuti

Sulle Attività e sulle tecnologie emerse come più significative dall'analisi quantitativa, è stata effettuata un'analisi più approfondita di carattere qualitativo (Grandis, 2012). I risultati di tale analisi non sono esposti in questo elaborato, per gli stessi si rinvia al full paper.

5. Risultati preliminari

Si ricorda che il lavoro è un work in progress e alcuni risultati sono in corso di elaborazione come anche taluni risultati dell'analisi qualitativa.

I risultati della ricerca sono esposti seguendo l'ordine delle attività (Metodologia, paragrafo n.1).

Delle attività oggetto dell'intervista, la Formazione\aggiornamento del personale è stata esclusa dall'analisi dei risultati poiché non ha fatto emergere, da parte degli intervistati, alcuna inerenza con la consulenza aziendale.

a) Tenuta della contabilità

Elaborazione quantitativa:

- Esternalizzata: 72 % (n.13)

Q3. Quale figura professionale svolge l'Attività?

La figura professionale a cui tutte e 13 le società affidano tale attività è quella del Dottore Commercialista.

- Internalizzata: 28 % (n.5)

Q4. Su una scala da 0 a 10, di quanta consulenza professionale esterna necessita la società per fare in modo che l'Attività sia efficace?

La media dell'utilità percepita dalle società che tengono internamente la contabilità è pari a 3. In particolare, il 60% (n.3) delle società che tengono internamente la contabilità non sentono il bisogno di alcuna consulenza esterna. Il restante 40% (n. 2) ha individuato un'utilità media di 7,5.

Q5. Qualora fosse stata indicata un'utilità superiore allo zero, quale pensa possa essere la figura professionale più adeguata a supportare la Società in tale Attività?

Entrambi gli intervistati che hanno ravvisato un'utilità del consulente esterno lo hanno identificato nella figura professionale del dottore commercialista.

Q6. Dato il livello di bisogno percepito, la Società quanto sarebbe disposta ad investire sulla consulenza per migliorare l'Attività?

In corso di elaborazione.

b) Dichiarazioni fiscali

Elaborazione quantitativa:

- Esternalizzata: 100% (n.18)

Q3. Quale figura professionale svolge l'Attività?

Tutte le società esternalizzano tale attività alla figura professionale del Dottore Commercialista.

- Internalizzata: 0%

c) Bilancio

Elaborazione quantitativa:

- Esternalizzata: 94% (n.17)

Q3. Quale figura professionale svolge l'Attività?

Tutte le società che esternalizzano tale attività alla figura professionale del Dottore Commercialista.

- Internalizzata: 6 % (n.1)

Q4. Su una scala da 0 a 10, di quanta consulenza professionale esterna necessita la società per fare in modo che l'Attività sia efficace?

La media dell'utilità percepita dalle società che redigono il bilancio internamente è pari a 2.

Q5. Qualora fosse stata indicata un'utilità superiore allo zero, quale pensa possa essere la figura professionale più adeguata a supportare la Società in tale Attività?

L'intervistato ha individuato come figura professionale più adeguata il dottore commercialista.

Q6. Dato il livello di bisogno percepito, la Società quanto sarebbe disposta ad investire sulla consulenza per migliorare l'Attività?

In corso di elaborazione.

d) Segreteria societaria

Elaborazione quantitativa:

- Esternalizzata: 67% (n.12)

Q3. Quale figura professionale svolge l'Attività?

Tutte le società si rivolgono a dottori commercialisti.

- Internalizzata: 33 % (n.6)

Q4. Su una scala da 0 a 10, di quanta consulenza professionale esterna necessita la società per fare in modo che l'Attività sia efficace?

La media della necessità di un supporto esterno percepita dalle società che effettuano la segreteria societaria in autonomia è pari a 1,7. Di queste, il 67% (n.4) non avverte alcuna necessità, mentre il 33% (n.2) avverte una necessità media di 5.

Q5. Qualora fosse stata indicata un'utilità superiore allo zero, quale pensa possa essere la figura professionale più adeguata a supportare la Società in tale Attività?

Entrambi gli intervistati hanno individuato come figura professionale più adeguata il dottore commercialista.

Q6. Dato il livello di bisogno percepito, la Società quanto sarebbe disposta ad investire sulla consulenza per migliorare l'Attività?

In corso di elaborazione.

e) Bilancio di sostenibilità

Elaborazione quantitativa:

- Esternalizzata: 17% (n.3)

Q3. Quale figura professionale svolge l'Attività?

Il 67% (n.2) delle società, che esternalizzano tale attività, si sono rivolti a società specializzate, mentre il 33% (n.1) rientra nel bilancio di sostenibilità consolidato redatto dalla capogruppo.

- Non effettuata: 83% (n.15)

Q7. Su una scala da 0 a 10, quanto pensa possa essere utile per la Società iniziare ad effettuare tale Attività?

La media dell'utilità percepita del bilancio di sostenibilità dalle società che non lo redigono è pari a 5. In particolare, il 27% (n.4) di queste non ravvede alcuna utilità in questa attività, mentre il restante 73% (n.11) percepisce un'utilità media di 6,5.

Q8. Qualora fosse stata indicata un'utilità superiore allo zero, quale pensa possa essere la figura professionale più adeguata al suo svolgimento?

Degli 11 intervistati che hanno ravvisato un'utilità in questa attività, il 27% (n.3) ha indentificato come figura professionale più adeguata alla redazione del bilancio di sostenibilità il dottore commercialista, un altro 27% (n.3) l'ingegnere ambientale, il 9% (n.1) l'avvocato, un altro 9% (n.1) il revisore, un altro 9% (n.1) l'ingegnere gestionale ed il restante 18% un professionista specializzato. Ad ogni modo, tutti vedono come prerequisito necessario la specializzazione del professionista in materia di sostenibilità.

Q9. Dato il livello di utilità percepito, la Società quanto sarebbe disposta ad investire per effettuarla?

In corso di elaborazione.

f) Diritto commerciale

Nell'affrontare questa attività, per tutti gli intervistati sono stati riscontrati risultati significativamente diversi in base all'ambito della contrattualistica ed a quello delle operazioni straordinarie. Ne consegue la decisione di dividere l'attività Diritto commerciale in due diverse sotto-attività: Contrattualistica e Operazioni straordinarie.

f.1) Contrattualistica

Elaborazione quantitativa:

- Esternalizzata: 67% (n.12)

Q3. Quale figura professionale svolge l'Attività?

Il 33% (n.4) delle società, che esternalizzano tale attività, si rivolgono a studi legali e commerciali, il 25% (n.3) a studi legali, l'8% (n.1) alla capogruppo, un altro 8% (n.1) all'associazione di categoria. Vi è inoltre un 8% (n.1) che non ha saputo identificare una figura professionale in particolare, ritenendo che sono svariate in base alla casistica, mentre il restante 17% (n.2) si interfaccia con grandi imprese fornitrici che presentano loro i contratti già predisposti.

- Internalizzata: 33% (n.6)

Q4. Su una scala da 0 a 10, di quanta consulenza professionale esterna necessita la società per fare in modo che l'Attività sia efficace?

La media dell'utilità percepita dalle società che predispongono la contrattualistica internamente è pari a 2,5. In particolare, l'83% (n.5) non presenta alcuna necessità di una consulenza esterna, mentre il 17% (n.1) ha dichiarato una necessità pari a 10.

Q5. Qualora fosse stata indicata un'utilità superiore allo zero, quale pensa possa essere la figura professionale più adeguata a supportare la Società in tale Attività?

L'intervistato ha individuato come figura professionale più adeguata il legale.

Q6. Dato il livello di bisogno percepito, la Società quanto sarebbe disposta ad investire sulla consulenza per migliorare l'Attività?

In corso di elaborazione

f.2) Operazioni straordinarie

Elaborazione quantitativa:

- Esternalizzata: 61% (n.11)

Q3. Quale figura professionale svolge l'Attività?

Tutte le società che nel corso della loro vita hanno avuto a che fare con operazioni straordinarie, per la loro attuazione si sono rivolti a studi legali e commerciali.

- Non effettuata: 39% (n.7)

In questo caso, non sono state poste ulteriori domande, in quanto l'effettuazione o la non effettuazione dipende dal verificarsi o meno della casistica. È possibile, quindi, affermare che il 39% del campione non si è mai trovato ad affrontare operazioni straordinarie.

g) Finanza agevolata

Elaborazione quantitativa:

- Esternalizzata: 67% (n.12)

Q3. Quale figura professionale svolge l'Attività?

Il 58% (n.7) delle società, che hanno esternalizzano tale attività, si sono rivolti a dottori commercialisti, il 17% (n.2) a società specializzate, l'8% (n.1) a consulenti del lavoro e dottori commercialisti, un altro 8% (n.1) all'azienda fornitrice del bene oggetto di agevolazione e il restante 8% (n.1) ha dichiarato che dipende in base al bando.

- Internalizzata: 11% (n.2)

Q4. Su una scala da 0 a 10, di quanta consulenza professionale esterna necessita la società per fare in modo che l'Attività sia efficace?

Tutte le società che hanno una funzione interna apposita per la gestione della finanza agevolata non avvertono alcuna necessità di un supporto esterno.

- Non effettuata: 22% (n.4)

Q7. Su una scala da 0 a 10, quanto pensa possa essere utile per la Società iniziare ad effettuare tale Attività?

La media dell'utilità percepita della finanza agevolata dalle società che ne usano è pari a 4,25. In particolare, il 50% (n.2) di queste non ravvede alcuna utilità in questa attività, mentre il restante 50% (n.2) percepisce un'utilità media di 8,5.

Q8. Qualora fosse stata indicata un'utilità superiore allo zero, quale pensa possa essere la figura professionale più adeguata al suo svolgimento?

Dei 2 intervistati che hanno ravvisato un'utilità in questa attività, uno ha indentificato come figura professionale più adeguata il dottore commercialista, l'altro il dottore commercialista e gli istituti di credito.

h) Controllo di gestione

Elaborazione quantitativa:

- Esternalizzata: 6% (n.1)

Q3. Quale figura professionale svolge l'Attività?

L'unica società del campione che esternalizza il controllo di gestione lo affida al dottore commercialista.

- Internalizzata: 89% (n.16)

La media dell'utilità percepita dalle società che effettuano il controllo di gestione internamente è pari a 2,56. In particolare, il 69% (n.11) non presenta alcuna necessità di una consulenza esterna, mentre il 31% (n.5) ha presentato una necessità media pari a 8,2.

Q5. Qualora fosse stata indicata un'utilità superiore allo zero, quale pensa possa essere la figura professionale più adeguata a supportare la Società in tale Attività?

Delle 5 società che hanno ravvisato una necessità della consulenza esterna, il 20% (n.1) ha individuato come figura professionale più adeguata il dottore commercialista, il 40% (n.2) un consulente aziendale ed il restante 40% (n.2) non ha saputo identificare una professionalità specifica.

Q6. Dato il livello di bisogno percepito, la Società quanto sarebbe disposta ad investire sulla consulenza per migliorare l'Attività?

In corso di elaborazione.

- Non effettuata: 6% (n.1)

Q7. Su una scala da 0 a 10, quanto pensa possa essere utile per la Società iniziare ad effettuare tale Attività?

L'unica società del campione che non effettua il controllo di gestione ne percepisce un'utilità pari a 7.

Q8. Qualora fosse stata indicata un'utilità superiore allo zero, quale pensa possa essere la figura professionale più adeguata al suo svolgimento?

L'intervistato ha indentificato come figura professionale più adeguata il dottore commercialista.

i) Pianificazione strategica

Elaborazione quantitativa:

- Internalizzata: 78% (n.14)

Q4. Su una scala da 0 a 10, di quanta consulenza professionale esterna necessita la società per fare in modo che l'Attività sia efficace?

La media dell'utilità percepita dalle società che effettuano la pianificazione strategica internamente è pari a 1,30. In particolare, il 75% (n.12) non presenta alcuna necessità di una consulenza esterna, mentre il 25% (n.2) ha presentato una necessità media pari a 9.

Q5. Qualora fosse stata indicata un'utilità superiore allo zero, quale pensa possa essere la figura professionale più adeguata a supportare la Società in tale Attività?

Entrambe le società hanno ravvisato una necessità della pianificazione strategica hanno individuato come figura professionale più adeguata l'informatico.

Q6. Dato il livello di bisogno percepito, la Società quanto sarebbe disposta ad investire sulla consulenza per migliorare l'Attività?

In corso di elaborazione.

- Non effettuata: 22% (n.4)

Q7. Su una scala da 0 a 10, quanto pensa possa essere utile per la Società iniziare ad effettuare tale Attività?

La media dell'utilità percepita della pianificazione strategica dalle società che non la effettuano è pari a 6,5. In particolare, il 25% (n.1) di queste non ravvede alcuna utilità in questa attività, mentre il restante 75% (n.3) percepisce un'utilità media di 8,7.

Q8. Qualora fosse stata indicata un'utilità superiore allo zero, quale pensa possa essere la figura professionale più adeguata al suo svolgimento?

Dei 3 intervistati che hanno ravvisato un'utilità in questa attività, il 33% (n.1) ha indentificato come figura professionale più adeguata il dottore commercialista, un altro 33% (n.1) il data analyst ed il restante 33% (n.1) un consulente aziendale.

Q9. Dato il livello di utilità percepito, la Società quanto sarebbe disposta ad investire per effettuarla?

In corso di elaborazione.

Parole chiave: Consulenza aziendale; tecnologia; innovazione; studi professionali; PMI; intermediazione tecnologica; interviste

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L'intelligenza artificiale negli enti locali: casi d'uso ed evidenze empiriche per l'erogazione dei servizi e l'efficienza amministrativa

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1. Introduzione

L'intelligenza artificiale (IA) sta gradualmente entrando a far parte della quotidianità degli enti locali, aprendo nuove prospettive di applicazione, riconducibili a quattro dimensioni (Goossens et al., 2025). In primo luogo, consente di migliorare la qualità e la quantità dei servizi offerti ai cittadini, nonché le modalità di fruizione da parte degli utenti. In secondo luogo, contribuisce a incrementare l'efficienza dei processi produttivi e organizzativi interni. Un terzo ambito di applicazione, oggi in fase di crescita, riguarda l'utilizzo dell'IA come supporto ai processi decisionali, mentre all'orizzonte si profila la prospettiva della cosiddetta IA agentica, capace non solo di assistere ma, in alcuni casi, di sostituirsi al tradizionale decisore umano (Kim, 2023).

Questo studio si concentra sui primi due utilizzi dell'IA negli enti locali, analizzando un data set di casi d'uso raccolti dalla Commissione Europea nell'ambito dell'iniziativa Public Sector Tech Watch (PSTW, https://interoperable-europe.ec.europa.eu/collection/public-sector-tech-watch). Questo data set contiene oltre duemila casi d'uso riferiti a diversi livelli di pubbliche amministrazioni e a un'ampia gamma di tecnologie emergenti (tra cui IA, Blockchain, 5G, realtà virtuale e aumentata, e gemelli digitali). A partire da questa base, sono stati selezionati i casi già operativi di utilizzo dell'IA nella pubblica amministrazione locale, individuando, all'epoca di questo studio, 233 casi. L'analisi persegue un triplice obiettivo: innanzitutto tracciare una mappa di dove e in quali ambiti l'IA viene utilizzata; successivamente capire se prevale un orientamento al miglioramento dei servizi ai cittadini o all'efficienza interna dei processi; infine, individuare i casi che si distinguono per un forte miglioramento dell'efficienza interna tramite l'IA o dell'erogazione dei servizi verso l'esterno.

2. Background teorico

L'applicazione dell'IA nell'amministrazione pubblica si colloca in un contesto teorico interdisciplinare che integra contributi sull'innovazione tecnologica, sul management pubblico e sulla governance digitale. A livello generale, l'adozione dell'IA da parte degli enti pubblici, in particolare degli enti locali, può essere interpretata alla luce dei modelli di e-government (OECD, 2003), in cui la tecnologia non si limita a digitalizzare i processi esistenti, ma catalizza una profonda trasformazione delle modalità di erogazione dei servizi, delle strutture di governance e delle stesse strutture decisionali.

Recenti studi (Anshari et al., 2024; Yigitcanlar et al., 2024) evidenziano come l'IA rappresenti una leva strategica per la trasformazione amministrativa, capace di integrare efficienza, innovazione e sostenibilità nella gestione locale, in linea con gli obiettivi di sviluppo sostenibile (SDGs) e con le agende di smart governance europee.

In particolare, due filoni teorici sono centrali per l'inquadramento del presente studio; il primo è quello che formula il paradigma della smart governance, secondo cui le tecnologie intelligenti possono migliorare la capacità degli enti pubblici di pianificare, coordinare ed erogare servizi in modo più efficiente, flessibile e reattivo (Meijer & Bolívar, 2016; Namysłowska & Olbryk, 2025). Questo filone teorico sottolinea il potenziale dell'IA come facilitatrice

dell'interazione tra cittadini e amministrazione, attraverso l'uso di strumenti predittivi, chatbot, sistemi di decisione automatizzata e processi di personalizzazione del servizio, ma anche che tali strumenti richiedono di essere messi in relazione con il contesto normativo e competenziale (Wihlborg et al., 2016).

A tali prospettive si aggiunge la visione di una smart governance "data-driven" (Mahant, 2025), in cui l'IA diventa un'infrastruttura cognitiva capace di supportare la cooperazione interistituzionale, l'analisi predittiva e la presa di decisioni basate su evidenze, contribuendo a modelli di amministrazione digitale più reattivi e trasparenti.

Il secondo inquadramento teorico proviene dalla teoria del valore pubblico (Moore, 1997), che enfatizza il bilanciamento tra efficienza amministrativa, equità nell'erogazione dei servizi e democrazia. Utilizzando questa lente teorica, l'uso dell'IA da parte degli enti locali va valutato non solo in base agli output tecnici o ai risparmi di risorse, ma anche alla sua capacità di generare valore, in particolare valore sociale, e di promuovere trasparenza e fiducia (Goossens et al., 2025).

Come sottolineato da Ogu et al. (2024) e Bester (2024), il valore pubblico creato attraverso l'IA deriva dall'interazione tra la performance amministrativa e la soddisfazione dei cittadini: la tecnologia assume significato solo se inserita in processi di governance inclusiva e responsabile, capaci di produrre benefici percepiti dalla collettività.

Questi approcci si integrano con la letteratura sulle tecnologie emergenti nel settore pubblico (Wirtz et al., 2019), che identifica diversi livelli di maturità nell'adozione dell'IA e mette in evidenza sfide organizzative e nuove necessità in termini di competenze e di adeguamento degli asset organizzativi, nonché implicazioni politico-amministrative (Margetts & Dorobantu, 2019). In questo senso, autori come Igbokwe (2024) e Hassan & Fatile (2024) evidenziano che la readiness istituzionale, ossia il livello di preparazione digitale e organizzativa, rappresenta un fattore critico per il successo, poiché l'IA tende ad avere effetti più significativi nei contesti in cui sono presenti infrastrutture dati consolidate, leadership innovativa e capacità di governance multilivello.

Infine, il quadro teorico si completa con l'adozione del sistema COFOG (Classification of the Functions of Government), che consente di mappare gli ambiti di policy in cui le tecnologie sono applicate, fornendo uno schema utile per confronti e comparazioni a livello europeo. Questa dimensione classificatoria, combinata con una prospettiva di policy learning (Nzobonimpa, 2023), consente di analizzare come i diversi livelli di governo locale apprendano e adattino i modelli di IA in risposta a specifiche priorità di efficienza, equità e trasparenza.

Nell'insieme, il background teorico di questo studio esplorativo orienta l'analisi verso una comprensione multilivello dell'adozione dell'IA nella pubblica amministrazione locale, focalizzandosi non solo su come e dove essa venga implementata, ma anche sul perché, evidenziando la relazione tra innovazione e priorità strategiche di policy. Questa prospettiva integrata sottolinea che l'IA, più che una semplice tecnologia di supporto, costituisce un vero e proprio driver istituzionale per la creazione di valore pubblico e la riorganizzazione dei processi decisionali a livello locale.

3. Metodologia

3.1. Campionamento

Lo studio si basa sull'analisi secondaria dei dati raccolti dal PSTW. Tale iniziativa della Commissione Europea documenta progetti e casi d'uso di tecnologie emergenti nel settore pubblico in Europa, standardizzando le informazioni a livello amministrativo e classificandole in base a diversi fattori, tra cui la tecnologia impiegata (Wirtz et al., 2019), l'obiettivo funzionale e lo stato di implementazione.

Su questo database è stata condotta una selezione basata sui seguenti criteri di inclusione:

- Progetti riguardanti il livello amministrativo locale, comprendente comuni, città metropolitane e autorità regionali con funzione di erogazione di servizi diretti ai cittadini;

- Progetti che impiegano l'IA come tecnologia principale, incluse le sue sottocategorie (machine learning, natural language processing, ecc.);
- Progetti operativi, ossia progetti già attivi, escludendo quelli in fase pilota e in pianificazione.
- L'applicazione di tali criteri ha portato all'individuazione di 233 casi d'uso distribuiti in 26 paesi europei.

3.2. Analisi dei dati

L'analisi del campione si articola in due fasi. La prima fase adotta un approccio quantitativo descrittivo. I casi sono stati classificati in base a due dimensioni analitiche principali. La prima dimensione è quella territoriale, in particolare il paese in cui sono state implementate le iniziative. La seconda dimensione è l'ambito di policy, secondo il sistema di classificazione COFOG, per identificare i settori di maggiore concentrazione (ad es. mobilità, ambiente, sicurezza, amministrazione generale). Questa prima fase ha prodotto un resoconto descrittivo dei casi, utile sia per la comunità accademica che per i practitioners.

Successivamente è stata effettuata un'analisi testuale qualitativa incrociata dei casi, in chiave interpretativa, volta a valutare il bilanciamento tra obiettivi (servizi ai cittadini vs. efficienza interna), tecnologie adottate e ambiti applicativi. Tale analisi permette di delineare dei pattern ricorrenti nei progetti osservati, utile per formulare riflessioni sulla fattibilità, sulle implicazioni di governance e sugli orientamenti di policy attuali e futuri. Sulla base della precedente analisi, vengono individuati casi che si distinguono per il livello di efficienza interna e per la qualità dei servizi erogati, e vengono approfonditi integrando le informazioni del dataset con quelle dei canali ufficiali dell'ente specifico (sito web o canali social dell'ente e/o dell'iniziativa e altri database ufficiali).

Lo studio si conclude con un'agenda di ricerca che propone piste di approfondimento per indagare il crescente ruolo dell'IA nelle amministrazioni locali europee.

4. Risultati preliminari

4.1. La geografia dei progetti

Circa il 75% dei casi di tecnologie di IA implementate negli enti locali si concentra in meno di un terzo dei 26 paesi mappati: Italia, Paesi Bassi, Germania, Finlandia, Regno Unito, Spagna e Polonia. Il numero di progetti in questo gruppo di paesi oscilla tra 34 in Italia e 15 in Polonia. (Tabella 1). Questa distribuzione geografica suggerisce una progressiva convergenza verso modelli locali di IA che segue un processo di concentrazione in specifici contesti istituzionali, amministrativi e sociali. I casi di implementazione di sistemi basati sull'IA si concentrano prevalentemente in economie ad alto e medio-alto reddito, caratterizzate da un'elevata intensità di servizi avanzati e da ecosistemi dell'innovazione consolidati, mentre nei paesi a reddito medio-basso emergono soprattutto iniziative isolate, spesso legate a specifiche città o regioni e sostenute da programmi europei o nazionali. Nel complesso, questi pattern suggeriscono che l'adozione dell'IA nei governi locali sia tuttora un fenomeno capability-driven: l'IA tende a essere implementata dove già esistono infrastrutture digitali, risorse fiscali, competenze amministrative e reti di attori pubblici e privati in grado di promuoverne lo sviluppo e la governance. In questo senso, più che ridurre i divari territoriali, l'IA rischia di riflettere e riprodurre le disuguaglianze preesistenti nelle capacità di governo locale.

Paese	**N. casi**	**% sul totale**
Italia	34	14,59%

Paesi Bassi	28	12,02%
Germania	26	11,16%
Finlandia	25	10,73%
Regno Unito	24	10,30%
Spagna	23	9,87%
Polonia	15	6,44%
Belgio	8	3,43%
Svezia	8	3,43%
Danimarca	6	2,58%
Austria	5	2,15%
Francia	5	2,15%
Estonia	4	1,72%
Repubblica Ceca	3	1,29%
Romania	3	1,29%
Svizzera	3	1,29%
Croazia	2	0,86%
Grecia	2	0,86%
Irlanda	2	0,86%
Bulgaria	1	0,43%
Islanda	1	0,43%
Norvegia	1	0,43%
Portogallo	1	0,43%
Serbia	1	0,43%
Slovacchia	1	0,43%
Slovenia	1	0,43%
Totale	*233*	*100,00%*

Tabella 1. Distribuzione dei casi di uso IA negli EE.LL

4.2. I settori di applicazione-COFOG

Considerando gli ambiti di intervento secondo la classificazione COFOG, l'IA trova spazio in un'ampia varietà di servizi degli enti locali. Quasi la metà dei progetti analizzati si concentra in tre macroaree principali (Tabella 2):

Servizi pubblici generali (55 casi, 23,6%): un'area molto trasversale, in cui si stanno diffondendo sportelli virtuali, chatbot e assistenti intelligenti a supporto della comunicazione con i cittadini;

Mobilità e trasporti (26 casi, 11,2%): in questo ambito vengono utilizzati, per esempio, sistemi predittivi e algoritmi per ottimizzare il traffico urbano e il trasporto pubblico. Ad Amsterdam ed Helsinki sono stati implementati sistemi predittivi di congestione e semafori

intelligenti. Sistemi di trasporto pubblico on-demand basati su algoritmi di ottimizzazione dei percorsi e guida della città sono stati implementati a Turku (Finlandia) e Trento.

Polizia (19 casi, 8,2%): in questo settore l'IA è utilizzata per investigazioni, per il riconoscimento intelligente, per effettuare previsioni, per il monitoraggio delle politiche e per la raccolta e l'analisi delle informazioni.

Completano il quadro altri settori rilevanti, come ordine pubblico e sicurezza, cultura e protezione sociale, che mostrano un crescente interesse per le soluzioni basate sull'IA, sebbene con un numero di progetti più limitato. Nel settore della sicurezza, Barcellona e Dubrovnik hanno adottato sistemi di video analytics e di riconoscimento automatico degli eventi per il monitoraggio di parcheggi e altri spazi pubblici. Ad Amsterdam, la gestione degli incidenti e della criminalità è supportata da sistemi di previsione basati sull'IA. Nell'ambito della protezione dell'ambiente e, in particolare, della raccolta differenziata, Messina e Rotterdam hanno implementato sistemi intelligenti per la gestione della raccolta differenziata. Genk e Berlino eseguono un monitoraggio basato sull'IA di fattori ambientali, come la qualità dell'aria, mentre Parigi e Helsinki sfruttano l'IA per monitorare il consumo energetico. Nell'ambito della fiscalità, emerge il caso del comune di Karlsruhe, in Germania, che supporta i cittadini nelle questioni relative alla dichiarazione dei redditi tramite un chatbot.

Da un'analisi più approfondita delle iniziative emerge che, nella maggior parte dei casi, i sistemi di IA implementati non si limitano a supportare una funzione specifica, ma sono trasversali a diverse aree dell'ente.

COFOG II	**N. casi**	**%**
Servizi pubblici generali	55	23,61%
Trasporti	26	11,16%
Polizia	19	8,15%
Servizi generali	17	7,30%
Ordine pubblico e sicurezza	14	6,01%
Cultura	8	3,43%
Protezione sociale	8	3,43%
Servizi ospedalieri	6	2,58%
Illuminazione stradale	6	2,58%
Totale primi 10 settori	**177**	75,97%
Altri settori minori	56	24,03%
Totale complessivo	*233*	*100,00%*

Tabella 2. Distribuzione dei casi di uso IA per categorie COFOG

4.3. Finalità dell'impiego di sistemi di IA negli enti locali: miglioramento dei servizi o dell'efficienza interna?

Uno degli aspetti più interessanti emersi dallo studio riguarda le finalità principali per cui l'IA è impiegata nei casi analizzati. Le informazioni al riguardo presenti nel dataset sono frutto di una valutazione dei benefici che si attende che le diverse applicazioni dell'IA apportino in base alla loro natura e al loro potenziale. Il fatto che si tratti soprattutto di iniziative recenti, infatti, non consente ancora di valutarne gli impatti, se non quelli nel brevissimo termine. Nel 58% dei casi (135) l'IA è utilizzata per migliorare i servizi pubblici, mentre nel 42% dei casi (99) per migliorare l'efficienza amministrativa.

Nel primo caso, i benefici apportati dalle applicazioni di IA implementate e quelli attesi riguardano principalmente l'ottenimento di servizi pubblici più reattivi ed efficienti e la riduzione dei costi (113 casi). Tra queste applicazioni rientra quella del Comune di Wroclaw che ha introdotto un sistema di illuminazione basato sull'IA. I sensori di controllo remoto e la tecnologia LED percepiscono i cambiamenti del traffico urbano, regolando di conseguenza l'intensità della luce. Questo sistema permette di ridurre i costi e il consumo di elettricità e di migliorare l'efficienza e la sicurezza.

Un altro vantaggio legato all'erogazione di servizi al pubblico è la creazione di nuovi canali o servizi (93 casi). Degli esempi sono il servizio London TravelBot, che permette di controllare lo stato dei treni e dei bus tramite Facebook Messenger e il sistema ARNO del comune di Tartu (Estonia), che permette di gestire le candidature e l'allocamento dei bambini negli asili. Un beneficio riportato in 85 casi è il miglioramento della qualità dei sistemi informativi e dei servizi, legati a casi come la piattaforma sviluppata dal Comune di Messina per la gestione dei rifiuti, che fornisce informazioni sulla raccolta, sul trasporto dei rifiuti e sui pagamenti. Sempre relativamente agli obiettivi legati all'erogazione dei servizi, 81 casi permettono di avere una maggiore personalizzazione dei servizi e 98 di ottenere dei servizi che siano citizen-centered. Questi due tipi di benefici vanno in genere di pari passo e vengono raggiunti principalmente attraverso la creazione di chatbot e assistenti virtuali a supporto dei clienti, in diverse aree, come la comunicazione, l'educazione, la gestione dei rifiuti, i servizi sanitari e i trasporti.

Relativamente all'efficienza interna, si delineano diversi benefici più specifici. Per 82 casi si riporta un miglioramento della qualità dei processi e dei sistemi, avvenuto o atteso. Un esempio che spicca è Neuropolis, un sistema basato sull'IA che consente una ricerca intelligente e personalizzata dei documenti necessari agli impiegati del comune di Friburgo. In questo modo essi, anziché impiegare una grande quantità di tempo nella ricerca delle informazioni, possono dedicarsi direttamente all'analisi delle informazioni già selezionate dal sistema in pochi secondi. In 43 casi è associata una maggiore reattività da parte dell'ente. Uno di questi casi è costituito dal sistema installato nel comune di Rotterdam, basato su sensori che monitorano i livelli di riempimento dei contenitori di rifiuti. 36 casi sono associati ad un miglioramento della gestione delle risorse pubbliche. Emerge il caso della Contea di Devon, nel Regno Unito, che ha implementato un sistema di allocazione delle risorse basato sull'IA, che supporta la pianificazione finanziaria nel settore dei servizi sociali, fornendo un primo calcolo di quante risorse sarebbero necessarie da destinare a ciascun individuo preso in considerazione. Un numero minore di casi (16) riporta il beneficio della riduzione dei costi, probabilmente complessivamente limitato dal fatto che, per raggiungere una maggiore efficienza dei costi nel lungo periodo grazie all'IA, si deve far fronte a costi importanti nel breve periodo. È esemplare il caso della Contea di Powys, nel Regno Unito, che ha ridotto significativamente i costi amministrativi sviluppando un'applicazione per la revisione automatica delle domande per il programma di supporto nazionale, in grado di accettare quelle che rispettano i criteri stabiliti, eliminare i duplicati e segnalare le richieste fraudolente. Per 5 casi sono riportati benefici legati a maggiore equità,

onestà e uguaglianza. Uno di questi spicca per la sua innovatività, il robot Tengai, creato nel Comune di Upplands-Bro (Svezia), per supportare il processo di reclutamento dei dipendenti e ridurre i bias. Il robot si occupa delle prime fasi del processo, ossia dell'assegnazione del punteggio sulla performance dei candidati e delle prime interviste, in cui analizza i comportamenti, il problem-solving e varie abilità. Successivamente lo staff si occupa della valutazione della motivazione. L'ultima categoria di benefici consiste in una maggiore collaborazione e comunicazione. Questo è raggiunto in quattro casi attraverso la collaborazione con i cittadini, per il monitoraggio della spazzatura (Amsterdam), del riempimento delle spiagge (Barcellona), delle abitudini dei turisti (Gipuzkoa) e delle condizioni delle strade (Vaasa, Finlandia). L'ultimo caso che riporta tali benefici riguarda invece la collaborazione tra più enti, in particolare autorità svedesi, comuni e regioni, e aziende private, che impiegano un assistente digitale condiviso.

5. Considerazioni conclusive

I risultati preliminari dell'analisi mostrano che l'impiego dell'IA negli enti locali europei non è più soltanto una prospettiva futura, ma una realtà in crescita, nella quale gli enti locali, soprattutto quelli dei paesi a reddito alto e medio-alto, risultano già attivamente coinvolti. I benefici sono tangibili: servizi più accessibili e personalizzati per i cittadini e per gli uffici, che possono contare su processi più rapidi, basati su dati più affidabili e con minor margine di errore. Questo si riflette anche in una migliore gestione delle risorse umane e finanziarie. È chiaro quindi che sempre più comuni si stanno avvicinando al concetto di smart governance, intesa non solo come l'adozione di strumenti tecnologici avanzati, ma anche come trasformazione dei processi decisionali e organizzativi, orientata a una maggiore efficienza, trasparenza e capacità di risposta ai bisogni della collettività (Meijer & Bolívar, 2016; Namysłowska & Olbryk, 2025). In questo senso, i risultati empirici confermano che l'adozione di sistemi di IA, in particolare nei settori della mobilità, dell'amministrazione generale e della sicurezza, riflette una progressiva istituzionalizzazione della governance data-driven (Mahant, 2025), in cui la capacità di coordinamento e di reattività delle amministrazioni è mediata dall'uso dell'analisi predittiva e dall'automazione dei processi decisionali. Inoltre, la predominanza di progetti finalizzati al miglioramento dei servizi pubblici (58%) rispetto a quelli mirati all'efficienza interna (42%) suggerisce come le amministrazioni locali europee stiano interpretando l'IA in una chiave di "valore pubblico" (Moore, 1997; Ogu et al., 2024): le tecnologie sono utilizzate non solo per ridurre i costi e i tempi, ma per creare esperienze amministrative più personalizzate e inclusive per i cittadini. Allo stesso tempo, i casi che evidenziano un miglioramento dell'efficienza interna, come Neuropolis a Friburgo o il sistema di allocazione delle risorse della contea di Devon, riflettono la dimensione di preparedness istituzionale discussa da Igbokwe (2024) e Hassan & Fatile (2024). Tali soluzioni emergono soprattutto in contesti caratterizzati da una maturità digitale, infrastrutture dati consolidate e leadership amministrative orientate all'innovazione.

Infine, le evidenze di collaborazione interistituzionale e con i cittadini (ad es. Amsterdam, Barcellona, Vaasa) sostengono la visione di un modello di smart governance collaborativa, coerente con la letteratura, che enfatizza il ruolo dell'IA come catalizzatore di nuove forme di co-produzione dei servizi pubblici (Osborne & Nasi, 2024; Wirtz et al., 2019; Yigitcanlar et al., 2024).

In questo quadro, l'IA si configura come un abilitatore strategico, capace di rafforzare le pratiche di governo basate sui dati e di favorire forme più strutturate di collaborazione tra amministrazioni, cittadini e altri attori territoriali, pur sollevando al contempo nuove sfide in termini di competenze, governance dei dati ed equità. In linea con la teoria del valore pubblico, la diffusione dell'IA negli enti locali europei non si traduce solo in efficienza tecnica, ma contribuisce alla costruzione di fiducia, trasparenza e accountability verso i cittadini,

confermando il nesso tra innovazione tecnologica e legittimazione democratica (Goossens et al., 2025).

Osservando le applicazioni di IA sviluppate negli enti locali europei emerge che la creazione di valore pubblico risulti centrale e il cittadino sia spesso messo al centro dei sistemi implementati, cercando di migliorare la sua esperienza con i servizi offerti, il suo benessere e la sua partecipazione. Risultano ancora pochi, ma non assenti, i casi di IA finalizzati ad ottenere maggiore equità, onestà ed uguaglianza.

Questa transizione verso amministrazioni "intelligenti" richiede una governance consapevole e responsabile. È necessario sviluppare linee guida chiare che garantiscano trasparenza, verificabilità e accountability degli algoritmi, gestendone i potenziali rischi. È inoltre necessario comprendere in che modo i sistemi di IA possono supportare in modo integrato le diverse aree dell'ente, favorendo un maggiore coordinamento tra di esse. In prospettiva, il legame tra teoria e risultati empirici suggerisce che l'efficacia dell'IA nella pubblica amministrazione locale dipenda dalla capacità di allineare innovazione tecnologica, capacità organizzativa e obiettivi di valore pubblico. Nel proseguimento di questo studio, l'approfondimento dei casi di best practice di applicazione dell'IA emergenti, tra gli altri, per i benefici ottenuti e per quelli attesi nel medio-lungo termine, contribuirà ad una maggiore comprensione della natura delle iniziative di maggiore successo e di come esse contribuiscano ad aumentare l'efficienza interna e l'erogazione di servizi verso l'esterno.

Parole chiave: Intelligenza artificiale; enti locali; erogazione di servizi; efficienza amministrativa

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When social interaction matters: innovating in a hybrid work setting

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1. Purpose of the paper

Hybrid work, characterised by a mix of in-office and remote work arrangements, has emerged as a dominant mode of work post-COVID-19. As digital technologies proliferate, hybrid work, sometimes defined as remote working, telework, telecommuting, or work-from-home, has become an increasingly common practice and constitutes an essential dimension in the future of work (Bai J. et al., 2021; Denicolai et al., 2022). The transition to this new way of working leads to changes in organisations, modifying the role of the HR function and the design of HR practices, with important implications and new expectations for employees (Bai et al., 2021). Hybrid work can be considered an effective strategy which can help organisations in reducing costs (e.g., Egan, 1997), improve work–family balance (e.g., Shamir & Telework Salomon, 1985) and reduce air pollution and traffic congestion (e.g., Handy & Mokhtarian, 1995). Hybrid work has also been promoted as a lever to increase female labour market participation and reduce gender inequalities (Angelici & Profeta, 2023; Butera, 2020). The literature has analysed the link between hybrid/remote working and a firm's performance (Agostoni, 2020; Brynjolfsson et al., 2020; Bloom et al., 2015) and highlights employees' well-being improvement as a possible mediator in this relationship (Agostoni, 2020; Krekel et al., 2019). More specifically, higher motivation and creativity, less absenteeism, loyalty, and a results-oriented culture are some of the factors through which employees' well-being may predict higher organisational performance (Agostoni, 2020; Krekel et al., 2019; Bertolini, 2006; Golden & Veiga, 2005). Furthermore, previous studies have primarily studied the link between employees' well-being and firm performance (e.g. Krekel et al., 2019). However, it is unclear under which strategic and organisational conditions the hybrid work can represent an effective practice for firms to simultaneously improve the organisational performance and the well-being of employees. While offering flexibility and cost-saving opportunities, it raises concerns about reduced social interaction, which is crucial for innovation.

The pandemic has resulted in significant disruptions of social and economic activities, as lockdowns forced non-essential businesses to close and individuals to stay home. This period of hardship has led to a rapid transition to flexible working to allow economic activities to survive. The rapidity of this transition has been crucial in disrupting the previous status quo (Marsh et al., 2022). Still, it has not allowed companies and their leaders to reconsider essential elements. In the new work setting, it is often necessary to rethink tasks and processes, find the right competencies and talents apt to the new working conditions, redefine the workplace in terms of space and time, and promote an innovative culture able to create added value by exploiting the opportunities deriving from the digital technology transformation (Marsh et al., 2022).

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Within the previously described context, this paper aims to investigate how hybrid work influences companies' innovative capacities[4] addressing key questions such as: how does the limitation of physical presence in the workplace impact workers' social relations and, ultimately, innovation? What hybrid work models can better balance flexibility with the need for collaboration and creativity? What is the role and contribution of digital technologies to innovation and creativity?

The short paper is organised as follows. The first section presents the theoretical background and the research questions. The second section introduces the method and the expected results of the ongoing research project, while the last section reports the main contribution expected from this study.

2. Literature review and research questions

Innovation management is a multifaceted process involving the development and implementation of new ideas within an organisational context (Ven, 1986). Key concepts include managing attention, transforming ideas into reality, balancing part-whole relationships, and providing institutional leadership (Ven, 1986). The process integrates technological, market, and organisational changes (Tidd et al., 2001) and can be conceptualised as a framework comprising seven categories: inputs management, knowledge management, innovation strategy, organisational culture and structure, portfolio management, project management, and commercialisation (Adams et al., 2006). Effective measurement of innovation management is crucial for both practitioners and academics, yet the literature offers diverse, sometimes contradictory approaches (Adams et al., 2006). A holistic framework for innovation management measurement can help organisations evaluate their innovation activities, assess the extent of innovation embeddedness, and identify areas for improvement (Adams et al., 2006). This comprehensive approach is essential for turning ideas into useful and marketable products (Adams et al., 2006). Innovation is broadly defined as the process of translating ideas into goods, services, or processes that create value (Dodgson et al., 2013). It encompasses multiple dimensions, including product and process innovation, and can be classified as incremental or radical (Hidalgo & Albors, 2008; Leonard & Barton, 2013). Determinants of innovation performance include organisational culture, leadership, resource availability, and collaboration (Dodgson et al., 2013; Phillips, 2013). Research also highlights the critical role of knowledge sharing, social capital, and employee empowerment (Laursen & Foss, 2013).

Organisational dimensions significantly shape the capacity to innovate. A supportive culture and clear leadership facilitate experimentation and risk-taking, while structured yet flexible team dynamics encourage creativity (Dodgson et al., 2013; Leonard & Barton, 2013). Collaboration, both internal and external, is particularly vital. Innovation ecosystems thrive on partnerships that combine diverse expertise and resources, as highlighted by studies on organisational learning and external networks (Dodgson, 2013; Phillips, 2013). In hybrid work settings, the interplay between physical and virtual spaces presents unique challenges and opportunities for fostering interaction and trust, which are pivotal for innovation (Lauring & Jonasson, 2024; Petani & Mengis, 2023).

Building on this theoretical foundation, this study examines how hybrid work configurations influence innovation through social interaction. It focuses on identifying organisational practices that sustain innovation in hybrid environments.

Existing research underscores the importance of social interaction in fostering creativity and innovation within organisations. With its blend of physical and virtual spaces, hybrid work

[4] The paper is based on a research project conducted within the “Ecosystem MUSA -Multilayered Urban Sustainability Action" - Spoke 6- Digital Transformation and Wellbeing founded by the European Union - NextGeneration, PNRR (2022-2025).

presents unique challenges and opportunities for maintaining the social dynamics essential for collaborative innovation. Hybrid work, characterised by a blend of remote and in-office arrangements, has emerged as a dominant work model in the post-pandemic era. It is defined by its flexibility, which allows employees to alternate between physical and virtual spaces in line with organisational policies and individual needs (Lauring & Jonasson, 2024). Hybrid work configurations vary widely, from fixed schedules for in-office days to entirely fluid arrangements that prioritise autonomy. These configurations have a profound impact on team dynamics, communication, and collaboration, all of which are critical components of innovation processes. The challenge lies in optimising these configurations to retain the benefits of flexibility while minimising potential disruptions to social interaction and creative synergy.

The relationship between hybrid work and innovation is deeply intertwined with organisational management. Effective innovation management in hybrid settings requires reimagining traditional leadership, communication channels, and collaborative practices (Petani & Mengis, 2023). For instance, organisations must adopt digital tools and practices that support seamless collaboration across physical and virtual environments. At the same time, maintaining a culture that fosters trust, inclusivity, and creativity is essential. Leadership plays a pivotal role in ensuring that hybrid work models do not undermine the spontaneity and serendipity that often drive innovation. By strategically aligning hybrid work configurations with organisational goals, firms can harness the potential of this model to enhance innovation outcomes.

The following research questions guide the study:

- How does hybrid work adoption impact workers' social relations and, ultimately, companies' ability to innovate?
- Does the limitation of physical presence hinder innovation, and what hybrid work models can better balance flexibility with the need for collaboration and creativity?
- What hybrid work configurations and digital technologies support flexibility, innovation and creativity?

3. Method and expected results

This research employs a mixed-method approach, combining survey data from 500 firms in Lombardy with qualitative interviews. The survey focuses on hybrid work adoption, innovation performance, digital technology adoption, and team dynamics. We expect findings to reveal that hybrid work models that emphasise structured in-person collaboration days foster greater innovation than fully remote or ad-hoc hybrid arrangements. Digital technology adoption is generating a moderating effect. The research questions have been addressed by conducting a quantitative study. Original data are collected through a survey administered to a sample of Italian firms. The survey was conducted from December 2023 to February 2024 and focused on firms in the Lombardy region. Considering this region, we could select a homogeneous sample and control for all environmental factors that could alter the relationship between hybrid work configuration, social interaction, and innovation.

The sample selection is based on a dataset of about 2500 firms provided by the University of Milano-Bicocca's internship and placement services. Given that these firms are partners of the University, our expected response rate is about 20% (500 responses). The questionnaire lasts about 20 minutes, is targeted to HR/personnel managers, and is administered via CATI.

To answer the research questions, the questionnaire has been structured into four main sections, which allow for inspection of the following dimensions:

- SECTION A: Firm's structural characteristics and organisational performance
- SECTION B: Hybrid working adoption and its perceived effectiveness on Employee well-being and Firms' Performance
- SECTION C – Strategic and organisational characteristics (with a focus on the role of trust)

- SECTION D – Exponential technologies use and data-driven decision-making

To detect Hybrid working configurations, we selected different items from existing literature, which refer to:

- Hybrid working objectives (e.g. reduction of company costs, increased productivity, increased competitiveness, improved work-life balance, increased employee satisfaction, increased employee wellbeing)
- Hybrid working organisation (e.g. n. of days of hybrid working by roles, workstation reservation, the minimum number of employees expected to be present in the office, schedule of in-person meetings, space reorganisation, conventions with coworking spaces, etc.)
- Hybrid working management (e.g. employees' participation in the definition of hybrid working and performance objectives, constraints on remote working time and place, performance checks, reorganisation of working time, activities and tasks, autonomy in the performance of tasks, level of trust, etc.)
- Hybrid working organisational support (e.g. training courses on the use of digital technologies and soft skills; provision of computers, tablets, company telephones, ergonomic chairs, contributions to household utilities; initial period of presence for new employees)
- With regards to the outcome variables, we use the construct of perceived effectiveness of Hybrid working by focusing on the following dimensions:
- Social interaction: regular meetings, employee involvement, use of digital technology, cultural dimension, involvement and internal communication.
- Employee well-being: physical health of employees, psychological well-being of employees, employee stress levels, burnout levels, work-life balance, employees' quality of life, job satisfaction, employee motivation, sustainability of work rhythms, quality of work performed, commitment, quality of relations between colleagues, quality of relations between managers and employees

Firm's performance: employee productivity, knowledge exchange, innovation capacity, new products, services or programmes, customer satisfaction, ability to attract and retain critical profiles, and absenteeism.

Finally, about strategic and organisational characteristics, we included items and scales to measure, for example, competitive strategy, Corporate Social Responsibility (CSR) and business ethics, training, performance assessment, job design, employee participation, internal communication, job autonomy, functional flexibility, etc. Furthermore, the survey included specific questions to detect exponential technology use and data-driven decision-making.

The data analysis explores and checks which hybrid work configuration is more effective in improving employee wellbeing and the firm's performance, and which strategic and organisational characteristics shape these relationships. The goal is to identify opportunities, challenges and drawbacks related to hybrid work adoption on social interaction and innovation. We expect that flexibility, HR practices, and culture are designed to support employees in using digital technologies, in developing new skills, and in adopting a new concept of work to avoid negative consequences related to hybrid work, stimulate innovation for the firm, and enhance employees' creativity and well-being.

4. Contribution

This study contributes to the emerging literature on hybrid work by providing empirical evidence on its impact on innovation. It highlights the role of social interaction as a mediator and examines how different hybrid work configurations can either hinder or enhance innovation. The findings are expected to inform organisational strategies for designing hybrid work policies that maximise both employee well-being and innovation outcomes. This study advances the theoretical understanding of workplace relationships by challenging the conventional view that

positions them along a simplistic positive-negative continuum. By bridging theories of emotions and workplace relationships, this study provides a novel framework that captures the dynamic interplay between emotions and relational configurations (Baumaister et al, 2007; Staw et al., 1994).

Furthermore, the paper contributes to the growing body of research on relational complexity by systematically delineating the sources, outcomes, and dynamics of ambivalent and indifferent relationships. It establishes a typology that integrates digital technology adoption with relationship functionality, enabling a more precise categorisation of workplace relationships. This typology not only fills significant gaps in the literature but also offers a conceptual foundation for future studies to explore how these relationships evolve and influence organisational processes.

Keywords: Hybrid work; innovation management; creativity and innovation; flexible work models

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The paper is based on a research project conducted within the “Ecosystem MUSA - Multilayered Urban Sustainability Action" - Spoke 6- Digital Transformation and Wellbeing founded by the European Union - NextGeneration, PNRR (2022-2025).

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Educazione imprenditoriale, sostenibilità e benessere urbano: una revisione sistematica della letteratura

Giorgia Maria D'Allura[1], Valentina Mallamaci[2], Federica Romano[3]

1. Introduzione

Le grandi aree urbane rappresentano oggi laboratori cruciali delle trasformazioni economiche e sociali: in esse si concentrano innovazione, creatività e capitale umano, ma anche disoccupazione giovanile, disuguaglianze, esclusione e pressioni ambientali (Behrens & Robert-Nicoud, 2014; Juntti & Ozsezer-Kurnuc, 2023). In questo contesto, l'imprenditorialità viene spesso presentata come strumento chiave per generare occupazione, promuovere coesione sociale e accelerare la transizione verso modelli di sviluppo sostenibile (Acs et al., 2013; Shabbir, 2023).

L'educazione all'imprenditorialità è considerata uno strumento fondamentale per sviluppare competenze, atteggiamenti e mindset imprenditoriali (Cui et al., 2021; Dissanayake et al., 2022), non solo in funzione della creazione di impresa, ma anche per stimolare capacità di iniziativa, problem solving e innovazione sociale (Solomon et al., 2019; Blankesteijn, 2024). Ciononostante, resta poco chiaro in che misura e con quali meccanismi l'educazione imprenditoriale contribuisca effettivamente al benessere e alla sostenibilità nelle città (Neumann, 2021; Wiklund et al., 2019).

Questo short paper, basato su una revisione sistematica della letteratura (Tranfield et al., 2003; Adams et al., 2017), si pone tre obiettivi principali:

- Mappare i principali filoni di ricerca che collegano imprenditorialità ed educazione imprenditoriale.
- Verificare quanto e come vengano considerati i contesti urbani, la sostenibilità e il benessere.
- Proporre un'agenda di ricerca che enfatizzi il ruolo delle grandi aree urbane e delle istituzioni educative nel promuovere imprenditorialità inclusiva e sostenibile.

2. Quadro teorico

La letteratura sull'imprenditorialità è stata tradizionalmente guidata da tre grandi prospettive. Una prima prospettiva è quella psicologica, che guarda soprattutto agli atteggiamenti, alle intenzioni e alle caratteristiche individuali dell'imprenditore, con particolare attenzione all'intenzione imprenditoriale, al senso di autoefficacia e alle motivazioni personali (Cui et al., 2021; Dana et al., 2021). Una seconda prospettiva, di tipo istituzionale ed ecosistemico, sposta lo sguardo sui contesti: qui diventano centrali le regole formali e informali, le politiche pubbliche e, più in generale, il funzionamento degli ecosistemi imprenditoriali fatti di attori, risorse e relazioni (Aldrich & Fiol, 1994; Bruton et al., 2010; Isenberg, 2010; Terjesen et al., 2016). Negli ultimi anni si è poi affermata una terza prospettiva, socio-ambientale, che si concentra sull'imprenditorialità sociale, green e sostenibile e sui suoi effetti in termini di sviluppo sostenibile e coesione sociale (Hall et al., 2010; Johnson & Schaltegger, 2020; Shabbir, 2023).

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L'educazione imprenditoriale si colloca in un punto di intersezione tra queste tre linee di ricerca. Da un lato, infatti, interviene su dimensioni cognitive e motivazionali, influenzando intenzioni imprenditoriali, percezioni di autoefficacia e motivazioni dei potenziali imprenditori (Cui et al., 2021; Mambali et al., 2024). Dall'altro lato, è fortemente modellata dalle istituzioni e dalle politiche che ne definiscono obiettivi, strumenti e risorse (O'Connor, 2013; Walter & Block, 2016). Allo stesso tempo, può essere progettata in modo tale da orientare i percorsi imprenditoriali verso finalità di sostenibilità ambientale e di benessere collettivo, promuovendo nuove forme di imprenditorialità sociale e responsabile (Mets et al., 2021; Solomon et al., 2019).

In questo quadro, le grandi aree urbane rappresentano contesti particolarmente significativi. Esse ospitano infatti ecosistemi imprenditoriali articolati, nei quali convivono università, incubatori, investitori e fitte reti sociali (Bischoff et al., 2018; Bolzani et al., 2021). Allo stesso tempo concentrano molte delle principali sfide sociali e ambientali del nostro tempo, come disuguaglianze, marginalità e forme diverse di degrado ambientale (Behrens & Robert-Nicoud, 2014; Fan et al., 2023; Juntti & Ozsezer-Kurnuc, 2023). Proprio per questo possono trarre un beneficio diretto da iniziative imprenditoriali capaci di generare impatti sociali e ambientali positivi, ad esempio attraverso modelli di business inclusivi o orientati alla rigenerazione dei territori (Yunus et al., 2010; Neumann, 2021).

Nonostante tali premesse, il nesso tra educazione imprenditoriale, contesti urbani, sostenibilità e benessere rimane ancora poco esplorato nella ricerca, lasciando aperto uno spazio rilevante per ulteriori approfondimenti teorici ed empirici.

3. Metodologia

La revisione sistematica si basa sui database Scopus e Web of Science, selezionando articoli e review in lingua inglese, pubblicati in riviste di Business & Management indicizzate in Journal Citation Reports (Clarivate, 2023). La procedura segue approcci consolidati nelle systematic reviews in ambito management e public administration (Cook et al., 1997; Tranfield et al., 2003; Rashman et al., 2009; Adams et al., 2017).

Dopo le fasi di identificazione, screening e selezione, il campione finale comprende 234 contributi. L'analisi combina:

- esame qualitativo dei contenuti, per individuare temi, definizioni di educazione imprenditoriale e riferimenti a sostenibilità e benessere (Webster & Watson, 2002; Neumann, 2021);

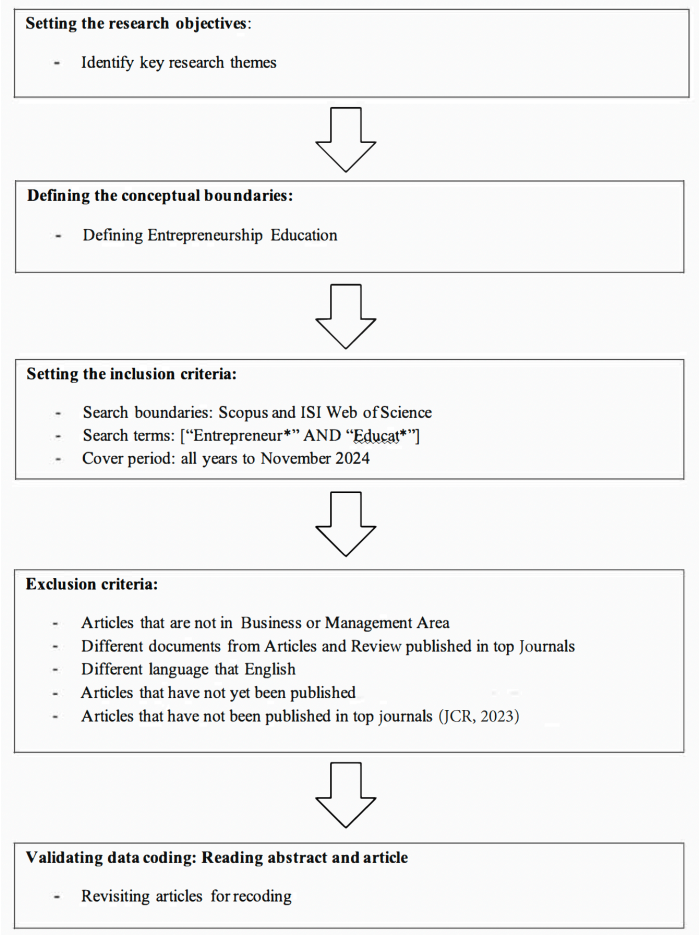


Figura 1. Processo di revisione

- text mining e analisi di co-occorrenza, tramite software di network analysis, per identificare cluster tematici e relazioni tra parole chiave, in linea con pratiche consolidate di bibliometric e mapping studies (Dissanayake et al., 2022).



Figura 2. Text mining, elaborazione originale

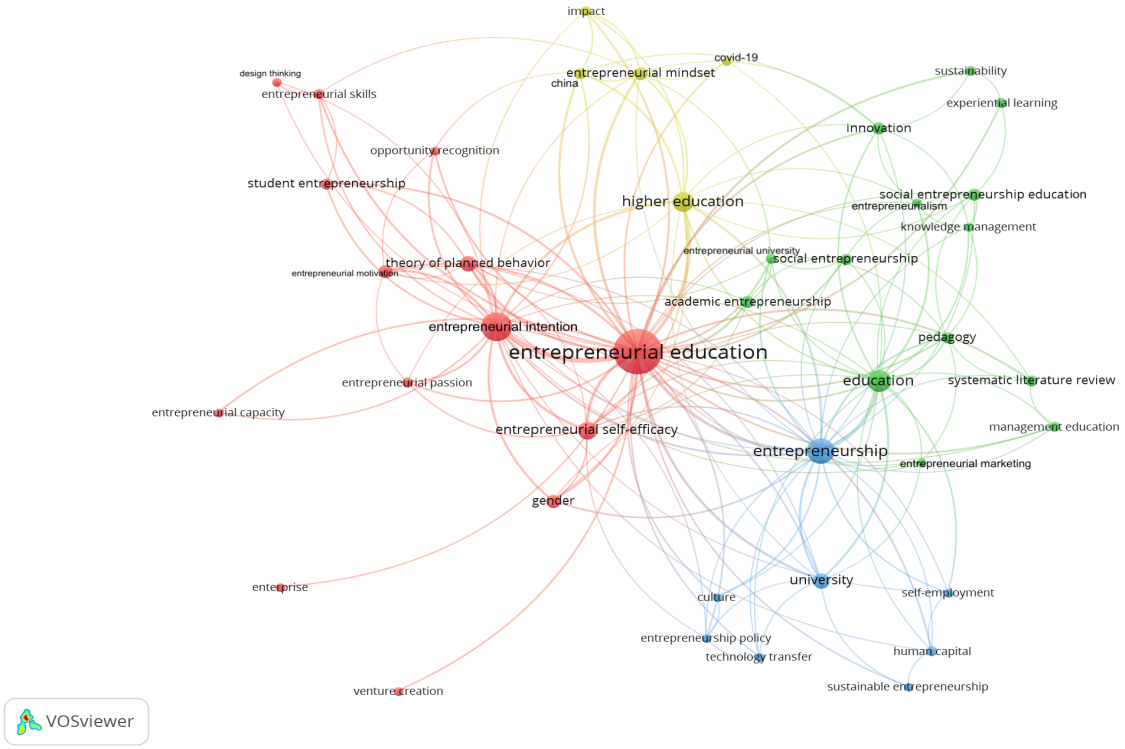


Figura 3. Analisi di Co-occorrenza delle parole chiave, elaborazione originale

4. Risultati

L'analisi della letteratura permette di distinguere quattro grandi gruppi di contributi.

Il primo cluster riguarda i fattori psicologici e l'intenzione imprenditoriale. In questo filone gli autori si concentrano soprattutto su come intenzione imprenditoriale, atteggiamenti, norme soggettive e percezione di controllo comportamentale si sviluppino e si trasformino lungo i percorsi formativi (Cui et al., 2021; Dana et al., 2021). Molta attenzione è dedicata anche agli effetti dei corsi di educazione imprenditoriale su autoefficacia, motivazione e propensione effettiva all'avvio di un'impresa, con un focus particolare sugli studenti universitari (Huang et al., 2021; Ahn & Winters, 2023). In questo insieme di studi, però, il contesto urbano compare solo sullo sfondo: l'interesse è rivolto quasi esclusivamente alle variabili individuali, mentre gli elementi territoriali o istituzionali rimangono marginali (Yi & Duval-Couetil, 2022).

Un secondo cluster, in rapida espansione, è quello dedicato all'imprenditorialità sociale, all'innovazione e alla sostenibilità. Qui rientrano le ricerche su imprenditorialità sociale e ibrida (Bacq & Janssen, 2011; Yunus et al., 2010), sulle iniziative che nascono con l'obiettivo esplicito di affrontare problemi sociali o ambientali (Hall et al., 2010; Johnson & Schaltegger, 2020) e sui modelli di business pensati per generare valore sociale e orientati alla sostenibilità (George & Bock, 2011; Shabbir, 2023). Alcuni lavori si occupano in modo più diretto di come educare a queste forme di imprenditorialità sociale e sostenibile (Solomon et al., 2019; Al Issa et al., 2024; Mambali et al., 2024; Mets et al., 2021). Anche in questo caso, tuttavia, il riferimento ai contesti urbani è spesso implicito e poco tematizzato.

Il terzo cluster mette al centro il ruolo delle università e dei loro Technology Transfer Offices (TTOs) all'interno degli ecosistemi imprenditoriali. Le università vengono descritte come snodi fondamentali di sistemi imprenditoriali complessi (Isenberg, 2010; Bischoff et al., 2018), in cui trovano spazio spin-off, incubatori universitari e programmi di accelerazione (Bolzani et al., 2021). In questo ambito rientrano anche gli studi sulle politiche e sugli strumenti a supporto dell'imprenditorialità accademica e studentesca (O'Connor, 2013; Walter & Block, 2016). Sebbene tali ecosistemi si sviluppino spesso in grandi città, il legame tra l'azione delle università, lo sviluppo urbano sostenibile e il benessere dei territori non viene quasi mai tematizzato in modo esplicito e sistematico.

Infine, un quarto cluster riguarda la higher education e l'idea di imprenditorialità come mindset trasversale. Qui l'attenzione si sposta su programmi rivolti a studenti provenienti da discipline molto diverse, non solo economiche o manageriali (Dissanayake et al., 2022; Blankesteijn, 2024), e su approcci formativi di tipo esperienziale, come project work, service learning e learning by failing (Testa & Frascheri, 2015; Solomon et al., 2019). In questi contributi emergono riflessioni sull'importanza dell'imprenditorialità per sviluppare resilienza e capacità di adattamento, soprattutto in contesti di crisi come la pandemia di Covid-19 (Wiklund et al., 2019). Si affacciano così i temi della cittadinanza attiva, del benessere e dello sviluppo personale, ma ancora una volta con pochi riferimenti espliciti alle specificità sociali, economiche e ambientali delle grandi aree urbane.

5. Discussione

Dall'analisi emerge che, pur esistendo una vasta produzione scientifica su imprenditorialità ed educazione imprenditoriale, il collegamento con i temi della sostenibilità e del benessere urbano resta ancora parziale e poco sistematico (Neumann, 2021; Wiklund et al., 2019). In particolare, si possono individuare tre nodi critici.

Il primo riguarda la prevalenza del livello micro: la maggior parte degli studi continua a concentrarsi sugli individui, sulle loro intenzioni imprenditoriali e sui fattori psicologici che le influenzano (Cui et al., 2021; Dana et al., 2021). Rimangono invece meno esplorati i livelli meso e macro, come gli ecosistemi urbani, le istituzioni, le politiche pubbliche e le dinamiche specifiche delle città (Bruton et al., 2010; Walter & Block, 2016). Di conseguenza diventa difficile comprendere perché programmi formativi simili possano produrre esiti differenti in contesti urbani diversi (Terjesen et al., 2016).

Un secondo limite riguarda la misurazione degli impatti. L'efficacia dei percorsi di educazione imprenditoriale viene spesso valutata osservando variazioni nelle intenzioni degli studenti, nei loro atteggiamenti o nella soddisfazione rispetto ai corsi (Yi & Duval-Couetil, 2022; Dissanayake et al., 2022). Molto meno attenzione viene dedicata a ciò che accade dopo: quante nuove imprese vengono realmente avviate e con quali risultati (Acs et al., 2013; Lyons & Zhang, 2018), quali effetti sociali e ambientali generano sui territori urbani (Hall et al., 2010; Johnson & Schaltegger, 2020), e in che misura contribuiscono a ridurre disuguaglianze e a migliorare il benessere delle comunità locali (Apetrei et al., 2019; Neumann, 2021).

Infine, la terza criticità riguarda la limitata attenzione ai gruppi più vulnerabili. Solo una porzione ridotta della letteratura considera in modo esplicito giovani NEET, migranti, donne, persone con basso reddito o basso livello di istruzione (Lyons & Zhang, 2018; Apetrei et al., 2019), pur essendo questi gruppi spesso sovrarappresentati nelle grandi città (Behrens & Robert-Nicoud, 2014). Ciò finisce per ridurre il potenziale dell'educazione imprenditoriale come vero strumento di empowerment urbano e di rafforzamento della coesione sociale.

6. Agenda di ricerca

Alla luce delle lacune emerse, si può delineare un'agenda di ricerca articolata in tre grandi direzioni.

La prima riguarda l'integrazione tra prospettiva istituzionale ed educativa. Servono studi che mettano davvero in dialogo questi due piani (Bruton et al., 2010; Walter & Block, 2016), chiedendosi in che modo politiche locali, regolamentazioni e infrastrutture urbane influenzino l'efficacia dei programmi di educazione imprenditoriale. Allo stesso tempo occorre capire come università ed enti formativi si inseriscano negli ecosistemi urbani, interagendo con amministrazioni pubbliche, imprese e organizzazioni del terzo settore (Isenberg, 2010; Bischoff et al., 2018). Un simile approccio aiuterebbe a spiegare perché iniziative formative simili producano risultati molto diversi da una città all'altra.

Una seconda direzione di lavoro riguarda lo sviluppo di metriche di impatto maggiormente orientate al benessere. La valutazione dei programmi non dovrebbe limitarsi agli esiti economici, ma includere esplicitamente dimensioni come il benessere individuale e collettivo, la coesione sociale e la sostenibilità ambientale (Neumann, 2021; Shabbir, 2023). Ciò implica la costruzione di indicatori di impatto sociale e ambientale in linea con gli Obiettivi di sviluppo sostenibile e con la definizione di sviluppo sostenibile proposta dalla WCED (1987), oltre alla promozione di studi longitudinali che seguano nel tempo gli effetti dell'educazione imprenditoriale, mettendo in relazione dati micro (competenze, intenzioni, comportamenti) e dati di contesto urbano (Fan et al., 2023; Juntti & Ozsezer-Kurnuc, 2023). L'approccio suggerito da Yi & Duval-Couetil (2022), basato sulla validità descrittiva e sulla trasparenza metodologica, può rappresentare un importante punto di riferimento.

Infine, una terza direttrice riguarda la promozione di forme di imprenditorialità realmente inclusive nelle città. In questa prospettiva diventa cruciale esplorare come l'educazione imprenditoriale possa coinvolgere in modo mirato gruppi urbani vulnerabili – ad esempio attraverso programmi specifici e alleanze con attori del territorio, come associazioni, enti locali e organizzazioni di quartiere (Lyons & Zhang, 2018; Apetrei et al., 2019). Metodologie didattiche di tipo esperienziale e comunitario – come i living labs urbani, i progetti di rigenerazione o il service learning – possono trasformare gli studenti in co-progettisti di soluzioni ai problemi delle città (Solomon et al., 2019; Blankesteijn, 2024). In quest'ottica, l'integrazione stabile di contenuti legati all'imprenditorialità sociale e green nei curricula formativi (Mets et al., 2021; Mambali et al., 2024) rappresenta un passaggio essenziale per coniugare educazione imprenditoriale, sostenibilità e benessere urbano.

7. Conclusioni e implicazioni pratiche

Lo short paper mette in evidenza come il dibattito scientifico sull'imprenditorialità, sull'educazione imprenditoriale e sul ruolo delle università sia ormai molto articolato e maturo (Dissanayake et al., 2022; Bolzani et al., 2021). Tuttavia, quando si guarda al nesso tra queste dimensioni e i temi della sostenibilità e del benessere nelle grandi aree urbane, il quadro risulta ancora frammentato: i collegamenti sono presenti, ma raramente affrontati in modo sistematico e integrato (Hall et al., 2010; Neumann, 2021; Wiklund et al., 2019).

Da questa constatazione derivano alcune implicazioni concrete per policy maker, amministratori urbani e istituzioni universitarie. In primo luogo, diventa cruciale progettare percorsi di educazione imprenditoriale che non si limitino a promuovere la creazione di impresa in senso stretto, ma che dichiarino esplicitamente obiettivi di impatto sociale e ambientale, in coerenza con il paradigma dello sviluppo sostenibile (WCED, 1987; Johnson & Schaltegger, 2020). In secondo luogo, si suggerisce di lavorare alla costruzione di veri e propri ecosistemi urbani collaborativi, in cui città, università, imprese, terzo settore e comunità locali condividano visioni, risorse e responsabilità (Isenberg, 2010; Bischoff et al., 2018). A ciò dovrebbe affiancarsi l'istituzione di sistemi di monitoraggio più completi, capaci di misurare non solo il numero di

start-up avviate, ma anche il loro contributo alla riduzione delle disuguaglianze, al miglioramento del benessere e alla qualità della vita nei contesti urbani (Neumann, 2021; Fan et al., 2023).

In una prospettiva di medio-lungo periodo, l'educazione imprenditoriale nelle grandi città può così diventare un dispositivo strategico per tenere insieme innovazione, inclusione e sostenibilità. Perché ciò avvenga, però, è necessario superare una visione dell'imprenditorialità intesa esclusivamente come generazione di valore economico e riconoscerla invece come leva centrale delle strategie di sviluppo urbano sostenibile, capace di incidere sulle dimensioni sociali, ambientali e di benessere collettivo (Hall et al., 2010; Shabbir, 2023).

Parole chiave: Educazione imprenditoriale, sostenibilità, benessere individuale

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Organizational model for the underwater cultural heritage: experiences from Southern Italy

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1. Introduction

Diving tourism is considered a segment of particular interest within the tourism sector, representing a niche market of sports and adventure tourism. The number of scuba divers and visitors engaging in snorkelling activities continues to increase year after year. It has become a hybrid form of tourism, attracting a wide range of travellers, including nature and marine environment enthusiasts who embrace the values of sustainable and slow tourism (Izzo et al., 2021).

The literature on diving tourism has primarily focused on sustainability by addressing environmental and economic dimensions, while largely overlooking social aspects (Lucrezi et al., 2017). The analysis of inter-organizational networks, also through the lenses of stakeholder theory and social network analysis, helps to address this gap by highlighting cooperative relationships as a means to enhance competitiveness and effectiveness - outcomes that are difficult to achieve through traditional hierarchical and market-based governance mechanisms (Powell, 1990).

In particular, there is growing scholarly interest in examining the implications of managing tourist destinations through network-based organizational structures (Barnes et al., 2017; Bodin et al., 2020).

The focus on combining structural network analysis with stakeholder perceptions and cultural frames is consistent with current debates in management and cultural policy studies, which increasingly conceptualize governance as a socially embedded and negotiated process, rather than a purely technical or instrumental one (Ruzol et al., 2017).

This study aims to investigate inter-organizational networks for the enhancement of UCH tourism by integrating cultural tourism and diving tourism models, with the objective of describing different organizational configurations across three regions of Southern Italy - Campania, Puglia, and Calabria – involved in the MUSAS project (Museums of Underwater Archaeology), which focuses on the protection, enhancement, and networking of underwater archaeological heritage.

The emergence and development of Underwater Archaeological Parks (Davidde, 2002) have further increased interest in this field, outlining a new model of UCH tourism (Canoro et al., 2024) that can be identified as a form of sustainable underwater tourism (Dimmock and Musa, 2015) at underwater cultural heritage sites.

As Arnaboldi and Spiller (2011:641) pointed out tourism studies increasingly emphasize the relevance of network-based approaches that integrate tourism with other value chains (d'Angella and Go, 2009; Lemmetyinen and Go, 2009; Novelli et al., 2006), particularly those related to cultural heritage (Aas et al., 2005; Ballesteros and Ramírez, 2007; Xie, 2006), in order to foster sustained value creation (Ryan, 2002). However, despite the widely acknowledged advantages of

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more holistic and systemic management models, the development and long-term maintenance of tourism and cultural networks remain complex and challenging processes. At the core of such systems lies stakeholder collaboration, which has been consistently identified in the literature as a crucial element for effective network governance (e.g. Bramwell and Sharman, 1999; Jamal, 2004; Jamal and Getz, 1995; Jamal and Stronza, 2009; Medeiros de Araujo and Bramwell, 2002).

2. Method

The research project adopts a multiple case study methodology, which allows for the exploration of complex phenomena (Eisenhardt, 1989; Eisenhardt and Graebner, 2007; Yin,1994) and, through a longitudinal approach, enables an understanding of evolutionary processes and ongoing dynamics.

The exploratory analysis highlights the social dimensions of the relationships established within and beyond the network, seeking to address the gap identified in the literature by drawing on social network analysis and stakeholder theory.

Specifically, the study examines networks for the enhancement of underwater cultural heritage through three case histories in Southern Italy: Campi Flegrei Active in Campania Region, Esac in Puglia and Reggio Calabria welcome in Calabria.

The paper provides insights for a better understanding of the phenomenon through the analysis of these networks within a longitudinal study conducted in the post-pandemic period, (June 2023 - December 2025), using semi-structured interviews and desk analysis.

Following Aaboen et al. (2012), this study adopts a longitudinal multiple case study approach to capture inter-organizational processes. Specifically, it investigates the processes through which networks are formed and developed to promote tourism at underwater cultural heritage sites.

The study seeks to investigate the evolutionary processes and ongoing dynamics characterizing the networks in three cases examined in the Regions of Puglia, Calabria, and Campania, all of which fall within the scope of the MUSAS project (Museums of Underwater Archaeology), aimed at the protection, enhancement, and networking of underwater archaeological heritage. Initiated in 2017 and concluded in 2023, the MUSAS project was adopted as the analytical point of departure, as it represents the first systematic attempt to establish a network among underwater cultural heritage sites in Southern Italy. The longitudinal research design makes it possible to trace the evolution of these networks, from the MUSAS project to nowadays.

The first phase of the research is based on literary review and desk analysis carried out through the examination of documents - including statutes, internal regulations, network agreements, websites, reports, articles. During this phase and thanks to the involvement of one of the authors in some projects and processes to develop UCH tourism, we identify stakeholders to interview. Besides, in some cases the interviewee suggested protagonists of the network building process who were contacted and included in the sample.

The second phase involves a semi-structured interview guide to get a full understanding of the networks, the actors, the management of relationships among members, the coordination mechanisms and the stakeholders.

The interviews were conducted by phone, recorded and transcribed. Eight key stakeholders (see table 1) were selected by considering a range of actors drawn from different organizations and backgrounds, in order to ensure representation of the various stakeholder, groups involved and to achieve a wide representation of interests. These stakeholders include representatives from public organizations, diving centres, associations and Universities.

Respondent	**Organization**	**Role**	**Region**

Fabio Pagano	Archaeological Park of Baia	Director	Campania
Vincenzo Maione	Campi Flegrei Diving Center	General Manager	Campania
Rita Auriemma	University of Salento	Associate Professor	Puglia
Gianpaolo Colucci	Anfora Association	President	Puglia
Salvatore Medaglia	University of Calabria	Researcher in Archaeology	Calabria
Fabio Bruno	University of Calabria	Full Professor	Calabria
Roberta Eliodoro	Megale Hellas Diving	Legal Representative	Calabria
Loredana Ierace	Chamber of Commerce	Head of Studies and Promotion Service	Calabria

Table 1. Key Stakeholders

3. Multiple case study

The longitudinal multiple case study allows us to investigate the following research questions (RQs):

RQ1: Who are the actors involved in the inter-organizational network for the development of underwater archaeological tourism?

RQ2: Who are the stakeholders, and how have they been involved?

RQ3: How are relationships within the network managed?

RQ4: What coordination mechanisms are adopted to effectively manage interdependencies?

The study is based on three case history to compare network experiences in the three regions of southern Italy: Campi Flegrei Active in Campania, ESAC in Puglia and Reggio Calabria Welcome in Calabria. The results of the comparative analysis are summarised in Table 2.

	CAMPANIA	**PUGLIA**	**CALABRIA**
Inter-organizational network	**Campi Flegrei Active**	**ESAC**	**Reggio Calabria Welcome**
Type of network	Bureaucratic Network	Bureaucratic Network	Bureaucratic Network
Actors	20 companies of the tourist system	Superintendencies-University- Region	Chamber of commerce and companies
Stakeholders	UAP of Baia, Region, Municipalities, Universities, Associations, Community	Diving centres, Hotels, B&B, MPA's, SME's, Associations	Companies of the tourist system, diving centres, tourist and environmental guides
Relationship Management	Network Agreement	Consortium between public bodies	Association

Coordination mechanism	Regulation	Coordination Body	Disciplinary

Table 2. Case histories

3.1. Campania region

In Campania, the analysis begins with the Underwater Archaeological Park (UAP) of Baia, one of the most significant areas for UCH tourism in Italy. Established in 2002 together with the Gaiola Underwater Park - among the first underwater archaeological parks created in the country and designated as marine protected areas (MPA) - the UAP of Baia today represents a benchmark model for the use and enjoyment of UCH. In 2023, it was recognized by UNESCO as a best practice for the implementation of the 2001 Convention on the Protection of the Underwater Cultural Heritage. The steady increase in visitor numbers and the strong interest not only in the site's biological features but especially in its archaeological assets make it an exemplary case of sustainable underwater archaeological tourism (Canoro and Ferrara, 2024).

The Park covers approximately 200 hectares within the municipalities of Pozzuoli and Bacoli, in the volcanic area of the Campi Flegrei, which is characterized by a high concentration of landscape, natural, architectural, and archaeological resources. Internationally known as the "submerged Pompeii," the site has experienced a significant increase in tourist demand related to archaeological diving in recent years. A meaningful indicator of this trend is provided by PADI Adventures, a global booking platform for diving activities: in 2024, the Baia UAP, visited through the Centro Sub Campi Flegrei, ranked first worldwide among the top diving destinations (Canoro et al., 2024).

A first attempt at establishing an inter-organizational network for the enhancement of cultural tourism, driven by businesses and associations in the sector, is represented by the Campi Flegrei Active project. Launched in 2019 by Federalberghi Campi Flegrei, the initiative involved accommodation facilities, tourism enterprises, and cultural associations with the aim of developing an integrated tourism offer and promoting authentic experiences within the territory. Formalized in 2021 through a network contract among twenty local enterprises, the project seeks to develop a shared promotional model in which underwater heritage plays a central role.

The network agreement regulates coordination and control mechanisms. Management is entrusted to a committee composed of three members, responsible for implementing the network program and fostering cooperation among the enterprises. The Assembly, which brings together all participating firms, operates on a collegial basis and deliberates on amendments to the program and on strategic guidelines.

The stakeholders involved include diving centre and a glass-bottom boat, accommodation facilities, restaurants, cultural enterprises, tour operators, as well as residents living in areas affected by archaeological heritage. Associations that are not formally part of the business network represent key stakeholders, namely the local community, which contributes to the creation of authentic experiences, while the network enterprises coordinate tourism services and promote these experiences through a dedicated web portal.

The inter-organizational business network, which can be characterized as a bureaucratic network regulated by network agreements and coordination mechanisms based on internal regulations, highlights the absence of public institutions in their role of defining strategic directions, supporting territorial tourism development, and fostering forms of public - private collaboration.

The management model of the UAP of Baia demonstrates the effectiveness of this collaborative approach: the public authority is responsible for protection, research, and maintenance, while private operators manage visits, site access, promotion, and enhancement of the site.

Thanks to initiatives promoted by private operators, new technologies for virtual visits have been implemented, such as the Baia Experience 3D virtual tour accessible through Oculus Go, as well as video game–based tourism through the serious game Dive in the Past (Canoro et al., 2021; Izzo et al., 2021; Greco et al., 2024). The latter was developed within the European project MeDryDive, which enabled the creation of a freely downloadable app accessible via any smartphone. Baia Experience, by contrast, originated from a self-funded research project launched in the 1980s, which enabled underwater surveying of the site. Starting from the mapping of the submerged ruins, this long-term research process has evolved to the present day, allowing anyone to visit the UAP of Baia by wearing a virtual reality headset and to admire reconstructions of the Claudius Nymphaeum and the thermal complex as they appeared in the 3rd century AD.

The findings from the desk analysis and the interviews conducted with the Archaeological Park of Campi Flegrei - which manages the UAP of Baia - and with a diving operator indicate that the future prospects of UCH tourism in Campania require the consolidation of relationships among system actors. The establishment of shared governance bodies, such as Destination Management Organizations (DMOs), could facilitate coordination among institutions, tourism operators, cultural service providers, and local communities. In the absence of a stable governance structure, efforts remain fragmented, and the potential of underwater heritage is not fully realized in relation to its actual capacity to foster territorial development.

Despite the presence of one of the most important underwater archaeological parks in the Mediterranean, Campania still lacks a stable network dedicated to the enhancement of UCH. The absence of coordination among institutional, economic, and cultural actors has led to fragmented initiatives, often promoted by forward-looking private operators seeking to develop forms of cultural tourism based on the site's underwater potential. In this context, the UAP of Baia represents a strategic resource that remains insufficiently integrated into a shared territorial promotion system capable of generating positive spillover effects across the wider area.

3.2. Puglia region

In Puglia, the network for the promotion of UCH tourism was created on the initiative of the Euro Mediterranean Seascapes Archaeology Centre (ESAC), which brings together the experience and expertise of three regional universities (the University of Salento, the University of Bari "Aldo Moro", the University of Foggia), the Puglia Region (Department of Tourism, Cultural Economy and Territorial Enhancement) in collaboration with the National Superintendence for Underwater Cultural Heritage (established in 2019), and the territorial Superintendencies for the provinces of Brindisi and Lecce, Barletta and the metropolitan city of Bari. The Centre was established in 2021 with a three-year agreement approved by the Regional Council [4] to systematize the knowledge, skills and abilities acquired through national and international projects born out of collaboration between the University and the Region, for the enhancement of coastal and underwater heritage of Puglia.

ESAC's main objectives are research, training, conservation and enhancement of Puglia's underwater heritage. It aims to implement a structured and conscious path for the enhancement of underwater sites and coastal landscapes most illustrative of the historical values of Puglia and its strong Mediterranean vocation, understood as a resource for socio-cultural growth and sustainable tourism development of the territories. The governance of the Centre is carried out through a coordinating body, as the Propositive, Advisory and Evaluation Steering Body, which is responsible for deciding on the activities to be conducted in the various areas of interest of the Centre. The coordination is composed of a pro tempore contact person from each of the subjects involved.

[4] Regional Council Decree n. 1104 0f 7 July 2021

The decision-making process is largely attributed to the Region, which plays an operational role in valorisation activities through the "Poli biblio-museali"[5]. The Superintendency assumes an advisory and authorising function, contributing on the basis of its competences in the field of protection and the state of conservation of the sites, while the Universities play a project role by developing proposals and partnerships for national and cross-border territorial cooperation.

The project "Andar per Mare, underwater and coastal itineraries of Puglia" was born within this framework to enhance the region's submerged heritage, ensuring its expanded accessibility, both through direct use and with the aid of innovative technologies.

The project aims to plan and structure an integrated tourism and cultural offering, with low environmental impact and high sustainability, divided into thematic coastal and underwater tours, to be included in the Regional Museum System circuit and the Puglia Paths network.

Starting from approximately 700 artifacts and contexts surveyed, approximately 40 sites suitable for public use, already accessible or susceptible to immediate enhancement, were identified, selected according to criteria of: location, conservation conditions, depth, visibility, and accessibility. The element of fundamental importance in building and achieving these results is precisely the involvement of local stakeholders in developing a shared strategy for the participatory management of the selected sites. This co-design process is based on other virtuous experiences already existing in Italy (UAP of Baia) and in Puglia itself (Egnazia; wreck of San Pietro in Bevagna).

Project stakeholders were involved through technical discussions in the various relevant territorial areas, which included the participation of diving canters, SMEs in sports, recreational, and hospitality activities, nautical service providers, cultural and environmental associations. Stakeholders involved in the project have signed a Memorandum of Understanding (MoU), contributing to varying degrees to the design activities. They have also been included in both the digital portal and the paper guide.

In 2025, the agreement between the institutions promoting ESAC was not renewed, effectively ending an experience of synergistic collaboration between the Universities, the Puglia Region, and the Superintendencies. Recent institutional reorganizations within the Region and the National Superintendency, combined with conflictual relations between the Region and the Ministry of Culture, have compromised the continuity of this cooperation, disrupting a governance model that had demonstrated effectiveness in enhancing underwater archaeological heritage.

Currently, with the conclusion of the ESAC experience, there is no stable coordination system for activities and projects related to the development of underwater archaeological tourism. A new institutional structure is pending from the Region, which could take on a leadership role through the "Poli biblio-museali" or other operational bodies and tools. These entities should be able to integrate research, valorisation, and heritage management at the territorial level, promoting a unified and shared vision.

The Puglia Region operates in the tourism sector through the Puglia Region's Tourism and Culture Department, the Puglia Promozione Regional Tourism Agency, the Puglia Public Theatre Consortium, and the Puglia 365 Strategic Tourism Plan, a participatory planning and development tool for cultural tourism. Furthermore, through the Destination Management System (DMS), the Region promotes hotel and non-hotel accommodations and cultural operators. Since 2018, this

[5] The Puglia Region has established "Poli biblio-museali" as a regional system of museums, libraries, and cultural venues capable of engaging with the state's peripheral structures regarding cultural heritage, standardizing service standards, and valuing the vast wealth of assets, knowledge, and experiences of the provinces of Puglia and municipalities in a single, coordinated policy of valorization and enjoyment (https://www.piiilculturapuglia.it/poli-biblio-museali/).

tool has evolved into a digital ecosystem of culture and tourism, serving both visitors and operators offering their services, facilitating supply and demand matching.

Desk analysis and interviews reveal a marked fragmentation of supply in the underwater archaeological tourism sector. On the one hand, the Puglia Region's Department of Tourism, Cultural Economy, and Land Valorisation-through "Poli biblio-museali" and in collaboration with the stakeholders who promoted ESAC- works to support UCH tourism, including through Puglia365, encouraging the networking of diving canters and tourism businesses. On the other hand, Puglia Promozione does not always proceed in a coordinated manner with ESAC, with the result that the integration of UCH tourism into the regional cultural offering is partial and uneven.

This fragmentation ultimately diminishes and weakens the role of researchers in promoting heritage awareness, through the dissemination of knowledge of the enormous underwater heritage, recognized as an element of identity in the construction of collective memory and a sense of belonging in a community. However, the lack of public valorisation and recognition of this work risks undermining its legitimacy: when research is not understood and validated by the community, its ability to impact the local area weakens (Rita Auriemma, University of Salento).

On the contrary, the experience gained within ESAC - thanks to collaboration with the Puglia Region and the coordination of "Poli biblio-museali" - has produced concrete results. In numerous museums in Puglia, the narration of the history of the area today integrates the underwater heritage, through immersive technology such as Oculus Go and three-dimensional reconstructions. Among the most significant achievements is the exhibition "In the Sea of Intimacy: Underwater Archaeology Tells the Story of Puglia", held at Brindisi Airport from 2019 to 2021, which made the underwater dimension of the regional heritage accessible to a wide audience.

The path continues through the museums of the museum network of Puglia and is enriched with new exhibition experiences, such as the multimedia installation of the Egnazia Museum - a site selected by the MUSAS project - which presents the archaeological park and its submerged site in an integrated manner.

The experience of Puglia shows that the network to function must be structured with a defined governance. Despite the absence of structured coordination, activities are continuing. Among the most significant challenges is the definition of the management plan for the Porto Cesareo underwater and coastal park, developed as part of a project funded by the Puglia Region. Following the conclusion of the archaeological campaign conducted by the University, restoration work was carried out, along with the preparation of trails, the design of underwater trails, and the introduction of lightweight infrastructure - such as signal buoys, canoes, and transparent SUPs - as well as spaces like training rooms.

These interventions are possible in the Underwater Park thanks to the presence of a regulation and a management body. Otherwise, for the coastal sites of Salento there is not a single authority capable of coordinating the set of localities involved. In this context, the Region could play a strategic role in regulating the relationship between users and service operators through provider accreditation systems, like the UAP of Baia, where underwater activities and visits with transparent-bottom boats and other marine sports are authorized and regulated.

3.3. Calabria region

In Calabria Region, the stakeholders involved in the development of UCH tourism include the Calabria Region, the Chambers of Commerce, and the University of Calabria, with the support of the Superintendencies, responsible for protection and enhancement activities. Despite the strong territorial continuity between sea and land that characterizes the region, there is a lack of structural and ongoing interventions dedicated to the valorisation of the underwater heritage. The scientific community has repeatedly highlighted the need to implement participatory processes

that include local diving canters, economic operators, Superintendencies, and the Coast Guard, to build a stable and qualified offering of UCH tourism.

According to Salvatore Medaglia (University of Calabria), there is still no real supply system: only episodic or discontinuous initiatives are recorded. Among the attempts to structure a regional model is the Sustainable Tourism Development Plan 2023-2025, which, through the "Calabria Straordinaria" project, aims to deseasonalize flows and diversify the offering, enhancing villages, inland areas, the sea, mountains, food and wine, and culture. The digital portal created by the Region supports this strategy, offering a modern information ecosystem oriented towards the integrated promotion of heritage.

The Kaulonia Archaeological Park, together with the submerged area in front, represents one of the main regional references for research and dissemination activities, also thanks to participation in projects such as MUSAS. Calabria is also a hub of excellence in the field of technologies applied to underwater cultural heritage, thanks to the Department of Mechanical, Energy and Management Engineering (DIMEG) of the University of Calabria and the spin-off 3D Research, which develop virtual and augmented reality tools, 3D reconstructions, underwater tablets, and digital applications.

The Punta Stilo area, in Monasterace Marina, offers an emblematic example of integration between archaeological heritage and the marine environment. Progressive coastal erosion and geological phenomena have led to a westward shift of the ancient coastline, making part of the archaeological site accessible today even at shallow depths. Megale Hellas diving, in collaboration with the Locri Epizephirii Museum and Archaeological Park and the Kaulonia site, has been running underwater archaeology camps and courses since 2013, combining scientific rigor and outreach activities.

Interviews conducted with stakeholders reveal a recurring critical issue: the lack of adequately structured diving services and the difficulty of collaborating with independent museums following the reform of cultural heritage governance. Previously, cooperation between the Superintendency and Megale Hellas diving was a virtuous model of an informal network; the introduction of new ministerial procedures following the reorganization of the museum sector has instead made the signing of public-private agreements more complex.

The University of Calabria, leader subject of the "BlueCulTour project, is promoting sustainable tourism models based on the valorisation of the maritime and UCH of the Ionian Sea. Partners include the Calabria Region, the National Superintendency for Underwater Cultural Heritage, and the Greek Municipality of Kyllini in collaboration with the Ministry of Culture's Underwater Antiquities Ephorate of Greece and the Capo Rizzuto Marine Protected Area. The project funded by the Interreg Greece - Italy Programme, also includes a training part for both diving and cultural and creative industries to increase the quality level of the services offered, with a focus on communication strategies relating to submerged goods. The project, launched in 2025, will last two years.

This project, like other national and international projects, has a limited duration and represents temporary networks for the development of underwater archaeological tourism, of strong interest due to its potential for a vision of cultural and sustainable tourism.

A further attempt to structure a system of enterprises was promoted by the Chamber of Commerce of Reggio Calabria, through the creation of a product club "Reggio Calabria Welcome". This form of network is configured as a bureaucratic governance model, in which horizontal companies-sometimes competitors-cooperate to manage common resources and adopt shared standards. Interdependence between actors is governed by membership criteria, behavioural rules and decision-making procedures defined by the assembly bodies and formalized in statutes and regulations, ensuring a stable framework for coordination between enterprises and institutions.

Despite such efforts, the picture that emerges is that of a fragmented operational network, characterized by isolated initiatives and weak integration between research, diving canters,

cultural institutions, and public administrations. The construction of a truly integrated regional system would require a stronger coordinating role on the part of the Calabria Region, capable of permanently connecting scientific research, cultural valorisation, tourism services, and territorial governance.

4. Concluding remarks

The comparative analysis of three development models in Campania, Puglia, and Calabria highlights a persistent fragmentation in attempts to build inter-organizational networks around UCH, largely driven by interinstitutional conflicts and unclear governance arrangements. While decentralization processes following the reform of Title V of the Italian Constitution have strengthened the role of Regions in tourism governance (Art. 117 Cost.), they have also increased institutional complexity, often resulting in coordination failures, communication barriers, and power asymmetries that constrain entrepreneurial development and long-term network consolidation.

Consistent with the literature on network governance, the findings confirm that cooperative relations among firms tend to emerge within decentralized and bottom-up models of collaboration. However, their effectiveness remains contingent upon stable public - private partnerships and clear institutional leadership. The cases show that, in the absence of coordinated governance, initiatives remain isolated and vulnerable, despite growing policy attention to UCH tourism - particularly in the post-pandemic period and following the national legislative efforts[6] recognizing diving and UCH tourism as strategic for safety, environmental protection, and heritage valorization.

The UAP of Baia, in Campania, represents the largest submerged archaeological site in the world, accessible through diving, snorkelling, canoeing, and glass bottom boats. One of the main attractors of diving tourism internationally is the first site in Italy to be recognized as a UNESCO best practice for the application of the 2001 UNESCO Convention for the Protection of the Underwater Cultural Heritage

The UAP of Baia represents a paradigmatic case of effective public-private collaboration, anticipating contemporary governance models by integrating protection, research, and tourism use through regulated access and accredited service providers. Similarly, bottom-up networks in the Campi Flegrei area demonstrate how trust-based social relations (Masiello et al., 2015) and collaborative relationships between businesses and local associations can foster cultural tourism, although their sustainability requires institutional support through destination management tools such as DMOs and DMSs (Canoro, 2021).

The coordination of such interorganizational networks that are based on cooperative relationships can be effectively managed by coordination mechanisms such as knowledge sharing and decision participation in bottom-up co-design processes of territorial development models.

In Puglia, the ESAC experience illustrates both the potential and fragility of interinstitutional networks. While the Centre successfully coordinated research, protection, and valorization through a hierarchically structured governance model, its temporary nature and subsequent institutional conflicts undermined continuity.

Entrepreneurial development needs a clear and defined context in which the rules define a framework that fosters investment. In this context, the Puglia Region should play a strategic role in regulating the relationship between users and service operators through provider accreditation systems, like the UAP of Baia, where diving activities and visits with glass-bottom boats and other marine sports are authorized and regulated.

[6] See the Bill on the Enhancement of the Sea Resource presented in 2024 - subsequently amended in 2025 (https://www.senato.it/leggi-e-documenti/disegni-di-legge/scheda-ddl?did=59478)

In Calabria Region, submerged sites of archaeological interest are not yet developed from a tourist point of view. A further attempt to structure an entrepreneurial system to support UCH tourism was promoted by the Reggio Calabria Chamber of Commerce through the creation of the product club "Reggio Calabria Welcome". This experience represents a bureaucratic form of governance, in which companies belonging to the same segment - sometimes even competitors - cooperate to manage common resources and adopt shared standards. Interdependence between actors is regulated by membership criteria, behavioural norms and decision-making procedures defined by assembly bodies and formalized in statutes and regulations, providing a stable framework for coordination between enterprises and institutions.

Despite these attempts, the regional system still appears fragmented: isolated initiatives prevail, limited integration between the scientific community, diving centres, cultural institutions, and public administrations, and an absence of shared strategies. Consolidating a truly effective network would require a more decisive leadership role from the Calabria Region, capable of permanently connecting research, cultural valorisation, tourism services, and territorial governance. Only through an integrated vision and coordinated direction will it be possible to transform the submerged archaeological heritage into an engine of sustainable development for the area.

These findings confirm that the evolution of UCH governance increasingly depends on the alignment between legal frameworks, policy instruments, and operational practices (Calantropio and Chiabrando, 2023). Moreover, in line with Ruzol et al. (2017), the study confirms that formal network structures alone are insufficient to explain cooperation dynamics. Socio-cultural and interpretive factors - values, worldviews, and perceptions of authority - play a crucial role in shaping actors' behavior and the resilience of governance arrangements. This also aligns with Pinto's (2019) argument that effective organizational performance emerges from managing paradoxes among multiple stakeholders rather than resolving them through purely technical solutions.

From a methodological perspective, while the multiple case study approach enabled in-depth comparative insights, the findings remain context-specific and cannot be generalized. The value of the research lies in its participatory nature and engagement with ongoing processes, which allowed for a nuanced understanding of evolving inter-organizational dynamics.

Overall, the study contributes to management and cultural policy debates by framing UCH tourism governance as a socially embedded and negotiated process.

However, the study has several limitations to consider and evaluate in future research. In particular, future research should further advance the analysis by deepening the application of social network analysis to UCH management.

As suggested by Gospodini et al. (2025), the creation of local social networks, together with participatory decision-making processes and collaborative projects, can foster tourism and economic development through sustained cooperation among local stakeholders.

The study provides insights for policy makers and tourism operators, highlighting how diving practiced in natural contexts of scenic and cultural value can become a driver of sustainable tourism, while also promoting protection, awareness, and a sense of belonging to the territory. Underwater parks and MPA emerge as complex tourist destinations where institutions, firms, and communities act as network facilitators. In synergy with institutions, such networks can promote a path of economic growth based on the quality of cultural provision and the valorization of local resources.

Keywords: Underwater cultural heritage tourism; organizational model, inter-organizational networks, stakeholder theory

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Promuovere la Transizione Digitale nel Settore Culturale: Strategie e Modelli di Business

Lorenzo Venezia[1], Elena Borin[2], Ruba Saleh[3]

1. Introduzione

Nel panorama contemporaneo, le organizzazioni culturali si trovano al centro di una profonda trasformazione imposta dalla digitalizzazione. La crescente pressione verso l'adozione di tecnologie innovative, unita alla complessità dei cambiamenti sociali ed economici in atto, impone a musei, biblioteche, archivi, organizzazioni e centri culturali di ripensare in modo radicale le proprie strategie organizzative e i propri modelli di business. In questo panorama, la transizione digitale non rappresenta soltanto un'opportunità di aggiornamento tecnologico, ma una vera e propria sfida imprenditoriale (Li et al., 2022; Ost C Saleh, 2021), capace di ridefinire le modalità con cui queste istituzioni generano valore, dialogano con i propri pubblici (Lerro et al., 2022; Sukhovskaya C Ermakova, 2020) e perseguono la propria missione culturale e sociale.

Nonostante l'urgenza del cambiamento, molte organizzazioni del settore culturale si confrontano con ostacoli strutturali e culturali che rallentano o impediscono l'implementazione efficace di strategie digitali. Tra questi, si segnalano la frammentazione degli interventi, la mancanza di visione strategica, la scarsità di competenze digitali interne (fra cui quelle legate all'utilizzo dell'intelligenza artificiale) (Van Laar et al., 2019; Cerquetti, 2023), la resistenza al cambiamento, l'assenza di infrastrutture adeguate e la scarsità delle risorse finanziarie. Di fronte a tali criticità, emerge la necessità di sviluppare strumenti operativi capaci di accompagnare in modo strutturato e sostenibile il percorso di trasformazione di tali organizzazioni, tenendo conto delle loro specificità e risorse limitate (Nasta, 2025; Pererva C Mazorenko, 2025).

A partire da questo contesto, il presente contributo si propone di analizzare lo stato della transizione digitale nel settore dei centri culturali nella Regione di Bruxelles-Capitale. La scelta di questa area metropolitana come contesto di indagine è dettata dall'identificazione di Bruxelles come centro di potenziale prima ricezione delle linee europee in materia di transizione digitale, in quanto sede delle strutture politiche ove le strategie a livello europeo vengono elaborate. Inoltre, è considerata particolarmente interessante la sua struttura istituzionale, caratterizzata dalla coesistenza di due comunità linguistiche con competenze culturali distinte, da un tessuto associativo eterogeneo e da una popolazione tra le più diverse d'Europa (Janssens, 2001; Saeys et al., 2025), che genera sfide specifiche in termini di governance digitale, mediazione culturale e raggiungimento di pubblici plurali. Studiare come i centri culturali di questa regione affrontano la trasformazione digitale permette perciò di esaminare, in un contesto ad alta complessità, il rapporto tra innovazione tecnologica e missione culturale, educativa e sociale delle organizzazioni.

Il presente contributo intende rispondere alle seguenti domande di ricerca:

RQ1: Quale è il livello di digitalizzazione dei centri culturali della Regione di Bruxelles-Capitale?

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RQ2: Come si distribuisce il livello di digitalizzazione tra le diverse tipologie di centri culturali, ovvero i centri culturali francofoni, i centri culturali fiamminghi, gli istituti nazionali di cultura e i centri culturali multidisciplinari?

RQ3: Quali dimensioni della transizione digitale risultano più sviluppate e quali invece presentano le lacune significative nel campione analizzato?

Il progetto di ricerca è stato inizialmente sviluppato all'interno dell'iniziativa C-SHIP[4] 2025 coordinata da ICHEC Management School (Bruxelles, Belgio). Tale modello, si pone l'obiettivo non solo di contribuire alla discussione teorica, ma anche di proporre un approccio integrato e adattivo volto a sostenere le organizzazioni culturali nella progettazione di strategie digitali personalizzate e sostenibili, dando infine anche un supporto ai decision-makers nella definizione di strategie digitali orientate all'innovazione, alla resilienza e all'impatto sociale.

Il presente contributo è strutturato in cinque sezioni. Dopo una prima introduzione, il paper propone una revisione della letteratura. Nella sezione seguente, vengono presentati il research design e la metodologia di ricerca. La sezione successiva presenta i risultati dell'indagine, e si delineano i risultati attesi nel prosieguo dei lavori di ricerca. Infine, l'ultima sezione traccia delle conclusioni sulla base dei risultati della ricerca, delineando ulteriori sviluppi futuri e limitazioni.

2. Revisione della letteratura: la transizione digitale nell'imprenditoria culturale e creativa

Il settore culturale e creativo rappresenta una componente fondamentale dell'ecosistema socioeconomico europeo: nel 2022, oltre 2 milioni di imprese culturali nell'UE hanno generato circa 199 miliardi di euro di valore aggiunto, pari al 2,0% dell'economia complessiva delle imprese. Il fatturato netto del settore culturale è stato di circa 503 miliardi di euro, pari all'1,3% del fatturato netto totale generato nell'economia delle imprese dell'UE nel 2022 (EUROSTAT, 2023). Oltre all'impatto economico, il settore si caratterizza per la forte componente di trans-settorialità (Della Lucia C Segre, 2017; Solima C Minguzzi, 2014), che lo pone all'incrocio tra finalità civiche, logiche di impatto sociale e riflessioni legate al valore della produzione artistica e culturale (Kalfas C al., 2024). I principali attori di questo settore (fra cui sono inclusi una molteplicità di organizzazioni, quali musei indipendenti, centri culturali, fondazioni, associazioni e biblioteche pubbliche o private) sono spesso caratterizzati da una spiccata attenzione a tematiche sociali e culturali (tanto che si parla spesso di imprenditoria sociale culturale) (Birnkraut, 2017; Chin C Mees, 2021; García et al., 2015; Li et al., 2022; Ost C Saleh, 2021; Tricarico et al., 2022), da una forte connessione con i territori (Costa, 2020, 2020; Lazzeroni et al., 2013; Solima C Minguzzi, 2014), da una mission orientata allo sviluppo culturale partecipato (Boiano et al., 2019; Négrier C Dupin-Meynard, 2020; Piber et al., 2019), ma anche da fragilità strutturali, quali risorse finanziarie limitate e forte dipendenza da fondi pubblici (Bonet C Donato, 2011; Borin et al., 2017; Cea-D'Ancona et al., 2022), carenza di competenze manageriali (Gustafsson C Lazzaro, 2021; Shadkam et al., 2025) e difficoltà nell'adozione delle innovazioni tecnologiche, nonostante

[4] Cultural Entrepreneurship. C-SHIP è un programma intensivo di apprendimento attivo dedicato all'imprenditorialità culturale, pensato per artisti e professionisti della cultura, così come per chi aspira a diventarlo. È definito apprendimento attivo perché si basa su sessioni interattive, incontri e discussioni, attività pratiche e momenti di coaching. Attraverso casi di studio reali, i partecipanti innovano i propri modelli di business e operativi, creano partenariati, esplorano metodi cooperativi ed etici per gestire progetti culturali e ottimizzano l'impatto sociale delle proprie iniziative, tra le altre attività. Durante la formazione, i partecipanti a C-SHIP progettano, testano e realizzano un progetto sostenibile e ad alto impatto. C-Ship program | ICHEC.

il settore sia stato identificato come uno dei settori a forte impatto innovativo (Leslie C Rantisi, 2017; Wilson C Stokes, 2005).

In questo scenario, l'innovazione e l'imprenditorialità assumono significati peculiari. Da un lato le organizzazioni culturali spesso non perseguono il profitto come fine primario, ma sono chiamate a sviluppare logiche imprenditoriali per garantire sostenibilità, innovazione e impatto (Chuayounan et al., 2022; Dobreva C Ivanov, 2020). Dall'altro, alcune spinte verso logiche di tipo imprenditoriale sono molto sentite dal settore, vista la sua forte attenzione alle dinamiche di innovazione (Strøm et al., 2020), quali le sfide e opportunità della sostenibilità e della digitalizzazione (Borin, 2023; Kovaitė et al., 2022; Massi et al., 2020; Dematos Guimarães C Maehle, 2026). Di recente, il settore culturale e creativo sta riflettendo sul cambio di paradigma legato all'AI (Gurel, 2025), che comporta l'adozione di strumenti propri del management strategico ma anche riflessioni legate alla maggiore attenzione alla creazione di valore condiviso, che viene spesso sentita come uno sbocco naturale dagli attori dell'ecosistema culturale e creativo.

In sintesi, l'imprenditorialità nel settore culturale si distingue per la sua natura ibrida: combina la creatività, l'attenzione a tematiche sociali, e cerca di conciliare l'interpretazione negativa di logiche di profitto (che caratterizza il settore artistico) con l'interesse per lo sviluppo di competenze strategiche e gestionali dell'imprenditoria. A differenza dell'imprenditoria classica, essa mira a generare non solo valore economico, ma anche valore sociale e culturale, in ottica partecipativa e trasformativa. In questo contesto, la digitalizzazione viene quindi spesso interpretata non solo un fattore tecnologico, ma una leva per ripensare il modello organizzativo, il posizionamento strategico e la relazione e il coinvolgimento dei pubblici (Lerro et al., 2022; Sukhovskaya C Ermakova, 2020).

La letteratura scientifica sull'argomento sottolinea perciò come l'imprenditorialità culturale stia adottando approcci non lineari alla transizione digitale, capaci di incorporare elementi di rischio, sperimentazione e adattamento continuo (Valiati C Möller, 2025). La figura del "cultural entrepreneur", intesa come colui che coniuga visione, sensibilità culturale e capacità di innovazione sistemica, assume una centralità crescente (Liu et al., 2022; Oppioli et al., 2025). Il contesto della transizione digitale, con le sue logiche di rete, abilitazione e disintermediazione, accentua il bisogno di leadership distribuita e di competenze nuove, spesso ancora carenti nelle istituzioni culturali tradizionali. La riflessione sulle Intelligenze "artificiali", che ora dominano il dibattito sulla produzione artistica, sta progressivamente entrando anche nel dibattito sul miglioramento del management culturale (Valiati C Möller, 2025).

Infatti, l'affermarsi dell'ecosistema digitale sta modificando in profondità anche le condizioni di operatività del settore culturale. Le tecnologie digitali (dalla realtà aumentata all'intelligenza artificiale, dai sistemi di gestione dei dati al digital storytelling) offrono nuove modalità per produrre, distribuire e fruire contenuti culturali ma anche per ottimizzare i processi di gestione delle aziende culturali stesse. Il digitale non è quindi solo uno strumento: è un ambiente, un'infrastruttura relazionale e cognitiva, che ridisegna le dinamiche tra attori, risorse e pubblico.

All'interno del dibattito accademico-scientifico sulla transizione digitale nelle aziende culturali, possiamo individuare vari strand emergenti di ricerca.

Un primo strand emergente è quello relativo agli ecosistemi digitali nel settore culturale e alla governance di tali ecosistemi (Borin C Donato, 2022; Derakhshan, 2025). Da un lato, si sottolinea come le organizzazioni culturali non siano più entità isolate, ma nodi interconnessi di una rete fatta di partner, stakeholder, comunità e piattaforme tecnologiche, secondo un modello sempre più partecipativo e inclusivo (Flew et al., 2019; Hsu et al., 2023; Ngo C Ngo, 2025). L'adozione di logiche di open innovation (Bujor C Avasilcăi, 2023; Dianova et al., 2023), la co-creazione con i pubblici (Dematos Guimarães C Maehle, 2026) e la collaborazione tra istituzioni rappresentano fattori chiave per attivare processi di innovazione sostenibile (Abhari C Davidson, 2017). Si invita quindi alla partecipazione e alla co-creazioni con i pubblici e il sistema di stakeholders, che possano anche promuovere la creazione di comunità online che contribuiscano

attivamente alla mission dell'istituzione (Costa, 2020; Boaino et al., 2019; Piber et al., 2019; Dragouuni et al., 2025; Arrigoni et al., 2019). Dall'altro, viene sottolineato come queste dinamiche richiedano una trasformazione culturale e organizzativa profonda, non sempre facile da implementare in contesti a volte caratterizzati da rigidità strutturali e risorse limitate.

Un secondo strand emergente, è quello relativo alla riflessione sullo sviluppo di strategie digitali, anche legate ai business models innovativi (Benghozi et al., 2021; Borin C Donato, 2022; Cruz-Martinez, 2024; Lian C Xie, 2024; Pererva C Mazorenko, 2025). La definizione di strategie digitali efficaci e sostenibili costituisce infatti una delle principali sfide per le organizzazioni del settore culturale. Si sottolinea infatti come tali strategie debbano integrare obiettivi artistici, sociali ed economici, rispecchiando la missione dell'organizzazione e al contempo garantendone la sostenibilità nel lungo periodo, anche in un'ottica di contributo allo sviluppo sostenibile (Hosseini C Rajabipoor Meybodi, 2023). In questo contesto, viene evidenziata l'importanza di modelli di business flessibili, orientati al valore e capaci di adattarsi all'evoluzione del contesto digitale diventano strumenti fondamentali e soprattutto ci si focalizza sull'allineamento fra la strategia digitale e la missione culturale, educativa o sociale dell'organizzazione culturale stessa (Li, 2015; Lian C Xie, 2024; Nasta, 2025). Rilevante è anche la riflessione, legata ad importanti interventi a livello europeo e globale (Council of Europe, 2024; UNESCO, 2021), sulla necessità di sviluppare principi etici specifici nell'implementazione di strategie digitali nel settore culturale e oltre, che esplicitino le politiche dell'azienda verso le sfide digitali (ad es, deepfake, AI biases, ecc…).

Infine, un terzo strand studia l'integrazione tra competenze e cultura organizzativa come base per un'efficace trasformazione digitale nel settore culturale (Cerquetti, 2023; Gradin, 2022; Salvador C Comunian, 2024; Van Laar et al., 2019). In questa linea di ricerca, emerge che le strategie digitali non possono essere calate dall'alto, ma devono risultare da un processo partecipativo, adattativo e di apprendimento continuo, capace di valorizzare le conoscenze diffuse ma anche di promuovere una costante formazione sull'uso della tecnologia e su nuovi mezzi di interazione con i pubblici. In questo strand di ricerca possiamo includere riflessioni tecniche sull'utilizzo delle tecnologie emergenti (Povroznik, 2018; Bolognesi C Aiello, 2020), sul marketing digitale (Dianova, 2023; Larkin, 2023; Li, 2023) ma anche le ricerche che si focalizzano sull'esperienza dell'utente (Nappi et al., 2024).

Da questa analisi della letteratura sulla trasformazione digitale nel settore culturale, si evince tuttavia che, nonostante la crescente attenzione al tema della digitalizzazione nel settore, c'è ancora limitata attenzione nella riflessione sulla mancanza di modelli operativi specifici che supportino in modo strutturato il cambiamento e che possano integrare tutte le prospettive sopra-menzionate. Molti contributi si concentrano sulle tecnologie disponibili o sulle esperienze pionieristiche, ma pochi offrono strumenti pratici, scalabili e facilmente implementabili da parte di organizzazioni a risorse limitate. A questa lacuna nella letteratura, prova a rispondere il recente rapporto Digital culture - a review of evidence and experience, with recommendations for UK policy, practice and research (Oman 2024), focalizzato sul Regno Unito, che costituisce una sintesi di evidenze empiriche, prospettive istituzionali e raccomandazioni operative relative all'impatto della digitalizzazione sulle organizzazioni culturali. Il report affronta in modo sistemico le dimensioni chiave della trasformazione digitale: governance e strategia, competenze del personale, modelli di partecipazione e co-creazione, infrastrutture tecnologiche e processi operativi, sostenibilità economica e sistemi di monitoraggio.

Il presente contributo mira quindi a contribuire ulteriormente a colmare questo gap di ricerca, analizzando lo stato dell'arte nell'area della Regione di Bruxelles-Capitale, con un campione di ricerca selezionato, che serve come base teorica per la successiva proposta di un framework per la transizione digitale. Tale framework, si baserà sia sulle evidenze emerse dal report di Oman, ma il modello proposto sarà a sua volta ri-calibrato in funzione delle specificità socio-culturali e linguistiche del territorio, della frammentazione istituzionale caratteristica della capitale belga e della composizione del pubblico e degli stakeholder.

3. Struttura e metodologia della ricerca

Al fine di analizzare le domande di ricerca, si è deciso di adottare un approccio quantitativo (quantitative research method), seppur di carattere esplorativo e preliminare. Pur riconoscendo che la dimensione del campione circoscritta ai centri culturali della Regione di Bruxelles-Capitale non consente generalizzazioni statistiche di ampia portata, questo studio si configura come un primo passo di un'indagine più ampia, volta a mappare lo stato della trasformazione digitale nel settore e a identificare tendenze e pattern ricorrenti su cui fondare future ricerche di maggiore scala. In questo senso, l'approccio quantitativo risulta comunque appropriato per diverse ragioni metodologiche. In primo luogo, consente di condurre uno studio sistematico su un campione definito di soggetti, garantendo comparabilità dei dati e una prima base empirica per la generalizzazione dei risultati (Creswell C Creswell, 2023; Leavy, 2017). La ricerca quantitativa si caratterizza inoltre per un elevato grado di oggettività e accuratezza: lavorando su un numero limitato di variabili applicate a un insieme di casi e seguendo procedure standardizzate, è possibile garantire sia la validità che l'affidabilità dei risultati ottenuti (Kothari, 2004).

Un ulteriore vantaggio di questo approccio risiede nella sua replicabilità: il rispetto di standard metodologici consolidati permette ad altri ricercatori di riprodurre lo studio e di confrontarne gli esiti con quelli di ricerche analoghe, contribuendo così alla cumulabilità del sapere scientifico (Neuman, 2011; Creswell and Creswell, 2023). La metodologia quantitativa consente inoltre di sintetizzare grandi quantità di informazioni e di effettuare confronti sistematici tra categorie diverse o attraverso intervalli di tempo, rendendo possibile un'analisi strutturata e comparabile dei fenomeni indagati (Kothari, 2004). Infine, questo approccio permette di ridurre al minimo l'influenza del bias personale del ricercatore, favorendo una maggiore neutralità nell'interpretazione dei dati (Leavy, 2017).

La ricerca è consistita nell'analisi delle fonti secondarie di 57 centri culturali (la lista completa è disponibile nell'allegato 1) dell'area della Regione di Bruxelles-Capitale), condotta dai ricercatori coinvolti nella ricerca. Il campione dei casi studio analizzati comprende 14 centri culturali francofoni, 22 centri culturali fiamminghi, 18 istituti nazionali di cultura dell'Unione europea o altrove, e 3 centri culturali multidisciplinari a vocazione trasversale. La scelta di focalizzare la ricerca all'area geografica della Regione di Bruxelles-Capitale è stata dettata da molteplici criteri. Innanzitutto, l'interesse dell'area, identificata come primo luogo di potenziale applicazione delle politiche europee vista la vicinanza con le istituzioni europee stesse, e quindi dalla potenziale attitudine degli attori della Regione di Bruxelles-Capitale ad aderire a processi di innovazione facilitati dalle politiche europee (Chin C Mees, 2021; Dotti C Spithoven, 2017), in questo caso quelle relative alla Digital and Green Transition. Inoltre la regione di Bruxelles è un territorio complesso, in cui sono presenti due comunità principali (francofona e fiamminga) ma anche innumerevoli nazionalità. Infine, la scelta di questa città è stata dettata da criteri di disponibilità di raccolta dati (due degli autori operano in tale area geografica). L'analisi è stata condotta nei mesi di Novembre e Dicembre 2025 tramite una codifica basata su un framework interpretativo suddiviso in sei tematiche.

Come sopra accennato, il framework interpretativo è stato elaborato sulla base della fase preliminare di analisi della letteratura (illustrata nella precedente sezione) che ha permesso di identificare alcuni elementi fondamentali legati alla strategia digitale. Le principali caratteristiche del presente framework sono sintetizzate nella Tabella 1. I sei criteri analitici specifici presi in esame sono i seguenti:

Strategia digitale: l'adozione o meno di una strategia digitale in linea con la missione culturale, educativa o sociale fondamentale del centro;

Tecnologie emergenti: l'uso di tecnologie emergenti e "dirompenti" (ad esempio, IA, XR/VR/AR, digitalizzazione 3D);

Marketing digitale: l'utilizzo di strumenti di marketing digitale (ad es. la gestione sicura dei biglietti online, le offerte di eventi virtuali o l'utilizzo del crowdfunding;

Aspetti etici: l'esplicitazione di principi etici nelle strategie digitali, (per es. tramite dichiarazione etica) che spieghino come i centri culturali si approccino alle molteplici sfide digitali (ad es. AI biases, deepfake, ecc);

Esperienza utente: l'attenzione alle esperienze degli utenti, visibili ad es. in investimenti in piattaforme unificate e di facile utilizzo che offrano contenuti coinvolgenti e di alta qualità;

Partecipazione e co-creazione: l'invito alla partecipazione, co-creazione e l'uso di piattaforme (come wiki o API) per sollecitare commenti e critiche da parte del pubblico, oppure per promuovere comunità online che contribuiscono attivamente alla missione dell'istituzione.

Per comprendere come questi aspetti legati alla transizione digitale si concretizzino nei centri culturali del campione, è stata svolta un'analisi approfondita di fonti secondarie (illustrate nella tab. 1). Tali aspetti sono stati codificati secondo tre codici descrittivi: disponibile, non disponibile, parzialmente disponibile.

Criteri di analisi	**Principale letteratura di riferimento**	**Aspetti analizzati**	**Fonti consultate per l'analisi delle aree**
Strategia digitale	Cruz-Martinez (2024); Lian and Xie (2024)	Adozione o meno di una strategia digitale Allineamento della strategia digitale con la missione culturale, educativa o sociale fondamentale del centro.	Rapporto annuale, sito web
Tecnologie emergenti	Povroznik (2018); Bolognesi C Aiello (2020)	Uso di tecnologie emergenti e "dirompenti" (ad es. IA, XR/VR/AR, digitalizzazione 3D, ecc…).	Sito web, eventi
Marketing digitale	Dianova (2023); Larkin (2023); Li (2023)	Impiego del marketing digitale (ad es. applicato alla gestione dei biglietti online e mobili, offerta di eventi virtuali, iniziative di crowdfunding, ecc…).	Sito web e social media
Aspetti etici	Council of Europe, 2024 UNESCO, 2021	Esplicitazione di principi etici (ad es. tramite un Code of Ethics) tramite dichiarazioni, codici, ecc… volta ad esprimere i principi sui quali si fonda l'approccio aziendale alle sfide digitali (ad es. relativamente a AI biases, deepfake, ecc).	Comunicazione ed eventi
Esperienza utente	Nappi *et al.*, 2024	Utilizzo di piattaforme orientate al miglioramento dell'esperienza utente (ad es. che consentano un facile utilizzo, che offrano contenuti coinvolgenti e di alta qualità, ecc…).	Sito web

Partecipazione e co-creazione	Costa (2020); Boaino *et al.* (2019); Piber *et al.* (2019); Dragouni *et al.,* (2025); Arrigoni *et al.,* (2019)	Invito alla partecipazione nella co-creazione di strategie e contenuti tramite online tools, uso di piattaforme (come wiki o API) per sollecitare commenti e critiche da parte del pubblico, oppure per promuovere la creazione di comunità online che contribuiscano attivamente alla missione dell'istituzione.	Social media, podcast, webinar, questionari, sito web

Tabella 1. Focus di analisi, letteratura di riferimento, aspetti analizzati, fonti consultate per l'analisi

4. Risultati

Prima di procedere all'analisi dei risultati per ciascun criterio, è opportuno delineare alcune caratteristiche strutturali del campione analizzato, che emergono trasversalmente dai dati raccolti e costituiscono un contesto interpretativo essenziale per la comprensione dei risultati.

Un primo elemento di rilievo riguarda la dimensione delle risorse umane. L'analisi delle fonti secondarie evidenzia come la grande maggioranza dei centri culturali del campione non disponga di figure professionali specificamente dedicate alla gestione della transizione digitale, quali un Digital Transition Officer o un Digitalisation Strategist. Tale assenza non appare riconducibile esclusivamente a vincoli finanziari, ma sembra riflettere una carenza strutturale più profonda nella concezione del lavoro culturale, in cui le competenze digitali strategiche non sono ancora percepite come una priorità organizzativa autonoma. Questa condizione non è peraltro peculiare al contesto brussellese: i report del progetto europeo ENUMERATE documentano come, già nel 2012, solo il 3,3% del personale retribuito delle istituzioni culturali europee fosse impegnato a tempo pieno nelle attività di digitalizzazione (Stroeker C Vogels, 2012), con team dedicati composti in media da circa 5,5 persone nelle istituzioni di dimensioni medio-piccole. Il report successivo del 2014 registra un incremento di circa il 50% del personale coinvolto rispetto alla rilevazione precedente, segnalando al contempo che nelle istituzioni con budget più limitati (tra €10.000 e €50.000 annui) fino al 92% del personale risulta coinvolto nelle attività di digitalizzazione (Stroeker C Vogels, 2014), a testimonianza di come la scarsità di risorse umane dedicate costituisca una criticità strutturale e di lungo periodo nel settore culturale europeo. A tutto questo si aggiunge il sovraccarico lavorativo del personale che riduce significativamente la disponibilità di tempo e risorse cognitive da dedicare a processi di apprendimento e implementazione di nuove strategie digitali.

Un secondo elemento riguarda le asimmetrie tra le comunità linguistiche del campione. I 22 centri culturali fiamminghi beneficiano dell'appartenenza al network N22 – Brussels Gemeenschaps Centra, sostenuto dalla VGC – Vlaamse Gemeenschapscommissie, che favorisce la condivisione di risorse, buone pratiche e strategie digitali comuni. I 14 centri francofoni, invece, dispongono di un ecosistema di federazioni (ACC[5], Astrac[6] e La Concertation ASBL Action

[5] https://www.centres-culturels.be/

[6] https://astrac.be/

Culturelle Bruxelloise [7]) e reti (RABKO [8], BRUXEO [9], CESSoC [10]) per il lavoro di sensibilizzazione, coordinamento e scambio delle pratiche ma le loro collaborazioni appaiono frammentate e determinate prevalentemente dalla prossimità geografica, senza tradursi in un coordinamento strategico a livello di comunità linguistica. Questa asimmetria suggerisce che il livello di digitalizzazione di un centro culturale non dipenda esclusivamente dalle risorse interne, ma sia significativamente influenzato dal grado di connettività istituzionale della rete di appartenenza.

Un terzo elemento riguarda i 18 istituti nazionali di cultura, la cui autonomia strategica risulta limitata dalla dipendenza formale o sostanziale dalle rispettive ambasciate nazionali e dai Ministeri degli Affari Esteri dei paesi di riferimento. Le scelte in materia di transizione digitale riflettono pertanto le politiche culturali e digitali definite a livello nazionale piuttosto che i bisogni specifici del contesto brussellese, producendo un profilo di digitalizzazione fortemente eterogeneo e difficilmente comparabile con quello degli altri sottogruppi.

Un quarto elemento riguarda i 3 centri multidisciplinari a vocazione trasversale, (BOZAR, Les Halles de Schaerbeek e Le BAMP), che si distinguono per la loro indipendenza dalle logiche comunitarie e per una vocazione pluridisciplinare che attraversa le comunità linguistiche della regione. Questa doppia trasversalità, disciplinare e linguistica, potrebbe favorire approcci più sperimentali alla transizione digitale (Bujor C Avasilcăi, 2023), ma si traduce al contempo in approcci alla digitalizzazione disomogenei, rendendo difficile l'identificazione di un profilo digitale comune per questo sottogruppo. Questi elementi trasversali costituiscono quindi un primo spunto di riflessione, su cui si sono poi interpretati i risultati della preliminare analisi quantitativa, che verranno illustrati nei seguenti paragrafi e analizzati per ciascuno dei sei criteri del framework interpretativo adottato (strategia digitale, tecnologie emergenti, marketing digitale, aspetti etici, esperienza utente, partecipazione e co-creazione).

Il criterio della strategia digitale (vedi Grafico 1) registra il risultato più critico dell'intera analisi: il 100% dei centri analizzati risulta classificato come "non disponibile", poiché nessuno dei 57 centri culturali del campione dispone di una strategia digitale pubblica documentata. Questo dato si inserisce in modo significativo nel quadro teorico delineato dal secondo strand della letteratura, che sottolinea come la definizione di strategie digitali efficaci e sostenibili costituisca una delle principali sfide per le organizzazioni del settore culturale (Cruz-Martinez, 2024; Lian C Xie, 2024; Pererva C Mazorenko, 2025). L'assenza totale di strategie digitali documentate nel campione analizzato suggerisce che i centri brussellesi si trovino ancora in una fase pre-strategica della transizione digitale, in cui mancano non solo i modelli di business innovativi teorizzati dalla letteratura, ma anche le condizioni organizzative di base per la loro elaborazione. In particolare, l'allineamento tra strategia digitale e missione culturale, educativa e sociale dell'organizzazione, identificato dalla letteratura come elemento fondamentale per una trasformazione digitale sostenibile (Li, 2015; Lian C Xie, 2024; Nasta, 2025), risulta di fatto impossibile da valutare in assenza di una strategia esplicitamente formulata e resa pubblica. Questo dato richiede tuttavia una lettura differenziata a seconda del sottogruppo considerato. Nel caso dei centri fiamminghi, l'assenza di una strategia digitale autonoma non implica necessariamente una mancanza di orientamento strategico: l'N22 elabora e gestisce centralmente la strategia di digitalizzazione per i centri affiliati, definendo linee guida grafiche standardizzate

[7] https://www.laconcertation-asbl.org/

[8] https://rabbko.be/fr/

[9] https://www.bruxeo.be/

[10] https://www.cessoc.be/

per i rispettivi siti web. Per i centri francofoni, gli istituti nazionali e i centri multidisciplinari invece l'assenza riflette una lacuna più profonda che trova una spiegazione teorica nel terzo strand della letteratura relativo all'integrazione tra competenze e cultura organizzativa come base per un'efficace trasformazione digitale (Cerquetti, 2023; Salvador C Comunian, 2024; Van Laar et al., 2019). Come evidenziato da questo filone di ricerca, le strategie digitali non possono essere calate dall'alto, ma devono risultare da un processo partecipativo e adattativo che valorizza le competenze diffuse all'interno dell'organizzazione. La scarsità di risorse umane specializzate, il sovraccarico lavorativo del personale e l'assenza di un coordinamento istituzionale strutturato che caratterizzano questi sottogruppi impediscono di fatto l'avvio di tale processo, confermando empiricamente quanto teorizzato da Gustafsson C Lazzaro (2021) e Shadkam et al. (2025) circa le fragilità strutturali che ostacolano la trasformazione digitale nelle organizzazioni culturali a risorse limitate.

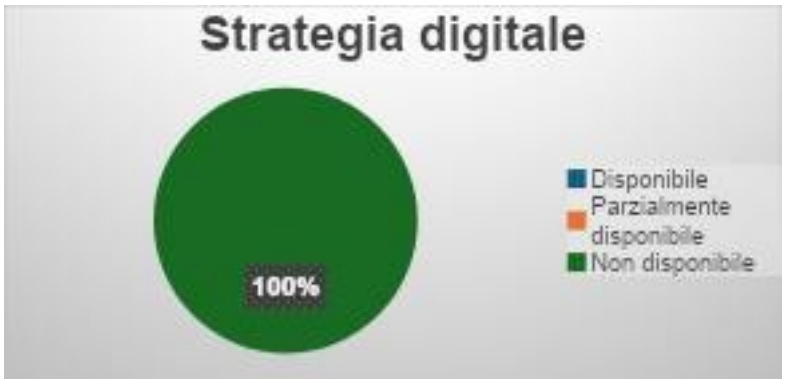


Figura 1.Strategia digitale

Il criterio delle tecnologie emergenti (Grafico 2) presenta un quadro parzialmente più articolato rispetto al precedente. Il 35% dei centri risulta classificato come "parzialmente disponibile", evidenziando l'esistenza di alcune esperienze di adozione sperimentale di tecnologie quali l'intelligenza artificiale, la realtà estesa (XR/VR/AR) o la digitalizzazione 3D. Tuttavia, il restante 65% non mostra alcuna evidenza di utilizzo di tali tecnologie, e l'assenza di valori pienamente "disponibili" per l'intero campione indica che, laddove presenti, queste tecnologie vengono adottate in modo occasionale e non sistematico, senza raggiungere un livello di integrazione strutturale nei processi organizzativi. Questo risultato si colloca nel quadro del terzo strand della letteratura, che include riflessioni tecniche sull'utilizzo delle tecnologie emergenti come leva per ripensare le modalità di produzione, distribuzione e fruizione dei contenuti culturali (Povroznik, 2018; Bolognesi C Aiello, 2020). La letteratura evidenzia inoltre come il settore culturale e creativo stia riflettendo sul cambio di paradigma legato all'intelligenza artificiale (Gurel, 2025; Valiati C Möller, 2025), che comporta non solo l'adozione di nuovi strumenti tecnologici ma anche una revisione profonda dei modelli organizzativi e gestionali. L'adozione ancora frammentata e sperimentale di tecnologie emergenti nel campione analizzato suggerisce che i centri brussellesi si trovino in una fase ancora lontana da questa revisione sistemica, confermando quanto osservato dalla letteratura circa le difficoltà del settore culturale nell'adozione strutturale delle innovazioni tecnologiche (Leslie C Rantisi, 2017; Wilson C Stokes, 2005).

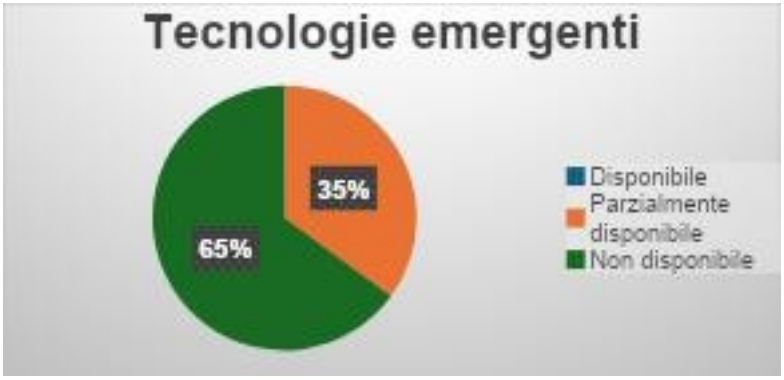


Figura 2. Tecnologie emergenti

Il criterio del marketing digitale (grafico 3) registra il risultato più positivo dell'intera analisi. Il 79% dei centri culturali del campione risulta classificato come "disponibile", a testimonianza di una presenza digitale orientata alla comunicazione e alla promozione delle proprie attività attraverso strumenti quali la biglietteria online, i social media e la promozione di eventi. Solo il restante 21% non mostra evidenze significative di strumenti di marketing digitale strutturati. Questo risultato trova un ancoraggio nel terzo strand della letteratura, che identifica nel marketing digitale una delle dimensioni più accessibili della trasformazione digitale per le organizzazioni culturali (Dianova, 2023; Larkin, 2023; Li, 2023), in quanto richiede competenze relativamente diffuse e investimenti contenuti rispetto ad altre dimensioni della transizione digitale. Tuttavia, come sottolineato dal secondo strand, la definizione di strategie digitali efficaci e sostenibili richiede che gli strumenti di marketing digitale siano integrati in una visione strategica più ampia, allineata alla missione culturale, educativa e sociale dell'organizzazione (Lian C Xie, 2024; Nasta, 2025). L'elevata adozione di strumenti di marketing digitale in assenza di una strategia digitale documentata, come emerge dal confronto tra questo criterio e il precedente, suggerisce quindi che i centri brussellesi abbiano sviluppato una digitalizzazione prevalentemente operativa e comunicativa, senza che questa si sia ancora tradotta nella visione strategica integrata teorizzata dalla letteratura.

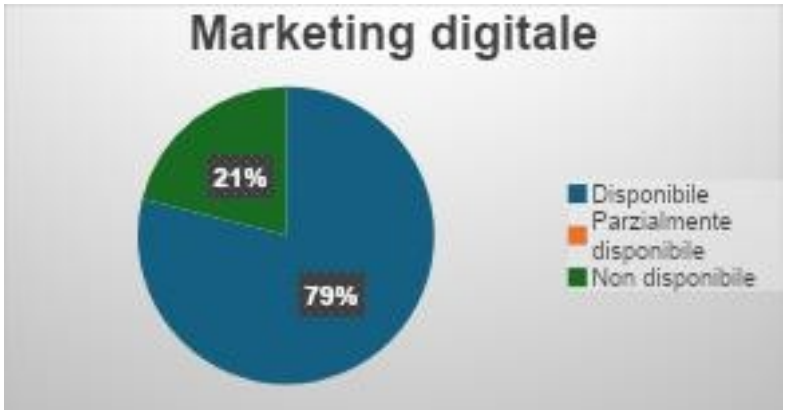


Figura 3. Marketing digitale

Il criterio degli aspetti etici (Grafico 4) rivela una delle lacune più significative dell'intera analisi. Solo il 9% dei centri del campione dispone di una dichiarazione etica pubblica in materia digitale, ad esempio relativamente ai bias dell'intelligenza artificiale o ai deepfake, mentre il 91% non mostra alcuna evidenza pubblica in questo senso. Questo risultato si collega direttamente al

secondo strand della letteratura, che sottolinea la rilevanza crescente della riflessione etica nell'implementazione di strategie digitali nel settore culturale, in linea con importanti interventi a livello europeo e globale (Council of Europe, 2024; UNESCO, 2021). Tali documenti evidenziano la necessità che le organizzazioni culturali sviluppino principi etici espliciti che orientino il loro approccio alle sfide digitali, quali i bias algoritmici, i deepfake e la gestione dei dati personali. L'assenza quasi totale di dichiarazioni etiche pubbliche nel campione analizzato indica che questa dimensione, pur teoricamente riconosciuta come prioritaria dalla letteratura e dalle istituzioni internazionali, non si è ancora tradotta in pratiche organizzative concrete nei centri brussellesi. Questo risultato assume una rilevanza particolare alla luce del cambio di paradigma legato all'intelligenza artificiale in corso nel settore culturale e creativo (Gurel, 2025; Valiati C Möller, 2025), che rende sempre più urgente lo sviluppo di una governance etica del digitale anche nelle organizzazioni di dimensioni medio-piccole.

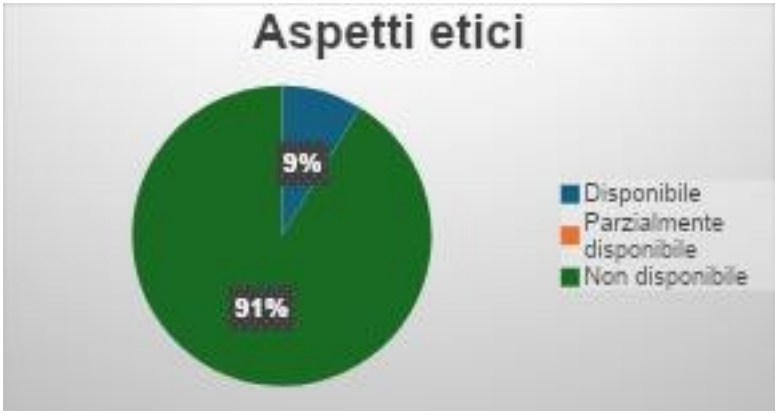


Figura 4. Aspetti critici

Il criterio dell'esperienza utente (Grafico 5) è l'unico a registrare un valore pienamente positivo per l'intero campione: il 100% dei centri culturali analizzati dispone di un sito web funzionante, confermando che la presenza digitale di base costituisce ormai una condizione acquisita per la totalità delle organizzazioni considerate. Questo risultato si collega al terzo strand della letteratura, che identifica nell'esperienza utente una dimensione fondamentale della trasformazione digitale nel settore culturale (Nappi et al., 2024), sottolineando come le piattaforme digitali debbano essere progettate per offrire contenuti coinvolgenti e di alta qualità, capaci di rispondere alle aspettative di pubblici sempre più diversificati. Va tuttavia segnalata una particolarità rilevante: i siti web dei 22 centri fiamminghi affiliati all'N22 presentano una struttura grafica e un'interfaccia utente pressoché identiche, frutto delle linee guida standardizzate definite dal network. Se da un lato questa uniformità garantisce qualità e coerenza visiva, dall'altro solleva interrogativi sulla capacità di ciascun centro di esprimere la propria identità digitale in modo autonomo e distintivo, e di adattare l'esperienza utente alle specificità del proprio pubblico di riferimento, in linea con quanto teorizzato dalla letteratura circa la necessità di una digitalizzazione capace di valorizzare la relazione e il coinvolgimento dei pubblici (Lerro et al., 2022; Sukhovskaya C Ermakova, 2020).



Figura 5. Esperienza utente

Il criterio della partecipazione e co-creazione presenta, insieme a quello della strategia digitale, il risultato più critico: il 100% dei centri risulta classificato come "non disponibile", poiché nessun centro del campione utilizza strumenti digitali strutturati, quali wiki, API aperte o piattaforme di community online, per coinvolgere attivamente il pubblico nella co-creazione di contenuti e strategie. Questo risultato acquista una rilevanza teorica particolare alla luce del primo strand della letteratura, relativo agli ecosistemi digitali nel settore culturale e alla governance di tali ecosistemi (Borin C Donato, 2022; Derakhshan, 2025). Tale filone di ricerca sottolinea come le organizzazioni culturali non siano più entità isolate, ma nodi interconnessi di una rete fatta di partner, stakeholder, comunità e piattaforme tecnologiche, secondo un modello sempre più partecipativo e inclusivo (Flew et al., 2019; Hsu et al., 2023). L'adozione di logiche di open innovation e la co-creazione con i pubblici sono identificate come fattori chiave per attivare processi di innovazione sostenibile (Abhari C Davidson, 2017; Bujor C Avasilcăi, 2023), mentre la promozione di comunità online che contribuiscano attivamente alla missione dell'istituzione è considerata un elemento centrale di una governance digitale matura (Costa, 2020; Boiano et al., 2019; Dragouni et al., 2025). L'assenza totale di tali pratiche nel campione analizzato indica quindi che i centri culturali brussellesi si trovano ancora al di fuori di questa logica di ecosistema digitale, operando secondo un modello prevalentemente unidirezionale nella loro relazione con il pubblico, in cui il digitale viene utilizzato come canale di diffusione piuttosto che come infrastruttura relazionale e cognitiva condivisa. È importante precisare che questa codifica non implica che i centri siano chiusi alla partecipazione in senso lato: molti comunicano una vocazione all'apertura e all'inclusione attraverso i propri canali di comunicazione. Tuttavia, come evidenziato dalla letteratura, tale apertura non si traduce in forme di partecipazione digitale strutturata e misurabile, confermando quanto osservato da Flew et al. (2019) circa la difficoltà di implementare dinamiche di ecosistema digitale in contesti caratterizzati da rigidità strutturali e risorse limitate. Questo divario tra la dimensione valoriale dichiarata e le pratiche digitali effettivamente implementate rappresenta uno degli elementi più significativi emersi dall'analisi, e suggerisce che lo sviluppo di forme strutturate di co-creazione digitale costituisca una delle principali aree di intervento prioritario per i centri culturali della Regione di Bruxelles-Capitale.

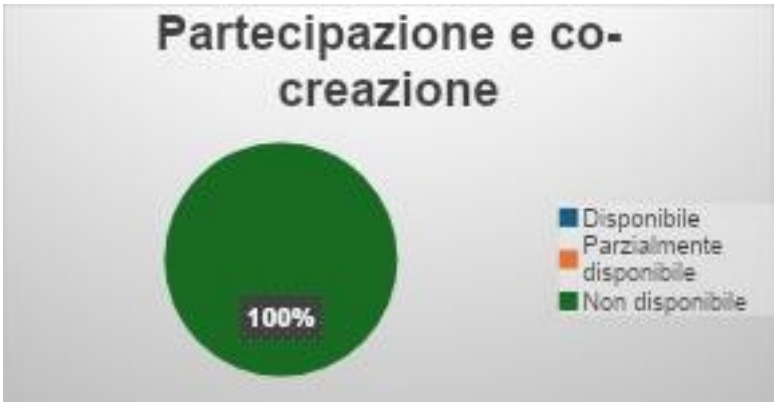


Figura 6. Partecipazione e co-creazione

Nel complesso, i dati restituiscono un panorama digitale caratterizzato da una forte asimmetria tra dimensioni. La presenza digitale di base, testimoniata dalla disponibilità universale di siti web e dalla diffusa adozione di strumenti di marketing digitale, appare consolidata, mentre le dimensioni più strategiche e valoriali della transizione digitale, quali la definizione di strategie esplicite, l'adozione di principi etici e lo sviluppo di forme di partecipazione strutturata, risultano ancora largamente assenti. Questo divario indica che i centri culturali brussellesi si trovano in una fase di digitalizzazione prevalentemente operativa, in cui gli strumenti digitali vengono utilizzati principalmente come canali di comunicazione e promozione, senza che si sia ancora sviluppata una visione strategica integrata della transizione digitale.

5. Conclusioni, limitazioni e sviluppi futuri della ricerca

Il presente contributo si è proposto di analizzare il livello di digitalizzazione dei centri culturali della Regione di Bruxelles-Capitale attraverso un framework interpretativo basato su sei criteri derivati dalla letteratura scientifica sul tema. L'obiettivo non era soltanto descrittivo, ma mirava a comprendere in che misura le pratiche digitali osservabili siano integrate in una visione strategica coerente con la missione culturale, educativa e sociale delle organizzazioni analizzate.

La letteratura esistente aveva già documentato come la trasformazione digitale nel settore culturale si caratterizzi per una profonda asimmetria tra la dimensione operativa e quella strategica, e come ostacoli quali la carenza di competenze specializzate, il sovraccarico lavorativo del personale e la frammentazione istituzionale costituiscano freni strutturali ricorrenti (Salvador C Comunian, 2024; Gustafsson C Lazzaro, 2021; Bujor C Avasilcăi, 2023). I risultati della presente ricerca confermano questo quadro, ma lo arricchiscono di elementi empirici originali che consentono di andare oltre la diagnosi generale.

Il dato più significativo che emerge dall'analisi riguarda la natura sistemica e multifattoriale della digitalizzazione culturale. I centri brussellesi mostrano un profilo complessivamente basso di maturità digitale nelle dimensioni strategiche e valoriali (nessuno dispone di una strategia digitale pubblica documentata, pochissimi di una dichiarazione etica, nessuno ha sviluppato forme strutturate di partecipazione digitale) a fronte di una presenza digitale operativa ormai consolidata, testimoniata dalla disponibilità universale di siti web e da una diffusa adozione di strumenti di marketing digitale. Questo divario non è riconducibile a un unico fattore, ma è il prodotto dell'interazione tra variabili endogene, quali le competenze del personale e la visione strategica, e variabili esogene, quali le policies istituzionali e la disponibilità di fondi dedicati. In particolare, il caso dell'N22, cioè la rete che coordina i 22 centri fiamminghi del campione, fornisce un'evidenza empirica concreta e inedita del ruolo abilitante delle reti istituzionali

strutturate per la digitalizzazione culturale: un elemento che la letteratura aveva teorizzato (Flew et al., 2019) ma che raramente era stato documentato in modo diretto e misurabile a livello di campione.

Sul piano del contributo teorico e pratico, la ricerca suggerisce che la transizione digitale nei centri culturali non possa essere affrontata come un processo puramente tecnico-organizzativo interno, ma richieda un approccio sistemico che tenga conto del contesto istituzionale di appartenenza, delle dinamiche di rete e delle politiche culturali a livello locale e regionale. Questo ha implicazioni dirette per i policy maker e per i finanziatori del settore culturale: investire nella costruzione di reti istituzionali strutturate e nel coordinamento strategico tra organizzazioni può produrre un impatto sulla digitalizzazione culturale più significativo rispetto a interventi frammentati e centrati sul singolo ente.

La ricerca presenta alcune limitazioni che è opportuno dichiarare esplicitamente. L'analisi si basa esclusivamente su fonti secondarie pubblicamente disponibili, con il rischio di sottostimare il livello reale di digitalizzazione di centri che non comunicano pubblicamente le proprie pratiche. Il campione è inoltre circoscritto alla Regione di Bruxelles-Capitale, il che limita la generalizzabilità dei risultati, e la natura dell'approccio adottato non consente di cogliere le motivazioni e le dinamiche interne che sottendono i livelli di digitalizzazione osservati.

Queste limitazioni definiscono al contempo i principali sviluppi futuri. In una seconda fase della ricerca, attualmente in corso di progettazione, si prevede di affiancare all'analisi quantitativa una componente qualitativa basata su interviste semi-strutturate con i responsabili di alcuni dei centri analizzati. I risultati emersi costituiranno inoltre la base empirica per la proposta e la validazione del framework come uno strumento teorico-operativo progettato per accompagnare i centri culturali in percorsi di innovazione digitale adattivi e sostenibili, la cui trasferibilità si intende testare su scala europea attraverso un ampliamento comparativo della ricerca.

Parole chiave: Cultural centres; digital strategy for culture; digital transition; digital development; digital business models

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ALLEGATO 1

Lista dei centri culturali del campione di ricerca.

#	CENTRO CULTURALE	COMUNITÀ DI RIFERIMENTO	LINGUA	STATUS LEGALE
1	Anderlecht (Escale du Nord)	Anderlecht	francese (belga)	ASBL - Association sans but lucratif (Associazione senza scopo di lucro)
2	Berchem (Archipel 19)	Berchem	francese (belga)	ASBL
3	Etterbeek (Le Senghor)	Etterbeek	francese (belga)	ASBL
4	Evere (L'entrela)	Berchem, Sainte-Agathe et Koekelberg	francese (belga)	ASBL
5	Forest, Centre Culturel de Forest	Forest-Brass	francese (belga)	ASBL
6	Ganshoren (La Villa)	Ganshoren	francese (belga)	ASBL
7	Jette (Armillaire)	Jette	francese (belga)	ASBL
8	La Concertation – Action Culturelle bruxelloise	Saint Gilles	francese (belga)	ASBL
9	La Maison de la création – Centre culturel de Bruxelles-Nord	Laeken	francese (belga)	ASBL
10	Saint-Gilles (Le Jacques Franck)	Saint Gilles	francese (belga)	ASBL
11	Schaerbeek (centre culturel de Schaerbeek)	Schaerbeek	francese (belga)	ASBL
12	Woluwe-St-Pierre - Whalll	Woluwe-St.Pierre	francese (belga)	ASBL
13	Watermael-Boitsfort - La Vénerie	Watermael-Boitsfort	francese (belga)	ASBL
14	Woluwe-St-Lambert - Wolubilis	Woluwe-St.Lambert	francese (belga)	ASBL
15	De Kriekelaar	Schaarbeek	fiammingo	ASBL
16	De Kroon	Sint-Agatha-Berchem	fiammingo	ASBL
17	De Linde	Haren	fiammingo	ASBL
18	De Maalbeek	Etterbeek	fiammingo	ASBL
19	De Markten	Brussel	fiammingo	ASBL
20	De Platoo	Koekelberg	fiammingo	ASBL
21	De Rinck	Anderlecht	fiammingo	ASBL
22	De Vaartkapoen	Sint-Jans-Molenbeek	fiammingo	ASBL

23	De Zeyp	Ganshoren	fiammingo	ASBL
24	Den Dam	Oudergem	fiammingo	ASBL
25	Elzenhof	Elsene	fiammingo	ASBL
26	Essegem	Jette	fiammingo	ASBL
27	Everna	Evere	fiammingo	ASBL
28	Het Huys	Ukkel	fiammingo	ASBL

Track 13: STRATEGIE, GOVERNANCE E ACCOUNTING PER LE AZIENDE E I NETWORK TURISTICI: LE SFIDE DELL'AVVENTO DELL'AI E DELLA SOSTENIBILITÀ

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Regulating Tourism in a World Heritage City: Hospitality Businesses' Perceptions

Camilla Ciappei[1], Diletta Vianello[2], Rebecca Miccini[3], Giovanni Liberatore[4]

1. Introduction

Overtourism refers to a situation where visitor numbers exceed a destination's sustainable capacity, leading to deteriorating local environments, strained infrastructure, and diminished quality of life for residents as well as poorer visitor experiences (Mihalič, 2020; Blázquez-Salom et al., 2023). Therefore, overtourism represents an extreme form of unsustainable tourism growth that irritates local stakeholders and undermines the long-term viability of the destination (Mihalič, 2020). This phenomenon has become a pressing concern in many popular urban destinations worldwide – from Barcelona (Paredes-Rodríguez & Spierings, 2020) and Amsterdam (Yuval, 2022) to Venice (Scarpi et al., 2022) – where historic city centers struggle with congestion, noise, and rising housing costs due to tourism. In these contexts, local authorities have intervened to limit the excessive intensity of tourism with various regulatory measures (Tokarchuk et al., 2021), including short-term rental regulations (Bei & Celata, 2023), temporary restrictions on tourism-related activities (Liu et al., 2020), and taxation policies (Yang et al., 2023), with consequences also on the activities of businesses operating in the area. Consequently, our aim is to understand the perception that hospitality firms have about regulations designed to protect heritage and manage visitor pressure.

Florence has been recognized UNESCO World Heritage site since 1982. Florence hosts roughly 9 million overnight tourists in 2023 and 1.5 million day-trippers (Florence daily news, 2024), translating to over 16 million overnight stays per year in a city of only approximately 720,000 residents (The Guardian, 2024), which now generates on the order of 70 million annually for municipal coffers (Eurispes, 2024). These heavy visitors flow has turned Florence into a case of overtourism, which is concentrated in approximately five square kilometers of the medieval center (Liberatore et al., 2023). Residents have voiced complaints about noise and congestion, and many are leaving the historic center, leading to a progressive depopulation of the area (The Guardian, 2024).

In response, Florence's municipal government has enacted a series of regulatory measures aimed at mitigating the impacts of overtourism while safeguarding the city's cultural heritage. These policies include UNESCO-endorsed protection plans and heritage management guidelines, special zoning in the historic core (allowing only conservation-oriented development) (UNESCO, 2021), tourism levies, and licensing limits on tourist accommodations. For example, the city has introduced regulations to preserve the historic character of its city center by limiting new commercial activities that clash with its artisanal identity, restricting visual advertising and the use of public space, enforcing noise and nightlife controls to safeguard residents' quality of life, and it moved in late 2023 to ban new short-term rental permits (e.g. Airbnb) in the UNESCO-designated center (The Guardian, 2024). Additional rules range from group size limits and noise

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regulations (such as banning loudspeaker use by tour guides) to restrictions on devices like rental lockboxes that facilitate unmanaged visitor flows (Florence daily news, 2024). These interventions reflect Florence's strategic stance that uncontrolled tourism must not undermine the city's livability. However, such regulations also put new pressures on the hospitality sector, which must comply and adapt (Liberatore et al., 2023). In the hospitality sector, it manifests through service congestion, diminished guest satisfaction, and reputational risks, thereby justifying city-level measures to redistribute tourist flows and enforce compliance (Papadopoulou et al., 2022; Mihalič, 2020). As regulatory responses to overtourism increase, firms are compelled to adapt operationally to maintain performance while aligning with sustainable destination goals.

The motivation for this study stems from the need to understand hospitality firms' perceptions of, and reactions to, municipal regulation in an over touristed World Heritage context (i.e. Florence) – a perspective that is critical for balancing economic vitality with heritage preservation and resident well-being.

We are collecting the opinion of hospitality firms through a survey addressed to owners and managers of hotels and B&Bs in Florence. Then, we will apply Structural Equation Modeling (SEM) to examine the relationships among the variables derived from the survey.

This study provides a contribution by focusing on the oft-overlooked businesses perspective in the context of overtourism management in a World Heritage city (Hagemans et al., 2024; Plichta, 2019). While prior research on overtourism has largely emphasized tourist experiences or resident attitudes, few empirical studies have examined how local hospitality firms perceive and react to government regulations designed to protect heritage and manage visitor pressure (Hagemans et al., 2024).

2. Theoretical framework

Given Florence's dependence on tourism, it is strategically important to evaluate how local businesses are responding to municipal policy measures. Understanding hospitality firms' perceptions and responses to regulation requires a theoretical foundation that acknowledges their position as both contributors to and subjects of tourism development. Stakeholder theory provides a conceptual starting point for exploring how tourism enterprises perceive their role in governance processes (Al Mahrizi et al., 2024). Tourism stakeholders are those involved with tourism activities, and they may be positively or negatively influenced by those activities (Pham et al., 2025; Sheehan & Ritchie, 2005). Accordingly, they may have different perceptions and reactions to policy measures that address tourism levels and activities. They may perceive regulations as detached from local realities or may show policy acceptance when the aim of the regulations reflects their concerns on heritage protection and destination's sustainability. According to this reflection, sustainable development theory suggest that tourism actors, including businesses, evaluate regulations not only in economic terms but also based on how they affect destination integrity and long-term viability (Tops & Lamers, 2024). Literature on heritage site protection (Aas et al., 2005) and tourism's alignment with sustainable development goals (UNWTO, 2018) suggests that when firms perceive municipal regulation as supporting destination—rather than constraining business—they are more likely to view such measures positively. Conversely, the exclusion of stakeholders from decision-making can generate mistrust, weaken legitimacy, and intensify resistance (Tops & Lamers, 2024).

These theories help explain hospitality firms' attitude toward regulatory measures in contexts that suffer from overtourism, depending on whether they feel aligned with the goals of sustainable development or limited by regulatory provisions. However, prior literature highlight a lack of studies focused on these topics (Khazaei et al., 2015).

This study aims to fill this gap investigating how hospitality businesses in Florence perceive the impacts of local government interventions aimed at managing tourism. The purpose is to clarify the business-side perspective on whether and how current municipal regulations affect

their competitiveness, innovation capacity, and commitment to sustainable practices. We focus on hotels and B&Bs as key stakeholders, with the aim of answering the following research question:

Do hoteliers and guesthouse operators view heritage-protection rules, tourism taxes, and operational restrictions as stifling constraints, or as catalysts for positive change?

By analyzing perceptions of regulatory pressure, we seek to determine the perceived influence of these interventions on business performance and adaptability.

3. Research design

The research employs a quantitative survey design. We developed a structured questionnaire consisting of 28 Likert-scale items to capture hospitality managers' attitudes and evaluations across several dimensions. All items were measured on a seven-point Likert scale, ranging from 1 ("strongly disagree") to 7 "strongly agree.' Survey constructs include: (1) Perceptions of municipal regulation (e.g. perceived stringency, fairness, and effectiveness of local tourism rules and enforcement) adapted from Lopez-Gamero et al., 2011 and Kasim & Ismail, 2012; (2) Cultural heritage protection priorities (the business's awareness of and support for protecting Florence's historic identity) adapted from Cantele & Cassia, 2020; (3) Business adaptability and innovation (actions taken to adjust business models, services or technologies in response to regulatory and market changes) adapted from Sobaih et al., 2021; and (4) Perceived business performance/competitiveness (self-reported indicators of how the business is faring in terms of occupancy, revenue, guest satisfaction, and long-term viability under the current policy environment) adapted from Akter et al., 2020 and Cantele & Cassia, 2020. The questionnaire was targeted to owners and managers of hotels and B&Bs in Florence. Data collection is being conducted through industry associations and online distribution, aiming for a robust sample of the local hospitality sector. For analysis, the study will apply Structural Equation Modeling (SEM) to examine the relationships among the latent constructs derived from the survey. SEM is chosen due to its strength in simultaneously estimating multiple hypothesized relationships and handling latent (unobserved) variables measured by our Likert-scale items. The following figure illustrates the hypothesized research model:

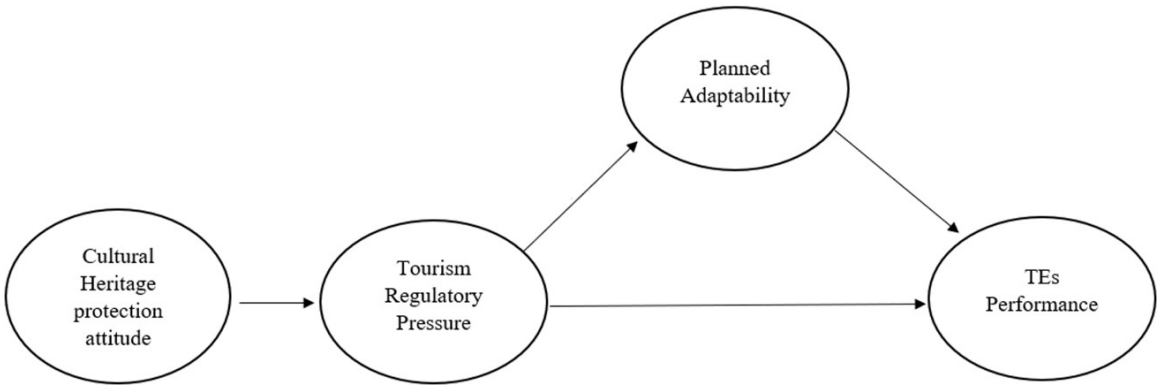


Figure 1. Research model

4. Expected results and contribution

We expect the results to show that a strong cultural heritage protection attitude positively influences the perception of tourism regulatory pressure, aligning with Cantele & Cassia (2020) and Lopez-Gamero et al. (2011), who find that environmental values heighten responsiveness to requirements, rules, or pressures imposed on a business from outside the organization—typically

by government authorities, regulatory bodies, or institutions. Regulatory pressure is expected to enhance both planned adaptability and tourism enterprises (TEs) performance, as firms often respond to external demands with structured, performance-enhancing strategies (Sobaih et al., 2021; Akter et al., 2020). Planned adaptability itself is predicted to improve TEs performance, consistent with findings that adaptive practices support competitiveness and stakeholder satisfaction (Cantele & Cassia, 2020). The findings of this research could offer valuable practical guidance for both policymakers and business operators in urban heritage destinations. For local government and destination managers, understanding the hospitality sector's perceptions will help in designing more balanced and effective tourism policies (Yuval, 2022; Boom et al., 2021). In line with Litvin (2024), the expected results suggest that stakeholders' perceptions should be considered by local government and that, in line with the stakeholder theory, tourism stakeholder should play a more active role in local government (McKercher, 2022). The practical outcome is to support a more collaborative approach in which municipal authorities and businesses work in tandem: policies are crafted with an awareness of industry realities, and businesses adjust their strategies to align with the city's long-term vision for sustainable tourism (Yuval, 2022). Effective destination management "done well…protects a place and the businesses that rely on the travel industry" whereas neglecting these issues can erode both the city's heritage and its tourism economy (WEF, 2024).

Keywords: Tourism regulation; firm performance; stakeholder participation; adaptability; heritage destinations; overtourism

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An intriguing new location for hospitality: The "lighthouse accommodation"

Marco Contri[1], Silvia Fissi[2], Elena Gori[3], Alberto Romolini[4]

1. Introduction

Most buildings have a finite lifespan, after which they experience various types of obsolescence—physical, economic, functional, technological, social, and/or legal—leading to their abandonment, demolition, or revitalization. Unfortunately, the economic crisis has exacerbated this phenomenon, revealing how traditional planning policies are no longer adequate (Lami, 2020). The debate over whether to demolish or revitalize unused and abandoned buildings that have lost their primary function has long been controversial among the public and government officials. This issue is particularly critical for historic buildings, which can be defined as cultural heritage assets with significant historic value; indeed, many of these structures lie in a state of abandonment or underuse, often due to high maintenance costs, economic constraints, or changing urban priorities (Fusco Girard and Gravagnuolo, 2025).

One effective practice for revitalizing and preserving valuable historic buildings is adaptive reuse (AR), which involves repurposing a building for a use other than its original function (Vafaie et al., 2023). This practice is not new; throughout history, people have often changed the uses of buildings when they became inappropriate for the purposes for which they were built (Lee, 2015). Several studies agree that the AR of historic buildings can offer significant economic, environmental, and social benefits, contributing notably to the urban circular economy (Fusco Girard and Gravagnuolo, 2025). Saleh and Ost (2023, p. 41) stated that "AR of cultural heritage is considered today as key in the implementation of sustainable development in the urban context." Moreover, the public sector, traditionally responsible for cultural heritage preservation and valorization, is increasingly implementing AR projects on historic buildings through public-private partnerships (PPPs). In this respect, research has shown that shared governance models involving broad public and private stakeholder engagement foster sustainable urban regeneration (Fusco Girard and Gravagnuolo, 2025). Additionally, reusing historic buildings may boost local tourism and thus has become increasingly popular in many tourist destinations worldwide, where obsolete or underused historic structures and sites are being converted into restaurants, cafés, hotels, shops, museums, and more (Vardopoulos et al., 2023).

AR of historic buildings has attracted the attention of scholars across disciplines, including historians, engineers, architects, interior designers, and urban planners (Plevoets and Van Cleempoel, 2019). Conversely, few studies address the managerial challenges of converting such buildings, and, in particular, none has thoroughly investigated the AR of lighthouses—a specific type of historic property that has often lost its original function and been repurposed for tourist accommodation, which Opačić et al. (2010) called "lighthouse accommodation." Indeed,

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lighthouses can benefit from AR projects that transform them into a new tourism product segment with attraction power and economic value (Azevedo, 2018; Chylińska, 2021; Magnani and Pistocchi, 2017). To provide an overview of the sector's potential growth, it is worth examining the number of active and inactive lighthouses worldwide: over 3,000 in Japan, more than 1,600 in Greece, approximately 700 in the United States and Canada, about 250 in the United Kingdom, and around 150 in Italy. With this in mind, this paper aims to fill the knowledge gap regarding AR projects on lighthouses and to explore the tourism potential of lighthouse accommodation in the contemporary hospitality industry, shedding light on potential markets for this new hospitality type and outlining a rich research agenda.

2. The adaptive reuse of historic buildings: benefits and critical factors

The concept of "adaptive reuse" combines the ideas of "adaptation" and "reuse" and refers to the process of changing the original purpose of an existing building to accommodate new and more suitable functions while preserving its original features and structure. This practice can be an effective strategy for regenerating obsolete or underutilized historic buildings, leading to economic, environmental, and social benefits and thus significantly contributing to the urban circular economy (Fusco Girard and Gravagnuolo, 2025; Vafaie et al., 2023).

From an economic standpoint, repurposing existing buildings is often faster and less costly than demolition and reconstruction. Indeed, revitalizing a given floor area through AR typically takes about half the time required to demolish and rebuild it from scratch. Moreover, the reuse of existing structural components significantly reduces the need for new materials, while the shorter contract periods typical of AR projects further contribute to cost savings. In this regard, Vafaie et al. (2023) noted that AR projects can generate savings of approximately 10-12% compared to new construction. Beyond direct cost advantages, AR of historic buildings can support neighborhoods' economic revitalization through urban regeneration. This contributes to creating an appealing environment that attracts, on the one hand, higher-income residents and, on the other, tourists drawn by enhanced streetscapes and cultural appeal. This increased attractiveness stimulates local economies by generating tourism revenues, supporting local businesses, and creating employment opportunities for the local workforce. The AR of historic buildings also offers the opportunity to preserve and valorize cultural heritage, often through PPPs. Indeed, cultural heritage is typically considered a "common good" and thus is traditionally funded by the public sector. However, in recent decades, increasing pressure on public budgets has reduced investment in the cultural sector (OECD, 2022). In response, public institutions increasingly leverage AR projects through PPPs, using private capital—partially or fully—to support the conservation and reuse of historic buildings.

From an environmental perspective, the building sector has a major impact on ecosystems—in this regard, the European Commission has recently emphasized that this sector is responsible for more than 35% of the EU's total waste generation[5]. On a global scale, the United Nations and the Yale Center for Ecosystems + Architecture recognize the building sector as "the largest contributor to climate change," underscoring the urgency of transitioning towards more sustainable practices[6]. In this context, several studies support the environmental benefits of AR; indeed, compared to demolition and new construction, repurposing historic buildings significantly reduces energy demand, greenhouse gas emissions, fossil fuel consumption, water use, and the

[5] https://single-market-economy.ec.europa.eu/industry/sustainability/buildings-and-construction_en (accessed 3 July 2024).

[6] https://wedocs.unep.org/20.500.11822/43293 (accessed 9 July 2025).

need for new raw materials. Furthermore, AR can enhance seismic resilience, limit urban sprawl, and thus preserve the existing ecosystem and local biodiversity.

Finally, regarding sociocultural impacts, Vafaie et al. (2023) note that preserving and repurposing heritage buildings strengthens the connection between local communities and their cultural roots, fostering shared identity and social cohesion. Indeed, these buildings are defined not only by their physical characteristics but also by the intangible associations they hold, such as cultural narratives, community identity, and historical context. Their AR can enhance residents' sense of belonging, particularly when local communities are actively involved in planning and implementation processes. Moreover, AR helps maintain attractive urban landscapes and supports successful regeneration strategies. This revitalization can improve residents' quality of life by enabling sociocultural activities (facilitated by these renewed spaces) and increasing safety, as enhanced urban environments are often associated with reduced crime and vandalism.

Despite these benefits, AR projects also involve significant challenges (Vafaie et al., 2023). First, several regulatory challenges, along with related functional and technical issues, must be addressed. Indeed, historic buildings often do not comply with current regulatory standards for fire protection, indoor air quality, thermal insulation, emergency escape routes, seismic protection, and accessibility for individuals with disabilities, necessitating structural upgrades. In addition, AR projects must align with urban planning regulations, zoning laws, and, where applicable, strict heritage protection requirements. In such cases, it is essential to maintain a harmonious balance between the building's original character and any new additions, which should be clearly identifiable and reversible for future adaptations. Consequently, the AR of historic buildings requires a careful balance between new functionality and the preservation of architectural integrity, historical authenticity, and cultural identity. In this regard, collaborative decision-making processes are crucial in achieving this balance, as they allow the integration of multiple stakeholder perspectives. As highlighted by Fiorani et al. (2017), effective participation should involve authorities, experts, and local communities. However, these constraints often lead to higher renovation costs and longer project timelines.

Another critical issue concerns the return on investment, particularly for highly deteriorated buildings. Such conditions may discourage private investors, especially in PPP contexts, where the private sector may favor projects with higher expected returns. As a result, less profitable but culturally valuable assets may remain under public responsibility. In addition to financial risks, private actors face regulatory and administrative uncertainties, including delays in permit approvals and the complexity of navigating multilevel governance systems. Moreover, adapted buildings typically require more intensive, ongoing maintenance than new construction, thereby increasing long-term operating costs. To mitigate these risks, public authorities should strengthen regulatory clarity and provide incentives through well-designed policies that facilitate implementation and reduce bureaucratic barriers.

Finally, the success of AR projects is strongly influenced by location and surrounding context. Accessibility, proximity to infrastructure and services, availability of transport and parking, and the overall quality of the neighborhood all affect the attractiveness of reused buildings and their economic performance.

3. Adaptive reuse of historic buildings for tourism

Tourists are often drawn to the combination of heritage, architectural character, and service offerings, as well as to the narratives associated with repurposed historic buildings. These elements contribute to memorable and evocative experiences, positively influencing visitors' willingness to stay in such places (Lee, 2015). As a result, a wide range of historic buildings worldwide have been adapted for tourism purposes, including religious structures, castles and fortresses, industrial sites, rural heritage, and coastal buildings (Fusco Girard and Gravagnuolo, 2025).

Religious structures are among the most frequently repurposed, largely due to their growing vacancy caused by declining congregations, changing societal values, and shifts in urban development patterns. Cultural uses are generally considered the most compatible with churches, leading to conversion into theaters or museums. Examples include the Church of Preachers in Neuveville (Switzerland) and the Church of San Francesco in Bolsena (Italy), both transformed into theaters, as well as the Ex Teresa Arte Actual in Mexico City, now an exhibition space. However, as Fiorani et al. (2017) noted, many churches have also been converted for commercial uses. Several of them have been converted into restaurants, pubs, or nightlife venues, such as the former Church of St. John the Baptist in Pittsburgh, now a brewery, and the Church of the Holy Communion in New York, which has been transformed into a nightclub. Similar examples can be found in Europe, including St. Mary's Church in Dublin (restaurant) and former churches in Milan and Montpellier (nightclubs). While conversions into hotels are less common, the reuse of convents and monasteries for hospitality purposes is more widespread, as demonstrated by projects such as the Kruisherenhotel in Maastricht and the Augustine Monastery in Prague, both of which are now luxury hotels.

Castles and fortresses represent another important category of heritage assets repurposed for tourism. Their monumental character, historical significance, and often scenic and less urbanized locations enhance their attractiveness (Péterfi, 2020). Some of them have been transformed into luxury hotels, such as the Château de Bagnols in France and Neemrana Fort-Palace in India, while others have been adapted for cultural use, including Gjirokastër Castle in Albania and Fort de Loncin in Belgium, both of which function as museums. In some cases, multiple functions are integrated within the same site. For instance, Ehrenbreitstein Fortress in Germany hosts exhibitions, cultural events, and a youth hostel, while CastelBrando in Italy combines accommodation, a museum, and conference facilities.

Emblematic examples of institutionalized and strategic AR projects on the aforementioned types of buildings can be found in the Iberian Peninsula, through the longstanding experience of "Paradores" in Spain and "Pousadas" in Portugal. Paradores de Turismo de España, established in 1928, is a state-owned chain of 99 high-end hotels located in historically significant public buildings (mostly monasteries and castles) that are often situated in protected or less conventional tourist areas. Similarly, the Portuguese Pousadas network, founded in 1941 and later partially privatized, operates luxury hotels in historic properties such as convents, castles, and palaces, demonstrating the long-term viability of structured AR strategies.

A third category of sites that are often the objects of AR projects comprises industrial buildings such as old factories, mills, warehouses, and stores. Indeed, the transition to a postindustrial economy has led to the abandonment of numerous factories, warehouses, and production facilities (Fiorani et al., 2017). AR projects focused on former industrial areas, whose success depends on their integration into the city and their ability to generate cultural, economic, and social benefits, can be important for documenting a critical historical period. Some of these old industrial buildings have been converted into museums, such as the Tate Modern in London. Others have been adapted into hotels or leisure venues, including the Factory Hotel in Münster (Germany) and the Distillery Inn in Colorado (USA), or into bars or pubs, like the Fábrica de Hielo in Valencia. Some projects adopt a multifunctional approach, as illustrated by the Lingotto complex in Turin, a former Fiat factory now hosting commercial, cultural, and leisure activities.

Other types of buildings used in AR tourism projects include farmhouses, barns, granaries, and other agricultural structures commonly found in rural areas. In response to an increasing demand for alternative, experience-based holidays, rural destinations are attracting more attention, and when properly restored and repurposed, their historic buildings can become distinctive assets for rural tourism (Kurnaz and Anıktar, 2024). A notable example is the "Trulli" of Alberobello (Apulia, Italy), which were originally temporary field shelters and warehouses or permanent dwellings for small-scale landowners and agricultural laborers and were later converted into hotels, restaurants, souvenir shops, and cultural venues. Similarly, in the Catalonia

region of Spain, traditional rural estates known as "Masias" have undergone AR to host boutique hotels and wineries, while disused agro-industrial sites have been converted into museums and art centers.

Finally, lighthouses and coastal buildings have emerged as particularly distinctive subjects for AR projects in tourism. Originally built for navigation and coastal defense, many have lost their original function due to technological advancements (Fusco Girard and Gravagnuolo, 2025). Rather than being abandoned or demolished, these structures—often located in highly scenic, remote settings—are increasingly being transformed into museums, hotels, and restaurants. Notable examples include the Capo Spartivento Lighthouse in Sardinia (Italy), converted into a luxury resort, the Belle Tout Lighthouse in the United Kingdom, now a bed and breakfast, and several Croatian lighthouses adapted into tourist apartments. In the United States, the Saugerties Lighthouse in New York operates as both a living museum and a bed-and-breakfast. These cases highlight how AR can revitalize coastal heritage, offering unique tourist experiences while preserving cultural heritage.

4. Discussion and conclusions

AR represents an approach to revitalizing lighthouses by transforming them into a unique form of accommodation within the hospitality industry. However, to date, scholars have not dedicated particular attention to this topic, which merits examination from both theoretical and managerial perspectives.

4.1. Practical implications: Lighthouses as accommodation for multiple tourism markets

Over the last few decades, an increasing number of lighthouses have been repurposed for tourist accommodation, offering a fascinating new location for hospitality, which Opačić et al. (2010) called "lighthouse accommodation." If lighthouse tourism is recognized in academia as a special form of tourism, in many countries it has not yet been systematically embedded in the tourism offer. Lighthouse accommodation would be ideal for contributing to the differentiation of the tourist offer, expanding the tourist season, and enhancing the attractiveness of the destination throughout the year, while also opening up new employment opportunities for local people (Šerić et al., 2023). In sum, lighthouse accommodation enables the development of new tourism offerings across different activity sectors. From a managerial perspective, it is therefore essential to understand the potential market positioning of this emerging form of accommodation, and for this reason, the following sections will analyze the possible target markets for this type of tourism initiative.

Escape Tourism

In today's increasingly stressful lifestyles, many individuals feel the urge to outrun everyday pressures, such as domestic responsibilities, professional obligations, or broader social constraints. In this respect, a report on the state of tourism and hospitality published by McKinsey & Company has recently pointed out that, nowadays, travelers, particularly from Europe and North America, are eager to "escape their daily routines" and place significant importance on "getting away from it all[7]."

In this context, lighthouses can be seen as providing ideal accommodation for what is known as "escape tourism," which is primarily driven by the desire to disconnect from everyday life and

[7] https://www.mckinsey.com/industries/travel/our-insights/the-state-of-tourism-and-hospitality-2024 (accessed 16 July 2025).

enjoy a peaceful and isolated environment that allows for a temporary change of lifestyle (Chylińska, 2021). Indeed, lighthouses are typically located in remote and scarcely urbanized areas, thus promising isolation, peace, and connection with unspoiled nature. As van Wee and Mokhtarian (2023) noted, while accessibility is generally considered a positive attribute in tourism, the opposite holds for escapist experiences, where tourists value low accessibility between the place they want to escape from and the location they want to escape to. Moreover, the isolation that typically characterizes the location of lighthouses is often accompanied by the absence of, or severely limited access to, information and communication technologies, which enhances tourists' perception of being "away from home" and experiencing a "true escape" (Zhang and Zhang, 2022). Consequently, lighthouses can attract tourists seeking to escape their daily lives and engage in relaxing and detoxifying experiences (Mylonopoulos et al., 2022), while "playing" the role of the lighthouse keeper (Azevedo, 2018). In particular, Opačić et al. (2010) point out that lighthouses may serve as ideal refuges for overstressed individuals who often have higher levels of education, financial capacity, and ecological sensitivity, providing them with opportunities for psychophysical restoration.

However, as Frochot and Lenglet (2023) emphasize, "escapism" in tourism is not only driven by the desire to escape the routine of daily life, as it can also arise from a deeper and more introspective motivation: the desire to temporarily disconnect in order to reconnect with oneself. In this regard, many tourists are increasingly seeking "silent travels," namely journeys to destinations away from crowded tourist hotspots, in locations that offer untouched landscapes, tranquility, and genuine silence, to disconnect from the noise of urban life, reconnect with nature, and find opportunities for meditation[8]. Travel becomes an opportunity to reflect and return to everyday life with renewed mental energy. Viewed from this perspective, lighthouses provide ideal accommodation for such conscious escapes. Their physical remoteness, symbolic solitude, and historical association with reflection and introspection offer an evocative atmosphere for tourists seeking a place where time slows down (Chylińska, 2021). Moreover, lighthouses may even become a source of inspiration for writers and artists (Mylonopoulos et al., 2022).

When located in isolated and largely uninhabited open-sea islands, lighthouses can also be ideal destinations for enthusiasts of "Robinson tourism," an extreme form of escape tourism that attracts tourists seeking solitude and the unbridled beauty of the open sea. These tourists enjoy activities such as swimming, fishing, and/or diving to explore the undersea world, valuing these experiences more than the quality of their accommodation (Opačić et al., 2010).

Heritage Tourism

Heritage tourism is a form of cultural tourism in which the primary motivation for visitors is to experience places, artifacts, and activities in a given location that are believed to be authentic representations of people and stories from the past. This sector has emerged as one of the fastest-growing segments of the global tourism industry[9], as increasing numbers of travelers seek meaningful experiences that combine cultural engagement, education, entertainment, and a strong sense of authenticity (Lee, 2015). The growing interest in heritage tourism has also led to a rising demand for heritage-based tourist accommodation (Vardopoulos et al., 2023). Indeed, travelers are increasingly opting for accommodation that offers unique stories and a distinctive character. Known as "heritage hotels," this kind of accommodation reflects or recreates its original

[8] https://www.forbes.com/sites/angelinavillaclarke/2024/11/26/travel-trends-report-2025-silent-travel (accessed 16 July 2025).

[9] https://kpmg.com/in/en/home/insights/2024/07/heritage-tourism-as-a-tool-for-sustainable-tourism-preservation-for-development.html (accessed 25 September 2024).

appearances and provides deep insights into local traditions and culture, allowing guests to experience and understand the history and culture of a particular region (Park et al., 2025).

In this context, lighthouses represent particularly compelling heritage assets for AR, serving as accommodation facilities that embody both tangible and intangible cultural values.

The tangible dimension refers to the physical components of the lighthouse itself—its tower, the keeper's house, and ancillary infrastructure—typically situated in remote, often dramatic coastal landscapes that enhance their scenic, iconic, and photogenic appeal. These elements not only bear architectural and historical significance but may also evoke a sense of authenticity and uniqueness that heritage tourists actively seek. Because of this, in the heritage hospitality sector, preserving the physical integrity of the original site is crucial. Indeed, guests tend to evaluate the quality of their heritage experience based on the perceived authenticity of the environment, which is closely linked to the presence of traditional architectural features, historically resonant interiors, and a coherent historical atmosphere (Park et al., 2025).

The intangible heritage associated with lighthouses is equally significant, as it encompasses maritime traditions, the legacy of lighthouse keepers, and the symbolic meanings attached to lighthouses as beacons of safety, solitude, and human resilience against natural forces. Their integration into coastal landscapes and local narratives reinforces a sense of continuity with the past and contributes to the creation and preservation of territorial identities (Magnani and Pistocchi, 2017). As Azevedo (2018) noted, lighthouses act as "identity maker[s]," shaping place-based narratives and individual memories. Notable examples, such as the ancient Lighthouse of Alexandria (Egypt), the Maiden's Tower in Istanbul (Turkey), and Robbins Reef Lighthouse in New Jersey (USA), illustrate how lighthouses can serve as cultural and symbolic reference points within their respective regions. As a result, tourists are attracted not only by the architectural uniqueness or panoramic views but also by the chance to inhabit spaces that embody seafaring myths, solitude, heroism, and community resilience.

The combination of these tangible and intangible elements makes lighthouses particularly evocative sites, capable of offering immersive and memorable experiences (Lee, 2015). Lighthouses act as powerful mediators between past and present, making them especially suitable for AR projects aimed at promoting heritage tourism.

Dark Tourism

Lighthouses hold several symbolic meanings and emotional resonances, which help explain their longstanding presence in art, literature, and cinema (Azevedo, 2018; Chylińska, 2021). Historically, they marked the limes (i.e., boundaries) of the known world, symbolizing the end of one land (finis terrae) and the beginning of a new one (initium terrae) simultaneously. This inherent duality, often enhanced by myths and legends, has inspired travelers to explore, discover, and overcome these limits (Magnani and Pistocchi, 2017). Consequently, lighthouses evoke a romantic past, filled with images of sailing vessels, maritime isolation, and endless sea journeys, which may attract tourists through a sense of nostalgia (Lee, 2015). Moreover, lighthouses are part of an "extraordinary non-daily life" (Chylińska, 2021), making them particularly suitable for experience-based tourism, including overnight stays in former keepers' quarters repurposed as accommodation.

However, lighthouses do not always evoke positive feelings. Indeed, their geographical isolation and exposure to violent weather conditions also associate them with stories of shipwrecks, drownings, and maritime tragedies. A notable example is the infamous "Coast of Death" in Galicia, Spain, where a stretch of coastline known as "The Way of Lighthouses" is named after the many lighthouses built along its cliffs to help ships avoid wrecks in an area renowned not only for its natural beauty but also for its extreme maritime danger. Moreover, several lighthouses are associated with disquieting disappearances and unsolved mysteries. The Flannan Isles Lighthouse in Scotland is one of the most enigmatic: In 1900, all three lighthouse

keepers vanished without explanation, leaving behind a fully functional light station and no signs of struggle. Across the Atlantic, the St. Augustine Lighthouse in Florida, USA, is reputed to be one of the most haunted lighthouses in the country. Numerous visitors and staff have reported sightings of ghostly figures, particularly those of two young girls who are believed to have drowned during the construction of the lighthouse in the 19th century. Accordingly, lighthouses also have a "darker" dimension (Azevedo, 2018; Mylonopoulos et al., 2022).

Dark tourism is an umbrella term that indicates any tourism historically or symbolically "related to death, suffering, atrocity, tragedy or crime" (Light, 2017, p. 277). To analyze the various facets of dark tourism, researchers have proposed a number of classifications. One influential categorization is Stone's (2006) "darker-lighter" tourism paradigm, which posits that sites of death and suffering are darker than those merely associated with death and suffering. At the darkest sites, the primary focus is on education and remembrance, with visitor services being a lower priority; in contrast, the lightest sites are more like tourist attractions, making them more commercial and often incorporating elements of entertainment.

In this second, Azevedo (2018) states that lighthouses can be classified as a "lighter dark tourism product" and appeal mainly to niche segments of tourists, such as "recreational storm chasers" (Xu et al., 2012), i.e., travelers who actively seek out extreme weather experiences for leisure and excitement. When reimagined as accommodation, lighthouses can thus offer these tourists not just a place to sleep but a deeply immersive spatial and emotional experience. This symbolic weight can satisfy a variety of dark tourism motivations, from morbid curiosity and a desire for reflective contemplation to thrill-seeking and an interest in confronting mortality within controlled environments. These experiences mirror the aesthetic and psychological appeal found in "lighter" forms of dark tourism, where the encounter with death or danger is suggestive rather than explicit (Azevedo, 2018).

4.2. Theoretical implications and avenues for future research

To date, lighthouse accommodation has been primarily investigated within the fields of engineering and architecture, receiving limited attention from management and tourism studies. However, AR projects on lighthouses for tourism purposes offer promising avenues for future research.

A first key area of inquiry concerns the identification and analysis of the most appropriate business model for lighthouse accommodation, including core elements such as the underlying business idea, innovation processes, and mechanisms of value creation. Theoretical contributions in this area could provide valuable insights for entrepreneurs and managers operating in, or intending to enter, this niche sector.

Sustainability is another crucial lens through which lighthouse accommodation can be examined. Relevant research areas include sustainable tourism, cultural sustainability (Zhang et al., 2025), and the circular economy, all of which can be applied meaningfully in this innovative hospitality model. Indeed, lighthouse accommodation can serve as a catalyst for the development of marginal coastal areas and small rural villages, which are typically excluded from mainstream national and international tourism circuits. In this sense, it could also contribute to heritage-led, community-oriented tourism development.

Another fruitful avenue for research is entrepreneurship. Lighthouse accommodation projects typically involve the AR of existing structures and the launch of entrepreneurial ventures with strong territorial embeddedness. Relevant research topics in this domain include financial planning and investment strategies, defining business models, designing proper organizational structures, and developing sustainability-oriented approaches to managing heritage buildings.

Moreover, lighthouse accommodation initiatives could be studied for their potential contribution to the preservation and valorization of public heritage assets, particularly through PPPs involving collaboration between entrepreneurs and public institutions. Given the increasing

constraints on public budgets, PPPs may represent an effective approach for rehabilitating and managing coastal public properties.

Additional managerial research areas include the development of effective and targeted marketing strategies, primarily through social media and online platforms, to position lighthouse tourism in an increasingly competitive tourism market. The unique identity and symbolic capital of each lighthouse can serve as the starting point for compelling narratives, thereby enhancing visibility and differentiation (Šerić et al., 2023).

Finally, management control and performance measurement systems represent an additional area of interest. Lighthouse accommodation initiatives would benefit from tailored tools for monitoring operational efficiency, financial sustainability, and broader social and environmental impacts. In this regard, identifying appropriate key performance indicators (KPIs) is crucial for evaluating and improving the effectiveness of such projects.

Building on these perspectives, future research could be guided by the following key questions:

- What business model underpins the lighthouse accommodation concept?
- What are the key features of lighthouse accommodation that generate value for tourists?
- In what ways does the lighthouse accommodation model contribute to innovation in tourism and hospitality?
- What sustainability strategies are currently being implemented or could be implemented within lighthouse accommodation projects?
- How can lighthouse accommodation contribute to the development of local tourism ecosystems?
- What are the core components of these entrepreneurial initiatives?
- What role can lighthouse accommodation play in the regeneration of coastal public heritage assets through PPPs?
- What marketing strategies can effectively support the positioning of lighthouse accommodation in the tourism market?
- Which management control tools are most suitable for improving cost-efficiency?
- Which KPIs should be used to assess the performance and sustainability of lighthouse hospitality ventures?

The managerial and theoretical implications outlined thus far are summarized in Figure 1.

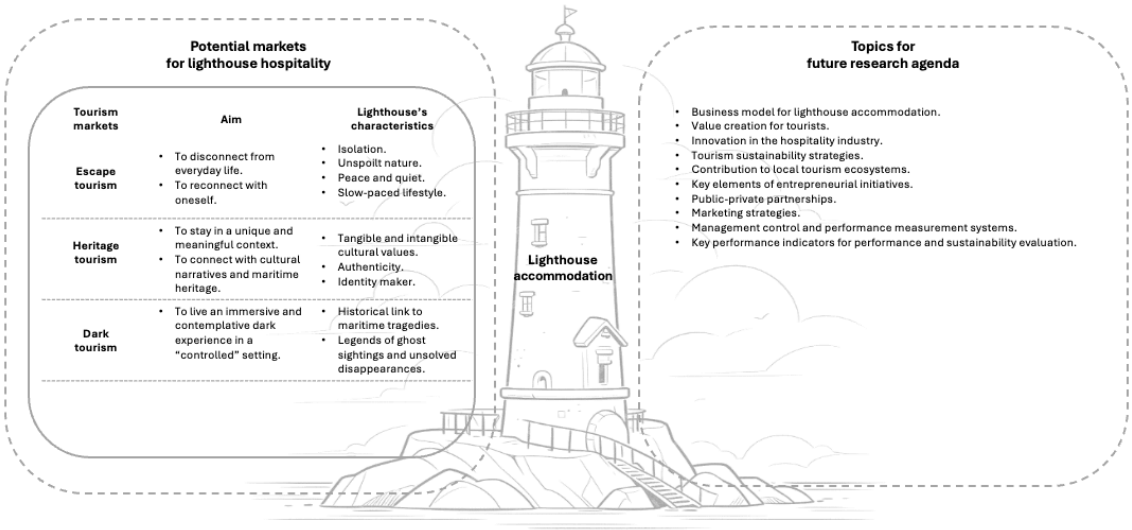


Figure 1. Lighthouse accommodation

Keywords: Lighthouse; hospitality; adaptive reuse; escape tourism; heritage tourism; dark tourism

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Prospector vs. Analyzer in Tourism SMEs: How Strategic Orientation Drives Green Innovation Performance?

Ludovica Antenozio[1]

1. Introduction

The increasing pressure toward sustainable development and environmental responsibility is reshaping the competitive landscape of the tourism industry. In particular, small and medium-sized enterprises (SMEs), which represent the backbone of the business economics in Europe (Katsinis et al., 2024) are increasingly called to align their strategic orientation with sustainability principles to remain competitive and resilient (Kim et al., 2024). Sustainability is no longer a reputational or ethical option, but a strategic imperative (Khan et al., 2023) that requires firms to rethink how they configure their resources, innovate their process, and create value in balance with environmental and social objectives (Wang et al., 2024).

Tourism SMEs play a crucial role in regional economies, employment, and destination development, but their innovation patterns differ substantially from those of large firms and manufacturing SMEs (Martínez-Román et al., 2015). Their innovation activities tend to be less formalised, more experiential, and deeply dependent on local networks, cooperation, and customer interaction (Martínez-Román et al., 2015; Nguyen et al., 2021). Proximity to consumers, combined with their flexibility and adaptability (Ahmed et al., 2022; Kahveci, 2023), make them particularly suited to implement sustainability oriented practices, even under resource constraints (Le & Govindan, 2024; Pronti et al., 2023). As Martínez-Román et al. (Martínez-Román et al., 2015) underline, the innovative behaviour of tourism SMEs is shaped by both internal factors (knowledge, organisational structure, human capital) and contextual factors (cooperation, funding, and institutional environment). Embedded in destination-based networks (Kallmuenzer et al., 2021), they often rely on relational resources rather than formal R&D, making learning-by-doing, partnerships, and cross-sectoral collaborations fundamental to their competitiveness (Kahveci, 2023; Muskat et al., 2021; Tajeddini et al., 2023).

Whitin this context, strategic orientation emerges as a key determinant of how tourism SMEs approach innovation and sustainability. According to Miles and Snow (1978), firms develop consistent strategic patterns to respond to environmental changes and to align internal processes with external demands. These patterns, known as strategic orientations, reflect different configurations of organizational behaviour and strategic posture (Aragón-Sánchez & Sánchez-Marín, 2005; Kim et al., 2024) and is seen as ‘‘the overall strategic direction of the company and the need to design new initiatives’’ (Okumus, 2001, p. 328). Specifically, in recent literature three dominant strategic orientations are identified: (i) prospector-oriented firms characterised by proactive and innovative posture. They continually seek new market opportunities, experiment with products and service and prioritise innovation over efficiency; (ii) analyzer-oriented firms represent a hybrid type, combining the stability of defenders with the adaptability of prospectors. They balance exploration and exploitation, adopting new practices once they have been tested by others; (iii) defender-oriented firms focusing on the maintenance of operational efficiency and the protection of a stable market niche. Their priorities lie in cost control, reliability, and incremental innovation. This typology of business strategy is also validate in tourism firms where firms follow

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one of the three strategic orientations to achieve firm performance (Avci et al., 2011; Khan et al., 2023). Specifically, in tourism context, prospector are typically those SMEs that anticipate sustainability trends, develop eco-friendly services, and adopt green certifications to differentiate themselves in competitive markets (Khan et al., 2023). Moreover, analyser strategies for tourism SMEs may translate into adopting green innovation selectively, implementing eco-efficient process and sustainable marketing practices once their economic benefits are proven. Finally, defenders in tourism sector, often comply with environmental regulations and adopt basic eco-efficiency measures but are less inclined to engage in more transformative green innovations due to their emphasis on short-term cost optimizations (Avci et al., 2011)

While prospectors actively build new dynamic capabilities to sustain eco-innovation, analysers leverage a mix of established routines and selective experimentation, and defenders rely on existing resources to achieve compliance-driven sustainability (Aragón-Sánchez & Sánchez-Marín, 2005). These mechanisms enhance efficiency, improve reputation, and attract environmentally conscious customers, generating competitive advantages that extend beyond short-term profitability (Vasileiou et al., 2022). Additionally, green innovation can be viewed as a valuable and inimitable capability that arises from a firm's ability to reconfigure its resources toward environmental performance (Kim et al., 2024).

In the tourism industry, the relationship between strategic orientation and green innovation acquires a distinctive relevance. The co-creation of sustainable experiences, the need for energy-efficient operations in accommodation and transport, and the increasing attention to ESG standards from tourists and institutions make sustainability a central dimension of competitiveness (Maziliauske, 2024) especially in tourism SMEs where regulatory bodies promote ESG-oriented initiatives, customers increasingly demand sustainable experiences, and competitive imitation pushes firms to adopt green innovation to remain legitimate within their ecosystems (Sharma & Sharma, 2024). Empirical evidence suggests that green innovation, encompassing eco-friendly products, energy-efficient processes, and environmentally responsible business models (Calderon-Monge & Ribeiro-Soriano, 2024; Ghag et al., 2022), enhances both environmental and economic performance when aligned with firms' strategic orientation and managerial commitment (Le & Govindan, 2024; Vasileiou et al., 2022).

Green innovation, encompassing eco-friendly products, energy-efficient processes, and environmentally responsible business models (Calderon-Monge & Ribeiro-Soriano, 2024; Ghag et al., 2022), is increasingly recognised as a strategic necessity rather than a reputational choice (Le & Govindan, 2024; Singh & Chakraborty, 2021; Tang et al., 2018). For tourism SMEs, green innovation translates into concrete actions such as waste reduction, circular practices, adoption of renewable materials, and integration of environmental certifications into quality standards (Maziliauske, 2024). Studies on Italian firms show that environmental innovation generates synergic effects with other types of innovation (e.g., marketing, organisational, and digital), enhancing financial performance when aligned with managerial commitment and stakeholder expectations (Vasileiou et al., 2022). Similarly, Qin et al. (Qin et al., 2024) emphasise the role of green entrepreneurial orientation as a dynamic capability that enables firms to leverage sustainability for business success. These mechanisms acquire a distinctive relevance in the tourism context.

Despite these benefits, tourism SMEs still face substantial barriers to implementing green innovation, including resource constraints, limited managerial expertise, and fragmented governance structure (Martínez-Román et al., 2015; Tang et al., 2018). Strategic orientation, therefore, becomes a critical lens through which to understand why some firms successfully engage in sustainability-driven innovation while others remain passive or reactive.

Building on these premises, the study aims to examine how the three strategic orientations shape the adoption of green innovation among tourism SMEs. Specifically, it addresses the following research questions: RQ1 "How do prospector-oriented tourism SMEs show a higher propensity to adopt green innovation practices?", RQ2 "How do analyzer-oriented tourism SMEs

integrate green innovation into their strategic and operational activities?" and RQ3 "How defender-oriented tourism SMEs implement green innovation?". By addressing these research questions, the study contributes to the literature on strategic management and sustainability in SMEs, by providing insights into how internal strategic orientation drive environmental innovation in tourism context. This research not only fills a relevant gap in the existing literature but also offers valuable implications for SME managers.

2. Purpose of the research

The objective of this paper is to investigate how different strategic orientations, influence the adoption of green innovation within tourism SMEs. While previous studies have explored how strategic orientation affect firm's performance and innovation capacity (Aragón-Sánchez & Sánchez-Marín, 2005; Avci et al., 2011; Camisón & Villar-López, 2014; Forés et al., 2023; Kim et al., 2024; Kwak et al., 2023), limited attention has been paid to how strategic patterns drive eco-innovation and environmental sustainability in small tourism businesses. This gap is particularly relevant given that tourism SMEs operate in highly competitive and resource-constrained environments where sustainability has become both a strategic priority and a source of long-term differentiation (Le & Govindan, 2024; K. Wang et al., 2024). Building upon these premises, this study posits that each strategic orientation configures firm's resource and capabilities in distinct ways, leading to different propensities for green innovation. Specifically, prospector-oriented tourism SMEs, are expected to show a stronger commitment to developing eco-innovative services and processes. Analyzer-oriented, may implement sustainability practices selectively once they are validated by the market. Conversely, defender-oriented tourism SMEs may engage in green innovation primarily for compliance purpose rather than as a proactive strategic choice.

Using data from the Istat, ISNART (Istituto Nazionale Ricerche Turistiche) and AIDA database, the study aims to examine how strategic orientation influence and extent the type of environmental innovation in tourism SMEs by identifying firm's strategic posture (i.e. innovation-led, hybrid, or efficiency-led) and their corresponding eco-innovation activities (i.e. reduction in energy and material use, recycling, renewable inputs, environmental certifications, innovation with environmental benefits). Understanding how these firms can leverage strategic orientation to pursue green objectives is crucial not only for their survival but also for the resilience of the broader tourism ecosystem. Additionally, it offers practical insights for policymakers aiming to support SMEs in their green adoption strategies, helping to bridge the gap between theoretical research and real-world applications. The empirical analysis will provide insights into the relationship of business strategy and sustainability in the context of tourism SMEs by aiming to advance existing research in two ways (i) by integrating strategic orientation and green innovation paradigms in tourism SMEs, (ii) by identifying which strategic profiles are most conductive to eco-innovation. By contributing to both theory and practice, this paper aims to serve as a reference point for future studies exploring the evolving role of strategy and green practices in tourism SME success, ultimately guiding firms toward competitive advantage.

3. Methodology

The empirical analysis draws on official Italian sources combining ISTAT and ISNART – Istituto Nazionale Ricerche Turistiche and AIDA database that allow us to compared data at the European level. These databases provide harmonised information on firms' innovation strategies, behaviours and outcomes and represents the official data source for monitoring innovation in both industrial and service sectors.

The study focuses on the subsample of Italian tourism SMEs, identified according to NACE Rev. 2, Section I (Accommodation and Food Service Activities) and corresponding ATECO divisions such as 55,56,79. This sector represents an ideal setting for analysing how different

strategic orientation shape environmental innovation, as tourism SMEs combine service-based value creation with increasing exposure to sustainability and competitiveness challenges. The SME definition follows the European Commission Recommendation 2003/361/EC, identifying firms with fewer than 250 employees and annual turnover below €50 million (Antenozio et al., 2024, 2026; Di Berardino & Antenozio, 2025).

The methodological design integrates two complementary phases, an exploratory-descriptive analysis and an econometric validation phase, aimed to capturing both the structural features and the determinants of green innovation adoption in tourism SMEs. The first phase provides an overview of the innovation behaviour among Italian tourism SMEs. Through descriptive statistics, the analyses identify the prevalence and intensity of environmental innovations, distinguishing between benefits obtained within the firms and during product or service use by final consumers. Specifically, internal eco-innovation includes lower material and water consumption per unit of product; reduced energy use or CO_2 emissions; reduced air, water, noise, or soil pollution; substitution of traditional materials with less harmful or polluting ones; replacement of fossil fuels with renewable energy sources; recycling of materials and waste and reuse of water for internal or commercial purposes. Consumer-related eco-innovation includes reduced energy consumption and CO_2 emissions during product or service use; lower environmental pollution during usage; greater ease of product recycling at end-of-life; and longer product or service life. The second phase empirically tests the relationships between strategic orientation and green innovation. The aim it to evaluate whether strategic oriented tourism SMEs differ in propensity to adopt eco-innovation practices. To operationalise strategic orientation variables, the study draws on the strategic variables, which capture firms' competitive strategies and market approaches. For prospector orientation, we include the following variables like introduction of new product or services; improvement of existing products or services; reaching new consumer groups; offering customized or tailor-made solutions. The analyzer orientation is constructed using data regarding quality leadership; broad product/service range; serving a stable customer base; bridging factor between innovation and stability. The corresponding variables for the defender's orientation related to price leadership; offering one or a few key products/services; offering standardised products/services; maintaining stable customers.

Composite indices are created to capture the multidimensional nature of eco-innovations. Additionally, control variables such as firms size, age, turnover, geographical macro-area, funding obtained, contextual pressure (institutional, market, cultural) are also included in the analysis to account for structural heterogeneity within the Italian tourism ecosystem.

We aim to employ regression models with robust standard errors to estimate the determinants of green innovation. Models are specified as:

$$Yi = \alpha + \beta 1\ X\ \text{strategy}\ ,\ i + \gamma Zi + \varepsilon i$$

where Yi denotes the green innovation adoption, Xstrategy,i variable represent the firm's strategic orientation and Zi includes control variables. Heteroskedasticity-robust estimators and cluster corrections are applied to ensure coefficient reliability, while multicollinearity and specification tests (VIF) validate model stability.

By leveraging these databases, the study ensures methodological comparability with previous European analyses while offering a novel focus on tourism SMEs and the link between strategic orientation and green innovation.

4. Preliminary results

Preliminary descriptive evidence highlights several emerging patterns regarding the strategic orientation and green innovation behaviour of Italian tourism SMEs. Most firms report at least one innovation activity but the diffusion of environmental innovation remains heterogeneous,

revealing marked differences depending on the strategic posture adopted. Firms classified as prospector-oriented demonstrate the highest propensity toward green innovation, especially in terms of eco-processes and product redesigns aimed at reducing energy use, emissions, and material consumption. These firms typically engage in multiple types of environmental benefits, both internal and consumer-related, suggesting that exploratory and opportunity-seeking behaviour drives a more proactive approach to sustainability. Conversely, analyzer-oriented tourism SMEs exhibit an intermediate position. They selectively adopt green innovations that have proven to be cost-effective or institutionally supported, such as improving product quality through eco-efficiency measures or integrating environmental certifications to enhance reputation. This behaviour reflects their balanced strategy between exploration and exploitation, where environmental initiatives are implemented only after market validation or regulatory reinforcement. Preliminary evidence also indicates that analyzers tend to prioritise internal environmental benefits over consumer-related outcomes, aligning sustainability with operational efficiency rather than market differentiation. Finally, defender-oriented firms show the lowest levels of green innovation activity. Their environmental initiatives are generally limited to compliance with environmental regulations or incremental efficiency improvements, such as minor reductions in energy use or pollution control. These firms are typically characterised by cost leadership, product standardisation, and a focus on a stable customer base, which limit their flexibility and willingness to engage in radical sustainability transitions. This finding aligns with the theoretical expectation that defenders, due to their efficiency-oriented configuration, perceive green innovation primarily as a constraint rather than an opportunity.

Preliminary results also suggest that strategic orientation significantly shapes the type and intensity of eco-innovation among tourism SMEs. Prospectors lead in environmental innovation through proactive exploration and differentiation; analyzers adopt a more cautious, efficiency-driven approach; and defenders remain primarily reactive, focused on compliance. These patterns confirm the Miles and Snow (Miles & Snow, 1978) framework's relevance for understanding sustainability-oriented strategic behaviour in small firms and extend it to the environmental domain of tourism enterprises. These findings provide preliminary validation of the conceptual model and underscore that strategic orientation is a key internal driver of sustainability transformation. While prospector strategies enable proactive eco-innovation and market differentiation, analyzer strategies favour incremental and cost-effective environmental practices, and defender strategies maintain compliance-based efficiency.

5. Managerial and policy implications

This study provides valuable insights for both managers of tourism SMEs and policymakers aiming to foster sustainability-oriented innovation. From a managerial perspective, the findings underline that green innovation success depends on the firm's underlying strategic orientation and the coherence between competitive priorities and sustainability goals. Managers of tourism SMEs should therefore interpret sustainability as a strategic lever rather than a mere compliance requirement, aligning environmental initiatives with the firm's strategic identity. For prospector-oriented firms, the results suggest that sustainability can serve as a platform for differentiation and market positioning. Their exploratory attitude and openness to experimentation enable them to integrate eco-innovation directly into new product and service development. Managers in these firms should exploit their natural proactivity by translating environmental challenges into new business opportunities, for example, by launching eco-certified experiences, investing in renewable resources, or adopting circular business models that enhance both brand value and environmental impact. For analyzer-oriented firms, sustainability requires a balance between innovation and efficiency. Managers should focus on adopting green practices that have already demonstrated operational or economic benefits, such as energy-efficient technologies, waste management systems, or green supply chain partnerships. This incremental, data-driven approach

allows analyzers to consolidate reputation and customer loyalty while maintaining cost competitiveness. To support this balance, firms should implement systematic monitoring mechanisms to evaluate the return on sustainability investments and progressively scale up successful initiatives. For defender-oriented firms, environmental innovation is not a natural driver of competitiveness but can still be leveraged to strengthen efficiency and regulatory compliance. Managers in these firms should integrate sustainability into core operations by prioritising low-cost, high-impact actions which improve both performance and compliance with environmental standards. Adopting voluntary certifications and transparent reporting can further enhance legitimacy in increasingly sustainability-conscious markets. The development of specific KPIs linking economic, environmental, and reputational outcomes can help firms maintain strategic coherence and measure progress toward sustainability. Furthermore, collaboration emerges as a critical enabler as engaging with universities, research centres, and destination networks can compensate for limited internal resources and provide access to new knowledge, technologies, and funding opportunities. Building organisational cultures that encourage learning-by-doing, cross-functional teamwork, and employee involvement in eco-innovation strengthens firms' adaptive capacity in the long term.

Policymakers should design differentiated incentive schemes that recognise the distinct pathways through which prospector, analyzer, and defender firms engage with sustainability. For instance, prospectors could be supported through grants for radical eco-innovation projects and internationalisation of sustainable tourism offerings; analyzers could benefit from vouchers or tax credits for adopting certified green technologies; and defenders could receive targeted training and consultancy support to improve compliance and efficiency. Moreover, public authorities should invest in local collaborative ecosystems, promoting innovation hubs, clusters, and sustainability incubators that connect SMEs with research institutions, local governments, and industry associations. These platforms facilitate knowledge transfer, access to funding, and collective experimentation, all essential to scale up environmental innovation in tourism destinations. These policy directions align with the European Union's objectives (i.e SME Strategy for a Sustainable and Digital Europe (2020), the European Tourism Agenda 2030), which emphasise sustainable competitiveness and low-carbon transformation of tourism ecosystems. Furthermore, NextGenerationEU funds and Cohesion Policy instruments offer an unprecedented opportunity to accelerate sustainability transitions by financing collaborative innovation projects, destination-based clusters, and tourism-focused living labs. Finally, the establishment of integrated European monitoring frameworks that combine environmental, social, and competitiveness metrics could help policymakers assess the real impact of sustainability-oriented strategies. Aligning national and regional initiatives with EU-wide objectives will be crucial to ensure that investments in green innovation strengthen not only firm-level performance but also the long-term resilience and attractiveness of European tourism business.

6. Research Limitations

This study presents several limitations that also open directions for future research. First, the analysis focuses exclusively on Italian tourism SMEs, whose structural and institutional characteristics make the context particularly relevant but may limit the generalizability of findings to other national settings. Future research could extend the analysis to other European countries. Second, the study relies on cross-sectional data, which, while methodologically robust and harmonised, does not capture dynamic effects or temporal evolution. Future econometric analyses will aim to quantify these relationships by estimating the marginal effect of each strategic orientation on different types of green innovation (internal vs. consumer-related). Additional robustness checks will explore whether firm size, geographical area, and tourism sub-sector (accommodation vs. food services) moderate these effects, offering a more granular understanding of how tourism SMEs align strategic behaviour with sustainability objectives.

Third, although the databases include detailed indicators on innovation and strategy, variables are self-reported and categorical, potentially underestimating the qualitative depth of strategic behaviour and environmental engagement. Future studies could integrate these data with qualitative evidence or complementary sources, such as firm websites or sustainability reports, to capture the nuances of green innovation processes. Future research could explicitly test the role of inter-firm collaborations, stakeholder pressures, and institutional incentives as external enablers of sustainability-oriented innovation, confirming whether cooperation and learning-by-doing act as substitutes for formal R&D in resource-constrained tourism SMEs. Despite these limitations, this study represents an initial step toward understanding how strategic orientations shape sustainability transitions in tourism SMEs and provides a foundation for future multi-country, multi-method research on strategy-innovation alignment in the green economy.

Keywords: Tourism SMEs; strategic orientation; green innovation; sustainability strategy

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Strategie di sostenibilità nelle DMO Italiane: uno studio esplorativo mediante Fuzzy Formal Concept Analysis (FFCA)

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1. DMO e sostenibilità

La letteratura sul turismo ha ampiamente discusso l'importanza della sostenibilità per lo sviluppo duraturo ed equilibrato dei territori, definendola un elemento prioritario dato il suo impatto multidimensionale (sociale, culturale, economico e ambientale) sulle destinazioni. L'attuazione di modelli di sviluppo locale e di business sostenibili soddisfa le esigenze e le aspettative dei turisti, delle imprese e dei residenti e offre opportunità di crescita ambientale, sociale, economica e culturale (Lee, 2001).

La letteratura di matrice manageriale ha approfondito il ruolo della sostenibilità nello sviluppo turistico e nella competitività delle destinazioni (McDonagh e Prothero, 2014, Pike e Page, 2014; Sharmin et al., 2021, Lee, 2001), nonché come leva per il coinvolgimento degli stakeholder (Byrd, 2007; Ruhanen et al., 2015; Bramwell et al., 2017; Sharpley, 2020). Inoltre, diversi studi hanno evidenziato il ruolo centrale svolto dalle destination management organization (DMO) nel guidare questo processo (d'Angella et al., 2025; Scuttari et al., 2023; Wagenseil et al., 2022). Nella gran parte di questi studi è stata applicata una prospettiva di analisi territoriale, focalizzata sulla destinazione. Al contrario, i modelli attraverso i quali le DMO implementano la sostenibilità a livello organizzativo sembrano essere un tema meno esplorato, sebbene esso sia di grande interesse per qualsiasi organizzazione. In questa prospettiva, la sostenibilità è un elemento strategico fondamentale per le DMO non solo come obiettivo di lungo termine delle destinazioni che gestiscono, ma diventa un principio cardine per la loro stessa operatività e sopravvivenza in quanto organizzazioni. Essa garantisce la resilienza nel lungo termine, la credibilità presso gli stakeholder, la capacità di interecettare nuovi bisogni dei visitatori e, in alcuni casi, favorisce l'accesso a finanziamenti. La multidimensionalità dell'argomento richiede un approccio alla sostenibilità strategico e complesso, soprattutto da parte delle organizzazioni - come quelle che operano nel settore del turismo - la cui stessa sopravvivenza e il cui modo di fare business dipendono dalla loro capacità di essere sostenibili (Weaver, 2011).

Questo lavoro di ricerca mira a comprendere il livello di maturità delle DMO nel processo di trasformazione verso la sostenibilità e a dimostrare l'efficacia della Fuzzy Formal Concept Analysis come metodo per identificare i modelli di attuazione della sostenibilità. Tale metodologia appare infatti particolarmente efficace nell'estrarre modelli comuni di attuazione della sostenibilità nel caso in cui la ricerca si basi su un set di dati con più variabili ordinali e categoriche.

Alla luce di questi obiettivi, questo studio vuole rispondere alle seguenti domande di ricerca:

- Qual è il livello di maturità delle DMO nel processo di trasformazione verso la sostenibilità?

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- Esistono dei modelli di implementazione della sostenibilità adottati dalle DMO?
- La metodologia FFCA rappresenta un metodo di analisi efficace per identificare i modelli di implementazione della sostenibilità?

I primi risultati dello studio, ancora in corso, mostrano come questa metodologia permetta di riconoscere fattori di comunanza nelle azioni intraprese dalle diverse DMO verso la sostenibilità.

2. Metodologia

Il disegno della ricerca si fonda su un approccio quantitativo, in cui i dati sono stati raccolti attraverso un sondaggio. È stata condotta un'indagine censuaria su 268 DMO regionali e subregionali italiane tramite posta diretta (CAWI), con tre successivi richiami telefonici (CATI). I rispondenti (n=109; tasso di risposta: 40,7%) coprono 18 delle 21 regioni italiane, con una copertura maggiore nella parte nord-orientale del Paese (47,0%). Trattandosi di uno studio non interventistico che ha raccolto solo dati organizzativi e non personali, è stato considerato a basso rischio per i partecipanti e non ha richiesto alcun consenso alla privacy per il trattamento dei dati.

La misurazione della sostenibilità delle DMO italiane si basa sugli standard internazionali proposti nella sezione Destination Management Performance del GDS-Index (GDS-Movement, 2024), uno score basato su un sistema di criteri di valutazione sviluppato e testato da un comitato internazionale di esperti, tra cui eminenti studiosi nel campo del turismo sostenibile. Il GDS Index dispone di una serie di indicatori dedicati alla misurazione della Destination Management Performance. Ai fini di questo studio sono stati selezionati 23 dei 29 elementi originari raggruppati in 11 dimensioni di sostenibilità (6 elementi sono stati esclusi da un gruppo di esperti in quanto non adatti al contesto italiano). Ogni elemento è collegato a un punteggio corrispondente (destination sustainability score - DSS); il punteggio massimo associato ai 23 elementi selezionati è 61,5, che corrisponde ad un'eccellente performance in termini di gestione sostenibile delle destinazioni (Tabella 1).

Nome della dimensione	Descrizione	Item associati	Max DSS
Strategy	Esistenza, contenuti, caratteristiche e metriche di una strategia della DMO dedicata alla sostenibilità o rigenerativà della visitor economy	1, 5	7.5
Visitor Management	Implementazione di azioni da parte della DMO per la gestione dei visitatori nella destinazione	7	3
Climate action	Implementazione di azioni da parte della DMO per la mitigazione degli impatti	8	3
DEI	Esistenza di un programma e di iniziative da parte della DMO per l'inclusione sociale	9 e 10	4.5
Policy & Certification	Esistenza di policy della DMO dedicate alla gestione della sostenibilità e ottenimento di certificazioni di sostenibilità a livello di DMO e di destinazione	11, 12, 13, 14	9
Governance	Essitenza di manager o comitati che assumono le responsabilità di gestione della sostenibilità della DMO	15	2
Capacity building	Implementazione di attività di diffusione, sensibilizzazione e formazione sulla sostenibilità destinate al personale della DMO o agli attori del turismo	17, 18, 19	8
Measurement & Reporting	Esistenza di un Sistema per il monitoraggio, il reporting e la diffusione degli obiettivi e dei risultati ottenuti dalla DMO con riferimento alla sostenibilità	20, 21, 22, 23	12
Marketing & Communications	Contenuti e caratteristiche delle attività di comunicazione della DMO relative alla sostenibilità rivolte a turisti e interlocutori commerciali	24	3

Mobility	Esistenza di attività di promozione svolte dalla DMO relative alla mobilità dolce rivolte a visitatori e partecipanti agli eventi	26, 27	5
Impact and Regeneration	Esistenza e implementazione di attività di sensibilizzazione della DMO di progetti locali sulla sostenibilità rivolte ai visitatori, ai partecipanti agli eventi e ai propri clienti e presenza di un piano per la legacy degli eventi	28, 29	4.5
Totale			61.5

Tabella 1. Le dimensioni del DSS, fonte: elaborazioni proprie

La Formal Concept Analysis (FCA) è una teoria matematica introdotta da Rudolf Wille per esplorare e organizzare i dati (Ganter e Wille 2012). Nel corso degli anni è stata applicata in diversi ambiti, dall'apprendimento automatico alla biologia. Nonostante il suo potenziale, solo pochi lavori, fra cui Yuxia e Bian (2015) e Cimiano, Hotho e Staab (2005), impiegano la FCA negli studi sul settore turistico, mentre più nello specifico non si sono rilevate applicazioni in lavori di ricerca sulla gestione delle destinazioni. Ciò è in parte dovuto al fatto che le tecniche FCA non sono molto conosciute al di fuori dell'informatica e che la ricerca negli ambiti del turismo si basa principalmente su metodi statistici più ampiamente utilizzati (regressione, analisi dei cluster e così via).

Nell'ambito della FCA, il set di dati iniziale, chiamato contesto formale, rappresenta la relazione tra due categorie: oggetti e attributi. Di solito viene visualizzato come una tabella binaria, in cui le righe corrispondono agli oggetti, le colonne agli attributi e ogni cella contiene 1 (se l'oggetto ha l'attributo) o 0 (in caso contrario). Il risultato dell'FCA è una raccolta di particolari cluster, chiamati concetti formali. Un concetto formale è costituito da un insieme di oggetti e da tutti gli attributi che li caratterizzano. In questo studio, gli oggetti corrispondono alle DMO e gli attributi corrispondono alle dimensioni di sostenibilità del punteggio GDS, ovvero alla performance composita delle DMO in ciascuna dimensione (vedi Tabella 1).

La Fuzzy Formal Concept Analysis (FFCA) estende questa teoria matematica esprimendo la relazione tra oggetti e attributi in gradi di verità, anziché solo attraverso due opzioni di risposta (1 o 0) (Alwersh & László, 2022). Secondo questo approccio, ogni cella può assumere un valore compreso tra 0 e 1, che rappresenta il grado con cui un oggetto possiede un determinato attributo. Di conseguenza, la FFCA è adatta a domini in cui le proprietà sono graduali piuttosto che rigorosamente presenti o assenti.

Nel contesto della nostra analisi, i gradi sono costruiti sulla base della capacità di una determinata DMO di implementare parzialmente o completamente una specifica dimensione di sostenibilità del DSS score (Tab.1): 0 (non ancora), 0,5 (parzialmente) e 1 (completamente). Ad esempio, se i valori associati a una specifica DMO per le categorie Strategia, DEI e Gestione dei visitatori sono rispettivamente 0, 0,5 e 1, ciò significa che la DMO non ha ancora attivato la dimensione della Strategia, ha implementato parzialmente la DEI e ha implementato completamente le attività di Gestione dei visitatori.

In letteratura sono stati proposti vari approcci basati sulla teoria della logica fuzzy (Klir & Yuan, 1995) per estrarre concetti da un contesto formale con valori di verità multipli. In questo studio si è optato per uno dei metodi più semplici chiamato approccio "fuzzy to crisp" (Majidian, et al, 2011). Secondo questo approccio, un concetto è definito come un insieme di oggetti A e un insieme di attributi B. A differenza di un concetto classico, in cui gli oggetti e gli attributi sono semplicemente inclusi o esclusi, ogni oggetto a in A è associato a un valore $\beta(a)$ (da 0 a 1), che indica il grado di verità con cui a soddisfa tutti gli attributi in B. Matematicamente, $\beta(a)$ è calcolato come il grado minimo della relazione tra a e ciascun attributo in B. Ad esempio, si consideri il caso ipotetico in cui un concetto comprenda la coppia (A, B), dove A include una ipotetica DMOx e B è costituito da Misurazione e rendicontazione, Mobilità e Strategia. In questo

caso, β(DMOx) = 0,5, il che significa che la DMOx ha implementato tutte queste categorie almeno in parte.

Il numero di concetti generati a partire dal dataset è solitamente elevato, il che richiede l'identificazione e la focalizzazione dell'analisi solo su quelli più rilevanti. Alcuni concetti sono infatti più generali (includono molti oggetti ma pochi attributi), mentre altri sono più specifici (comprendono meno oggetti ma più attributi definiti). I concetti intermedi sono i più informativi perché raggiungono un equilibrio tra generalità e specificità. Un altro fattore importante da considerare è il "supporto" di un concetto, definito come la somma dei gradi associati ai suoi oggetti. I concetti con un supporto più elevato sono generalmente più significativi (Elhady, G. F., et al, 2024).

In questo studio, i nomi delle DMO sono stati pseudonimizzati, poiché la ricerca si concentra sui modelli di implementazione della sostenibilità e non sulle prestazioni delle singole organizzazioni.

3. Primi risultati

Alcune prime analisi descrittive hanno mostrato che l'implementazione della sostenibilità a livello di DMO è ancora in una fase iniziale, poiché il punteggio medio dei rispondenti è di 15,9 punti (max score 61,5 punti), in un range di valori rilevati compreso tra 0 e 53 punti, con solo 4 DMO che superano i 40 punti. Per identificare i modelli di sostenibilità è stato quindi applicato il metodo FFCA. Dal set di dati iniziale sono stati ricavati 253 concetti C_0,…, C_{252}, che catturano la relazione tra 109 DMO e le 11 dimensioni di sostenibilità, con valori uguali a 0, 0,5 e 1. I concetti rappresentano modelli di associazione tra le dimensioni, interpretati come modelli condivisi o archetipi di implementazione della sostenibilità.

I concetti sono organizzati in 12 livelli in base alla loro generalità, definita dal numero di attributi che contengono. Il concetto superiore (C_0) include tutte le DMO ma nessun attributo ed è quindi privo di informazioni. All'estremo opposto, il concetto inferiore (C_{252}) combina tutti gli 11 attributi ma include solo una DMO, con grado 0,5, e rappresenta quindi il modello di implementazione più efficace (ovvero il migliore nel nostro set di dati).

Per selezionare i concetti più significativi, si è proceduto in due fasi: 1) identificazione dei livelli centrali e 2) selezione dei concetti.

In primo luogo, si sono identificati i livelli centrali attorno al valore mediano nel reticolo concettuale (livelli 5 e 6). Si è quindi calcolato il supporto di ciascun concetto, partendo dal presupposto che un valore di supporto elevato indica un modello di implementazione solido e ricorrente. Tra i 2 livelli centrali – 5 e 6 - abbiamo quindi selezionato il livello 6 in base alla "regola del gomito" (Liu e Deng, 2020) applicata ai valori di supporto. La tabella 2 elenca i concetti dei livelli 5 e 6 con il supporto più elevato, insieme alle dimensioni di sostenibilità associate e al numero corrispondente di DMO.

	Concetti	**Attributi (dimensioni della sostenibilità)**	**Supporto**	**N. DMO**
Layer 5	C_{206}	Mobility, Strategy, Visitor Management, DEI, Governance	12.5	23
	C_{90}	Mobility, Visitor Management, DEI, Governance, Capacity Building	12.5	25
Layer 6	C_{213}	Mobility, Strategy, Visitor Management, DEI, Governance, Capacity Building	9.5	19
	C_{233}	Mobility, Strategy, Visitor Management, Climate Action, DEI, Governance	5.5	10

Tabella 2. Concetti, attributi della sostenibilità, supporto e n. di DMO relativi dei livelli 5 e 6, fonte: elaborazioni proprie

I concetti di livello 5 presentano supporti simili, il che rende difficile distinguere un modello dominante. Al contrario, al livello 6, il concetto C_{213} spicca in modo particolare, mostrando valori di supporto molto più elevati rispetto al concetto successivo (9,5 per C_{213} rispetto a 5,5 per C_{233}).

Per questo motivo, da qui in avanti la nostra analisi si concentra sul concetto C_{213}, che comprende 19 DMO e 6 categorie di sostenibilità: Mobility, Strategy, Visitor Management, DEI, Governance e Capacity Building. Ogni DMO è associata a C_{213} con un grado di veridicità pari a 0,5, che indica un'implementazione parziale di tutte e sei le dimensioni.

Nel loro complesso, le sei dimensioni includono sia attività prettamente interne alla DMO, sia attività di gestione della destinazione.

La tabella 3 fornisce una visione dettagliata del modello C_{213} mostrando in che misura ogni DMO ha implementato ognuna delle sei categorie. Inoltre, mostra la cardinalità di ciascuna DMO, che è la somma dei suoi gradi di appartenenza agli attributi. Una cardinalità più elevata riflette quindi un'implementazione più forte. Si osservi che due DMO - "DMOg" e "DMOl" - raggiungono la cardinalità più alta - pari a 5,5 su un valore massimo di 6 - emergendo come le migliori in termini di prestazioni all'interno di questo modello.

DMO	**Strategy**	**Visitor Management**	**DEI**	**Governance**	**Capacity Building**	**Mobility**	**Cardinalità**
DMOa	1	0.50	0.50	1	1	1	5
DMOb	1	1	0.50	1	0.5	0.5	4.5
DMOc	0.5	1	1	1	0.5	0.5	4.5
DMOd	1	1	0.50	1	1	0.5	5
DMOe	1	1	0.50	0.5	0.5	0.5	4
DMOf	1	0.50	0.50	0.5	0.5	1	4
DMOg	1	1	1	1	0.5	1	5.5
DMOh	1	1	1	0.5	0.5	1	5
DMOi	1	0.5	0.5	1	0.5	0.5	4
DMOj	1	0.5	0.5	1	0.5	0.5	4
DMOk	1	0.5	0.5	1	0.5	0.5	4
DMOl	1	1	1	1	0.5	1	5.5
DMOm	1	1	0.5	1	0.5	1	5
DMOn	1	1	0.5	0.5	0.5	1	4.5
DMOo	1	1	0.5	1	1	0.5	5
DMOp	1	1	0.5	1	1	0.5	5
DMOq	1	0.5	0.5	1	0.5	1	4.5
DMOr	1	1	1	0.5	1	0.5	5
DMOs	1	1	1	0.5	1	0.5	5

Tabella 3. Grado di implementazione di ciascuna categoria di sostenibilità da parte delle DMO appartenenti al concetto C_{213} e relativa cardinalità, fonte: elaborazioni proprie

Secondo la tabella 3, strategy è la variabile pienamente implementata da tutte le DMO tranne una. Visitor management e governance sono pienamente implementate da 13 su 19. DEI e capacity building sono invece quelle meno implementate appieno, solo 6 DMO su 19. Questi dati suggeriscono quindi che le DMO italiane che hanno realizzato questo modello di sostenibilità,

abbiano già raggiunto un livello avanzato soprattutto nella formalizzazione di una strategia di sostenibilità, in seconda battuta nella gestione sostenibile dei visitatori e nell'integrazione della sostenibilità nei loro sistemi di governance. Le politiche di diversità e inclusione insieme alle attività di formazione sulla sostenibilità necessitano ancora di ulteriori sforzi per una piena realizzazione.

La lettura orizzontale dei dati, invece, mostra come nessuna DMO abbia implementato pienamente tutte le sei dimensioni che compongono il concetto, poiché la cardinalità massima è pari a 5,5. Essa viene raggiunta da solo 2 DMO su 19, mentre 8 DMO mostrano una cardinalità pari a 5, 4 DMO hanno un valore complessivo pari a 4,5 e le rimanenti 5 DMO pari a 4. Ciò suggerisce come anche all'interno del concetto ci sia ancora spazio per un potenziamento futuro delle attività di sostenibilità realizzate dalle DMO.

In conclusione, il concetto C_{213} evidenzia un modello di sostenibilità che combina attività di gestione operativa dei flussi turistici (gestione dei visitatori e mobilità) con iniziative strategiche volte a promuovere la sostenibilità (strategy, DEI, governance e capacity building). Questi risultati suggeriscono che oggi in Italia, un gruppo importante di DMO implementano la sostenibilità lungo quattro direttrici. Una prima direttrice riguarda l'urgenza di affrontare problemi operativi legati alla gestione dei flussi e della mobilità che spesso rappresenta il primo concreto stimolo all'implementazione di pratiche di sostenibilità. Ad essa si associa una seconda direttrice più orientata al lungo periodo che riguarda la formulazione di strategie condivise e il loro monitoraggio. Una terza direttrice include la presenza di ruoli (sustainability manager) e strutture (comitati interni o aperti ad operatori esterni) dedicati alla governance della sostenibilità. Infine, una quarta e ultima direttrice riguarda le politiche di inclusione e le attività di formazione rivolte sia ai dipendenti della DMO che ai pubblici esterni (visitatori e stakeholder della destinazione).

I risultati dello studio mostrano come un'efficace implementazione delle pratiche di sostenibilità implichi una combinazione di molteplici dimensioni di azione, implementate dalle DMO a diverse velocità.

4. Conclusioni e prossimi passi

Questo lavoro evidenzia il potenziale dell'FFCA nel rivelare modelli articolati di implementazione della sostenibilità, costituiti da gruppi di attività e funzioni implementati con alta frequenza in contemporanea da diverse DMO localizzate in luoghi diversi del Paese.

Il metodo FFCA si presenta quindi come un approccio metodologico potente per estrarre modelli comuni di implementazione della sostenibilità, specialmente nel caso di dataset composti da variabili categoriali. L'applicazione della FFCA nel turismo e, più in generale, nell'individuazione dei modelli di implementazione delle strategie di sostenibilità è innovativa e appropriata perché: 1) riconosce il carattere graduale e progressivo del processo di implementazione della sostenibilità fornendo uno strumento in grado di individuare livelli intermedi di adozione; 2) consente di cogliere le combinazioni delle molteplici dimensioni che caratterizzano l'implementazione della sostenibilità distinguendo quelle generali da quelle più specifiche.

I prossimi passi dell'analisi si concentreranno su: i) un ulteriore sviluppo applicativo del metodo FFCA e ii) sul suo confronto con altri metodi ben noti di analisi multivariata (es. PCA). Per quanto riguarda il primo aspetto, intendiamo effettuare un'esplorazione più dinamica del reticolo concettuale, ad esempio sviluppando strumenti per navigare attraverso i suoi diversi livelli e mettere a fuoco come i concetti evolvono da generali a specifici. Inoltre, studieremo le implicazioni logiche tra gli attributi, per comprendere meglio come le dimensioni della sostenibilità meno implementate iniziano ad emergere in relazione a quelle più forti e consolidate. In questo metodo, un'implicazione è definita come una regola che esprime una dipendenza o una relazione costante tra gli attributi all'interno di un contesto. In termini semplici: "Se un oggetto

possiede l'attributo A, allora possiede necessariamente anche l'attributo B". Questa analisi consentirà quindi di identificare non solo le dimensioni che caratterizzano i modelli di implementazione della sostenibilità nelle DMO italiane, ma anche i nessi causali tali dimensioni. Per quanto riguarda invece il secondo aspetto, valuteremo la capacità dell'FFCA di superare altri metodi comunemente utilizzati (ad esempio l'analisi dei cluster) in termini di: gestione dei dati categoriali; capacità di rilevare i gradi di appartenenza di ciascuna unità statistica a un costrutto specifico; struttura e interpretabilità dei risultati.

Parole chiave: Strategia; sostenibilità; DMO; FFCA

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Configurations for successful artificial intelligence adoption in hospitality: Evidence from a fsQCA analysis of managerial perceptions

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1. Introduction

Artificial Intelligence (AI) is reshaping hospitality through automation, personalization, and operational efficiency (Buhalis, 2025; Wong et al., 2023). As competitive pressures intensify and guest expectations evolve, hospitality firms are increasingly compelled to explore AI-enabled solutions ranging from intelligent revenue management systems to AI-powered concierge services and predictive maintenance tools. However, despite its potential, adoption is uneven, particularly in small and medium-sized enterprises constrained by resource limitations and digital knowledge gaps (Cozzio et al., 2025). In this context, understanding the specific combinations of managerial, strategic, and perceptual factors driving AI implementation is essential. This study focuses on the South Tyrol region, a representative tourism ecosystem characterized by family-run, leisure-oriented hotels, offering a microcosm of Italian hospitality. The research aims to uncover which factors, and in what combinations, determine successful AI adoption using Fuzzy-Set Qualitative Comparative Analysis (fsQCA), a method capable of capturing causal complexity (Pappas & Woodside, 2021). Unlike variance-based approaches that examine the net effects of individual predictors, fsQCA identifies combinations of conditions that are jointly sufficient to produce an outcome, making it particularly suited to SME environments where no single factor operates in isolation. The analysis compares configurations of internal awareness, investment, perceived impact on customer, and data security to reveal the conditions under which AI implementation succeeds or fails.

2. Literature Review

Four antecedents are analyzed: AI awareness and strategic integration, investment in staff training and organizational change, perceived customer impact and experience enhancement, and the relevance of data security and privacy.

Artificial intelligence awareness reflects both technical understanding and strategic commitment to technology integration (Leung, 2019). Managers who view AI as a strategic enabler tend to align its use with competitive advantage, driving more extensive adoption (Cozzio et al., 2025). Strategic awareness therefore functions as a prerequisite for deliberate and sustained AI integration, rather than ad hoc or reactive experimentation. Conversely, a lack of awareness fosters uncertainty, resistance, and fragmented innovation efforts.

Investing in human capital is essential for aligning AI with employee capabilities. Training mitigates fear of job loss, increases acceptance, and fosters cultural readiness (Ersoy & Ehtiyar, 2023; Li et al., 2019). Drawing on Mayo's Human Relations Theory (Sarachek, 1968), employee

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inclusion and trust are pivotal to technological change. Hospitality organisations that systematically invest in upskilling programmes tend to exhibit lower resistance to AI implementation and higher rates of sustained adoption, suggesting that investment in training functions as both a technical and a cultural enabler.

AI-driven personalisation and operational efficiency enhance service satisfaction and loyalty (Li et al., 2022; Go et al., 2020). Intelligent systems capable of anticipating guest preferences, from personalised room settings to tailored dining recommendations, represent a qualitative shift in service delivery that goes beyond routine automation. Such applications redefine the guest journey by creating individualised touchpoints that increase perceived value and emotional attachment to the brand. Managers who perceive AI as augmenting, rather than replacing, the human dimension of hospitality demonstrate higher engagement with technology and are more likely to champion its adoption internally (Zhong et al., 2022).

Data protection and regulatory compliance remain both obstacles and enablers. In the hospitality context, where guests share sensitive personal and financial information, transparent data governance is particularly salient. Regulations such as the General Data Protection Regulation (GDPR) impose formal obligations on hospitality firms, yet also provide a structural impetus for developing responsible AI practices. Properly integrated data management strategies can therefore transform perceived risks into trust-building mechanisms, reinforcing guest confidence and long-term loyalty (Chen & Kuo, 2017; Rasheed et al., 2024).

Overall, these factors do not operate in isolation but interact dynamically. Prior research has often examined these antecedents independently, thereby underestimating the configurational logic that governs technology adoption decisions in practice. The fsQCA approach is uniquely suited to capture this interdependence, identifying how multiple conditions combine to yield successful AI adoption and distinguishing the configurations that lead to non-adoption. This perspective aligns with complexity theory, which posits that organisational outcomes rarely stem from a single cause but emerge from the conjunction of mutually reinforcing conditions.

3. Methodology

Data were collected from 76 hotel professionals (hotel owners, hotel managers, and first-line managers) between September 2023 and March 2024. South Tyrol provides a particularly relevant research setting owing to its high tourism density, strong concentration of independently operated family hotels, and active regional digitalisation initiatives. Semi-structured interviews were conducted in person or via video call, lasting between 45 and 75 minutes, allowing participants to elaborate on their direct experience with AI tools and yielding richer contextual data than structured survey instruments alone could provide. The interview protocol explored participants' awareness of AI, investment in training, perceived customer impact, and data privacy practices. The outcome variable Successful AI Adoption (Adop) was analyzed in relation to four antecedent conditions: AI awareness and strategic integration (Awa), Investment in staff training and organizational change (Inv), Perceived customer impact and experience enhancement (Imp), and Relevance of data security and privacy (Sec). The analyses follow the evaluation structure defined by Cangialosi (2023) and Pappas & Woodside (2021). All numerical computations were performed using R software (Duşa, 2018). Construct reliability and validity were assessed through confirmatory factor analysis. Although the reliability indices (Cronbach's $\alpha = 0.568$; $\Omega = 0.602$) were modest, the model fit indices (CFI = 0.948; SRMR = 0.055) demonstrated acceptable consistency. Factor loadings indicated that Awa had the strongest influence (0.855), confirming its central theoretical role in the model.

The implementation of fsQCA requires transforming the values of the variables from numerical data bounded within the [0, 1] interval into fuzzy membership scores. The main technique used to transform the data is the direct calibration procedure, which requires defining three reference values delimiting the inclusion, exclusion, and cross-over of the data within the

membership function assigned to the corresponding fuzzy numbers. Two different sets of reference values are usually defined through the percentiles of the observed variables, namely, the 5th, 50th, and 95th or the 20th, 50th, and 80th. The latter are recommended when dealing with asymmetric or not normally distributed data. The standard calibration procedure is performed by applying a logistic function to transform the data. The resulting scores range from the maximum ambiguity value of 0.50 to the full inclusion and exclusion values defined by 1 and 0, respectively. In this regard, calibrated scores cannot be equal to 0.50 since the resulting membership would remain ambiguous, leading to the subsequent configuration to be excluded from the analysis. A standard solution consists of adding 0.001 to any 0.50 score (Fiss, 2011). Any score of 0.50 was therefore replaced with 0.501 to ensure that all potential configurations were preserved (Mattke et al., 2021).

4. Results and discussion

The main objective of fsQCA is to identify all the variable configurations leading to the outcome defined in the construct. The "Quine–McCluskey" algorithm applied for Boolean minimization delivers three sets of solutions, complex, intermediate, and parsimonious, describing the variable combinations reaching the frequency threshold required for meaningful inferences regarding their effect on the outcome variable. Complex solutions are generally omitted due to the large set of potential configurations among variables that they deliver. Therefore, the main variable configurations considered are those derived from the parsimonious solution, which describes the "core conditions," and the intermediate one, which delivers both "core" and "peripheral" conditions (Fiss, 2011).

Tables 1 and 2 present the results of the analysis while distinguishing between core and peripheral conditions. Following standard convention, the core solutions are written in bold characters. The raw coverage (proportion of outcome cases explained by a given configuration), unique coverage (proportion of outcome cases explained by a specific configuration, excluding any overlap with other variable configurations), and consistency (strength of the relationship, namely, the extent to which the configuration leads to the outcome) of the different variable configurations are also described in the table.

As illustrated in Tables 1 and 2, the main configuration fostering Adop is given by Awa∗Imp∗Sec, while the combinations triggering ∼Adop are ∼Awa∗Sec and ∼Inv∗∼Imp∗Sec. The variable Imp defines a core solution together with Awa when fostering adoption, reflecting the importance of a clearly articulated guest-centric rationale in justifying AI investment. Managers who can communicate the direct value of AI for enhancing guest experiences appear better positioned to build the internal consensus needed to sustain adoption over time. The coordinated effect of ∼Inv and ∼Imp defines a compounding barrier that data security considerations alone cannot overcome. Sec remains a consistent peripheral condition across all configurations, functioning as a contextual enabler rather than a primary driver of adoption.

	inclS	**PRI**	**covS**	**covU**
1 **Awa∗Imp**∗Sec	0.875	0.786	0.682	–
M1	0.875	0.786	0.682	

Table 1. Configurations fostering Adop decisions

	inclS	**PRI**	**covS**	**covU**
1 **∼Awa**∗Sec	0.958	0.933	0.692	0.302
2 **∼Inv**∗**∼Imp**∗Sec	0.889	0.844	0.390	0.000
M1	0.897	0.845	0.692	

Table 2. Configurations fostering ∼Adop decisions

The results of the two previous tables are summarized in Table 3 using the standard fsQCA notation. This table describes the existence of a unique configuration of variables sufficient to generate high levels of Adop. A second set composed of two configurations leading to low levels of Adop complements these results, highlighting, in both cases, the substantial importance of Awa and ∼Awa in the Adop and ∼Adop decisions, respectively.

	Adop	**∼Adop 1**	**∼Adop 2**
Awa	●	Ø	
Inv			Ø
Imp	●		Ø
Sec	•	•	•
Consistency	0.875	0.958	0.889
Raw coverage	0.682	0.692	0.390
Unique coverage	–	0.302	0.000
Solution consistency	0.875	0.897	
Solution coverage	0.682	0.692	

• denotes high levels of a given variable being present in the configuration leading to the outcome; Ø denotes low levels of a given variable being present in the configuration leading to the outcome; blank spaces imply that the variable is not relevant in the configuration leading to the outcome; large characters describe core variables while small ones refer to peripheral ones.

Table 3. Configurations derived from the parsimonious and intermediate solutions.

Several sensitivity analyses were performed to validate the robustness of the results. More precisely, the thresholds selected when performing fsQCA are based on the guidelines provided in the literature; thus, the parameters selected initially are modified and the results obtained are compared to those defining the initial configurations. Comparisons focus on the overall consistency and coverage derived from the modifications implemented in the frequency, consistency, and PRI thresholds, as well as the percentiles selected to transform the data into fuzzy numbers. The high consistency scores observed across all configurations (ranging from 0.875 to 0.958 for Adop and ∼Adop respectively) provide strong evidence that the identified conditions reliably predict the outcome variable, lending credibility to the theoretical model proposed in this study.

As summarized in Table 4, the main significant changes in the Adop and ∼Adop scenarios are observed when shifting the calibration thresholds and obtaining consistent Awa∗Sec and ∼Awa∗Sec configurations, respectively. In this case, Awa and ∼Awa remain as the main reference determinants triggering Adop and ∼Adop decisions, respectively.

	Adop	**∼Adop**
Awa	●	Ø
Inv		
Imp		
Sec	•	•
Consistency	0.986	0.951
Raw coverage	0.876	0.783
Unique coverage	–	–
Solution consistency	0.986	0.951
Solution coverage	0.876	0.783

Table 4. Alternative Calibration Thresholds fostering Adop and ∼Adop decisions

5. Conclusion

The fsQCA analysis reveals that AI awareness and strategic integration represent the essential foundation for successful adoption within the hospitality sector. Awareness emerges as the core condition, consistently present across all configurations leading to high levels of adoption. Data security, while peripheral, plays a stabilizing and legitimizing role in shaping managerial confidence in technological systems. In addition, hotels that combine strong awareness with a clear customer orientation (Awa∗Imp∗Sec) demonstrate an ability to align strategic intent with perceived guest benefits, achieving adoption through the synergy of internal

readiness and external value creation. In contrast, configurations characterized by the absence of awareness and training (~Awa or ~Inv) correspond to non-adoption scenarios, where even a focus on data security, often viewed as a defensive or compliance-driven aspect, cannot offset the lack of strategic and cultural readiness. This finding carries a particularly important message for hotel owners and general managers: investing in data security infrastructure without first cultivating organisational awareness and a shared understanding of AI's potential value is unlikely to produce meaningful adoption outcomes. The sequencing of capability-building efforts therefore matters, and awareness must be established as a foundation before other enabling conditions can exert their full effect.

These findings underline the multifaceted nature of AI adoption, confirming that organizational success depends not on isolated factors but on their coherent interaction. The overall results highlight the principle of equifinality, indicating that multiple combinations of conditions can lead to the same outcome of successful adoption. Nonetheless, configurations sharing a high level of awareness reveal superior consistency and coverage across models, reaffirming its pivotal role. These patterns suggest that awareness serves not only as a technical understanding of AI tools but also as a manifestation of organizational learning and leadership commitment. Hotels with high awareness levels tend to perceive AI as a complement to, rather than a substitute for, human service quality, which in turn supports a positive organisational narrative around technology adoption. This narrative dimension is particularly significant in family-run establishments, where strategic decisions are often shaped by personal values and long-term stewardship orientations rather than short-term efficiency calculations. Conversely, a lack of awareness reinforces inertia and resistance to change, particularly in traditional contexts where the perceived risk of disrupting established service routines outweighs the anticipated benefits of AI adoption.

Taken together, the results provide both theoretical and managerial insights. From a theoretical perspective, they support the idea that organizational readiness is a multidimensional construct encompassing knowledge, strategy, and legitimacy. From a managerial standpoint, they emphasize that successful AI adoption requires an integrated approach that combines awareness-building, investment in employee development, and transparent communication of data security practices. Hotel managers are therefore advised to treat AI adoption not as a discrete technological project, but as an ongoing organisational capability that requires continuous reinforcement through training, clear communication of strategic intent, and governance frameworks that safeguard guest data. These findings confirm that technology integration in hospitality is not a purely technical process, but a cultural and strategic transformation shaped by collective understanding and trust.

The implications extend beyond hospitality, offering insights for other service sectors navigating AI transformation. Policymakers should support digital literacy and training programmes, especially in regions dominated by SMEs, where structural barriers to AI adoption are most pronounced. Industry associations and regional bodies could play a meaningful role in facilitating knowledge transfer and providing shared infrastructure that reduces the entry costs associated with AI implementation. Future research could expand cross-regional comparisons or incorporate longitudinal data to trace how awareness evolves with AI maturity, and to examine whether the configurations identified here hold across different cultural and broader institutional contexts.

Keywords: Artificial intelligence adoption; fsQCA; hospitality; SMEs; managerial awareness; data security; South Tyrol

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Navigare la Transizione: AI e Stakeholder Engagement nella gestione dei porti turistici. Il Sistema Porto Turistico di Maratea

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1. Introduzione

Negli ultimi anni, la letteratura sul turismo costiero e marittimo ha indagato con forte interesse il tema della sostenibilità e della gestione integrata nei porti turistici, in particolare nel Mediterraneo, riconoscendoli come elementi centrali per lo sviluppo equilibrato delle aree costiere (Martínez-Vázquez et al., 2021; Poletan Jugović et al., 2022).

In tale prospettiva, il porto turistico non deve essere considerato come un'infrastruttura isolata, ma come un sistema articolato di funzioni e servizi integrati, che comprende molteplici attività, tra cui quelle nautiche e commerciali, oltre a servizi collaterali e spazi di supporto (carroponte, aree tecniche, distributori di carburante, intrattenimento).

Il "sistema porto turistico", dunque, risulta essere un'infrastruttura fondamentale che collega l'economia locale, il turismo e l'ambiente ma al contempo, rappresenta anche uno spazio vulnerabile sia dal punto di vista ecologico che sociale (Kovačić et al., 2011).

Questa loro duplice natura, da un lato essenziale per l'integrazione delle dinamiche economiche, turistiche e ambientali; dall'altro vulnerabile agli impatti dei cambiamenti climatici e alle pressioni derivanti dalla crescita del turismo, solleva interrogativi cruciali per una gestione efficiente. Sebbene questi porti rappresentino una risorsa strategica per la prosperità delle aree costiere, è fondamentale che la loro pianificazione e gestione siano orientate a garantire un equilibrio sostenibile, che contemperi la crescita economica con la tutela dell'ambiente e la coesione sociale delle comunità locali. Nel caso specifico del turismo costiero e marittimo, i porti turistici, da semplici punti di ormeggio assumono un ruolo cruciale nella blue economy, diventando piattaforme di valore territoriale e rappresentando punti di connessione tra ecosistemi naturali, imprese turistiche e comunità locali (Kovačić et al., 2011).

In questo scenario, la sostenibilità non riguarda soltanto gli aspetti ambientali, ma impatta in maniera incisiva anche sulla dimensione sociale, influenzando le interazioni con le comunità locali, le istituzioni e gli operatori del settore, in linea con i principi della sostenibilità (Spinelli & Benevolo, 2022; Coles, 2024). Salvatore et al. (2021) evidenziano come la costruzione di reti collaborative e modelli di governance condivisi, si rivelino essenziali per promuovere processi di apprendimento collettivo e per favorire la legittimazione delle decisioni strategiche.

Infatti, in questo quadro, il successo delle destinazioni turistiche marittime dipende sempre più dalla qualità della governance e dalla capacità di coordinare una molteplicità di attori, pubblici e privati, chiamati a contribuire a un equilibrio tra competitività e tutela del territorio (Butler, 1999; Biondi & Lara, 2015). Un elemento fondamentale della governance condivisa è il coinvolgimento attivo di tutti gli stakeholder, che deve tradursi in un processo decisionale

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partecipativo in cui le esigenze ecologiche, economiche e sociali siano bilanciate in modo equo e trasparente.

Ciononostante, il contributo di Luoma et al. (2017) mette in luce come la sostenibilità nei porti turistici venga ancora interpretata in modo disomogeneo tra i diversi attori coinvolti, evidenziando la mancanza di un'unica direzione circa gli obiettivi, rendendo complesso il processo di co-creazione di valore sostenibile e la costruzione di una visione integrata tra i diversi stakeholder.

Infatti, come osservato da Koo et al. (2019), la resilienza degli ecosistemi turistici costieri dipende dalla capacità delle istituzioni di coinvolgere i cittadini nel definire soglie di cambiamento accettabili e promuovere processi di apprendimento collettivo e adattamento continuo.

Dunque, il processo di coinvolgimento multi-stakeholder diventa un driver primario per la transizione verso il modello di green port che integra obiettivi di efficienza economica, tutela ambientale e responsabilità sociale (Poletan Jugović et al., 2021).

Tuttavia, tale approccio resta spesso frammentato e debolmente integrato nei piccoli porti turistici, dove mancano risorse economiche, competenze gestionali, oltre a strumenti di monitoraggio efficaci e di raccolta dati basati su tecnologie digitali e strumenti predittivi (Spinelli & Benevolo, 2024; Martínez-Vázquez et al., 2021), capaci di anticipare criticità e di migliorare la trasparenza dei processi decisionali.

Non di meno, di recente, la letteratura ha cominciato ad individuare una forte connessione tra stakeholder engagement, digitalizzazione e sostenibilità (Myrovali et al., 2025). In questo senso, l'utilizzo di sistemi digitali potrebbe svolgere un ruolo chiave, introducendo forme di governance basate sull'innovazione tecnologica e sulla partecipazione degli stakeholder, capaci di supportare processi decisionali più trasparenti e inclusivi (Skaržauskienė et al., 2022).

Dunque, l'utilizzo di strumenti di intelligenza artificiale (AI) può attenuare le difficoltà legate a questi aspetti per il "sistema porto turistico", contribuendo al monitoraggio ambientale, alla gestione dei flussi e all'utilizzo degli ormeggi, alla previsione della domanda e alla trasparenza dei dati, facilitando decisioni più informate e sostenibili (Ioras e Bandara, 2025). Al contempo, la letteratura mostra anche che gli strumenti tecnologici basati su AI, non sono sufficienti a garantire una governance efficiente che implementa scelte sostenibili. Fiducia, partecipazione e dialogo con gli stakeholder, sono elementi fondamentali per supportare l'innovazione sostenibile, che altrimenti rischia di produrre resistenze e squilibri istituzionali (Battistella et al., 2018; Benevolo & Spinelli, 2022).

Alla luce di queste evidenze, lo stakeholder engagement emerge come una condizione abilitante per la governance sostenibile nei porti turistici. Gli stakeholder che orbitano intorno a tale contesto devono essere considerati co-produttori di valori e non semplici destinatari di decisioni top-down (Georgopoulos et al., 2025). Infatti, in linea con Luoma et al. (2017), dialogo costante e strumenti di comunicazione condivisa risultano fondamentali per promuovere obiettivi di sostenibilità nei contesti portuali.

La letteratura di riferimento ha analizzato in modo approfondito, sia nei porti commerciali che in quelli turistici, le dimensioni tecniche e ambientali della sostenibilità, soffermandosi in particolare sugli strumenti di monitoraggio ambientale e sui meccanismi di gestione delle performance ecologiche (Martínez-Vázquez et al., 2021; Angelopoulos, Leonardou & Pallis, 2022; Spinelli & Benevolo, 2022).

Ciononostante, emerge un gap significativo. Considerando quanto detto, la letteratura sui porti turistici ha trascurato il modo in cui le pressioni istituzionali (Di Maggio & Powell, 1983; Scott, 2008), impattano sulla sostenibilità sociale che, coadiuvata dagli strumenti di AI, si riflette sull'efficienza della governance di tali organizzazioni.

In questa prospettiva, il "sistema porto turistico" di Maratea (Basilicata, PZ) rappresenta un contesto di ricerca emblematico. A seguito della recente scadenza delle concessioni dei servizi in area portuale e alla sua aggiudicazione da parte di una società privata di recente costituzione,

l'infrastruttura si trova in una fase di transizione, in cui la nuova gestione non è ancora pienamente operativa.

2. Scopo della ricerca

Il presente studio si configura come un work in progress esplorativo, volto a interpretare come la dimensione sociale della sostenibilità, con particolare attenzione allo stakeholder engagement e al ruolo dell'intelligenza artificiale, si combini per supportare la transizione della governance dei porti turistici, contribuendo a migliorare l'efficienza complessiva dei servizi erogati. Tale costrutto potrebbe essere rappresentato nel caso individuato. Nel contesto dei porti turistici, l'interconnessione tra Institutional Theory (Di Maggio & Powell, 1983; Scott, 2008) e Stakeholder Theory (Freeman, 1984), orientata alla dimensione sociale della sostenibilità e all'adozione dell'AI, non è stata ancora pienamente esplorata.
L'indagine proposta è volta a fornire un'ulteriore visione sul tema, con l'auspicio di comprendere come, date le pressioni istituzionali, AI e stakeholder engagement interagiscono nel determinare l'efficienza della governance portuale.
Alla luce di queste considerazioni, l'obiettivo è condurre un'analisi integrata dei suddetti fattori, articolata attorno alla seguente domanda di ricerca.
RQ1: Come l'interazione tra AI e sostenibilità nella dimensione dello stakeholder engagement può migliorare l'efficienza complessiva della governance portuale?

3. Metodologia

Questo studio adotta il disegno di caso singolo illustrativo (Yin, 2015), volto a comprendere come le pratiche di stakeholder engagement e l'adozione di AI possano determinare un miglioramento dell'efficienza della governance portuale, nella cornice della Stakeholder Theory (Freeman, 1984) e della Institutional Theory (Di Maggio e Powell, 1983; Scott, 2008).

Si è ritenuto che la scelta di analizzare un singolo caso studio, anziché procedere con un'analisi di più entità, fosse più adatta all'indagine da condurre in quanto ciò consente uno studio più approfondito e contestualizzato delle dinamiche tra i diversi stakeholder che orbitano intorno all'oggetto di indagine (Dyer & Wilkins, 1991).

Tale metodologia si rivela particolarmente idonea per indagare fenomeni complessi e fortemente dipendenti dal contesto (McCutcheon & Meredith, 1993), offrendo una singolare ricchezza interpretativa, in linea con la tradizione qualitativa interpretativa (Eisenhardt, 1989).

La scelta del porto turistico di Maratea (Basilicata, Pz) risponde a criteri di rilevanza teorica e pragmatica. Infatti, il caso rappresenta un contesto di transizione istituzionale, a seguito della scadenza delle concessioni portuali e dell'assegnazione a una nuova società privata non ancora pienamente operativa. Questa fase di cambiamento offre un'opportunità utile per analizzare come la governance portuale si adatti e ridefinisca la propria visione alla luce delle pressioni istituzionali e alle nuove sfide legate alla sostenibilità e alla digitalizzazione.

L'analisi adotta una prospettiva estesa al "sistema porto turistico di Maratea", includendo non solo l'infrastruttura portuale in senso stretto, ma anche i servizi collaterali e le attività economiche e sociali che gravitano intorno ad essa. Tale approccio consente di cogliere la complessità del network locale e di comprendere come le pratiche di governance e di innovazione tecnologica influenzino l'intero ecosistema di servizi connessi al porto.

Seguendo l'approccio di Rahmadian et al. (2023), lo studio ha l'obiettivo di illustrare come la creazione di valore relazionale e la legittimazione istituzionale possano essere favorite da pratiche di cooperazione, sostenute dall'utilizzo di strumenti digitali ed in particolare dall'utilizzo dell'AI.

In linea con la letteratura esistente (Yin, 1994; 2003), il processo di raccolta dei dati avverrà in due fasi.

Nella prima, saranno condotte interviste semi-strutturate con i principali stakeholder coinvolti nella gestione del "sistema porto": i membri della nuova società concessionaria, i rappresentati delle istituzioni, gli operatori turistici, le associazioni locali, i residenti, i diportisti e i gestori di attività commerciali, che hanno forti legami con il sistema porto turistico di Maratea. Le interviste, di durata media variabile, saranno registrate e saranno strutturate sulla base di domande guida, definite collettivamente dai ricercatori, presentate a ciascun intervistato, seguendo un ordine flessibile per incoraggiare un dialogo spontaneo e una narrazione libera e approfondita.

Le aree tematiche centrali verteranno sui temi della governance istituzionale e dei processi aziendali, sullo stakeholder engagement e sul capitale relazionale, sull'adozione dell'intelligenza artificiale e degli strumenti digitali e infine, sulla sostenibilità e sugli impatti ambientali e sociali nel contesto di studio.

Successivamente, le interviste saranno integralmente trascritte e rese anonime per garantire la riservatezza dei partecipanti.

Nella seconda fase, a completamento delle interviste, sarà condotta un'analisi documentale di fonti secondarie tra cui: bandi di gara, regolamenti e articoli di stampa. Allo stesso tempo, parte del team dei ricercatori coinvolti, osserverà in maniera diretta pratiche di interazioni tra i diversi stakeholder.

La triangolazione tra dati primari e secondari (Patton, 1980), consentirà di garantire validità agli elementi raccolti e sarà seguita dalla codifica tematica delle informazioni raccolte (Miles, 1994).

Inoltre, il coinvolgimento di più ricercatori arricchirà l'analisi, in quanto la diversità delle prospettive migliorerà l'interpretazione dei dati e la convergenza delle osservazioni, rafforzandone la credibilità (Eisenhardt, 1989).

4. Risultati attesi

L'analisi del caso oggetto di studio metterà in luce un processo di transizione istituzionale, nel quale, ci si attende, che l'efficienza della governance del sistema porto turistico di Maratea derivi da un equilibrio dinamico tra dimensioni istituzionali (Di Maggio & Powell, 1983; Scott, 2008), relazionali (Freeman, 1985) e tecnologiche, che interrelate tra loro, possano favorire la costruzione di un sistema di governance portuale efficiente e orientato alla sostenibilità.

Come illustrato in figura 1, si ipotizza che i meccanismi abilitanti, espressi nell'interazione tra stakeholder engagement e AI, emergano come risposta alle pressioni istituzionali e alle aspettative degli stakeholder. Si prevede, dunque, che il contesto istituzionale e le esigenze degli attori coinvolti, non vengano recepite dalla governance portuale in modo passivo, bensì rappresentino una linea guida fondamentale per la costruzione di una strategia futura ottimale, che sia capace di coniugare legittimazione sociale e apertura verso nuove modalità di coordinamento.

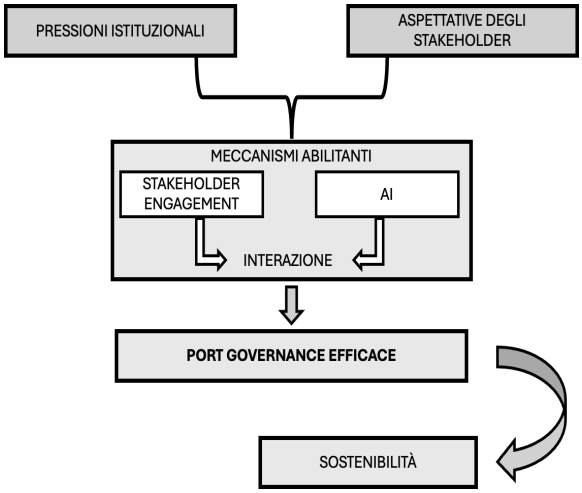


Figura 1. Modello integrato per l'efficacia della governance portuale

Sul piano tecnologico, l'AI è destinata a diventare un valido strumento, a disposizione della nuova governance, capace di monitorare una vasta gamma di dati. Tuttavia, essa non può assurgere a elemento sostitutivo della componente umana (Dağıstan et al., 2025) anche se l'utilizzo di strumenti digitali non potrà che migliorare la condivisibilità e la verificabilità dei dati, riducendo le asimmetrie informative tra governance e stakeholder. Questo processo potrebbe produrre risultati tangibili come indicatori chiari e tracciabilità delle decisioni, contribuendo ad alimentare la fiducia da parte degli stakeholder nella nuova governance portuale.

Parallelamente, sul piano relazionale, ci si attende che il livello d'impiego degli attori interessati, passi da una condizione passiva a un approccio di ascolto che prevede il consulto degli stakeholder da parte della governance del sistema porto turistico di Maratea (Gao & Zhang, 2006). Dunque, si auspicano forme di cooperazione e co-decisione come: tavoli periodici, feedback costanti con operatori e diportisti, analisi congiunte sugli indicatori potenziati dall'utilizzo dell'AI. In contesti come i porti turistici, dove le percezioni sulla sostenibilità sono spesso eterogenee, la condivisione strutturata delle informazioni è essenziale per allineare gli obiettivi e ridurre i fraintendimenti (Luoma et al., 2017).

Si auspica che strumenti digitali supportati da AI, che forniscono le basi informative e la partecipazione strutturata degli stakeholder, tradotta in dialogo sociale, si rafforzino reciprocamente.

Complessivamente, da questa interazione si prevede possa emergere un modello di governance portuale più efficiente e legittimo fondato su maggiore trasparenza, coordinamento e responsabilità condivisa, che possa offrire un esempio paradigmatico di come un piccolo contesto locale, sostenuto da strumenti digitali e processi partecipativi, sia in grado di trasformare le pressioni istituzionali in leve di innovazione sostenibile e di sviluppo territoriale.

5. Limiti della ricerca

Questo studio presenta alcune limitazioni che definiscono il campo di applicazione e ne orientano le prospettive di sviluppo future. In primo luogo, l'analisi si concentra su un singolo caso studio, il "sistema porto turistico di Maratea", per cui i risultati non possono essere immediatamente generalizzati ad altri contesti al netto di una validazione comparativa. In secondo luogo, poiché la nuova governance portuale non si è ancora insediata al momento della ricerca, non è ancora possibile osservare gli effetti dei processi di coinvolgimento degli stakeholder e dell'introduzione degli strumenti digitali basati su AI. Al contempo però, la condizione di transizione che sta vivendo il contesto di indagine offre l'opportunità di osservare in tempo reale

come questi fattori abilitanti possano contribuire a definire un modello di governance più trasparente, partecipativo e orientato alla sostenibilità. Infine, la natura qualitativa dello studio, consente futuri approfondimenti di natura quantitativa sia sul contesto in oggetto che in altri porti turistici simili.

6. Implicazioni manageriali

Dalla validazione del modello ipotizzato, risulteranno evidenti la connessione logica e l'influenza sui comportamenti e sulle scelte gestionali dei sistemi porti turistici, in grado di favorire la transizione della loro governance verso un eco-sistema efficiente. Una gestione, dunque, che tenga conto anche della sostenibilità sociale oltre che di quella ambientale, in grado di migliorare l'efficienza complessiva dei servizi resi con la creazione di valore positivo per la collettività.

Le implicazioni manageriali nell'implementazione dell'AI nella logica seguita in questo studio, possono essere diverse, tutte riconducibili e sintetizzabili nell'opportunità di riconciliare le esigenze dei diversi stakeholder. Tra queste: la creazione di un valore sociale condiviso, una gestione economica e finanziaria dei servizi offerti dal sistema porto turistico coerente con le aspettative della clientela - diportisti e non - con conseguente loro maggiore soddisfazione, time reference di medio-lungo periodo con itinerari strategici gestionali e di marketing in particolare, migliore predisposizione all'implementazione di tecnologie innovative, già da tempo utilizzate nella gestione dei porti commerciali, che a breve riguarderanno anche il diporto nautico (tracciamento degli itinerari, attenzione al trattamento dei reflui di bordo, sicurezza della navigazione).

Quanto appena indicato è considerabile in un rapporto di causa-effetto che dovrebbe guidare il management, da sempre interessato ad aumentare la soddisfazione della clientela, implementando sistemi e procedure adeguati agli assetti organizzativi delle loro imprese, dunque con investimenti anche nella formazione, soprattutto di natura esperienziale, in modo da poter disporre di quelle competenze specialistiche riconducibili all'Intelligenza Aziendale.

7. Originalità del paper

L'originalità dello studio in oggetto risiede nella prospettiva integrata e multidimensionale adottata per analizzare la governance sostenibile del "sistema porto turistico", combinando in modo innovativo l'Institutional Theory (Di Maggio & Powell, 1983; Scott, 2008) e la Stakeholder Theory (Freeman, 1984), in relazione, anche, all'adozione dell'IA. A differenza della letteratura esistente, prevalentemente focalizzata sugli aspetti ambientali e tecnici della sostenibilità (Martínez-Vázquez et al., 2021; Spinelli & Benevolo, 2022), lo studio partendo dalle pressioni istituzionali e dalle aspettative degli stakeholder, propone una lettura centrata sulla dimensione sociale della sostenibilità, interpretando stakeholder engagement e strumenti digitali basati su AI, come fattori abilitanti di una governance portuale efficiente che favorisce pratiche di gestione sostenibili e condivise. L'originalità del contributo emerge, inoltre, dal contesto di studio analizzato. Il caso del "sistema porto turistico di Maratea", attualmente in fase di transizione istituzionale, permette di osservare in modo approfondito come la governance si adatti alle sfide della sostenibilità e della digitalizzazione (Rahmadian et al., 2023; Georgopoulos et al., 2025). Il lavoro propone una visione innovativa dell'AI, non solo come strumento tecnico di monitoraggio e gestione (Ioras & Bandara, 2025), ma come leva di legittimazione sociale capace di rafforzare trasparenza, fiducia e partecipazione degli stakeholder, favorito dal dialogo tra questi ultimi e la governance portuale (Battistella et al., 2018; Benevolo & Spinelli, 2022). In questo modo, il paper contribuisce a colmare un gap significativo nella letteratura sui porti turistici, offrendo un modello interpretativo originale che connette in un quadro unitario innovazione tecnologica e sostenibilità

sociale, delineando un percorso di evoluzione verso forme di governance portuale più efficienti, inclusive e orientate allo sviluppo sostenibile (Myrovali et al., 2025; Poletan Jugović et al., 2022).

Parole chiave: Stakeholder engagement; intelligenza artificiale (AI); governance portuale; sostenibilità sociale

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Verso la sostenibilità dei sistemi turistici fragili: un framework per la gestione dei rifugi alpini

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1. Introduzione

Il turismo svolge un ruolo centrale nelle economie globali e regionali, ma il concetto di nature-based tourism evidenzia un persistente paradosso: gli stessi ambienti che attraggono visitatori sono quelli più vulnerabili alle esternalità negative generate dal turismo. Il turismo montano mondiale-secondo segmento più visitato dopo le destinazioni costiere (United Nations Environment Programme, 2007) rappresenta circa il 15–20% del valore turistico globale (Debarbieux et al., 2014) e dipende in modo critico dall'integrità del paesaggio, dalla biodiversità e dall'equilibrio ecologico.

Con l'intensificarsi della domanda, aumentano le pressioni ambientali (es. produzione di rifiuti, consumo di risorse, disturbo degli habitat), soprattutto negli ecosistemi alpini più fragili. In questo contesto, i rifugi svolgono un ruolo cruciale quali nodi di accoglienza e logistica, ma affrontano sfide specifiche: distanza, isolamento, vincoli di approvvigionamento, vincoli ambientali, stagionalità marcata e profili eterogenei dei visitatori. Queste caratteristiche complicano la gestione, amplificando rischi e trade-off di sostenibilità.

È in questo quadro concettuale e pragmatico che il presente work in progress propone un quadro analitico integrato per interpretare i rifugi alpini come organizzazioni ibride, considerando sia la loro missione di interesse pubblico (riparo, sicurezza, tutela del territorio), sia le attività orientate al mercato (servizi di ospitalità, generazione di ricavi) (Brandsen e Karrè, 2011).

Il concetto di "ibridazione economica", pur oggetto di un ampio dibattito (OECD, 2004) e di critiche che ne sottolineano i potenziali rischi finanziari (Koppell, 2003) e culturali (Jacobs, 1994; Bozeman, 2007) per il settore pubblico, costituisce in questa fase della ricerca uno strumento utile per analizzare i rifugi alpini lungo diverse dimensioni: la finalità (creazione di valore sociale/ambientale e sostenibilità economica); la natura dell'offerta (beni e servizi erogati); i modelli di proprietà e governance (configurazioni associative o pubblico-private, come nel caso del Club Alpino Italiano (CAI), rispetto alla proprietà privata). Tali dimensioni si manifestano in modo particolarmente evidente nelle pratiche micro-organizzative, attraverso processi di negoziazione e interazione che contribuiscono a plasmare la forma ibrida dei rifugi (Bishop e Waring, 2016).

In questa prospettiva, le organizzazioni ibride non possono essere comprese come meri enti "a metà" tra profit e non-profit: esse integrano in modo sistematico logiche di mercato e logiche della società civile, configurando una vera e propria identità organizzativa integrata (Jäger e Schröer, 2014). Muovendo da tali fondamenti teorici, ci siamo interrogati su come le organizzazioni impegnate nella gestione del turismo montano incorporino, reinterpretino e utilizzino questi concetti all'interno di uno spazio gestionale caratterizzato da confini labili e in parte intangibili.

A tal fine, abbiamo selezionato un'area che presentasse caratteristiche, materiali e immateriali, idonee a consentire un'analisi dei rifugi alpini come organizzazioni ibride anche sotto

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il profilo manageriale. In questo senso, la regione italiana del Trentino-Alto Adige/Südtirol rappresenta un caso di studio particolarmente interessante, sia dal punto di vista teorico sia da quello politico-amministrativo. I criteri che hanno guidato la scelta di questo caso sono illustrati in dettaglio nel capitolo 3.4.

Research gap e obiettivi della ricerca

Nonostante la rilevanza economica, sociale e ambientale dei rifugi alpini, la letteratura accademica è scarsa e frammentata. Gli studi esistenti raramente integrano misurazione delle performance, design della governance e dinamiche stakeholder in un'unica prospettiva di sostenibilità. Per rispondere a tale gap, gli obiettivi della ricerca sono:

- Identificare le caratteristiche intrinseche e contestuali che rendono alcuni rifugi più inclini a generare esternalità ambientali negative rispetto ad altri.
- Sviluppare uno strumento di classificazione replicabile basato su indicatori, utile per misurare le performance sostenibili, supportare disclosure non finanziarie "assurance-ready" e orientare scelte di governance a livello di rifugio e destinazione.
- Analizzare come differenti modelli di governance (es. modello associativo/pubblico-privato CAI vs. proprietà privata) influenzino performance, resilienza e pratiche di rendicontazione.

Si propone un sistema di indicatori che traduce caratteristiche fisiche e contestuali dei rifugi in misure di performance sostenibile (es. modalità di approvvigionamento, stress legato a capacità/stagionalità). La pipeline metodologica basata su FAMD e Cluster Analysis produce tipologie di rischio e un risultato sintetico che destinazioni e operatori possono utilizzare per dashboard, benchmarking e definizione di obiettivi.

Il confronto tra governance associativa/pubblico-privata (es. CAI con concessione a gestori privati) e governance privata evidenzia come le strutture organizzative condizionino l'uso delle risorse, le scelte di approvvigionamento e l'esposizione ambientale. I profili di cluster, interpretati alla luce della governance, orientano modelli di gestione adeguati per le PMI, consorzi e destinazioni che mirano a un approccio "sustainability-by-design".

Lo studio mira a supportare processi decisionali partecipativi basati su indicatori, allineando la pratica manageriale con aspettative degli stakeholder e limiti ambientali.

Attualmente il progetto fornisce: (i) un dataset curato a livello di singolo rifugio e una mappatura geospaziale del Trentino-Alto Adige; (ii) una specificazione FAMD e (iii) una logica di clustering per la suddetta profilazione.

Le attività in corso includono verifiche di robustezza (pesi alternativi, sensibilità delle variabili) e approfondimenti sulla governance tramite interviste, utili a raffinare la rappresentazione e orientare decisioni innovative informate dagli stakeholder.

2. Letteratura

2.1. Il contesto montano e le sue fragilità

Le montagne sono ampiamente concettualizzate come sistemi socio-ecologici fragili, nei quali limiti ambientali e attività umane sono strettamente interconnessi (Nyaupane e Chhetri, 2009). La geomorfologia-pendenze elevate, altitudine, dinamiche geologiche attive e condizioni climatiche severe-comporta una forte esposizione a rischi quali erosione, frane, valanghe, alluvioni e perdita di biodiversità (Jodha, 2001; Nepal e Chipeniuk, 2005). Questa fragilità intrinseca limita la capacità di carico, pur contribuendo all'attrattività dell'area, entro soglie sostenibili per ecosistemi e infrastrutture (Sharma, 2000). In tale contesto, crescita del turismo, comportamenti dei visitatori e gestione dei rifugi interagiscono in modo complesso. La diversità dei paesaggi, la stagionalità e le esperienze basate sulla natura costituiscono i principali fattori di attrattività delle destinazioni montane (Zuzana e Zuzana, 2015).

2.2. Turismo montano

Negli ultimi dieci anni il turismo montano ha subito un'espansione a livello globale (Moss et al., 2009; Pröbstl-Haider et al., 2016; Bertocchi et al., 2021) rendendo la destinazione montana la seconda tipologia di meta più visitata subito dopo le zone costiere (UNEP/PNUMA, 2007; Zuzana e Zuzana, 2015), contribuendo per circa il 15–20% al turismo globale, con un valore economico stimato tra i 70 e i 90 miliardi di dollari l'anno (Taher et al., 2015). Le Alpi europee da sole generano circa il 7–10% dei ricavi turistici globali nel 2002 (Duglio e Beltramo, 2019).

Nelle Alpi, la posizione centrale e l'aumento dell'accessibilità-reti stradali, impianti di risalita, e-bike-hanno ridotto gli attriti spazio-temporali (Paunović e Jovanović, 2017; Bausch e Gartner, 2020) favorendo la frequentazione da parte dei visitatori nei luoghi più popolari (inclusi i rifugi) rendendoli così delle mete iconiche (Río-Rama et al., 2019; Eurostat, 2025; Becken e Hay, 2008; Duglio e Beltramo, 2019). Tale aumento di accessibilità ha determinato un notevole incremento dei visitatori persino verso rifugi di alta quota una volta difficili da raggiungere, generando impatti ambientali significativi (Becken e Hay, 2008). La concentrazione del turismo di massa in poche aree alpine solleva interrogativi urgenti per lo sviluppo e la gestione sostenibile (Eurostat, 2025). Di conseguenza, la crescente facilità con la quale è ad oggi possibile raggiungere mete che in passato erano considerate proibitive, ha anche modificato i profili dei visitatori e i modelli di consumo. Rifugi un tempo frequentati prevalentemente da alpinisti che spesso richiedevano più giornate, ora accolgono una clientela eterogenea-famiglie, escursionisti giornalieri, mountain biker e visitatori "casuali" alla ricerca di natura e cucina locale (Zuzana e Zuzana, 2015; Río-Rama et al., 2019). I soggiorni sono più brevi, i picchi più intensi e le aspettative in termini di comfort e varietà di menù più elevate (Goymann et al., 2008). Questi cambiamenti influenzano la gestione, portando spesso ad una sovraproduzione durante i pasti e generando ingenti consumi di energia, acqua e rifiuti (Zuzana e Zuzana, 2015). Inoltre la domanda è altamente variabile-solitamente con picchi estivi e talvolta invernali-e richiede flessibilità nella gestione in risposta a incertezze climatiche, vincoli ambientali e regolamentari.

2.3. Turismo montano, esternalità negative e ruolo della governance

La combinazione di norme di libero accesso e la concentrazione del flusso di visitatori, amplifica le esternalità negative quali sovraffollamento, erosione dei sentieri, disturbo della fauna e accumulo di rifiuti, soprattutto nelle aree d'alta quota più sensibili (Demirović et al., 2017; Nepal, 2002). Nei rifugi, l'elevata densità di visitatori trasforma la normale ospitalità in gestione dei picchi: approvvigionamenti limitati, scarsità di acqua ed energia e percorsi di smaltimento dei rifiuti fortemente vincolati vengono facilmente messi sotto pressione durante i periodi di maggiore affluenza (Becken e Hay, 2008). Le risposte gestionali sono cruciali ma eterogenee, variando in funzione delle caratteristiche strutturali, della fragilità ambientale e del contesto istituzionale. L'obiettivo è identificare le caratteristiche strutturali e contestuali che rendono un rifugio potenzialmente più impattante di un altro e sviluppare un metodo per classificare e valutare la probabilità di generazione di esternalità negative. Di conseguenza, raggruppiamo i principali determinanti della pressione ambientale in quattro criteri: dimensione, localizzazione, vincoli e governance (Asadi et al., 2020; Demirović et al., 2017; Billis, 2010 Nepal, 2002; Boyd et al., 2009).

Il rifugio alpino come organizzazione ibrida

La governance risulta un aspetto centrale a causa della natura organizzativa complessa dei rifugi. Originariamente concepiti come ripari, oggi offrono anche alloggio, ristorazione e una serie di comfort. Poiché devono erogare servizi essenziali generando allo stesso tempo ricavi, i rifugi

possono essere concettualizzati come organizzazioni ibride, al crocevia tra modelli for-profit e non-profit (Haigh e Hoffman, 2014).

L'ibridità, realtà analitica inerente alla loro struttura e funzione (Boyd et al., 2009), si manifesta secondo tre dimensioni:

- Finalità organizzativa: bilanciare missione sociale (riparo e ospitalità) con obiettivi di redditività.
- Natura dell'offerta: combinazione di beni e servizi (Lusch e Vargo, 2011).
- Proprietà e governance: modelli privati, cooperativi o pubblici (Boyd et al., 2017; Billis, 2010).

In Italia, i rifugi alpini rientrano nella legislazione turistica generale (Legge 135/2001), tuttavia non esiste una regolamentazione nazionale organica che disciplini in modo unitario la loro costruzione e gestione. Parallelamente, la recente crescita economica delle aree montane, insieme a un aumento della sensibilità sociale e ambientale verso tali territori, ha stimolato un rinnovato interesse da parte delle amministrazioni pubbliche. Ciò ha favorito l'adozione di nuovi provvedimenti orientati alla tutela e alla valorizzazione dell'ambiente naturale e del patrimonio culturale locale. In particolare, la Legge 131 del 2025 prevede l'attuazione di interventi finalizzati allo sviluppo socio-economico, alla salvaguardia e alla valorizzazione delle specificità dei territori montani, promuovendo processi di crescita coerenti con le caratteristiche locali in diversi settori -tra cui il turismo e la valorizzazione del patrimonio culturale e ambientale-e incoraggiando la riduzione del consumo di suolo. Un elemento di rilievo introdotto da questa recente normativa è il riconoscimento della specificità dei territori montani e la promozione del loro sviluppo sostenibile quale fattore essenziale per il perseguimento di obiettivi comuni di coesione e sostenibilità territoriale.

All'interno di questo quadro normativo generale, spetta alle singole regioni e province autonome definire disposizioni specifiche relative alle caratteristiche funzionali dei rifugi (comprese le modalità di smaltimento, gli impianti, i requisiti igienico-sanitari minimi) calibrandole in base alla capacità ricettiva e alle condizioni ambientali dei luoghi (Legge 131/2025, art. 21). Tale competenza decentrata produce un contesto regolatorio frammentato e talvolta ambiguo, che può complicare i processi decisionali e gestionali.

In questo scenario irregolare e disomogeneo emerge l'esigenza di delineare un quadro di riferimento chiaro e sintetico per la gestione dei rifugi di montagna e trasversalmente del comparto turistico montano. In tale prospettiva, risulta utile analizzare le differenti forme di governance che influenzano in modo significativo la capacità di gestione di queste organizzazioni ibride:

- Governance associativa / pubblico–privata: associazioni come il Club Alpino Italiano (CAI) o l'Alpenverein Südtirol (AVS), in quanto enti pubblici non economici, possiedono numerosi rifugi che vengono spesso affidati in gestione a operatori privati. Questo modello consente di bilanciare la sostenibilità economica, garantita dalla gestione privata, con finalità sociali e ambientali, tutelate attraverso lo statuto e la supervisione dell'associazione.
- Governance privata: i rifugi di proprietà privata sono gestiti direttamente dai titolari, che mantengono pieno controllo strategico e operativo. In assenza di una supervisione associativa, tali strutture si conformano esclusivamente alla normativa nazionale e regionale, godendo di maggiore autonomia ma richiedendo una più elevata capacità di adattamento alle condizioni locali.

Concepire i rifugi come organizzazioni ibride consente di comprendere come differenti sistemi di governance e gradi di autonomia manageriale possano incidere sulle pratiche di sostenibilità e sulla generazione potenziale di esternalità positive.

Indicatori per la valutazione delle esternalità

Basandoci sulla letteratura, definiamo un set di criteri e indicatori per stimare la potenziale generazione di esternalità ambientali negative di un rifugio di montagna da una prospettiva manageriale (Malkina-Pykh, 2002).

Criterio	**Indicatore**	**Misura**
Dimensione	Capacità ricettiva	Numero di posti letto
	Stagionalità	Apertura su una stagione o più
Vincoli	Notorietà	Appartenenza area UNESCO
	Restrizioni	Area di rilevanza naturale (Parchi, aree protette)
	Approvvigionamento	Modalità di approvvigionamento materie prime
Localizzazione	Altitudine	Metri s.l.m.
	Distanza	Tempo minimo di cammino
Governance	Giurisdizione	Provincia
	Regime normativo	Tipo di governance

Tabella 1.

Questi indicatori supportano la classificazione e la valutazione comparativa della pressione ambientale dei rifugi, collegando caratteristiche strutturali e contestuali al potenziale livello di esternalità.

Questo studio in corso analizza i rifugi alpini nel più ampio contesto del turismo montano, adottando la teoria delle organizzazioni ibride come lente concettuale. L'obiettivo è comprendere:

- quali caratteristiche intrinseche e contestuali accrescono il potenziale di generazione di esternalità ambientali;
- come tali caratteristiche possano essere tradotte in un framework di misurazione e rendicontazione della sostenibilità "assurance-ready", utile alle decisioni e adattabile a diversi modelli di governance.

3. Metodologia

3.1. Research design e finalità

Sulla base della revisione della letteratura, che definisce le aree montane come sistemi socio-ecologici fragili e i rifugi alpini come organizzazioni ibride esposte a flussi turistici concentrati, lo studio analizza come le caratteristiche strutturali e contestuali dei rifugi influenzino il loro rischio di generare esternalità ambientali negative. L'obiettivo generale è duplice:

(i) sviluppare un metodo replicabile per valutare il rischio potenziale di esternalità negative ambientali tra diverse tipologie di rifugi; e (ii) tradurre i risultati in uno strumento di supporto decisionale utile a enti pubblici e gestori per orientare il turismo montano verso la sostenibilità.

Per tale finalità, la ricerca procede in due fasi integrate:

- Fase 1: Mappatura sistemica e classificazione desk-based. Si costruisce un censimento dei rifugi nell'area di studio, li si geolocalizza per l'identificazione spaziale, e si estraggono le caratteristiche strutturali per categorizzarli secondo gli indicatori definiti dalla letteratura (dimensione, localizzazione, governance, vincoli). Questa fase fornisce la base analitica per la valutazione del rischio ambientale e l'ossatura dello strumento decisionale.
- Fase 2: Analisi multivariata e clustering. Si applica la Factor Analysis of Mixed Data per individuare le strutture latenti che guidano il rischio di esternalità, seguita dalla Cluster Analysis per raggruppare i rifugi in profili omogenei. Questi risultati alimentano un indicatore sintetico interpretabile e generano insight utili per la governance.

3.2. Contesto e teoria

Sebbene le implicazioni ambientali, sociali ed economiche del tema siano considerevoli, la letteratura scientifica sui rifugi alpini è limitata. Una ricerca esplorativa su Scopus (Duglio e Beltramo, 2025) con un ampio set di parole chiave ha restituito solamente 54 pubblicazioni (40 articoli, 9 paper da conferenze, 3 capitoli di libro, 2 review) riguardanti i rifugi alpini, dal 1980 ad oggi (con un picco nel 2022). Con questo studio vogliamo porre un mattoncino che possa fornire una solida base per la letteratura in essere e per le prossime ricerche.

Dal disegno teorico del presente studio si sintetizzano evidenze di vulnerabilità ambientale, diversità paesaggistica e sistemi di governance, lasciando che relazioni e pattern ricorrenti (Babbie, 2007; Denzin, 1978; Polit, Beck e Hungler, 2003) guidino raccolta e analisi dei dati. Le categorie concettuali (dimensione, localizzazione, governance, vincoli) sono pertanto operative e non meramente descrittive.

3.3. Domanda di ricerca

Partendo dall'assunto che gli ambienti montani possiedono bassa capacità di carico, accessibilità limitata ed elevata esposizione climatica, indaghiamo:

- Quali caratteristiche intrinseche e contestuali dei rifugi determinano un rischio maggiore di generazione di esternalità ambientali negative?
- Come tali caratteristiche possono essere tradotte in un framework di misurazione e rendicontazione della sostenibilità "assurance-ready", utile alle decisioni e adatto a diversi modelli di governance?

Queste domande si concentrano sull'interdipendenza ambiente-uso e focalizzano l'analisi sul rischio potenziale, non sugli impatti effettivamente misurati.

3.4. Caso di studio: Trentino-Alto Adige/Südtirol

Il contesto empirico di questa ricerca è il Trentino-Alto Adige/Südtirol, comprendente le Province autonome di Trento e Bolzano, un territorio classificato come interamente montano (ISTAT, 2018). L'area rappresenta un laboratorio storico per l'evoluzione del turismo alpino organizzato e ospita numerosi siti di rilevanza ambientale e culturale, tra cui aree riconosciute come Patrimonio UNESCO e un'estesa rete di parchi naturali. Tra questi, spicca il Parco Nazionale dello Stelvio, uno dei più antichi e vasti d'Italia (130.734 ha), affiancato da ulteriori riserve e aree protette di interesse internazionale.

Il territorio è caratterizzato da una lunga tradizione di rifugi alpini, nati originariamente come semplici ricoveri e gradualmente trasformatisi in vere e proprie infrastrutture ricettive (Provincia

Autonoma di Trento, 2018; 2020; SAT, 2022). Questa evoluzione ha accompagnato, e in parte stimolato, la crescita del turismo alpino, che nel tempo si è affiancato e sovrapposto alle pratiche alpinistiche e sportive, ampliando la funzione sociale e ricreativa dei rifugi. Tale processo è stato ulteriormente accelerato dallo sviluppo tecnologico e infrastrutturale, che ha reso la montagna più accessibile attraverso impianti di risalita, nuove strade, rete di sentieri attrezzati, e-bike e altre forme di mobilità dolce. L'aumento dell'accessibilità ha prodotto un incremento significativo dei flussi turistici, rendendo la regione una destinazione altamente attrattiva ma anche soggetta a picchi di frequentazione che esercitano pressioni rilevanti sulle infrastrutture dei rifugi e sugli ecosistemi alpini.

Oggi i rifugi del territorio servono una domanda estremamente eterogenea e costituiscono un punto di riferimento nella gestione delle risorse in alta quota. Essi incarnano, allo stesso tempo, modelli di sostenibilità, presidi culturali, nodi logistici e catalizzatori di esperienze turistiche. Per queste ragioni, il Trentino-Alto Adige/Südtirol rappresenta un caso emblematico per analizzare la tensione tra sviluppo economico, sostenibilità ambientale e preservazione dell'identità culturale alpina (Associazione Rifugi Trentino, 2025; Dini et. al, 2020).

La scelta di questo caso di studio non è dettata da considerazioni di convenienza o prossimità, bensì da una motivazione analitica precisa. Il territorio si configura come un case study intenzionale, particolarmente adatto a indagare fenomeni complessi legati alla gestione dei rifugi alpini in contesti ad alta intensità turistica. La regione, infatti, combina in modo unico una forte pressione turistica, una ricca tradizione alpinistica, una struttura istituzionale peculiare e una significativa varietà di modelli gestionali. Queste caratteristiche la rendono un ottimo case study per osservare come le organizzazioni di alta quota affrontino sfide ibride legate alla sostenibilità, alla governance e alle dinamiche socio-ambientali.

3.5. Raccolta dati e sistema di indicatori

Poiché l'obiettivo è valutare il rischio potenziale di esternalità ambientali, l'analisi si concentra su dimensioni collegate e correlate a tale contesto, favorendo replicabilità e comparabilità tra contesti montani differenti.

I dati a livello di singolo rifugio sono scarsi e spesso aggregati a livello amministrativo.

Di conseguenza, abbiamo integrato cinque tipologie di fonti (associazioni, statistiche provinciali/comunali, registri ufficiali, siti web dei rifugi, dataset geospaziali) per costruire un dataset consolidato di 245 rifugi in Trentino-Alto Adige/Südtirol, ovvero il 76% di tutti i rifugi presenti in quest'area.

Indicatori

Guidati dalla letteratura e dalla fattibilità empirica, gli indicatori sono raggruppati in quattro criteri:

- Dimensione: capacità ricettiva (numero letti), stagionalità (apertura per una stagione o più stagioni).
- Localizzazione: altitudine (m s.l.m.), distanza (tempo minimo di cammino).
- Vincoli: notorietà (appartenenza a sito UNESCO), tutela (area di rilevanza naturale), approvvigionamento (modalità).
- Governance: giurisdizione (provincia), regime normativo (tipo di governance).

Gli indicatori hanno pesi uguali perché misurano caratteristiche strutturali e fisiche, non comportamenti gestionali.

Il sistema rappresenta un compromesso pragmatico tra rilevanza teorica e disponibilità dei dati.

3.6. Metodo analitico: FAMD e Cluster Analysis

In linea con le best practice sui sistemi di indicatori compositi (Saisana e Tarantola, 2002; Nardo et al., 2005), evitiamo di predefinire una regola di aggregazione "ottimale". Seguiamo invece una strategia multivariata in due fasi:

- Factor Analysis of Mixed Data (FAMD) - Riduce la dimensionalità, estraendo componenti che sintetizzano la varianza di variabili quantitative e qualitative.
- Cluster Analysis - Raggruppa i rifugi in base alla vicinanza nello spazio fattoriale, individuando cluster omogenei con caratteristiche strutturali e contestuali simili e quindi rischio potenziale simile.

3.7. Dall'analisi alla decisione

Il censimento, la mappatura e la categorizzazione forniscono lo "spazio decisionale": quali rifugi esistono, dove si trovano e con quali attributi.

La pipeline FAMD–cluster permette di trasformare quello spazio in:

- Tipologie di rischio (cluster) per guidare interventi mirati (es. logistica degli approvvigionamenti, manutenzione sentieri, gestione dei flussi).
- Indice sintetico utilizzabile da gestori ed enti pubblici per scenari di simulazione (es. come varia il rischio modificando accesso o capacità).
- Base per dashboard di monitoraggio integrabili successivamente con metriche gestionali/comportamentali per supportare reporting di sostenibilità a livello di rifugio e destinazione.

I risultati riflettono dati disponibili e misurano il rischio potenziale, non impatti effettivi. Le categorie di governance sono semplificate per migliorare comparabilità; approfondimenti futuri potranno esplorare sfumature istituzionali più fini.

4. Ricerche future

Questo paper in lavorazione costituisce la base per studi successivi. Partendo dall'analisi condotta, proponiamo un metodo che, sulla base di un insieme di variabili statisticamente rilevanti, identifica le organizzazioni ibride (rifugi alpini) con maggiore rischio potenziale di generare esternalità ambientali negative.

Come osservato, il modello considera intenzionalmente attributi strutturali e manageriali dei rifugi.

Tuttavia, dal punto di vista delle esternalità, i comportamenti lato offerta e lato domanda influiscono in modo determinante sulla performance di sostenibilità dei rifugi.

Le prossime fasi del programma di ricerca affronteranno pertanto tali dimensioni comportamentali, riconoscendo la sfida operativa e ambientale ricorrente nelle strutture di alta quota e considerando le diverse tipologie di governance.

Parole chiave: Turismo montano; organizzazioni ibride; misurazione delle performance di sostenibilità; modelli di governance; FAMD; cluster Analysis

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Imprenditrici e donne manager come driver di sostenibilità sociale nelle imprese del settore hospitality. Percorsi di carriera e paradossi di genere tra cambiamento e tradizione

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1. Introduzione

La disparità di genere nel settore turistico e dell'ospitalità assume tratti peculiari. Infatti, nonostante l'elevata partecipazione femminile alla forza lavoro, con il 54% di donne sul totale globale (UNWTO, 2019), permane il cosiddetto divario di genere nella leadership (Pritchard & Morgan, 2017), che riflette una ben nota dinamica di segregazione verticale (Baum, 2013). Oltre al cosiddetto fenomeno del "soffitto di cristallo", le evidenze empiriche su studi internazionali mostrano anche una persistente segregazione orizzontale (Campos-Soria et al., 2011), ovvero una sovra-rappresentazione delle donne in occupazioni specifiche che riflettono i ruoli domestici tradizionali (ad esempio, housekeeping e pulizie). Questi fenomeni si traducono in opportunità mancate per lo sviluppo del settore hospitality, minori opportunità di carriera per le donne e, in ultima analisi, rappresentano un ostacolo al raggiungimento degli Obiettivi di Sviluppo Sostenibile delle Nazioni Unite (cfr. SDG 5,8).

Per comprendere il contributo delle donne allo sviluppo sostenibile delle imprese turistiche e alla riduzione del divario di genere, è fondamentale riflettere criticamente sul loro ruolo di genere, poiché questo influenza le loro decisioni e azioni all'interno dell'azienda e, in ultima analisi, la struttura organizzativa aziendale nel suo complesso (Acker, 1990). Il presente studio approfondisce due aspetti: 1) il genere e le dinamiche di empowerment nelle imprese turistiche, familiari e altre e 2) gli elementi di intersezionalità nella leadership femminile legati alla religione, all'istruzione e alla cultura delle donne leader. A questo proposito, la definizione di genere si riferisce a "un costrutto sociale e culturale che distingue le differenze nelle caratteristiche di uomini e donne, ragazze e ragazzi, e di conseguenza si riferisce ai ruoli e alle responsabilità di uomini e donne. I ruoli basati sul genere e altre caratteristiche, quindi, cambiano nel tempo e variano a seconda dei diversi contesti culturali. Il concetto di genere include le aspettative relative alle caratteristiche, alle attitudini e ai comportamenti probabili di entrambi i sessi (femminilità e mascolinità)" (UNICEF, 2017).

Il genere come una struttura sociale nell'industria dell'ospitalità

Il quadro di riferimento per il presente studio è il modello teorico "Gender as a Social Structure in the Hospitality Industry" (Segovia-Pérez et al., 2019) – che rappresenta una

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applicazione nel settore hospitality della teoria "Gender as a Social Structure" di Barbara Risman (1998). Esso si sviluppa attorno all'ipotesi che un divario di genere nello sviluppo delle carriere femminili nel settore dell'ospitalità si rifletta in almeno tre livelli di analisi: individuale, interazionale, istituzionale e intersezionale. Il livello individuale riguarda questioni personali, quali la percezione di sé e delle proprie capacità, i limiti autoimposti, le aspirazioni di carriera e il percorso formativo delle lavoratrici. Il livello interazionale si riferisce alle dinamiche relazionali del "doing gender" (West & Zimmerman, 1987), ovvero al modo in cui le interazioni quotidiane rispettano (o contraddicono) le norme di genere di una certa società. La dimensione istituzionale, infine, si riferisce alle norme e alle consuetudini radicate nella cultura organizzativa, nonché nel contesto socioculturale in cui opera l'azienda, ovvero leggi, regolamenti e politiche. Il contributo di Segovia-Pérez et al. (2019) risiede nella teorizzazione di un quarto livello di analisi nel settore dell'ospitalità: il livello intersezionale. Partendo dalla teorizzazione dell'intersezionalità di Crenshaw (1989), Segovia-Pérez et al. (2019) identificano i ruoli di genere e l'equilibrio tra vita lavorativa e vita privata come le due variabili comuni all'intersezione dei livelli di analisi individuale, interazionale e istituzionale. Nel presente contributo si intende espandere questo livello di analisi, considerando ulteriori elementi di intersezionalità sopra citati.

Inoltre, ai fini di comprendere le dinamiche di evoluzione positiva delle carriere femminili, è fondamentale fare riferimento al concetto di empowerment (Kabeer, 1999), intendendo con esso l'ampliamento della capacità delle persone, e in particolare delle donne, di compiere scelte di vita strategiche in un contesto in cui tale capacità era loro preclusa in precedenza. Kabeer (1999) distingue queste scelte strategiche come quelle fondamentali per stabilire il corso della propria vita, cioè le "grandi decisioni" che determinano la direzione dell'esistenza di una persona aprendo o precludendo percorsi che strutturano le opportunità future. Ne sono esempi non soltanto il perseguimento dell'istruzione, il matrimonio o il divorzio, ma anche le decisioni sulla fertilità e la maternità e i percorsi di carriera. Le dinamiche di empowerment vengono mobilizzate, secondo Kabeer (1999), attraverso risorse, azioni e risultati. Tra le risorse figurano: a) i beni materiali, quali reddito, proprietà e altre risorse finanziarie; e b) i beni immateriali, quali risorse umane che si manifestano sotto forma di istruzione, competenze e conoscenze; e c) le risorse sociali, che possono essere reti, relazioni e connessioni. L'azione è al centro dell'empowerment con la sua capacità di definire i propri obiettivi, andando oltre le nozioni convenzionali di processo decisionale, e includendo la contrattazione, la negoziazione, la resistenza, la manipolazione, la sovversione e persino l'inganno. Infine, i risultati colgono la misura in cui l'empowerment viene realizzato. I risultati non si limitano a quelli materiali o finanziari, sebbene questi siano i più visibili e misurabili. Possono anche manifestarsi in contesti relazionali o sociali, ad esempio acquisendo influenza nella comunità, svolgendo il ruolo di mentori o contribuendo allo sviluppo delle politiche. Tali risultati possono anche essere profondamente interiori, come ad esempio il rafforzamento della fiducia in se stessi, l'acquisizione di indipendenza o lo sviluppo del rispetto verso se stessi.

Alla luce delle evidenze riportate, il presente studio mira a rispondere alle seguenti domande di ricerca (RQ):

- In che modo il genere influenza il ruolo di leader e il percorso di empowerment delle donne nelle imprese ricettive familiari?
- Insieme al genere, quali altri elementi di intersezionalità (tra cui istruzione, religione e cultura) possono influenzare le dinamiche di empowerment femminile e contribuire alla sostenibilità sociale delle imprese turistiche?

Il tema della sostenibilità sociale emerge nel design di ricerca in modo consapevolmente implicito, facendo riferimento alle aree tematiche suggerite da UN Tourism all'interno del documento Gender-inclusive Strategy for Tourism Businesses (UNWTO, 2022) per il raggiungimento degli obiettivi di sviluppo sostenibile delle Nazioni Unite (SDG 5,8): la riduzione dei gap di genere per le lavoratrici dipendenti, il sostegno all'imprenditoria femminile, la creazione di una leadership, di politiche e di dinamiche di decision-making attente alle pari

opportunità, l'educazione e la formazione delle donne, la promozione della parità di genere anche all'interno della società civile e infine il monitoraggio delle performance in termini di parità di genere.

La considerazione delle imprese familiari nello studio e il confronto con imprese non familiari è motivata non solo dall'elevata presenza di queste ultime nel settore hospitality in Italia, ma anche dal fatto che le imprese familiari, al contrario di quelle non familiari, sembrerebbero costituire un ambiente più inclusivo per le donne (Campopiano et al., 2017; Chadwick & Dawson, 2018; Tognazzo & Gubitta, 2022), capace di integrarle in ruoli di leadership più rapidamente (Barrett & Moores, 2009) e di garantire un migliore equilibrio tra vita lavorativa e vita privata, soprattutto in zone rurali (Nickel et al., 2023; Nulleshi & Kalonaityte, 2022). Nonostante queste prime evidenze, il modo in cui i ruoli di leadership sono modellati nel tempo, insieme ai fattori individuali e sociali che influenzano questi ruoli, rimangono temi poco esplorati, motivo per il quale si giustifica lo studio.

2. Metodologia

Lo studio adotta un approccio costruttivista-interpretativo (Schwandt, 1994), che sottolinea come i percorsi professionali delle donne manager o imprenditrici possano essere compresi al meglio studiando i significati che vengono soggettivamente attribuiti alle loro esperienze e il modo in cui tali significati vengono co-costruiti all'interno delle strutture sociali e organizzative, in primis l'impresa.

Per indagare queste dinamiche sono state condotte interviste 24 semi-strutturate con donne che a) possiedono o sono comproprietarie di un'attività ricettiva turistica oppure b) ricoprono o hanno ricoperto in passato posizioni dirigenziali o esecutive di alto livello per almeno cinque anni in aziende dell'ospitalità non a conduzione familiare[7].

Nel contesto europeo e italiano, la realtà della regione Alto Adige è stata selezionata a causa della sua elevata intensità turistica, la più alta in Italia con 12 pernottamenti all'anno per abitante in esercizi alberghieri nel 2024 (ISTAT, 2025). Le Filippine sono invece una realtà particolarmente rilevante per almeno due ragioni: 1) sono una destinazione turistica emergente caratterizzata da buone performance in termini di parità di genere (ventesimo posto nel mondo e al primo posto in Asia per parità di genere secondo il Global Gender Gap Report (World Economic Forum, 2025)); 2) sono state oggetto di analisi esplorative sul ruolo delle donne nell'economia turistica e nello sviluppo territoriale sostenibile (Gutierrez, 2024). All'interno del territorio filippino, la National Capital Region è la regione più visitata (DOT, 2025) e per questa ragione è stata selezionata.

Attraverso un campionamento ragionato sono state individuate 35 potenziali intervistate in Alto Adige e 23 nelle Filippine, che sono state contattate via e-mail e/o telefono. La saturazione dei dati è stata raggiunta con 13 interviste per il campione italiano e 11 interviste per il campione filippino. La struttura del settore hospitality in Alto Adige, formata quasi esclusivamente da imprese familiari, ha portato alla selezione di imprenditrici, mentre nelle Filippine (National Capital Region), ancora una volta per motivi legati alla struttura del settore, hanno prevalso le donne in ruoli manageriali in aziende non familiari. Tra le partecipanti selezionate figurano manager, vicedirettrici, direttrici, vicepresidenti, direttrici generali e fondatrici o proprietarie di

[7] È stato richiesto un periodo minimo di cinque anni in ruoli dirigenziali per garantire che le partecipanti avessero un'esperienza sufficiente per riflettere in modo significativo sui processi di empowerment e sui percorsi di carriera. Soglie simili sono state applicate nella ricerca sulla leadership e sul turismo, dove l'anzianità di servizio è considerata un indicatore di credibilità nell'esame dei percorsi di carriera (Ladkin, 2011).

imprese ricettive. Le imprese sono tutte PMI a conduzione familiare per l'Alto Adige, mentre per la National Capital Region vi sono 4 PMI e 7 aziende divenute parte di catene alberghiere.

La scelta di casi non omogenei risulta metodologicamente giustificata alla luce della natura del presente studio. Come sottolineato da Yin (2018), lo studio di caso non è finalizzato primariamente alla generalizzazione statistica, bensì alla generalizzazione analitica, ovvero al contributo allo sviluppo, all'arricchimento o alla riformulazione della teoria. In questa prospettiva, la selezione di casi differenti tra loro non rappresenta una debolezza del disegno di ricerca, ma al contrario costituisce una strategia intenzionale per ampliare lo spettro delle evidenze empiriche osservabili. Pertanto, poiché l'obiettivo dello studio non è quello di verificare ipotesi predefinite né di individuare relazioni causali generalizzabili a un universo più ampio, bensì di esplorare fenomeni ancora poco indagati, l'eterogeneità dei casi consente di cogliere una pluralità di dinamiche, configurazioni e meccanismi che difficilmente emergerebbero da un campione omogeneo (Eisenhardt, 1989). In un disegno esplorativo come quello del presente studio la priorità è stata attribuita alla scoperta di pattern, concetti e domande di ricerca emergenti, piuttosto che alla comparabilità rigorosa tra unità di analisi. Quindi, la selezione non omogenea di casi ha risposto all'esigenza di massimizzare il potenziale euristico dello studio, favorendo l'individuazione di elementi inattesi o marginali in grado di arricchire il quadro teorico di riferimento (Eisenhardt, 1989; Yin, 2018). I risultati ottenuti non avanzano pretese di generalizzazione empirica, bensì si configurano come contributi interpretativi e concettuali, utili a stimolare ulteriori ricerche e a raffinare le categorie analitiche già presenti.

Le interviste semi-strutturate hanno consentito ai ricercatori di approfondire argomenti delicati o complessi adattandosi al flusso della conversazione (Berg & Lune, 2012). Inoltre, l'orientamento della traccia dell'intervista alle storie di vita delle partecipanti ha consentito di collocare i percorsi professionali in contesti organizzativi e culturali più ampi, evidenziando i punti di critici e i cambiamenti che hanno plasmato le storie professionali. La traccia dell'intervista, uguale per le donne italiane e filippine, era strutturata in sei sezioni: i) percorsi di carriera; ii) fattori che hanno favorito la carriera; iii) ostacoli alla carriera; iv) discriminazioni e squilibri di potere sul posto di lavoro; v) equilibrio tra vita lavorativa e vita privata; vi) osservazioni conclusive. Infine, sono state raccolte anche informazioni demografiche per fornire ulteriore contesto ai dati raccolti.

Lo studio dei dati qualitativi è avvenuto applicando un'analisi tematico-narrativa (Braun & Clarke, 2006; Riessman, 2007) integrata con un approccio di grounded theory costruttivista (Charmaz, 2006; 2014) e un'analisi qualitativa di tipo deduttivo (Gilgun, 2019). Questo ha permesso di approcciare i dati sia attraverso costrutti teorici preesistenti, individuati tramite un'ampia revisione della letteratura, sia mantenendo al contempo un'apertura ai significati e alle categorie emergenti dal campo. Inoltre, l'analisi è stata guidata da quelli che vengono definiti concetti sensitivizzanti (Bowen, 2006); ovvero quei costrutti e concetti emersi durante la revisione della letteratura esistente che hanno guidato l'analisi e le prospettive dei ricercatori. In particolare, nel presente studio ci si riferisce al modello teorico "Gender as a Social Structure in the Hospitality Industry" (Segovia-Pérez et al., 2019) e al concetto di empowerment femminile (Kabeer, 1999). Partendo da questi presupposti i ricercatori hanno inoltre assunto una posizione riflessiva e critica, coerente con la prospettiva costruttivista, che ha consentito di usare i concetti precedentemente nominati come lenti interpretative preliminari senza però che essi venissero cristallizzati in schemi rigidi, quanto piuttosto impiegandoli per orientare l'analisi lasciando spazio alla riformulazione e all'integrazione delle nuove categorie che emergevano dai dati. Dal punto di vista operativo ciò ha fatto sì che la procedura di codifica dei dati fosse condotta adottando un approccio sistematico e iterativo volto a bilanciare sensibilità teorica e apertura all'emergenza empirica (Gioia et al., 2013). In una prima fase, l'analisi è stata orientata da costrutti teorici derivati dalla letteratura di riferimento, utilizzati come cornice interpretativa iniziale. Coerentemente con l'impostazione del modello, tale cornice non ha assunto un carattere vincolante, consentendo l'emersione progressiva di categorie interpretative nuove e non previste

a priori. Operativamente, ciò ha comportato l'aggregazione delle unità testuali (le sentenze) in temi di primo ordine, formulati mantenendo un linguaggio il più possibile aderente ai dati e caratterizzati da un elevato grado di specificità descrittiva. Questi temi rappresentano il livello di analisi più prossimo all'evidenza empirica e riflettono le categorie concettuali utilizzate dagli attori o implicitamente desumibili dal materiale analizzato. In una fase successiva, attraverso un processo comparativo e riflessivo, i temi di primo ordine sono stati ricondotti a temi di secondo ordine, concettualmente più astratti e maggiormente informati dalla teoria, che esprimono il dialogo interpretativo tra dati empirici e costrutti teorici. Infine, tali temi di secondo ordine sono stati ulteriormente sintetizzati nelle dimensioni aggregate secondo il modello di Segovia-Pérez et al. (2019), capaci di integrare e strutturare i livelli precedenti, fornendo una rappresentazione complessiva e teoricamente significativa dei principali pattern emersi dall'analisi (Gioia et al., 2013). La procedura di codifica è avvenuta in una prima fase a livello manuale, successivamente sono state operazionalizzate e gerarchizzate le codifiche utilizzando il software per l'analisi di dati qualitativi MaxQDA. Di seguito si riporta una tabella (Tab. 1) che illustra il processo di codifica con un testo di esempio. Al momento dell'invio del contributo, la codifica per l'Alto Adige è stata conclusa, mentre quella per le Filippine è ancora in corso. Per questo motivo, non si è proceduto ad una quantificazione dei dati qualitativi, riportando frequenze e importanza relativa dei diversi codici.

Testo (cit.)	**Temi di primo ordine**	**Temi di secondo ordine**	**Dimensioni aggregate**
"*Naturalmente c'è sempre il pericolo… o forse non proprio il pericolo …ma lo svantaggio per noi donne è sempre, come si dice, che possiamo avere figli…e che le persone hanno sempre paura quando raggiungi una certa età e assumi una posizione di leadership*."	Maternità	Ostacoli culturali	Livello interazionale

Tabella 1. Esempio di codifica delle unità testuali

3. Aree di studio

Prima di evidenziare i risultati emersi dallo studio qualitativo, appare necessario contestualizzare brevemente il turismo come fenomeno socio-economico nelle due realtà geografiche oggetto di studio, l'Alto Adige (IT) e la National Capital Region (PH).

L'Alto Adige nel 2024 ha registrato un totale di 37 milioni di presenze turistiche, di cui 27 milioni in strutture ricettive alberghiere, a fronte di mezzo milione circa di abitanti (ASTAT, 2025). L'importanza dell'economia turistica si riflette in un contributo sostanziale del turismo all'economia locale, che rappresenta l'11,4% del PIL locale solo contando gli effetti diretti (Windegger et al., 2023). Il settore alberghiero e della ristorazione in Alto Adige impiega la maggior parte delle donne che lavorano a tempo pieno nel settore privato (37,4% di tutte le lavoratrici), ma l'Alto Adige registra ancora un divario retributivo di genere dell'11,4% (ASTAT, 2023). In termini di imprenditoria femminile nel turismo l'Alto Adige si colloca leggermente al di sopra della media nazionale: delle 7.824 imprese turistiche attive nel 2022 (incluse quelle non alberghiere), 2.851 (36,4%) erano guidate da donne (Windegger et al., 2023); in Italia la percentuale scende al 21,2% (Federalberghi, 2023).

La National Capital Region presenta una intensità turistica molto inferiore rispetto alla realtà altoatesina, con 7 milioni di pernottamenti a fronte di 14 milioni di abitanti della regione. Il

numero di strutture ricettive accreditate è pari a 469, di molto inferiore a quelle altoatesine, ma con una dimensione media molto più elevata (120 stanze per struttura). Ciò spiega la diversa natura delle aziende nelle quali lavorano le donne intervistate e la presenza di strutture grandi e hotel in catena nel campione filippino.

Indicatori sul turismo (2024)*	**Alto Adige (IT)**	**National Capital Region (PH)**
Pernottamenti in strutture ricettive alberghiere	27,042,230	7,348,669 (2024)
Strutture ricettive alberghiere	3,950	469
Camere in strutture ricettive alberghiere	77,229	56,349
Dimensione delle strutture ricettive (Numero medio di camere per struttura)	19,6	120,1
Popolazione residente	537,533 (31.12.2023)	13.934.432 (1.7.2024)

Tabella 2. Indicatori sul turismo quale fenomeno socio- economico nelle aree di studio

4. Primi risultati

I primi risultati dello studio qualitativo sono riportati nelle due tabelle sottostanti (Tab. 3 e 4). e nella figura di comparazione dei due casi (Fig. 1), che sintetizzano le variabili sopra indicate con riferimento al caso italiano e a quello filippino e operano un confronto ragionato. Il percorso analitico e comparativo non è concluso e, nei prossimi passi mira a mappare tipologie di percorsi di carriera e modelli per studiare la progressione dell'empowerment femminile.

4.1. Le imprenditrici familiari altoatesine: percorsi di carriera e di empowerment

Nel campione altoatesino, le intervistate hanno riportato un percorso di carriera particolare, per almeno due ragioni: 1) l'azienda familiare ha costituito un luogo di esperienze sin dall'infanzia, con emozioni contrastanti; 2) l'assunzione del ruolo di imprenditrice per successione intra-familiare è avvenuto spesso in modo rapido, non contemplando una progressione graduale di carriera.

Per quanto riguarda il livello di analisi individuale, in tutto il percorso di carriera le intervistate hanno menzionato di aver sperimentato una mancanza di fiducia in sé stesse e nelle proprie capacità, che ha portato a barriere autoimposte con il potenziale di impedire alcune opportunità professionali. Rafforzano questo tipo di barriere le condizioni di contesto: una tradizione rurale e un contesto culturale e religioso in cui prevale un ruolo materno per la donna. Stanti queste condizioni di contesto, il processo di empowerment riportato a livello individuale fa leva su diverse risorse: l'eredità familiare, sia in termini materiali (l'azienda e alcune role models) che immateriali (culturali, valoriali), ma anche un'istruzione specializzata, spesso avvenuta all'estero, così come la creatività come risorsa personale. Tra le attività messe in campo ai fini di un empowerment individuale, ricorre un pattern di allontanamento da famiglia e azienda e la collezione di esperienze lavorative all'estero o in contesti avulsi dal turismo.

Il momento della successione intrafamiliare è un importante tappa dell'impresa familiare (Badia, Troisio, 2025) e risulta rilevante per l'empowerment delle intervistate. Sia in caso

accettino la gestione dell'impresa familiare su prevalente invito di una figura maschile (il padre), sia che fondino una propria azienda diversa da quella familiare per evitare conflitti, le donne diventano in questo momento imprenditrici a tutti gli effetti e acquisiscono progressivamente coscienza della propria libertà di progettare l'accoglienza e l'ospitalità. Entrambi i percorsi tratteggiano un processo di graduale (o radicale) ricerca della propria identità e del proprio stile dirigenziale all'interno (o all'esterno) dell'azienda familiare di origine, anche in contrasto con gli stili delle generazioni precedenti. In particolare, si possono riscontrare nel campione delle innovazioni intraprese dalle manager per conciliare la vita familiare con la dimensione aziendale, ad es., in meirto alle aperture durante le festività. Una intervista riporta: "Abbiamo deciso fin dall'inizio che il Natale è semplicemente importante, siamo chiusi dal 24 al 27 e qui ci sono solo i familiari, gli ospiti partono il 23 e tornano il 27. Bisogna solo educarli." (Int. 2).

Nell'ambito di questo percorso di assunzione di un ruolo di leadership, le donne intervistate riscontrano una sottostima delle proprie abilità e una eccessiva modestia, che determina a volte dei limiti autoimposti, come riporta una intervistata: "Uno degli ostacoli principali è che semplicemente rendiamo la vita più difficile a noi stesse. Siamo molto più caute quando facciamo qualcosa e tendiamo a sottovalutarci. In base alla mia esperienza professionale, gli uomini affrontano le cose dicendo: "Ok, chi lo fa? Certo che lo faccio io, perché sono in grado di farlo". Le donne, invece, pensano cinque volte prima di alzare la mano e dire: "Posso farlo". Io mi includo in questo gruppo. [...] E questo è il nostro problema più grande: spesso siamo troppo modeste" (Int.1).

	Intersezionalità	**Barriere alla carriera**	**Incentivi alla carriera**	**Risorse**	**Attività**	**Risultati**
Liv. individuale	Esperienza di vita in ambito rurale Le tradizioni cattoliche plasmano le aspettative delle "buone figlie" e delle eredi	Insicurezza/scarsa fiducia in se stesse Sottovalutazione delle donne	Formazione in ambito turistico Creatività Capacità interpersonali	Eredità familiare Istruzione (specializzata in turismo/universitaria/internazionale) Creatività	Accettare o opporsi ai meccanismi di successione Avviare un'attività in proprio per evitare conflitti familiari	Fiducia Libertà di progettare la propria visione dell'ospitalità
Liv. interazione	Le norme patriarcali della famiglia e della comunità rafforzano l'idea che gli uomini siano i naturali decisori in ambito aziendale	Gli ospiti, il personale e i fornitori si rimettono all'autorità degli uomini Pressioni relative al codice di abbigliamento per le donne	Sostegno da parte delle madri e delle sorelle nella cura dei bambini Solidarietà familiare	Reti comunitarie Mentori/modelli di riferimento Sostegno familiare	Utilizzare la figura dei mariti/padri per legittimare la propria autorità con i dipendenti; adottare un abbigliamento professionale per	Legittimità sociale Mantenimento dei rapporti familiari e con gli ospiti

					acquisire credibilità.	
Liv. Istituzionale	Strutture rurali, tradizioni cattoliche e tre comunità linguistiche (tedesco, ladino, italiano)	Il senso di penalizzazione e della maternità Lavoro autonomo penalizzante Orari di lavoro lunghi e irregolari; mancanza di servizi di assistenza all'infanzia compatibili con gli orari del settore alberghiero e della ristorazione Successioni aziendali patrilineari	Normalizzazione delle innovazioni promosse dalle donne (ad esempio, orari flessibili, chiusura durante le festività, assistenza all'infanzia per il personale) Associazioni turistiche	Proprietà aziendale Partecipazione a un'associazione alberghiera/turistica Patrimonio immateriale intergenerazionale legato all'esperienza di leadership aziendale, tramandata attraverso la successione intrafamiliare Legittimazione della persona in ambito socio-culturale	Chiusura delle attività per le festività familiari; offerta di servizi di assistenza all'infanzia per il personale Integrazione dei bambini sul posto di lavoro	Sostenibilità economica Innovazione in termini di conciliazione tra vita lavorativa e privata Stabilità aziendale e miglioramento della fidelizzazione dei dipendenti.

Tabella 3. Ostacoli alla carriera, fattori abilitanti e intersezionalità dei ruoli di genere delle imprenditrici nel settore dell'ospitalità delle imprese familiari in Alto Adige

Una volta assunto il ruolo di imprenditrici, a livello relazionale si innestano, sulla base di quanto riportato, alcuni meccanismi di screditamento del ruolo di leadership: ad esempio, le intervistate riportano che gli ospiti, il personale e i fornitori si rimettono all'autorità degli uomini (mariti o padri) e non riconoscono l'autorità femminile. Ciò avviene anche ad opera degli ospiti, come riporta una intervistata: "Quindi, per esempio, se sono seduta qui [alla reception] e il mio collega è seduto accanto a me, le persone si avvicinano a me, vedono che sono disponibile e mi dicono: 'Mi scusi, ho un problema', ma poi vogliono parlare con il mio collega per risolverlo" (Int.12). Per ovviare a tali criticità, le reti familiari e associative forniscono un supporto importante: da un lato sostengono le imprenditrici creando attorno a loro le condizioni di legittimazione del ruolo e di supporto per una più serena gestione dell'equilibrio lavoro-famiglia, dall'altro permettono di attribuire un (nuovo) significato collettivamente accettato del ruolo dell'imprenditrice nella società, mettendo in discussione i tradizionali ruoli di genere. Una delle intervistate ha condiviso una strategia personale per affrontare le situazioni di screditamento del proprio ruolo da parte dei dipendenti, dicendo: "Molto spesso scelgo la via più facile e uso la scusa 'mio marito ha richiesto che fosse così' quando le cose non funzionano, anche se mio marito non ne sa nulla. Ricorro spesso a questa scusa perché penso: perché dovrei sprecare un'ora a discutere quando tanto non funzionerà?" (Int.1) Un'altra intervistata ha rivelato una tattica simile, riportando di dire ai propri dipendenti che "sta arrivando il capo" (Int.3), riferendosi al marito, anche se è lei stessa a dirigere l'azienda.

Infine, a livello istituzionale, l'intervento e il supporto delle istituzioni sono avvertiti come fondamentali e al tempo stesso deficitari. La maggior parte delle donne riferisce infatti di assumersi la responsabilità primaria della cura dei figli e dei parenti anziani, in assenza di un supporto istituzionale adeguato (in particolare, di servizi di assistenza all'infanzia compatibili con gli orari del settore alberghiero e della ristorazione). Per far fronte al lavoro di cura, molte accettano una necessaria riduzione dell'orario di lavoro e beneficiano ancora una volta del sostegno familiare. In alternativa, optano per il multitasking, normalizzando la gestione dei propri figli all'interno della struttura ricettiva con una stressante sovrapposizione tra i doveri e i ruoli professionali e di cura. Una intervistata riporta: "[...] i nostri figli sono cresciuti nell'hotel. Potevano andare a nuotare, erano sempre nei paraggi e anche noi eravamo sempre lì. Quindi, se avevano fame, venivano da noi e pranzavamo insieme, cosa che facciamo ancora oggi. Avevano semplicemente la sensazione che io fossi lì, che la loro mamma fosse in hotel e che potevano sempre venire da me. "» (I.11). È interessante notare come diverse donne intervistate abbiano affrontato queste sfide diventando agenti attivi del cambiamento e trovando soluzioni creative per ovviare al mancato supporto delle politiche pubbliche, offrendo a propria volta soluzioni concilianti per i propri dipendenti, quali una turnazione attenta alle esigenze familiari, asili nido aziendali, o chiusure dell'attività durante le festività. Ad esempio, una intervistata riporta: "Uno degli uomini qui è appena diventato papá e gli abbiamo proposto, visto che ci sono asili nido vicino al posto di lavoro, di coprire noi i costi dell'asilo. Lo faremo sia per i papà che per le mamme." (I.2). Questi aspetti si riflettono in un empowerment sociale e politico delle imprenditrici, che si traduce a sua volta in risorsa per altre persone in azienda e nella società.

4.2. Le manager filippine: percorsi di carriera e di empowerment

Le interviste condotte su donne provenienti dalla National Capital Region delle Filippine rivelano come l'avanzamento di carriera in contesti aziendali non familiari sia negoziato attivamente a livello interno, interattivo e istituzionale. A livello individuale, la tabella mostra come l'interiorizzazione dei tratti culturali da parte delle partecipanti, in particolare di tratti come la modestia, strettamente legata alla posizione sociale e al background familiare, abbia influenzato il modo in cui hanno sviluppato inizialmente la fiducia in sé stesse e superato l'insicurezza, consentendo di prendere decisioni su quando e come cogliere le opportunità di carriera. Ad esempio, una partecipante ha costantemente minimizzato il proprio successo, introducendo i racconti dei propri risultati con queste parole: "Non è solo merito mio; direi piuttosto che sono stata fortunata nella strada che ho intrapreso" (Int.14). Un'altra riporta "A quel tempo, mi sentivo inadatta a lavorare nei grandi hotel di Manila." (Int. 16). Motivate dalla necessità di perseverare e lavorare sodo per essere considerate competenti, le partecipanti hanno assunto carichi di lavoro superiori a quelli richiesti all'inizio della loro carriera. Una intervistata, ad esempio, riferisce "Ho lavorato due settimane di fila. Senza un giorno libero... Dovevo farlo, dovevo essere lì perché sono una manager. Ma è stato estenuante." (Int. 15) considerandoli come un'opportunità di apprendimento, un modello che ha rivelato il loro valore in termini di perseveranza, di impegno e resilienza, ma che ha anche aumentato il rischio di burnout e in seguito ha influenzato il modo in cui hanno assunto il ruolo di madri, trovando difficile conciliare lavoro, vita personale e familiare.

	Intersezionalità	**Barriere alla carriera**	**Incentivi alla carriera**	**Risorse**	**Attività**	**Risultati**
Liv. Individuale	Tratti culturali interiorizzati Status sociale Background familiare	Insicurezza, scarsa fiducia in sé stessi Stress fisico (burnout) Umiltà (*hiya*) e paura di essere giudicati Congedo per maternità o assistenza familiare	Perseveranza interiorizzata, duro lavoro, resilienza, integrità Fede e spiritualità Automotivazione e ambizione di raggiungere l'indipendenza e la libertà finanziaria Passione per il servizio e per le persone Apprendimento e miglioramento continui	Istruzione (migliori università locali) Esperienza lavorativa e competenze Fede e spiritualità Perseveranza Resilienza, integrità	Esercitare il *diskarte* (elaborare strategie nonostante gli ostacoli) Risignificare le battute d'arresto Scegliere carriere alternative Trasferirsi all'estero per cercare opportunità	Difesa dei valori; autenticità Maggiore fiducia Mobilità internazionale Indipendenza finanziaria Equilibrio/armonia tra vita lavorativa e vita privata
Liv. Di interazione	Età Università frequentata Regione d'origine Status familiare	Mancanza di mentori o capi poco collaborativi Legami familiari che limitano la mobilità Conflitti tra colleghi Possibile complesso della mentalità del granchio (*pessimismo e ostacolamento*) Ridotte opportunità di promozione (*soffitto di*	Mentori e role model Sostegno da parte della famiglia (coniuge e parenti) e dei pari Rete (colleghi, clienti, partner) e comunità (filippini) Feedback dai colleghi	Sostegno finanziario della famiglia Mentori e modelli di riferimento; sostegno da parte di colleghi e pari Incoraggiamento della famiglia (coniugi, genitori, fratelli); Comunità/reti filippine all'estero	Cercare mentori Negoziare le responsabilità familiari Sfruttare le reti di contatti Solidarietà con i connazionali Affidarsi alla famiglia allargata per la cura dei figli Negoziare le promozioni	Promozioni anticipate Credibilità sul posto di lavoro Riconoscimento da parte dei colleghi Diventare mentore Famiglia che sostiene la continuità della carriera Accesso alla rete

		vetro e pavimento appiccicoso) Barriere linguistiche				
Liv. Istituzionale	Disponibilità finanziaria Situazione lavorativa	Leggi sui costi di servizio Accesso a opportunità educative Policy organizzative	Matriarcato percepito Programmi di riconoscimento a livello nazionale Sistema educativo Programmi di formazione aziendale e leadership Iniziative aziendali in materia di diversità e inclusione Valori aziendali Mobilità geografica	Programma di borse di studio per l'istruzione Programmi di formazione aziendale Programmi di formazione manageriale Premi di riconosciment o; iniziative per la diversità e l'inclusione Programmi DOT Politiche in materia di migrazione e cittadinanza	Sfruttare la formazione strutturata Allinearsi ai valori aziendali Ricominciare la carriera all'estero nonostante le lacune nelle credenziali Adattarsi ai cambiamenti salariali/politi ci (legge sui costi di servizio, eliminazione dei bonus) Promuovere la formazione istituzionale tra i colleghi	Riconoscimento del settore/dell'aziend a Istituzionalizzazio ne delle politiche Raggiungimento degli obiettivi organizzativi Associazione con reti istituzionali

Tabella 4. Ostacoli alla carriera, fattori abilitanti e intersezionalità dei ruoli di genere delle imprenditrici nel settore dell'ospitalità delle imprese familiari nelle Filippine

Nel bilanciare l'aspettativa culturale di dimostrare umiltà con l'aspettativa della leadership di prendere decisioni assertive, le partecipanti si sono affidate a mentori e colleghi che hanno sostenuto e legittimato la loro credibilità sul posto di lavoro. Ad esempio, una partecipante ha riportato "Avevo un professore all'università che era il direttore generale di questo hotel... è stato il primo a darmi una possibilità." (Int. 18). A livello interazionale, queste sono state le risorse più preziose delle partecipanti che le hanno sostenute nel loro progresso verso il livello manageriale. Per coloro che avevano già una famiglia, anche i coniugi e i membri della famiglia allargata sono stati fondamentali, poiché hanno fornito sostegno nel lavoro di cura e domestico. Le partecipanti sposate hanno riportato di aver avuto bisogno di partner in grado di discutere e prendere decisioni con loro e di comprendere i loro obiettivi e le loro priorità di carriera. Una intervistata ha riportato "Avevo bisogno di un marito che sapesse cucinare... Sono davvero grata a mia suocera perché ha cresciuto mio marito insegnandogli a occuparsi della casa." (Int. 17), e un'altra riporta "La

decisione [di avanzamento di carriera] è stata presa da entrambi... lui mi ha davvero sostenuta. Sa che la mia carriera è parte integrante della mia persona" (Int. 20).

A livello istituzionale, l'istruzione, in particolare l'università frequentata, è stata una risorsa importante all'inizio della carriera, quasi come se fungesse da gatekeeper delle opportunità future: da un lato influiva sull'autopercezione, dall'altro sulla maggiore validazione esterna delle proprie competenze. Una partecipante riferisce a questo proposito "Sono stata una studentessa dell'UST... Provengo da una delle migliori università delle Filippine." (Int. 18). L'avanzamento progressivo di carriera e l'ottenimento di riconoscimenti formali sul posto di lavoro e nel settore alimentavano progressivamente le aspirazioni di avere un'influenza positiva nelle proprie organizzazioni, con un effetto positivo a cascata. Le partecipanti descrivono che il loro più grande risultato è quello di essere considerate buone mentori e modelli di riferimento nella loro azienda.

4.3. Analisi comparativa: tratti comuni e paradossi di genere

La comparazione dei due casi di studio offre spazio per alcune riflessioni sui tratti comuni e le convergenze dei risultati ottenuti.

Emerge con forza nel campione il ruolo dei fattori di contesto abilitanti o limitanti il percorso di carriera. Tra i fattori abilitanti, l'istruzione appare fondamentale in entrambe le aree di studio e ha la funzione non tanto e soltanto di trasferire conoscenze, ma di favorire l'autostima, limitare l'eccessiva modestia e supportare la legittimazione esterna delle donne. Tra i fattori limitanti, si rileva come in entrambi i casi la persistenza di ruoli di genere ascrivibili al concetto di famiglia "tradizionale" e l'assenza di un supporto istituzionale per il lavoro di cura generino conflitti lavoro-famiglia, che sono più marcati nel settore dell'ospitalità a causa dei ritmi di lavoro serrati, della stagionalità e del lavoro su 7 giorni e 24 ore. Paradossale è notare come, per supportare il percorso di carriera di imprenditrici e donne manager, entrino in gioco altri membri della famiglia allargata, molto spesso di sesso femminile, che investono tempo nel lavoro di cura, a dimostrazione che il superamento degli stereotipi di genere è solo parziale.

La legittimità del ruolo dell'imprenditrice o della manager non è un fatto scontato. Piuttosto, in entrambi i paesi, si configura come un processo di legittimazione a tappe e uno scardinamento progressivo di stereotipi e pregiudizi, anch'esso non esente da paradossi. Si può affermare infatti che le donne intervistate, soprattutto quelle con famiglia, siano agenti di cambiamento intrisi di tradizione e che vivano, quotidianamente, un conflitto interno tra ruoli non completamente conciliati.

Un'ultima riflessione va spesa sulla diversa natura dei percorsi di carriera in aziende familiari e non familiari. In aziende non familiari il percorso di carriera si configura come un percorso lento e a più tappe, in cui l'empowerment e la legittimazione esterna avvengono in modo progressivo. Viceversa, nelle imprese familiari l'assunzione di ruoli di leadership avviene in modo più repentino, tipicamente attraverso la successione intra-familiare. Ciò comporta un riequilibrio dei ruoli familiari e aziendali molto più repentino, rendendo la legittimazione esterna del ruolo della nuova leader più difficoltosa e faticosa. Se è vero, quindi, che fare carriera in un'impresa familiare è più rapido (cfr. Barrett & Moores, 2009), non è detto che sia più semplice.

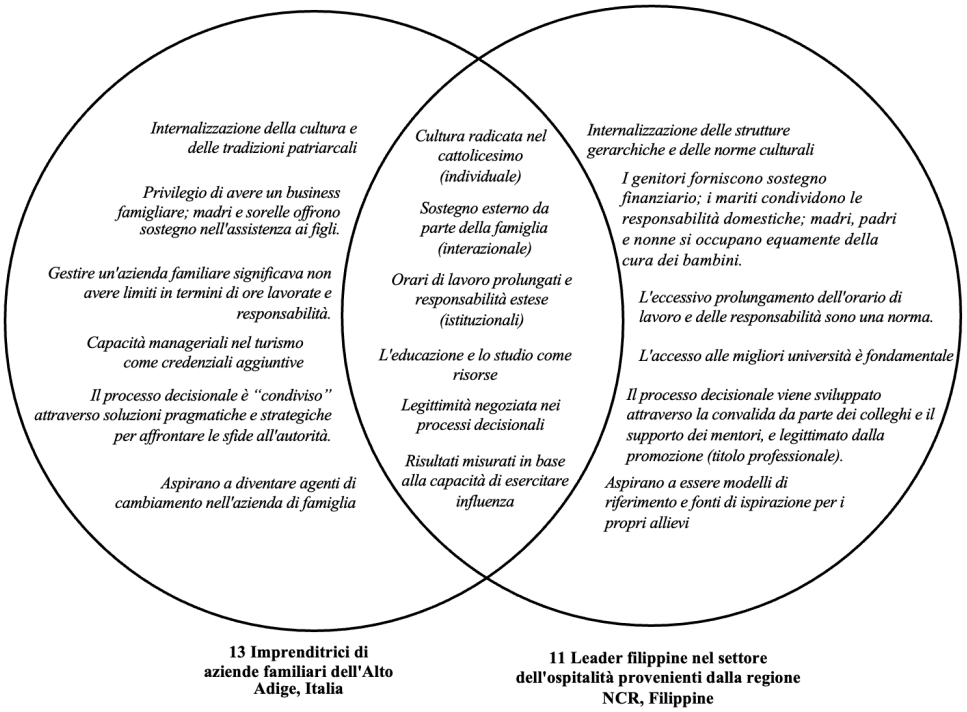


Figura 1. Analisi comparative del caso altoatesino e filippino

5. Analisi comparativa: tratti comuni e paradossi di genere

Lo studio qualitativo e comparativo sulle traiettorie di carriera di donne italiane e filippine ha permesso di mettere in luce alcuni aspetti legati all'implementazione della sostenibilità sociale all'interno delle imprese dell'ospitalità. La ricerca ha messo in luce, attraverso 24 interviste narrative tra loro diverse ma assonanti, come l'avanzamento di carriera femminile avvenga all'interno, e non contro, un sistema che resta inequivocabilmente intriso di stereotipi e paradossi di genere. Il divario di genere nella leadership (Pritchard & Morgan, 2017) non può essere colmato se non attraverso un percorso di continua negoziazione dei ruoli di genere, sia maschili che femminili, e una attività creativa di problem-solving sia individuale che istituzionalizzata. L'interiorizzazione del driver della sostenibilità sociale appare quindi un percorso multilivello, negoziato sulle sfere individuale, relazionale e istituzionale e fortemente influenzato dal contesto. In particolare, le caratteristiche peculiari del lavoro nel settore hospitality richiedono a tutti i livelli un'attenzione particolare alla conciliazione lavoro-famiglia. L'assunzione di un ruolo di leadership pone le donne in una posizione paradossale di sfida lavorativa e di delegittimazione sociale, complice il contesto culturale e religioso di riferimento, affrontabile con successo se le istituzioni o le reti familiari e associative riescono a fornire supporto e sostegno, con una condivisione del lavoro di cura e un riconoscimento della legittimità dei ruoli. Paradossali, a questo proposito, sono le dinamiche da gestire sia a livello familiare che aziendale, quali il trasferimento del lavoro di cura ad altre donne, la legittimazione del ruolo di leadership femminile ricorrendo a figure maschili, il ricorso, per le imprese familiari, al multitasking esercitando il ruolo di madre e di imprenditrice all'interno della struttura ricettiva. Queste dinamiche, pur indicando un progresso verso gli obiettivi di equità e parità di genere (SDG 5), potrebbero generare effetti rebound potenzialmente negativi.

In una prospettiva di ricerca futura, il concetto di disapprendimento (unlearning, ovvero la capacità di individui e organizzazioni di abbandonare routine e credenze datate, fuorvianti o dannose) (Tsang & Zhara, 2008; Maccioni et al., 2024) potrebbe costituire una lente analitica

particolarmente feconda per affrontare e gestire i paradossi che caratterizzano i percorsi di carriera di imprenditrici e donne manager e la sostenibilità sociale del lavoro imprenditoriale. Quest'ultima appare infatti intrinsecamente paradossale, in quanto non solo richiede di mantenere la continuità di assetti consolidati (impresa familiare, ruoli di cura, aspettative culturali e organizzative) bensì al contempo, di mettere radicalmente in discussione proprio quei presupposti che riproducono disuguaglianze di genere e forme di penalizzazione. In tale prospettiva, il disapprendimento andrebbe analizzato in modo sistematico su tutti e tre i livelli contemplati dal presento studio (individuale, relazionale e istituzionale) e non solo come processo a carico delle donne, ma anche come processo che coinvolge uomini, reti familiari, colleghi, organizzazioni e attori istituzionali. Infatti, in assenza di un disapprendimento diffuso, il lavoro di adattamento e costante negoziazione richiesto alle imprenditrici rischia di rimanere individualizzato, circoscritto all'ambiente protetto dell'impresa familiare ereditata, caratterizzato da metriche di valutazione sbilanciate e poco generativo di cambiamenti duraturi per le coorti successive.

In chiave più riflessiva, assumere il disapprendimento come lente teorica potrebbe quindi aiutare a riconoscere che la sostenibilità sociale non coincide con la semplice rimozione degli ostacoli, ma con la capacità di convivere con tensioni strutturali e caratterizzanti lo scenario contemporaneo tra cura e lavoro, umiltà e assertività, dipendenza familiare e autonomia imprenditoriale. Questo, senza trivializzarle a problemi da risolvere, bensì trattandole come dinamiche da negoziare continuamente. Non a caso, le traiettorie di carriera esaminate sembrerebbero mostrare come l'avanzamento professionale sia reso possibile da processi di disapprendimento di tratti culturali interiorizzati (ad esempio la modestia come vincolo alla visibilità della propria competenza), accompagnati da una ridefinizione congiunta dei ruoli di genere con mentori, colleghi, partner e organizzazioni. Pertanto, applicare il disapprendimento a questa linea di ricerca consentirebbe così di interrogare criticamente non solo ciò che le imprenditrici acquisiscono in termini di competenze e risorse, ma anche ciò che (insieme agli ecosistemi che abitano) devono disapprendere per rendere sostenibili, sul piano sociale, i propri percorsi di vita e di lavoro.

Parole chiave: Imprenditoria femminile; ospitalità; disparità di genere; percorsi di carriera

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Towards a Model of Regenerative Tourism and Place-Based Value Creation in Urban Commons

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1. Introduction

In recent years, the growing attention to sustainability and the reconfiguration of urban economies have stimulated a renewed interest in governance models capable of combining social inclusion, ecological awareness and economic resilience. Within this debate, the concept of the regenerative economy has emerged as a framework that moves beyond the linear and extractive logic of traditional growth models, advocating instead for systems that restore, renew and sustain the resources on which they depend (Gibbons, 2020; Andreucci et al., 2021).

This approach highlights the role of urban commons-based institutions in regenerating ecological systems as well as rebuilding community relations. Cities across Europe have witnessed the rise of urban commons, self-organized and community-managed spaces that represent alternative modes of governance, where the collective use and care of resources challenge the dichotomy between public and private ownership (Borch, Kornberger, 2015; Hussain, Kohn, 2018). Within this emerging paradigm, regenerative tourism has gained visibility as an extension of these principles, promoting visitor experiences that actively contribute to the restoration of local ecosystems and the empowerment of host communities (John et al., 2024).

The present study investigates the Beni Comuni di Napoli as a living laboratory capable to generate social innovation, environmental care and shared governance. The research aims to explore how these initiatives operationalize regenerative principles at the urban scale and how their governance structures contribute to long-term sustainability and territorial cohesion. Although previous research has primarily focused on the governance dimension of the commons (Armitage, 2008; Guttmann, 2021; Geagea, De Tullio, 2024) and on the regenerative economy as a driver of social and environmental value (Mehmood et al., 2020; Dos Santos Figueiredo et al., 2022), there is still a lack of studies examining how these urban commons are perceived by different stakeholders, particularly in relation to their potential contribution to regenerative and community-based tourism.

Naples represents a particularly significant case within this broader European context. Over the last decade, the city has institutionalized the recognition of the Beni Comuni di Napoli (Commons of Naples) as civic-use assets. These experiences, ranging from cultural hubs and social centers to community gardens and reclaimed public infrastructures, embody an experimental governance framework that redefines the relationship between citizens, institutions and the urban environment (Comune di Napoli, 2020).

Beyond the specificities of the Neapolitan context, the study aspires to shed light on the potential of commons-based models to inform broader strategies of sustainable development, particularly in sectors such as cultural and community-based tourism. The analysis, still in progress, seeks to integrate conceptual, empirical and methodological insights to assess the

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transformative value of commons governance within the transition toward regenerative urban economies.

2. Literature review and conceptual framework

The conceptual foundation of this study lies at the intersection of regenerative economics and the governance of urban commons. Regeneration implies a systemic process of renewal that restores the ecological and social foundations upon which economies depend (Raworth, 2017; Morseletto, 2020). In contrast to the extractive and degenerative logic of linear capitalism, regenerative approaches emphasize reciprocity, interdependence and the co-evolution of human and natural systems (Cole et al., 2013; Buckton et al., 2023). This vision situates economic activity within ecological boundaries, seeking to maintain balance by continuously reinvesting value into the health and vitality of socio-ecological systems (Čegar et al., 2024).

The urban commons perspective introduces a governance dimension to these debates. Commons are collectively managed resources sustained by communities through rules, norms and practices of care (Ostrom, 1990). In the urban context, commons management redefines the relationship between citizens and institutions by transforming neglected or underused assets into spaces of cooperation and civic production (Graziadei, 2023). The city thus becomes a co-produced environment, where governance emerges through continuous negotiation among public authorities, private actors and civil society (Frantzeskaki, Kabisch, 2016).

Combining these approaches allows a novel interpretation of regenerative governance, understood as a process that not only preserves or optimizes resources but actively renews social and ecological capacities through collective action. This study employs this integrated lens to examine how the Beni Comuni di Napoli embody regenerative dynamics. Their governance practices are deeply rooted in community participation, enabling processes of ecological and social renewal. By generating forms of social, cultural and environmental value grounded in local communities, these commons also contribute to shaping a model of regenerative tourism. This form of tourism moves beyond traditional notions of sustainability to promote visitor experiences that are participatory, educational and restorative for both people and places (Bellato et al., 2022).

According to Teruel (2018), regenerative tourism is: “an emergent, evolutionary and dynamic understanding, which includes sustainability within the framework of living systems and emphasises the relationship of man with himself, with the other and with the earth; where the other is invited to visit the place, slowing down the visitor’s pace and creating an experience that activates deep and positive connections between the visitor, the local community (the other), the place and the systems that support life there, aligning both the local and the visitor to the rhythms of nature” (Teruel, 2018, p. 64).

In this scenario, the Beni Comuni di Napoli can be interpreted as catalysts for a tourism economy that values authenticity and community engagement. By transforming the city into a living ecosystem where visitors actively participate in processes of regeneration rather than consumption. This process is made possible by the intrinsically regenerative nature of urban common goods, which function as living social infrastructures capable of hosting slow, participatory and conscious tourism practices. Common goods, thus, become places of environmental education, cultural regeneration and experimentation with new local economies, promoting a model of tourism that actively contributes to improving the resilience of the territory.

3. Methodology

The city of Naples provides a distinctive context for exploring the implementation of regenerative tourism through community-based governance. Since 2012, the Municipality of Naples has progressively recognized a series of disused or underutilized public buildings as Beni Comuni granting communities the right of civic use and collective management.

This legal and institutional innovation, unique in Italy and rare in Europe, formalizes the co-production of public value between local authorities and civic collectives (Comune di Napoli, 2020). As such, the Beni Comuni di Napoli represent an evolving system of shared governance, where social innovation, cultural production and ecological care converge within a unified urban framework. This institutional setting makes Naples a particularly relevant case for investigating emergent forms of regenerative governance and place-based value creation.

Seven emblematic initiatives compose this system: Ex Asilo Filangieri, Scugnizzo Liberato, Ex OPG Je so' Pazzo, Giardino Liberato di Materdei, Lido Pola, Ex Schipa and Santa Fede Liberata.Each occupies a building or area formerly abandoned, reactivated through citizen engagement and collective stewardship. The Ex Asilo Filangieri, situated in the historical center, has become a cultural and educational hub promoting cooperative production, open knowledge and shared artistic creation. Scugnizzo Liberato, housed in a former juvenile detention center, functions as a social incubator hosting workshops, co-working activities and local micro-enterprises. The Ex OPG Je so' Pazzo operates within a former psychiatric hospital, providing social services, political education and spaces for community health initiatives. The Giardino Liberato di Materdei embodies ecological regeneration through community gardening, biodiversity protection and inclusive leisure activities. Along the coast, Lido Pola in Bagnoli restores access to the sea and integrates environmental reclamation with social and cultural activities. The Ex Schipa, once a music school, now supports artistic experimentation and training for young creatives, while Santa Fede Liberata, a deconsecrated church, has been transformed into a space for cultural production, social theatre and civic dialogue. In this study, all seven officially recognized Beni Comuni di Napoli were included in the analysis. This choice reflects the specific nature of the Neapolitan commons framework, which ensures institutional homogeneity in terms of legal recognition and governance principles, while allowing for strong heterogeneity in objectives, types of activities, organizational practices and stakeholder configurations. Analysing the urban commons as an integrated system makes it possible to observe how shared regulatory foundations generate diverse forms of social innovation, regenerative practices and place-based value creation across different urban contexts. Taken together, these experiences form a distributed urban ecosystem rooted in cooperation, adaptive reuse and mutual learning. Their collective practice of "civic co-management" reinterprets the notion of the city as a living common, a relational space in which economic and social value is generated through care, reciprocity and trust. The Beni Comuni di Napoli, thus, represents a tangible manifestation of regenerative governance, in which the city's physical and symbolic resources are continuously renewed through collective agency.

The study adopts a qualitative and interpretive methodological approach, designed to capture the complexity, relationality and contextual embeddedness of the Beni Comuni di Napoli experience.

The focus is not on measuring quantitative outputs but on understanding the processes, meanings and interactions through which regenerative governance is enacted. This approach is particularly suited to the analysis of emergent governance arrangements and non-market forms of value creation that cannot be adequately captured through standardized indicators. This choice aligns with the epistemological orientation of urban and organizational studies that emphasize situated knowledge, reflexivity and the co-construction of meaning between researcher and participants (Javadi et al., 2024).

Given the exploratory nature of the research, the Beni Comuni di Napoli system constitutes an exemplary case that allows for an in-depth investigation of governance innovation and socio-ecological regeneration within a defined territorial context. The case study design facilitates both analytical depth and theoretical generalization, allowing insights to emerge inductively from empirical material (Eisenhardt, Graebner, 2007; Mills et al., 2017).

Data collection combines primary and secondary sources. First, document analysis was conducted on municipal resolutions, civic-use agreements and charters of self-governance

produced by the commons communities. These documents provide an institutional and discursive foundation for understanding how the idea of the commons is framed, negotiated and legitimized at the municipal level. The empirical phase of the research is still ongoing. However, several key stakeholder groups have already been identified. These include members of commons communities involved in everyday governance practices; civic activists engaged in urban regeneration processes; event organizers, educators and trainers delivering social and educational initiatives, such as Italian language courses for migrants and community-based sports programmes; and representatives of the local administration responsible for commons-related policies. So far, a total of 18 semi-structured interviews has been conducted, focused on the key issues of urban commons-based institutions and tourism regeneration.

Participant observation was undertaken during public assemblies, cultural events and collective maintenance activities in selected commons, allowing for the documentation of interactional practices and social rituals that sustain collective ownership.

The triangulation of these data sources strengthens the reliability and validity of the analysis by enabling the comparison between institutional narratives, community perspectives and observed practices. Data are being analysed through thematic coding, identifying recurrent patterns and interpretive categories related to urban commons-based institutions and tourism regeneration. The analytical process follows an iterative logic in which empirical insights and theoretical reflection continuously inform one another.

As the research is still in progress, data analysis remains open and reflexive. The aim is to construct a thick description of how regenerative principles materialize through commons-based governance.

4. Preliminary findings and discussion

Preliminary findings indicate that the Beni Comuni di Napoli enact a multi-layered form of regenerative governance that integrates participatory management, socio-ecological awareness and practices that lay the groundwork for regenerative tourism. Governance innovation emerges through collective decision-making and transparent accountability processes that challenge hierarchical models and foster distributed responsibility.

Furthermore, these commons cultivate socio-ecological regeneration by linking cultural activity, environmental care and community well-being. Gardens, workshops and cooperative events stimulate both ecological literacy and civic empowerment, weaving together the social and natural dimensions of sustainability. In this sense, the commons operate as regenerative nodes within the urban ecosystem, knowledge and care through community action. These initial interviews show that urban common goods provide a solid foundation for the implementation of regenerative tourism practices, thanks to their ability to integrate ecological, cultural and social values. They promote tourism that is rooted in caring for the place, the responsible use of spaces and the strengthening of local ties, promoting an approach that sees visitors as an active part of urban regeneration processes.

Collective practices for managing and reactivating spaces generate a virtuous cycle in which tourism becomes an opportunity to strengthen social cohesion, support local economies and enhance the city’s tangible and intangible heritage.

5. Conclusions and implications

The Beni Comuni di Napoli represent a living experiment in regenerative urban governance, where commons-based institutions mobilize civic participation and socio-ecological awareness. They demonstrate that regeneration can be achieved through collaborative processes that renew the relationships between communities, institutions and environments. This study makes three complementary contributions to the academic debate. Firstly, it contributes to the integration of

regenerative perspectives with theories of the urban commons by showing how collective governance practices enable the continuous renewal of social and ecological relations, moving beyond extractive and market-oriented approaches to urban development. While the literature has extensively examined common goods as a mechanism for resource management and civic participation, studies exploring its potential to generate regenerative dynamics at the urban scale remain limited. This study addresses this gap by examining the Beni Comuni di Napoli as a form of regenerative governance, where collective decision-making, practices of care and the production of relational value contribute to the continuous renewal of social and ecological systems. From this perspective, the research challenges the dominant tourism paradigm based on growth and consumption. Instead, it advances the idea of tourism as a participatory, educational and transformative practice deeply embedded in local contexts.

Secondly, it offers one of the few in-depth analyses of Naples' commons system as an institutionalised experiment in regenerative urban management, highlighting how a shared regulatory framework can support heterogeneous practices and locally grounded forms of value creation. This study adopts a systemic perspective capable of capturing the heterogeneity of practices and coherence of governance principles that characterise different urban commons. Through interviews with a range of stakeholders who are often marginalised in urban policy and tourism-related discourses, the research foregrounds their voices. Furthermore, the study provides empirical evidence that urban commons can function as living laboratories for regenerative tourism, offering participatory, slow and educational experiences that differ substantially from conventional urban tourism models. The preliminary findings demonstrate how visitors are incorporated, albeit temporarily, into local socio-ecological processes, thereby contributing to community life, environmental stewardship and cultural production. These empirical insights deepen our understanding of how tourism can actively support urban regeneration processes.

Thirdly, from a managerial and policy perspective, it emphasises the potential of commons-based governance to inform regeneration strategies within local economic systems, particularly those relating to culture, tourism and collective responsibility as key organizing principles. The research also has methodological value, as it explores interpretative approaches that can capture non-financial value dimensions such as trust, inclusion and ecological resilience. These dimensions are becoming increasingly relevant to sustainability accounting and urban policy design. There is emerging evidence to suggest that integrating regenerative principles into governance practices. In tourism and territorial development, the Beni Comuni project in Naples inspires participatory models that enhance cultural and environmental heritage while preventing its commodification. Preliminary findings suggest that tourism-related practices emerge as a secondary and relational outcome of commons-based regeneration processes. The regenerative tourism model is based on the ability of common goods to activate processes of care, participation and regeneration, which generate tangible benefits for the territory. They enable the creation of tourist itineraries that reflect local life, experiences immersed in the active culture of neighbourhoods and learning opportunities related to sustainability. Thus, they contribute to redefining the role of tourism as a force for renewal rather than a pressure on urban systems. In this way, tourism is reconfigured as a practice of encounter and mutual learning, contributing to urban renewal rather than exerting pressure on local systems.

6. Limitations and future research

While the study offers an original and valuable contribution, which derives from its examination of urban commons as drivers of regenerative tourism, its qualitative scope and geographically specific focus inevitably limit its generalizability. Nevertheless, these characteristics enable a more nuanced and in-depth understanding of the processes, practices and narratives underpinning regenerative governance in urban commons. Future research could expand the comparative dimension by exploring similar commons-based initiatives in other

Mediterranean and European cities, with particular attention to how different institutional frameworks shape the governance, sustainability and scalability of regenerative practices. Comparative analyses help assess the transferability of the Naples experience while accounting for contextual specificities. Further research should also investigate more systematically how commons-based governance interacts with local enterprises, cultural operators and tourism networks, clarifying the conditions under which regenerative practices can be integrated into broader local economic systems without compromising their civic and non-extractive nature. Finally, additional studies are needed to address how regenerative value generated by urban commons can be measured and accounted for, contributing to emerging debates on sustainability reporting, social impact evaluation and alternative metrics capable of capturing relational, ecological and place-based dimensions of value.

Keywords: Urban commons; Regenerative tourism; Urban governance; Naples; Community-led urban regeneration

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Sostenibilità sociale e inclusione nel settore ricettivo: scelte strategiche ed operative delle imprese alberghiere in Italia

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1. Obiettivo della ricerca e contesto teorico di riferimento

La ricerca si pone l'obiettivo di indagare le scelte strategiche ed operative adottate dalle imprese alberghiere e le direzioni future che esse prevedono di intraprendere in risposta a due tematiche ad oggi particolarmente sfidanti, nonché tra esse interconnesse: la sostenibilità sociale e l'inclusione. Con riferimento alle più ampie scelte strategiche perseguibili dalle imprese (Miles e Snow, 1978; Mintzberg e Waters 1985; Mintzberg 1995; Rispoli, 2002) la ricerca pone attenzione sia a strategie deliberate, sia a scelte ed azioni intraprese dalle imprese alberghiere (Rispoli e Tamma, 1995) che, implicitamente, sono orientate al raggiungimento di obiettivi di sostenibilità sociale e inclusione.

La ricerca - attualmente in progress - ideata, patrocinata e finanziata da Federalberghi (Federazione delle Associazioni Italiane Alberghi e Turismo) e ASAT (Associazione Albergatori ed Imprese Turistiche della Provincia di Trento) coinvolge il Dipartimento di Economia e Management (DEM) dell'Università degli Studi di Trento. Lo studio, che affronta un tema rispetto al quale oggi permane un gap conoscitivo, permetterà di ricostruire lo status quo rispetto alle scelte strategiche delle imprese alberghiere in Italia, analizzando se e come tale comparto della ricettività si stia interrogando e reagendo di fronte agli obiettivi che la sostenibilità sociale richiede.

Il focus di analisi sulle scelte delle imprese alberghiere in ambito di sostenibilità sociale ed inclusione scaturisce dalla crescente attenzione che il contesto istituzionale (nazionale ed internazionale) pone al tema della sostenibilità e dei criteri ESG (Environmental, Social and Governance) nella gestione delle imprese. Si considerino a titolo esemplificativo (e certamente non esaustivo) gli obiettivi di sviluppo sostenibile (Sustainable Development Goals - SDGs) definiti nel 2015 dall'Organizzazione delle Nazioni Unite attraverso l'Agenda 2030, piuttosto che le direttive e le raccomandazioni della Commissione Europea in tema di rendicontazione e responsabilità sociale di impresa (si pensi alla più recente Corporate Sustainability Reporting Directive - CSRD emanata nel 2022).

Anche nell'ambito della letteratura di tourism and hospitality management emerge chiaramente l'attenzione per queste tematiche, ma permane un knowledge gap rispetto alle scelte strategiche delle imprese alberghiere. A riguardo, Kalargyrou e Costen (2017) sottolineano tale gap con specifico riferimento alla dimensione sociale della sostenibilità e ai temi riconducibili all'inclusione (EDI - equality, diversity and inclusion). Con riferimento alle più ampie tematiche concernenti gli ESG, Su e Chen (2020) evidenziano un marcato gap di studi e ricerche sviluppati con riferimento al settore dell'ospitalità e del turismo.

Analizzare strategie ed azioni delle imprese alberghiere con riferimento a queste tematiche contribuisce a comprendere le scelte che esse stanno adottando o prevedono di implementare

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anche alla luce di un mutato contesto competitivo interessato da alcuni fattori specifici. Si considerino, infatti, alcuni dei principali trend che caratterizzano la domanda turistica (Randstad Research, 2024). I dati più recenti mettono in luce una crescita dei flussi turistici imputabile alla domanda internazionale (si vedano anche i dati di Banca d'Italia, 2023 e Rana, 2025). Tale target presenta profili socioculturali non necessariamente allineati con aspettative, abitudini e comportamenti espressi dalla domanda domestica. Si riscontra altresì un aumento di turisti senior che esprimono bisogni e attenzioni che spesso richiedono un'integrazione del tradizionale servizio alberghiero e/o una riorganizzazione delle modalità di erogazione dello stesso (si pensi, ad esempio, ad esigenze alimentari piuttosto che di accessibilità).

L'affermarsi di nuove abitudini di viaggio, tra cui la crescita del segmento "solo travel" (Laesser et al., 2009; Otegui-Carles et al., 2022) e il consolidarsi di un interesse sempre più marcato da parte della domanda turistica per hotel certificati o attestanti azioni e comportamenti sostenibili (Buonincontri e Micera, 2022) sono ulteriori fattori che possono avere un impatto significativo sulle scelte strategiche delle imprese alberghiere orientate alla dimensione sociale della sostenibilità e all'inclusione.

La capacità delle imprese alberghiere di fronteggiare le sfide che questi nuovi trend comportano, pone degli interrogativi proprio su scelte strategiche e azioni operative indirizzate sia ai dipendenti, in quanto forza lavoro che entra in diretto contatto con gli ospiti (si pensi, a titolo di esempio, al personale di front office dedito all'accoglienza degli ospiti in fase di check-in o al personale di sala), sia ai clienti, che attraverso il loro soggiorno fanno esperienza sia dell'atmosfera di accoglienza che caratterizza l'hotel, sia dei servizi e facilities offerti.

L'approccio multi-stakeholder che contraddistingue l'orientamento alla sostenibilità non si limita ad osservare clienti e dipendenti delle imprese, ma pone in primo piano anche le relazioni che si sviluppano tra l'impresa alberghiera e altri soggetti ritenuti strategici per la competitività della stessa. Rientrano in tali categorie i fornitori coinvolti nella supply chain dell'hotel, così come la comunità locale presente nel territorio in cui esso è inserito.

La considerazione di queste categorie di stakeholder e le azioni ad esse rivolte da parte dell'impresa alberghiera in tema di sostenibilità sociale e inclusione, pongono l'attenzione su obiettivi specifici dell'Agenda 2030 quali la salute, la parità di genere, le condizioni lavorative e le disuguaglianze. Nell'ambito degli studi di tourism and hospitaliy management tali tematiche sono state affrontate in diversi contesti Paese, con diversi approcci di metodo e da prospettive di analisi distinte (consumatore; dipendente; impresa). Si considerino, ad esempio, gli studi di Daruwalla e Darcy (2005) e Darcy (2010) che affrontano i temi della disabilità e dell'accessibilità dal punto di vista dell'ospite nei processi di scelta delle strutture ricettive; il contributo di Bengisu e Balta (2011) che approfondisce i principali fattori che influenzano il reclutamento di persone con disabilità nelle imprese ricettive, piuttosto che la più recente ricerca di Changa et al. (2025) che indaga pratiche di sostenibilità sociale adottate da direttori, manager e altre figure professionali coinvolte nell'hotel. Tali studi contribuiscono ad approfondire dimensioni connesse alla sostenibilità sociale e all'inclusione, ma, come già evidenziato, rispetto a tali topic permane un gap di conoscenze connesse alle scelte di condotta strategica delle imprese alberghiere.

Alla luce di questo scenario, le sezioni che seguono presentano aspetti di metodo e risultati preliminari di una ricerca che ha coinvolto le imprese alberghiere del contesto nazionale. L'Italia vanta il primato a livello europeo per capacità ricettiva alberghiera in termini di numerosità di imprese (circa 33.000 hotel), numero di camere (1,1 milioni di camere) e posti letto (2,3 milioni) (dati anno 2024) (Fonte: Rana, 2025). Le indicazioni riguardo alle scelte che hanno guidato la ricerca sul campo, la definizione dello strumento di rilevazione e il processo di analisi dei dati sono illustrate nel paragrafo che segue. La sezione 3 descrive alcuni dei principali risultati preliminari sino ad ora emersi. Attenzione è posta sia a strategie ed azioni rivolte a stakeholder interni all'impresa alberghiera (dipendenti), sia a stakeholder esterni (clienti, fornitori e comunità locale).

Nel paragrafo conclusivo, infine, si mettono in luce gli aspetti di originalità della ricerca e si delineano gli step di analisi successivi che si prevede di seguire, al fine di identificare possibili profili di imprese alberghiere che si differenziano per strategie adottate in tema di sostenibilità e inclusione.

2. Metodo della ricerca

2.1. Fuochi di ricerca e strumento di rilevazione

La ricerca analizza le scelte strategiche adottate dalle imprese alberghiere che rientrano nella dimensione della sostenibilità sociale e dell'inclusione con riferimento al contesto italiano. La popolazione di riferimento è rappresentata dalle imprese alberghiere associate a Federalberghi che, complessivamente, sono oltre ventimila, ossia oltre il 60% di tutte le imprese alberghiere a livello nazionale[4].

La ricerca sul campo si è avvalsa di una survey che ha previsto la somministrazione di un questionario online nel periodo aprile - ottobre 2025 a tutte le imprese alberghiere associate a Federalberghi. Complessivamente sono stati raccolti 1.119 questionari, di cui 624 compilati in ogni parte e ritenuti validi ai fini dell'analisi.

Per la definizione delle domande si è condotto uno scouting della letteratura scientifica che ha affrontato i temi della sostenibilità sociale e dell'inclusione con riferimento al settore dell'hospitality e della ricettività alberghiera. Dall'analisi sono emersi specifici topic che hanno messo in luce una declinazione delle tematiche oggetto della ricerca riferite alle diseguaglianze economiche, alle diseguaglianze di genere, alla diversa confessione religiosa e all'etnia di riferimento. Le domande sono state definite considerando quattro principali categorie di stakeholder: dipendenti, clienti, fornitori e comunità locale. La ricerca ha indagato fattori distintivi delle singole categorie di stakeholder e ha permesso altresì di ricostruire scelte strategiche e/o azioni implementate (o in previsione) da parte dell'hotel, finalizzate al raggiungimento di obiettivi di sostenibilità sociale e inclusione. Le principali dimensioni osservate dalla ricerca possono essere sintetizzate come segue:

- Con riferimento ai dipendenti, si è analizzata la presenza di attività di formazione ed iniziative volte ad accrescerne le competenze in tema di inclusività e l'adozione di incentivi per fidelizzare e motivare il personale.
- Con riferimento ai target di clientela si è osservata la presenza o programmazione di azioni e iniziative differenziate in ragione del Paese di provenienza, della composizione del nucleo turistico, dell'età, del genere e dell'orientamento religioso.
- Con riferimento ai fornitori si è rilevata la presenza di relazioni con gli stakeholder locali e l'utilizzo di prodotti a km zero.
- Con riferimento alla comunità locale si è indagata la presenza di collaborazioni con scuole, università, associazioni ed enti del terzo settore presenti sul territorio, così come il coinvolgimento in partnership con strutture locali e/o in attività sociali con la popolazione locale e in sponsorizzazioni di iniziative territoriali.

Per ciascuna categoria di stakeholder si è altresì rilevato se nelle attività di pianificazione e programmazione delle imprese alberghiere vi siano piani di sviluppo o azioni orientate ad accrescere le conoscenze e le competenze in tema di sostenibilità sociale e inclusione.

[4] Federalberghi è la principale organizzazione imprenditoriale del settore turistico-ricettivo in Italia. Essa rappresenta le istanze e gli interessi degli albergatori nei confronti delle istituzioni e delle organizzazioni politiche, economiche e sindacali. Aderiscono a Federalberghi oltre ventimila imprese su un totale di circa 32.000, attraverso 128 associazioni territoriali (www.federalberghi.it).

2.2. Analisi statistica dei dati

L'analisi statistica dei dati raccolti si è focalizzata sullo studio dell'associazione tra le risposte fornite alle varie domande, sotto domande e gruppi di domande, con l'obiettivo di indagare le relazioni sussistenti tra le varie dimensioni dell'inclusività e della sostenibilità sociale e le loro manifestazioni.

Le analisi svolte e in progress sono descritte brevemente di seguito, richiamandone lo scopo ed illustrandone le scelte che ne giustificano l'applicazione.

Preliminarmente è stata svolta un'analisi descrittiva del campione dei rispondenti (n = 624) rispetto alle principali caratteristiche delle strutture e alla loro distribuzione geografica, mettendole in relazione con la popolazione di riferimento (imprese alberghiere associate a Federalberghi), al fine di fornire una panoramica circa la rappresentatività del campione raccolto.

In seguito, l'analisi delle distribuzioni di frequenza delle risposte fornite ad ogni domanda o item ha permesso di dare una rappresentazione sintetica (in forma tabulare e grafica) delle distribuzioni univariate delle risposte nel campione.

L'analisi di associazione tra item e domande (fase di analisi in progress) si basa principalmente su tre tipologie di analisi, che richiamiamo di seguito.

Un'analisi preliminare di associazione è stata svolta per ogni gruppo di item appartenenti alla medesima domanda e, in alcuni casi specifici, tra item di domande differenti (ne è un esempio l'analisi riguardante rispettivamente le politiche di inclusività verso i dipendenti e le politiche di gestione del personale) sfruttando indicatori di associazione bivariata per variabili qualitative ordinali. Nello specifico, sono state calcolate la gamma di Goodman e Kruskal (Goodman, Kruskal 1954; Agresti, 2013) e la tau di Kendall (1938). Entrambi gli indicatori, assumendo valori compresi tra -1 (perfetta associazione negativa) e 1 (perfetta associazione positiva), consentono di mettere in evidenza le relazioni tra tutte le coppie di item confrontate, misurandone il segno e l'intensità (in entrambi i casi, il valore 0 indica l'assenza di associazione). Inoltre, l'analisi delle matrici di associazione permette di identificare eventuali gruppi di item particolarmente omogenei e metterli in relazione gli uni con gli altri.

La seconda famiglia di strumenti utilizzati per analizzare l'associazione tra item e tra gruppi di item è l'analisi delle corrispondenze multiple (multiple correspondence analysis - MCA) nel primo caso e l'analisi gerarchica dei fattori (hierarchical multiple factor analysis - HMFA) nel secondo. In entrambi i casi l'obiettivo dell'analisi è stato quello di ridurre la dimensionalità dei dati, fornendo una rappresentazione sintetica delle varie dimensioni della sostenibilità sociale e dell'inclusività e se e in che modo tali dimensioni siano in relazione. Dal punto di vista metodologico, la scelta è ricaduta su questo tipo di modelli sia per la loro natura eminentemente esplorativa, sia per la debolezza delle assunzioni che richiedono per essere applicati, sia a causa del rapporto sfavorevole tra il numero di variabili esaminate e il numero di osservazioni disponibili.

L'ultimo aspetto menzionato, relativo al rapporto tra variabili analizzate e osservazioni disponibili, ha reso necessario ricorrere all'analisi di regressione per studiare l'associazione tra le dimensioni della sostenibilità sociale dell'inclusività e le caratteristiche delle strutture alberghiere. Questo tipo di analisi, infatti, per essere condotta esclusivamente tramite HMFA avrebbe richiesto un numero di osservazioni di gran lunga superiore a quello disponibile. Per questo motivo, sono state utilizzate le componenti principali risultanti dalle MCA e dalle HMFA come variabili esplicative o come variabili dipendenti in alcuni modelli di regressione.

Le regressioni stimate consentono di indagare se e in che misura le dimensioni della sostenibilità sociale e dell'inclusività sono in relazione tra loro e con le caratteristiche delle strutture. L'analisi dei residui delle regressioni è poi utilizzata per individuare tendenze e peculiarità geografiche.

3. Risultati preliminari della ricerca

L'analisi preliminare dei dati raccolti attraverso la survey ha evidenziato attività ed iniziative che coinvolgono le imprese alberghiere in Italia con riferimento alla sostenibilità sociale e all'inclusione. I rispondenti sono prevalentemente titolari delle strutture (57%) e manager o direttori/direttrici dell'hotel (23%). Gli hotel appartengono per lo più alle categorie 3 stelle/3 stelle superior (49%) e 4 stelle/4 stelle superior (32%). Di seguito si presenta una sintesi delle principali evidenze emerse finora.

Con riferimento ai dipendenti, la maggior parte dei rispondenti (oltre l'80%) si avvale di personale sia in giovane età (sotto i 35 anni), sia in età matura (oltre i 55 anni) e nella quasi totalità delle imprese osservate vi è la presenza di dipendenti donne. Oltre il 66% degli hotel dichiara la presenza di dipendenti con disparate tradizioni culturali. Inferiore al 10%, invece, gli hotel che dichiarano la presenza di dipendenti con disabilità motorie e/o sensoriali (ad esempio: non vedenti, non udenti, ecc.) o con disabilità intellettive e/o psichiche (ad esempio: disturbi dello spettro autistico, ecc.). L'analisi delle azioni e dei piani di sviluppo adottati dalle imprese mette in evidenza, per la maggior parte delle imprese, la presenza di iniziative volte a: *a)* valorizzare gli anni di esperienza maturati dai/dalle dipendenti nel settore (81,9%); *b)* favorire la conciliazione tra vita privata e vita lavorativa dei/delle dipendenti (80%); *c)* tutelare la genitorialità dei/delle dipendenti (66,8%). Circa il 60% dichiara di monitorare i livelli di retribuzione delle dipendenti donne e dei dipendenti uomini e circa il 47% prevede turni di riposo differenziati per esigenze religiose o culturali.

Di poco inferiori al 40% sono gli hotel che promuovono piani di sviluppo dei talenti per i/le giovani dipendenti. In linea con la minore presenza di dipendenti con disabilità, si riducono le imprese che prevedono piani di sviluppo delle competenze e della carriera dei dipendenti con disabilità motorie e/o sensoriali (13,8%) o con disabilità intellettive e/o psichiche (circa 10%).

Con riferimento ai clienti, la ricerca mette in luce una differenziazione dei target serviti dalle imprese alberghiere, sia rispetto all'età anagrafica, sia rispetto al nucleo turistico, all'orientamento sessuale e alle tradizioni culturali. La maggior parte degli hotel accoglie quotidianamente clienti anziani, mentre i target di bambini, di donne che viaggiano da sole e di ospiti appartenenti alla comunità LGBTQIA+ (lesbiche, gay, bisessuali, trans, queer, intersessuali,...) sono presenti mensilmente. Anche la presenza di clienti con disabilità motorie e/o sensoriali o con disabilità intellettive e/o psichiche è meno abituale. Nella pianificazione dell'attività ricettiva, la maggior parte delle imprese alberghiere dichiara di aver considerato il tema dell'inclusione per i clienti senior, per le donne che viaggiano da sole, per i clienti bambini e per i clienti di disparate tradizioni culturali. Anche per gli altri segmenti viene indicata attenzione, sebbene rispetto ai clienti con disabilità le risposte denotino una pianificazione meno diffusa.

Con riferimento ai fornitori la maggior parte degli hotel acquista prodotti locali (58% vi ricorre spesso e il 14% sempre) e si avvale di stakeholder attenti alle pratiche etiche e solidali (48,9% spesso e 16% sempre).

Con riferimento alla comunità locale, infine, circa l'80% delle imprese alberghiere dichiara di collaborare con le scuole per tirocini e stage, sebbene circa il 37% lo faccia occasionalmente. Minore invece la collaborazione con le università, rispetto alle quali circa la metà dichiara di non collaborare mai. Le partnership con altre strutture del territorio (negozi, musei, stabilimenti, …) e la sponsorizzazione di iniziative sportive e/o culturali legate alla valorizzazione del territorio non coinvolgono diffusamente gli hotel. La maggior parte delle strutture non collabora mai con associazioni e/o enti del terzo settore per l'impiego.

4. Considerazioni conclusive

La ricerca presenta elementi di originalità rispetto al tema affrontato e al contesto territoriale considerato, inserendosi all'interno di un dibattito scientifico rispetto al quale si riscontra un marcato gap conoscitivo.

Da una fase preliminare di analisi emerge che le imprese alberghiere manifestano interesse e coinvolgimento in azioni e scelte strategiche orientate alla sostenibilità sociale e all'inclusione, ma queste si manifestano con intensità diversa in ragione della categoria di stakeholder osservata e della complessità dell'azione considerata. Gli ulteriori step di analisi, attualmente in progress, (cfr sezione 2.2) permetteranno di approfondire quanto sino ad ora emerso. Si potrà verificare, ad esempio, se vi siano profili di imprese alberghiere che dimostrano comportamenti virtuosi con riferimento a tutte le categorie di stakeholder - sia in termini di azioni, sia rispetto alle attività di pianificazione - o se invece prevalgano azioni saltuarie, non riconducibili a scelte strategiche deliberate per il raggiungimento di obiettivi di sostenibilità.

La ricerca permetterà di verificare eventuali associazioni tra variabili e specifiche dimensioni della sostenibilità che consentiranno di delineare profili di hotel che si differenziano per attitudini e attenzione rivolte alle scelte di sostenibilità sociale e di inclusione. Tale analisi permetterà altresì di identificare buone pratiche nell'approccio strategico orientato ad obiettivi di sostenibilità sociale e di inclusione per le imprese alberghiere. Output di particolare rilievo per le scelte strategiche di queste imprese, stante le sfide attuali che interessano il settore del turismo e dell'ospitalità.

Parole chiave: Impresa alberghiera; sostenibilità sociale; inclusione

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L'impegno delle aziende turistiche verso l'SDG 10: Un'analisi esplorativa

Benedetta Valeria Cannizzaro[1], Loredana Picciotto[2], Marcantonio Ruisi[3]

1. Introduzione

Gli obiettivi di sviluppo sostenibile (Sustainable Development Goals - SDGs) dell'Agenda 2030 (United Nations, 2015) stimolano la riflessione e l'azione in aree di importanza critica per l'umanità ed il pianeta, ponendo sfide complesse alle quali governi, collettività e ambiente imprenditoriale sono chiamati a dare risposta. Attraverso gli SDGs, le Nazioni Unite promuovono espressamente temi di significativa rilevanza sociale come l'uguaglianza di genere, il lavoro dignitoso per tutti e la riduzione delle disuguaglianze. Tra questi, la presente ricerca si focalizza sull'SDG 10 relativo alla "riduzione delle disuguaglianze all'interno di e fra le Nazioni", un tema di importanza cruciale considerato uno dei problemi più urgenti della società (Kuhn, 2020). Le disuguaglianze di reddito, di accesso alle risorse ed alle opportunità rappresentano un ostacolo significativo allo sviluppo sostenibile e alla pace, aumentando la povertà globale e avvilendo lo spirito di realizzazione e autostima delle persone. Per tale motivo l'Agenda 2030, attraverso l'SDG 10, ha posto tale tema al centro dell'attenzione globale. Sono stati previsti obiettivi e target specifici miranti a ridurre le diseguaglianze economiche, a promuovere l'inclusione sociale e garantire pari opportunità, tra i diversi Paesi ed al loro interno nelle diverse comunità del mondo.

Nel settore turistico l'obiettivo della riduzione delle diseguaglianze assume particolare rilevanza data la natura labour-intensive del comparto ed il suo impatto sulle comunità locali.

È importante avere altresì consapevolezza del delicato ruolo riconoscibile al settore. Esso può contribuire alla riduzione delle diseguaglianze (Buhalis et al., 2023), fungendo da catalizzatore attraverso molteplici opportunità economiche e di inclusione sociale, ma può anche amplificare le disparità, specie nella misura in cui le comunità locali ospitanti non traggano adeguati benefici dalle attività economiche e dai flussi turistici.

Tra i diversi attori della società, le aziende, specie di grandi dimensioni, sono particolarmente sensibilizzate ad adottare delle pratiche sostenibili ed a rendicontare i progressi compiuti nel raggiungimento degli SDGs (United Nations, 2015, SDG 12.6). Con riferimento all'SDG 10, l'UN Global Compact Network Italia auspica che le aziende offrano condizioni lavorative dignitose attraverso tutta la catena del valore, soprattutto per i gruppi svantaggiati. Più in generale, l'organismo italiano del Global Compact delle Nazioni Unite raccomanda una serie differenziata di possibili azioni e politiche aziendali per il conseguimento di tale obiettivo.

Alla luce di ciò, ed in risposta alle attese di stakeholder e società civile, un crescente numero di aziende contempla nelle proprie strategie gli obiettivi dell'Agenda 2030 ed ha implementato negli ultimi anni la rendicontazione SDGs (KPMG, 2018, 2020; PwC, 2019; Erin et al., 2022; Gunawan et al., 2020; Pizzi et al., 2020; Rosati e Faria, 2019; Tsalis et al., 2020), comprese le aziende del settore turistico (Costa et al., 2022; Damiano e Picciotto, 2025a; Di Vaio et al., 2022;

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Ferrero-Ferrero et al., 2024; Galant et al. 2024). Tuttavia, data la novità e la complessità della tematica, le conoscenze sono ancora limitate e la letteratura in materia è al suo stadio iniziale (Calabrese et al. 2021; Mio et al., 2020; Rosati e Faria, 2019; Tsalis et al, 2020). Alcuni studiosi hanno sottolineato l'importanza di condurre ulteriori analisi empiriche, anche nel settore turistico, sul reporting SDGs per comprendere meglio il processo di implementazione degli SDGs e le modalità di reporting (Avrampou et al., 2019; Buhalis, 2023; Medrado e Jackson, 2016; Mio et al., 2020; Serra-Cantallops et al., 2018; Franzoni e Avellino, 2019; Guix et al., 2018; Koseoglu et al. 2021). Si auspica, in particolare, una maggiore ricerca sul reporting SDGs, sia quale strumento di rendicontazione esterna agli stakeholder sia quale supporto decisionale agli attori aziendali nell'attività di governo (Mio et al., 2020).

In questa prospettiva, riconoscendo l'importanza critica dell'SDG 10 ed i limitati progressi finora conseguiti nel mondo (Halkos e Gkampoura, 2021; The Sustainable Development Goals Report, 2025), si ritiene che la rendicontazione sul tema rappresenti un fondamentale processo strategico per orientare le politiche aziendali, monitorare l'efficacia delle iniziative intraprese e dimostrare l'impegno in tale ambito agli stakeholder. Per tale motivo, la presente ricerca si propone di analizzare l'evoluzione temporale dell'impegno dichiarato dalle aziende del settore turistico verso l'SDG 10, al fine di comprendere se e come tali aziende stiano contribuendo al raggiungimento di tale obiettivo. In letteratura si riscontra una prevalenza di studi sulla disclosure SDGs complessiva delle imprese turistiche (Costa et al., 2022; Damiano e Picciotto, 2025a; Di Vaio et al., 2022; Dube, 2020; Galant et al. 2024), ma si sottolinea la necessità di studiare il loro ruolo anche nel conseguimento di singoli SDGs (Dube, 2020). Questo studio esplorativo si propone di colmare, almeno in parte, questo gap analizzando, attraverso l'utilizzo di dati estratti dal database Refinitiv Eikon, l'impegno dichiarato dalle aziende turistiche verso l'SDG 10 dall'introduzione dell'Agenda 2030, con riferimento a quattro distinte dimensioni di analisi: (1) la percentuale di aziende che dichiarano un impegno formale verso l'SDG 10; (2) l'evoluzione temporale di tale impegno; (3) le eventuali caratteristiche distintive per sottosettori turistici; (4) le differenze geografiche nell'adozione dell'obiettivo.

2. Quadro teorico di riferimento

L'avvicinamento alla fase finale dell'Agenda 2030 acuisce l'esigenza di un impegno fattivo ed accresce l'importanza di conseguire dei progressi verso gli SDGs, rendendo ormai critiche la misurazione e la rendicontazione delle performance di sostenibilità delle imprese.

Da diverso tempo le imprese hanno iniziato a rendicontare agli stakeholder, attraverso appositi report, la propria capacità di essere responsabili e di operare in modo sostenibile. Secondo la definizione del World Business Council for Sustainable Development (2002), il reporting di sostenibilità aziendale si riferisce ai report pubblici pubblicati dalle imprese al fine di fornire agli stakeholder interni ed esterni un quadro della posizione e delle attività aziendali sulle dimensioni economica, ambientale e sociale. Pertanto, tramite i report di sostenibilità le aziende descrivono il proprio contributo allo sviluppo sostenibile, comunicando pubblicamente azioni e iniziative intraprese, performance conseguite, impatto ambientale, sociale ed economico (Hahn e Kühnen, 2013; Baldarelli et al., 2017; Girella et al., 2019; Di Vaio et al., 2022).

Il reporting sugli SDGs si configura quale specifica pratica del reporting di sostenibilità e fa riferimento al processo tramite cui le aziende riportano i loro risultati relativi al raggiungimento degli SDGs (Bebbington e Unerman, 2018, 2020). Esso rappresenta un'evoluzione del reporting di sostenibilità manifestatasi nel contesto dell'Agenda 2030, che negli ultimi anni è stato oggetto di analisi da parte di diversi studiosi (Bebbington e Unerman, 2018; Calabrese et al., 2021; Damiano e Di Maria, 2024; Di Vaio e al., 2022; Erin et al., 2022; Gunawan et al. 2020; Mio et al., 2020; Pizzi et al., 2020; Rosati e Faria, 2019; Sicoli et al., 2024; Tsalis et al., 2020). Con il loro autorevole contributo, Bebbington e Unerman (2018) hanno dischiuso la strada ad un'agenda

di ricerca che studiasse l'inclusione degli obiettivi di sviluppo sostenibile nel reporting di sostenibilità delle organizzazioni aziendali.

Gli SDGs costituiscono un insieme di obiettivi interconnessi, tuttavia, la loro natura volontaria consente alle imprese di focalizzarsi su determinate problematiche ritenute prioritarie, allineando la propria strategia verso obiettivi specifici o maggiormente pertinenti con il core business (Ike et al., 2019; Gunawan et al., 2020; Van Zanten e Van Tulder, 2018). Un focus su specifici obiettivi dell'Agenda 2030 caratterizza spesso anche la rendicontazione, come emerge da recenti indagini su un rilevante numero di aziende nel mondo (KPMG, 2020; European Private Sector SDG Stocktake, 2024). In particolare, dall'analisi della KPMG (2020), condotta su 5.200 aziende di oltre 50 paesi, risulta che l'80% di esse pubblica il Report di sostenibilità. Tuttavia, emerge come il reporting sugli SDG sia spesso sbilanciato e scollegato dagli obiettivi aziendali, poiché la rendicontazione sugli SDG si concentra quasi esclusivamente sui contributi positivi delle aziende al raggiungimento degli obiettivi e manca la trasparenza dei loro impatti negativi. Inoltre, la ricerca rivela un maggiore impegno da parte delle aziende per gli obiettivi relativi al lavoro dignitoso e alla crescita economica (SDG 8), alle azioni per il clima (SDG 13) e alla produzione e il consumo responsabili (SDG 12). Un focus specifico delle politiche aziendali e della rendicontazione SDG si riscontra analogamente in un recente studio pubblicato dalle reti europee dell'UN Global Compact (European Private Sector SDG Stocktake, 2024). Dallo studio emerge che le aziende europee esaminate (oltre 1.400) hanno compiuto passi significativi nell'allineamento dei loro obiettivi. In particolare, dimostrano una conoscenza approfondita dei 17 SDGs ed un buon grado di integrazione nella strategia aziendale. Tuttavia, si riscontrano principalmente azioni a favore della parità di genere (SDG 5), del lavoro dignitoso (SDG 8) e del contrasto al cambiamento climatico (SDG 13), mentre risulta più limitato l'intervento in altri settori chiave. Inoltre, emerge ancora un divario tra strategia e misurazione della performance; molte aziende continuano a mostrare difficoltà nel tradurre gli obiettivi di sviluppo sostenibile in azioni concrete e misurabili. Anche altri studi hanno rilevato una certa difficoltà delle aziende a rendicontare efficacemente come le proprie attività si allineino e contribuiscano al raggiungimento degli SDGs (Costa et al., 2022; PwC, 2019).

Con specifico riferimento al settore turistico, alcune analisi mostrano un effettivo impegno delle imprese turistiche e dell'ospitalità a raggiungere e rendicontare gli SDGs (Damiano e Picciotto, 2025a, 2025b; Papagiannakis et al. 2024), altre sottolineano, invece, come la rendicontazione dovrebbe essere migliorata riconoscendo il contributo delle attività ad un numero maggiore di SDGs, tra cui proprio l'SDG 10 (Galan et al., 2024). Nonostante la rilevanza di questo tema, le conoscenze relative alle modalità con cui le imprese turistiche stanno effettivamente integrando l'SDG 10 nelle loro strategie di sostenibilità sembrano ancora limitate.

Dagli studi emerge, dunque, un quadro complesso ed in evoluzione, meritevole di ulteriori approfondimenti scientifici, anche alla luce della significativa valenza del reporting di sostenibilità messa in evidenza da alcuni studiosi. In letteratura si è posto, in particolare, l'accento su come la reportistica di sostenibilità, oltre a favorire una comunicazione trasparente verso gli stakeholder, possa anche influire sul pensiero e le scelte dei decisori aziendali, riorientando progressivamente le loro politiche verso pratiche sostenibili (Adams, 2017; Busco et al., 2018). Altri studiosi hanno poi osservato che le pratiche di rendicontazione nel settore turistico non sono state ancora analizzate in modo adeguato e necessitano di più approfondite analisi (Buhalis et al., 2023; Franzoni e Avellino, 2019; Gonçalves e Gaio, 2023, Guix et al., 2018; Koseoglu et al., 2021; Medrado e Jackson, 2016; Mio et al., 2020; Serra-Cantallops et al., 2018). Il focus sul reporting SDG costituisce una delle direttrici di ricerca proposte (Buhalis et al., 2023; Franzoni e Avellino, 2019; Mio et al., 2020) e caratterizza il presente studio limitando l'analisi, come anche auspicato (Dube, 2020), ad un singolo obiettivo di sviluppo sostenibile (SDG 10).

3. Metodologia

3.1. Campione

Il campione di analisi è costituito da 280 aziende quotate del settore turistico presenti nel database Refinitiv Eikon. Tali aziende appartengono a quattro sottosettori della classificazione TRBC (Thomson Reuters Business Classification) e si distribuiscono come segue:

- Restaurants & Bars: 86 aziende (30,7%)
- Leisure & Recreation: 72 aziende (25,7%)
- Casinos & Gaming: 64 aziende (22,9%)
- Hotels, Motels & Cruise Lines: 58 aziende (20,7%).

Le aziende del campione sono distribuite in 48 paesi, con una significativa concentrazione in alcune aree geografiche: Stati Uniti (31,4% del campione totale), Regno Unito (8,9%), India (6,1%), Giappone (5,4%) e Australia (5%). Tale distribuzione riflette la struttura del mercato turistico globale, caratterizzato da una forte presenza di operatori nei paesi economicamente avanzati, pur con una crescente rappresentanza di mercati emergenti.

3.2. Metodo di ricerca

L'analisi dell'impegno delle aziende del settore turistico verso l'SDG 10 si basa su un approccio quantitativo esplorativo (Creswell e Creswell, 2018), che mira a mappare sistematicamente la diffusione delle dichiarazioni formali di impegno verso la riduzione delle disuguaglianze nel periodo 2015-2023. La metodologia adottata consente di esaminare l'evoluzione temporale del fenomeno e di identificare differenze tra sottosettori e aree geografiche. L'analisi è stata condotta in R (R Core Team, 2021).

Nello specifico, l'analisi di questo contributo si articola in tre dimensioni complementari:

- Evoluzione temporale: calcolo della percentuale di aziende con impegno dichiarato per ciascun anno del periodo 2015-2023.
- Analisi per sottosettore: confronto delle percentuali di impegno tra i quattro sottosettori TRBC nell'anno 2023, integrato con l'analisi dell'evoluzione temporale per ciascun sottosettore nel periodo 2019-2023.
- Analisi geografica: esame delle differenze nelle percentuali di impegno tra i principali paesi rappresentati nel campione (con almeno 5 aziende), calcolando anche gli scostamenti rispetto alla media del settore.

Per il calcolo delle percentuali di impegno, sono state considerate esclusivamente le aziende per cui è disponibile l'informazione per l'anno specifico, escludendo i valori mancanti. Questo approccio ha consentito di evitare distorsioni legate alla crescita progressiva della copertura del database nel tempo.

3.3. Variabili

Il database Refinitiv Eikon, da cui sono estrapolati tutti i dati utilizzati per questo studio esplorativo, raccoglie sistematicamente informazioni autodichiarate dalle aziende in merito al loro impegno verso i 17 Obiettivi di Sviluppo Sostenibile. Per ciascuna azienda e per ogni anno del periodo 2015-2023, il database registra la presenza (Y) o l'assenza (N) di una dichiarazione formale di impegno verso l'SDG 10. È fondamentale sottolineare che l'analisi si concentra sulla presenza di dichiarazioni formali di impegno verso l'SDG 10, senza valutare l'effettiva implementazione di azioni concrete o la misurazione dei risultati ottenuti. La dichiarazione di impegno rappresenta pertanto un indicatore dell'allineamento strategico dell'azienda con l'obiettivo di riduzione delle disuguaglianze, ma non necessariamente una misura della performance effettiva in tale ambito. Sono state, inoltre, raccolte le informazioni relative al sottosettore di appartenenza e al paese in cui le aziende hanno sede legale.

4. Analisi

L'analisi dei dati rivela dinamiche complesse e articolate nell'evoluzione dell'impegno delle aziende turistiche verso l'SDG 10, caratterizzate da una partenza tardiva, un'accelerazione significativa e la persistenza di divari sostanziali tra sottosettori e aree geografiche.

4.1. Evoluzione temporale dell'impegno

L'evoluzione temporale dell'impegno verso l'SDG 10 nel settore turistico presenta quattro fasi distinte (Figura 1). La prima fase (2015-2018) è caratterizzata da un'assenza totale di dichiarazioni formali di impegno (0%). Nel 2019 si registra un primo balzo significativo, con il 12,30% delle aziende (23 su 187) che dichiara un impegno formale verso l'SDG 10. Questo punto di svolta coincide con una crescente pressione da parte degli stakeholder e l'intensificazione del dibattito pubblico sulle disuguaglianze a livello globale. La terza fase (2020-2021) rappresenta il periodo di maggiore accelerazione, con un incremento complessivo di 10,00 punti percentuali in soli due anni (da 15,96% a 25,96%). È plausibile ipotizzare che la pandemia di COVID-19, che ha evidenziato in modo drammatico le disuguaglianze esistenti in tutti i settori e quindi anche in quello turistico, abbia contribuito ad accrescere la consapevolezza delle aziende riguardo all'importanza di questo obiettivo. L'ultima fase (2022-2023) mostra un consolidamento del trend positivo, con una crescita più moderata ma costante (+4,15 punti percentuali nel 2022, +6,25 nel 2023), raggiungendo il 36,36% nell'anno più recente. La crescita media annua nel periodo 2019-2023 si attesta a 6,02 punti percentuali, un ritmo significativo ma non sufficiente per colmare rapidamente il gap persistente. Nonostante i progressi, la maggioranza delle aziende (63,64%) non dichiara ancora alcun impegno formale verso l'SDG 10 al 2023, evidenziando un ampio margine di miglioramento e la necessità di ulteriori azioni per promuovere l'adozione di questo obiettivo nel settore.

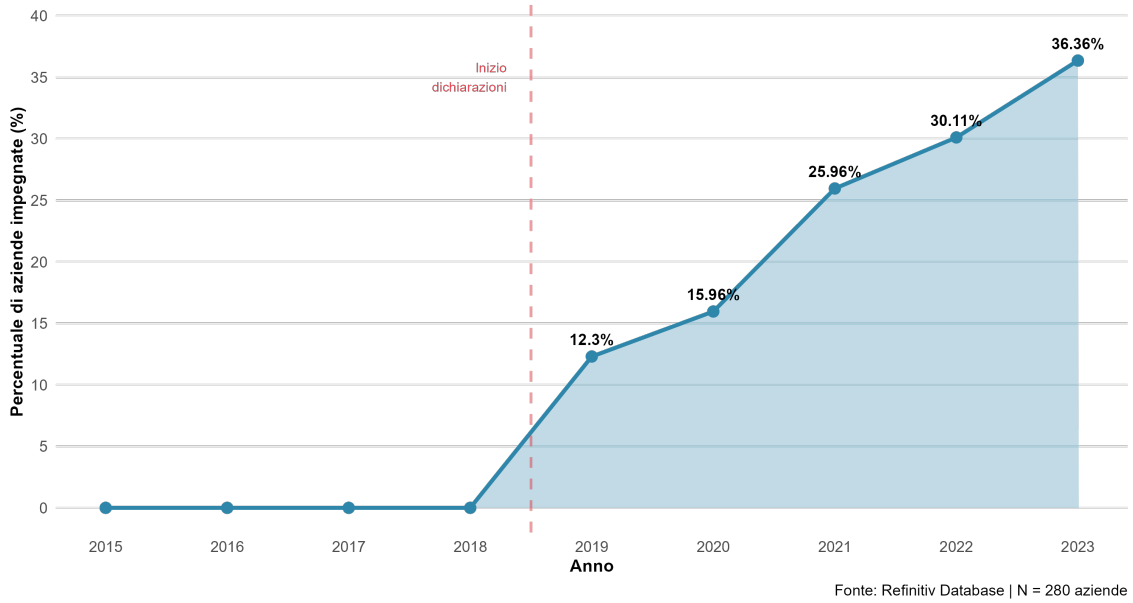


Figura 1. Evoluzione dell'impegno verso l'SDG 10 nel periodo 2015-2023.

4.2. Differenze per sottosettore turistico

L'analisi per sottosettore rivela differenze sostanziali nelle percentuali di impegno, suggerendo l'influenza di fattori specifici legati alle caratteristiche operative e alla visibilità pubblica dei diversi segmenti del settore turistico. In riferimento all'anno 2023, i sottosettori

Hotels, Motels & Cruise Lines (45,61%, 26 aziende su 57) e Casinos & Gaming (45%, 27 su 60) si posizionano come leader, con percentuali di impegno superiori di circa 9 punti percentuali rispetto alla media ponderata di settore (36,36%). Questi risultati possono essere ricondotti alla maggiore esposizione mediatica e reputazionale di tali attività, che le rende più sensibili alle pressioni degli stakeholder in materia di responsabilità sociale.

L'analisi dell'evoluzione temporale per sottosettore (2019-2023) mostra traiettorie differenziate (Figura 2). Il settore Hotels, Motels & Cruise Lines ha mantenuto una posizione di leadership lungo tutto il periodo, partendo dal 25% nel 2019. Il settore Casinos & Gaming ha, invece, registrato la crescita più marcata, passando dal 12% nel 2019 al 45% nel 2023, con un incremento complessivo di 33 punti percentuali che gli ha permesso di raggiungere il livello dei leader. Il settore Leisure & Recreation, pur mostrando una crescita assoluta dal 4,88% al 23,9%, mantiene un distacco significativo rispetto agli altri comparti.

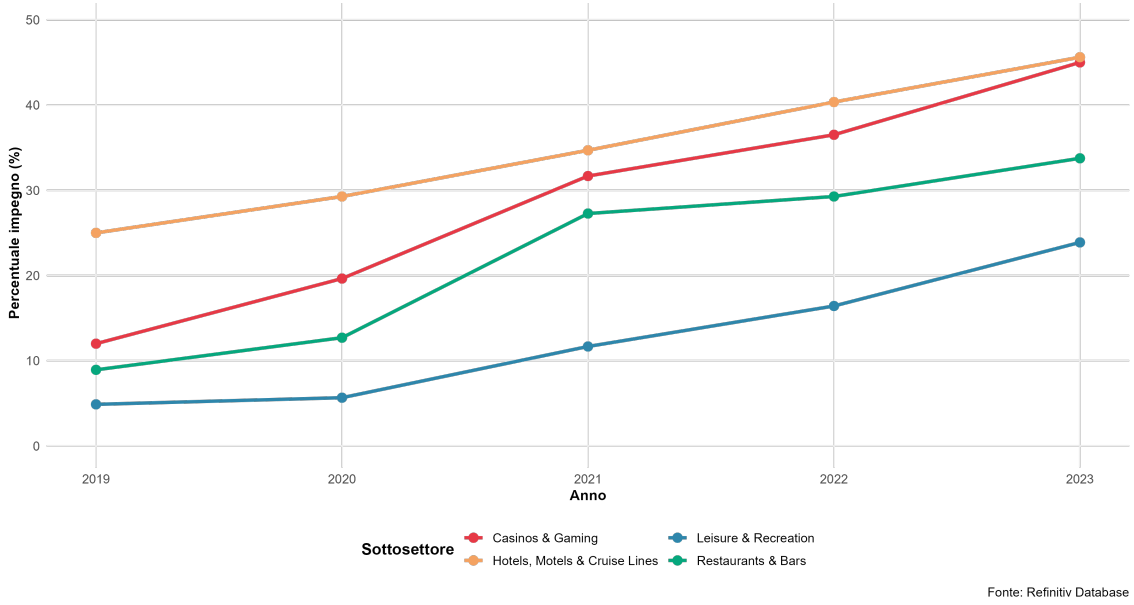


Figura 2. Evoluzione dell'impegno verso l'SDG 10 per sottosettore (2019-2023)

4.3. Differenze geografiche nell'adozione dell'obiettivo

L'analisi geografica, condotta sui paesi con almeno 5 aziende nel campione, rivela informazioni interessanti che sfidano alcune aspettative intuitive sulla relazione tra sviluppo economico, dimensione del mercato e impegno verso l'SDG 10 (Figura 3).

Nel 2023, la Malaysia emerge come leader mondiale con il 63,64% di aziende impegnate (7 su 11), seguita da Giappone (60%, 9 su 15) e Francia (60%, 3 su 5). Questi paesi mostrano percentuali di impegno superiori di oltre 20 punti percentuali rispetto alla media di settore, suggerendo la possibile influenza di framework regolatori più stringenti, di una cultura aziendale più orientata alla sostenibilità oppure di specifiche pressioni da parte degli stakeholder locali.

Particolarmente rilevante è il "paradosso geografico" rappresentato dagli Stati Uniti e dall'India. Nonostante costituiscano rispettivamente il 31,4% e il 6,1% del campione totale, questi paesi mostrano percentuali di impegno significativamente inferiori alla media: USA con 23,68% (18 su 76 aziende, -12,68 punti percentuali rispetto alla media) e India con 23,53% (4 su 17, -12,83 punti percentuali). Questo dato è controintuitivo considerando la rilevanza economica di questi mercati e suggerisce che la dimensione del mercato o il livello di sviluppo economico non sono predittori affidabili dell'impegno verso l'SDG 10.

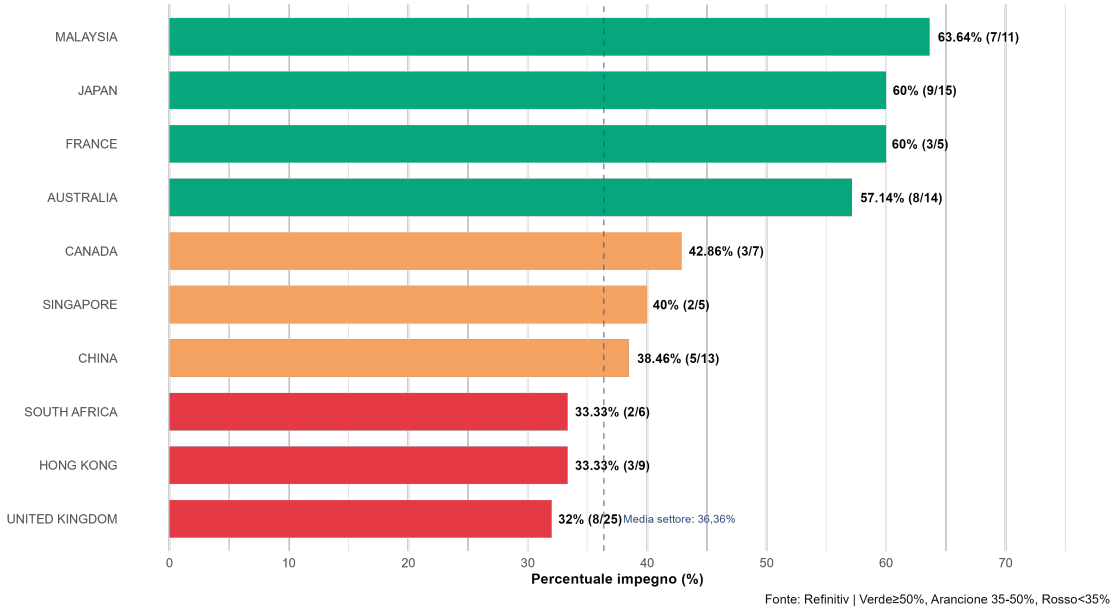


Figura 3. Top 10 paesi per impegno verso l'SDG 10 (2023)

5. Discussione e implicazioni

I risultati dell'analisi esplorativa offrono importanti spunti di riflessione sia sul piano teorico che su quello delle implicazioni pratiche per diversi gruppi di stakeholder.

Il gap di maturazione osservato nella prima fase (2015-2018) è riflesso della complessità del processo di integrazione degli SDGs nelle strategie aziendali, a prescindere dal settore di appartenenza. La mancata presenza di dichiarazioni formali in questa prima fase non deve essere interpretata necessariamente come disinteresse da parte delle aziende nel manifestare il proprio impegno alle questioni di interesse globale, quanto piuttosto come il tempo necessario per sviluppare framework di rendicontazione, definire KPI appropriati e allineare le strutture organizzative interne. Già a partire dal 2019 si assiste ad un sempre più crescente impegno da parte delle aziende a comunicare ai propri stakeholder le iniziative e le pratiche per il raggiungimento degli Obiettivi dell'Agenda 2030. Questo risultato si allinea con studi precedenti come García-Sánchez et al. (2024) che, utilizzando anch'essi aziende presenti in Refinitiv Eikon, hanno osservato un'evoluzione nelle azioni e nelle iniziative che le aziende stanno mettendo in moto al fine di contribuire al benessere delle persone, al pianeta e alla pace nel mondo. Il periodo 2020-2021 ha visto un'accelerazione improvvisa nella rendicontazione dell'SDG 10, sebbene ci siano differenze evidenti sia a livello settoriale che a livello geografico. Del resto, anche studi precedenti (si veda a tal proposito Monteiro et al., 2023) hanno messo in evidenza come il periodo 2020-2021 sia caratterizzato dalla presenza di forti variazioni nella rendicontazione dell'impegno verso gli SDG a livello regionale e nazionale.

Come anticipato all'inizio di questa sezione, questo studio ha implicazioni per vari gruppi di stakeholder, in primo luogo per i policy maker. La natura autodichiarata dei dati evidenzia la necessità di meccanismi di verifica indipendente. L'introduzione, ad esempio, di audit obbligatori sulle dichiarazioni relative agli SDGs potrebbero non solo aumentare l'accountability delle aziende, ma anche ridurre il rischio di greenwashing. In secondo luogo, i risultati dell'analisi delineano opportunità per le aziende. Esse, infatti, possono trarre vantaggi dall'analisi dei leader settoriali e geografici identificando pratiche trasferibili. Le imprese dei settori Hotels, Motels & Cruise Lines e Casinos & Gaming, così come quelle operanti in Malaysia, Giappone e Francia, rappresentano potenziali benchmark per lo sviluppo di strategie efficaci. Infine, l'analisi fornisce

elementi rilevanti per gli investitori e gli analisti ESG. Lo studio mostra una crescente adozione dell'SDG 10 suggerendo, quindi, che l'impegno verso la riduzione delle disuguaglianze potrebbe diventare un fattore sempre più centrale nella valutazione della sostenibilità (sociale) delle aziende turistiche. Di conseguenza, gli investitori dovrebbero monitorare con attenzione l'evoluzione delle posizioni aziendali rispetto all'SDG 10 come parte della loro analisi rischio.

6. Conclusioni, limiti e sviluppi futuri

Lo studio qui proposto ha avuto l'obiettivo di esplorare il graduale impegno delle aziende del settore turistico nella rendicontazione dell'SDG 10 utilizzando aziende quotate presenti all'interno del database Refinitiv Eikon nel periodo 2015-2023. Tuttavia, lo studio presenta alcuni limiti che devono essere tenuti in considerazione e che possono servire come punti di partenza per ricerche future.

In primo luogo, l'analisi si focalizza sulla presenza di dichiarazioni formali di impegno e non valuta l'effettiva implementazione di azioni concrete o la misurazione dei risultati ottenuti. Di conseguenza, studi futuri dovrebbero integrare l'analisi delle autodichiarazioni con metriche di performance reali quali, ad esempio, i gap retribuitivi o gli investimenti in programmi di inclusione sociale.

In secondo luogo, il campione utilizzato è limitato ad aziende quotate. Le PMI del settore turistico, che costituiscono la maggior parte delle imprese, potrebbero comportarsi in maniera differente. Ricerche future dovrebbero, quindi, analizzare le differenze anche in termini di dimensione settoriale.

Infine, la natura esplorativa e descrittiva dello studio non consente di identificare relazioni casuali tra le variabili osservate. Analisi econometriche sofisticate potrebbero investigare i reali motivi che spingono le aziende ad adottare l'SDG 10. Inoltre, tali analisi potrebbero essere integrate con casi studio e interviste al fine di indagare con maggiore profondità le motivazioni delle aziende e le sfide e le barriere incontrate nell'implementazione.

Parole chiave: SDG 10; report di sostenibilità; disuguaglianze; sviluppo sostenibile; aziende turistiche

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La misurazione della performance ESG e le sue relazioni con il sistema di controllo di gestione e la rendicontazione di sostenibilità. Il caso di Hilton Worldwide

Loredana Picciotto[1]

1. Introduzione

L'Agenda 2030 promulgata dalle Nazioni Unite (United Nations, 2015), declinando i 17 obiettivi di sviluppo sostenibile (SDGs), ha tracciato le fondamentali direttrici lungo le quali tutti gli attori della società sono chiamati ad impegnarsi per il benessere comune e per un futuro più responsabile e sostenibile. Questi obiettivi, articolati in 169 target, sono fortemente interconnessi ed affrontano temi critici per la salvaguardia del pianeta, il benessere delle persone e la crescita economica inclusiva (tra gli altri, il cambiamento climatico, la protezione dell'ambiente naturale, il contrasto alla povertà, la salute e la sicurezza, le diseguaglianze, ecc.). Al turismo viene riconosciuto un ruolo rilevante e catalizzatore nel raggiungimento degli SDGs (Buhalis et al., 2023; Scheyvens e Cheer, 2022; UNWTO, 2017), soprattutto in alcuni ambiti chiave individuati dall'UNWTO (2017) in occasione del International Year of Sustainable Tourism for Development del 2017 per orientare l'industria turistica verso l'Agenda 2030 e le sue ambiziose sfide.

Un ruolo fondamentale nel perseguimento degli SDGs viene riconosciuto al settore privato, in relazione alla varietà degli ambiti di azione e delle risorse coinvolte (Scheyvens et al., 2016; Calabrese et al., 2021). L'Agenda 2030 attribuisce, inoltre, una chiara responsabilità alle imprese, in particolare grandi aziende e multinazionali, invitandole espressamente ad adottare pratiche sostenibili ed integrare le relative informazioni nella loro rendicontazione (United Nations, 2015, SDG 12.6).

Parallelamente, si assiste da tempo ad una crescente attenzione da parte di investitori, stakeholder e società civile per i comportamenti assunti dalle imprese e gli impatti della loro attività (Steurer, 2005). Attenzione che investe anche il settore turistico (De Grosbois, 2012; Jones et al., 2014; Uyar et al., 2021), caratterizzato da esternalità e significativi impatti economici, ambientali e sociali (Agarwal, 2002; Van Wijk e Persoon, 2006).

Tra le imprese del settore vi è ormai una diffusa consapevolezza dell'importanza di un'idonea strategia che contempli espressamente le questioni della sostenibilità (Holcomb et al., 2007; Khatter et al., 2019; Medrado e Jackson, 2016), atteso che un governo responsabile richiede l'impegnativo allineamento di fattori economici, ambientali e sociali (Jones et al., 2014). Considerando che il settore del turismo dipende in larga misura dalle risorse naturali e dal capitale umano, è altresì fondamentale per una gestione responsabile e sostenibile adottare delle pratiche ESG (Environmental, Social and Governance) (Back, 2024). Il riferimento è alle tre fondamentali dimensioni che qualificano l'impegno e l'impatto di un'azienda in termini di sostenibilità.

Le informazioni su questi profili sono divenute sempre più importanti negli ultimi anni, dal momento che investitori e stakeholder richiedono un'adeguata trasparenza sulle performance aziendali non finanziarie. Si comprende, dunque, come in tale contesto abbia acquisito crescente rilevanza nel governo delle aziende la misurazione della performance ESG, testimoniata anche da una particolare attenzione negli studi accademici nell'ultimo ventennio (Dauerer, 2025). È stato

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osservato come il presidio e il monitoraggio delle performance di sostenibilità necessitano di un solido quadro di riferimento che, in primo luogo, colleghi la gestione degli aspetti ambientali e sociali con la strategia e la sfera competitiva e, in secondo luogo, integri le informazioni ambientali e sociali con le informazioni economiche e competitive, e con il reporting di sostenibilità (Schaltegger e Wagner, 2006).

La letteratura in materia si è recentemente soffermata sulle relazioni tra la misurazione delle performance di sostenibilità, i sistemi di controllo di gestione ed il reporting di sostenibilità (Beusch et al., 2022; Chiucchi et al., 2025; De Villiers et al., 2016; Herremans e Nazari, 2016; Lozano et al., 2016; Maas et al., 2016; Schaltegger e Wagner, 2006; Traxler et al., 2020), evidenziando i vantaggi e l'importanza di ricercare un'integrazione tra tali elementi ai fini di un'efficace gestione strategica della sostenibilità e la conseguente rendicontazione dei progressi compiuti. In relazione alla complessa e delicata interazione tra questi elementi, si auspicano ulteriori analisi in merito che evidenzino, tra gli altri aspetti, le modalità tramite cui viene ricercata detta integrazione (Chiucchi et al., 2025; Schaltegger e Wagner, 2006; Traxler et al, 2020), anche ricorrendo a dei casi studio (De Villiers et al., 2016).

In questa prospettiva, la presente ricerca intende analizzare il sistema di misurazione della performance ESG di un'azienda leader nel settore dell'ospitalità con l'obiettivo di far luce sulle sue relazioni con il sistema di controllo di gestione e la rendicontazione esterna di sostenibilità, e di comprendere se e come venga ricercata l'integrazione tra tali elementi per l'efficace implementazione della strategia di sostenibilità. Essa si propone di contribuire alla letteratura sulla misurazione della performance ESG offrendo degli spunti di riflessione su come venga gestito tale processo in relazione ad altri (di controllo e di reporting) interrelati, ai fini di un'efficace integrazione della sostenibilità nella gestione delle aziende alberghiere. Considerato che un'azienda leader può avere un ruolo di grande rilievo nello sviluppo di modelli di business sostenibili (Buhalis et al., 2023; Khatter et al., 2019), la ricerca potrebbe altresì fornire validi spunti manageriali per il monitoraggio e il raggiungimento degli SDGs.

2. Il quadro teorico di riferimento

Un sistema di misurazione delle performance di sostenibilità è preposto alla raccolta, all'analisi, al monitoraggio ed alla comunicazione delle informazioni sulle performance di sostenibilità (Maas et al, 2016). Detto sistema integra misurazioni ambientali e sociali ai tradizionali indicatori economico-finanziari e di competitività (Epstein e Roy, 2001), supportando i processi di pianificazione, implementazione e controllo di una strategia di sostenibilità ed offrendo una visione olistica della performance. L'acronimo ESG indica i criteri di sostenibilità, ambientale, sociale e di qualità di governo delle aziende che consentono di apprezzarne il valore generato, gli impatti dell'attività e, in ultima analisi, il loro contributo allo sviluppo sostenibile.

Nello specifico, la componente "environmental" riguarda le politiche e le performance di un'azienda in termini di impatto ambientale, come le emissioni di gas serra, la gestione dei rifiuti, l'uso delle risorse naturali e la conservazione della biodiversità. La componente "social" riguarda le relazioni dell'azienda con i dipendenti e la comunità, includendo questioni come le condizioni di lavoro, la salute e la sicurezza, i diritti umani e le relazioni con la comunità locale. La componente "governance" riguarda la struttura e la qualità di governo, abbracciando temi come i diritti degli azionisti, la remunerazione dei dirigenti, il rispetto dell'etica e la trasparenza.

La misurazione ESG assolve un ruolo critico nel governo aziendale e nei processi di rendicontazione esterna di pratiche sostenibili. In ordine al primo profilo, tale misurazione supporta e guida le decisioni manageriali per l'implementazione della strategia aziendale di sostenibilità (Maas et al., 2016); inoltre, in virtù dei suoi legami con i sistemi di controllo di gestione (Chiucchi et al., 2025; Malmi and Brown, 2008), essa orienta il comportamento dei dipendenti verso gli obiettivi di sostenibilità, favorendo un progressivo allineamento dell'organizzazione alla strategia perseguita. Integrando la misurazione ESG, i sistemi di

controllo di gestione possono, dunque, guidare l'organizzazione verso il raggiungimento di detti obiettivi (Beusch et al., 2022; Chiucchi et al., 2025; Crutzen e Herzig, 2013; Maas et al., 2016; Malmi e Brown, 2008). In ordine al secondo profilo, la misurazione della performance ESG ha un ruolo determinante nella rendicontazione esterna di sostenibilità, consentendo, attraverso metriche ed indicatori, di predisporre e comunicare, su base volontaria o obbligatoria, informazioni su pratiche, iniziative e performance di sostenibilità con appositi report destinati agli stakeholder esterni (Baldarelli et al., 2017, Rosati e Faria, 2019). Pertanto, la misurazione ESG svolge un ruolo fondamentale nel dare forma alla rendicontazione sulla sostenibilità, fornendo dati quantificabili e misurabili che migliorano la trasparenza e informano gli stakeholder.

Si comprende, dunque, come la misurazione ESG sia essenziale per la gestione e la disclosure delle pratiche sostenibili e degli impatti dell'attività aziendale sull'ambiente e sulla società (Nielsen, 2023), con implicazioni rilevanti sia per i sistemi di controllo di gestione sia per il reporting di sostenibilità. L'importanza di questi due elementi nel contesto della misurazione della performance ESG emerge anche nell'ambito dei due distinti approcci alla misurazione della sostenibilità evidenziati da alcuni studiosi (Burritt e Schaltegger, 2010; Chiucchi et al., 2025; Schaltegger e Wagner, 2006). Il primo approccio («outside-in») pone l'accento sulla rendicontazione esterna quale determinante della misurazione della performance ESG, il secondo approccio («inside-out») riconduce la scelta di misurare la performance ESG alla necessità di supportare le decisioni manageriali e guidare l'azione di un governo improntato a principi di responsabilità sociale e sviluppo sostenibile.

Di recente, un filone della letteratura in materia ha esaminato le relazioni tra la misurazione delle performance di sostenibilità, i sistemi di controllo di gestione ed il reporting di sostenibilità (Beusch et al., 2022; Chiucchi et al., 2025; De Villiers et al., 2016; Herremans e Nazari, 2016; Lozano et al., 2016; Maas et al., 2016; Schaltegger e Wagner, 2006; Traxler et al., 2020), evidenziando una complessa interazione che plasma la strategia di sostenibilità e le pratiche di misurazione (Chiucchi et al., 2025); sottolineando l'importanza di un approccio «integrato» per l'efficace implementazione della strategia di sostenibilità (De Villiers et al., 2016; Maas et al., 2016); e auspicando una più profonda comprensione di come la misurazione della performance ESG e le sue caratteristiche interagiscano con i sistemi di controllo di gestione ed il reporting di sostenibilità (Chiucchi et al., 2025; Traxler et al, 2020). Si sottolinea come le organizzazioni possano trarre vantaggio dall'integrazione del sistema di controllo di gestione e del reporting di sostenibilità nell'ambito di framework di misurazione della performance che contemplino la dimensione della sostenibilità, orientando l'attenzione del management e favorendo un'interiorizzazione delle misure di sostenibilità da parte dei dipendenti (Schaltegger e Wagner, 2006). Ciò consente, infatti, di comprendere meglio la sostenibilità nelle sue concrete declinazioni e di renderla maggiormente operativa, favorendo una più efficace attività di reporting. Al riguardo, i report di sostenibilità sono stati spesso criticati proprio per la loro mancata integrazione nelle attività di gestione quotidiana (Gray, 2010).

3. Metodologia

L'obiettivo dello studio verrà perseguito adottando una metodologia di ricerca qualitativa, coniugando l'analisi della letteratura specificatamente focalizzata sulle relazioni tra misurazione della performance, sistema di controllo di gestione e rendicontazione di sostenibilità con la presentazione di un caso studio rappresentativo (Creswell et al., 2007; Yin, 2009), idoneo a illustrare in via strumentale tale tema (Stake, 1995) ed a far emergere l'importanza di un approccio integrato per l'efficace implementazione di una strategia di sostenibilità.

In particolare, verrà esaminato il sistema di misurazione della performance ESG di Hilton Worldwide, azienda leader nel settore dell'ospitalità da tempo impegnata a monitorare e ridurre l'impatto ambientale e sociale dei suoi hotel in tutto il mondo (Hilton, 2018). Il caso è ritenuto d'interesse poiché l'azienda ha sviluppato una strategia ESG allineata con l'Agenda 2030,

supportata dal sistema di misurazione della performance «Lightstay», per cui ha conseguito – anche per l'ESG reporting – specifici riconoscimenti (Hilton 2023, 2024). Come emerge da un precedente studio (Damiano e Picciotto, 2026), Hiton si distingue tra i grandi operatori alberghieri per la sua rilevante e continuativa esperienza nel reporting di sostenibilità, abbracciando l'intero periodo che va dall'introduzione degli SDGs ad oggi.

L'analisi si soffermerà sulle caratteristiche di progettazione e sulle modalità d'impiego del sistema di misurazione della performance ESG di Hilton, due dimensioni del sistema di misurazione della performance ritenute rilevanti in letteratura per l'efficacia di governo (Flamholtz, 2002; Merchant e Riccaboni, 2001). L'ipotesi di fondo è che il focus su dette dimensioni possa consentire di far luce sulle relazioni tra misurazione della performance, sistema di controllo di gestione e rendicontazione di sostenibilità, facendo emergere come può essere ricercata e assicurata l'integrazione tra tali elementi. A tal fine, si è privilegiato il metodo dello studio di caso, considerato particolarmente appropriato quando si desidera investigare in profondità un fenomeno contemporaneo nel contesto reale in cui esso accade (Yin, 2009).

Il caso verrà sviluppato attraverso la raccolta di dati di natura primaria e secondaria (Eisenhardt, 1989). In particolare, una prima fase della ricerca si basa sulla raccolta e l'analisi di contenuto manuale di dati secondari (documenti e report aziendali, dati e informazioni disponibili sul sito web istituzionale) ed è finalizzata a indagare le caratteristiche distintive del sistema di misurazione della performance ESG di Hilton, in termini sia di progettazione sia di impiego (dimensioni delle performance di sostenibilità monitorate, natura e tipologia di indicatori di performance impiegati, tipologie di dati e report generati, modalità di supporto all'attività decisionale, di controllo gestionale e di reporting esterno).

Una seconda fase della ricerca è incentrata sulla raccolta e l'analisi di dati primari attraverso delle interviste semi-strutturate ad attori chiave. Questi dati, oltre a essere utili alla validazione e all'approfondimento dei dati secondari, sono considerati strumentali alla chiarificazione delle relazioni tra misurazione della performance ESG, sistemi di controllo di gestione e reporting di sostenibilità.

4. Risultati

Nella presente sezione vengono presentati distintamente i primi risultati emersi dall'analisi dei dati secondari, condotta in una prima fase della ricerca, ed i risultati attesi della seconda fase della ricerca relativi all'analisi dei dati primari che saranno in futuro raccolti.

4.1. Risultati preliminari della prima fase di ricerca

La Hilton Worldwide è tra le più grandi catene alberghiere al mondo con oltre 7.500 hotel presenti in 126 paesi. Essa ha adottato una strategia ambientale, sociale e di governance (ESG) allineata con l'Agenda 2030 e finalizzata a conseguire gli obiettivi del suo programma di responsabilità aziendale «Travel with Purpose». Incentrato su tre specifici ambiti di impegno ed intervento («persone», «hotel» e «comunità»), tale programma mira a ridurre in modo significativo l'impatto ambientale degli hotel ed a raddoppiare l'investimento nell'impatto sociale entro il 2030 (Travel with Purpose, 2024 Report). Nel 2022 l'azienda ha elaborato un nuovo quadro strategico ESG, rafforzando gli obiettivi ESG ed aggiornando i sotto-obiettivi all'interno di ciascun pilastro, esplicitando le priorità, i programmi e le pratiche che guideranno lo sviluppo futuro e che vengono misurate, monitorate e rendicontate.

In particolare, la strategia di Hilton è supportata dal suo sistema di misurazione della performance ESG, denominato «Lightstay», un sistema proprietario personalizzato progettato per monitorare le prestazioni ambientali e sociali di tutti gli hotel Hilton presenti nel mondo, ed i

progressi compiuti verso gli obiettivi per il 2030[2]. Nella fattispecie si tratta di una piattaforma tecnologica sviluppata per la misurazione delle prestazioni ESG del portafoglio globale di Hilton (proprietà gestite e in franchising), idonea a monitorare, analizzare e rendicontare il loro impatto ambientale e sociale nelle comunità in cui operano. In particolare, il sistema Lightstay presenta le seguenti caratteristiche indicate nella tabella 1:

- *Monitoraggio dell'impatto ambientale*: LightStay monitora i consumi energetici, idrici e i rifiuti prodotti usando variabili come le condizioni meteorologiche e l'occupazione delle camere su base mensile degli hotel, così come prevede i consumi futuri. Inoltre, monitora le emissioni di carbonio ed i progetti di efficienza. Ciò permette un *benchmarking* delle prestazioni tra gli hotel.
- *Monitoraggio dell'impatto sociale*: Lightstay rende disponibili dati specifici inerenti i fondi di soccorso distribuiti in caso di calamità naturali, le attività e le ore di volontariato nella comunità, le donazioni e le sovvenzioni assegnate dalla Hilton Global Foundation, la formazione sui diritti umani erogata, i rifugiati assistiti, l'impegno con partner locali per specifici progetti perseguiti, le informazioni sul programma di diversità dei fornitori adottato (ad esempio, numero di aziende di proprietà di donne, di minoranze, ecc.).
- *Monitoraggio della crescita professionale*: Lightstay rende disponibili dati e informazioni sui programmi di formazione del personale. Monitora le opportunità di carriera e di sviluppo professionale offerte ai dipendenti e alle comunità locali. Inoltre, rende disponibili informazioni su fiere del lavoro, workshop e seminari organizzati.
- *Disponibilità di dati utili*: Lightstay analizza e prevede i consumi delle utenze e i relativi costi, avvisando i team degli hotel quando vengono identificati dei picchi. Il sistema genera avvisi mensili per valori di consumo incompleti o fuori intervallo.
- *Disponibilità di indici di rischio per località*: LightStay mappa tutti gli hotel Hilton rispetto ad una serie di indici di rischio esterno (ambientali e comunitari locali) con un aggiornamento annuale, inclusi i rischi per calamità, climatici, idrici, biodiversità e violazione dei diritti umani.
- *Reporting ai clienti*: Lightstay consente di segnalare ai clienti le emissioni di Scope 3 da riunioni ed eventi ospitati negli hotel Hilton. Fornisce ai clienti dei report ambientali personalizzati sulle emissioni per notte in camera nell'ambito del programma «Meet with Purpose».
- *Condivisione di best practice*: Lightstay monitora le pratiche di sostenibilità operativa, di progettazione e costruzione degli hotel, consentendo la condivisione di *best practice*.
- *Coinvolgimento del personale*: Lightstay consente di connettersi con i *team* degli hotel per fornire indicazioni e report di conformità, formazione sul sistema, report personalizzati e riconoscimenti.

Tabella 1. Le caratteristiche del sistema «Lightstay»

Il sistema Lightstay rende disponibile un ricco set di dati, informazioni e indicatori di performance ESG, di natura quantitativa e qualitativa[3], che consente di misurare gli impatti

[2] Il sistema LightStay è allineato ai criteri elaborati dal *Global Sustainable Tourism Council* (GSTC) per il turismo e le pratiche di viaggio sostenibili.

[3] La completezza e l'accuratezza di dati e processi aziendali sono garantiti da DEKRA Certification Inc, che fornisce una revisione esterna indipendente sulle informazioni relative ai programmi ambientali, sociali e di governance (ESG) di Hilton. A partire dal 2008, ha fornito i servizi di validazione per il programma

sull'ambiente e sulla società degli hotel Hilton in tutto il mondo, così come di apprezzare l'impegno, i contributi ed i progressi raggiunti verso un modello di sviluppo sostenibile perseguito con la strategia «Travel with Purpose» (per i quali si rinvia dettagliatamente al report 2024).

Il patrimonio di dati e informazioni che confluisce in un unico sistema permette a Hilton di operare in modo più efficiente, di supportare decisioni consapevoli e di generare un impatto ambientale e sociale positivo. Dall'adozione di LightStay (avvenuta nel 2009), le proprietà Hilton hanno ridotto significativamente le emissioni di carbonio e contribuito attivamente al supporto delle comunità locali, risparmiando oltre 1 miliardo di dollari in costi di utenza[4].

Le modalità d'impiego del sistema Lightstay saranno approfondite nella futura fase della ricerca, tuttavia, dall'analisi condotta emergono alcuni elementi riguardanti il ruolo assegnato al sistema dal top management e dette modalità d'uso.

Il top management della Hilton riconosce al sistema Lightstay una rilevanza critica nei processi decionali ed operativi aziendali, nonchè ai fini della rendicontazione interna ed esterna, prevedendo la sua implementazione in tutti gli hotel Hilton come specifica forma di controllo. L'impiego di Lightstay è ritenuto essenziale, informando ogni hotel degli obiettivi specifici da perseguire e delle priorità di impatto sociale cui dedicare attenzione, motivo per cui esso si configura quale requisito standard per tutto il portafoglio globale. Tutti i nuovi hotel devono completare un corso di formazione «LightStay» online tramite la Hilton University entro tre mesi dall'apertura, Sono, inoltre, disponibili dei corsi avanzati e delle guide pratiche, così come un team di supporto LightStay che gestisce le relazioni con gli hotel nell'operatività quotidiana.

Per quanto concerne le modalità d'impiego, il sistema Lightstay supporta la pianificazione di budget e tutti gli hotel devono stabilire degli obiettivi di riduzione annuale, nonchè impegnarsi in dei progetti di miglioramento. Nell'ambito di un sistema generale di reportistica, Lightstay rende disponibili ai team degli hotel anche informazioni su aree prioritarie chiave della destinazione, permettendo un focus specifico e personalizzato nel monitoraggio e nel supporto dell'attività.

A sua volta, come standard di marchio globale, tutti gli hotel gestiti e in franchising devono utilizzare Lightstay per fornire i propri dati di impatto ambientale e sociale a Hilton. È, dunque, contemplata la responsabilizzazione dei team degli hotel nel concreto impiego del sistema. Nella piattaforma vengono immesse le caratteristiche e le certificazioni di sostenibilità di tutte le strutture e gli hotel devono inserire una serie di dati su base mensile, relativi a: consumi energetici e idrici da tutte le fonti; smaltimento dei rifiuti; eventi di volontariato; donazioni. L'immissione accurata dei dati da parte degli hotel è garantita da alcune specifiche funzionalità tecniche del sistema Lightstay (conversioni globali per l'inserimento di valori in valuta locale, profili della proprietà da compilare come standard del marchio, utilizzo del protocollo internazionale per il calcolo dei gas serra, avvisi mensili per l'inserimento dei dati delle utenze).

Il sistema Lightstay è progettato in modo da rilasciare cruscotti di indicatori in tempo reale ed aggiornamenti mensili, informando così regolarmente gli hotel sulle loro prestazioni ESG. I dati sono accessibili ai dipendenti ed alle parti interessate, come gli ospiti, permettendo di riconoscere gli sforzi dell'azienda, in linea con la sua visione di promuovere l'inclusività e la sostenibilità (Hilton, 2018). Utilizzando LightStay, tutti i membri dell'organizzazione dispongono di un ricco set di dati ed informazioni a supporto delle decisioni e dell'attività operativa quotidiana, così come hanno modo di seguire ed esaminare i progressi compiuti verso il

Lightstay, e dal 2010 ha fornito i servizi di certificazione ISO 9001 (gestione della qualità), 14001 (gestione ambientale) e 50001 (gestione energetica).

[4] Più precisamente, l'azienda specifica una riduzione delle emissioni di carbonio equivalenti alla rimozione di 390.350 auto dalla strada ed un supporto alle comunità locali con 6.273.934 ore di volontariato. https://stories.hilton.com/hilton-history/lightstay-a-decade-of-managing-our-environmental-and-social-impact

raggiungimento degli obiettivi condivisi della strategia «Travel with Purpose», con le conseguenti implicazioni in chiave di consapevolezza e coinvolgimento nella sua realizzazione. Inoltre, il sistema fornisce informazioni su best practice e benchmark, permettendo un'analisi comparativa tra hotel in un'ottica di miglioramento dell'efficienza e della sostenibilità dei processi aziendali.

LightStay consente poi ad ogni hotel di predisporre per gli ospiti dei report personalizzati con informazioni sull'impatto ambientale di soggiorni, meeting ed eventi, così che i clienti possano, a loro volta, fare scelte consapevoli ed allinearsi alla strategia di sostenibilità perseguita da Hilton. La possibilità di generare report ambientali personalizzati discende dall'integrazione della piattaforma Lightstay con il programma «Meet with Purpose», dedicato all'organizzazione di riunioni ed eventi dei clienti nelle strutture Hilton[5]. Questa integrazione deriva dall'impegno di Hilton a rafforzare il proprio modello di business implementando svariati programmi e soluzioni tecnologiche idonei a limitare il consumo di risorse ed il proprio impatto ambientale, valorizzando collaborazioni come quella con ei3, partner tecnologico nella gestione e nel miglioramento continuo delle funzionalità di Lightstay. Un altro programma integrato nella piattaforma è «Hotel Kitchen Toolkit», volto a fornire agli hotel una guida e delle tecniche per la riduzione degli sprechi alimentari in ogni fase del processo produttivo[6]. L'operatività di tale programma e il processo decisionale sono supportati dal monitoraggio dei dati tramite la piattaforma LightStay. Anche in virtù di questa integrazione, si favorisce una concreta integrazione dei criteri di sostenibilità della gestione nei processi aziendali.

In generale, l'idea di fondo che informa l'impiego del sistema Lightstay è che attraverso il monitoraggio dei principali elementi ambientali e sociali, gli hotel possono ottimizzare le loro operazioni, ridurre i costi ed allinearsi agli obiettivi aziendali, offrendo, al contempo, un'esperienza più sostenibile per gli ospiti e generando valore per i proprietari.

Il sistema Lightstay inizialmente è stato implementato per supportare la strategia di responsabilità sociale di Hilton ed era incentrato sulla misurazione degli impatti ambientali delle attività alberghiere (Zientara et al., 2020). Nel tempo si è gradualmente evoluto per rispondere alle più complesse esigenze di monitoraggio e rendicontazione della performance ESG. Oggi rappresenta anche una piattaforma di comunicazione ed è alla base di un reporting standardizzato sulla sostenibilità, garantendo agli stakeholder interni ed esterni l'aggiornamento sulle performance di Hilton. In particolare, il monitoraggio di dati e informazioni in LightStay consente, a livello di general management, di esaminare le prestazioni ESG ai fini dell'azione di governo e di predisporre la Relazione annuale sulla strategia ESG per il Consiglio di amministrazione. Al contempo, Lightstay permette di predisporre il report di sostenibilità, che fornisce un aggiornamento annuale sulla strategia e le performance del programma «Travel with Purpose». Esso esplicita le aree prioritarie di intervento, le attività e le iniziative, gli indicatori di performance ESG, con un espresso richiamo agli SDGs dell'Agenda 2030. Questi ultimi sono ampiamente integrati nel core business aziendale attraverso varie e numerose iniziative descritte nella reportistica di sostenibilità (Damiano e Picciotto, 2025). Il report è redatto in conformità agli standard della Global Reporting Initiative (GRI) e integra le raccomandazioni del Sustainability Accounting Standards Board (SASB) e della Taskforce on Climate-related Financial Disclosures (TCFD).

Oltre al report di sostenibilità, Hilton comunica esternamente la propria strategia, il programma «Travel with Purpose» ed i progressi realizzati verso gli obiettivi 2030, sul proprio sito web istituzionale con una sezione dedicata.

[5] Utilizzando i dati raccolti dalla piattaforma Lightstay, Hilton ha sviluppato il Meeting Impact Calculator per calcolare l'impatto ambientale di riunioni ed eventi. Sulla base dei dati di consumo di ogni hotel, viene creato un report personalizzato che descrive in dettaglio le stime di carbonio, energia, acqua e rifiuti.

[6] Il programma si propone di: prevenire la perdita e lo spreco di cibo attraverso una pianificazione ponderata del menu; recuperare cibo sano per le donazioni; incanalare gli scarti alimentari verso altri usi.

Come si evince dal seguente passaggio, la possibilità di operare una rendicontazione esterna trasparente viene considerata un fattore fondamentale nella relazione con gli stakeholder ai fini di un loro coinvolgimento nelle questioni materiali più rilevanti, nonché di collaborazione per la ricerca attiva di soluzioni.

"We use LightStay, our award-winning ESG performance measurement platform, to measure our hotels' impacts in the communities in which they operate. We believe that transparent external reporting allows us to better engage our stakeholders on the most material issues impacting our business and collaborate on solutions to address them." (Hilton 2022 ESG Report, p. 53).

4.2. Risultati attesi della seconda fase di ricerca

Come prima accennato, i risultati attesi della seconda fase della ricerca permetteranno di chiarire le relazioni tra misurazione della performance ESG, sistemi di controllo di gestione e reporting di sostenibilità, favorendo una maggiore comprensione: i. dei fattori chiave per un'efficace integrazione tra tali elementi (posto che dai risultati preliminari sembra riscontrarsi l'approccio «integrato» auspicato in letteratura); ii. di eventuali criticità d'impiego del sistema di misurazione della performance ESG che devono essere attentamente presiedute e governate per l'efficace implementazione della strategia di sostenibilità.

5. Contributo potenziale

Lo studio presenta dei limiti, primo fra tutti la non generalizzabilità dei risultati connessa al metodo del caso studio singolo impiegato. Esso consente, tuttavia, un'analisi approfondita dei caratteri di un sistema di misurazione della performance ESG di un'azienda leader di settore, soffermandosi sui profili qualificanti un approccio integrato per la gestione strategica della sostenibilità che valorizza i legami tra misurazione della performance, sistema di controllo di gestione e rendicontazione di sostenibilità. In tal senso, il contributo potrebbe essere ritenuto d'interesse in relazione al ruolo di attore chiave riconoscibile ad aziende leader del settore turistico in virtù dell'influenza esercitabile nella comunità economica e imprenditoriale. I risultati dell'analisi possono far luce su aspetti critici ed innovativi riscontrabili nel sistema di misurazione della performance ESG della Hilton che potrebbero essere utili nella riflessione scientifica e nella sfera manageriale.

Più in generale, lo studio può contribuire alla letteratura sui sistemi di misurazione della performance della sostenibilità e le loro relazioni con il sistema di controllo di gestione ed il reporting di sostenibilità, specie con riferimento alle modalità tramite cui viene ricercata una concreta integrazione tra tali elementi ai fini di una gestione strategica della sostenibilità ed una trasparente comunicazione agli stakeholder dell'impegno profuso. Inoltre, in ottica manageriale, potrebbe offrire degli spunti per altre realtà del settore turistico impegnate nel raggiungimento e nella rendicontazione degli SDGs.

Parole chiave: Misurazione della performance ESG; controllo di gestione; report di sostenibilità; sviluppo sostenibile; imprese turistiche

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The sustainability report of tourism companies: an analysis of online travel agencies

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1. Introduction

The role of companies within society, combined with their ethical implications, has sparked growing interest from the academic community and the business world (Harrison & Freeman, 1999). The identification of competitive advantages is a strategic priority for organisations, as it leads to the achievement of their primary goal: the creation of value in a market characterised by intense competition among businesses. According to Porter and Kramer (2006), such benefits are not limited to economic aspects, but also include social and environmental dimensions, which play an increasingly important role in the definition of current business strategies. Businesses are called upon to make public their own initiatives and practices that have a direct impact on society. In this context, there has been a growing interest among external stakeholders in companies providing clear evidence of the sustainability of their own activities under the environmental, social, and governance (ESG) profile. Similarly, there is a growing need within organisations to integrate sustainability goals with traditional economic and financial goals in order to ensure a more balanced and responsible management approach (Bachiorri, 2017). The literature is primarily concerned with the analysis of the factors that motivate the dissemination of such activities, the contents communicated, the modes of communication used, and the effects that these have on image and business performance (Benoit-Moreau & Parguel, 2011). In terms of communication modes, Rikhardsson and Holm (2006) demonstrate that the lack of shared standards is one of the most significant criticisms in the study of the phenomenon. In fact, the lack of uniform criteria limits the ability to effectively use the information disclosed in decision-making processes. In the field of sustainability accounting studies, numerous theoretical and normative proposals have been advanced to promote the standardisation and transparency of social and environmental performance practices, to discipline the performance of non-financial performance, including social, environmental, and sustainability reports developed on the basis of international standards, such as those proposed by the Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB). Within this field of research, sustainability reporting by companies operating in the hotel and tourism sector plays a particularly significant role, as these organisations are highly exposed to growing environmental instability and rapid climate change.

The tourism industry is a major global industry, but the impact of social and environmental practices on the companies that operate remains a research area that has received insufficient attention from academic literature (De Grosbois, 2012). The purpose of this study is to go deeper into the topic of measuring business sustainability in the tourism industry, with a focus on online travel agencies (OTA). In fact, these latter have gradually gained a central position in the digital

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intermediation system between companies that provide transport and lodging services and end users, consolidating a competitive advantage over traditional operators in the sector. The major online travel agencies (OTA) — Booking.com, Airbnb, and Expedia — have demonstrated a growing interest in sustainability issues, with a particular emphasis on environmental issues, albeit employing various strategies. Booking has developed the Travel Sustainable program, which allows users to identify resource structures that use practices with low environmental and social impact (Gonzalez et al., 2025). Airbnb, on the other hand, has implemented a host-centric approach, providing recommendations for reducing energy consumption, efficient waste management, the use of environmentally friendly cleaning products, and the promotion of sustainable mobility (Arzoumanidi et al., 2022). Expedia has included an eco-compatibility criterion to its own rating system, allowing users to express their opinions on the sustainability practices of structures (Gonzalez et al., 2025). Based on the preceding considerations, the current study examines the environmental, social, and governance initiatives implemented by the major OTAs mentioned above, as well as the channels through which such initiatives are presented in the respective sustainability reports. The analysis is carried out using a qualitative approach, based on a documentary study of the previous reports of Booking.com, Airbnb, and Expedia. The investigation is carried out both in a diachronic perspective — taking the period 2022-2024 into account — and in a sychronic perspective, by comparing the various informative areas of the three reports and evaluating the qualitative and quantitative characteristics of the data in them.

This work is structured as follows. Section 2 examines the relevant literature and develops the study hypotheses. Section 3 describes the data, the study, and the methodology used. Section 4 presents the results, while Section 5 presents our conclusions and identifies some points for future research.

2. Literature review

2.1. Sustainability, transparency and institutional drivers in tourism

Sustainability has received increasing attention from the academic literature in the tourism industry, which has demonstrated its strategic importance not only in terms of environmental protection and social responsibility, but also as a factor determining long-term competitiveness and value creation (Streimikiene et al., 2020). Numerosi studi sottolineano, in particular, come le imprese turistiche operano in un contesto caratterizzato da una forte esposizione agli stakeholder e da una crescente sensibilità pubblica verso le tematiche ambientali, sociali e di governance (Environmental, Social, and Governance - ESG); elementi, questi, contribuiscono ad accrescere la rilevanza della sostenibilità come strumento di trasparenza e responsabilità.

According to Hahn and Kühnen's (2013) research, sustainability reporting practices are influenced by a variety of factors, including institutional factors, stakeholder pressures, competitive dynamics, and specific company characteristics. In particular, the authors demonstrate how regulation, even of a supranational nature, and the adoption of international guidelines promote the diffusion of standardised performance frameworks, whereas investor, consumer, and other stakeholder expectations highlight the role of disclosure as a tool for transparency and legitimacy. In this perspective, sustainability disclosure serves a crucial role not only as an informational but also as a symbolic function, establishing itself as a communication and legitimacy system aimed at bolstering corporate reputation and reducing informational imbalance. However, numerous contributions demonstrate that sustainable tourism practices continue to be characterised by a high degree of heterogeneity, and that these differences in performance limit the comparability of company disclosures in time and space.

In the tourism industry, literature (UNWTO, 2004; Vučetić, 2017; Streimikiene et al., 2021) has invested in the concept of sustainable development, emphasising multiple definitions that converge on key elements such as economic growth compatible with environmental protection, carbon emission reduction, and efficient use. According to the World Tourism Organization

(UNWTO, 2004), measuring the level of sustainable development necessitates the adoption of a structured set of indicators capable of representing the various interconnected dimensions of sustainability. The most significant dimensions are generally identified as environmental, economic, and social (Vučetić, 2017, p 318).

In particular, the environmental dimension receives the most criticism and, as a result, attention, because the tourism industry exerts significant pressure on natural resources, emissions of greenhouse gases, and local ecosystems, directly influencing the environmental quality of destinations and, indirectly, their competitiveness over time (Streimikiene et al. Environmental indicators, in particular, allow for the assessment of the impact of tourism activities and, at the same time, the support of continuous improvement processes, thereby contributing to the preservation and improvement of the quality of natural resources (Kiss, 2015).

These indicators play a vital role in the "measuring" of sustainability, both for internal performance monitoring and for stakeholder reporting (Tang et al., 2023; Zhang et al., 2025). Despite the fact that the literature has demonstrated how, among the various tools for measuring sustainability in tourism, environmental indicators are the most widely used, the effective integration of these indicators in decision-making processes and performance practices remains heterogeneous, particularly in relation to the type of industry operator and the model. The growing emphasis on measuring and standardising such impacts explains the adoption of performance frameworks such as GRI Standards capable of structuring and making environmental information produced by tourism businesses comparable (Guix et al., 2024; Rüger & Maertens, 2023). In terms of economic dimension, it refers to the ability of tourism businesses to provide long-term economic value, ensuring profitability for those who hold the title and contributing to local development. The literature emphasises that economic sustainability is not limited to profit generation, but also includes equitable value distribution across the value chain, support for local suppliers, and job creation (AA.VV., 2025; Bachiorri, 2017; Khaghaany et al., 2019).

Economic performance measurement using structured indicators allows for the monitoring of profits, investments, tax contributions, and expenditures on the local economy, allowing for comparative analysis of companies and time periods.

Finally, the social dimension takes into account the effects of tourism on individuals and communities, including working conditions, human rights, social equity, inclusiveness, and cultural value (Bachiorri, 2017; Jones & Comfort, 2018). Social sustainability entails active participation of host communities, the promotion of responsible workplace practices, and the protection of cultural heritage. Social performance measurement using structured standards, such as GRI 400, allows for the transparent documentation of the social impacts of tourism businesses and the comparison of operator performance (Guix et al., 2024; Zhang et al., 2025).

2.2. ESG, standardisation and the limits of disclosure in tourism

This theoretical framework links the three traditional dimensions of sustainability to the need for standardised and comparable reporting frameworks to achieve the best sustainability assessment for individual companies over time and across companies.

As is well known, theory and legislation recommend the use of sustainability reporting tools, such as social, environmental, and sustainability reports based on frameworks and standards developed by international and European bodies, to standardise, or at least harmonise, and compare sustainability disclosures by companies, particularly tourism companies.

The Integrated Reporting Framework (IR), Global Reporting Initiative Standards (GRI), European Sustainability Reporting Standards (ESR), and International Financial Reporting Standards for Sustainability Disclosure are examples.

Due to the diversity of the proposed models, the literature has also examined the changes caused by sustainability reporting in the accounting and corporate professions and relevant professional jurisdictions (Lai A., Stazzecchini R., 2021), as well as the differences between the

various frameworks, particularly those of the GRI and the ISSB and/or SASB, to identify the future dire Recent studies have shown that generalist reporting models may not capture the specific characteristics of tourism companies, suggesting the need for more tailored approaches. Ye Jin et al. demonstrate how the lack of sector-specific standards might affect the quality and usefulness of provided ESG information, emphasising the necessity for empirical investigations of tourism firms' usage of current frameworks.

Due to their multi-stakeholder focus, the GRI Standards are one of the most frequently utilised and internationally accepted sustainability reporting standards. To meet stakeholders' increased need for information, these standards were created in the late 1990s to give corporations a structured and shared instrument to disclose their economic, environmental, and social performance transparently and comparably. They enable customisable sustainability disclosures across relevant dimensions and reporting on direct and indirect value chain impacts by adopting a stakeholder-oriented perspective.

The GRI Framework has evolved to improve clarity, internal consistency, and alignment with sustainability legislation and conceptual advances. Revisions to the standards' numbering and classification scheme eliminated the distinction between the GRI 100, 200, 300, and 400 series. The GRI 100 series standards have been reorganised and combined into the Universal Standards, renamed GRI 1 (Foundation), GRI 2 (General Disclosures), and GRI 3 (Material Topics). Due to their modular and flexible nature, the GRI Standards are ideal for comparative and longitudinal evaluations of framework adoption and macro-category coverage.

2.3. Online Travel Agencies and the transformation of the tourism sector

Intermediaries between hotels, bed and breakfasts, cruise operators, and other tourism service providers and consumers play a key role in the tourism business.

Online travel agencies (OTAs) are becoming increasingly important in the global tourism sector and impacting market dynamics. They balance supply and demand, minimise consumer search costs, and standardise tourism offers while haggling with established providers (Garcia et al., 2022). The OTA business model's high digitisation and absence of direct infrastructure control make environmental and social implications difficult to quantify. OTAs' indirect effects on the tourism supply chain include supplier selection, sustainable or unsustainable practices promotion, and price policies. This unique feature makes OTAs a good case study for sustainability practices because their ESG development is primarily a multiplier effect along the value chain (Garcia et al., 2022).

OTAs adopting standardised reporting standards is a huge opportunity, according to this interpretation. Structured reporting allows stakeholders to receive transparency and accountability and monitor ESG performance across the supply chain, but the literature shows that practices vary widely. Thus, empirical examination of OTAs provides a unique viewpoint on how digital enterprises might include sustainability into their business model without direct touch with natural resources or tourism infrastructure.

2.4. Research questions

As stated above, although OTAs are recognised as playing a key role in promoting sustainability and setting new ESG standards within the sector, the literature on sustainability and ESG disclosure practices in tourism has not yet systematically and comparatively analysed OTA reporting models and practices and, more specifically, the evolution of reporting over time and the relative level of coverage of the various economic, environmental and social dimensions. In light of this gap, taking into account that the most widely used reporting model in industry practice is the GRI Framework and assuming that the OTAs that have demonstrated the greatest sensitivity

towards sustainability are Booking.com, Expedia Group and Airbnb, this study aims to answer the following Research Questions:

- RQ1: To what extent do OTAs adopt GRI standards in their sustainability reports?
- RQ2: Which categories of GRI standards (Universal, Economic, Environmental, Social) are most frequently reported by OTAs?
- RQ3: How does the reporting of GRI standards by Booking.com, Expedia Group and Airbnb vary over time (2022–2024)?

With regard to the first question, the aim of the study is to assess the level of compliance of the sustainability reports of the three OTAs under consideration with GRI standards and the differences that emerge between them in the adoption of these standards.

With regard to the second question, the aim of the study is to analyse the differences between the OTAs under consideration in the application of GRI standards in relation to specific areas of sustainability within their reports.

With regard to the third question, the research objective is to study, through a longitudinal analysis, the evolution over time of the adoption of GRI standards in the sustainability reports of the OTAs under consideration, in order to highlight any trends, changes in the level of compliance, and the degree of maturity of reporting, including from a comparative perspective between the various companies analysed.

In order to answer the research questions formulated, this study adopts a qualitative approach based on a documentary analysis of the sustainability reports published by the selected OTAs. In particular, the analysis focuses on the sustainability reports of Booking.com, Expedia Group and Airbnb for the period 2022–2024, examining their level of compliance with GRI standards through the construction of specific analysis matrices.

3. Research method

3.1. Sample

The methodology adopted follows a comparative multi-case study supplemented by a quantitative analysis of the documents. The sample comprises Airbnb, Expedia and Booking.com, selected as the leading OTAs in Italy, renowned for the variety of accommodation and packages they offer, and united by their status as listed companies with uniform reporting obligations – a condition that ensures a high degree of comparability of information. The data are drawn from public documents: Sustainability Reports for Booking.com, Global Impact Report for Expedia, and Sustainability and Community Update for Airbnb. These documents are available on the investor relations websites of the respective online travel agencies. The selection of the sample is based on their market significance and the availability of comparable financial and non-financial data.

The authors manually collected the data from the aforementioned documents using the GRI classification system. As the selected companies only have data available for the years 2022–2024, this time frame was chosen.

3.2. Research analysis method

A methodological design inspired by the qualitative content analysis model developed by Philipp Mayring (2015) was adopted, comprising seven stages. However, in view of the specific objectives of this research, not all the stages envisaged in the original model were applied in full. The methodological framework was therefore adapted, involving a partial reorganisation and simplification of the operational stages.

The categorical system was then defined, identifying main categories and subcategories derived from the relevant literature. During this phase, guidelines for data coding were developed,

drawn up in line with the Global Reporting Initiative (GRI) framework, to form the operational basis of the analysis.

Subsequently, the research activity focused on the examination of the empirical material and the interpretation of the results, which were analysed and discussed in relation to the research questions, with the aim of providing analytical evidence consistent with the objectives of this study.

4. Analysis of the results

This section presents the results of the empirical analysis in relation to the three research questions underpinning this study. In accordance with GRI criteria, a deductive categorisation approach is used to classify the content of the publications across the three dimensions of sustainability and their various subcategories. As mentioned, for Booking.com, Sustainability Reports covering the 2022–2024 period were examined. For Expedia, however, the analysis focused on the Global Impact Reports covering the same timeframe. Finally, with regard to Airbnb, the documents entitled Sustainability and Community Update were analysed.

With regard to the variables relating to the presence of a materiality analysis and the adoption of GRI standards, a binary approach was used to construct the tables, assigning a value of 0 in the case of absence and a value of 1 in the case of presence.

Table 1 provides a summary of the documents analysed, indicating for each one the number of pages, the presence of a materiality analysis and the adoption of GRI standards.

Online Travel Agencies (OTA)	**AIRBNB**			**EXPEDIA**			**BOOKING**		
YEAR	**2022**	**2023**	**2024**	**2022**	**2023**	**2024**	**2022**	**2023**	**2024**
SUSTAINABILITY REPORTS							X	X	X
GLOBAL IMPACT REPORT				X	X	X			
SUSTAINABILITY AND COMMUNITY UPDATE	X	X	X						
NUMBER OF PAG	10	51	58	57	66	45	62	50	32
MATERIALITY ASSESSMENT	0	0	0	1	1	1	1	1	1
GRI STANDARDS	1	1	1	1	1	1	1	1	1

Table 1. Characteristics of the analyzed sustainability reports

Building on this preliminary framework, the analysis proceeds with a systematic examination of the GRI standards adopted by the main OTAs covered in the study.

The analysis is structured according to the macro-area model set out in the GRI Standards, distinguishing between reportable GRI Universal Standards (GRI 2 and GRI 3) and thematic standards relating to the economic (GRI 200 – Economic), environmental (GRI 300 – Environmental) and social (GRI 400 – Social) dimensions.

The construction of the compliance matrices is based on the GRI Content Indexes, formally reported in the sustainability reports of Booking.com and Expedia Group. Conversely, for Airbnb, which does not have a structured GRI Content Index, the analysis is conducted by referring to the

environmental information disclosed by the company, with particular attention to the data on greenhouse gas emissions contained in the section “Corporate GHG Emissions by Scope”. These disclosures have therefore been mapped to the environmental macro-area (GRI 300 – Environmental), enabling a consistent comparison at thematic level, even in the absence of explicit adoption of the GRI standards by the company.

Specific compliance matrices were also developed for each OTA analysed for the examination of the GRI Universal Standards.

These tables enable an analysis, for each company, of the evolution of GRI standard adoption, with particular reference to the disclosures required by GRI 2 (General Disclosures) and GRI 3 (Material Topics) during the period under review.

In order to provide an adequate assessment, the authors have grouped the matrices into a single table that encompasses the GRI Universal Standards and the three OTAs under analysis (Table 2).

MATRICE DI CONFORMITA' GRI (COMPLIANCE MATRIX)	**BOOKING**			**EXPEDIA**			**AIRBNB**		
	2022	**2023**	**2024**	**2022**	**2023**	**2024**	**2022**	**2023**	**2024**
GRI 2 GENERAL DISCLOSURES									
GRI 2-1: Organizational Details	1	1	1	1	1	1	0	0	0
GRI 2-2: Entities preparing the report (consolidation)	1	1	1	1	1	1	0	0	0
GRI 2-3: Reporting period	1	1	1	1	1	1	0	0	0
GRI 2-4: Restatement of information from previous reports	1	0	0	1	1	1	0	0	0
GRI 2-5: External assurance	0	0	0	1	1	1	0	0	0
GRI 2-6: Main activities	1	1	1	1	1	1	0	0	0
GRI 2-7: Employees	1	1	1	1	1	1	0	0	0
GRI 2-8: Main suppliers	0	0	0	0	0	0	0	0	0
GRI 2-9: Governance structure and composition	1	1	1	1	1	1	0	0	0
GRI 2-10:Role of governance in oversight	1	1	1	1	1	1	0	0	0
GRI 2-11: Chair of the highest governance body	1	1	1	1	1	1	0	0	0
GRI 2-12:Role of the highest governance body in overseeing the management of impacts	1	1	1	1	1	1	0	0	0

GRI 2-13: Delegation of responsibility for managing impacts.	1	1	1	1	1	1	0	0	0
GRI 2-14:Role of the highest governance body in sustainability reporting	1	1	1	0	0	0	0	0	0
GRI 2-15:Conflicts of interest	1	1	1	1	1	1	0	0	0
GRI 2-16: Communication of critical concerns	1	1	1	1	1	1	0	0	0
GRI 2-17:Collective knowledge of the highest governance body	0	0	0	1	1	0	0	0	0
GRI 2-19 Remuneration policies	1	1	1	1	1	1	0	0	0
GRI 2-20 Process to determine remuneration	0	1	1	1	1	0	0	0	0
GRI 2-21 Ratio of annual total compensation	1	1	1	1	1	1	0	0	0
GRI 2-22 Statement on sustainable development strategy	0	0	0	1	1	1	0	0	0
GRI 2-23 Political commitments	1	1	1	1	1	1	0	0	0
GRI 2-24 Integrating policy commitments	0	0	0	1	0	0	0	0	0
GRI 2-25 Processes to remediate negative impacts	0	0	0	1	0	0	0	0	0
GRI 2-26 Mechanisms to seek advice and raise concerns	0	0	0	1	1	1	0	0	0
GRI 2-27 Compliance with laws and regulations	1	1	1	1	1	1	0	0	0
GRI 2-28 Membership associations	1	1	1	0	1	1	0	0	0
GRI 2-29 Approach to stakeholder engagement	1	1	1	0	0	0	0	0	0
GRI 2-30 Collective bargaining agreements	0	0	0	0	0	0	0	0	0
GRI 3 Material Topics									
GRI 3-1: Process to determine material topics.	0	0	0	0	0	0	0	0	0

GRI 3-2: List of material topics and boundaries.	0	0	0	0	0	0	0	0	0
GRI 3-3 Management of material topics	0	1	1	0	0	0	0	0	0
TOTAL	20	21	21	24	23	21	0	0	0
PERCENTUAL	**63%**	**66%**	**66%**	**75%**	**72%**	**66%**	**0%**	**0%**	**0%**

Table 2. GRI- General disclosure compliance matrix

Analysis of the compliance matrices reveals significant differences between the leading OTAs. Expedia Group stands out as the most consistent in its adoption of the GRI Universal Standards, with compliance rates of 75% in 2022, 72% in 2023 and 66% in 2024. Booking.com maintains a good level of compliance, albeit with more limited use of certain disclosures, recording a consistent 66% over the three-year period under review. For Airbnb, as the GRI Index is not included in the reports analysed, compliance stands at 0%, highlighting a marked disparity compared to other OTAs.

With regard to environmental standards, these are of particular significance, as the environmental impact is predominantly indirect and stems primarily from activities within the value chain. In this regard, a compliance matrix has been drawn up (Table 3), which shows, for the sample analysed, which standards from the GRI 300 series have been adopted and which have not.

Serie 300 - ENVIRONMENTAL	**BOOKING**			**EXPEDIA**			**AIRBNB**		
GRI 301 Materials	**2022**	**2023**	**2024**	**2022**	**2023**	**2024**	**2022**	**2023**	**2024**
GRI 301-1 Materials used by weight or volume	0	0	0	0	0	0	0	0	0
GRI 301-2 Recycled input materials used	0	0	0	1	0	0	0	0	0
GRI 301-3 :Reclaimed products and their packaging	0	0	0	0	0	0	0	0	0
GRI 302 Energy									
GRI 302-1 Energy consumption within the organization	0	0	0	1	1	1	0	0	0
GRI 302-2 Energy consumption outside of the organization).	0	0	0	0	0	0	0	0	0
GRI 302-3: energy intensity..	0	0	0	0	0	0	0	0	0
GRI 302-4: Reduction of energy consumption	0	0	0	0	0	0	0	0	0
GRI 302-5: Reductions in energy requirements of products and services	0	0	0	0	0	0	0	0	0

GRI 303 Water and Effluents									
GRI 303-1: Interaction with water as a shared resource	0	0	0	0	0	0	0	0	0
GRI 303-2: Management of water discharge-related impacts	0	0	0	0	0	0	0	0	0
GRI 303-3: Water withdrawal	0	0	0	0	0	0	0	0	0
GRI 303-4: Water dischargei.	0	0	0	0	0	0	0	0	0
GRI 303-5: Water consumption	0	0	0	0	0	0	0	0	0
GRI 304 Biodiversity									
GRI 304-1: Location in areas of high biodiversity.	0	0	0	0	0	0	0	0	0
GRI 304-2: Significant impacts on biodiversity.	0	0	0	1	1	1	0	0	0
GRI 304-3: Protected or restored habitats.	0	0	0	0	0	0	0	0	0
GRI 304-4: Species on the IUCN Red List.	0	0	0	0	0	0	0	0	0
GRI 305 Emissions	1	1	1	1	1	1	1	1	1
GRI 305-1:Direct GHG emissions (Scope 1).	1	1	1	1	1	1	1	1	1
GRI 305-2: Indirect GHG emissions from purchased energy (Scope 2).	1	1	1	1	1	1	1	1	1
GRI 305-3: Other indirect GHG emissions (Scope 3).	0	0	0	0	0	0	1	1	1
GRI 305-4: GHG emissions intensity.	1	1	1	1	1	1	1	1	1
GRI 305-5: Reduction of GHG emissions.	0	0	0	0	0	0	0	0	0
GRI 305-6: Ozone-depleting substance (ODS) emissions.	0	0	0	0	0	0	0	0	0
GRI 305-7: Air emissions (NO_x, SO_x, etc.).	0	0	0	1	0	0	0	0	0
GRI 306 – Waste									
GRI 306-1: Generation of waste and significant impacts.	0	0	0	1	0	0	0	0	0

GRI 306-2:Management of waste-related impacts..	0	0	0	0	0	0	0	0	0
GRI 306-3: Waste generated.	0	0	0	0	0	0	0	0	0
GRI 306-4: Waste diverted from disposal (e.g., recycling).	0	0	0	0	0	0	0	0	0
GRI 306-5: Waste directed to disposal.	0	0	0	0	0	0	0	0	0
GRI 307 – Environmental Compliance									
GRI 307-1: Non-compliance with environmental laws.	0	0	0	0	0	0	0	0	0
GRI 308 -Supplier Environmental Assessment									
GRI 308-1: New suppliers subject to environmental screening	0	0	0	0	0	0	0	0	0
GRI 308-2: Negative environmental impacts in the supply chain.	0	0	0	0	0	0	0	0	0
TOTAL	4	4	4	9	6	6	5	5	5
PERCENTUAL	**13%**	**13%**	**13%**	**28%**	**19%**	**19%**	**16%**	**16%**	**16%**

Table 3. GRI 300- Environmental compliance matrix

The results show that the three OTAs analysed adopt environmental standards to a limited extent. Booking.com has a compliance rate of 13%, which remained constant throughout the three-year period. Expedia Group recorded a rate of 28% in 2022, which fell to 19% in 2023 and 2024; Finally, Airbnb shows an unchanged adoption rate of 16% throughout the period analysed.

Finally, social standards (GRI 400) are examined. Analysis of the results reveals significant differences in adoption levels and social disclosure among the companies considered, which are highlighted in Table 4 below.

Serie 400 - SOCIAL	**BOOKING**			**EXPEDIA**			**AIRBNB**		
GRI 401 – Employment	**2022**	**2023**	**2024**	**2022**	**2023**	**2024**	**2022**	**2023**	**2024**
GRI 401-1: New hires and employee turnover.	0	0	0	1	1	0	0	0	0
GRI 401-2: Benefits for full-time employees.	0	0	0	1	1	1	0	0	0
GRI 401-3: Parental leave.	0	0	0	1	1	1	0	0	0
GRI 402-Management Relations									

GRI 402-1: Minimum notice period for operational changes	0	0	0	0	0	0	0	0	0
GRI 403 – Occupational Health and Safety									
GRI 403-1: Occupational health and safety (OHS) management system.	0	0	0	0	0	0	0	0	0
GRI 403-2:Hazard identification, risk assessment, and incident investigation.	0	0	0	1	0	0	0	0	0
GRI 403-3: Occupational health services.	1	1	1	0	0	0	0	0	0
GRI 403-4: Worker participation in OHS.	0	0	0	0	0	0	0	0	0
GRI 403-5: Worker training on OHS.	0	0	0	0	1	1	0	0	0
GRI 403-6: Worker health	1	1	1	1	1	1	0	0	0
GRI 403-7: Prevention and mitigation of OHS impacts.	0	0	0	0	0	0	0	0	0
GRI 403-8: Workers covered by an OHS management system.**S**.	0	0	0	0	0	0	0	0	0
GRI 403-9: Work-related injuries.	0	0	0	0	0	0	0	0	0
GRI 403-10: Work-related ill health	0	0	0	0	0	0	0	0	0
GRI 404 – Training and Education									
GRI 404-1: Average hours of training per employee.	0	0	0	0	0	0	0	0	0
GRI 404-2: Programs for upgrading employee skills and transition assistance programs.	0	0	0	1	1	1	0	0	0
GRI 404-3: Performance and career development reviews.	0	0	0	0	0	0	0	0	0
GRI 405 – Diversity and Equal Opportunity									
GRI 405-1: Diversity of governance bodies and employees	0	0	0	1	1	1	0	0	0
GRI 405-2: Ratio of basic salary and remuneration of women to men.	0	0	0	1	1	1	0	0	0
GRI 406 – Non-discrimination									

GRI 406-1: Incidents of discrimination and corrective actions taken.	0	0	0	0	0	0	0	0	0
GRI 407 – Freedom of Association and Collective Bargaining									
GRI 407-1: Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk.	0	0	0	0	0	0	0	0	0
GRI 408 – Child Labor									
GRI 408-1: Operations and suppliers at significant risk for incidents of child labor.	0	0	0	1	1	1	0	0	0
GRI 409 – Forced or Compulsory Labor									
GRI 409-1:Operations and suppliers at significant risk for incidents of forced or compulsory labor.	0	0	0	1	1	1	0	0	0
GRI 410 – Security Practices									
GRI 410-1: Security personnel trained in human rights policies or procedures	0	0	0	0	1	1	0	0	0
GRI 411 – Rights of Indigenous Peoples									
GRI 411-1: Incidents of violations involving rights of indigenous peoples.	0	0	0	0	0	0	0	0	0
GRI 412 – Human Rights Assessment									
GRI 412-1: Operations subject to human rights reviews or impact assessments.	0	0	0	0	0	0	0	0	0
GRI 412-2: Employee training on human rights policies or procedure	0	0	0	0	0	0	0	0	0
GRI 412-3: Significant investment agreements and contracts that include human rights clauses or that underwent human rights screening.	0	0	0	0	1	1	0	0	0
GRI 413 – Local Communities									
GRI 413-1: Operations with local community engagement, impact assessments, and development programs..	0	0	0	0	0	0	0	0	0

GRI 413-2: Operations with significant actual and potential negative impacts on local communities	0	0	0	1	1	1	0	0	0
GRI 414 – Supplier Social Assessment									
GRI 414-1: New suppliers that were screened using social criteria.	0	0	0	0	0	0	0	0	0
GRI 414-2: Negative social impacts in the supply chain and actions taken	0	0	0	1	1	1	0	0	0
GRI 415 – Public Policy									
GRI 415-1: Political contributions.	0	0	0	1	1	1	0	0	0
GRI 416 – Customer Health and Safety									
GRI 416-1: Assessment of the health and safety impacts of product and service categories..	0	0	0	0	0	0	0	0	0
GRI 416-2: Incidents of non-compliance concerning the health and safety impacts of products and services.	0	0	0	0	0	0	0	0	0
GRI 417 – Marketing and Labeling									
GRI 417-1: Requirements for product and service information and labeling.	0	0	0	0	0	0	0	0	0
GRI 417-2: Incidents of non-compliance concerning product and service information and labeling.	0	0	0	0	0	0	0	0	0
GRI 417-3: Incidents of non-compliance concerning marketing communications.	0	0	0	1	0	1	0	0	0
GRI 418 – Customer Privacy									
GRI 418-1: Substantiated complaints concerning breaches of customer privacy and losses of customer data	0	0	0	0	0	0	0	0	0
GRI 419 – Socioeconomic Compliance									
GRI 419-1: Non-compliance with laws and regulations in the social and economic area	0	0	0	0	0	0	0	0	0
TOTAL	2	2	2	14	15	15	0	0	0

PERCENTUAL	**5%**	**5%**	**5%**	**35%**	**38%**	**38%**	**0%**	**0%**	**0%**

Table 4. GRI- Social compliance matrix

As highlighted by the following summary charts, Expedia Group takes a more systematic approach to reporting, whilst Booking.com and Airbnb show significantly lower or zero levels of compliance across various categories of standards.

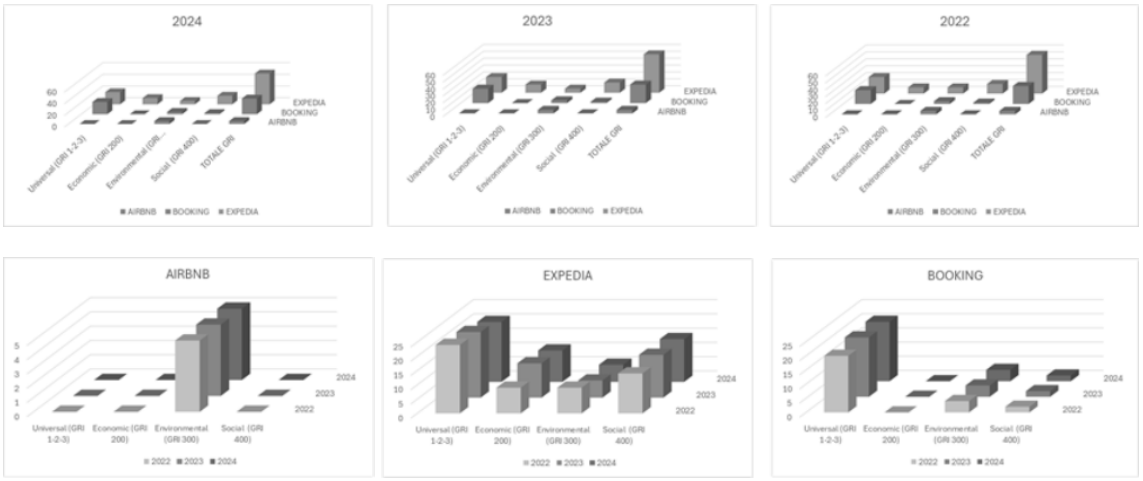


Figure 1. GRI adoption among the analysed OTAs (2022-2024)

The analysis of the sustainability reports published by Booking.com, Expedia Group and Airbnb between 2022 and 2024 reveals a picture characterised by significant variation in the ESG reporting practices adopted by the leading OTAs. The results show that the adoption of GRI standards is neither uniform in scope nor depth, confirming the sector's difficulties in producing fully comparable and consistent disclosures across the various dimensions of sustainability. Expedia Group emerges as the operator with the highest level of formal alignment with the GRI framework, being the only OTA in the sample to systematically report on all categories of standards (Universal, Economic, Environmental and Social).

In contrast, Booking.com focuses its reporting predominantly on universal standards, highlighting a substantial lack of disclosure relating to economic, environmental and social standards. This suggests a reporting approach geared more towards organisational and governance aspects, rather than the structured measurement of ESG impacts.

As regards Airbnb, the analysis shows that the company has not formally adopted the GRI framework. However, the company provides some environmental information, particularly regarding greenhouse gas emissions, which are categorised under the environmental macro-area to allow for a thematic comparison with other OTAs.

5. Conclusion

This study used an analytical framework to evaluate Booking.com, Expedia Group, and Airbnb's sustainability reports to find similarities and differences.

Based on the literature on tourism company sustainability, particularly OTAs, the research questions examined the three selected agencies' financial statements' GRI compliance, the categories of standards most frequently reported in them, and any changes in individual reporting dimensions over time. As noted in the results section, the empirical investigation found some variability in company reporting and a focus on the environment. These results have several

limitations, but they allow us to make some final conclusions and suggest future research. The small sample size of three companies and the short financial statement observation period of three years are major limitations of this study. This limits the capacity to generalise the data and analyse the sample firms' sustainability actions' long-term evolutionary dynamics. The study is primarily descriptive, summarising OTA sustainability reports.

Due to these constraints, future studies could increase the number of operators and reference time span to acquire more robust and generalisable evidence. More normative research could help define an OTA sustainability reporting methodology. This study's theoretical implications pertain to how the results help OTAs comprehend reporting procedures and design more structured ESG disclosure strategies.

In the absence of tourism-specific standards, the academic debate should also focus on dedicated reporting models for tourism companies to improve the completeness, transparency, and comparability of the information in their sustainability reports, especially OTAs, in response to growing pressure from legislators, institutions, and stakeholders. In this sense, an ad hoc GRI standard for the tourism sector might help enterprises disclose their environmental, economic, and social impacts more consistently, enabling valid comparisons between operators and eras. A standard for ESG information in digital tourism would improve openness, accountability, and legitimacy of the business.

Keywords: Sustainability report; travel agency; GRI; environmental; social; governance

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Local businesses' perception of the overtourism induced by social media influencers in lesser-known destinations: Empirical evidence from Italy and Vietnam

Alessandro Bigi[1], Michelle Bonera[2], Ha Vi Le[3]

1. Introduction

Along with the development of social media has been the boom of the tourism industry in recent years (Song & Wondirad, 2023). One aspect that significantly contributes to this growth is influencer marketing (Kamarulzaman et al., 2025), particularly its role in the rapid development of tourism in previously less-visited destinations. Besides the benefits, the tourism attracted by influencer marketing in these locations also has a significant negative impact on stakeholders (Koens et al., 2018). The research on how relevant stakeholders, such as the local residents (Almeida-García et al., 2016; Đurkin Badurina & Soldić Frleta, 2021; Halim et al., 2022) and visitors (Krajickova et al., 2022), react to this phenomenon has gained increasing importance recently (Zhang et al., 2019); however, there has not been much research done to clarify the impact of overtourism on the local entrepreneurs' perception.

Therefore, this study was conducted with the aim of studying the impact of tourism caused by influencer marketing on the awareness of local businesses in little-known tourist destinations, with empirical research in two countries: Vietnam and Italy. Italy is described as a tourism destination with many mature components, particularly with many tourism sectors at theirs stagnation and rejuvenation phases (Bernini et al., 2020), while Vietnam reflects an emerging tourism context (Le, 2020) with rapid, social-media-driven growth (Sinh Duc Hoang et al., 2024). Comparing these contexts allows exploration of how tourism maturity shapes business reaction towards influencer-driven tourism pressure. Although two countries differ significantly in geographical features, the analysis is conducted at a destination level. Country context is used to interpret institutional difference, rather than as a unit of comparison.

Through this article, the researchers aim to analyze and compare the impact of this phenomenon on the perception of local businesses between different less-visited destinations of two countries with different levels of tourism maturity through a thematic analysis, with semi-structured interviews with time frame from 2025-2026; thereby providing implications for local authorities and local businesses, contributing to a more sustainable development of the tourism industry in lesser-known locations.

2. Conceptual background and literature review

The rapid development of social media has been accompanied by a significant boom in the tourism industry in recent years (Song & Wondirad, 2023). Among the key drivers of this growth are social media influencers (SMI), whose profound impact on tourism stems from their ability to shape consumer behavior and evoke emotional responses that increase travel intentions

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(Kamarulzaman et al., 2025). Influencer marketing (IM) has an impact on nearly every stage of the customer journey. With the pre-purchase phase, travel content from influencers triggers followers' desire to travel by cultivating emotional connections (Wu et al., 2024). Besides, benign envy, which results from upward social comparison during exposure to travel content, is also considered a driver of willingness to travel (Asdecker, 2022). During the purchase stage, customers' decision to travel to a specific destination is significantly influenced by the credible suggestion of social media influencers. Finally, customers' trust in SMI has been proven to positively impact their satisfaction with the travel experience. To be specific, following an SMI's recommendation can make consumers feel comfortable with their purchasing decision and feel they made a wise choice (Kamarulzaman et al., 2025). At a strategy level, destination management organizations use influencer marketing as a non-intentional marketing approach to boost the popularity of the destination (Kamarulzaman et al., 2025; Wu et al., 2024).

However, social media, including influencer marketing, is also identified as a driver for overtourism. To be specific, social media influencers and their viral content rapidly increase destination popularity, leading to excessive visitation and a concentration of tourist flow in specific areas (hot spots) which exceed the carrying capacity of the locations (Song & Wondirad, 2023).

Overtourism is formally defined by the UNWTO as the impact of tourism on a destination, or parts thereof, that excessively influences the perceived quality of life of citizens and/or the quality of visitors' experiences in a negative way (Koens et al., 2018). Milano et al. (2018) defined overtourism as the excessive growth of visitors to tourist destinations, which leads to overcrowding.

When overtourism occurs, it generates several negative externalities, namely physical overcrowding, socio-cultural and economic deterioration, environmental degradation, and loss of authenticity (Song & Wondirad, 2023). The effect of overtourism induced by IM doesn't stop at popular destinations but also affects lesser-known locations. The rapid, unintentional popularity triggered by social media in lesser-visited destinations results in severe infrastructural strain, environmental degradation, a disconnect between virtual image and physical reality, and precarious economic stability (Wengel et al., 2022; Yang et al., 2025)

Loverio et al. (2022) found that increased stakeholder cooperation can mitigate negative problems brought by mass tourists by enabling the creation of multifaceted, long-term solutions that public or private entities could not achieve alone. The effectiveness stems from comprehensive engagement. Edward Koh et al. (2019) proposed a BRAVE framework integrating businesses, residents, authorities, visitors, and environmentalists to tackle overtourism collaboratively Therefore, it is important to understand the impact of overtourism on stakeholders' perception in less-visited destinations. Prior studies mostly focus on visitors' or the overall local communities' perception. In terms of visitors' perception, overtourism in less-visited destinations is viewed negatively with several impacts: damage to the visual of the destination, over commercialization leading to higher prices, and overcrowding. Their overall assessment is characterized by different socio-demographic variables: origin and intention to visit, age, and gender (Krajickova et al., 2022). On the other hand, the response of local communities is reported differently. In lesser-known regions, particularly those in the early or moderate stages of tourism growth, overall resident perception may remain net positive. Residents generally believed the economic and social benefits outweighed the negative impacts. However, even in these relatively positive cases, underlying negative impacts related to traffic, pollution, or price inflation were still acknowledged. (Almeida-García et al., 2016)

Yet, prior research has largely overlooked the impact of overtourism induced by social media influencers on the local businesses' perception. There have been recent calls for further search on the data of other relevant stakeholders, other than visitors or overall local communities, especially tourism businesses that might see tourism growth differently from local residents (Kuščer & Mihalič, 2019; Krajickova et al., 2022) Additionally, despite extensive attention to a particular

destination, limited focus has been given to cross-country research with different cultures, economic and political situations (Peters et al., 2018; Gaunette Sinclair-Maragh, 2016). Besides, according to Moteab Alsaloum et al. (2024), "a more thorough analysis for future studies should be considered by using qualitative analysis to gain a deeper understanding of the residents' perceptions and attitudes towards tourism development."

Synthesizing the above streams of literature reveals three key gaps:

First, the absence of research on local business perceptions of overtourism, even though this group is directly affected and may hold perspectives distinct from residents and visitors.

Second, there is a lack of cross-country comparative evidence, especially across destinations that differ significantly in tourism competitiveness and development stage.

Third, despite much attention given to quantitative research, a critical gap exists in understanding the local businesses' perception at a deeper and explanatory level using a qualitative method.

Addressing these gaps, this study was conducted with the aim of studying the impact of tourism caused by social media influencers on the perception of local businesses in little-known tourist destinations, with empirical research from in-depth interviews with business owners in two countries: Vietnam and Italy.

3. Theoretical Framework

3.1. Justification for country and destination selection

Country-level rationale

According to Lundberg (2015), a country's degree of tourism development significantly affects how its stakeholders perceive tourism. While there are stable differences in how residents perceive cultural and natural preservation, their reaction toward economic benefits differs dramatically with the change in tourism development. To be specific, negative impact perceptions may be higher with lower levels of tourism development.

Therefore, we expect the level of tourism competitiveness will affect how the local businesses in different countries react to overtourism. Two countries, Vietnam and Italy, were chosen using the Shift-Share Analysis Indicators proposed by Dogru et al. (2020). This methodology uses basic economic figures (Tourist arrivals, Tourism receipts, and Per-tourist-Dollar) to determine a country's competitive standing objectively. Italy's higher statistics indicate a more mature and highly competitive tourism industry compared to Vietnam. Observing the same phenomenon in two countries with different degrees of competitiveness might bring value to the research.

Destination-level rationale

A list of candidate destinations was first compiled by the authors through a collection process of different news and reports regarding tourism in Vietnam and Italy. Destinations are publicly identified as lesser-known destinations, which gain popularity after the endorsement of IM. The locations shortlisted process also concerns the relative similarity in geographical dimensions and positions to eliminate the influence of confounding variables

To theoretically justify the classification of "lesser-known destination", the study adopt the definition of Kareem et al. (2025), which describes lesser-known destinations (LKDs) as "locations, attractions, or regions that receive fewer visitors compared to mainstream tourist sites. This status is typically a result of their off-the-beaten-path nature, emerging status in the tourism sector, or a lack of significant marketing efforts."

To confirm the chosen destinations, meet the definition requirement, we analyse data based on the indicators used in a research by Đurkin Badurina and Soldić Frleta (2021). In this study,

the author identified the term “less-visited”, or “lesser-known”, in comparison with a highly visited destination. Both of the destinations are characterized by similar geographical position, number of inhabitants, and infrastructural structure; however, the difference lies in the number of visitors and overnights, which represent the tourism intensity. Therefore, we will collect secondary data about the number of visitors and overnight beds, comparing them with highly visited destinations, to conclude whether they qualify as lesser-known destinations

These destinations will undergo a further screening step through secondary data on visitors number. Specifically, we observe the changes in the number of tourists before and after the time when the post was posted on the TikTok platform to confirm that the overtourism phenomenon induced by social marketing happened in these destinations. This approach follows the methodology of Wengel et al. (2022). In their study, the overtourism induced by IM phenomenon was quantified by comparing visitor counts before and after viral social media exposure.

3.2. Social Exchange Theory (SET)

This study is grounded in the Social Exchange Theory (SET) (Ap, 1992), which posits that residents evaluate tourism based on a cost-benefit analysis. At its core, SET claims that when the exchange of resources is balanced or higher in favour of the residents, tourism impacts are perceived positively. On the other hand, the influence is viewed negatively when the exchange of resources is low (Ap, 1992). The construct has evolved from its initial conceptualization toward a broader understanding encompassing the community comparison (Gursoy & Rutherford, 2004). The study suggested that there are five main factors influencing the community reactions towards tourism: community attachment, community concern, use of tourism resources, ecocentric attitudes, and the state of the local economy. Also, it indicates that the local economy acts as a mediating role in the influence of these factors. To be specific, the higher the perceived importance of local economic development, the more likely the residents are to support tourism, while they are less concerned about social costs. A modern application with moderating variables has been analysed in more recent research according to Nunkoo and Ramkissoon (2011). The authors suggest that the perceived benefits/costs of tourism are influenced by trust in tourism institutions, power to influence tourism, and neighborhood conditions.

In recent studies, the SET is widely adopted to evaluate the perception of local residents towards the impact of tourism, with the assumption that tourism development’s economic benefits offset its environmental and socio-cultural costs (Peters et al., 2018). Prior studies consistently showed that residents’ perception is largely shaped by an evaluation of cost and benefit in terms of economic and socio-cultural impacts (Peters et al., 2018; Pekerşen & Kaplan, 2022; Halim et al., 2022), compared to less-weighted environmental impacts (Halim et al., 2022).

Other frameworks, such as Stimulus-overload theory (González-Reverté, 2021), or Identity theory (Sinclair-Maragh, 2017), focus on understanding negative emotional response due to overtourism saturation, or explaining why residents with different demographic characteristics support/oppose overtourism. But they do not provide a mechanism to analyse cost-benefit evaluation. In contrast, SET aligns directly with the objective of this research, of examining how perceived impacts shape stakeholders’ attitudes.

While previous studies applied SET to evaluate the general residents’ perception of tourism, this work advances the theory by contextualizing it in the perspective of a specific stakeholder - the local businesses - in the context of lesser-known destinations, which gain overnight popularity due to IM. The use of SET in this study enables a more comprehensive explanation of how local entrepreneurs perceived overtourism. Local entrepreneurs are likely to support tourism development if they perceive the benefits—such as increased income, job growth, and business visibility—as outweighing the costs (overcrowding, loss of authenticity, infrastructure pressure). This definition is particularly suitable for evaluating local entrepreneurs’ perception towards overtourism because it explains why entrepreneurs in the same destination may have very

different perceptions of the same phenomenon. It is important to note that their perception of tourism's impact depends on their sustainability orientation—defined by their awareness of environmental degradation and their commitment to long-term resource preservation (Akhtar et al., 2022). It adapts a cost-benefit analysis with key measurements, including: perceived economic impacts, perceived socio-cultural impacts, perceived environmental impacts, to evaluate the outcome - the local business's support/opposition for tourism resulting from IM, with three distinct research questions:

RQ1: How do local entrepreneurs perceive the economic benefits of influencer-driven tourism, and how do these perceptions influence their support for tourism growth?

RQ2: How do local entrepreneurs perceive social, cultural, and environmental costs of influencer-driven tourism, and how do these perceptions influence their support or opposition?

RQ3: How do local entrepreneurs' perceptions of overtourism differ between a highly competitive (Italy) and an emerging tourism market (Vietnam), and what contextual factors shape their responses?

4. Research method

To address the research aim, a qualitative design will be used based on an interpretative, inductive thematic coding process. To ensure an holistic representation of the tourism ecosystem, primary data will be collected through semi-structured interviews using a purposive sampling Tourism business owners and managers in Italy and Vietnam's lesser-known tourist spots will be interviewed. The sample is stratified according to the UNWTO Tourism Satellite Account (TSA) framework to guarantee coverage across the entire tourism value chain. Participants are recruited from the following "tourism-characteristic" industries: accommodation, food and beverage, transport, travel services, cultural and recreational services, retail (Douglas, 2010), The sample size will in line with the principle of theoretical saturation, meaning that data collection continues until no new themes or insights emerge from additional interviews (Glaser & Strauss, 1967).

A flexible interview guide, built around the three research questions, will include open-ended prompts on perceived economic benefits, social–cultural and environmental costs, and contextual conditions in Italy and Vietnam. The guide will ensure coverage of these core topics while allowing the interviewer to pursue unanticipated issues raised by participants, generating rich narratives that can be inductively coded through thematic analysis. This will help us get detailed, contextualized accounts of how influencer-driven overtourism affected their businesses and the areas around them. Interview transcripts will be analysed using Leximancer, a Bayesian, machine-learning-based content analysis software (www.leximancer.com). Leximancer automatically extracts concepts from patterns of word co-occurrence and groups them into higher-order themes without predefined coding categories, thereby reducing researcher subjectivity (Smith & Humphreys, 2006; Bigi et al., 2021). The software performs both conceptual (thematic) and relational (semantic) analysis, generating concept maps that visually display how salient concepts cluster and interrelate across the corpus and between the Italian and Vietnamese cases (Smith & Humphreys, 2006; Bigi et al., 2016). First, a combined analysis will identify the overall concepts and themes structure. Then, separate runs by country will allow comparison of: (a) the salience of shared concepts (e.g. economic benefits, crowding, cultural change), (b) country-specific concepts and themes, and (c) differences in how concepts co-occur and cluster in the concept maps across the two contexts.

5. Expected outcome

We expect to see a high awareness of local businesses of the phenomenon. There will be a mixed perception of this phenomenon, with the anticipation that Italy, a country with higher

tourism maturity and competitiveness, will generally react more positively towards overtourism caused by influencers than Vietnam

In terms of economic expectations, the authors predict that the businesses will foresee a higher revenue when tourists arrive. However, the instability and dependency on viral fame are also concerns. The economic impacts are expected to be the main factor determining the business owners' support/opposition of tourism in lesser-known destinations.

With socio-cultural and environmental impacts, while it is considered a major cost in the evaluation of residents' attitudes, we expect a lower impact of this construct in the business's perception due to the differences in interests between the two stakeholders. Nevertheless, the local entrepreneurs are expected to see a threat in loss of authenticity, overcrowding, and environmental pressures when influencer-driven tourists flock in.

Finally, in this study, we expect to find out about how businesses will adopt their business strategy in response to the situation, whether they are more likely to collaborate with influencers to further expand the effect, or to avoid them.

6. Expected contributions

The Social Exchange Theory (SET) serves as the foundational lens for this analysis because it directly addresses how stakeholders evaluate tourism based on a cost-benefit trade-off. SET is best suited to local businesses because it explains their support or opposition through perceived economic gains (e.g., revenue, visibility) versus costs (e.g., overcrowding, infrastructure strain), even though it is usually applied to residents. By placing existing theory within the unique perspective of entrepreneurs in lesser-known locations affected by influencer-driven overtourism, this framework advances existing theory and enables a nuanced understanding of how various impacts shape business strategies and attitudes.

This study contributes to the growing body of research on local businesses' perceptions by offering new insights into how overtourism, caused by social media, shapes the responses of key stakeholders in little-known destinations. The findings are expected to enrich theoretical understanding and provide practical guidelines for policymakers to achieve more sustainable growth in tourism.

Regarding the research's theoretical contribution, findings from this study help expand overtourism theory, SET in particular, by adding the perspective of a new stakeholder - the local businesses. A cross-country analysis might introduce new insights about destination development in emerging vs mature tourism economies, with a focus on lesser-known destinations. Besides, a qualitative analysis is expected to reveal nuances that prior quantitative studies failed to capture, by introducing a new voice from an undermined stakeholder perspective.

Concerning practical contributions, due to the importance of local businesses to the destination developments, understanding their attitudes might help tourism practitioners and policymakers to design a more sustainable destination strategy with a clear guide for businesses on how to respond to influencer-driven demand. Besides, the collaboration of the destination entrepreneur and the content influencers can potentially open a new future for the destination tourism development, which should be carefully considered and mediated by the authority. The authority must understand and manage the local readiness towards the phenomenon in small destinations before overoturism further escalates.

Keywords: Influencer marketing; overtourism; social media; local businesses; lesser-known destinations

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Track 14: SUPPLY CHAIN MANAGEMENT E MARKETING: DALL'ORDER FOR FULFILLMENT ALL'INTEGRAZIONE STRATEGICA FABBRICA-MERCATO

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Operational Transparency in Closed-Loop Supply Chains: Activating Consumers as Suppliers

Benedetta Baldi[1], Ivan Russo[2], Ilenia Confente[3]

1. Introduction

The textile and clothing industry ranks among the most environmentally damaging sectors, contributing significantly to water pollution, land degradation, and carbon emissions (European Parliament, 2024). In response, policymakers have intensified efforts to address these environmental challenges, introducing strategies to reduce waste, extend garment lifecycles, and promote textile recycling while also urging companies to cut their carbon emissions and environmental footprint (Ellen MacArthur Foundation, 2024). This shift necessitates fundamental changes to the supply chain, aligning with the principles of the circular economy, such as "closing the loop" (Hazen et al., 2021). A closed-loop supply chain emphasizes retrieving products from consumers and recovering their remaining value (Guide & Van Wassenhove, 2009), with the goal of reducing natural resource extraction, waste, and emissions.

In the closed-loop supply chain for the textiles and clothing industry, consumers play a pivotal role by initiating the reverse flow of goods necessary for product recovery and closed-loop processes. End-of-use garments move from consumers to retailers, positioning consumers as key actors in reverse logistics processes (Denizel & Schumm, 2023; Vadakkepatt et al., 2021). Essentially, consumers act as suppliers within the closed-loop supply chain, determining the fate of discarded products. Therefore, engaging consumers is crucial for the success of closed-loop systems; yet retailers face the challenge of determining the best way to connect with them. The logistics and supply chain management literature provides evidence that transparency is a powerful tool for shaping consumer behavior, with a primary focus on forward supply chain contexts (e.g., Duan & Aloysius, 2019; Mollenkopf et al., 2022; Peinkofer & Jin, 2023).

2. Purpose and background of the research

This study aims to investigate how operational transparency within closed-loop supply chain contexts fosters active consumer participation in initiating reverse logistics and closed-loop supply chain processes. Specifically, the study aims to answer the following research question: How does operational transparency in closed-loop supply chains influence consumers' intention to participate in take-back initiatives?

The research is grounded in the consumer-centric supply chain management, which positions consumers as key and active supply chain actors (Baldi et al., 2024; Esper et al., 2020), and operational transparency literature (Budler et al., 2024). The transparency literature has long been characterized by a lack of a clear definition, which limits both scholars and practitioners from fully understanding its role in supply chains (Mollenkopf et al., 2022; Montecchi et al., 2021). However, recent efforts have moved toward a more consistent definition (Bell et al., 2016; Budler

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et al., 2024). This study adopts the definition by Budler et al. (2024), who describe operational transparency as organizations' ability to proactively engage in communication with stakeholders to create visibility and traceability within upstream and downstream supply chain operations. More specifically, visibility refers to the ability of organizations to see across (or into) their SC, and traceability refers to the ability to access any or all information relating to the products, and to follow the movement of products through specified stage(s) such as production, processing, and distribution. Much of the transparency literature has focused on the upstream and forward operationalization of the concept, leaving the adaptation of the concept to reverse and closed-loop processes underexplored. A closed-loop supply chain focuses on reclaiming products from consumers to recover added value, aiming to minimize resource consumption and waste (Hazen et al., 2021). To develop a closed-loop supply chain, companies can choose from several product recovery options as alternatives to waste disposal, including remanufacturing, repair, refurbishing, recycling, or reuse (Geissdoerfer et al., 2020). The critical element enabling the reverse product flows related to any of these recovery processes is the collection of end-of-use products from consumers. Therefore, consumers play a pivotal role in initiating reverse flows. The end-of-use products brought back to stores re-enter the closed-loop supply chain and undergo one of the recovery options, where they may be recycled into new products, repurposed, or sold in secondhand markets (Denizel & Schumm, 2023). Among the various product recovery options in closed-loop supply chains, recycling plays a pivotal role, and it is the focus of this study. Recycling involves extracting valuable components from returned products and converting them into raw materials for reprocessing (Ellen MacArthur Foundation, 2021). Recycling involves disassembling products to the material level, which are then reprocessed into new inputs for manufacturing (Denizel & Schumm, 2023). While recycling is often viewed as a last-resort option in a circular economy—because embedded energy and value are lost in the process—it is crucial for reducing natural resource extraction by incorporating recycled materials into new production cycles (Ellen MacArthur Foundation, 2021; Raz & Souza, 2018). This minimizes waste by transforming discarded items into valuable inputs for new production (Dwivedi et al., 2023).

The signaling theory (Connelly et al., 2011; Spence, 1973, 2002) serves as the theoretical lens for the investigation. According to the signaling theory, signals help reduce information asymmetry between two parties—in this case, the retailer (signaler) and consumers (receiver)—in a market where one party (the consumer) has limited information for decision-making, while the other (the retailer) is fully informed. To bridge this gap and mitigate the information asymmetry, the informed party sends signals that the less informed party can use to guide its decisions (Stiglitz, 2002). In this study, operational transparency related to closed-loop supply chain processes serves as a signal sent by retailers to reduce information asymmetry and influence consumer involvement in closed-loop processes. Transparency in forward supply chains has been shown in the literature to positively influence consumers' behaviors, such as increased purchase intention, favorable attitudes toward the firm, and a higher willingness to pay (e.g., Duan & Aloysius, 2019; Mollenkopf et al., 2022; Peinkofer & Jin, 2023). Therefore, we hypothesize that operational transparency in closed-loop supply chains has a positive influence on consumers' intention to participate in take-back programs.

H1. Retailers' operational transparency has a positive influence on consumers' intention to participate in take-back programs.

According to signaling theory, consumers evaluate signals by considering the perceived costs associated with producing them. Signals that are more costly to imitate are generally viewed as more credible and therefore exert a stronger influence on consumer judgments (Connelly et al., 2011). Within the context of closed-loop supply chains, operational transparency functions as such a costly signal, as it demands extensive investments and coordination across supply chain partners (Budler et al., 2024; Morgan et al., 2023). We propose that when retailers disclose their operational information related to closed-loop initiatives, consumers interpret this transparency as a signal that enhances perceptions of the retailer's credibility. Retailer credibility plays a vital

role in consumer decision-making (Nilsson et al., 2004; Dawar & Parker, 1994), as credible retailers are more likely to be trusted, and their disclosed information is more readily accepted and used by consumers.

H2. Exposure to operational transparency positively influences consumers' perceived credibility of the retailer.

Self-efficacy originates in the psychological literature (Bandura, 1977) and refers to individuals' beliefs in their ability to perform the actions necessary to achieve desired outcomes. These beliefs influence both the initiation and persistence of behavior: individuals with strong self-efficacy are more likely to attempt challenging tasks and to continue striving in the face of difficulties. In the context of this study, the disclosure of operational transparency information serves as a form of textual persuasion that can shape consumers' self-efficacy regarding participation in closed-loop initiatives. However, the effectiveness of such persuasion depends on the credibility of its source. Here, the retailer represents the source of the disclosed information, and the retailer's credibility determines the extent to which consumers accept and internalize the information. When the retailer is perceived as trustworthy, knowledgeable, and reliable, consumers are more likely to incorporate operational transparency information into their beliefs and feel more capable of engaging in closed-loop behaviors, thus acting as suppliers. Therefore, we hypothesize that consumers' perceived credibility of the retailer positively influences self-efficacy. Additionally, the relationship between operational transparency and consumers' intention to participate in take-back programs is sequentially and positively mediated by retailer credibility and self-efficacy.

H3. Consumers' perceived credibility of the retailer positively influences consumers' perceived self-efficacy.

H4. Perceived credibility of the retailer and perceived self-efficacy sequentially and positively mediate the relationship between operational transparency and consumers' intention to participate in take-back programs.

3. Methodology

In line with recent logistics and supply chain management research on consumer behavior (Jin et al., 2022; Masorgo et al., 2023; Peinkofer et al., 2022), between-subjects scenario-based survey experiments with U.S. consumer participants are used to test the causal relationships proposed in the hypotheses (Rungtusanatham et al., 2011). The methodology provides a valuable opportunity to investigate consumers' decision-making (Eckerd & Bendoly, 2011; Knemeyer & Naylor, 2011). It is particularly suitable to isolate effects that are difficult to observe in noisy environments (Rungtusanatham et al., 2014). Moreover, in scenario-based experiments, varying versions of a scenario communicate information about different levels of the manipulated variable to participants (Rungtusanatham et al., 2011). Before the main experiment, pretests were conducted to ensure scenario realism and to conduct manipulation checks (Bachrach & Bendoly, 2011). Experiments were developed via Qualtrics, and participants were recruited through Prolific Academic.

We conducted three main experiments to test the hypothesized relationship. Study 1 served to test the direct relationship between operational transparency and intention to participate in the take-back program (H1). Study 2 tested the direct effect of operational transparency on perceived retailer credibility (H2). Study 3 tested the relationship between retailer credibility and self-efficacy (H3) and the sequential mediation model (H4).

4. Results

Study 1 involved 100 U.S. consumer respondents (53% female; M_age = 46.6) who participated in a single-factor (operational transparency: yes vs. no) between-subjects

experimental design. We tested H1 using a one-way ANOVA. Results confirm the positive and direct effect of operational transparency on consumers' intention to participate in take-back programs ($F = 7.30$; $p < 0.01$). Study 2 involved 200 U.S. consumer respondents (54.5% female; M_age = 43.5), who participated in a single-factor (operational transparency: yes vs. no) between-subjects experimental design. We tested H2 using a one-way ANOVA, which confirmed the positive and direct effect of operational transparency on perceived retailer credibility $F = 10.23$; $p < 0.01$). Study 3 involved 401 U.S. consumers (53.6% female; M age = 44.6), who participated in a single-factor (operational transparency: yes vs. no) between-subjects experimental design. We tested H3 and H4 following the recommendations of Rungtusanatham et al. (2014) for mediation analysis using bootstrapping. We conducted the analysis with the PROCESS macro for SPSS (Hayes, 2012). This method, based on ordinary least-squares regression, estimates mediation effects with sufficient statistical power through bootstrap confidence intervals (Hayes, 2018). We run a PROCESS model 6 using 95% bias-corrected bootstrapping with 5000 samples. The model includes operational transparency as the independent variable, the intention to participate in the take-back program as the dependent variable, and retailer credibility and self-efficacy as sequential mediators. The model results reveal a significant and positive impact of perceived retailer credibility on self-efficacy (beta coefficient = 0.51; $p < 0.01$), as well as a positive and significant sequential mediation (total indirect effect = 0.44; SE = 0.12; CI [0.219, 0.678]). Therefore, all four hypotheses are fully supported.

4. Theoretical and managerial contributions

This study offers theoretical and managerial contributions. First, it complements the operational transparency literature by disclosing information about the reverse logistics processes, thus adding to the literature that has primarily focused on upstream and forward processes. Second, it contributes to the operational transparency literature by shedding light on the key mechanisms, namely retailer credibility and self-efficacy, which lead operational transparency to affect consumers' participation as suppliers in closed-loop initiatives. Third, this study advances the consumer-centric supply chain management literature by redefining consumers as suppliers within supply chain processes, thereby closing the loop. The findings offer managers actionable insights into the strategic value of operational transparency investments and their potential effectiveness in driving consumer engagement. The design of closed-loop supply chains anchored in operational transparency logic requires considerable investments and strategic choices at the company level. To be strategically effective, such investments must yield a return for companies by positively influencing and changing consumers' intentions and behaviors. The findings of this study provide guidance for retailers on how to accomplish this. Effective disclosure not only enhances consumer engagement but also plays a crucial role in building relationships with consumers, fostering the retailer's credibility, and improving consumers' self-efficacy in their personal actions.

Keywords: Operational transparency; closed-loop supply chain; experimental design; consumer-centric

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Managing tensions towards supply chain emissions reduction: managerial cognition and organizational factors

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1. Introduction

Climate change is widely regarded as one of the most pressing issues of our time, as evidenced by the increasing frequency of extreme weather events, droughts, biodiversity loss, and substantial global costs associated with infrastructure damage. Greenhouse gas (GHG) emissions, with carbon dioxide being the most common, are a primary contributor. Policymakers worldwide, along with advocacy groups like the United Nations Sustainable Development Goals and the Science Based Targets initiative, are actively working to reduce emissions and the effects of climate change (IPCC, 2023; Wieland & Creutzig, 2025). However, recent news indicates that the world is on a "catastrophic pathway" to 2.7 degrees of heating by the end of the century, with slow progress in implementation plans and in aligning near-term emissions trajectories with net-zero targets (Kaplan, 2023; UNEP, 2024).

Organizations are commonly presented as the best agents to respond to the issue of climate change, and measures to cut emissions are taking center stage within companies' environmental, social, and governance (ESG) strategies even amidst national climate policy shifts (Ellram & Tate, 2025; Velázquez Martínez et al., 2025). However, many of these corporations have also been the most significant contributors to escalating carbon emissions. Together with industry and manufacturing, sectors such as power and energy, and transportation represent over 50% of global GHG emissions (Ritchie et al., 2020; UNEP, 2024). Such sectors characterize most companies' supply chains; thus, relevant progress in tackling climate change cannot overlook the environmental impact generated outside of one focal firm.

Supply chains represent a central intervention point for solving the climate crisis, as the majority of emissions are generated here. A leading carbon disclosure system's report showed that an organization's upstream supply chain emissions were on average 26 times higher than its own emissions (CDP, 2024), while Apple reports that nearly 100% of its 2023 emissions were generated outside of Scope 1, direct emissions (Apple, 2024; Wieland & Creutzig, 2025). On average, Scope 3 emissions (defined by the GHG Protocol as indirect emissions from suppliers, transportation, product use, and all other parts of the supply chain) form up to 80% of overall emissions for most companies (McKinsey, 2024; Ellram & Tate, 2025).

Literature on supply chain Scope 3 emissions has highlighted the need to invest and innovate across multiple sectors (Zhang et al., 2024). However, the inherent challenges (e.g., unreliable data and scarce transparency, trade-offs around sustainable procurement, cost of investing in energy-efficiency and renewable resources) generate tensions among pressures to reduce the environmental impact, without compromising firm growth. We argue that these tensions may contribute to the observed low alignment of most companies' emissions pathways with the Paris targets (Cenci et al., 2023). In this study, we examine the management of such tensions by juxtaposing two levels of analysis. Specifically, we explore how organizational-level elements

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and individual-level cognitive factors enable management of tensions, in the context of implementing a series of initiatives to decarbonize a firm's supply chain.

In understanding supply chain emissions reduction, paradox theory provides a valuable theoretical lens by investigating how organizations navigate the paradoxical tensions (Poole & Van de Ven, 1989; Smith & Lewis, 2011; Lewis & Smith, 2022) that manifest along the implementation of multiple initiatives. Previous studies investigated managerial cognitive framings, suggesting that a paradoxical framing enables decision-makers to cultivate the ability to embrace and engage contradictions (Hahn et al., 2014; Xiao et al., 2019). The extant literature, however, indicates that paradoxical framing alone does not necessarily lead to the most desirable outcome in sustainability contexts. This study addresses this gap by examining how managerial cognitive framings, paired with organizational factors, influence paradoxical tensions' perception and management during the path towards supply chain emissions reduction. We conduct a single case study (Ketokivi & Choi, 2014; Yin, 2014) of a best-in-class organization in the cosmetics and beauty industry. Building on interviews and secondary data, we conduct an analysis with a point of departure in paradox theory.

2. Conceptual background

2.1. Management of supply chain GHG emissions

Management of supply chain GHG emissions has climbed up the environmental sustainability discourse, becoming a top issue both within corporate agendas and within management academic literature. Such an increase in attention is due to increasingly frequent consequences of climate change with severe economic impacts on business activities, as well as alarming reports from climate experts (Ellram & Tate, 2025; Wieland & Creutzig, 2025). Firms are increasingly pressured to reduce GHG emissions (hereinafter referred to solely as "emissions") both by legislators and by consumers and customers. Specifically, businesses are expected to take responsibility not only for their direct emissions but also for the more complex and dispersed Scope 3 emissions arising across their supply chains (De Stefano & Montes-Sancho, 2024).

Empirical research on supply chain emissions has investigated drivers and enablers for firms to reduce Scope 3 emissions (De Stefano & Montes-Sancho, 2024; Ellram et al., 2022; Villena & Dhanorkar, 2020). On the other side, literature has shed light on barriers and common challenges (Vieira et al., 2024; Schramm & Lehner, 2024; Zhang et al., 2024). Despite the contributions made by previous studies to understand the role of supply chain management (SCM) in addressing the climate crisis, the topic has only recently started to gain traction within the discipline (Hettler & Graf-Vlachy, 2024; Wieland & Creutzig, 2025), and extant studies mainly focus on specific, narrow practices (Ellram & Tate, 2025). Given the interdependence of emissions sources, achieving emissions reduction objectives requires a combination of organizational commitment, initiatives, and investments covering vast areas of a company's internal organization and its supply chain. Against this backdrop, research shortcomings and gaps persist regarding a broader perspective on firms' approaches to managing emissions across their supply chains.

Looking at corporate action, data shows that many companies still struggle to take effective action in reducing their environmental impact across their supply chains and that the majority of emissions pathways are still misaligned with the targets set by the Paris Agreement on Climate Change (Wieland & Creutzig, 2025; Cenci et al., 2023). The lack of progress suggests that companies face substantial tensions in reconciling emissions reduction programs with other - often competing - performance demands (Cichosz et al., 2025; Wright & Nyberg, 2017) and signals limited capacity for firms to manage the emerging paradoxes in practice.

2.2. Paradox theory and coping with paradoxical tensions

Paradox as theory research explores how paradoxes are organizationally conceived of and responded to, and finds that how paradoxes are navigated has significant implications for organizational performance (Smith & Lewis, 2011). A crucial aspect of paradox theory lies in its articulation of paradoxical tensions - elements that, while individually logical, present contradictions when considered collectively (Smith & Lewis, 2011). These paradoxical tensions typically manifest as two contradictory poles, or objectives, that organizations must manage simultaneously. Previous research has identified four predominant types of paradoxical tensions: performing; belonging; organizing; and learning (Lewis & Smith, 2022). Secondly, paradox theory offers insights into management responses to tensions, either by fostering a virtuous circle of valuing both poles of a tension ("both-and" approaches), or by inducing a vicious circle that privileges only one such pole ("either-or" approaches) (Schad et al., 2016; Smith & Lewis, 2011). Such responses are influenced by managerial cognitive framings, defined as how managers interpret stakeholders' pressures and make sense of the ubiquitous tensions in sustainability (Hahn et al., 2014; Smith & Lewis, 2011; Xiao et al., 2019).

Existing studies within SCM literature on paradoxes have largely focused on identifying and describing paradoxes that arise in specific case examples (Dahlmann et al., 2023). However, to bring actual progress to the issue of reducing supply chain emissions and tackling climate change, it is necessary to take a step forward and understand how to navigate or manage such paradoxical tensions.

Attempting to achieve sustainability goals in supply chains involves multiple tensions (Montabon et al., 2016). While the adoption of the paradox perspective to managing sustainability challenges is a "relative newcomer" to SCM research (Carter et al., 2020), this theoretical lens has significantly grown in the last decade in the corporate sustainability field (Hahn et al., 2014) as well as in management and organization studies (Smith & Lewis, 2011). Previous studies integrated paradox theory in the investigation of managerial cognitive frames, proposing the existence of a business case frame and a paradoxical frame (Hahn et al., 2018). In SCM literature, research into managerial cognitive processes is still rare.

Further empirical research suggests that a paradoxical framing alone does not always produce the most desirable outcome in sustainability contexts. Rather, several researchers have emphasized that we need to pay more attention to organizational and supply chain contexts (Benkert, 2021; Wright & Nyberg, 2017; Xiao et al., 2019), specifically to contextual factors that may influence individual-level managers' cognitive frames and, in turn, decision-making in tension management (Benkert, 2021; Grewatsch & Kleindienst, 2018). There remains a significant gap in our understanding of what factors characterize firms that are effective in addressing sustainability-related tensions and that are, in turn, making meaningful progress in reducing supply chain GHG emissions. Therefore, in this study we address organizational factors that may influence the tensions that managers perceive, and how they elaborate on them in light of individual-level managerial cognitive frames. We argue that these factors shape management responses to the paradoxical tensions in a firm seeking to reduce its supply chain emissions.

3. Methodology

Our research approach is qualitative, as we aim at gaining further understanding into the interplay of organizational factors (e.g. organizational culture, leadership behaviors, decision-making guidelines) (Benkert, 2021; Grewatsch & Kleindienst, 2018) and managerial cognition factors (Hahn et al., 2014; Preuss & Fearne, 2022; Xiao et al., 2019) that characterize an organization that is successful in managing emissions-related tensions throughout its supply chain. The need for rich empirical evidence and theoretical explanation, as well as the invitation to provide actionable managerial guidance, suggested an exploratory approach for our research.

The research design was based on the recommendations of Yin (2014) and Ketokivi & Choi (2014) and closely followed previous research in logistics and SCM literature (e.g. Ellram et al.,

2022). We conduct a case study for theory elaboration (in our case, paradox theory) to enhance its explanatory power and applicability (in our case, paradoxical tensions and management responses in the context of supply chain emissions reduction). In line with previous literature (Benkert, 2021; Xiao et al., 2019), we juxtapose two levels of analysis, namely the organizational level and the individual level, as this allows exploring how factors pertaining to the organizational context and to individuals' cognition interplay for an effective reduction of supply chain emissions. We have collected 9 interviews throughout different functions (namely, board members, sustainability, logistics, procurement, R&D) at an Italian company in the beauty and cosmetics industry.

3.1. Research context

A company working in the beauty and cosmetics industry was chosen as the context of this study. The reason for this case selection was twofold: first, the company represents a best-in-class organization in terms of measuring supply chain emissions and reporting, as well as implementing initiatives by partnering and collaborating with actors throughout its supply chain. The selection responds to calls for research that engages with best-in-class organizations to understand what effective practice is (Ellram & Tate, 2025). The second motive for case selection regards the industry, which represents significant opportunities for emissions reduction due to the presence of a huge variety and types of raw materials - which frequently include chemicals, microplastics, and are characterized by complex extraction processes (Cubas et al., 2022) -, the pervasive presence of packaging, as well as intensive logistics and transportation processes related to procurement and distribution phases.

The selected organization is responsible for the formulation, production, distribution, and sales of skincare and haircare products. For anonymity, the case will be referred to as *Cosmetics*. *Cosmetics* is a multinational group headquartered in Italy, with eight international affiliates; it employs over 1.000 people globally, half of which are in Italy, where formulation and production processes are based.

3.2. Data collection

To gather data from field, we used semi-structured interviews and field observations, paired them with public information from websites, annual reports, and sustainability reports, as well as internal documents, presentations, and e-mails. Participants involved in the research are identified based on theoretical sampling guidelines, in conjunction with snowball effect techniques (Bryman & Bell, 2022). The interview protocol invites managers within different functions (namely, top management team member, sustainability, logistics, and R&D functions) in the organization, to grasp how individuals perceive, recognize and make sense of paradoxical tensions – also in light of how they perceive the organizational context - and how, in turn, they respond, manage or navigate potential contradictions related to reducing the environmental impact of the overall organization while reconciling their functions' objectives.

Participants were selected based on a set of criteria: key involvement in their firm's sustainability initiatives, sufficient knowledge of logistics and SCM issues, and representation of different roles and levels of responsibility within the company's organizational structure. Lastly, in a few cases, the initial interviews made it clear that we needed additional data; therefore, additional respondents were invited for further interviews. Details regarding key informants are provided in Table 1. A total of 9 semi-structured interviews – lasting between 45 and 90 minutes - have been collected, electronically recorded with participants' permission, and transcribed. Most interviews are collected online, and, for interviews collected on site, the facility tour became part of the data collection effort. Finally, to complement available information, we combine these primary sources of evidence with notes taken during the meetings and additional secondary data.

This design allowed the researcher to capitalize on triangulation, combining different types of data from multiple sources (Pagell & Wu, 2009).

#	Interviewee's role	Function	Experience	Years in the firm
1.	Procurement and Purchasing Director	Procurement and purchasing	27	10
2.	Procurement and Purchasing Manager	Procurement and purchasing	10	7
3.	Corporate Packaging Research Development and Innovation Manager	R&D	20	18
4.	LCA and Product Sustainability Specialist	R&D	9	9
5.	Sustainability Operations Project Specialist	Sustainability	5	2
6.	Sustainability Advocacy Specialist	Sustainability	3	3
7.	Internal Logistics Manager	Logistics	32	29
8.	Head of Logistics, Inventory, Traceability, Sales Operations Processes	Logistics	12	11
9.	External Consultant and Board Member	Board	36	21

Table 1. Interview participants' overview

The interview protocol consisted of two parts: one explored the interviewees' role within the organization, individual-level values, and the priority they assigned to environmental issues in respect to other business issues, and whether they perceived tensions and how they reacted to these. The second part involved organizational-level questions about actions the organization had taken to reduce supply chain emissions, leadership behaviors and decision-making guidelines, and the perception of tensions emerging among different functions in the firm or actors in the supply chain. Finally, each interviewee was asked to think of one shift in practices or strategies that could speed up their process towards the net-zero goal. A more detailed version of the interview guide is provided in Appendix A. To guide the number of interviews included in this study, we followed two criteria: first, we aimed to include relevant informants; secondly, we stopped data collection as we were not gaining additional insights (i.e., theoretical saturation).

3.3. Data analysis

All interviews were initially conducted in Italian, because the study was conducted in Italy; therefore, after the transcription process, the interview transcripts were translated into English. A colleague who is fluent in both Italian and English then double-checked the correctness. During data analysis, we followed the steps suggested by Gioia et al. (2013): the analysis phase started with first-order coding of meaningful concepts from each interview and was facilitated by the software NVivo. Examples of quotes are displayed in the next section, accompanied by the interviewee's role and interview number in parentheses. Second-order themes were then derived by connecting various first-order themes. Lastly, the researchers looked for patterns across interviews to group themes into broader aggregate categories.

4. Findings

In the following section, we present an account of organizational factors that characterize organizations that are effective in reducing their supply chain emissions and how such factors influence managers' perception of sustainability-related tensions. Then, we describe how managerial cognitive frames shape managers' responses to paradoxical tensions surrounding supply chain emissions reduction goals.

4.1. Organizational culture, leadership behaviors, and decision-making guidelines

Across all interviews, sustainability emerged as a foundational element of the case-company's organizational culture. Interviewees repeatedly described sustainability as "part of who we are" and as a shared identity that guides everyday decisions. This cultural orientation was seen as the outcome of a long process of internal socialization, which first started with the development of an ethics chart for the firm and was later substantiated with the decision to apply for the B Corp certification. Such certification was obtained in 2016 and renewed in 2023.

Leadership behavior was widely recognized as a critical driver of the company's sustainability trajectory. Respondents highlighted the consistent and visible commitment of the top management team, both in how corporate leaders linked sustainability to the firm's long-term strategy and in how they took part in periodic meetings with different functions regarding the topic. In 2023, the company launched its long-term development strategy based on four pillars: decarbonization, circular economy, biodiversity, and water. Cosmetics, however, also aims at reaching half a billion euros in revenue within the next five years. As noted by an interviewee, the goals of reducing supply chain emissions and of growing steadily generate tensions. Leadership, therefore, plays a dual role: on one side, it sets growing directions and, on the other, it embodies sustainability through daily behaviors and periodic statements.

Cosmetics has also codified sustainability principles into formal decision-making guidelines and measuring tools, transforming commitments into measurable processes. Procurement and R&D for product and packaging provide the clearest examples of this institutionalization. Managers described a structured approach in which sustainability is systematically evaluated through predefined criteria and quantitative metrics.

4.2. Managerial cognition and responses to paradoxical tensions

Across the interviews, managers at *Cosmetics* displayed different approaches through which they made sense of sustainability and the tensions surrounding supply chain emissions reduction. While all respondents recognized value in the company's sustainability orientation, they differed in which tensions they perceived and how, as well as in the way they acted upon them.

A first group of managers displayed a more pragmatic orientation towards sustainability, emphasizing win-win conditions of cost efficiency and environmental impact reduction, or highlighting situations where they adopted an "either-or" approach, dismissing sustainability indicators in favor of cost KPIs or service level KPIs. These individuals perceive sustainability as strategically valuable but economically contingent; they legitimize it as long as it remains aligned with financial and operational performance. Examples of this framing can be found in the Procurement and Purchasing team as well as in the Supply Chain & Logistics function. We interpret this as an "either–or" response to paradoxical tensions, shaped by situational flexibility. Similarly, the logistics function faces tensions between environmental impact and costs, service level, as well as technological and infrastructure availability. To balance tensions between service level, costs, and environmental impact, also in light of available solutions and infrastructure, dedicated deliveries in the area surrounding the company's headquarters have been implemented. A few initiatives, on the other hand, are not progressing due to a lack of agreement between logistics and commercial functions: to expand the area of deliveries performed with electric vehicles, a renegotiation of service KPIs would be needed, as the autonomy of these vehicles

would not guarantee the current service level. At this point, commercial departments have not decided yet whether to penalize the service lever; therefore, this type of emissions reduction initiative in the logistics field remains hard to scale in broader geographical areas. Beyond transport and route optimization, both logistics professionals framed sustainability as an issue requiring visibility across the entire supply chain. The logistics department remains grounded in efficiency and process optimization, and among interviewees, it appears to be the function that experiences tensions among competing demands the most.

A second group of managers viewed sustainability goals and business performance as interdependent elements of the same system. These interviewees could rationalize the competing demands they were exposed to in their different roles, and frame the multiple sides of a paradox as mutually reinforcing and inherently complex. In this cognitive, unintentional process, managers frequently mentioned the support of the large adoption of technical and scientific tools and metrics, as well as their backgrounds. This orientation was mostly visible among R&D and Sustainability professionals, who frequently described sustainability as an analytical problem that required understanding multiple, interconnected variables.

Most managers in this group also described personal values as deeply aligned with the firm's mission. A strong identification reinforced their resilience toward contradictions, as sustainability and the reduction of environmental impact are not simply a task but an expression of personal and professional coherence.

To sum up preliminary findings, Table 2 highlights organizational-level elements and individual-level cognitive factors that shape management responses to paradoxical tensions and reports some exemplary quotes.

Factors contributing to management responses to paradoxical tensions		**Exemplary quotes**
Organizational-level factors	Strong leadership commitment to sustainability issues	Our leadership has always made it clear that we are a company with a purpose - not to be the best in the world, but to be the best for the world. (#3) The meaning of the company is its missions, to create a good life for all through beauty, ethics and sustainability. The product and everything else are tools. (#9)
	Adequate allocation of resources	In the majority of situations, Cosmetics prefers a supplier that is more expensive but more sustainable. (#2) As a company, we have a target of reducing by 55% our emissions by 2030. To do so, we support other functions with our technical and normative knowledge in defining what initiatives they can undertake and we accompany them in the implementation. (#5)
	Decision-making guidelines based on objective measurement	We have a platform that allows us to measure our suppliers' sustainability. This criterion weights 20% of our evaluation and it is balanced with reliability and quality. Other conditions being equal, we always prefer the supplier with the highest sustainability score, or the B Corp supplier over non certified one. (#2) We have published a sustainability strategy based on decarbonization, circularity, biodiversity and water. We have set objective targets that guide our investments and growth strategy. (#9)
Managerial cognition	Paradoxical cognition allows framing paradoxical tensions as poles to be integrated	I realized sustainability has to be based on functionality and data. You can't make something ultra-light and fantastic if it breaks and becomes waste. (#3) I explain to suppliers that this [implement initiatives to reduce emissions, track progress and report] is a journey

	rather than conflicting values	they have to do […] because it brings value to their firm. (#2)
	Paradoxical cognition in intra-organizational tensions management	At the beginning, it was my opinion against someone else's; now, with numbers and evidence, discussions are much more constructive and colleagues from other functions […] understand our point more easily. (#3)
	Paradoxical cognition and supply chain positive spillover	When I need to transfer to our suppliers the concept of having a good impact on the environment, I do not struggle at all. Assimilating this way of thinking helped me so much in my professional and personal growth; it is something I deeply feel and believe in, and it seems so obvious to share it with suppliers. (#1) In our last meeting, I asked to our main transport provider to have an electric truck on the route they cover for us daily. They have realized that we are activating all sorts of [more sustainable] alternative suppliers and solutions and finally they agreed to further investigate this idea. (#8)

Table 2. Factors enabling tensions management

5. Discussion

This study aims to explore how managers within different functions, as key actors in firm and supply chain sustainability (Preuss & Fearne, 2022), perceive, make sense of, and respond to tensions between indicators of cost, service, quality, and environmental impact in their daily operations. Moreover, as suggested by earlier investigations (Benkert, 2021; Xiao et al., 2019), organizational factors, were also investigated to clarify whether and how organizational elements influenced individual managers' perception of such tensions. By combining insights from paradox theory with qualitative data tackling two levels of analysis, initial findings show that managers do not simply react to competing demands by attaining either cost, performance, or sustainability; rather, they interpret and frame competing demands in light of organizational orientation and manage emerging tensions accordingly. A paradox perspective allows for a greater understanding of how tensions, which can hardly be removed in the sustainability context, can be managed to integrate supply chain emissions reduction goals with other – more traditional - business aims.

6. Limitations and future research

This research presents some limitations. First, the study assesses a single organization that is a leader in setting sustainability targets and implementing related strategies. Thus, due to a limited number of interviews, results may not be generalizable to other industry settings. Secondly, this research does not directly assess upstream suppliers' perspectives on the issue of supply chain emissions reduction, which represents a significant limitation in the analysis of Scope 3 emissions.

Keywords: Sustainable supply chain management; decarbonization; paradox theory; cognitive frames; organizational frames; case research

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L'effetto di Lean Production e Industria 4.0 sulle performance operative d'impresa: evidenze da uno studio sul campo

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1. Introduzione

Per migliorare costantemente le prestazioni operative di tempo, costo, qualità e flessibilità, le imprese industriali nel tempo hanno sperimentato numerose soluzioni organizzative e tecnologiche in grado di incidere favorevolmente sulle performance produttive e logistiche (Abdelilah, El Korchi, and Balambo 2018; Shekarian, Reza Nooraie, and Parast 2020). Uno dei paradigmi organizzativi più celebri e diffusi è rappresentato dalla Lean Production (LP), le cui origini risalgono alle prime esperienze maturate in Giappone presso Toyota a partire dagli anni '50 del secolo scorso (Womack, Jones, and Roos 1990). La LP ha trovato ampio consenso e diffusione in quanto consente di eliminare (o quanto meno ridurre) i cosiddetti "sprechi" dei processi di produzione, ovvero quelle inefficienze che limitano l'efficacia e l'efficienza delle operations aziendali (Shah and Ward 2003).

Più di recente nuove tecnologie, note come Industria 4.0 (I4.0) (Kagermann, Wahlster, and Helbig 2013), hanno cominciato a diffondersi nell'industria determinando lo sviluppo di sistemi cyberfisici che connettono oggetti, impianti e operatori, offrendo significativi benefici operativi (Zangiacomi et al., 2020). Alcuni recenti contributi hanno ipotizzato che nei contesti produttivi lean le soluzioni I4.0 possano essere adottate in modo più efficacie grazie alla migliore organizzazione e linearità dei processi produttivi (Rossini et al. 2019; Tortorella and Fettermann 2018). Ciò porta a ritenere che l'adozione congiunta di questi due paradigmi possa ulteriormente potenziare i benefici legati all'uso delle nuove tecnologie (Rosin et al. 2020; Rossini et al. 2022; Chiarini and Kumar 2021).

Tuttavia, nonostante l'apparente coerenza di fondo tra LP e I4.0, la loro implementazione congiunta potrebbe in realtà generare esiti sfavorevoli (Agostini and Filippini 2019; Azadegan et al. 2013). Infatti, la LP è fortemente orientata alla valorizzazione del personale di fabbrica, al contrario I4.0 promuove l'automazione (De Treville and Antonakis 2006; Pun, Chin, and Gill 2001). Alcuni contributi hanno, infatti, dimostrato che l'effetto sinergico tra LP e I4.0 si riscontra solo a fronte di specifiche condizioni (Bhatia and Kumar 2022; Jang, Chung, and Son 2022; Saxby, Cano-Kourouklis, and Viza 2020) o riguarda solo alcune specifiche dimensioni prestazionali (Ding, Ferràs Hernández, and Agell Janè. Nùria 2023; Pozzi, Rossi, and Secchi 2023; De Giovanni, Belvedere, and Grando 2024).

2. Obiettivi e metodologia

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Questo studio intende approfondire la relazione tra LP e I4.0, allo scopo di comprendere: 1) se e in che misura LP e I4.0 influiscono sulle prestazioni produttive; 2) se l'interazione tra i due paradigmi determina effetti sfavorevoli sulle prestazioni produttive.

L'indagine empirica è stata condotta attraverso una survey su un campione di stabilimenti localizzati in Italia (Forza, 2002), identificati attraverso gruppi tematici sui temi LP e I4.0 attivi su LinkedIn o presso centri di ricerca. Complessivamente sono stati inviati a partecipare all'indagine circa 700 stabilimenti e sono stati raccolti 189 questionari utilizzabili, con un tasso di risposta del 27%.

Il questionario è stato sviluppato partendo dal lavoro di Tortorella e Fettermann (2018). Il costrutto "Lean Production" è stato misurato attraverso 41 affermazioni valutabili in scala di Likert da 1 a 5 e relative alle pratiche più diffuse della LP, come proposto da Shah and Ward (2007). Il costrutto "Industria 4.0" è stato quantificato attraverso 9 item proposti da Tortorella and Fettermann (2018), che riguardano le principali soluzioni I4.0, ovvero: Internet of Things (IoT), Cloud Computing, Cybersecurity, Big Data and Analytics, Simulazioni, Integrazione orizzontale e verticale, Additive Manufacturing (3D Printing), Advanced Manufacturing Solutions e Realtà Aumentata.

Il costrutto "Prestazione operativa" è stato misurato attraverso 7 item relativi alle principali prestazioni delle operations, ovvero: produttività, servizio logistico, scorte, sicurezza, qualità, flessibilità, sostenibilità. I primi cinque item sono basati su Tortorella and Fettermann (2018); gli ultimi due sono stati aggiunti in ragione della recente rilevanza di queste dimensioni prestazionali.

Sono state, inoltre, utilizzate le seguenti variabili di controllo: dimensione aziendale, durata di implementazione di LP (maggiore o minore di due anni), natura del processo produttivo (ripetitivo/non ripetitivo; discreto o continuo), localizzazione degli stabilimenti dell'azienda (solo in Italia o anche all'estero), localizzazione dell'headquarter (Italia o estero).

I dati raccolti sono stati analizzati attraverso una regressione gerarchica su otto diverse variabili dipendenti (Hair et al. 2014). Nella prima, la variabile dipendente è "Prestazione operativa". Le altre riguardano ciascun singolo attributo prestazionale identificato nel questionario. Il Modello 1 considera esclusivamente le variabili di controllo, ovvero:

- Dimensione aziendale ("Dimensione", dove 1 è <50 dipendenti; 2 è 50-250 dipendenti; 3 è >250 dipendenti);
- Durata di implementazione di LP ("LPexp", dove 1 è > 2 anni; 0 è < 2 anni);
- Localizzazione degli stabilimenti ("PlantLoc", dove 1 indica stabilimenti in Italia e all'estero, 0 solo in Italia);
- Localizzazione dell'headquarter ("HQLoc", dove 1 indica HQ all'estero, 0 indica HQ in Italia);
- Produzione ripetitiva/non ripetitiva ("RepPP", dove 1 indica ripetitiva, 0 non ripetitiva);
- Produzione discreta/continua ("ConPP", dove 1 indica continua, 0 indica discreta).

Nel Modello 2 si aggiungono i seguenti predittori:

- Implementazione di Lean production ("LP")
- Grado di adozione di Industria 4.0 ("TEC")

Il Modello 3 aggiunge anche l'effetto di interazione:

- Interazione tra LP e TEC (LP*TEC)

3. Risultati

Le tabelle 1, 2a e 2b riportano i risultati delle regressioni.

	Prestazione operativa		
	Modello 1	**Modello 2**	**Modello 3**

Dimensione	,016	-,023	-,040
LPexp	,276***	,143*	,145**
PlantLoc	-,008	-,080	-,074
HQLoc	-,104	-,128*	-,129*
RepPP	,024	,039	,043
ConPP	,134*	,117*	,108*
TEC		,111	,528
LP		,416***	,656***
LP*TEC			-,578
R-squared	0,101***	0,290***	0,296***

** significativo al 10%; ** 5%; *** 1%*

Tabella 1. Regressione su prestazione operativa

	Produttività			**Servizio logistico**			**Scorte**		
	M.1	**M.2**	**M.3**	**M.1**	**M.2**	**M.3**	**M.1**	**M.2**	**M.3**
Dimensione	,038	,017	-,008	-,107	**-,145***	**-,146***	,003	-,027	-,028
LPexp	**,282****	**,197****	**,201****	**,230****	,100	,101	**,235****	**,161****	**,162****
PlantLoc	-,050	-,090	-,081	,045	-,022	-,022	-,118	**-,170****	**-,170***
HQLoc	-,044	-,058	-,059	-,008	-,031	-,031	-,043	-,060	-,060
RepPP	-,076	-,070	-,064	,108	**,121***	**,121***	-,110	-,094	-,094
ConPP	,018	,008	-,004	-,015	-,031	-,032	,078	,066	,065
TEC		,133	**,753***		**,131***	,164		-,052	-,031

LP		**,180****	**,537****		**,371*****	**,390***		**,388*****	**,400***
LP*TEC			-,860			-,046			-,030
R-squared	,081**	,140*****	,153*****	,063*	,228*****	,228*****	,066*	,182*****	,182*****

** significativo al 10%; ** 5%; *** 1%*

Tabella 2a. Regressione sulle singole dimensioni prestazionali

	Sicurezza			**Qualità**			**Flebilità**			**Sostenibilità**		
	M1	**M2**	**M3**	**M1**	**M2**	**M3**	**M1**	**M2**	**M3**	**M1**	**M2**	**M3**
Dimensione	,116	,093	,082	-,044	-,072	-,102	,011	-,017	-,021	,050	,036	,030
LPexp	**,152***	,056	,057	,123	,039	,044	,042	-,067	-,066	**,198****	**,165****	**,166****
PlantLoc	-,015	-,058	-,054	-,069	-,120	-,109	,100	,050	,052	,078	,053	,055
HQLoc	-,112	-,128	-,128	-,078	-,094	-,096	**-,172****	**-,190****	**-,191****	-,008	-,016	-,016
RepPP	,007	,012	,015	,078	,090	,098	-,038	-,031	-,030	**,149****	,157	**,158****
ConPP	,102	,092	,086	**,176****	**,164****	**,149****	,108	,096	,094	**,127***	**,121***	**,118***
TEC		**,164***	,436		,025	**,777****		**,165***	,264		-,042	,090
LP		**,185****	,342		**,323*****	**,756*****		**,234*****	,292		**,197****	,273
LP*TEC			-,377			**-1,044****			-,138			-,183

R-squared	,060*	,133***	,135***	,063*	,158**	,176**	,036ns	,132**	,132**	,124**	,153**	,154***

** significativo al 10%; ** 5%; *** 1%*

Tabella 2b. Regressione sulle singole dimensioni prestazionali

Come si può notare nella Tabella 1, la regressione su "Prestazione operativa" evidenzia che la lunghezza di implementazione di LP è l'unica variabile di controllo statisticamente significativa in tutti i Modelli. Inoltre, concentrando l'analisi sui Modelli 2 e 3, LP dimostra di essere un driver rilevante, caratterizzato da coefficienti di regressioni positivi. Al contrario TEC e LP*TEC non sono significativi.

Tuttavia, osservando i risultati delle regressioni nelle Tabelle 2a e 2b, relativi alle singole dimensioni prestazionali delle operations, si osservano evidenze interessanti. È confermato il ruolo significativo della lunghezza di implementazione di LP nell'influenzare molte delle prestazioni operative. Al contrario, le altre variabili di controllo hanno un rilievo molto più circoscritto. Inoltre, LP si conferma essere un predittore statisticamente significativo per tutti i profili prestazionali, mentre TEC è rilevante per 5 su 7 almeno in un Modello. In tutti i casi, i coefficienti di regressioni sono positivi, dimostrando un effetto favorevole di LP e TEC sulle prestazioni operative. Infine, l'interazione tra LP e TEC è statisticamente significativa solo per Qualità, dove assume valore negativo.

Considerando la rilevanza della lunghezza di implementazione di LP nello spiegare il fenomeno in esame, è stata condotta anche una regressione sul sottocampione di stabilimenti che adottano LP da oltre due anni (116 osservazioni), utilizzando esclusivamente LP e TEC come variabili indipendenti.

	Prestaz. operativa	**Produttività**	**Servizio logistico**	**Scorte**	**Sicurezza**	**Qualità**	**Flessibilità**	**Sostenibilità**
TEC	**2,470****	**1,294****	**,870***	,080	**1,029***	**1,159****	**,949***	,136
LP	**3,533*****	**,746****	**,763****	,471	**,680****	**,970****	**,770****	,240
LP*TEC	**-2,296****	**-1,522****	-,970	-,273	-1,180	**-1,600****	-1,131	-,171
R-squared	,242***	,094**	,212***	,105***	,107***	,121***	,148***	,030ns

** significativo al 10%; ** 5%; *** 1%*

Tabella 3. Regressione sulle singole dimensioni prestazionali per stabilimenti con implementazione di LP maggiore di 2 anni

Come si vede nella Tabella 3, tutte le regressioni hanno un R quadro significativo, con l'unica eccezione di Sostenibilità. Inoltre, LP e TEC sono predittori significativi non solo per Prestazione operativa, ma anche per tutte le singole dimensioni prestazionali, con l'eccezione di Scorte e Sostenibilità. Tuttavia, per Prestazione operativa, Produttività e Qualità l'interazione tra LP e TEC è significativa e negativa, dimostrando che l'intensificarsi di LP determina una minore efficacia di TEC.

Per approfondire la comprensione di questa evidenza, è stata condotta un'analisi su due sottocampioni di stabilimenti, uno con implementazione di LP sopra la media (HLP), l'altro con implementazione di LP sotto la media (LLP). I risultati sono rappresentati in Figura 1, dove Prestazione operativa è messa in relazione a TEC per ciascuno dei due sotto campioni.

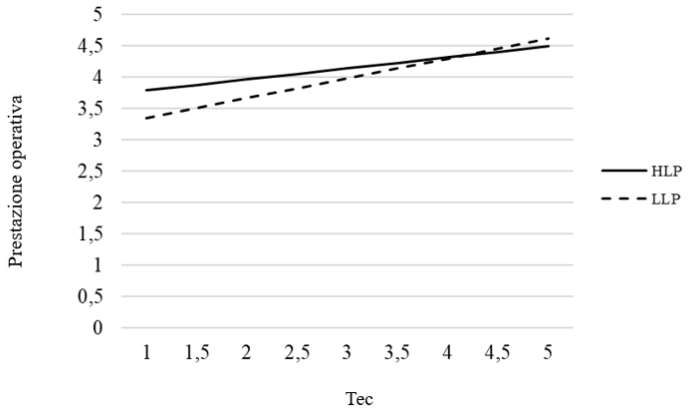


Figura 1. Relazione tra Prestazione operativa e TEC

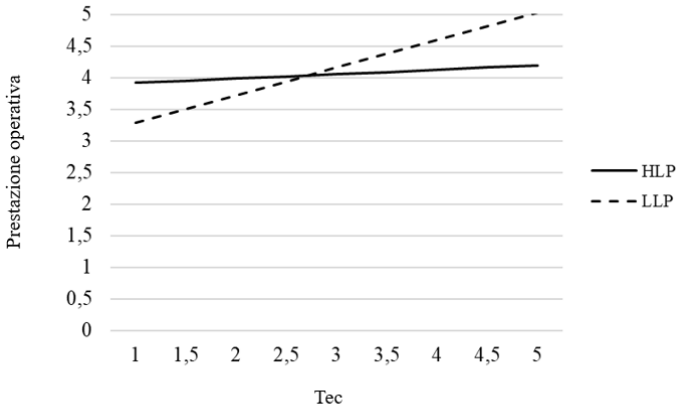


Figura 2. Relazione tra Prestazione operativa e TEC (LP > 2 anni)

Nella Figura 1, per elevati livelli di TEC gli stabilimenti del gruppo LLP beneficiano di una prestazione superiore.

La stessa analisi è stata replicata sui soli stabilimenti caratterizzati da una lunghezza di implementazione di LP superiore a due anni. La Figura 2 descrive le evidenze.

Come si può notare, il fenomeno già descritto nella Figura 1 è ancora più accentuato nella Figura 2. Infatti, la differenza di inclinazione delle due rette è chiaramente maggiore nella Figura 2. Inoltre, il punto di intersezione tra le due rette si colloca su un valore più basso di TEC rispetto alla Figura 1, evidenziando che l'interazione con LP può ridurre l'efficacia di I4.0 persino a fronte di un moderato sforzo di adozione delle nuove tecnologie.

4. Conclusioni

Questo paper, che rappresenta nello stato attuale un work in progress, contribuisce al dibattito sulla relazione tra I4.0 e LP. I risultati dimostrano che sia LP sia I4.0 possono contribuire a migliorare le prestazioni operative. Tuttavia, si dimostra anche che, in contesti caratterizzati da una lunga ed intesa adozione di LP, l'efficacia di I4.0 risulta attenuata. Queste evidenze offrono un contributo nuovo agli studi accademici su questo fenomeno e, nella prospettiva del management, evidenziano un elemento di criticità su cui è necessario soffermarsi prima di varare programmi di adozione di I4.0 in stabilimenti lean.

Keywords: Lean production; industria 4.0; prestazioni operative; survey

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Selezione Strategica Dei Fornitori e Mitigazione del Rischio Mafioso: L'Innovazione dei Processi Aziendali Mediata dall'Intelligenza Artificiale

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1. Introduzione

L'avvento dell'Intelligenza Artificiale (IA) e, più in generale, della moderna trasformazione digitale ha alimentato un crescente interesse scientifico nei confronti del Business Process Management (BPM) (Cronemyr et al., 2025; Moreira & Dallavalle, 2025; Szelągowski & Berniak-Woźny, 2024). Crescente enfasi è stata conseguentemente attribuita alla Business Process Technology (BPT), intesa come l'infrastruttura tecnologica attraverso cui le organizzazioni integrano decisioni data-driven di natura predittiva e automatizzata nei propri processi operativi (Draheim, 2010; Iden et al., 2025; Van Looy, 2021). Alla luce della marcata volatilità, incertezza e vulnerabilità che connotano l'odierno ambiente d'impresa (Cavusgil et al., 2020; Manuj & Mentzer, 2008; Simangunsong et al., 2012), l'architettura strategica della BPT può configurarsi come un abilitatore cruciale di capacità organizzative avanzate per l'identificazione e la gestione dei rischi aziendali (Slagmulder & Devoldere, 2018; Muehlen & Ho, 2005; Röglinger et al., 2022; Thabet et al., 2021). Fra i processi più rilevanti che la BPT può supportare, la selezione dei fornitori riveste un ruolo decisivo nel garantire la continuità operativa, la reputazione e la redditività delle imprese (Kull et al., 2014; Wagner & Bode, 2008; Wissuwa et al., 2022; Riedl et al., 2013; Roehrich et al., 2014; Zhang et al., 2024). Studi recenti hanno evidenziato come le tecnologie basate sull'IA possano accrescere efficienza, agilità, capacità di gestione del rischio e resilienza delle catene di fornitura (Lu et al., 2025; Modgil et al., 2022; Singh et al., 2024; Yang et al., 2023; Uren & Edwards, 2023). Tuttavia, queste tecnologie pongono sfide rilevanti per gli utilizzatori umani, sia per la loro intrinseca complessità e la conseguente carenza di competenze specifiche (Cannas et al., 2024; Dey et al., 2024), sia per la natura opaca e difficilmente intelligibile dei risultati prodotti (Brintrup et al., 2024; Sadeghi et al., 2024), oltre che per le preoccupazioni concernenti la gestione dei dati sensibili, la cybersicurezza e i profili collaterali di rischio (Cheung et al., 2021; Nozari et al., 2022). In questo alveo di riflessione, lo studio indirizza lo sguardo verso un'area di criticità dai riflessi globali che, anche a fronte della sua pervasività, riscuote una sempre più marcata, per quanto recente, attenzione in dottrina manageriale: l'infiltrazione della criminalità organizzata (CO) nell'economia legale tramite le strutture societarie legali (Cincimino et al., 2024; 2025). Questo fenomeno rappresenta una minaccia di elevato profilo per le imprese legittime (IL) e pone una sfida complessa all'integrità dei protocolli di selezione dei fornitori (Marelli et al., 2020; Savona & Berlusconi, 2015; Savona & Riccardi, 2015; 2018). L'instaurazione di relazioni d'affari con controparti criminali determina infatti l'esposizione a rischi multidimensionali che possono generare derive distorsive e profondi nocumenti economico-sociali, fino a pregiudicare la stessa continuità aziendale (Champeyrache, 2014; 2018). Alla luce di tali sfide, congiuntamente ai progressi

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tecnologici che accompagnano l'integrazione dell'IA nei processi aziendali (Abbasi et al., 2025; Baryannis et al., 2019; Jackson et al., 2024; Sharma et al., 2022), il presente lavoro pone il seguente interrogativo di ricerca: come percepiscono i supply chain manager l'integrazione dell'IA nei processi decisionali finalizzati alla mitigazione del rischio di instaurare relazioni commerciali con controparti criminali?

Al fine di rispondere a tale interrogativo, lo studio ha preliminarmente individuato, nell'ambito del mercato dei servizi rivolti alle imprese, una soluzione tecnologica di recente sviluppo basata sull'IA che, per quanto a conoscenza degli autori, presenta caratteri di marcata originalità nel panorama degli strumenti commercialmente disponibili a supporto della prevenzione aziendale del rischio di instaurare relazioni con controparti criminali. In coerenza con tale scelta empirica, lo studio adotterà un disegno di ricerca esplorativo fondato su uno studio di casi multipli (Eisenhardt, 1989; Eisenhardt & Graebner, 2007). Questo approccio consentirà di comprendere le ragioni e le modalità attraverso cui la tecnologia innovativa è stata implementata nei processi aziendali di selezione e monitoraggio dei fornitori in molteplici realtà aziendali, nonché di analizzare come essa venga percepita dai componenti delle unità organizzative deputate alla supply chain security all'atto della sua integrazione nelle ordinarie routine decisionali aziendali.

La fase propedeutica all'indagine sul campo ha previsto un'intervista semi-strutturata in profondità allo sviluppatore e fondatore dello strumento tecnologico. Nel presente contributo congressuale sono specificamente trattati gli esiti di tale intervista, che, sottoposti a un'analisi tematica riflessiva (Braun & Clarke, 2019; 2021), hanno permesso di decodificare la genesi, le finalità e l'architettura analitica della tecnologia. L'elaborazione preliminare delle evidenze raccolte attraverso l'intervista ha permesso di enucleare quattro pilastri concettuali destinati a orientare il futuro protocollo di ricerca: la proiezione etica dello strumento tecnologico quale "anticorpo sociale" contro l'illegalità, un'innovativa "chirurgia" di precisione volta a minimizzare gli errori, il potenziamento cognitivo del decision-making umano in antitesi alla sostituzione algoritmica e, infine, la creazione di un forte "scudo di rete" a tutela della continuità operativa aziendale. Il prosieguo dell'indagine si sostanzierà nella conduzione di focus group (Greenbaum, 1998; Krueger, 1997a; 1997b; 2014) presso imprese che hanno adottato la soluzione tecnologica individuata, eterogenee per dimensione e comparto economico, al fine di vagliare la tenuta della visione teleologica del fondatore alla prova delle prassi operative e intercettare eventuali disallineamenti nel rapporto uomo-macchina. Lo studio intende così accertare se l'integrazione della BPT agisca quale leva per la ricalibrazione della percezione manageriale del rischio, identificando al contempo le determinanti di una corretta postura proattiva e data-driven nei processi decisionali osservati. Sotto il profilo dottrinale, il contributo si snoda lungo una triplice direttrice volta ad ampliare il paradigma della BPT, estendere la letteratura sulla supplier selection e corroborare gli studi sulla resilienza delle IL alle infiltrazioni della CO nelle catene di fornitura globali. L'indagine offre anche importanti implicazioni operative, evidenziando l'efficacia della due diligence algoritmica nel convertire rischi opachi in variabili governabili, elevando la selezione dei fornitori a leva reputazionale dinamica e virtuosa.

2. Letteratura di Riferimento

2.1. Gestione dei processi aziendali, tecnologia e avanzamento dell'IA

La dottrina contemporanea ravvisa nella sinergica orchestrazione tra fattore umano e risorse tecnologiche innovative il fondamento per garantire l'efficienza di lungo periodo dei processi aziendali (Bresciani et al., 2025; Iden et al., 2025; Moreira & Dallavalle, 2025; Szelągowski & Berniak-Woźny, 2024). Al di là del mero affinamento operativo, la letteratura mostra come il BPM sia in grado di riorientare le organizzazioni riconfigurandone le posture da reattive ad anticipatorie e proattive, nelle quali la visibilità informativa in tempo reale e il supporto decisionale algoritmico contribuiscono congiuntamente a irrobustire la continuità operativa e il

rinnovamento strategico (Klun & Trkman, 2018; Zelt et al., 2018). In tale riconfigurazione, la BPT si presenta simultaneamente come esito e come abilitatore della trasformazione digitale del BPM, inscrivendosi in una relazione simbiotica e sinergica nella quale il BPM definisce la visione strategica dei processi e i canoni metodologici di eccellenza, mentre la BPT fornisce le infrastrutture tecnologiche attraverso cui tali principi vengono concretizzati, scalati e sostenuti in contesti organizzativi complessi (Draheim, 2010; Grover & Kettinger, 1995; Kirchmer, 2017; Vom Brocke & Mendling, 2018). Nel configurarsi come disciplina olistica (Dumas et al., 2018), il BPM ha elevato la tecnologia da fattore ausiliario a pilastro costitutivo del successo aziendale (Beverungen et al., 2020; Kerpedzhiev et al., 2021). La corrente dottrinale sul BPM indica che l'efficacia operativa possa essere ottenuta per mezzo della capacità delle tecnologie informative di innervare l'intero ciclo di vita dei processi aziendali, dall'ideazione sino al miglioramento continuo (Rahimi et al., 2016; Trkman, 2010; Ozkan et al., 2024; Weinzierl et al., 2024). L'avvento dell'IA ha ulteriormente catalizzato il passaggio verso flussi di lavoro cognitivi e predittivi capaci di innescare all'interno delle imprese cicli autonomi di ottimizzazione (Abbasi et al., 2025; Dumas et al., 2023; Caruso et al., 2023; Dwivedi et al., 2021), con implicazioni profonde nei processi decisionali multi-criteriali, come la selezione dei fornitori (Alikhani et al., 2019; Bak, 2018; De Boer et al., 2001; De Assis Santos & Marques, 2022; Chai et al., 2013; Kilubi, 2016a; 2016b; Sodhi et al., 2012), così da garantire un posizionamento competitivo dinamico e prospero nei mercati attuali (Chai & Krause, 2006; Cousins & Spekman, 2003; Li et al., 2006).

2.2. La tecnologia nei processi di selezione dei fornitori

La letteratura manageriale contemporanea conferisce ai processi di selezione dei fornitori la valenza di imperativi strategici, riconoscendone l'incidenza determinante sulla sostenibilità organizzativa di lungo periodo (Araz & Ozkarahan, 2007; Borges de Araújo et al., 2015; Dekker et al., 2013). Le più recenti traiettorie d'indagine scientifica postulano l'adozione di architetture decisionali ibride e multicriterio, capaci di sintetizzare dimensioni prestazionali eterogenee quali la qualità, la reattività operativa, la solidità patrimoniale e, con crescente enfasi, la gestione del rischio[4] (Abdulla & Baryannis, 2024; Chai et al., 2013). In tale prospettiva, si consolida la consapevolezza che la stima dell'affidabilità dei fornitori derivi da un processo sistemico fondato sulla necessaria convergenza di metriche quantitative e qualitative eterogenee (Ho et al., 2010; 2015). L'affinamento dei paradigmi valutativi ha generato la possibilità di valutare le capacità di resilienza dei partner (Hosseini & Barker, 2016; Rajesh & Ravi, 2015), promuovendo lo sviluppo di quadri decisionali olistici idonei a governare la complessità selettiva insita negli scenari dinamici e transnazionali (Harland et al., 2003; Manuj & Mentzer, 2008). Questa evoluzione, rafforzata dai recenti shock delle supply chain e dalla crescente consapevolezza delle loro

[4] Superando il paradigma dell'ottimizzazione dei costi, l'attuale dottrina privilegia l'analisi di proxy operative — quali tassi di difettosità, varianza nei lead time, vincoli capacitivi e flessibilità di volume — per inferire la resilienza strutturale del partner (Hallikas et al., 2005; Hosseini & Barker, 2016; Yoon et al., 2018). A tale quadro quantitativo si integrano valutazioni qualitative sull'assetto manageriale e sulla capacità tecnologica, quali indicatori di reattività e potenziale innovativo (Wu & Barnes, 2011), unitamente a parametri di stabilità finanziaria e compliance normativa ponderati algoritmicamente per preservare la continuità aziendale (Kull & Talluri, 2008). In siffatto scenario, l'esame delle metriche storiche abilita stime predittive cruciali per la mitigazione proattiva di minacce operative e reputazionali (Bruno et al., 2012; Cheng et al., 2020; Choudhary et al., 2023; Gernert et al., 2023; Islam et al., 2021; Ma & Li, 2024; Wu, 2009). Parallelamente, l'avanzamento interdisciplinare attesta l'efficacia di tecniche statistiche applicate a fonti testuali eterogenee — dai bilanci di esercizio ai social media — nella prevenzione di frodi e dissesti finanziari (Akhtar et al., 2023; Jim et al., 2024; Kosasih et al., 2024; Li et al., 2023a; 2023b; Lokanan & Maddhesia, 2025; Sadeek & Hanaoka, 2023).

vulnerabilità (Craighead et al., 2007), ha spinto le imprese a includere la resilienza e il profilo di rischio dei fornitori tra i criteri centrali della propria cultura aziendale (Gebhardt et al., 2022; Hosseini et al., 2019; Schoenherr et al., 2023; Wissuwa et al., 2022). In questo contesto, una BPT all'avanguardia può fungere da architettura di sintesi per flussi informativi variegati, permettendo di raggiungere capacità gestionali superiori (Acitelli et al., 2025; Caputo et al., 2019; Fettke & Di Francescomarino, 2025; Kang & Bhawna, 2025). La letteratura recente evidenzia, infatti, come i benefici derivanti dai processi di digitalizzazione (Perano et al., 2023), trovino un fondamentale e ulteriore potenziamento nell'integrazione di tecnologie basate sull'IA (Baryannis et al., 2019; Kagalwala et al., 2025). L'innesto di tali soluzioni agisce quale catalizzatore per l'efficienza decisionale e la reattività aziendale (Spreitzenbarth et al., 2024), favorendo una migliore gestione olistica dell'intero ciclo di vita dei partner commerciali (Chai & Ngai, 2015; Ganesh & Kalpana, 2022; Helo & Hao, 2022; Gunasekaran et al., 2017; Toorajipour et al., 2021; Zamani et al., 2023). Tuttavia, emergono dilemmi etici profondi nell'utilizzo dell'IA concernenti trasparenza, equità e responsabilità delle decisioni autonome, oltre al rischio di un'eccessiva dipendenza umana da sistemi che restano suscettibili di errore (Hendriksen, 2023).

Persistono, inoltre, preoccupazioni sostanziali riguardo all'opacità algoritmica, alla possibile amplificazione di bias discriminatori e all'eccessiva dipendenza tecnologica (Bauer & Gill, 2024; Berente et al., 2021; Fernández-Loría et al., 2022; Richey et al., 2023; Wang et al., 2023). La letteratura documenta altresì il rischio che pregiudizi cognitivi umani preesistenti vengano codificati e amplificati dai modelli di calcolo, perpetuando iniquità sistemiche nei processi di selezione (Hu et al., 2025). Ne deriva l'urgenza di ricercare un adeguato bilanciamento che eviti l'erosione del capitale umano e delle capacità distintive (Raisch & Krakowski, 2021). Al fine di garantire relazioni d'affari affidabili e durature (Lau et al., 2018; Luo et al., 2009; Kannan & Tan, 2002; Garfamy, 2009; Sarkis & Talluri, 2002; Spekman, 1988; Taherdoost & Brard, 2019), si delinea la necessità di concettualizzare una stretta simbiosi tra BPM e BPT, dove la corretta interazione tra uomo e macchina diviene il fattore chiave abilitante per il potenziamento della gestione dei processi aziendali (Cannas et al., 2024; Guida et al., 2023; Liang et al., 2024).

3. Metodologia

3.1. Contesto di ricerca e selezione del campione

Nell'attuale scenario globalizzato, la CO trascende i confini dei mercati illeciti per configurarsi come una minaccia sistemica che compromette l'integrità delle istituzioni socio-economiche e le dinamiche del commercio internazionale (Savona et al., 2016; United Nations Office on Drugs and Crime, 2024; World Economic Forum, 2024). Sebbene i mercati illegali costituiscano la fonte primaria di reddito della CO, la strategia prevalente si fonda sul reinvestimento sistematico dei proventi nell'economia legale tramite veicoli societari legali (Bianchi et al., 2022; Mirenda et al., 2022). L'integrazione di imprese controllate dalla CO nella filiera economica risponde a una triplice finalità: il riciclaggio dei proventi illeciti, la costruzione di relazioni stabili con attori economici e istituzionali e, in misura determinante, l'amplificazione dei profitti e del potere, nonché del controllo territoriale e di settori economici strategici (Barone & Narciso, 2015; Catino, 2019; Chircop et al., 2023; Slutzky & Zeume, 2024). L'opacità delle operazioni è garantita dall'impiego di prestanomi di fiducia e dalla costituzione di intricate architetture proprietarie multilivello, così da favorire il radicamento della CO nei mercati transazionali legittimi[5] (Buckley et al., 2024; Compin, 2008; Pacini et al., 2019). In siffatto scenario, le IL fronteggiano una marcata esposizione al rischio di instaurare inconsapevolmente

[5] Stime recenti evidenziano che l'86% delle reti europee più pericolose utilizza strutture legali per le proprie attività (Europol, 2024; 2025). Nel contesto italiano, i gruppi di CO controllano circa il 2% delle imprese registrate (Arellano-Bover et al., 2024).

relazioni con imprese infiltrate dalla CO (Marelli et al., 2020; Parbonetti, 2021; Savona & Berlusconi, 2015; Transcrime, 2013). Le ripercussioni sistemiche per le IL si esplicano attraverso una duplice dimensione d'impatto. Sul versante esogeno, l'intervento delle forze dell'ordine può determinare l'improvvisa interruzione della catena di fornitura (Calamunci, 2022; Ferrante et al., 2021; Operti, 2018). Sul piano endogeno, le imprese controllate dalla CO palesano una strutturale inaffidabilità e orizzonti opportunistici che sfociano spesso in instabilità interne e inadempienze contrattuali (Arlacchi, 2007; Champeyrache, 2014; 2018; La Rosa & Paternostro, 2015). A fronte delle criticità emerse, e fatta salva l'eccezione di un ristretto novero di working paper incentrati su modelli quantitativi di identificazione di proxy criminali nelle aziende (Ambrosini et al., 2024; Cariello et al., 2024), la letteratura ad oggi offre esigui contributi volti ad investigare qualitativamente le strategie aziendali tese a prevenire l'interazione con le controparti criminali lungo le catene di fornitura (Cincimino et al., 2024). Per colmare tale lacuna, la presente indagine si avvale della mediazione istituzionale del Centro di Ricerca su Impresa, Mafia ed Economia dell'Università di Padova, il cui ruolo di gatekeeper ha garantito l'accesso privilegiato al dominio empirico (Yin, 2016).

Il fulcro dell'indagine risiede nell'analisi di un'innovativa tecnologia recentemente sviluppata, concepita per supportare le IL nella decodifica di pattern riconducibili a sodalizi criminali. Sotto il profilo procedurale, l'architettura della ricerca si svolge in due fasi sequenziali interconnesse. In via preliminare, la mediazione del gatekeeper ha consentito la conduzione di un'intervista élite in profondità al fondatore e CEO della società sviluppatrice della soluzione tecnologica (durata: 120 minuti), finalizzata a chiarire la teleologia dell'innovazione e le aspettative implementative (Harvey, 2011; Solarino & Aguinis, 2021). Le risultanze tassonomiche scaturite dal processo di codifica di tale intervista preliminare hanno orientato l'architettura del disegno di ricerca di prossima attuazione, strutturato come studio di casi multipli (Eisenhardt, 1989; Eisenhardt & Graebner, 2007), guidando altresì la definizione del protocollo per le successive interviste semi-strutturate (Edwards & Holland, 2013; Qu & Dumay, 2011) tramite l'approccio focus group (Greenbaum, 1998; Krueger, 1997a; 1997b; 2014). L'iter investigativo prevederà il coinvolgimento diretto delle imprese utilizzatrici di tale innovazione nei processi di selezione delle partnership commerciali mediante un contatto già avviato con la totalità della popolazione di riferimento costituita da circa 15 aziende, eterogenee per settori economici e dimensioni. La fase di raccolta dati in via di calendarizzazione si sostanzierà in interviste della durata prevista di 60 – 120 minuti rivolte a figure chiave, quali analisti e security officer, al fine di far emergere i processi di sense-making manageriale e di cogliere il nesso tra le aspettative iniziali del provider e l'esperienza operativa degli user (Alam, 2021; Yin, 2018). Il rigore metodologico sarà preservato da strategie di validità di costrutto e affidabilità che includono la tracciabilità della catena di evidenze e la triangolazione dei dati mediante l'analisi di fonti secondarie disponibili online quali siti istituzionali e documenti aziendali per ricostruire la storia delle imprese e le strategie di compliance integrando e corroborando tali informazioni con le narrazioni che emergeranno dalle interviste (Denzin & Lincoln, 2011; Gibbert et al., 2008).

3.2. Processo di codifica

L'analisi si incardina nel paradigma interpretativo-costruttivista avvalendosi di una strategia di analisi tematica riflessiva (Braun & Clarke, 2019). Conseguentemente, i temi finali rappresentano costruzioni logiche derivate da una codifica analitica all'interno della quale l'attività di ogni ricercatore è stata concepita come un processo di *sense-making* attivo e indipendente (Braun & Clarke, 2021).



Figura 1. I 6 Step dell'Analisi Tematica Riflessiva

La Figura 1 illustra il processo di codifica designato, ponendo una forte enfasi sull'approccio abduttivo-iterativo che abbraccia cicli iterativi di combinazione sistematica tra evidenze empiriche e apparato teorico di riferimento (Dubois & Gadde, 2002; Gibbs, 2007; Timmermans & Tavory, 2012). Supportata dall'ausilio del *software* NVivo 15, ogni intervista condotta sarà sempre seguita dalla fase di trascrizione e di anonimizzazione al fine di rendere tracciabili i passaggi logici e, al contempo, mitigare i *bias* idiosincratici, favorendo così il confronto collegiale sistematico (Flick, 2013; 2018). Inoltre, la riproducibilità sarà garantita mediante un *audit trail* rigoroso e la stesura di una descrizione densa del contesto che permetta giudizi informati sulla trasferibilità dei risultati (Tracy, 2024).

4. Temi emergenti prodromici al design di ricerca

La selezione dell'impresa erogatrice della soluzione tecnologica scaturisce dalla sua natura pionieristica, tale da configurarla quale unicum nel panorama dei servizi di prevenzione aziendale. Le evidenze offerte dal fondatore in merito all'architettura tecnica in esame hanno permesso di decodificare la genesi valoriale e la teleologia operativa della piattaforma tecnologica.

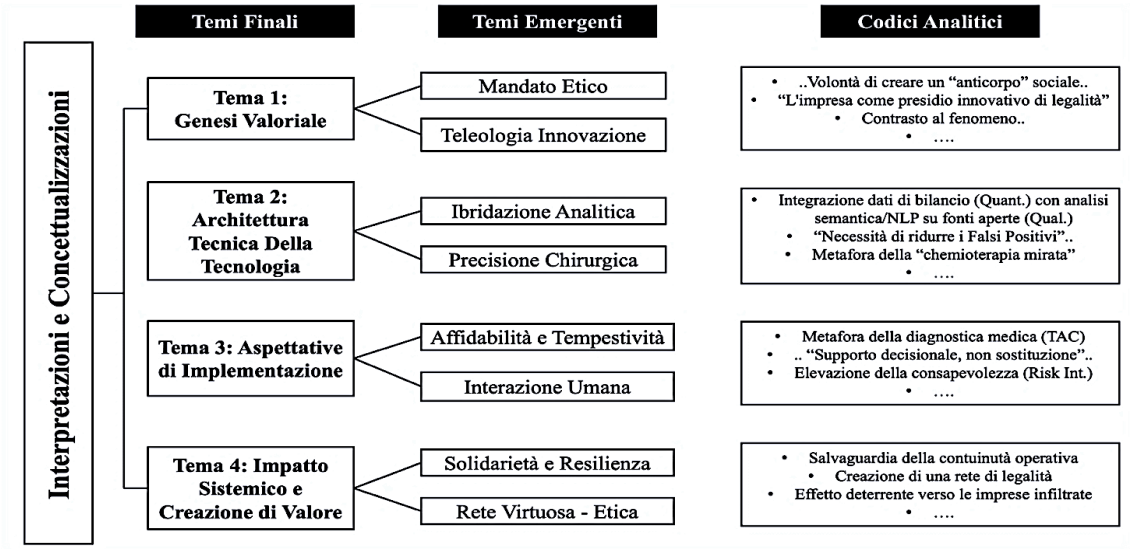


Figura 2. Esiti dell'analisi tematica riflessiva derivante dall'intervista al fondatore e CEO dell'impresa erogatrice della tecnologia (Eseguita il 27/11/25 presso la sede legale della stessa)

L'analisi tematica riflessiva ha fatto emergere una concezione dello strumento che trascende il mero adempimento di compliance per configurarsi come un vero e proprio anticorpo sistemico a salvaguardia dell'impresa. Dalle evidenze raccolte si delinea la volontà di istituire un ecosistema di legalità in cui l'algoritmo non si limita a fungere da barriera difensiva, bensì agisce come catalizzatore di sviluppo economico, nonché di resilienza e affidabilità della catena di approvvigionamento dell'impresa lecita. Sotto il profilo funzionale la tecnologia viene descritta come un supporto decisionale avanzato che, volendo operare in analogia con la diagnostica medica di precisione, integra l'analisi quantitativa di metriche finanziarie e la profilazione qualitativa basata su fonti aperte per offrire al decisore umano un risk intelligence predittivo capace di minimizzare i falsi positivi e salvaguardare la continuità operativa.

In questo contesto, emerge con chiarezza il tema della "centralità aumentata" dell'operatore umano, laddove l'IA non mira alla sostituzione delle prerogative manageriali, ma al loro potenziamento cognitivo, fornendo un quadro informativo depurato da rumore di fondo e bias cognitivi che abilita scelte consapevoli e tempestive in scenari di incertezza. In sintesi, il primo nucleo tematico emerso dal processo di coding ancora la teleologia dell'innovazione tecnologica in un mandato etico, elevando lo strumento a presidio di legalità e anticorpo sociale contro la pervasività criminale. Parallelamente, l'architettura tecnica sostanzia un'ibridazione analitica di "precisione chirurgica" che fondendo metriche quantitative e semantiche, minimizza i falsi positivi evocando, per usare una metafora medica, una "chemioterapia" mirata. Sul fronte delle aspettative di implementazione, si delinea una tecnologia che non vicaria bensì potenzia la capacità umana di decision-making, affinando la risk intelligence decisionale in analogia con la diagnostica medica evoluta. Infine, la prospettiva dell'impatto sistemico tratteggia una rete virtuosa di solidarietà e di resilienza, ove la tutela della continuità operativa si trasfigura in potente deterrente verso le infiltrazioni illecite.

5. Risultati aspettati e prime conclusioni

È ragionevole ipotizzare che le imprese utilizzatrici percepiscano lo strumento come una protesi cognitiva essenziale, capace di trasformare l'incertezza radicale legata al rischio criminale in un rischio calcolabile e governabile. Più che una mera automazione del giudizio, dalle prossime interviste alle aziende utilizzatrici ci si attende di riscontrare una dialettica simbiotica: da un lato l'algoritmo che agisce come filtro ermeneutico, riducendo il rumore informativo, dall'altro il manager che evolve il proprio ruolo da semplice selettore a garante etico ed esegeta del dato, riservandosi l'ultima istanza valutativa sulle segnalazioni di anomalia. I potenziali contributi teorici derivanti dal presente studio si possono articolare lungo tre direttrici. In primo luogo, lo studio mira ad ampliare il filone emergente sulla BPT, chiarendone il ruolo non solo come abilitatore operativo, ma come architettura fondamentale che rafforza il giudizio umano in contesti decisionali complessi e ad alto rischio. In secondo luogo, lo studio intende estendere la letteratura sulla selezione strategica dei fornitori, introducendo e ancorando empiricamente una dimensione di rischio cruciale, finora trascurata, relativa alla mitigazione delle interazioni con imprese legali infiltrate dalla CO, elevando il rischio di integrità a criterio di primo ordine e formalizzando una proxy che lo collega alla resilienza e al capitale reputazionale all'interno del portafoglio complessivo dei rischi di supply chain. Ne discende, in ultima istanza la possibilità di orientare lo sviluppo futuro di cornici di gestione del rischio di supply chain più olistiche, che incorporino sistematicamente tale proxy ai fini della mitigazione della contaminazione da CO. In terzo luogo, il lavoro ambisce a contribuire all'evoluzione della letteratura manageriale sull'infiltrazione della CO nell'economia legale attraverso le imprese, in particolare nel dominio degli studi dedicati alle strategie poste in essere dalle imprese legittime per contrastare le

controparti criminali. Sul piano pratico, le implicazioni appaiono sostanziali. Per i manager, la ricerca mette in luce il valore tangibile degli strumenti di due diligence supportati dall'IA nel presidio dell'integrità aziendale e nella tutela della continuità operativa, trasformando rischi opachi in variabili governabili. Per i professionisti, lo studio offre una cornice metodologica e operativa per l'evoluzione delle attività di consulenza, consentendo di integrare assessment tecnologici avanzati nei processi di valutazione del rischio di controparte e di rafforzare la qualità dei servizi di due diligence offerti alle imprese, con particolare riferimento alla prevenzione dell'infiltrazione criminale nelle catene di fornitura. Per i decisori pubblici, l'indagine evidenzia la necessità di promuovere ecosistemi istituzionali favorevoli all'adozione di tali tecnologie, anche attraverso standard o incentivi, al fine di rafforzare in modo strutturale la tenuta dell'economia legale.

Parole Chiave: Criminalità organizzata; innovazione tecnologica predittiva; salvaguardia dell'integrità commerciale; rete virtuosa di legalità

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Digital technologies for sc transparency: a review from a circular supply chain perspective

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1. Framing the research

The increasing complexity and geographical diversification of modern supply chains (SC) have led to a critical emergence of demand from consumers and companies alike to make the SC more transparent, specifically by tracking the provenance and production conditions of purchased and distributed products (Busse et al., 2017; Wilhelm et al., 2016). This higher attention has been intensified by various social and environmental crises, including recent pandemics (such as COVID-19), the frequent incidence of diseases, food scandals, and pervasive product waste, all of which have illuminated the severe opacity inherent in contemporary supply chains.

Indeed, the exponential growth of supply chains to a transnational level, often involving numerous actors located in developing countries, has resulted in immense complexity and vast geographical distances. This inherent structure results in a systemic lack of visibility beyond direct, tier-one suppliers (Boström et al., 2012; Busse et al., 2016), exacerbating information distortion and inaccuracies among SC actors (Gurtu & Johny, 2019).

This situation has created an imperative need for SC transformation, demanding that they become more transparent, sustainable, and responsible (Closs et al., 2011), thereby enabling companies and suppliers to reliably trace social and environmental breaches (Pagell & Wu, 2009).

In this context supply chains transparency (SCT) has emerged as a pivotal capability allowing the disclosing of detailed and accurate information with key stakeholder about operations and products history, such as their origin, sourcing, manufacturing processes, costs, and logistics, while also incorporating stakeholder feedback for supply chain improvement (Bai & Sarkis, 2020, Carter & Easton, 2011; Carter & Rogers, 2008).

SCT is thus viewed as a key enabler for obtaining a new, more collaborative, resilient, and sustainable supply chain network.

To better understand the academic debate on SCT, a clarification of its key concepts is necessary. While terms such as visibility, traceability, disclosure, information sharing, and openness are often used as near-synonyms, they hold a crucial functional distinction. Transparency is the strategic outcome. Specifically, visibility and traceability are depicted as the antecedents of transparency (Montecchi et al., 2021). Visibility is characterized as a potential outcome of information sharing activities (Barratt & Oke, 2007), while information sharing itself is the active process of information exchange.

In contrast, openness and disclosure are better defined not only as components of transparency but also as crucial factors influencing its implementation. Specifically, transparency guides the organization toward establishing the appropriate level of disclosure. Furthermore, openness reflects a broader organizational orientation to promote a climate of proactive disclosure (Cadden et al., 2013). However, viewed as an inclination or willingness to make information available, openness is also defined as an important antecedent of SCT (Budler, 2024).

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Maintaining clarity regarding the functional roles of these interrelated concepts is essential when investigating the strategic impact of SCT.

The current imperative to focus on Supply Chain Transparency (SCT) is primarily warranted by the emergence of technological requirements essential to support it (van Hoek, 2019). New and emerging technologies appear to offer significant promise to improve both the level and quality of transparency, enabling large volumes of data to be rapidly and efficiently gathered, transferred, integrated, and processed (McGrath et al., 2021). As stated by Budler et al. (2024) technology plays a central role in ensuring effective transparency by overcoming inherent limitations, particularly the common lack of information access beyond first-tier suppliers in multi-level supply chains (Bai & Sarkis, 2020).

Digital technologies provide the means for data capture, analysis, and monitoring while new data collection and sharing technologies, such as barcodes, QR codes, GPS software, and mobile phone sensors (Adams et al., 2014; Wang & Wei, 2007), enhance accessibility to customer and supplier information (Kim & Kankanhalli, 2009).

Technology solutions such as RFID, blockchain (BC) and the Internet of Things (IoT) have been examined to understand how they support the tracking of goods throughout supply chains. Traceability, which is the ability to follow an item across multiple supplier layers by generating an information trail, is a prerequisite for visibility. (Khan et al., 2022). Transparency results when visibility is achieved: all parties can see the product's status, location, and history, which in turn boosts confidence in its safety and quality. Budler (2024) confirms that exploring the connection between antecedents and technologies is essential to understanding how to harness technology to support efforts aimed at increasing transparency in SCs.

Sustainability has provoked a multitude of discussions in the SCM literature (Seuring & Müller, 2008; Morali & Searcy, 2013). However, global consumption patterns remain dangerously unsustainable.

As stated by Hazen et al. (2017 p.461) "the world's population cannot sustain this level of consumption without changing the way products are sourced, produced, delivered, reclaimed and regenerated". The circular economy (CE**)** has been recognized as having great potential to help organizations achieve a breakthrough in sustainability performance and is currently stands as an essential paradigm for global development.

This urgency is underscored by the Circularity Gap Report (2025) which highlights a deteriorating situation: the global circularity metric continues its decline, driven primarily by the massive inflow of virgin materials that outpaces the volume of secondary, recovered resources. This trend is quantified by a recent fall in the circularity metric, decreasing from 7.2% to 6.9% as of the latest analysis. It is illustrative of the magnitude of this challenge to note that if we were to successfully recycle all materials currently categorized as potentially circular but unutilized, the Global Circularity Metric could realistically rise to approximately 25% (Circle Economy, 2025). Furthermore, data reveal a major gap between the global waste collection rate (82%) and the subsequent recycling rate (27% in 2021), unequivocally pointing to profound inefficiencies within existing systems.

This situation highlights the critical need to rethink current systems, through the lenses of circular economy which offers a pathway to improve well-being while safeguarding natural environments and ecosystems through the continuous rethinking and optimizing of resource utilization.

In the context of SCM and circular economy has been formally defined as circular supply chain management (CSCM) (Genovese et al., 2017; Nasir et al., 2017). Rigorous definitions of this concept abound.

For example, Batista et al. (2018) described the CSCM as a management approach that necessitates the deliberate coordination of all supply flows, both forward and reverse, through the integration of an entire business ecosystem.

A supplementary definition focuses on the integration of circular thinking directly into the management of the supply chain. The guiding principle for this approach is the zero-waste vision (Farooque et al., 2019). The circular supply chain in designed to restore and regenerate resourced which is realized through system-wide innovation spanning both business models and all supply chain functions, from the initial product/service design phase through to end-of-life and waste management. Crucially, this definition also emphasizes the key importance of collaboration across all stakeholders throughout a product/service lifecycle, including parts/product manufacturers, service providers, consumers, and users.

However, the successful implementation of CSC models requires unprecedented levels of information visibility across complex, multi-tier supply networks. In doing so supply chain transparency (SCT), has been identified as a potential catalyst for circular transitions. By making material flows, product lifecycles, and environmental impacts visible to stakeholders, SCT theoretically enables the coordination, trust, and decision-making capabilities necessary for circular business models.

Supply chain transparency is theorized as a necessary information infrastructure that enables circular economy strategies by making product lifecycles, material origins, and return flows visible to actors across the supply chain. Recent integrative frameworks explicitly position Supply Chain Transparency as the central mediating mechanism between digital technologies (AI, blockchain, IoT) and circular supply chain performance (Xing et al., 2025).

Digital technologies generate and capture supply chain data allowing SCs transparency. This information infrastructure enables circular practices. This framework highlights that digital technologies alone are insufficient; their value for circularity is realized through the transparency capabilities they create.

2. Purpose of the paper

Despite the extensive existing research on SCT's role in enabling crucial outcomes such as collaboration, resilience, and sustainability (Al- Khatib, 2025; Di Paola et al., 2023; Santharm & Ramanathan, 2022; Rejeb et al, 2021) the precise role of SCT in achieving a circular SC is still in its nascent era. This work-in-progress paper aims to address this lack of academic literature. The purpose is to systematically summarize the previously published documents on this connection to better understand the role of digital technologies in enabling transparency and, consequently, how transparency helps firms to achieve circularity. Moreover, the final output intends to be the construction of a framework linking technologies, transparency dimensions and circular economy practices.

3. Methodology

The objective of this literature review is to critically analyze and systematize the role of SC Transparency, enable by digital technologies, as a crucial determinant and transmission mechanism for the adoption and success of Circular Supply Chain models.

For this reason, the following research questions was proposed to guide the review:

RQ1: What are the dominant research trends and key thematic clusters that characterize the literature at the nexus of Supply Chain Transparency (SCT) and Circularity, and how has the conceptual focus of this relationship evolved over time?

To follow the objective of this review, it was employed the 10-step methodology (Table 1) for a Bibliometric-Systematic Literature Review (B-SLR), as described by Marzi et al. (2025). This specific review type is instrumental in addressing the research problem by uncovering underexplored areas where further research is needed and simultaneously aids in constructing conceptual models and theoretical frameworks (Marzi et al., 2025).

The combination of a bibliometric (quantitative) analysis and a systematic qualitative analysis is uniquely suited to mitigate the potential biases inherent in adopting either methodology separately. Specifically, the qualitative analysis of the Systematic Literature Review (SLR) is susceptible to interpretive bias (MacCoun 1998; Tranfield et al. 2003). This interpretive bias is effectively mitigated using quantitative (bibliometric) methods, which, according to Zupic & Čater (2015) serve as a complement to, rather than a substitute for, traditional review methods (Donthu et al. 2021). By offering a rigorous quantitative base, the bibliometric analysis allows scholars to apply their creativity to move existing knowledge forward.

The 10 steps process suggested by Marzi et al., (2025) are outlined below (Table 1).

B-SLR STEPS	**Application to SC Transparency and circular supply chain**
Step 1: Research Question and Boundaries of The Study	Topic: Transparency and circular supply chain
Step 2: Search Query Definition	The query was defined through a trial-and-error process led by previous literature
Step 3: Database Selection	Database: Web of Science Search date: 2025-12-01 Search in: title, abstract and keywords
Step 4: Data Screening and Data Cross-Checks	Inclusion/exclusion criteria Document type: peer reviewed articles Language: English Subject area: Business economics Raw dataset (n=131)
Step 5: Data Cleaning and Export	The manual selection following the boundaries of the selected topic and the inclusion/exclusion criteria
Step 6: Bibliometric Approach	Co-citation analysis (Bibliometrix) Co-occurrence analysis (Bibliometrix) Keywords co-occurrence (Bibliometrix)
Step 7: Clusters' Topic Identification	Bibliometrix Graphical representation of the results
Step 8: Sample Ordering and Selection	All documents will be included for SLR
Step 9: Systematic Literature Review	Holistic analysis of the dataset Specific analysis of the documents in the clusters
Step 10: Developing A Theoretical Contribution	Conceptual framework and research agenda

Table 2. Based on Marzi et al. (2025)

In Step 2, the search query was defined. The terms included in the query were established by referencing previous literature reviews and through a trial-and-error process which resulted in the most appropriate query. This rigorous process permitted to minimize thematic deviation and ensure a sharp focus on the core research theme. The final query resulted in three parts: the first component focused on Supply Chain Transparency (SCT), which serves as the primary construct of this review. This part was deliberately constrained to the core construct of transparency, leading to the explicit exclusion of antecedent concepts such as visibility and traceability (Schäfer, 2022) to maintain a rigorous thematic focus, thereby avoiding potential conceptual deviation from the central objective of the analysis.

The second component delimited the research scope by centering the query on the Circular Supply Chain (CSC) and its foundational pillars (Govindan & Hasanagic, 2018)

The third element addressed Smart Technologies (e.g., Blockchain, IoT). The inclusion of this part was crucial, as the ultimate aim of the review is to articulate the role of these digital technologies in enabling transparency and, consequently, how they can be effectively leveraged to achieve broader circularity goals.

To select the database for the analysis, the recommendation of Donthu et al. (2021) was followed: selecting a single database to avoid redundant actions and mitigate potential human errors.

The database selected (in Step 3) for the review was the Web of Science (WoS), powered by Clarivate Analytics. WoS was chosen due to its selective indexing criteria, high-impact journals, and guaranteed access to essential research in the fields of innovation and sustainability (Asubiaro et al., 2024; Budler et al. 2024).

The title, abstract, and keyword search query were run on WOS, and a raw database of 764 documents was extracted.

This preliminary result was obtained without applying any filter. Subsequently, three inclusion and exclusion criteria were set to determine the final sample: research area to focus on the field of interest, document type to include only peer-reviewed papers, and language to avoid interpretative biases. The application of these criteria yielded a final sample of 131 document.

The review process followed the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework (Figure 1) to ensure replicability and methodological rigor of the study (Donthu et al. 2021)

After converting the raw dataset into a suitable format for the bibliometric tool bibliometrix (an R package developed by Aria & Cuccurullo, 2017), the sample was screened. This screening was conducted based on abstract reading and full-text reading, where necessary, to refine the results and ensure relevance. This process led to the final sample of 112 documents that fully align with the defined thematic scope and the established inclusion and exclusion criteria.

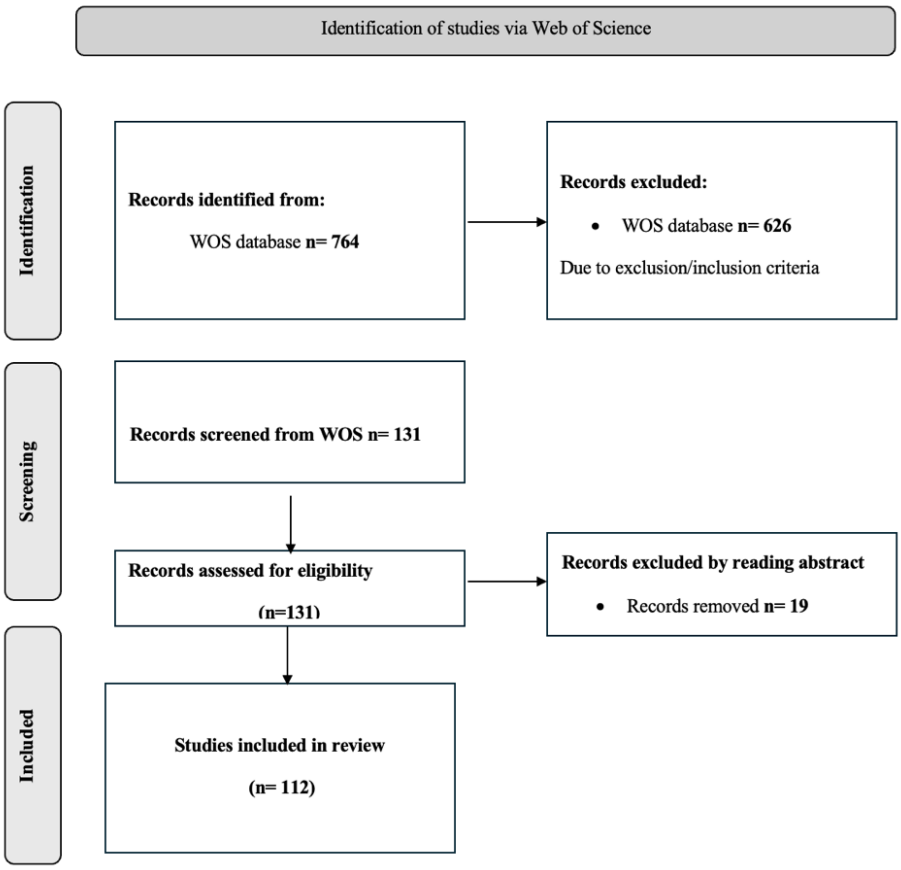


Figure 2. PRISMA Framework

4. Results

A descriptive analysis of the collected corpus was performed to detail the main characteristics of the sample. Covering the period from 2016 to 2025, the literature in this area is demonstrably young, with only 12 documents published between 2016 and 2021 (9 of which appeared in 2021) and 100 published between 2022 and 2025.

The field exhibits a high degree of dynamism, evidenced by a substantial Annual Growth Rate of 44.81%. As Figure 2 illustrates, annual scientific production follows a pronounced positive trend, peaking in 2022 with 26 documents and continuing its growth trajectory into 2025 with 28 papers. This high growth rate and the relatively young age of the documents confirm that the research area covered by the collection is undergoing significant and rapid development.

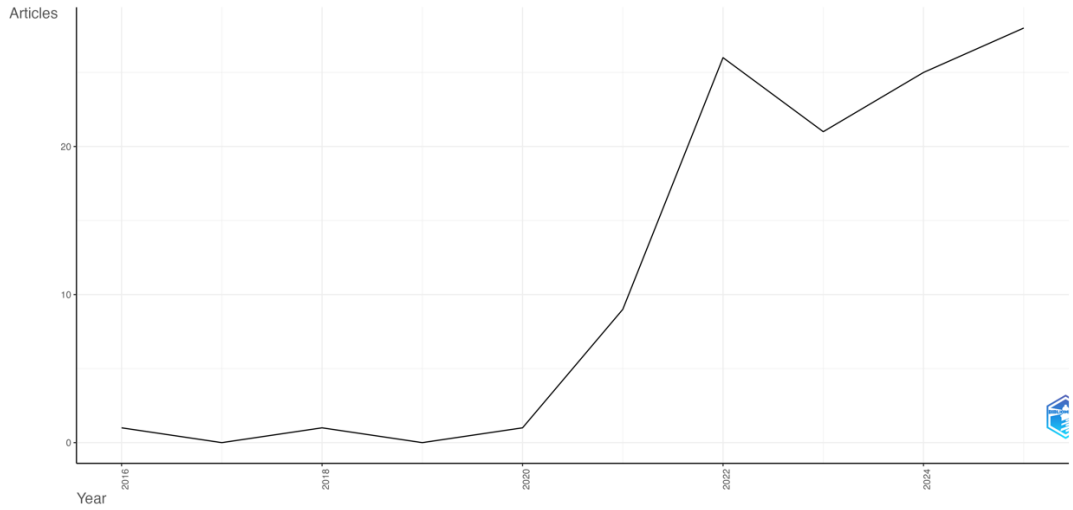


Figure 3. Annual Scientific Production, Authors elaboration (developed with Biblioshiny)

To visualize the most important themes within the field, a thematic analysis was conducted using Bibliometrix. The resulting graphic representation (Figure 3) utilizes a quadrant scheme, which categorizes topics into four distinct groups: motor themes (core and well-developed), basic themes (foundational themes that can grow more), niche themes (specialized and isolated), and emerging/declining themes (new or fading research areas).

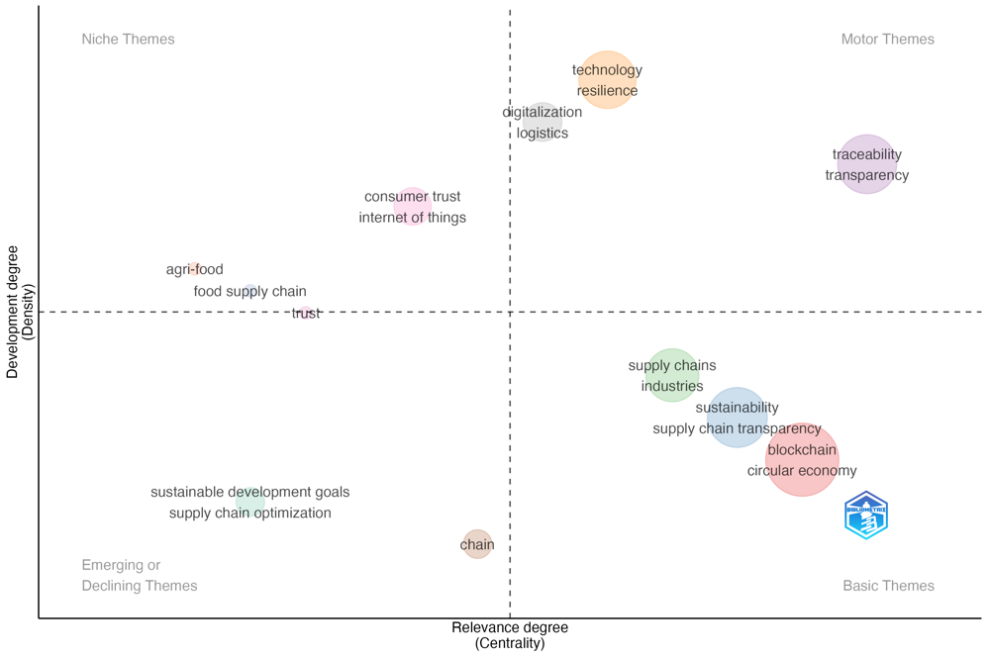


Figure 4. Thematic analysis, Authors elaboration (developed with Biblioshiny)

The preliminary analysis clearly identifies technology, digitalization, and the constructs of traceability and transparency as established motor themes. This prevalence highlights the growing importance and maturity of research dedicated to the digital transformation of supply chain capabilities.

This thematic dominance is rooted in a fundamental paradigm shift within the field. While traditional supply chains primarily focused on production and delivery, the advancements towards

Industry 4.0 and the digital era necessitate the prioritization of sustainability, data security, and privacy alongside economic efficiency (Huang et al., 2023). This requires a holistic technological approach encompassing environmental and social considerations throughout the entire product life cycle. Digital technologies such as Blockchain, QR codes, and RFID tags are recognized as central enablers of this transition, enhancing both traceability and transparency.

Within the basic themes' quadrant, concepts such as Supply Chain, Sustainability and Blockchain (BC) are observed. Their positioning indicates their status as a foundational and highly relevant topic, although its potential for further growth and evolution within this specific context is recognized.

Blockchain (BC) is identified as a central, predominant theme, representing the most studied technology in this field, particularly in connection with the Circular Economy (CE). Academic literature widely agrees that the transition toward a circular economy is increasingly dependent on smart technological integration. (Bergendahl, Sarkis, and Timko, 2018).

Due to its intrinsic characteristics, such as enhanced transparency, decentralization, peer-to-peer data synchronization, smart contracting capabilities, and data immutability, BC provides numerous benefits that are foundational to support the circular transformation of supply chains (Khan et al., 2022; Kouhizadeh et al.,2019).

Furthermore, Khan et al. (2021) asserts that adopting BCT may also help organizations improve efficiency and reduce costs through resource regeneration promising long-run returns and contribute significantly to social, economic, and environmental sustainability (Khan et al., 2021).

Niche themes, situated in the upper-left quadrant, indicating low centrality but high density. Themes like trust, consumer trust, agri-food, food SC, are positioned in this quadrant. This suggests that these themes are specialized area with strong internal connections but less influence on the broader field. The Food Supply Chain (FSC) represents one of the areas with the highest research density concerning the application of tracking technologies. This high concentration is due to the intrinsic complexities and unique challenges of the sector, which make it particularly receptive to these technological solutions. The inherent need for robust solutions addressing issues such as product perishability, safety, provenance verification, and susceptibility to fraud drives the intensive study and early application of technologies like Blockchain and IoT within the FSC, positioning it as a leading domain for traceability research (Ali et al., 2021).

The second important niche theme identified is centered on trust and consumer trust. This theme is intrinsically linked to Blockchain Technology (BCT), which fundamentally shifts reliance from trust in human parties to trust in the underlying technology itself.

Academic literature highlights BCT's role in resolving issues stemming from a lack of transparency and trust by securely sharing verifiable data. Specifically, the technology helps mitigate market acceptance challenges associated with remanufactured products, a crucial component of the Circular Economy, which are often perceived by consumers as lacking reliability; thus, BCT can significantly improve circular manufacturing through remanufacturing initiatives (Govindan, 2022). Consequently, trust emerges as a critical design factor for developing circular blockchain platforms within supply chains. This necessity contrasts with the pre-BCT environment, where processes such as recycling, remanufacturing, and redistribution were highly constrained, typically relying upon centralized control mechanisms, fragmented individual local databases, the prerequisite involvement of trusted third parties, and the subsequent formation of trusted dyadic relationships among supply chain partners (Centobelli et al., 2022).

The cluster focused on Sustainable Development Goals (SDGs) is situated in the lower-left quadrant of the thematic map, categorizing it as an emergent theme. This positioning suggests that the direct linkage between SDGs and the core research field is not yet fully integrated or established as a dominant area of study.

For example, Tsolakis et al. (2021) conceptualize transparency as a necessary enabling mechanism to achieve specific SDGs by leveraging Blockchain technology to overcome information asymmetry. The authors argue that SDGs present a key opportunity for the redesign of supply chains. Digital technologies, such as Blockchain, are instrumental in attaining SDGs related to livelihoods, food security, and the environment. This is achieved precisely because these technologies allow for the real-time identification of issues and the implementation of interventions by ensuring data authentication, verifiability, and confidentiality.

From this preliminary analysis of the literature was identified the prominent role of traceability as a key mechanism leads to transparency defined as a mediator in the association between emerging technologies and transparency (Khan et al., 2022). This consideration stimulating a focused, vertical analysis on this antecedent before proceeding to a broader investigation of overall transparency.

To better understand the function of transparency in enabling circular supply chains, this study deliberately chose to examine its primary antecedent: traceability. Through this in-depth study of traceability, we gain clearer insights into the essential role of digital technologies in enabling this capability and its contribution to achieve broader transparency.

Analysis of the papers within our sample focusing on traceability reveals several key research themes. Blockchain clearly emerges as the central technology; it is not only the most frequently used tracking solution but is generally defined as the principal technology for enabling a transparent supply chain. Beyond transparency, it can also be seen as a pivotal enabler of circularity. Implementing Blockchain solutions simplifies energy supply procedures and reduces request volatility, allowing production to occur in real-time based on market demand. This functionality directly enables the optimization and conservation of natural resources, contributing substantially to circular economy goals (Centobelli et al., 2022).

Furthermore, a strong focus on the food and pharmaceutical sectors was observed, alongside an under-exploration of other central sectors where the recycling or regeneration of products is notoriously difficult. The analysis also highlights that product traceability has a direct impact on consumer trust when purchasing sustainable, recycled, or upcycled products. This finding is central to our research, as it demonstrates how enhanced transparency can potentially impact consumer choice, subsequently influencing the willingness of firms to adopt circular practices. The literature extensively covers the barriers to implementing tracking technologies, which is not surprising given that technologies purposed for this require substantial initial investment and are subject to various challenges, including technology acceptance and integration issues. A significant emerging theme identified is the use of tools such as Digital Product Passports (DPP), which, although still underexplored, is recognized as a promising approach, particularly for mapping downstream activities and product lifecycle journeys.

The analysis highlights a significant research gap: most documents concentrate their efforts on pre-production and in-production traceability, neglecting the critical phase of downstream traceability. Downstream traceability specifically addresses the product's end-of-life journey, when the product reaches the final consumer and subsequent recovery is managed. Traceability across the entire supply chain remains largely deficient, which is particularly problematic in sectors where resource waste occurs at multiple stages throughout the chain, such as the food and fashion industries. This deficiency severely hinders the implementation of effective circular strategies.

5. Research limitations

This systematic literature review is subject to several methodological limitations that must be acknowledged.

Firstly, a key limitation concerns the selection of sources, as the choice of database (Web of Science) and the stringent inclusion/exclusion criteria may have inherently influenced the

completeness of the final analysis. Furthermore, the exclusion of "gray literature," while enhancing the study's replicability and rigor (Adams et al., 2017), simultaneously restricts the diversity and flexibility of the findings derived from the corpus.

Secondly, a significant limitation stems from the decision to narrow the search query's focus to "transparency" alone, deliberately excluding closely related concepts such as "traceability" and "visibility," despite their frequent recurrence in the research domain. While the explicit objective of this decision was to narrow the analysis to achieve a deeper understanding of the distinct role of transparency, this specificity may nonetheless have restricted the selection of relevant papers included in the final review.

6. Managerial implications

The findings of this literature review would offer significant managerial implications for practitioners across multiple levels of the supply chain. Recognizing the inherent value of digital technologies in achieving sustainability goals, this review wants to provide an implementation roadmap for circular supply chain processes viewed through the critical lens of Supply Chain Transparency (SCT).

This review intends to offer clear, actionable guidelines for the efficient creation and enhancement of transparency capability. This guidance allows practitioners to fully understand the strategic deployment of smart technologies and their specific, measurable impact on enabling and sustaining a robust Circular Supply Chain (CSC).

Based on the preliminary findings of this review, firms aiming to transition toward circularity must implement advanced tracking systems capable of monitoring resource utilization and identifying waste throughout the Supply Chain (SC). More crucially, such systems must be able to "shadow" the product from its origin to its end-of-life, a phase that remains indispensable for the effective management of recycling, reuse, and remanufacturing practices.

This analysis reveals that most existing studies focus their efforts on pre-production and in-production traceability, often neglecting the critical downstream phase. This imbalance highlights an ongoing gap in the attempt to fully trace global supply chains, which frequently renders the successful implementation of circular economy principles ineffective.

However, a key insight emerging from this preliminary evidence is that while data tracking provides the necessary foundation for circularity, the strategic sharing of this information represents the true turning point for the actualization of circular SCs. Beyond the mere collection of data, inter-organizational transparency may act as a catalyst for enhanced collaboration. Indeed, these technologies facilitate the real-time identification of inefficiencies and the implementation of corrective interventions by ensuring data authentication, verifiability, and confidentiality.

Consequently, practitioners should explore emerging tools such as the Digital Product Passport (DPP). Although still underexplored in current literature, the DPP is recognized as a promising approach for mapping downstream activities and capturing the entirety of the product lifecycle journey, thereby bridging the gap between production and sustainable end-of-life management.

7. Originality of the paper

The distinct originality of this study lies in its ability to overcome the current fragmentation in the literature by proposing a systematic synthesis that directly connects SC transparency to circular economy practices. Unlike existing reviews, this work systematically investigates the relationship between the enabling technologies for transparency (such as Blockchain) and the actual implementation and impact on the circular supply chain. This integrated approach allows us to fully comprehend the scope and influence of these adoptions on circular practices, thereby addressing a significant gap in academic research.

Keywords: Supply chain; transparency; circular economy; circular supply chain; digital technologies

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Blockchain e AI nelle PMI del Food & Beverage: Effetti su Redditività e Customer Experience

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1. Introduzione

Il settore alimentare e delle bevande è tra i più significanti in Europa: contribuisce in modo sostanziale al PIL, all'occupazione e alla bilancia commerciale, ed è riconosciuto come uno dei settori manifatturieri più importanti dell'Europa centrale (e, più in generale, dell'UE). Da sempre ha rivestito un ruolo chiave nella crescita sostenibile a lungo termine, dando stabilità economica in un contesto di incertezza globale (Łukiewska & Juchniewicz, 2021; Gazzola et al., 2024). Le analisi di competitività mostrano come il settore abbia mantenuto nel tempo elevati livelli di produttività, redditività e quote di esportazione (Notta et al., 2012). Il settore ha inoltredimostrato resilienza durante le crisi economiche, come la crisi finanziaria del 2007- 2011, periodo in cui ha superato gli indici di mercato più ampi in termini di rendimenti e stabilità (Tanda, 2018; Konstantinidis et al., 2019).

I piccoli produttori (PMI) del settore food and beverage svolgono un ruolo significativo nello sviluppo socioeconomico, seppur la loro performance finanziaria vari da paese a paese (Gardijan & Lukač, 2020). Tale significatività è confermata dalla struttura del mercato europeo: a fronte di poche ma grandi aziende (con una quota superiore all'1%), se ne trovano innumerevoli di dimensioni medio-piccole (Belyaeva et al., 2020). L'attenzione verso le PMI del settore deve quindi essere massima, in quanto il loro apporto è fondamentale e sempre più importante, riscontrando una sempre maggioreintegrazione al loro interno di modelli di business orientati alla sostenibilità (anche se in misura minore rispetto alle imprese occidentali più grandi) (Belyaeva et al., 2020). Questo può non stupire, in quanto una caratteristica delle PMI è la capacità di sviluppare cambiamenti interni mostrando maggiore adattabilità organizzativa a svariati tipi di innovazioni digitali forti, nonostante la scarsità di risorse da investire (Chan et al., 2018). In tale contesto, dunque, strumenti come la blockchain e l'intelligenza artificiale possono offrire determinanti vantaggi competitivi.

2. Blockchain

La blockchain è una tecnologia di registro digitale distribuito e decentralizzato che consente di registrare e verificare transazioni in modo sicuro e trasparente senza la necessità di un'autorità centrale. Funziona come un registro pubblico condiviso, dove ogni blocco contiene un insieme di transazioni, è collegato al blocco precedente tramite crittografia e non può essere modificato una volta aggiunto, garantendo così immutabilitàe tracciabilità (Niranjanamurthy et al., 2018). Questa struttura distribuita è mantenuta da una rete di nodi che validano le transazioni attraverso meccanismi di consenso peer-to-peer, rendendo la blockchain resistente a manomissioni e frodi (Yaga et al., 2018). Il primo utilizzo fu di supporto alle sole criptovalute (come Bitcoin), ma la blockchain col tempo e il suo sviluppo ha trovato implementazione in molti settori, quali finanza, sanità e servizi governativi, che si aggiungono al tema centrale di questo progetto: la gestione

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della supply chain. Il motivo è semplice, anche se non banale: le aziende e i mercati sfruttano le sue caratteristiche di sicurezza, trasparenza e decentralizzazione (Krichen et al., 2022).

Queste caratteristiche sono essenziali lungo tutta la filiera e la catena di approvvigionamento del settore agroalimentare; la blockchain ne migliora la tracciabilità, la trasparenza e la sicurezza alimentare, grazie a dei registri digitali e immutabili condivisi tra gli operatori. Ciò ha come conseguenza una riduzione dell'incertezza tra i partecipanti della filiera, che permette di aumentare l'affidabilità dei dati e contribuire a prevenire frodi e, cosa importantissima, contaminazioni alimentari. Laddove al contrario ci fossero problemi, difetti o prodotti non sicuri, tale tecnologia consente l'identificazionee la rimozionerapida degli stessi (Li et al., 2021; Feng et al., 2020). Il risvolto operativo è anche verso quelle imprese della filiera ritenute "emarginate", permettendo di promuovere il commercio equo, con migliori opportunità per quest'ultime di integrazione nel mercato globale (Kshetri, 2023).

3. Intelligenza artificiale

Fra le più importanti, dirompenti, ed epocali innovazioni applicabili all'azienda (e non solo) possiamo citare anche l'intelligenza artificiale (AI). Con volontà di sintesi si potrebbe definire come l'insieme di tecniche, metodi e sistemi informatici progettati per simulare, estendere o automatizzare capacità cognitive tipiche dell'intelligenza umana, quali l'apprendimento, il ragionamento, la percezione e la capacità decisionale (Russell & Norvig, 2021). L'AI è molto utile alle aziende perché migliora l'ef ficienza operativa, automatizza e ottimizza i compiti ripetitivi, efficientando allo stesso tempo l'uso delle risorse, e conseguentemente riducendo i costi operativi (Solano et al., 2024). Le risorse in surplus possono dunque essereriallocate, aumentando la risposta dell'impresa a cambiamenti di mercato grazie ad una struttura organizzativa più snella, specie in mercati con una forte competizione interna (Li et al., 2023). L'AI potrebbe essere applicata a tutti i livelli aziendali e a tutte le funzioni ed unità organizzative; ciò consentirebbe decisioni più rapide e accurate grazie all'analisi avanzata dei dati, favorendo innovazione continua e vasta personalizzazione dei servizi, elementi chiave per la soddisfazione del cliente (Yaşar, 2024). L'effetto cardineè che le aziende AI oriented possono arrivare a migliorarele performance sia a livello organizzativo che di processo, ottenendo vantaggi competitivi sostanziali (Wamba-Taguimdje et al., 2020).

4. Research problem

4.1. RQ1: Blockchain e redditività

Numerosi studi evidenziano che, a determinatecondizioni, l'adozione della tecnologia blockchain nelle catene di approvvigionamento del settore food & beverage abbia molteplici effetti positivi (Tabella 1). Analisi di casi e approcci di modellizzazione dimostrano che la blockchain può ottimizzare i profitti, in particolare nei beni deperibili e in condizioni di incertezza e fluttuazione della domanda (Stranieri et al., 2021; Keskin et al., 2024; Vern et al., 2024; Vu et al., 2024; Li et al., 2021; Yang et al., 2021; Wamba et al., 2020). I miglioramenti apportati potrebbero palesarsi anche verso l'esterno, aumentando la fiducia di consumatori e clienti, giustificando strategie di prezzo premium, accrescendo di conseguenza i ricavi (Rogerson & Parry, 2020).

L'implementazione delle nuove tecnologie a fronte di questi vantaggi pone anche alcune sfide: le aziende difatti dovranno fronteggiare la complessità della messa a punto della tecnologica (manca una standardizzazione e generalizzazione della stessa) e le problematiche di accettazione nella governance (Katsikouli et al., 2020; Rogerson & Parry, 2020; Apeh & Nwulu, 2025). L'entità dei guadagni in termini di redditività dipende infatti da fattori come i costi di implementazione, la struttura della supply chain e il coinvolgimento degli stakeholder (Liu et al., 2022; Deqing et al., 2024; Thoukidides et al., 2025; Wu et al., 2021). Costi elevati ed avversione

al rischio dei partner dellasupply chain possono annullarei benefici finanziari, soprattutto quando le preoccupazioni dei consumatori sulla sicurezza alimentare non sono rilevanti.

Asserzione	Descrizione	Fonti
L'adozione della blockchain aumenta la redditività nelle imprese del settore alimentare e delle bevande	Numerosi studi empirici e di modellizzazione mostrano incrementi di profitto grazie a una maggiore efficienza e tracciabilità	Stranieri et al., 2021; Keskin et al., 2024; Vern et al., 2024; Vu et al., 2024; Li et al., 2021; Yang et al., 2021; Wamba et al., 2020
La blockchain migliora le performance della supply chain e il vantaggio competitivo	Forte consenso su una migliore trasparenza, tracciabilità ed efficienza operativa	Stranieri et al., 2021; Vern et al., 2024; Vu et al., 2024; Li et al., 2021; Wamba et al., 2020; Rogerson & Parry, 2020
L'incremento di redditività dipende dai costi di implementazione e dal contesto	Alcuni studi mostrano che costi elevati o un'inadeguata applicazione possono annullare i benefici, specialmente per le PMI	Liu et al., 2022; Deqing et al., 2024; Katsikouli et al., 2020; Thoukidides et al., 2025; Wu et al., 2021

Tabella 1. Blockchain e redditività

Poche ricerche hanno studiato le specifiche sfide affrontate dalle PMI in tale contesto; da tale gap deriva la prima domanda di ricerca:

RQ1. Attraverso quali meccanismi l'adozione della blockchain influenza la performance economica delle PMI del settore alimentare e delle bevande?

4.2. RQ2: Integrazione blockchain e intelligenza artificiale

Integrare blockchain e AI può consentire di superare i limiti delle singole tecnologie, seppur (anche in tal caso) con alcune sfide aperte (Tabella 2). Tale combinazione migliora la qualità dei dati, la resilienza delle supply chain, la prevenzione delle frodi e la personalizzazione dei servizi (Kumar et al., 2022; Tsolakis et al., 2022; Khan et al., 2023; Patel et al., 2023).

I settori che traggono maggior beneficio dall'integrazione sono supply chain, produzione, audit o i settori della finanza o sanità. Un esempio di applicazione potrebbe essere il supporto ai sistemi di packaging intelligenti per combattere le frodi alimentari (Yang et al., 2024). Specificatamente nella supply chain, la combinazione di AI e blockchain migliora la tracciabilità delle singole materie e lavorazioni, la previsione della domanda e la sostenibilità (Charles et al., 2023). In ambito finanziario invece, la sinergia aumenta la sicurezza delle transazioni e la capacità di rilevare frodi (Kumar et al., 2022). Ulteriori studi empirici e casi reali mostrano che l'adozione congiunta porta inoltre a incrementi misurabili di efficienza, riduzione dei costi, miglioramento della qualità dei prodotti e della customer satisfaction (Wang et al., 2022).

Permangono sfide legate alla scalabilità (è stata riscontrata difficoltà nel farla funzionare su larga scala in maniera generalizzata), ovvia complessità tecnica, elevati costi di implementazione, carenza di competenze tecniche e specifiche (Crocco et al., 2025; Patel et al., 2023).

Asserzione	Descrizione	Fonti
L'integrazione di blockchain e AI genera sinergie superiori	Numerosi studi empirici e review mostrano benefici	Kumar et al., 2022; Tsolakis et al., 2022; Khan et al., 2023; Patel et al., 2023

rispetto all'adozione isolata per la profittabilità aziendale	misurabili in efficienza, sicurezza e innovazione	
L'integrazione migliora la resilienza e la sostenibilità delle supply chain	Evidenze empiriche in supply chain agricole e industriali mostrano aumenti di produttività e riduzione cost	Tsolakis et al., 2022; Khan et al., 2023; Charles et al., 2023
Le barriere tecniche e regolatorie limitano l'adozione su larga scala	Studi segnalano ostacoli di scalabilità, costi e competenze	Charles et al., 2023; Patel etal., 2023
Mancano studi longitudinali e cross-settoriali sull'impatto a lungo termine	La maggior parte degli studi è concettuale o su casi pilota, con pochi dati su effetti di lungo periodo	Charles et al., 2023; Crocco et al., 2025
L'adozione isolata di AI o blockchain offre benefici limitati rispetto all'integrazione	Studi comparativi mostrano che i limiti delle singole tecnologie vengono superati solo tramite integrazione	Kumar et al., 2022; Tsolakis et al., 2022; Khan et al., 2023

Tabella 2. Sinergie tra blockchain e AI

La customer experience (CX) agisce come mediatore e amplificatore tra integrazione tecnologica e profittabilità. Nel banking digitale, gli attributi tecnologici (qualità del servizio digitale, usabilità, velocità, personalizzazione, innovazione percepita) migliorano la CX; la CX aumenta soddisfazione e loyalty, che a loro volta si collegano ai risultati finanziari (Mbama et al., 2018; Mbama & Ezepue, 2018). Ma anche nelle PMI fintech l'adozione di tecnologie digitali migliora valore percepito, supporto e velocità del servizio, che potenziano CX e generano intenzioni di fedeltà, considerate driver di ricavi futuri (Barbu et al., 2021). Mancano però studi empirici che isolano il contributo della customer experience ai profitti sulle PMI del settore alimentare e delle bevande.

RQ2. In che misura l'uso combinato di blockchain e AI migliora la profittabilità attraverso la customer experience nelle PMI del settore alimentare e delle bevande?

5. Metodologia

Il disegno metodologico adottato per questa ricerca si fonda su un approccio di tipo "multiple case study" (Yin, 2018), integrato successivamente dall'applicazione del metodo Delphi (Okoli & Pawlowski, 2004; Linstone & Turoff, 1975).

La componente di multiple case study riguarderà in un primo momento l'analisi di alcune aziende del settore agrifood che hanno integrato soluzioni di intelligenza artificiale e blockchain nella propria supply chain, per poi espandersi eventualmente a settori affini per una verifica di robustezza. Le informazioni ottenute dai casi saranno poi utilizzate per alimentare il panel Delphi, così da validare e/o generalizzare i risultati. I casi oggetto di analisi saranno molto probabilmente selezionati secondo una logica di purposive sampling, privilegiando imprese che abbiano già introdotto o pianifichino l'introduzione delle tecnologie sotto esame e che siano classificate come piccole e medie imprese (PMI) in base ai criteri europei.

Il metodo Delphi è emerso da una prima analisi preliminare dove furono considerate anche altre metodologie qualitative, come discussioni di gruppo o focus group, con l'intento di non volerle concepire solo come semplici "forme allargate di intervista" (Fon tana & Frey, 1994; Goldman, 1962; Hartman, 2004; Mayan, 2009). Difatti, la specificità del tema di ricerca e l'elevato livello professionale e decisionale dei partecipanti che formeranno il "campione di studio" hanno reso preferibile escludere quest'ultime metodologie, poiché rischierebbero di produrre semplici interviste multi-vocali piuttosto che un confronto realmente esperto e

indipendente. Il metodo Delphi si configura come la soluzione ideale per questa impostazione, poiché consente di superare il doppio social desirability bias, evitando le dinamiche di influenza o di soggezione reciproca che possono emergere nei confronti diretti tra partecipanti di alto profilo. Inoltre, riduce drasticamente anche il rischio di litigi o affermazioni forzate delle proprie idee.

A ciò si aggiunge la possibilità di svolgerlo in modo indipendente ed asincrono, eliminando la necessità di incontri in presenza sincrona e favorendo una partecipazione più riflessiva, approfondita ed incondizionata. Il metodo in aggiunta consente di integrare la modalità di ricerca qualitativa con una successiva quantitativa, offrendo la possibilità di esplorare percezioni ed esperienze soggettive, ma anche di analizzare le convergenze e le priorità che emergono nei diversi round di consultazione. Un ulteriore valore aggiunto risiede nel beneficio immediato per i partecipanti, i quali possono accedere alle risposte e alle esperienze condivise dagli altri informant, arricchendo così la propria prospettiva e favorendo un apprendimento reciproco all'interno del processo di indagine. Queste caratteristiche rendono il Delphi particolarmente adatto a studi in cui il tema richiede la raccolta di valutazioni complesse, specifiche e multidisciplinari, facendo emergere insight che non verrebbero fuori utilizzando altre modalità (Morgan, 1998). Il campione previsto comprenderà esperti del settore agrifood che abbiano, o abbiano avuto, un ruolo attivo nella transizione od implementazione delle nuove tecnologie all'interno della propria organizzazione, garantendo l'anonimato dei partecipanti (a meno che tutti non accettino l'opposto all'atto del reclutamento) e selezionati in modo dagarantire omogeneità rispetto all'esperienza nel campo oggetto di studio, assicurando che non vi siano relazioni dirette o conoscenze tra loro, almeno a nostro sapere (Powell et al., 2003). Il numero complessivo dei partecipanti sarà compreso tra 8 e 10, con un possibile overrecruiting del 20% a tutela dei partecipanti in caso di defezioni non preannunciate di alcuni di essi.

Il modello Delphi seguirà un protocollo strutturato e articolato in più fasi (Hasson, Keeney & McKenna, 2008) (tabella 3), con la possibilità di estendersi fino a tre round, garantendone almeno due. Si inizierà definendo la domanda di ricerca e predisponen do la comunicazione da inviareai partecipanti. Successivamente, nel primo round, verrà ipoteticamente inviata una mail contenente una o due domande aperte relative al tema di indagine, accompagnata dall'indicazione dei tempi massimi per la restituzione delle risposte. Le informazioni raccolte saranno poi analizzate e sintetizzate, al fine di individuare le principali aree di convergenza e gli elementi di interesse emersi, così che nel secondo round tali risultati verranno condivisi con tutti i partecipanti, che potranno esprimere valutazioni, priorità o ulteriori riflessioni sui temi più rilevanti emersi. Tale fase permetterà di affinare progressivamente il livello di consenso e di approfondire i punti di disaccordo. Laddove il processo sarà più complesso o necessiterà di maggiore elaborazione, potremmo prevedereun ulteriore round di validazione volto a consolidare i risultati e a garantire la robustezza del consenso raggiunto. Infine, si procederà con l'analisi conclusiva e con la valutazione complessiva del grado di accordo tra gli esperti, così da identificare le convergenze, le divergenze e le possibili linee guida per la ricerca futura.

FASE	DESCRIZIONE
1	Definizione della domanda di ricerca e predisposizione delle mail da inviare
2	Round 1 – Invio ai partecipanti di una mail contenente una o due domande aperte relative al tema di ricerca, con indicazione di tempi massimi di restituzione delle risposte
3	Analisi e sintesi delle risposte del primo round
4	Round 2 – Condivisione dei risultati sintetizzati del primo round, rendendoli poi pubblici a tutti i partecipanti e rilanciando eventuali topic di interesse di ricerca venuti fuori. Richiesta ai partecipanti di esprimere valutazioni o priorità sugli aspetti più rilevanti
5	Feedback controllato e iterazioni successive, con eventuale terzo round di validazione

6	Analisi finale e valutazione del consenso, utile a identificare convergenze, divergenze e possibili linee guida future

Tabella 3. Protocollo Delphi

6. Risultati attesi

L'indagine consentirà di valutare se, e con quale sforzo economico ed umano, anche le imprese che non hanno ancora integrato innovazioni di intelligenza artificiale e blockchain nella propria supply chain possano trarre un vantaggio dall'adozione di tali tecnologie. L'analisi qualitativa, successivamente ed eventualmente supportata da una quantitativa, permetterà di comprendere se la convenienza percepita ed "effettivamente goduta" superi i costi di implementazione e in quali condizioni organizzative ed economiche tale scelta risulti vantaggiosa.

La ricerca vorrebbe inoltre verificare se l'integrazione di AI e blockchain possa generare un miglioramento misurabile nella relazione cliente–fornitore lungo tutta la catena di fornitura (dalla materia prima al consumatore finale). L'adozione di soluzioni innovative può infatti incrementare la tracciabilità, la tempestività e l'affidabilità delle informazioni, elementi che la letteratura riconosce come determinanti nella costruzione della fiducia. Si prevede che i risultati attesi possano offrire un contributo teorico e applicativo nel comprendere l'impatto dell'integrazione tra AI e blockchain sulla profittabilità e sulla gestione delle relazioni nelle supply chain, fornendo alle imprese indicazioni utili per sviluppare strategie tecnologiche più innovative, sostenibili e consapevoli.

Parole chiave: Blockchain; artificial intelligence; small and medium-sized Enterprises (SMEs); food and beverage industry

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The support of incubators and accelerators in value creation during startups' internationalization

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1. Introduction

New ventures are increasingly expanding beyond their national markets, aiming for global reach as a means of survival and competitiveness in today's dynamic business environment (Mintz and Lilien, 2024; Mondal and Sinha, 2025). This growing trend toward internationalization is driven by startups' need to access larger markets, diversify risks, and leverage global innovation ecosystems. However, entering international markets presents considerable challenges (Cantù et al., 2025), including navigating unfamiliar regulatory landscapes, managing cultural differences, and establishing business relationships with foreign stakeholders despite limited brand recognition and market presence. These obstacles often require startups to acquire new capabilities and resources that are difficult to secure independently.

In this context, entrepreneurial support organizations (ESOs), such as incubators and accelerators, have emerged as vital intermediaries that facilitate startups' access to international markets and networks (Marval, 2025). By offering tailored support programs, mentorship, and critical resources, these organizations play an essential role in helping new ventures overcome barriers to internationalization (Dourado Freire et al., 2023; Runfola and Monteverde, 2023). Their interventions often include providing strategic guidance, technical and financial assistance, and fostering network connections, all aimed at accelerating the global expansion of startups.

As highlighted by Bergman and McMullen (2022), ESOs represent an interesting research avenue for advancing studies on entrepreneurial support and support organizing. Thus, the aim of this study is to investigate how incubators and accelerators activate knowledge creation in the internationalization process of startups. Specifically, the research explores the types of resources and services these actors provide and how they tailor their support to address the challenges faced by startups in foreign markets. To achieve these objectives, a qualitative research approach was adopted by conducting 13 semi-structured interviews with entrepreneurs and professionals operating within accelerators, incubators, startups participating in their programs, and other actors. This methodology enables an in-depth exploration of the lived experiences and perspectives of key stakeholders involved in startup internationalization, providing rich insights into the practical mechanisms through which incubators and accelerators facilitate global growth.

Through this approach, the study aims to fill a gap in the existing literature by offering an understanding of how accelerators and incubators support startups to create value during internationalization.

2. Literature review

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The academic debate on the internationalization of startups highlights a positive role of accelerators and incubators (e.g., Deyanova et al., 2022; Wu et al., 2025). For example, scholars argue that accelerators and incubators equip startups with relevant competencies, such as effective use of social media for marketing (Hussain and Barman, 2025). In addition, their programs often help startups identify and secure funding opportunities to strengthen their financial capabilities (Paoloni and Modaffari, 2022) and play a key role in forging business connections with global suppliers, partners, and institutions. Indeed, ESOs create international linkages between entrepreneurial ecosystems (Marval, 2025). According to Grilli and Marzano (2023), startups affiliated with university-based accelerators are more likely to engage in R&D collaborations, whereas those in public accelerators tend to form commercial partnerships. Pinto and Rua (2023) recently highlighted that the networking and knowledge sharing improve the understanding of target markets, thus supporting more credible and successful international market entry by connecting entrepreneurs with investors and international stakeholders. In this regard, the recent study by Raeisy et al. (2025) demonstrated that network integration represents a critical success factor, arguing that startups in incubators and accelerators achieve stronger outcomes when embedded in networks which enhance knowledge exchange, resource access, and ecosystem connectivity.

In particular, accelerator hubs offer strong infrastructural backing to innovative ventures (Fuad et al., 2024), and foster exchange of information between international partners, which helps build trust (Schepis, 2021). Furthermore, accelerators may intensify competition among early-stage ventures, stimulating performance improvements (Moritz et al., 2021). In this vein, Costa et al. (2024) suggest that to effectively support global expansion, accelerators and incubators should cultivate an internationalization mindset among participating startups. Literature in international entrepreneurship emphasizes that adopting global business models enhances organizational performance and contributes to the sustainable growth of local economies (Henn et al., 2022).

Although accelerators and incubators share several similarities, they also have distinct characteristics. Accelerators typically operate through time-bound programs designed to support the entrepreneurial journey of startups. They offer resources such as seed funding, co-working spaces, and access to networks, along with educational and mentorship initiatives that often culminate in a demo or graduation event (Cohen et al., 2019). Corporate accelerators, which are sponsored by established firms, follow a similar model but tailor support based on company-specific goals and resources (Del Sarto et al., 2024; Kohaler, 2016).

Conversely, incubators are defined more broadly as shared office spaces that offer strategic support, continuous monitoring, and business assistance with the goal of nurturing startups while minimizing the risk of failure (Hackett and Dilts, 2004). These facilities provide value through network access and are frequently located within innovation hubs or science parks that promote R&D collaborations (Bibeau et al., 2024). Incubation is widely recognized as a model for facilitating new venture development (Bruneel et al., 2012), enhancing startup performance (Hou et al., 2022). Accordingly, Braun and Souranta (2025) highlighted that incubatees are better able to innovate their business models because incubators create a supportive environment which helps entrepreneurs overcome key challenges. Over time, incubators have gained prominence for delivering specialized services that accelerate time-to-market and enable integration into networks of technological and commercial actors (Hausberg and Korreck, 2020).

A key feature common to both accelerators and incubators is their emphasis on networking. These organizations cultivate various relationships across business and non-business domains (Pauwels et al., 2016), which is especially critical in internationalization processes. The ability to share resources and initiate joint activities across national and international settings facilitates innovation and market entry. Access to external networks is fundamental, as it supports complex problem-solving, reduces costs and development time, and accelerates the commercialization and dissemination of innovations (Aarikka-Stenroos et al., 2017).

3. Research aim and methodology

While the internationalization of startups has received considerable attention in the previous literature (e.g., Costa et al., 2024; Forsberg and Hulsink, 2024; Schepis, 2021), the specific role played by accelerators and incubators in this process remains underexplored (Pinto and Rua, 2023). To address this gap, the present study aims to investigate the following research questions:

RQ1. How do accelerators and incubators support startups to create value during internationalization?

Thus, the aim of this ongoing study is to explore how incubators and accelerators support startups to create value during internationalization. Given the exploratory nature of the research, a qualitative approach was chosen (Yin, 1994), relying on semi-structured interviews with professionals from both accelerators and incubators, startups that have participated in acceleration or incubation programs and other actors (Creswell and Creswell, 2018).

The data collection phase began in 2022 and is still ongoing. A total of 13 interviews has been collected with various key informants, including senior managers, managing partners, heads of incubation and open innovation, and other professionals with direct experience in guiding startups through internationalization. Specifically, the current sample includes six startups, three incubators, one accelerator, a national trade agency, and a venture capital firm.

The interviews followed a semi-structured protocol developed by the researchers, based on a comprehensive review of the literature on startup internationalization. While the main themes of the interview guide remained consistent, the questions were adapted to align with the professional roles of the interviewees. For example, startup key informants were first invited to outline their professional backgrounds, then to describe how their companies were supported in expanding internationally, highlighting the involvement of key stakeholders such as suppliers, institutions, and investors. They were also asked to elaborate on the evolution of these relationships. Professionals working within incubators and accelerators were asked to explain how their organizations contribute to the internationalization of new ventures, focusing in particular on the structure and content of the programs they offer to entrepreneurs. All key informants were encouraged to provide concrete examples and share specific stories or experiences from their organizations. At the end of each interview, participants were invited to share any additional insights or relevant information that had not emerged during the earlier stages of the conversation.

Interviews were conducted through Microsoft Teams and lasted approximately one hour. With the informed consent of the participants, all interviews were recorded and subsequently transcribed verbatim to ensure accuracy and facilitate in-depth analysis.

The transcribed interviews serve as the primary source of data for the study and are supplemented by additional material shared by key informants, including company presentations, internal reports, press releases, and articles from relevant industry publications. The analytical process is being carried out using a coding strategy informed by principles of grounded theory. Specifically, the researchers are employing open, axial, and selective coding to enable constant comparison across cases (Corbin and Strauss, 1990). As the analysis progresses, recurring themes and patterns are emerging and are being interpreted in light of a priori framework informed by the existing body of literature on international entrepreneurship and startup support ecosystems.

4. Preliminary results

The preliminary findings of this study underscore the key role that incubators and accelerators play for supporting startups to create value during internationalization. The analysis has revealed three key areas: (1) characteristics of the support programs for startups, (2) the main resources provided to startups during internationalization, and (3) the development of

international business relationships. The findings also highlight several important distinctions between the roles incubators and accelerators play in the internationalization process.

4.1. Characteristics of the support programs for startups

Both accelerators and incubators offer support programs for startups. However, one of the most notable differences lies in the duration and scope of the programs offered to startups. Accelerator programs are typically short-term and intensive, designed to help startups rapidly scale or transition to their next growth milestone, such as securing a new round of investment or entering a foreign market. These programs generally follow a structured timeline and culminate in a demo day or investor pitch event.

Incubators tend to offer long-term support, often spanning several years, and sometimes extending beyond the initial incubation period through affiliated institutions such as innovation hubs or science parks. This extended timeline allows incubators to adapt their services to the evolving needs of startups, with a stronger emphasis on sustained growth and capacity building. Incubators commonly provide tutorship services focused on business plan development, as well as mentorship opportunities facilitated through collaborations with large corporations and SMEs within the innovation ecosystem.

4.2. Main resources provided to startups during internationalization

Startups participating in either type of program generally report an enhanced capacity to expand into international markets. However, the nature of the support provided varies. Accelerators typically offer access to a curated network of international mentors, investors, and local stakeholders in target markets. Additionally, many accelerators provide startups with seed funding or equity-based investment as part of their value proposition. They also offer practical guidance, such as insights into international customer behavior and market entry strategies and equip entrepreneurs with technical and managerial skills through structured training modules.

In contrast, incubators provide more personalized consultancy services that help startups prepare for the complexities of international expansion. These include support for understanding local market dynamics, navigating foreign regulatory environments, and adapting business models to global scalability. The findings suggest that incubators play a critical role in helping early-stage ventures overcome cultural, legal, and operational barriers. Their long-term engagement enables them to guide startups through the foundational phases of growth and support their integration into relevant business networks.

4.3. The development of international business relationships

Both incubators and accelerators facilitate valuable opportunities for startups to expand their networks beyond domestic borders. They do so by granting access to international events, pitch competitions, and matchmaking initiatives with potential investors, customers, and strategic partners. These activities improve the visibility and credibility of startups in global markets and foster trust-based relationships that are essential for international growth.

In sum, while both incubators and accelerators act as enablers of knowledge creation in startup internationalization, their approaches differ in intensity, duration, and service orientation. Accelerators emphasize rapid scaling through high-intensity programming and investment readiness, whereas incubators offer long-term developmental support tailored to the evolving needs of startups. However, both contribute meaningfully to improving the access of startups to international markets by providing resources, knowledge, and relational capital.

5. Discussions and conclusions

The findings of this study highlight that ESOs play a fundamental role in supporting startups to create value throughout the internationalization process. Consistent with previous research (Costa et al., 2024; Hussain and Barman, 2025; Marval, 2025), these support organizations facilitate the development of strategic relationships with international stakeholders and activate a broad range of resources: both tangible, such as infrastructure and technical support, and intangible, such as expert knowledge, access to global networks, and the reinforcement of trust. These elements are instrumental in helping startups shape their internationalization strategies and overcome key barriers to entering foreign markets.

However, the study also reveals important distinctions in the way accelerators and incubators operate in this context. Accelerators tend to focus on short-term, high-intensity support that accelerates connections with investors, international mentors, and market entry opportunities. Their programs are often geared toward preparing startups for rapid growth, investment readiness, and immediate international expansion. On the contrary, incubators focus on long-term engagement, nurturing sustained business relationships, and supporting the gradual development of core entrepreneurial capabilities. This includes assistance in areas such as business model refinement, regulatory compliance, and cultural adaptation, capabilities that are essential for building a foundation for future international growth.

Importantly, the results also indicate that both types of organizations provide tailored support based on the specific innovation profile and development stage of the startups they host. In line with Donaldson et al. (2025), this individualized approach encompasses customized training modules, targeted mentorship, and carefully curated networking opportunities. Such tailored support is crucial for enabling startups to transition into scaleups, particularly as they navigate the complexities of internationalization.

In general, this study reinforces the idea that incubators and accelerators serve as intermediaries and enablers to create value in the global innovation ecosystem. By mobilizing both internal resources and external networks, these actors improve the international readiness of startups and contribute to the diffusion of innovation across borders. Their complementary roles, i.e., accelerators driving speed and access, incubators fostering depth and resilience, highlight the multifaceted nature of entrepreneurial support in global markets.

Generally, this study contributes both to academic debate and provides managerial implications. Indeed, although the academic literature has increasingly addressed the internationalization of startups in recent years (e.g., Kuster and Rezende, 2022; Olivieri and Testa, 2024), the specific role of accelerators and incubators in facilitating new ventures' access to international markets remains underexplored. This study contributes to filling this gap by shedding light on how these support organizations actively intervene in the internationalization processes of startups.

In particular, the findings offer an original perspective on the role of incubators and accelerators within the broader field of startup internationalization focusing on value creation. The analysis reveals that both types of organizations are instrumental in enabling startups to establish relationships with international stakeholders and in mobilizing key tangible and intangible resources. However, their modes of intervention differ substantially. Accelerators tend to emphasize short-term engagement aimed at rapidly building investors and mentoring relationships to facilitate rapid market entry. On the contrary, incubators focus on cultivating long-term business relationships and strengthening the entrepreneurial capabilities necessary for sustainable international growth. Indeed, as demonstrated by Bandera and Thomas (2017), startups that collaborate with more than one type of partner have a higher survival rate, and incubators play a key role in this regard.

Moreover, this study offers several important implications for professionals and policy makers involved in the startup ecosystem.

First, the findings highlight the proactive and multifaceted role that ESOs play in activating knowledge for the internationalization of startups. These organizations provide critical capabilities that help startups shape their strategies and overcome the various barriers to entering foreign markets. Both incubators and accelerators provide a combination of tangible resources, such as physical infrastructure and technical support, and intangible assets, including specialized knowledge, access to extensive business networks, and the reinforcement of trust. This dual support system is essential for startups to successfully navigate the complexities of international expansion.

Second, consistent with the insights of Donaldson et al. (2025), our research confirms the importance of tailoring support to the specific innovation level and development stage of each startup. Customized training, mentorship, and networking opportunities are crucial components of effective incubation and acceleration programs. In line with Catanzaro et al. (2020), it is suggested that export support services should be adapted to early internationalizing startups. Furthermore, to maximize their impact, these programs should be ideally co-designed and implemented in collaboration with policymakers.

More generally, ESOs enable knowledge creation in startup internationalization more effectively if they are integrated within a broader ecosystem that includes institutions, local partners, venture capitalists, and other stakeholders (Noronha and Pillai, 2025). Over time, as startups gain experience and establish direct relationships within international markets, their reliance on incubators and accelerators may decrease (Gao et al., 2021). This progression underscores the importance of dynamic support models that evolve alongside the growing maturity and market engagement of startups.

In summary, these findings suggest that startup internationalization requires coordinated efforts among multiple actors in the ecosystem, supported by flexible and tailored incubation and acceleration programs designed to meet the evolving needs of startups.

Keywords: Accelerators; incubators; startups; internationalization; business relationships; value creation

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Connettere per innovare: le reti di relazioni nella transizione verso modelli di business circolari

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1. Introduzione

Negli ultimi anni, il dibattito scientifico relativo ai modelli di business circolari ha conosciuto un incremento sostanziale (Geissdoerfer et al., 2018; Huemer & Flygansvær, 2025).

La letteratura ha focalizzato l'analisi sui cambiamenti interni alle imprese, esaminando come la transizione circolare influenzi le strutture organizzative, i processi intraorganizzativi e le capacità di innovazione (Broccardo et al., 2025; Ranta et al., 2018). Tuttavia, si è sviluppato anche un crescente interesse verso la dimensione interorganizzativa in contesti di mercato, considerando la collaborazione con fornitori, clienti e altri attori, con i quali vengono condivise risorse, conoscenze e competenze (Athaide et al., 2018; Barletta et al., 2024; Pedersen et al., 2023; Stål et al., 2023).

In particolare, l'evoluzione verso modelli di business circolari implica un ripensamento complessivo delle modalità attraverso cui le imprese si relazionano tra di esse. La transizione non si esaurisce nella ridefinizione delle attività produttive o nella sostituzione di risorse materiali, ma comporta una trasformazione dei processi relazionali che sostengono la cooperazione tra gli attori del network (Urbinati et al., 2017). In tal senso, il raggiungimento della circolarità può essere interpretato come un processo che ridefinisce il modo in cui le imprese interagiscono, condividono informazioni e sviluppano innovazioni congiunte (Rizos et al., 2016).

Questa prospettiva mette in luce come il passaggio da un modello di business lineare a uno circolare non sia un semplice mutamento tecnologico, bensì un cambiamento più complesso che richiede nuove forme di coordinamento, fiducia e reciprocità che tradizionalmente contraddistinguono le relazione di business (Bocken et al., 2016). Le relazioni interorganizzative sembrano diventare, quindi, un elemento costitutivo della circolarità, poiché consentono la gestione congiunta di risorse, la progettazione di soluzioni comuni e la co-creazione di valore lungo l'intera filiera (Aarikka-Stenroos et al., 2022; Stumpf et al., 2021). Comprendere tali trasformazioni significa, dunque, osservare come le imprese adattino il proprio modello di business non solo al proprio interno, ma anche nella configurazione delle loro relazioni esterne.

La ricerca, infatti, vuole evidenziare come nel dibattito sui modelli di business circolari sia necessario spostarsi da una prospettiva interna all'impresa verso una visione più ampia, che include le relazioni interorganizzative e i processi di scambio tra attori. La transizione alla circolarità appare, infatti, come un fenomeno complesso e multilivello, in cui la riconfigurazione dei modelli di business si intreccia con la trasformazione delle relazioni e delle interdipendenze che definiscono la struttura dei network.

Tale prospettiva consente di superare una lettura che guarda principalmente alle attività intraorganizzative rispetto ai processi di transizione, ponendo attenzione ai meccanismi di collaborazione, adattamento e co-creazione che sostengono il raggiungimento di un modello di business circolare.

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Sul piano teorico, il lavoro propone di considerare la circolarità non soltanto come un esito di innovazione tecnologica o di strategia d'impresa, ma come un processo relazionale che prende forma attraverso interazioni reiterate tra attori interdipendenti. In questa prospettiva, le relazioni interorganizzative diventano una componente costitutiva del modello di business, non un semplice contorno operativo.

2. Quadro teorico

In questo quadro, diversi contributi della letteratura hanno cercato di classificare le imprese in base al grado di integrazione della circolarità nei propri modelli di business, individuando traiettorie evolutive che riflettono diversi livelli di maturità organizzativa e relazionale (Bocken & Konietzko, 2022; Djelic & Quack, 2007; Foroozanfar et al., 2022; Salmi & Kaipia, 2022).

Infatti, la recente letteratura scientifica distingue tre principali categorie di imprese nel processo di transizione verso la circolarità (Salmi & Kaipia, 2022). Le Linear Incumbent sono aziende storicamente ancorate a modelli di business lineari, che basano la propria competitività sull'efficienza produttiva e sull'ottimizzazione dei costi; la loro evoluzione verso la circolarità risulta spesso ostacolata da "dipendenze di percorso" (Djelic & Quack, 2007), legate a routine operative. Le Circular Incumbent, d'altra parte, corrispondono a imprese che hanno avviato processi di riconfigurazione dei propri modelli di business, integrando elementi di eco-innovazione, riuso o riciclo nei flussi produttivi. Infine, le Born Circular sono imprese nate direttamente su principi di economia circolare: spesso piccole realtà o start-up che sperimentano nuovi paradigmi organizzativi, relazionali e tecnologici, facendo della sostenibilità la propria proposizione di valore distintiva.

Accanto a questa classificazione in letteratura sull'innovazione dei modelli di business per la sostenibilità si trova una ulteriore distinzione tra due principali approcci evolutivi. Il primo, definito accomodativo, si basa su interventi graduali e incrementali che mirano a migliorare l'efficienza dei processi interni, ridurre gli sprechi o integrare pratiche ambientali senza modificare in modo sostanziale la logica complessiva del modello di business (Schaltegger et al., 2012). In questo caso, la sostenibilità viene incorporata come estensione o adattamento delle attività esistenti, senza alterare la struttura fondamentale delle attività intraorganizzative (Makkonen & Johnston, 2014; Melander & Tell, 2019).

Il secondo approccio, definito proattivo, implica invece una riconfigurazione più profonda del modello di business. Le imprese che adottano questa strategia tendono a rivedere il proprio core business alla luce di obiettivi ambientali e sociali, integrando la sostenibilità come parte integrante della proposta di valore, delle relazioni con gli attori e delle logiche di profitto. Si tratta di un cambiamento che non riguarda solo i processi, ma anche l'identità e la missione dell'impresa.

Massa et al. (2017) propongono una distinzione analoga tra due modalità di trasformazione del modello di business: la riprogettazione completa, che comporta la creazione di una nuova architettura di attività e risorse in linea con i principi della sostenibilità e della circolarità, e la riconfigurazione di elementi esistenti, in cui l'impresa conserva la struttura di base ma introduce progressivamente nuovi elementi, come pratiche di riuso, riciclo o collaborazione interorganizzativa (Melander & Tell, 2019).

Queste prospettive contribuiscono a chiarire le diverse traiettorie evolutive verso la circolarità, ma restano in larga parte centrate sulle trasformazioni interne all'impresa. Tali classificazioni infatti si concentrano principalmente sull'analisi delle dimensioni interne ai modelli di business, come la capacità organizzativa, le strategie di innovazione e la gestione delle risorse, senza approfondire i cambiamenti che si verificano a livello dei processi interorganizzativi (Melander & Tell, 2019).

Le dinamiche interorganizzative offrono invece una chiave interpretativa utile per analizzare come la circolarità emerga dalle interazioni tra attori interdipendenti e dai processi di adattamento

reciproco che legano imprese, fornitori e clienti (Håkansson & Snehota, 1989). Secondo questo aspetto, il modello di business non è concepito come un sistema chiuso, ma piuttosto come un insieme di relazioni che subiscono trasformazioni nel tempo in funzione dei flussi materiali, informativi e di conoscenza che attraversano la rete (Håkansson et al., 2009). Infatti, le modalità attraverso cui le imprese sviluppano la transizione verso modelli di business circolari variano sensibilmente in relazione alla loro dimensione e struttura organizzativa. Le grandi imprese tendono a gestire la circolarità attraverso risorse dedicate, competenze specializzate e meccanismi formali di coordinamento, che consentono di pianificare e monitorare in modo sistematico le trasformazioni dei propri modelli di business. Al contrario, le PMI, spesso caratterizzate da strutture più flessibili ma da risorse limitate, attivano percorsi di innovazione circolare principalmente attraverso le relazioni (Luthra et al., 2022; Rizos et al., 2016). La collaborazione con altri attori diventa lo strumento attraverso cui accedere a conoscenze, competenze tecniche e opportunità di sperimentazione che non potrebbero essere sviluppate internamente.

Per questo, lo sviluppo di un modello circolare non può essere interpretato come il risultato di strategie isolate, ma come l'esito di processi relazionali fondati su interazioni, adattamenti e scambi tra attori interdipendenti che sono determinanti per il successo dello stesso modello di business (Håkansson & Waluszewski, 2007).

La circolarità emerge quindi all'interno dei network, dove imprese, fornitori, clienti e partner tecnologici co-evolvono e ridefiniscono nel tempo le proprie relazioni.

In tale prospettiva, la ricerca intende indagare come i processi di trasformazione verso modelli di business circolari influenzino – e, al contempo, siano influenzati da – le dinamiche organizzative e le relazioni inter-organizzative nei network locali delle PMI.

3. Obiettivi della ricerca

Questo studio, nel tentativo di riflettere sulle dinamiche interorganizzative, vuole far luce sul rapporto tra il processo aziendale rivolto allo sviluppo di un modello di business più orientato alla circolarità e la gestione delle relazioni interorganizzative. Queste ultime, oggetto di particolare attenzione dello studio, possono costituire per le PMI non solo un'opportunità per avviare la transizione verso modelli di business circolari, ma anche uno spazio in cui tale trasformazione finisce per ridefinire la natura stessa delle relazioni inter-organizzative. Le PMI, caratterizzate da capacità strategiche e risorse limitate, tendono storicamente a valorizzare le reti relazionali come leva per colmare tali vincoli; in questo quadro, le interazioni con fornitori, clienti e partner strategici assumono un ruolo cruciale.

La collaborazione inter-organizzativa, già riconosciuta come motore di innovazione, può infatti alimentare un circolo virtuoso in cui lo scambio continuo di conoscenze, competenze e risorse sostiene la transizione verso la circolarità. Contemporaneamente, il processo di trasformazione circolare può generare nuove esigenze, nuovi standard e nuove pratiche che rivedono le modalità di cooperazione tra gli attori, modificando le aspettative reciproche, la natura degli scambi e le forme di coordinamento.

Le relazioni inter-organizzative non si limitano, infatti, al mero trasferimento di beni o servizi legati a una transazione economica: esse costituiscono piattaforme complesse di interazione, in cui circolano informazioni, capacità tecniche e visioni strategiche. In questo ambiente dinamico, la transizione circolare e l'evoluzione delle relazioni nelle reti locali si alimentano reciprocamente, contribuendo a definire nuovi percorsi di sviluppo per le PMI.

4. Metodologia

Per studiare questo fenomeno, la ricerca adotta un approccio qualitativo che permette di esplorare in profondità le dimensioni relazionali inter-organizzative alla base dello sviluppo di modelli di business circolari nelle piccole e medie imprese. Tale approccio consente di cogliere

non solo la struttura formale delle relazioni, ma anche le dinamiche meno visibili che emergono nei processi di collaborazione: le logiche di scambio, i meccanismi di fiducia, le interdipendenze operative, le pratiche condivise e le percezioni degli attori coinvolti. Attraverso interviste approfondite, analisi comparativa dei casi e ricostruzione narrativa dei percorsi di transizione, il metodo qualitativo rende possibile comprendere come le relazioni influenzino la trasformazione verso la circolarità. Al contempo, consente di osservare come tale trasformazione riorienti e ridefinisca le relazioni stesse (Eisenreich et al., 2021; Runfola et al., 2017). Tale scelta metodologica si fonda sulla natura esplorativa dell'indagine, che mira a comprendere come la transizione verso modelli di business circolari emerga dalle interazioni tra attori oltre che da strategie formalizzate rivolte ai processi intraorganizzativi. Coerentemente con tale impostazione, le interviste in profondità rappresentano lo strumento più adeguato per raccogliere evidenze empiriche dirette, consentendo di indagare i significati, le percezioni e le pratiche attraverso cui le imprese interpretano e costruiscono relazioni orientate alla sostenibilità (Eisenhardt & Graebner, 2007).

Le interviste sono state condotte con PMI appartenenti ai settori del tessile e della pelletteria, ambiti in cui i legami interorganizzativi assumono un ruolo centrale nei processi di innovazione e cooperazione. La ricerca segue l'approccio del systematic combining (Dubois & Gadde, 2014), che valorizza la connessione dinamica tra teoria ed evidenza empirica. In questo modello, il processo di analisi non si sviluppa in modo lineare ma attraverso un continuo movimento tra quadro teorico, dati raccolti e concettualizzazione emergente. Tale logica consente di affinare progressivamente i concetti interpretativi, costruendo un dialogo costante tra letteratura e osservazione empirica.

Attraverso questa impostazione, la ricerca non si limita a verificare ipotesi predefinite, ma mira a far emergere nuove interpretazioni su come la transizione verso modelli di business circolari prenda forma nelle relazioni tra attori e, al contempo, le trasformi. In questo modo offre un contributo concettuale ed empirico alla comprensione dei processi di innovazione sostenibile nelle PMI.

5. Contesto empirico

Il settore tessile e della pelletteria costituisce un contesto empirico particolarmente rilevante per indagare le dinamiche relazionali che caratterizzano la transizione verso modelli di business circolari. Si tratta di comparti storici del made in Italy, definiti da una forte frammentazione produttiva e da una prevalenza di piccole e medie imprese. Le aziende operano lungo filiere articolate, in cui i processi di progettazione, lavorazione e distribuzione sono distribuiti tra una molteplicità di attori, generando un elevato grado di interdipendenza. La numerosità e la stabilità delle relazioni tra imprese rendono questi settori un terreno privilegiato per osservare come cooperazione e scambio di conoscenze possano sostenere la transizione verso pratiche più sostenibili e circolari.

L'interesse verso questi contesti deriva dal fatto che essi rappresentano una sintesi tra continuità e innovazione. Pur basandosi in gran parte su modelli di business tradizionali, centrati su processi lineari e su logiche di efficienza produttiva, molte imprese stanno progressivamente sperimentando pratiche di recupero, riuso e rigenerazione dei materiali. Allo stesso tempo, la densità relazionale tipica di questi comparti costituisce una risorsa distintiva: le relazioni di lungo periodo, fondate su fiducia e conoscenza reciproca, favoriscono la condivisione di risorse, competenze e soluzioni tecniche.

Per le PMI, tali relazioni non rappresentano soltanto un mezzo per garantire stabilità operativa, ma anche una leva strategica di innovazione. La prossimità relazionale e la capacità di cooperare con altri attori diventano infatti elementi centrali per sviluppare configurazioni di rete orientate alla circolarità. In questo senso, il tessile e la pelletteria offrono un luogo privilegiato

per comprendere come la sostenibilità e l'innovazione emergano non da processi isolati, ma dal continuo intreccio di relazioni che definisce l'identità stessa di questi sistemi produttivi.

6. Risultati preliminari e discussione

Dall'analisi dei dati emerge come l'interesse per l'ottimizzazione dei processi, il riciclo degli scarti e le soluzioni di eco-design si sia sviluppato all'interno di un sistema di relazioni consolidate con fornitori tecnologici, laboratori territoriali e aziende del distretto. Queste collaborazioni attivano processi inter-organizzativi di sperimentazione congiunta e di scambio di conoscenze che risultano propedeutici all'adozione di pratiche circolari e alla loro integrazione nei processi aziendali.

Parallelamente, il graduale orientamento verso la circolarità ha portato l'azienda a rivedere alcune componenti del proprio modello di business, introducendo nuove attività, nuovi processi e modalità produttive più integrate che richiedono un coordinamento più intenso e strutturato con la rete di partner. L'adozione di pratiche di eco-design e il riciclo sistematico degli scarti, ad esempio, richiedono la creazione di flussi informativi continui con fornitori specializzati, la definizione congiunta di specifiche tecniche e l'avvio di sperimentazioni condivise su materiali e processi. Allo stesso modo, le esigenze di efficientamento richiedono una maggiore sincronizzazione con i terzisti, i laboratori e gli attori distrettuali, rendendo i processi inter-organizzativi parte integrante del funzionamento del nuovo modello operativo.

In questo modo, la trasformazione verso modelli di business circolari non solo è abilitata dalle relazioni esistenti, ma contribuisce a sua volta a ridefinirle: i partner sono maggiormente coinvolti nelle fasi di progettazione e di revisione dei processi, gli ambiti di collaborazione si ampliano e i meccanismi di coordinamento diventano più stabili e ricorrenti. Le relazioni, inizialmente funzionali alla sperimentazione, si consolidano dunque come elementi strutturali del modello di business rinnovato, rafforzando i legami esistenti e generando nuove forme di cooperazione. Il caso mostra quindi un circolo virtuoso in cui i processi inter-organizzativi sostengono la transizione circolare e, al contempo, la transizione modifica tali processi e favorisce l'innovazione del modello di business, confermando la natura bidirezionale delineata dalla domanda di ricerca.

7. Conclusioni

La ricerca, dunque, sebbene in una sua fase preliminare, tenta di individuare diverse configurazioni relazionali che caratterizzano le PMI nella loro transizione verso modelli di business circolari. Ci si attende di poter distinguere tra imprese che utilizzano le relazioni prevalentemente come meccanismi di supporto operativo e quelle che le trasformano in leve strategiche di innovazione e rigenerazione delle risorse. L'analisi delle interazioni e delle pratiche collaborative consentirà di elaborare una classificazione interpretativa delle modalità con cui le imprese fanno leva sulle relazioni interorganizzative per sostenere la circolarità. I risultati attesi mirano quindi a far emergere un quadro di lettura capace di spiegare come la rete di relazioni possa costituire, per le PMI, una fonte di resilienza e apprendimento collettivo, favorendo percorsi di transizione sostenibile più coerenti con le loro specificità strutturali.

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Digital Platforms for Value Chain Collaboration in the Smart Building Sector: an explorative case study

Elisa Martina Martinelli[1]

1. Introduction and theoretical background

In the current fast changing and highly competitive business environment, companies are compelled to manage increasing complexity driven by the demand for more sustainable and innovative solutions. This dynamic global context, characterized by increasingly interconnected and demand-driven supply chains and growing customer expectations, necessitates the evolution of traditional sectors.

The construction and building sector is currently undergoing transformation to address these challenges (Ghansah, 2024), and to effectively manage these critical social-economic and environmental challenges, modern buildings are undergoing a continual evolution. They are increasingly engineered to simultaneously minimize their ecological footprint and enhance occupant quality of life, leveraging new technologies to optimize resource efficiency and ensure robust waste management across the entire building lifecycle. This evolution is driven mainly by the diffusion and adoption of technologies such as Artificial intelligence (AI), Internet of Things (IoT), and advanced data analytics tools (European Commission, 2025a). The smart building concept, defined as a structure capable of "sensing, interpreting, communicating, and actively responding" to changing conditions (European Commission, 2025b), identifies a building embedded with solutions that utilize data-driven and needs-based technologies, often leveraging real-time data from various sensors and user inputs to optimize resources according to specific demands (Farzaneh et al., 2021). These technologically-equipped buildings require integrated digital platforms to manage multiple assets in real time, monitoring performance and ensuring building functionality, comfort, and sustainability. The smart building concept has gained increasing attention in academia and industry due to its capability to improve efficiency and intelligently support life, particularly in facility management. Consistent with the European Commission (2025b) conceptualization, this research focuses on the smart building's critical role during the facility management stage in a business-to-business (B2B) environment. This stage necessitates the deliberate integration of people, places, and processes to optimize the built environment. In particular, the strategic objective of an owner of a building is to satisfy the demand side: supporting the productivity of the business customer elevating their occupant experience. It is through a proper facility management system that the necessary functionality, efficiency, comfort, safety, and sustainability of the built environment are ultimately ensured (Ghansah, 2024). Considering the socio-economic and sustainability issues, the evolution of technology and the global trends, the potential application of the Digital Twin (DT) concept in the construction and building sector has attracted increasing interest from researchers and practitioners (Ghansah and Lu, 2023). Despite the vast potential of DT for smart buildings, significant challenges emerge during the decision to implement these technologies specifically at the facility management stage, primarily due to the conceptual novelty of this integration (Holopainen et al., 2024).

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In the contemporary business landscape, characterized by rapid shifts and intense competition, organizations are increasingly forced to navigate complexities driven by the urgent demand for sustainable and innovative solutions. This global environment is defined by interconnected, demand-driven supply chains and heightened customer expectations, making the evolution of traditional sectors a necessity rather than an option. Among these, the construction and building sector is currently undergoing a significant transformation to address these modern challenges. This evolution is vital for both socio-economic and environmental reasons. On one hand, the building stock of a nation is a cornerstone of its socio-economic development (Arun et al., 2025; Chatzikonstantinidis et al., 2025). On the other hand, this sector is a major contributor to the global climate crisis, as it accounts for approximately 32% of the world's energy consumption and 34% of global CO2 emissions (UN Environment Programme, 2025).

To manage these social and environmental pressures, modern buildings are evolving to minimize ecological footprints while enhancing occupant quality of life. This shift is primarily propelled by the adoption of advanced technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), and sophisticated data analytics (European Commission, 2025a). A smart building is thus defined as a structure capable of sensing, interpreting, and responding to changing conditions, utilizing data-driven technologies to optimize resources according to specific demands (European Commission, 2025b). These buildings require integrated digital platforms to manage assets in real time, ensuring functionality, comfort, and sustainability.

The smart building market is experiencing substantial growth, valued at 117.4 billion USD in 2024 and projected to reach 548.5 billion USD by 2032 2032 (Fortune Business Insights, 2025). Within this market, the facility management stage is particularly critical, especially in business-to-business (B2B) environments. This stage involves the deliberate integration of people, places, and processes to optimize the environment for productivity and occupant experience. Consequently, the application of the Digital Twin (DT) concept has gained significant traction. Originating in the early 2000s, the DT creates a connection between virtual and real spaces through continuous data flow (Grieves, 2005).

Despite its potential for efficient fault detection and carbon emission reduction, incorporating DT at the facility management stage presents challenges due to its conceptual novelty. Current research is limited, often because of the high complexity of modeling the underlying physics and a historical tendency to view smart buildings through a purely operational lens (Bujari et al., 2021; Ghansah, 2024; Holopainen et al., 2024; Seghezzi et al., 2021).

Integrating DT into facility management establishes a powerful virtual platform for real-time analysis and operational execution (Sepasgozar et al., 2020). It functions as a optimization management system that consolidates data from disparate sources into a Single Pane of Glass (SPOG), creating a single source of truth for all building systems (IBM, 2025). Key systems providing information for this DT include Building Information Modeling (BIM), which manages 3D models and life cycle data (Villani et al., 2025), and the Building Management System (BMS), which monitors core functions like heating and security (Ahmad and Alshurideh, 2025a). The emergence of IoT-enabled BMS marks a turning point, allowing buildings to monitor environmental parameters and occupancy to reduce energy usage (Taboada-Orozco et al., 2024). The further integration of AI leads to AIoT-enabled BMS, facilitating predictive maintenance and strategic coordination among diverse stakeholders (Poyyamozhi et al., 2024). This technological transition fosters a customer-oriented strategy where DT provides real-time feedback to align stakeholders and satisfy the business customer (Chatzikonstantinidis et al., 2025).

Given the current context, the existing body of literature, and the identified lack of extensive research, this study primarily aims to investigate how emerging digital platforms are transforming the smart building industry. Specifically, the research explores how these platforms facilitate the use of DTs to foster collaboration among various value chain participants while promoting a customer-centric strategic integration paradigm specifically tailored to the business client and the actual users of the building.

2. Methodology

The research is currently in an initial exploratory phase of a larger ongoing project. It utilizes a qualitative approach grounded in a single case study design. This methodological choice is justified by the suitability of qualitative methods for exploratory inquiries in specialized, dynamic industries like the smart building sector (Ellram, 1996; Yin, 2013). A deep analysis of a single successful case allows for uncovering complex organizational and collaborative dynamics that quantitative instruments might miss (Gustafsson, 2017; Yin, 2009). This approach provides theoretical depth by examining a contemporary phenomenon within its real-world context where the boundaries between technology and organization are often blurred (Yin, 2013).

The subject of this study is Company Alpha, a firm founded in 2000 in Rome that operates as a global platform-based entity across four continents. Alpha was chosen because it represents a best practice in implementing platform-based strategies to address sustainability and value chain integration. The company focuses on an experience-first approach to create sentient built environments by leveraging data as a critical asset. Its core technology is a proprietary modular digital platform designed for the development and management of space-centric applications. Alpha's influence is notable in the national facility management market, and its growth is fueled by an aggressive mergers and acquisitions strategy, such as its 2025 acquisitions of a Spanish solution provider and an open innovation firm.

To analyze Alpha’s strategic transition, the study employs the ORBIT innovation framework (Ahmad and Alshurideh, 2025b; Narang and Devaiah, 2014). This framework consists of five phases: Opportunity Scanning, Research & Development, Building Collaborative Ecosystems, Implementation, and Tracking Performance. Data collection involved a triangulation of primary and secondary sources. Secondary data included a review of corporate reports, market analyses, and official websites to establish strategic positioning. Primary data were gathered through two semi-structured interviews conducted face-to-face in November 2025. One interview was held with the Managing Director to understand the internal R&D process and strategic vision, while the second was with a Company Consultant to gain an outside-in perspective on ecosystem development and stakeholder collaboration.

3. Preliminary considerations and future developments

The preliminary findings from the case of Company Alpha demonstrate the pivotal role of digital platforms in reshaping the smart building sector through DT-enabled collaboration. Analysis through the ORBIT framework shows that Alpha moved beyond conventional DT by identifying energy inefficiency and spatial rigidity as critical shortcomings in traditional models. A specific opportunity was recognized in the rise of smart working, where organizations required building providers to guarantee accessible workspaces for employees near their homes. Consequently, Alpha implemented its digital platform as a technological core that connects service supply from contractors and engineers with corporate demand from business clients.

In the R&D phase, Alpha designed its platform as a Platform-as-a-Service (PaaS) to optimize interactions between physical assets and occupants. By integrating BIM processes, the platform allows for a holistic visualization of the building and data-driven decision-making in real-time. Furthermore, the platform utilizes AIoT-enabled BMS to aggregate data from various sensors, applying machine learning for predictive maintenance and dynamic climate control based on actual occupancy. This enables the building to function as an extended collaborative community ecosystem where the platform acts as a market mediator between demand and supply. The open architecture ensures interoperability, allowing all stakeholders to co-create value by contributing information and tracking transactions.

During implementation, Alpha focused on creating a self-improving solution based on business customer needs. The platform integrates data in a single sharing environment, making the building more transparent and improving occupant comfort. This method decentralizes control, allowing for rapid intervention in maintenance and real-time updates to the information contained in the DT. Finally, in the tracking performance phase, value is measured through outcomes such as energy savings and employee well-being rather than just square footage. These insights are then used to identify new opportunities, starting the iterative loop of innovation again.

By examining a novel solution that surpasses conventional methods in smart building facility management, this preliminary study addresses specific voids in the existing literature. Although DTs offer significant potential, there is a marked deficiency in research regarding their application during the facility management phase (Bujari et al., 2021; Ghansah, 2024; Holopainen et al., 2024; Seghezzi et al., 2021). This lack of academic inquiry is largely due to the novelty of the concept and the technical difficulties associated with modeling complex physical processes within new digital platforms (Pašek and Sojková, 2018). Moreover, current scholarship is mostly limited to engineering perspectives, failing to provide strategic insights from a supply chain management standpoint or to explore the value chain through a customer-focused marketing lens.

Managerially, the case shows how, by leveraging new technologies (e.g., AIoT-enabled BMS), it is possible to develop solutions that valorize and enrich the value chain, orienting it towards customer-centric strategies. This has allowed Alpha to position itself not only as a strategic intermediary between B2B supply and demand, revolutionizing the facility management process, but also to include another strategic actor in the value chain: the business customer and, in particular, the final user of the smart building (specifically, its employees). This new technological platform has allowed, in fact, the creation of an extended collaborative community ecosystems in which the user is not only the focus of the value chain, but also actively contributes to the improvement and development of the platform in the management and efficiency of the smart building, thereby maximizing their satisfaction.

Despite providing valuable exploratory insights into the platform-based integration of the construction value chain, the principal limitation of the present research resides in its current preliminary stage of investigation and the use of a singular case study design. While a single case offers theoretical depth, it inherently restricts the generalizability of the findings across the wider building sector. The initial results, therefore, serve primarily as an exploratory foundation for further analysis and investigations. Future research efforts will address this limitation through a structured progression towards generalization. Specifically, the next phase of investigation should embrace a multiple case study approach, allowing for cross-case comparison and pattern identification regarding collaborative platform implementation across different firm sizes and geographical contexts. Furthermore, subsequent studies will incorporate a longitudinal analysis design to capture the temporal evolution of collaborative ecosystems and the long-term impacts of AIoT-enabled platforms on operational efficiency and sustainable performance. Beyond these comparative and temporal studies, a critical avenue for future research involves exploring the applicability and implementation challenges of this platform-based model across diverse sectors to assess the model's scalability and multi-industry relevance.

Keywords: Digital twin; value chain; smart building; digital platform; B2B

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The Impact of Reselling Platforms on Fashion Consumer Behavior: A Cross-Country Comparative Study

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1. Introduction

Fashion industry is at the intersection of commerce, culture, and creativity, and in recent decades, it has come under growing criticism of its social, environmental, and economic footprint. With fast fashion having long dominated global markets with its rapid production cycles, low prices, and rapid turnover, this strategy has come under growing pressure from emerging sustainable and circular alternatives. Of these, reselling platforms have grown at a phenomenal rate, not only representing a technological development in the fashion sector but also a very apparent revolution in consumer psychology, values, and construction of identity.

2. Brief literature review and research gaps

Studies on second-hand shopping are limited. Existing research identifies a variety of factors that influence second-hand shopping such as economic necessity and price equity. Similarly, scholars have indicated that purchasing used goods is an efficient method for reducing waste and pollution (Khurana and Tadesse, 2019; Machado et al., 2019). As an example, in the past few years, the second-hand clothing business has grown steadily as more young buyers have become interested in vintage clothing (Su et al., 2019). This is due to the fact that environmental value is the most significant predictor of views toward used apparel (Padmavathy et al., 2019). In recent years, the market for second-hand goods has undergone a significant transformation with the rise of consumer-to-consumer (C2C) online platforms. C2C online commerce refers to online transactions between two users that involve the exchange of goods. Such transactions are carried out through various online marketplaces, including popular platforms such as eBay, Etsy, or Taobao, as well as auction websites (Statista, 2022). The proliferation of these platforms has made it easier than ever for individuals to buy and sell used items directly to one another, bypassing traditional intermediaries like thrift stores or pawn shops.

In even more recent times, there has been a shift towards mobile-based shopping platforms that encourage consumers to engage in C2C transactions without having to go through traditional business channels. The fashion industry has particularly benefited from this trend, offering new opportunities for both consumers and sellers (Johan et al., 2020) and C2C e-commerce has proven popular, especially among younger generations. Thus, social shopping platforms (e.g., Vinted and Depop) enable millions of sellers and resellers to develop their own, more or less “professional”, virtual store and connect with consumers, thanks to rating, reviews and direct interactions between buyers and sellers that allow price bargaining and requesting for additional information, “social” elements far from the logic of todays’ retail or e-commerce. In addition, buying and selling

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second-hand items incorporate several elements of sustainability, both economical and environmental.

Sustainability motivations mainly indicate consumers' concern for the environment, particularly in relation to sustainability issues and beliefs (Hamari et al., 2016). Consumers who care about the environment will question the necessity and usefulness of a product before making a purchase in order to safeguard the environment and abstain from ecologically hazardous behaviour (Parguel et al., 2017). It has been proven that sustainability-inclined beliefs (Hamari et al., 2016; Kim & Yoon, 2021) positively influence attitude towards collaborative consumption. Environmentally conscious consumers are more likely to engage in sustainable clothing consumption (Diddi et al., 2019; Parguel et al., 2017; Styvén & Mariani, 2020). Parguel et al. (2017), for instance, argued that the environmental awareness of French consumers has prompted them to purchase used goods through C2C platforms such as the local Leboncoin. Consumers believe that their actions can help to reduce waste by recycling, extending product life spans, and resulting in a decrease in indulgent, unsustainable consumption (Parguel et al., 2017; Turunen & Leipämaa-Leskinen, 2015).

Economic motivations refer to consumers' price consciousness (Padmavathy et al., 2019). In early studies on thrift store purchasing, economic motivation had been emphasised extensively (Ferraro et al., 2016). Price-conscious consumers are more likely to purchase secondhand clothing (Yan et al., 2015) and are referred to as highly economically-oriented bargain hunters (Seo & Kim, 2019). According to Edbring et al. (2016), consumers who purchase second-hand goods, especially clothing, tend to avoid purchasing first-hand goods at original prices because they may be able to purchase branded goods for a lower price or higher-quality products for a lower price on the secondary goods market.

Consumption on C2C platforms shows how users have incorporated technology into their daily lives and are progressively forming a conscience about being good for the environment. Studies on consumers' purchases of used goods have been conducted (Guiot & Roux, 2010; Mohammad et al., 2021; Seo & Kim, 2019; Yan et al., 2015), but there are fewer empirical studies on consumers' online selling and reselling behaviour for particular used goods like apparel.

As the world faces growing concerns over the environmental impact of fast fashion, the importance of sustainability and ethical values is becoming increasingly prominent in consumer behaviour. The study by Park (2023) highlights that consumer behaviour on C2C online platforms for second-hand fashion products is heavily influenced also by their level of environmental consciousness. Consumers who prioritize environmental sustainability and saving tend to view second-hand trading platforms as an effective way to recycle products and purchase good quality second-hand fashion products. In contrast, consumers with low environmental consciousness tend to use the platform for hedonistic and experiential consumption.

3. Research goals and methodology

The research examines the disruptive role of reselling sites in restructuring the new fashion consumption, and more precisely their psychological, behavioral, and cultural impacts on customers. Based on the theory of conspicuous consumption, circular economy, and digitalization, the study examines how the forces of sustainability, price sensitivity, and uniqueness conflict and converge under second-hand fashion. It also examines the evolving luxury consumption dynamics, where the conventional understanding of exclusivity is being redefined by the impact of accessibility, resale, and value redefinition.

In striving to accomplish this, the study adopts a mixed theoretical and empirical approach.

A quantitative methodological approach was employed. A structured online survey was created and administered to a representative consumer sample, more precisely among Generation Z and Millennials, who are at the forefront of online fashion cultures and green consumption behaviors. Customer experience is therefore addressed through an online questionnaire used to

gather quantitative data from 181 participants across multiple countries who were largely Generation Z members, which is a technology-oriented and highly interactive consumer group when it comes to sustainability stories.

The population for this study was sampled using a non-probability convenience sampling method whereby it tried reaching those people who are of a different nature via casual and virtual settings. It was deemed appropriate to the research exploratory nature as well as to the desired population, who are those in clothes and therefore relevant to the topic of fashion and sale websites.

The survey was posted online from April 3rd to April 25th, 2025, on different platforms such as WhatsApp, Instagram, and LinkedIn, and word of mouth. These platforms gave the survey extensive and rapid coverage, and by this, the researcher was able to reach out to the respondents of different countries and backgrounds, primarily from those who are digitally enabled and fashion-oriented. The link to the survey was shared for free, with no restrictions in terms of age, gender, and nationality, and on voluntary and anonymous terms.

The single inclusion criterion employed was that the participants would have to purchase clothing, frequently or rarely.

Though convenience sampling limits statistical generalizability of findings, it facilitated the attainment of rich qualitative data set consistent with the research purposes. The researchers received 181 valid responses. Participants filled out the questionnaire voluntarily, and their information was processed according to good ethical research practice.

By segmenting adopters and non-adopters and psychographic profiling of factors such as eco-attitude, price consciousness, and desire for uniqueness, this research presents a multi-dimensional typology of contemporary consumers and adoption determinants.

The online format offered easy reach and comparability between samples, and the researcher's international academic community supported gathering answers from diverse nations and cultures. This diversity enriched the dataset and allowed observation of cross-cultural dynamics and generational trends of reselling behavior.

Six research goals were originally formulated to explore a variety of dimensions of the phenomenon. These goals were later reorganized into three more comprehensive and interconnected macro-goals in the course of analytical design. The reorganization aimed at enhancing conceptual cohesiveness, minimizing thematic duplication, and facilitating easier more integrated interpretation of results between corresponding hypotheses.

The first objective is centered on identifying the main motivations for engaging in reselling platforms and the psychological profiles of consumers. It investigates if participants are driven by pure sustainability values, economic motivations, or by seeking weird and rare products. It also investigates the role of marketing cues, generation identity, and psychographic factors such as price sensitivity and eco philosophy. Primary variables in this section are self-reported motivation scales, impulse buying behavior, and consumer segmentation using cluster analysis.

The second aim investigates whether engaging with reselling platforms produces behavior change in the long run. Specifically, it investigates whether such engagement leads to reduced consumption of fast fashion, increased circular behavior (e.g., reselling rather than disposing), and internalized and normalized second-hand fashion practice. It also investigates whether the use of platforms becomes routinized and which mechanisms such as moral licensing, where reselling legitimizes overconsumption, occur. Frequency of usage, experience years, and buying and disposal behavior indexes are at the center of this analysis.

The third objective is about the impact of second-hand settings on both the symbolic meanings and perceived value of luxury clothing. It questions if luxury products purchased through reselling sites are viewed as less valuable, if the sites make luxury democratically available or symbolically diluted, and why consumers purchase second-hand luxury products. This part also explains perceived tensions between exclusivity and access, and if various forms of platforms (e.g., peer-to-peer vs. B2C) appeal to various consumer profiles.

In addition to these three core objectives, the research employs a set of transversal factors that, while not formally codified as standalone goals, are highly significant in shaping platform usage. These are trust perceived in retailers, product authenticity anxiety, perceived ease of use of the platform, the impacts of social proof and reviews, and broader psychological second-hand consumption resistance. They describe how certain consumers, who have expressed sustainability-values aligned with reselling, do not adopt reselling behaviors. They cite underlying emotional and cultural inhibitions, i.e., hygiene concerns, fear of deception, or affection for the notion of "newness", that can act against adoption even by ideologically friendly consumers.

These goals are complemented by hypothesis sets that are statistically tested with tools such as t-tests, regression, and cluster analysis. Emphasis is placed on transversal variables such as trust, usability, and perceived authenticity that have the maximum mediating impact on consumer adoption of platforms.

Research Objective	*Associated Hypotheses*
Objective 1: To understand the psychological motivations and consumer profiles behind second-hand fashion adoption	*H1a*: Consumers who prioritize sustainability are more likely to adopt reselling platforms. *H1b*: Consumers motivated by affordability are also more prone to impulsive purchases. *H1c*: The perceived uniqueness of second-hand items increases purchase frequency. *H1d*: Some users engage in "moral licensing" by using reselling to justify unsustainable purchases. *H4a*: Younger generations are significantly more likely to use reselling platforms. *H5a*: Influencer marketing does not directly affect adoption, but is relevant for profiling specific user types. *H5b*: Promotional offers primarily impact consumers with existing price sensitivity.
Objective 2: To analyse behavioural changes in fashion consumption patterns linked to reselling platforms	*H6a*: Engagement with reselling platforms is associated with a reduction in the purchase of new clothing. *H6b*: Consumers are more likely to resell than donate or accumulate clothing after using these platforms. *H6c*: Experience with reselling platforms increases frequency of use. *H2a*: The use of reselling platforms reduces guilt related to fast fashion consumption. *H2b*: Second-hand shopping increases wardrobe turnover, fostering faster consumption cycles. *H1d (revisited)*: Reselling may enable less sustainable habits through delayed disposal justification.
Objective 3: To explore how second-hand affects the perception and symbolic value of luxury fashion	*H3a*: Luxury items purchased second-hand are perceived as having lower value compared to new luxury. *H3b*: Second-hand platforms are not perceived to significantly enhance luxury accessibility. *H3c*: Price is not the primary driver behind second-hand luxury purchases. *H4c*: Platform choice (e.g., Vinted, Depop, Vestiaire) is influenced by age and type of purchase intention.

Table 1. Research Objective and Hypotheses

By the amalgamation of behavioral, motivational, and cultural data, this study is able to give a multi-dimensional view of how second-hand fashion websites are changing consumption behaviors, brand constructs, and notions of value in a digital technology- and circular economy-driven world. The incorporation of transversal adoption barriers also suggests that behavioral change is not solely value- or incentive-dependent, but a multifaceted combination of cognitive, emotional, and experiential forces that reselling sites need to strategically manage.

4. Results

Results indicate an omnibus behavioral context. While sustainability is often invoked as an explanation of resale, uniqueness and affordability are the variables that consistently predict usage. The study further confirms that reselling website use is associated with a decline in fast fashion consumption and circular disposal behavior, which suggests a shift towards linear to circular fashion paradigms.

Nonetheless, it also identifies contradictions such as moral licensing and fast fashion rotation through which reselling can facilitate, but not contain, overconsumption. Furthermore, in the luxury fashion context, resale undermines normative values through both a democratization of access and an erosion of symbolic exclusivity, resulting in cultural friction between inclusivity and distinction.

With the integration of these findings, the thesis contributes to industry practice in addition to Academic theory. It expands the academic conversations around online consumer behavior, circularity, and sustainable fashion consumption, and provides practical guidance for the brands and platforms for whom a dynamic marketplace is challenging. Ultimately, this research shows that the future of fashion may not depend on new materials or technologies, but on a deeper cultural shift, one where ideas of value, trust, and identity are being reshaped by changing consumer attitudes.

The study ultimately affirms that fashion, far from being a superficial or ephemeral domain, serves as a powerful lens through which to observe and influence broader societal transformations.

Keywords: Second-hand; reselling platforms; Gen Z; fashion

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Rethinking Diversification and Innovation in FMCG Markets: an Empirics-First Analysis

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1. Introduction

Fast-moving consumer goods (FMCG) markets across Europe have undergone structural transformations driven by intensified retailer power, saturation of product categories, and the rapid growth of Private Labels (PL). Italy represents one of the most promising and dynamic Private Label markets in Europe, distinguished by rapid growth in penetration, increasing category leadership, and rising consumer trust in retailer-owned brands. The country's low retailer concentration and sophisticated category management practices have enabled PL ranges to expand beyond traditional value tiers into premium, functional, and specialised segments, strengthening retailers' strategic influence across the FMCG landscape.

Retailers have consolidated their ability to shape assortments, control visibility, and drive innovation within categories. As a result, National Brand manufacturers (NB) face mounting pressure to defend brand equity and profitability. To respond, many manufacturers have relied heavily on product diversification, SKU proliferation, and incremental innovation to sustain market presence. These strategies are often complemented by persistently high promotional pressure, even as competitive roles evolve. Yet, it remains unclear whether such approaches generate real growth, expand market boundaries, or reinforce competitive advantage.

This study adopts an empirics-first approach to reassess the effectiveness of diversification and innovation strategies in contemporary FMCG retailing. Drawing on survey data from 24 leading manufacturers and scanner data from the entire Italian FMCG market, we explore how brands diversify, how innovation is executed, how promotional behaviour evolves, and how national brands compare to Private Labels over time. Rather than testing predefined hypotheses, we allow empirical patterns to guide conceptual refinement. The combination of managerial insights and market-level performance data enables a comprehensive analysis of strategic choices and their actual outcomes. Italy's dense retailer ecosystem and strong PL penetration provide an ideal context for understanding broader dynamics in mature FMCG markets.

2. Brief Literature Review and Research Gaps

Research on brand strategy identifies diversification and innovation as central drivers of growth. Brand extensions and line variants can leverage existing brand equity (Aaker, 1990; Keller, 2003), reinforce consumer attention, and manage shelf presence (Bronnenberg & Wathieu, 1996). However, scholars also highlight risks of overextension, including cannibalisation, loss of clarity, and diminishing incremental returns. While line extensions may support short-term defence, they seldom create genuine new demand (Dekimpe et al., 1997).

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Parallel literature on Private Labels has shifted from viewing PL as low-cost substitutes to recognising them as structural competitors, supported by retailer endorsement, cross-category legitimacy, and growing quality parity (Gielens, 2012; Sethuraman & Gielens, 2014). Retailers' category management power allows PL to achieve leadership in categories where NB traditionally dominated, altering the competitive landscape.

Promotional strategy is another critical dimension. Promotions can stimulate purchase incidence (Neslin, 2002), yet excessive reliance may erode baseline sales and distort brand positioning (Pauwels et al., 2002). Despite this, promotional behaviour tends to show rigidity, often disconnected from changes in market structure or brand role.

Finally, innovation research acknowledges that new product performance depends on category context, retailer support, and display conditions (Ataman et al., 2010). However, most empirical studies analyse innovation at aggregated market levels, neglecting channel heterogeneity. This is a significant omission in markets where discounters, supermarkets, and premium retailers differ in shopper missions, space allocation, and innovation visibility.

Together, these works highlight the strategic complexity of FMCG markets but leave open fundamental questions about the real contribution of diversification and how brands navigate increasingly PL-dominated environments.

Despite extensive scholarship, three key gaps persist:

a**.** Limited empirical assessment of diversification outcomes: while diversification is widely promoted as a growth strategy, few studies quantify its actual contribution to portfolio renewal or sales expansion. Existing work often assumes diversification to be beneficial without testing whether it changes competitive boundaries or merely redistributes volume across variants.

b. Lack of integration between diversification, brand role, and promotional behaviour: research seldom links diversification patterns to competitive roles (leader vs. follower). Our evidence suggests that follower brands diversify disproportionately and maintain high promotional pressure even in weak competitive positions. This misalignment remains underexplored theoretically and empirically.

c. Absence of channel-sensitive innovation frameworks: innovation has rarely been studied at the channel level, despite widespread retailer heterogeneity and the centrality of retailer endorsement for innovation success. The neglect of channel-specific patterns limits understanding of how innovation performs across formats and how PL strategies reshape innovation pathways.

Taken together, these gaps reveal a structural disconnect between the strategies national brand manufacturers prioritise - diversification, innovation, and promotions - and the market dynamics unfolding in an environment increasingly shaped by Private Labels. Existing literature provides only partial insights into how these strategic levers operate under contemporary retail conditions, and it does not fully account for the asymmetries introduced by retailer-owned brands or for the limited market impact of incremental product proliferation. Moreover, prior studies rarely integrate strategic intentions with actual market outcomes, leaving unclear whether manufacturers' efforts effectively sustain competitiveness in the face of expanding PL presence. To address these limitations, this study investigates the following research question (RQ):

RQ. How effective are national brand manufacturers' diversification, innovation, and promotional strategies in sustaining competitive performance within an Italian FMCG market increasingly shaped by the rise of Private Labels?

3. Data and methodology

This study employs a mixed-method, empirics-first design (Golden et al., 2023), integrating managerial perceptions with objective market behaviour. A structured survey was conducted with 24 national brand manufacturers operating in major FMCG categories. The instrument collected information on strategic priorities, innovation intensity, diversification initiatives, promotional investments, and perceptions of category evolution.

To validate survey insights, we analysed longitudinal scanner data covering the full Italian FMCG market. These data offer granular visibility into sales dynamics, category leadership, promotional intensity, and comparative trends for NB and PL.

We follow an empirics-first logic through four stages:

- Pattern identification across survey and scanner data
- Cross-validation of managerial perceptions with observed outcomes
- Segmentation by brand role (leader vs. follower) and category type (core vs. non-core)
- Interpretive synthesis feeding conceptual refinement on diversification and innovation under retailer-driven competition

This approach enables us to uncover structural regularities that traditional hypothesis-driven studies often overlook.

4. Results

This section integrates survey evidence from 24 national brand manufacturers (NB) with scanner-based market data from the Italian FMCG sector. The results are structured around five tables derived directly from the empirical material and are presented sequentially to illustrate patterns in innovation, diversification, competitive roles, and the relative performance of NB and Private Labels (PL). Across all analyses, a consistent picture emerges: NB increasingly rely on tactical proliferation, while PL consolidate structural advantages across categories.

Innovation Intensity and the Nature of New Launches

To assess the strategic depth of NB innovation, Table 1 summarises the composition of new industrial launches in 2025. The data show that line extensions account for 53.6% of all launches, making them the dominant form of innovation. New lines under existing brands represent an additional 28.0%, whereas completely new brands make up only 10.1%, despite wide variation among companies (0-79%). A small share (8.3%) pertains to existing foreign brands introduced in Italy.

Type of Launch	**Mean % of Total Launches**	**Range Across NB Groups**
Line extensions of existing brands	53.6%	4% - 93%
New lines under existing brands	28.0%	0% - 70%
Existing foreign brands launched in Italy	8.3%	0% - 50%
Completely new brands created	10.1%	0% - 79%

Table 1. Innovation Mix of National Brand Launches, 2025

These results indicate that manufacturers prioritize incremental innovation, primarily through variants that reinforce existing brand architectures. The prevalence of line extensions, combined with the fact that some firms launched more than 100 new SKUs in a single year (Circana, 2025), shows that innovation is often used tactically to secure distribution and shelf visibility rather than to expand consumption or enter new demand spaces. This innovation model lacks strategic depth, as it reinforces existing boundaries rather than challenging or extending them.

Limited contribution of market diversification

Despite managerial emphasis on diversification beyond core categories, the actual impact of such strategies is marginal. Table 2 summarises the contribution of new categories introduced over the past three years.

Indicator	**Mean Value (NB)**	**Range Across NB Groups**
% of SKU in new categories vs. 2022	4.8%	0% - 30%
% of sales generated in new categories vs. 2022	5.3%	0% - 35%

Table 2. Contribution of New Categories to Portfolio and Sales

The data show that diversification into new categories accounts for less than 5% of both product assortment and total revenues. Even for firms more active in diversification, the revenue contribution rarely exceeds one-third. These findings demonstrate that market diversification efforts are not translating into meaningful commercial outcomes. Instead, they appear to dilute managerial attention and resource allocation while delivering limited new growth. This is consistent with the broader theme of tactical proliferation rather than strategic expansion.

Differences in category breadth and promotional intensity by brand role

Scanner data reveal significant structural differences between leaders and followers, summarised in Table 3. Leader brands operate in fewer categories - 3.2 on average - whereas follower brands operate across 6.1 categories, nearly double. This suggests that follower brands overextend their portfolios in an attempt to compensate for weaker market positions. The pattern is reinforced by promotional intensity: followers exhibit 34.5% promotional pressure, compared to 33.0% for leaders.

Brand Role	**Avg. Number of Categories (2025)**	**Value Share Trend**	**Promotional Pressure (2025)**
Leaders	3.2	Declining share in core categories (29.4% to 26.6%)	33.0%
Followers	6.1	Declining share in secondary categories (4.0% to 3.6%)	34.5%

Table 3. Category Breadth and Promotional Pressure by Brand Role

These findings indicate that promotional strategies remain rigid and undifferentiated, even when competitive positions deteriorate. Rather than tailoring promotions to market structure or brand role, NB maintain or increase promotional effort in secondary categories, where returns are typically lower. This suggests a mismatch between commercial execution and strategic positioning - and contributes to erosion of profitability.

Comparative growth trajectories of NB and PL

A central element of this study is the comparison between NB and Private Label performance. Table 4 shows the evolution of value sales between 2020 and 2025 across core and non-core categories.

Segment	**NB Growth**	**PL Growth**
Core categories	+€3.9B	+€5.1B
Non-core categories	-€1.2B	+€2.3B
Total growth	+€2.7B	+€7.4B

Table 4. Growth of NB vs. PL in Core and Non-Core Categories, 2020-2025

The results clearly show that PL outperform NB across all segments. NB achieve modest growth in core categories but decline in non-core areas, while PL exhibit strong and balanced growth in both. This pattern supports the interpretation that PL operate with a structurally transversal model, leveraging retailer control over categories to gain legitimacy and share, whereas NB struggle to sustain performance outside historical strengths.

Inversion of category leadership and price convergence

Table 5 expands on the structural shift in competitiveness by comparing leadership and price indices over time.

Metric	**2020 NB**	**2025 NB**	**2020 PL**	**2025 PL**
Number of categories with leadership	241	215	219	246
Weighted incidence of category leadership	44.6%	34.4%	55.4%	65.6%
Average Price Index	144	141	71	74

Table 5. Evolution of Category Leadership and Price Indices, 2020-2025

The inversion of leadership is striking: PL increase leadership from 219 to 246 categories, surpassing NB, whose leadership declines from 241 to 215. At the same time, price differences narrow, not because PL cut prices, but because NB reduce theirs. This strategic convergence undermines differentiation and accelerates consumer migration toward PL, which offer similar value propositions at structurally advantaged cost positions.

Summary of results

Together, the tables reveal a consistent narrative: NB strategies rely heavily on incremental innovation, tactical diversification, and uniform promotional policies that fail to account for competitive roles or structural changes in the market. Meanwhile, PL continue to strengthen their presence, leveraging retailer endorsement, transversal category coverage, and coherent price-value positioning. These dynamics collectively reshape the competitive landscape and challenge long-standing assumptions about the sources of brand growth in FMCG markets.

5. Discussion

The results reveal a structural misalignment between manufacturers' strategic intentions and market realities. First, diversification remains reactive and defensive. Followers diversify more extensively than leaders, yet diversification contributes little to growth. This indicates that diversification is often a symptom of competitive weakness rather than a pathway to leadership. Second, innovation is treated as channel-agnostic, despite clear differences in how retail formats legitimise, display, and support new products. This blind spot reduces the effectiveness of innovation and may contribute to premature failure rates. Third, retailer-driven competition reshapes strategic logic. PL's transversal presence and structural control over assortments make category breadth a natural competitive asset. NB, whose equity depends on vertical depth and differentiated value propositions, cannot imitate retailer strategies without eroding their brand rationale. Finally, promotional behaviour exhibits rigidity: even as brands lose leadership, promotional intensity remains high or increases, suggesting organisational routines rather than adaptive responses to market structure.

6. Conclusion and managerial implications

This study offers an empirically grounded reassessment of diversification, innovation, and competitive positioning in FMCG markets. The findings show that product diversification - despite being central to managerial strategy - rarely expands markets or strengthens competitiveness. Instead, manufacturers should shift attention toward market-centric diversification, identifying new consumption occasions, unmet needs, or broader demand spaces rather than accumulating incremental variants. Managers should also develop channel-sensitive innovation strategies, recognising that innovation performance varies across retail environments. Collaboration with retailers, differentiated launch programmes, and channel-specific shopper insights will be essential. Promotional investments must be aligned with brand competitive roles. Leaders and followers require distinct promotional logics; maintaining uniform intensity is inefficient and may harm long-term brand equity. Finally, manufacturers must resist strategic convergence with Private Labels. Differentiation - not imitation - is the foundation of value creation in retailer-driven markets.

7. Limitations and future research

This study is subject to several limitations that define both its scope and its opportunities for future research. First, the analysis focuses exclusively on the Italian FMCG market, a context with strong PL penetration and high retailer concentration. While Italy provides a valuable setting for observing mature retail dynamics, results may not generalise to markets with different competitive structures or PL development. Second, the study is descriptive and exploratory, consistent with the empirics-first approach. Further work should incorporate causal modelling, structural equation approaches, or quasi-experimental methods to deepen the analysis. Third, while scanner data allow channel-level breakdown, the present study has only begun to explore channel effects conceptually. Future research should operationalise channel-sensitive innovation models, examining how discount, supermarket, hypermarket, and premium channels shape

adoption and performance. Finally, the survey sample covers 24 NB manufacturers representing a substantial but incomplete share of the Italian market. Expanding the sample and integrating retailer perspectives would enrich understanding of how strategic decisions evolve along the value chain. Despite these limitations, the study offers a foundation for a broader research programme aimed at rethinking diversification, innovation, and brand strategy in an era of escalating retailer dominance and Private Label sophistication.

Keywords: FMCG; private label; diversification; innovation; brand strategy; Italy

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Track 15: SYNERGIES FOR COMPETITIVE ADVANTAGE: QUALITY, INNOVATION, AND SUSTAINABILITY

Il monitoraggio ambientale con drone a supporto degli strumenti di gestione ambientale di processo

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Antonella Pia d'Aries, Michele Posa, Ivano De Turi, Antonello Garzoni

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Flaviana Capolini, Maria Francesca Renzi, Olimpia Martucci, Roberta Guglielmetti Mugion, Laura Di Pietro , Veronica Ungaro

Il monitoraggio ambientale con drone a supporto degli strumenti di gestione ambientale di processo

Stefano Duglio[1], Giuseppe Tassielli[2], Riccardo Beltramo[3]

1. Introduction

Il presente contributo illustra le attività che si stanno compiendo nell'ambito del progetto "L'uso di sistemi aeromobili a pilotaggio remoto (droni) nel monitoraggio ambientale integrato con sistemi di gestione ambientale e analisi del ciclo di vita (LCA): set-up ai fini del miglioramento del profilo ambientale di siti di discarica e impianti industriali" (Progetto di rilevanza nazionale - PRIN - 2022), con il contributo del Ministero della Educazione, Università e ricerca, Prot. 2022FPFPT5, al fine di impiegare i dati rilevati da drone per il miglioramento della gestione ambientale di processo, con riferimento ai Sistemi di Gestione Ambientali normati attraverso lo Standard Internazionale ISO 14001:2015 o il Regolamento Europeo EMAS – Eco-Management and Audit Scheme.

L'attività è attualmente in itinere e rappresenta il frutto della collaborazione tra l'Università degli Studi di Bari "Aldo Moro", quale capofila di progetto e l'Università degli Studi di Torino, e si sta concentrando in particolare sul monitoraggio delle emissioni fuggitive di gas metano (CH4) da discariche di rifiuti solidi urbani.

2. Inquadramento del contesto

Il monitoraggio ambientale svolge un ruolo centrale nella diagnosi degli impatti generati dalla gestione dei siti e degli impianti produttivi in genere, nonché nel miglioramento della comprensione dei processi di produzione in un'ottica di ottimizzazione dell'impiego delle risorse e della gestione degli aspetti ambientali significativi derivanti dai processi stessi.

Con riferimento alle discariche di rifiuti urbani, è necessario sottolineare come queste rappresentino una delle principali fonti di emissione di metano (Yong et al., 2024) e recenti studi (Mønster et al. 2019) hanno sottolineato che circa il 12% del metano generato globalmente dalle discariche sia collettato e della necessità, quindi, di dare priorità a questa operation.

Nel contesto europeo ed italiano, il collettamento di gas metano a finalità di produzione di energia elettrica e termica si pone quale vincolo normativo e rappresenta un processo significativo, sia in termini di efficienza della produzione energetica, che in termini di potenziali emissioni non controllate (fuggitive) di gas climalteranti nell'ambiente (Daugėla et al., 2020). Tuttavia, e nonostante il fatto che tutte le discariche abbiamo processi ed impianti atti a collettare il gas metano, vi possono sempre essere delle emissioni non controllate in atmosfera (Daugėla et al., 2020).

Ne consegue che il monitoraggio di tali emissioni riveste un duplice interesse per l'ente gestore di discarica di rifiuti solidi urbani: da un alto, infatti, esso si pone quale strumento per una corretta gestione ambientale e, inoltre, può fornire indicazioni utili a migliorare l'efficienza di processo, con implicazioni economiche che possono essere significative per i gestori dei siti.

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Ulteriore obiettivo del progetto, quindi, è quello di integrare le misure effettuate nei Sistemi di Gestione Ambientale (SGA) già formalizzati nei casi studio, attraverso l'adesione allo Standard ISO 14001:2015 o a Regolamento Europeo EMAS in modo che i rilievi possano contribuire al miglioramento del profilo ambientale dei siti e delle aziende.

Come noto, i Sistemi di Gestione Ambientale maggiormente implementati per la gestione ambientale di processo, ovvero lo Standard ISO 14001 ed il Regolamento EMAS, hanno la medesima struttura documentale e si differenziano sostanzialmente per un diverso livello di comunicazione con le parti interessate che vede, in EMAS, la sua principale espressione nel documento di Dichiarazione Ambientale (EMAS, 2009). Entrambi i modelli pongono un forte accento sull'importanza del monitoraggio delle variabili ambientali significative in fase di controllo (Beltramo et al., 2016) come elemento per comprendere l'andamento del profilo ambientale dell'organizzazione ed il raggiungimento degli obiettivi e traguardi ambientali.

3. Approccio metodologico

Il monitoraggio delle emissioni fuggitive di gas metano da discarica non è una operazione di facile svolgimento per diversi motivi: in primo luogo, le emissioni possono variare da discarica a discarica (Fosco et al., 2024), la distribuzione del gas non è necessariamente uniforme (Jońca et al., 2022) e l'evento può essere episodico (Yang et al., 2018), rendendo difficile intercettare e quantificare l'emissione stessa.

Allo stato attuale, quindi, nel campo della ricerca scientifica sul tema sono state testate diverse soluzioni, ognuna delle quali presenta punti di forza e di debolezza, in relazione al fatto che la misurazione delle emissioni fuggitive ha dei vincoli sia in termini spaziali che temporali. Esistono diversi metodi per rilevare le perdite di gas di discarica: piattaforme terrestri, rilevatori portatili, laboratori mobili, aeromobili con equipaggio dotati di strumenti specifici e satelliti (Yang et al., 2018; Shaw et al., 2021; Hollenbeck et al., 2021; Tassielli et al., 2024) o una loro combinazione.

Ognuna di queste metodologie contiene dei punti di debolezza: le piattaforme terrestri, attraverso l'impiego delle camere di flusso a terra, possono superare la variabile temporale, essendo in grado di operare per lunghi periodi di tempo, ma non sono in grado di coprire aree ampie (Emran et al., 2017), mente i satelliti, che possono ovviare a tale criticità, possono avere problemi in termini di risoluzione spaziale (Mønster et al., 2019) oltre a costi operativi elevati (Yang et al., 2018).

Altre tecnologie quali i rilevatori portatili, i laboratori mobili ed i velivoli con equipaggio solitamente incontrano limitazioni nella copertura di vaste aree, mentre gli elicotteri devono far fronte a costi elevati e difficoltà nel raggiungere luoghi remoti ed in aree interne.

In questo contesto, il gruppo di ricerca ha optato per impiegare i cosiddetti sistemi aeromobili a pilotaggio remoto (acronimo UAS dall'inglese Unmanned Aerial Systems), anche detti droni, in quanto presentano un notevole potenziale per migliorare radicalmente il monitoraggio ambientale, ponendosi come opportuna soluzione che può ovviare alle criticità poc'anzi esposte. Infatti, i sensori montati su UAS offrono una straordinaria opportunità per colmare il divario esistente tra le osservazioni sul campo ed il tradizionale telerilevamento aereo, fornendo dettagli spaziali elevati su aree relativamente grandi con un possibile risparmio di costi e di tempo impiegato per svolgere l'attività.

L'impiego dei droni nel monitoraggio ambientale delle emissioni fuggitive di metano dalle discariche rappresenta una significativa innovazione metodologica rispetto ai tradizionali sistemi di misura a terra. Le piattaforme a pilotaggio remoto consentono infatti di ottenere una copertura spaziale più estesa e dettagliata, garantendo una risoluzione superiore nella localizzazione delle sorgenti di emissione. Grazie alla possibilità di volare a basse quote e di seguire traiettorie programmate con elevata precisione, i droni permettono di individuare con maggiore accuratezza

le aree critiche, incluse quelle difficilmente accessibili per via delle condizioni morfologiche o della presenza di infrastrutture.

Dal punto di vista operativo, l'utilizzo dei droni comporta una notevole riduzione dei tempi di rilievo e un incremento dell'efficienza complessiva delle campagne di monitoraggio. Le operazioni possono essere condotte su ampie superfici in tempi sensibilmente inferiori rispetto ai metodi manuali, consentendo di ripetere le misurazioni con maggiore frequenza e di rilevare anche variazioni temporanee delle emissioni.

Un ulteriore vantaggio riguarda la sicurezza degli operatori, che possono effettuare le attività di controllo mantenendosi a distanza dalle aree potenzialmente pericolose, evitando così l'esposizione diretta a gas, terreni instabili o superfici irregolari tipiche dei siti di discarica.

Dal punto di vista tecnico-scientifico, l'integrazione tra sensori specifici per la rilevazione del metano – come quelli basati sulla tecnologia TDLAS (Tunable Diode Laser Absorption Spectroscopy) – e sistemi di posizionamento satellitare consente di ottenere dati accurati e georeferenziati. Tali informazioni possono essere elaborate per generare mappe di concentrazione, modelli di dispersione o rappresentazioni tridimensionali del plume, fornendo un supporto analitico di elevato dettaglio per la valutazione e la mitigazione delle emissioni.

L'uso dei droni risulta inoltre vantaggioso sotto il profilo economico: la riduzione del personale necessario, dei tempi operativi e delle attività di campionamento al suolo comporta una diminuzione complessiva dei costi di monitoraggio. Allo stesso tempo, la possibilità di identificare tempestivamente eventuali fughe di biogas contribuisce a ottimizzare i sistemi di captazione e a ridurre le perdite di metano, con benefici ambientali ed energetici.

Infine, la tracciabilità e la documentazione digitale dei dati raccolti favoriscono la conformità ai requisiti normativi e la trasparenza nei processi di controllo ambientale. Le informazioni possono essere archiviate e integrate in sistemi GIS o in piattaforme di monitoraggio continuo, consentendo un approccio più sistematico e sostenibile alla gestione della discarica.

Inoltre, l'attività di monitoraggio consente di alimentare gli archivi dati che sono a supporto della fase di controllo dei Sistemi di Gestione Ambientale, che possono essere impiegati sia a corredo della predisposizione della Analisi Ambientale Iniziale e di contesto che, in caso di adesione alle Registrazione EMAS, della Dichiarazione Ambientale.

Nell'ambito del progetto, quindi, si sta operando per integrare le informazioni raccolte tramite UAS nell'Analisi Ambientale Iniziale e nelle registrazioni del sistema di gestione ambientale, fondamentali per il calcolo degli indicatori utili a comprendere il raggiungimento degli obiettivi e dei traguardi che sono stati identificati dall'ente gestore. Inoltre, l'azione risulterà utile in sede di Audit interno, considerato che il monitoraggio degli obiettivi è fondamentale per verificare l'eventuale non raggiungimento di parte di essi, che rappresenta una importante fattispecie di non conformità di cui è necessario rilevare le cause e proporre le opportune azioni preventive e correttive che andranno poi discusse e confermate in fase di riesame del sistema. La Figura 1 riporta il diagramma di flusso delle fasi di processo nell'ambito di un Sistema di Gestione Ambientale. In particolare, si evidenzia in quali momenti possono essere integrati i dati ottenuti dalla misurazione effettuata con drone.

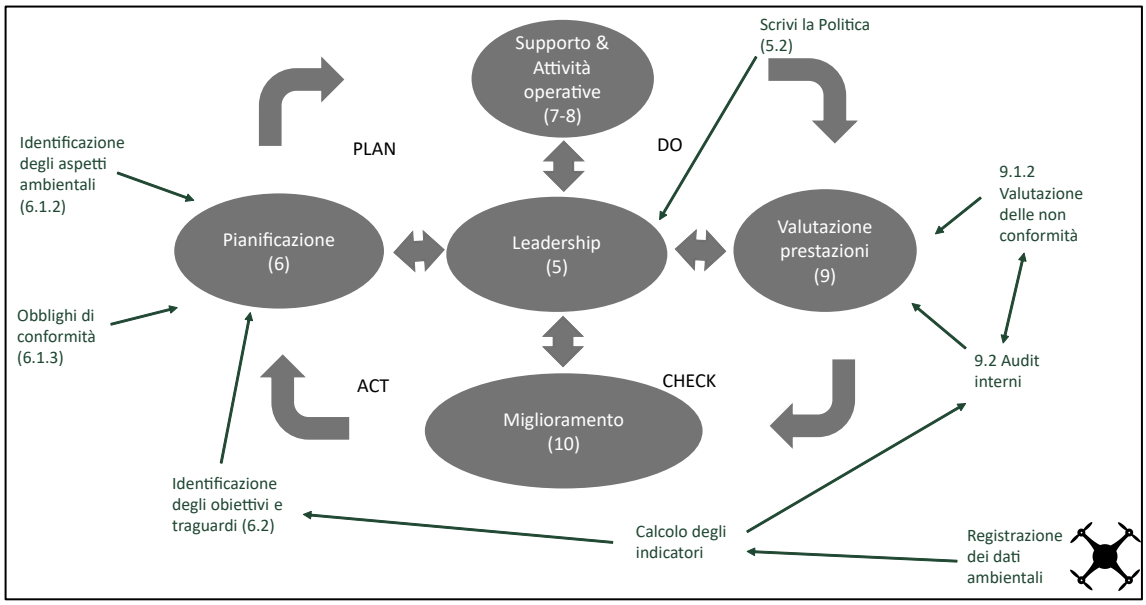


Figura 1. Monitoraggio da drone e fasi di processo di un Sistema di Gestione Ambientale

4. Fattibilità economica dell'uso di droni per il monitoraggio ambientale delle discariche

L'adozione di droni per il monitoraggio ambientale delle emissioni di biogas da discarica richiede una valutazione economica accurata, che tenga conto sia dei costi diretti sia dei benefici indiretti nel medio-lungo periodo. I costi associati a questa tecnologia possono essere suddivisi in investimenti iniziali e costi operativi ricorrenti.

Gli investimenti iniziali comprendono innanzitutto l'acquisto del drone, che per applicazioni professionali di monitoraggio ambientale presenta un costo variabile in funzione delle prestazioni, dell'autonomia di volo e della capacità di carico. A questo si aggiunge il costo dei sensori specifici per il rilevamento delle emissioni di biogas, in particolare sensori per il metano, che rappresentano spesso la voce più rilevante dell'investimento. Ulteriori costi riguardano i software di elaborazione e analisi dei dati, necessari per trasformare le misurazioni grezze in mappe emissive e report ambientali, nonché la formazione del personale e le certificazioni richieste dalla normativa vigente per il pilotaggio dei droni. La tabella 1 riporta una stima dei costi di investimento iniziali necessari per avviare un'attività di monitoraggio del biogas tramite drone.

Voce di costo	**Valore indicativo**
Drone professionale	€10.000 – >€20.000+
Sensore gas/metano dedicato	€20.000 – €30.000+
Software di analisi dati + GIS	€5.000 – €10.000 (licenze)
Formazione personale / certificazioni	€1.000 – €5.000 a operatore

Tabella 1. Investimenti iniziali

Accanto ai costi di avviamento, occorre considerare i costi operativi annuali, che includono la manutenzione del drone e dei sensori, la sostituzione delle batterie, le assicurazioni obbligatorie, l'aggiornamento dei software e la calibrazione periodica della strumentazione. A

questi si sommano i costi del personale tecnico addetto alle operazioni di volo e all'interpretazione dei dati raccolti. Complessivamente, tali costi risultano generalmente inferiori rispetto a quelli necessari per condurre monitoraggi tradizionali estesi e frequenti sul campo.

Il confronto economico con i metodi di monitoraggio tradizionali evidenzia alcuni vantaggi significativi dell'uso dei droni. Le tecniche convenzionali, basate su rilievi a terra e campionamenti puntuali, comportano un impiego intensivo di personale, tempi lunghi e una copertura spaziale limitata. Al contrario, i droni consentono di monitorare vaste superfici in tempi ridotti, riducendo il numero di ore uomo necessarie e aumentando la frequenza dei controlli. Questo porta a una maggiore efficienza operativa e a una migliore individuazione delle emissioni fuggitive di metano.

Oltre ai benefici economici diretti, l'utilizzo dei droni genera importanti benefici indiretti. La disponibilità di dati ad alta risoluzione spaziale e temporale migliora la qualità del monitoraggio ambientale e supporta una gestione più efficace della discarica. L'individuazione precoce delle perdite di biogas consente interventi correttivi tempestivi, riducendo le emissioni climalteranti e i potenziali costi associati a sanzioni o non conformità normative. Inoltre, la raccolta sistematica di dati digitali favorisce la trasparenza e il rispetto degli obblighi di rendicontazione ambientale, con ricadute positive in termini di immagine e sostenibilità.

In conclusione, dal punto di vista economico l'impiego dei droni nel monitoraggio delle emissioni di biogas da discarica risulta generalmente fattibile e vantaggioso, soprattutto per siti di medie e grandi dimensioni o per gestori che devono effettuare controlli frequenti. Sebbene l'investimento iniziale possa essere significativo, il ritorno economico può manifestarsi in un arco temporale di tre-cinque anni, grazie alla riduzione dei costi operativi, al miglioramento dell'efficienza e alla mitigazione dei rischi ambientali e normativi.

5. Risultati attesi

Il progetto è attualmente in una fase di implementazione che ha visto, allo stato attuale, l'impiego dei droni con riferimento a due casi studio, le discariche di rifiuti solidi urbani gestite dalla ASET S.p.A. di Fano in Provincia di Pesaro-Urbino ed Ecologica Sangro S.p.A., a Lanciano, in Provincia di Chieti.

La Tabella 2 riporta le informazioni principali dei casi studio pilota e dell'attività di monitoraggio effettuata.

Denominazione	**Ente Gestore**	**Località**	**Capienza**	**Numero di voli**	**Ettari coperti**
Discarica di Fano	Aset S.p.A.	Fano	50/55.000 tonnellate/anno	42	17,24
Discarica di Lanciano	Ecologica Sangro S.p.A.	Lanciano	100.000 tonnellate/anno	38	9,6

Tabella 2. Casi pilota

Il rilievo è stato condotto con l'obiettivo di effettuare misurazioni ripetute delle emissioni in differenti condizioni meteoclimatiche ed emissive, al fine di valutare la variabilità dei risultati in funzione dei parametri ambientali. A tal proposito, sono state eseguite complessivamente sei sessioni di misura nell'ambito della medesima campagna sperimentale: due nella mattinata iniziale, due nel pomeriggio e due nel mattino successivo, in modo da garantire una copertura temporale rappresentativa delle diverse condizioni atmosferiche.

In tabella è riportato il numero totale di voli effettuati sui due siti di indagine, necessari per coprire integralmente le aree di interesse e consentire la ripetizione delle misure in condizioni controllate.

Per l'acquisizione dei dati è stato impiegato un drone DJI Matrice 300 RTK, equipaggiato con un sensore per la rilevazione del metano basato su tecnologia TDLAS (Tunable Diode Laser Absorption Spectroscopy).

La metodologia di rilievo adottata si articola in due fasi operative distinte: una prima fase di detection, finalizzata all'individuazione preliminare delle fughe di metano, e una successiva fase di quantificazione, mirata alla stima del flusso emissivo. L'applicazione delle metodiche sviluppate ha richiesto la definizione di specifici parametri di volo, calibrati per garantire la ripetibilità e l'affidabilità delle misurazioni. Le caratteristiche di volo sono state impostate come segue: quota costante dal suolo pari a 10 m, velocità di traslazione del drone di 2 m/s e frequenza di acquisizione del dato pari a 10 Hz.

Contestualmente alle misurazioni delle emissioni, sono stati acquisiti i dati meteoclimatici mediante una stazione meteorologica portatile installata in prossimità del sito di rilievo. Le variabili registrate comprendono la temperatura dell'aria, la pressione atmosferica, la direzione e la velocità del vento, informazioni necessarie per la corretta interpretazione dei dati emissivi e per l'analisi delle condizioni di dispersione.

I dati raw ottenuti dalle campagne di misura necessitano di successiva elaborazione al fine di estrapolarne le informazioni utili. A tal fine sono stati testati e messi a punto vari algoritmi con differenti funzioni: rimozioni degli errori di misura del sensore, soprattutto in fase di registrazione del background di metano presente nell'ambiente; individuazione delle serie di dati contenenti effettivamente letture di metano emesso; quantificazione dei flussi corrispondenti a ciascun leak individuato.

I dati così ottenuti sono utili a definire in maniera più approfondita il quadro emissivo dei siti. Le informazioni raccolte, pertanto, possono essere impiegate in forma integrata nei rispettivi sistemi di gestione ambientale per focalizzare maggiormente la significatività degli impatti generati dalle proprie attività.

Entrambi i siti sono dotati di strumenti gestionali di processo: in particolare, ASET S.p.A. è certificata secondo lo Standard ISO 14001:2025, con ultimo rinnovo a Marzo 2024, mentre Ecologica Sangro S.p.A. è sia certificata secondo lo Standard ISO 14001:2025 che registrata in conformità al Regolamento Europeo EMAS 1221/2009 e s.m.i., con Dichiarazione Ambientale emessa in Aprile 2025.

I risultati attesi, derivanti dalle fasi attualmente in implementazione, sono di seguito riportati:

1. Creazione dell'archivio dati a corredo della predisposizione del documento di Analisi Ambientale Iniziale e di Contesto (ISO 14001 ed EMAS) e della Dichiarazione Ambientale EMAS, attraverso la integrazione delle informazioni raccolte tramite UAS nell'analisi ambientale stessa.
2. Predisposizione di metodiche di post-processing più idonee per ottenere informazioni utili alla gestione.
3. Indicazione delle modalità di integrazione dell'uso di UAS all'interno di un Sistema di Gestione Ambientale e creazione di linee guida per l'impiego dei droni a tali finalità, in particolare sulle seguenti fasi di sistema:

- Punto norma 6.1 – "Misure relative ai rischi e alle opportunità", nella macrofase Pianificazione del sistema, relativamente alla valutazione degli aspetti ambientali significativi.
- Punto norma 7.4 – "Comunicazione", nella macrofase Sostegno dove, relativamente all'ambiente EMAS, si pone l'accento sulla necessità di divulgare le informazioni ambientali in coerenza con l'allegato IV "Comunicazione in materia ambientale", che contiene le specifiche per redigere la Dichiarazione Ambientale EMAS.
- Punto norma 9.1 – "Monitoraggio, misurazione, analisi e valutazione", nella macrofase di Valutazione delle prestazioni, nella sua parte di valutazione dei sistemi di monitoraggio.

Keywords: Droni; monitoraggio ambientale; discariche di rifiuti urbani; metano; sistemi di gestione ambientale

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L'innovazione circolare dei modelli di business nel contesto delle born-green startup

Antonella Pia d'Aries[1], Michele Posa[2], Ivano De Turi[3], Antonello Garzoni[4]

1. Introduction

L'attuale contesto economico, segnato dall'urgenza di promuovere nuove forme di creazione di valore sostenibile in linea con i principi della Triple Bottom Line (Elkington, 1997) (persone, pianeta e profitto) e con le linee guida dell'Unione Europea (European Commission, 2019; 2020), pone diverse sfide e opportunità rilevanti per la competitività delle imprese (Fülöp e Cifuentes-Faura, 2025). Oggi le aziende sono chiamate a ripensare l'imprenditorialità (Esau et al., 2025), l'organizzazione dei processi (Duan et al., 2024) e la gestione delle filiere (Cheng et al., 2023) per rispondere in modo virtuoso ai cambiamenti ambientali e sociali.

Ne deriva l'esigenza di un ripensamento in chiave sostenibile dell'identità aziendale (George, 2025) e del modello di business (Atkova et al., 2025), inteso come struttura logica che disciplina attività, creazione e distribuzione del valore (Climent e Haftor, 2021; Demil e Lecocq, 2010; Osterwalder e Pigneur, 2010; Teece, 2010). Questo obiettivo si confronta con un contesto profondamente trasformato da tecnologie quali intelligenza artificiale, blockchain, sensori intelligenti e deep-tech, che costituiscono risorse chiave per la competitività di lungo periodo (Xing et al., 2026) e, al contempo, abilitano il conseguimento degli Obiettivi di Sviluppo Sostenibile (Muench et al., 2022; Dal Mas et al., 2024). Ciononostante, molti modelli restano ancorati alla sola prospettiva tecnologica non pienamente integrata con la sostenibilità (Biloslavo et al., 2018), una criticità significativa alla luce dell'insostenibilità del paradigma lineare e dell'urgenza di promuovere forme più responsabili di creazione del valore (Sarja et al., 2021).

In questa prospettiva, l'innovazione del modello di business si configura come leva strategica capace di trasformare interi settori (Demil e Lecocq, 2010). Tra gli attori emergenti spiccano le born-green startup, che coniugano sostenibilità e solidità economica (Hahn et al., 2018), benché la ricerca empirica sulla loro adozione di strategie circolari resti limitata (Van Opstal e Borms, 2023). Operando spesso in nicchie favorevoli alla sperimentazione e alla definizione di nuovi paradigmi di mercato (Horne e Fichter, 2022), tali imprese devono tuttavia dimostrare capacità di consolidamento al di fuori di questi spazi. Persistono inoltre tensioni tra sostenibilità e crescita, aspetto centrale delle agende di ricerca avanzate da diversi studiosi (e.g., Filippelli et al., 2025). Il presente studio ha l'obiettivo di indagare tale quesito, esaminando come le born-green startup traducano i principi della sostenibilità in modelli di business circolari e quali fattori orientino il loro potenziale di crescita. Attraverso un single case study (Yin, 2017) su Alpha, startup italiana del food-tech, si osservano percorsi evolutivi fondati su apprendimento e adattamento continui, più che su espansione standardizzata. Le evidenze ampliano la comprensione dello sviluppo dei modelli circolari come processi relazionali e rigenerativi, evidenziando l'importanza di mantenere coerenza tra valori e crescita e il ruolo di contesti istituzionali abilitanti.

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La struttura dell'articolo è la seguente: la Sezione 2 offre una revisione della letteratura sull'innovazione circolare dei modelli di business e sulla sua convergenza con il contesto delle born-green startup, con un focus sul settore food-tech. La Sezione 3 illustra la metodologia di analisi; la Sezione 4 presenta i risultati preliminari, mentre la Sezione 5 conclude discutendo le implicazioni e delineando i suggerimenti per la ricerca futura.

2. Revisione della letteratura

2.1. Innovazione dei modelli di business ed economia circolare

Un modello di business articola la logica secondo cui un'azienda crea e fornisce valore ai clienti. Delinea inoltre l'architettura di ricavi, costi e profitti associati all'impresa che fornisce tale valore (Teece, 2010), basandosi su attività, risorse e capacità realizzate internamente o in collaborazione con partner e clienti (Zott e Amit, 2010). Da una prospettiva strategica, il modello di business orienta le decisioni in contesti incerti (McGrath, 2010) e amplia la nozione di valore oltre la relazione impresa–cliente, includendo tutti gli attori coinvolti nei processi organizzativi (Haftor e Climent, 2023). L'innovazione del modello di business è quindi emersa come prospettiva centrale per la riconfigurazione dei meccanismi di creazione e cattura del valore. Pur essendo spesso associata alla modifica della proposta di valore per il cliente (Bocken et al., 2014), l'innovazione dei modelli di business va intesa come un processo continuo (Bachmann e Jodlbauer, 2023).

L'innovazione sostenibile di questi ultimi nasce al fine di integrare obiettivi economici, ambientali e sociali (Shakeel et al., 2020; Yang et al., 2017; D'Amato et al., 2017), ma nella pratica è ancora affrontata con cautela, spesso percepita dalle imprese come costo piuttosto che come leva strategica (Dhir et al., 2023). In questo contesto, il paradigma dell'economia circolare si è affermato quale risposta al modello lineare, promuovendo la massimizzazione dell'uso e del valore di prodotti, componenti e materiali (Jabbour et al., 2019). Tale approccio permette di attenuare gli effetti della scarsità di risorse e dell'aumento dei costi energetici (Van Opstal e Borms, 2023), rafforzando il legame fra imprenditorialità, innovazione e risoluzione delle sfide socio-ambientali (Lüdeke-Freund e Dembek, 2017). La crescita della ricerca sull'innovazione sostenibile ha contribuito a chiarire come tecnologie e pratiche sociali facilitino le transizioni verso la sostenibilità (Boons e Lüdeke-Freund, 2013), enfatizzando il ruolo dei modelli di business fondati sulla Triple Bottom Line (Bocken et al., 2014).

Poiché sostenibilità ed economia circolare costituiscono sfide globali, la loro operazionalizzazione attraverso i modelli di business circolari assume rilevanza strategica (Geissdoerfer et al., 2017; Kajtazi et al., 2023). Questi traducono i principi dell'economia circolare in strutture operative complesse e innovative (Jabbour et al., 2019), orientate alla rigenerazione di valore lungo il ciclo di vita dei materiali (Bocken e Konietzko, 2022). La loro diffusione dipende dalla presenza di ecosistemi imprenditoriali dinamici ed orientati alla sostenibilità (Neumeyer e Santos, 2018), in grado di favorire la sperimentazione e la crescita di nuovi modelli circolari (Tiba et al., 2021).

Tuttavia, la loro gestione richiede capacità di fronteggiare le tensioni insite nelle transizioni sostenibili (Bommel, 2018). Nelle fasi iniziali di trasformazione settoriale, le nuove imprese sostenibili si mostrano più pronte a cogliere opportunità emergenti rispetto agli operatori tradizionali (Hockerts e Wüstenhagen, 2010). Tali realtà, definite "emerging Davids" (Hockerts & Wüstenhagen, 2010), si configurano in tal modo come protagoniste di un cambiamento orientato a integrare innovazione economica, rigenerazione ambientale e valore sociale.

2.2. Economia circolare e born-green startup

L'imprenditorialità sostenibile è emersa come un ambito distintivo di ricerca che integra la creazione di valore economico, sociale ed ecologico all'interno di un orientamento unitario (La

Rocca e Dal Molin, 2024). Essa pone l'accento sulla salvaguardia della natura, delle comunità e dei sistemi di supporto alla vita, generando al contempo benefici finanziari e non finanziari per la società (Shepherd et al., 2011). Tale prospettiva si è intensificata in risposta alle crescenti pressioni ecologiche e ai limiti planetari, che al tempo stesso aprono nuove opportunità per le startup ecologiche di creare valore affrontando le sfide globali della sostenibilità (Kuckertz et al., 2019; Bonfanti et al., 2024).

Le imprese green incarnano questa evoluzione, offrendo soluzioni pratiche e innovative a problematiche di natura sociale e ambientale (Criscuolo e Menon, 2015; Esty e Winston, 2009). Tra queste, le born-green startup si distinguono come veri e propri agenti del cambiamento. Nate con la sostenibilità come missione fondativa, piuttosto che come adattamento successivo, esse si configurano come motori dell'innovazione verde e circolare (Bendig et al., 2022; Hoang e Böckel, 2024), spesso sfidando le logiche dominanti di mercato e richiedendo pertanto forti livelli di legittimazione e fiducia. La loro peculiarità risiede nell'agilità organizzativa, nell'orientamento valoriale e nell'assenza di vincoli legati a sistemi ereditati dal passato (Demirel et al., 2019), elementi che consentono loro di sperimentare modelli di business circolari di natura dirompente (Henry et al., 2020) e di porsi come precursori nei processi di transizione verso la sostenibilità. Molte di queste imprese nascono direttamente su principi circolari (Sehnem et al., 2021). In tal modo, esse propongono soluzioni radicali a problematiche quali l'inquinamento, l'esaurimento delle risorse e la tutela della salute pubblica (Tiba et al., 2021).

Il loro percorso di sviluppo segue tuttavia le fasi tipiche del ciclo di vita imprenditoriale: startup, transizione, crescita e uscita (Picken, 2017), nel corso delle quali possono emergere specifiche tensioni. La pressione a crescere rapidamente per attrarre investimenti, conquistare quote di mercato e ottenere economie di scala si scontra spesso con la necessità di preservare la coerenza e la performance sostenibile nel lungo periodo (Filippelli et al., 2025). In questo contesto, sebbene le startup siano ampiamente riconosciute come motori di innovazione, gli studi empirici dedicati alla selezione e all'implementazione di strategie circolari restano limitati ed in uno stato iniziale (Van Opstal e Borms, 2023; De Angelis, 2021).

3. Metodologia

3.1. Disegno di ricerca e strategia di campionamento

Per rispondere agli obiettivi di ricerca, lo studio adotta un campionamento per criteri (criterion sampling) per la selezione di un caso ad alta informatività (Fletcher e Plakoyiannaki, 2011; Patton, 2002). In primo luogo, ci siamo concentrati su settori caratterizzati da una forte compresenza di innovazione e sostenibilità. In secondo luogo, abbiamo cercato born-green startup che avessero conseguito risultati rilevanti in termini di performance sociali, ambientali ed economiche, così da esaminare il processo di integrazione di pratiche sostenibili nel modello di business. In terzo luogo, abbiamo dato priorità a casi che garantissero accesso a informatori con prospettive multiple, interne ed esterne all'impresa (De Massis e Kotlar, 2014). In quarto luogo, ci siamo orientati verso born-green startup basate su modelli di produzione circolari, idonee a rivelare antecedenti, barriere e fattori abilitanti di tale processo. Infine, abbiamo selezionato questo caso rivelatorio poiché, nonostante la recente fondazione (2023), Alpha, startup innovativa del settore food-tech, si è distinta grazie a un'alternativa al cioccolato priva di cacao, ottenuta tramite una tecnologia brevettata che trasforma la carruba, attraverso processi di tostatura e fermentazione, in un prodotto di alta qualità. Tale innovazione valorizza la materia prima e si allinea ai principi dell'economia circolare, promuovendo l'efficienza nell'uso delle risorse e la riduzione degli sprechi.

3.2. Raccolta dati

I dati sono stati raccolti da fonti primarie e secondarie mediante un disegno qualitativo che combina interviste semi-strutturate, osservazione diretta e analisi documentale (Strauss e Corbin, 1998). La raccolta è iniziata nella primavera 2025 ed è proseguita per diversi mesi, consentendo un coinvolgimento prolungato con i membri di Alpha e con l'ecosistema organizzativo, al fine di cogliere voci e prospettive multiple. Una sintesi operativa delle fonti e dei materiali è riportata in Tabella I.

I dati primari sono stati raccolti mediante tre round di interviste semi-strutturate con figure chiave di Alpha Food: il Co-founder, il New Product Development Manager e il Financial Manager. Le interviste hanno esplorato le componenti del modello di business (meccanismi di creazione, distribuzione e cattura del valore), il grado di integrazione dei principi di economia circolare, le barriere e i fattori abilitanti, nonché il potenziale di crescita del modello. Tutte le interviste sono state audio-registrate, trascritte verbatim e integrate con annotazioni raccolte durante visite in loco, osservazioni dirette e conversazioni informali in occasione di incontri operativi ed eventi pubblici. I dati secondari sono stati raccolti attraverso fonti documentali. Queste hanno incluso materiali online (sito web, comunicati stampa, post social), documentazione interna e risorse visive/multimediali (fotografie, video, rassegna stampa). Tali materiali sono stati analizzati per contestualizzare le evidenze primarie, ricostruire l'evoluzione storica e strategica di Alpha e triangolare le prospettive, rafforzando la validità costruttiva (Eisenhardt, 1989; De Massis e Kotlar, 2014) e supportando lo sviluppo teorico attraverso profondità contestuale e convergenza evidenziale (Rondi et al., 2024).

Fonti	**Metodi di raccolta dati**	**Descrizione**	
Fonti primarie	Interviste	CMO e Co-Founder	1
		NPD Manager	1
		Financial Manager	1
	Visite in loco	Alpha	2
	Osservazioni dirette		
Fonti secondarie	Documenti di archivio	Sito web e social network	Alpha
		Archivi online	+ 14 articoli,
		Comunicati stampa	video, podcast.

Tabella 1. Raccolta dati

3.2. Analisi dei dati

I dati qualitativi sono stati e saranno analizzati attraverso un processo abduttivo e iterativo (Timmermans e Tavory, 2012), muovendosi costantemente tra evidenza empirica e interpretazione teorica per sviluppare una comprensione fondata sul campo ma teoricamente informata del fenomeno. Questo approccio consente di collegare i pattern emergenti ai fondamenti concettuali dello studio, rafforzando coerenza teorica e validità interna (Yin, 2017). L'analisi è stata guidata dal framework Antecedenti–Attività–Risultati (De Massis et al., 2022) e dal Twin Transition framework (Leipziger et al. 2025), così da cogliere come antecedenti organizzativi e di contesto, scelte/attività del modello e relativi esiti interagiscono lungo il percorso di sviluppo del modello di business circolare. La prima ha riguardato la lettura estensiva e la codifica aperta (open coding) di tutte le trascrizioni delle interviste, le field notes e i materiali per mappare lo sviluppo cronologico del caso, le attività, gli attori e le interazioni chiave. Il coding descrittivo ha permesso di delineare la struttura del processo, mettendo in luce la sequenza degli eventi e i meccanismi che ne hanno orientato l'evoluzione. La seconda fase è stata incentrata

sull'approfondimento di antecedenti e meccanismi che hanno abilitato l'integrazione dei principi dell'economia circolare nel modello di business. Particolare attenzione è stata rivolta ai moderatori contestuali e ai meccanismi che collegano antecedenti e attività. La terza fase, attualmente in corso, riguarda l'analisi dei risultati, sia realizzati sia attesi, a livello organizzativo e inter-organizzativo. L'obiettivo finale è lo sviluppo di un framework concettuale robusto che colleghi le dimensioni analizzate e si innesti nella teoria sui modelli di business circolari e sulle born-green startup.

4. Risultati preliminari

4.1. Strategie di innovazione circolare: principi e modalità di adozione

Alpha integra i principi dell'economia circolare sin dalla sua fondazione come born-green startup, riconoscendo la rilevanza delle criticità ambientali, sociali ed economiche associate alla filiera tradizionale del cacao. A differenza delle imprese che adottano pratiche sostenibili in fasi successive, Alpha nasce con la sostenibilità quale pilastro non negoziabile del modello di business.

"L'economia circolare è al centro del nostro modello di business; ne è il cuore pulsante." (Co-Founder).

La filiera del cacao presenta importanti esternalità: elevati consumi idrici ed emissivi, fenomeni di deforestazione, perdita di biodiversità e diffuse criticità sociali, tra cui sfruttamento minorile, condizioni lavorative precarie e una riduzione dei redditi, con un impatto particolarmente significativo sulle donne. L'aumento dei prezzi delle materie prime intensifica tali pressioni, rendendo particolarmente attrattive alternative con caratteristiche funzionali analoghe.

"Per chi lavora grandi volumi, un cioccolato che costa la metà, con le stesse proprietà industriali e un gusto simile, è un forte incentivo." (Financial Manager)

In tale scenario, l'orientamento alla circolarità risponde a pressioni sistemiche. La natura di startup conferisce agilità e rapidità di innovazione, favorendo l'integrazione precoce di pratiche circolari nei processi produttivi, senza gli ostacoli tipici delle grandi imprese.

"Essere una startup ci ha aiutati quasi al 90%; oggi è un grande vantaggio." (NPD Manager)

Alla base del modello si colloca la valorizzazione di scarti agricoli trasformati in ingredienti ad alto valore. Il caso più emblematico è quello della carruba, tradizionalmente utilizzata per i semi destinati alla produzione di gomma di carruba, mentre la polpa viene spesso scartata o impiegata in lavorazioni marginali. L'impiego della carruba è coerente con principi di efficienza delle risorse e resilienza ecologica.

"Semplicemente non usando cacao, non italiano e con filiere molto complesse, facciamo già una scelta sostenibile." (Financial Manager).

La carruba, coltura perenne resiliente alla siccità, non richiede irrigazione né input chimici, cresce in aree aride del Mediterraneo, non implica deforestazione o perdita di fertilità del suolo. Inoltre, l'apertura dello stabilimento in Puglia favorisce il reperimento locale della carruba, di cui l'Italia è secondo produttore mondiale, e riduce i costi ambientali legati al trasporto. La strategia circolare si estende anche al fabbisogno energetico.

"Ci affidiamo all'energia solare per quasi il 100% del fabbisogno: durante l'orario di lavoro funzioniamo quasi esclusivamente con il fotovoltaico." (Co-Founder).

Ciò consente di scollegare la crescita produttiva dal consumo di risorse fossili.

Nel complesso, il caso Alpha dimostra come la CE possa essere integrata operativamente lungo l'intera catena del valore, dalla scelta delle risorse alla produzione, per generare un sistema agroalimentare più resiliente e competitivo.

4.2. Antecedenti, barriere e fattori abilitanti nello sviluppo dei modelli di business circolari

L'attuale macro-ambiente, segnato dalla crisi climatica, dalla pressione sulle filiere e dall'aumento dei prezzi del cacao, accresce la rilevanza di modelli fondati su ingredienti a basso impatto e su approvvigionamento locale. Lo sviluppo del modello di business di Alpha si confronta tuttavia con alcuni ostacoli strutturali quali la disponibilità biofisica della carruba, risorsa locale non ancora pienamente destinata all'uso alimentare. Reperire forniture certificate e tracciabili risulta pertanto complesso, così come gestire le fluttuazioni delle materie prime complementari. Sul piano operativo, la crescita del modello incontra vincoli tecnici, poiché la trasformazione della carruba in un sostituto del cacao richiede processi sofisticati (fermentazione, macinazione, incorporazione dei grassi) e continui investimenti in ricerca e sviluppo.

Persistono inoltre barriere socio-culturali. Il forte radicamento del consumo di cioccolato e la diffidenza verso ingredienti alternativi rendono lento il cambiamento delle preferenze.

"Il principale ostacolo sono sicuramente le persone, in altre parole la cultura. Siamo abituati a consumare cioccolato, quindi la prima grande difficoltà è culturale." (Co-Founder)

La concentrazione del settore dolciario, dominato da pochi attori, limita il riconoscimento commerciale e la possibilità di stringere partnership strategiche. A questo si aggiungono i vincoli finanziari tipici delle startup.

Contestualmente, esistono fattori che sostengono l'evoluzione del modello di business circolare. In primo luogo, la versatilità della carruba, coltura resiliente, a basso impatto idrico e adattabile a molteplici applicazioni alimentari, che offre un'alternativa promettente al cacao. Inoltre, l'ingresso di Alpha avviene in un contesto di crescente attenzione verso la sostenibilità. Le imprese ricercano ingredienti in grado di sostenere obiettivi ESG, in un mercato caratterizzato da competizione limitata. L'interesse di investitori orientati all'impatto rappresenta un ulteriore elemento abilitante, fornendo capitale, visibilità e mentoring strategico.

"I nostri investitori forniscono capitale, naturalmente, ma portano anche una visione strategica. Agiscono come advisor; sono persone con cui siamo in costante contatto." (Financial Manager)

Infine, le attività educative promosse dall'azienda contribuiscono a ridefinire la percezione della carruba, da risorsa marginale a ingrediente moderno e sostenibile, favorendone l'accettazione presso consumatori e operatori di filiera.

4.3. Outcome dei modelli di business circolari: persone, pianeta, profitto

Questa sezione analizza gli impatti del modello di business circolare di Alpha lungo le dimensioni ambientale, sociale ed economica.

Sul piano ambientale, la sostituzione del cacao con la carruba costituisce l'innovazione più significativa, consentendo una riduzione fino al 90% del consumo idrico e dell'80% delle emissioni di CO_2 rispetto al cioccolato convenzionale.

"Il nostro prodotto […] è molto rispettoso dell'ambiente, quasi due volte più sostenibile rispetto al cioccolato tradizionale." (NPD Manager)

La filiera corta, interamente radicata in Italia, riduce ulteriormente l'impronta dei trasporti e rafforza la resilienza produttiva. Lo stabilimento prossimale alle aree di coltivazione favorisce l'efficienza operativa, in linea con l'obiettivo di rimanere locali, migliorare la filiera e aggiungere valore. La carruba, coltura perenne resistente alla siccità, può essere impiantata su terreni marginali, contribuendo alla rigenerazione agroecologica, al sequestro del carbonio e alla preservazione della biodiversità. L'intero processo produttivo mira a minimizzare gli scarti e a ottimizzare l'uso di risorse in ottica circolare, persino il sito web aziendale è progettato per generare emissioni digitali inferiori alla media. L'intero processo produttivo minimizza gli scarti e promuove l'uso di energia e risorse in chiave circolare, persino il sito aziendale è progettato per generare emissioni digitali inferiori rispetto alla media.

Gli impatti sociali si manifestano sia sul versante dei consumi, sia su quello territoriale. Il nuovo prodotto vegetale privo dei principali allergeni e caratterizzato da ridotti contenuti di

zuccheri, risponde alle esigenze di salute pubblica legate all'aumento di intolleranze e patologie metaboliche. Le proprietà nutrizionali della carruba conferiscono all'alternativa un profilo funzionale e salutistico. In chiave complementare, la scelta di operare nel Mezzogiorno genera effetti socio-economici positivi, contribuendo alla valorizzazione del patrimonio agroalimentare mediterraneo e favorendo la riconnessione dei consumatori con l'identità territoriale.

"Il nostro obiettivo è rimanere locali, migliorare la filiera e aggiungere valore. Questo, da solo, migliora in modo significativo la nostra impronta di sostenibilità." (NPD Manager)

La dimensione economica del modello poggia sulla trasformazione di una risorsa agricola sottoutilizzata in una filiera locale stabile, capace di rivitalizzare aree rurali e generare valore diffuso.

"L'intera area del Salento potrebbe diventare un importante hub per la lavorazione della carruba, creando reddito e opportunità per gli agricoltori […]. Questo potrebbe generare nuove attività e opportunità di lavoro." (Co-Founder)

La possibilità di coltivare, trasformare e distribuire la carruba interamente in Italia riduce la dipendenza da materie prime importate e da mercati globali volatili, offrendo maggiore stabilità rispetto al cacao. Il nuovo prodotto, comparabile al cioccolato in termini di performance industriale ma a costi tendenzialmente inferiori, si configura come alternativa competitiva per le imprese di trasformazione. Questo approccio permette di trattenere valore nei territori di produzione, generando occupazione nelle fasi di coltivazione, trasformazione e sviluppo tecnologico e contribuendo alla diversificazione dell'economia agricola meridionale, rafforzandone la capacità di adattamento ai cambiamenti climatici e alle crisi delle colture tradizionali.

5. Implicazioni dello studio e conclusioni

Il presente studio punta ad offrire tre principali contributi teorici. In primo luogo, estendere la letteratura su imprenditorialità sostenibile e circolare (Esau et al., 2025; La Rocca e Dal Molin, 2024) e sulla gestione sostenibile delle filiere (Cheng et al., 2023), integrandola con il filone emergente sulle born-green startup (Bendig et al., 2022; Hoang e Böckel, 2024). In secondo luogo, contribuisce a colmare le lacune conoscitive sui meccanismi di sviluppo dei modelli di business circolari, offrendo un'analisi approfondita di antecedenti, fattori abilitanti e barriere e informando gli studiosi sui meccanismi di creazione di valore sostenibile (Filippelli et al., 2025). In terzo luogo, lo studio estende la letteratura sull'innovazione circolare dei modelli di business (Shakeel et al., 2020; Yang et al., 2017; D'Amato et al., 2017), facendo emergere pratiche e meccanismi per affrontare le tensioni intrinseche alle transizioni sostenibili (Bommel, 2018).

Sul piano manageriale, i risultati preliminari indicano l'esigenza di coniugare sostenibilità e performance mediante flessibilità progettuale, modularità dei processi, apertura all'innovazione e cooperazione con stakeholder eterogenei. Strategie comunicative efficaci e narrazioni autentiche risultano cruciali per costruire legittimità, così come una cultura organizzativa valoriale in grado di guidare le decisioni in condizioni di incertezza. Con riferimento alle implicazioni di policy, le evidenze analizzate suggeriscono la necessità di politiche pubbliche che sostengano la maturazione dei modelli di business circolari attraverso definizione di standard, strumenti di certificazione, appalti pubblici orientati alla sostenibilità, sviluppo di infrastrutture territoriali adeguate e interventi di sensibilizzazione. In questo quadro, istituzioni e imprese agiscono come co-protagonisti di una transizione sistemica in cui benefici ambientali, sociali ed economici sono interdipendenti e cumulativi.

Pur offrendo contributi rilevanti, la ricerca presenta limiti che ne circoscrivono la trasferibilità. L'adozione di un singolo caso abilita un'analisi in profondità, ma limita la generalizzabilità a settori o contesti socio-istituzionali differenti. Inoltre, l'impostazione trasversale restituisce una fotografia puntuale del processo, non catturando, tuttavia, appieno

l'evoluzione temporale. Questi limiti aprono spazi per future ricerche: studi multi-caso, approcci longitudinali e analisi comparative interregionali. Tali approfondimenti contribuirebbero ad una comprensione più solida e generalizzabile dei processi attraverso cui i modelli di business circolari si sviluppano, evolvono e generano impatti sistemici.

Parole chiave: Business model; economia circolare; startup; innovazione; sostenibilità

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GRINS: progetto PNRR per una piattaforma dati a supporto della sostenibilità della filiera bovina italiana

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1. Introduzione

Il settore zootecnico italiano rappresenta uno dei pilastri dell'economia agroalimentare nazionale, con un ruolo strategico non solo nella produzione di carne e latte, ma anche nel mantenimento di sistemi agricoli, occupazione rurale e tradizioni territoriali. La produzione bovina, in particolare, contribuisce in modo significativo al valore aggiunto del settore agricolo e alla sicurezza alimentare del paese, ma è anche responsabile di impatti ambientali rilevanti, tra cui emissioni di gas serra, consumo di suolo, uso di acqua e produzione di reflui zootecnici (Gerber et al., 2013).

Negli ultimi anni, la crescente attenzione a temi come la mitigazione dei cambiamenti climatici, la transizione verso pratiche agricole sostenibili e l'adozione di strategie ESG (Environmental, Social, Governance) ha reso cruciale per le aziende e i policymaker disporre di dati affidabili e specifici per il contesto nazionale. Tuttavia, fino ad oggi, gran parte delle analisi ambientali per la zootecnia italiana si sono basate su database esteri, poco rappresentativi delle caratteristiche dei sistemi produttivi italiani, con razze, tipologie di allevamento e pratiche gestionali differenti (Berton et al., 2025). Questa lacuna limita la capacità delle aziende di valutare l'effettivo impatto ambientale dei propri processi e di prendere decisioni strategiche basate su evidenze scientifiche.

In questo scenario, il progetto GRINS (Growing, Resilient, INclusive and Sustainable), finanziato nell'ambito del Piano Nazionale di Ripresa e Resilienza (PNRR), mira a colmare questa lacuna sviluppando database nazionali e regionali di Life Cycle Inventory (LCI) per i principali sistemi produttivi italiani, tra cui l'allevamento dei bovini. Il progetto GRINS ha coinvolto un network di università e centri di ricerca italiani, combinando competenze scientifiche avanzate con conoscenze manageriali e applicative, il cui risultato scientifico sarà integrato nella piattaforma AMELIA, gestita dalla Fondazione GRINS, diventando così uno strumento accessibile e operativo per supportare la ricerca, le decisioni aziendali e le politiche di sostenibilità lungo l'intera filiera agroalimentare.

L'obiettivo è sviluppare una base dati completa e armonizzata, che consenta di misurare in modo accurato le emissioni, il consumo di risorse e gli impatti ambientali lungo l'intera filiera bovina, dalla coltivazione delle materie prime fino ai prodotti finali: carne, latte e derivati. Grazie

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a questa infrastruttura informativa, aziende, filiere e policymaker potranno individuare leve di intervento efficaci per migliorare la sostenibilità delle produzioni, ottimizzare l'efficienza delle risorse e rispondere in modo trasparente ed efficace alle richieste dei mercati nazionali e internazionali.

L'approccio del progetto non si limita a un'analisi ambientale fine a sé stessa, ma intende supportare una gestione strategica del settore, facilitando la pianificazione di investimenti, l'implementazione di innovazioni tecnologiche, e la definizione di politiche di mitigazione delle emissioni, come quelle relative al metano enterico, oggi oggetto di attenzione a livello europeo. In questo senso, GRINS rappresenta uno strumento chiave per connettere la sostenibilità ambientale alla competitività industriale e alla governance delle filiere agroalimentari italiane, supportando anche l'ottenimento di certificazioni riconosciute come il Made Green in Italy, in grado di valorizzare la qualità ambientale dei prodotti e rafforzare il posizionamento delle imprese sui mercati nazionali ed europei.

L'obiettivo del progetto è sviluppare una base dati completa e armonizzata per la zootecnia bovina, capace di supportare analisi di impatto ambientale, strategie aziendali e politiche pubbliche. Questi dati permetteranno alle imprese di valutare gli effetti ambientali lungo l'intera filiera, dalla coltivazione delle materie prime alla produzione di carne e latte, e di individuare interventi mirati per migliorare l'efficienza delle risorse, ridurre gli impatti e valorizzare i prodotti a livello nazionale e internazionale.

2. Metodologia e approccio scientifico

Il progetto ha permesso di costruire inventari di ciclo di vita completi e coerenti per l'intera filiera bovina, fornendo dati trasparenti e riproducibili che rappresentano strumenti concreti per le decisioni strategiche di aziende e policymaker. Questi inventari non solo descrivono in dettaglio i flussi di materiali ed energia, ma offrono anche indicazioni pratiche per identificare leve di miglioramento lungo tutta la filiera, supportando la pianificazione di interventi mirati per la sostenibilità, l'efficienza produttiva e la gestione responsabile delle risorse.

Gli inventari coprono in modo integrato tutte le fasi principali della filiera bovina, dalla produzione agricola dei foraggi e dei mangimi, alla trasformazione delle materie prime, fino alle attività di allevamento e alla fase di macellazione, con l'obiettivo di rappresentare l'intero sistema produttivo e i relativi flussi di materiali, energia ed emissioni (Figura 1). In questo quadro sono state selezionate le principali razze bovine da carne (13) e da latte (5), classificandole per età e genere, che complessivamente rappresentano oltre il 95% della popolazione bovina italiana. La scelta è stata effettuata applicando criteri di rappresentatività basati sul peso delle popolazioni nazionali (cut-off dell'1%) e regionali (cut-off del 5%), così da garantire una copertura realistica delle diverse tipologie produttive presenti sul territorio (BDN, 2023).

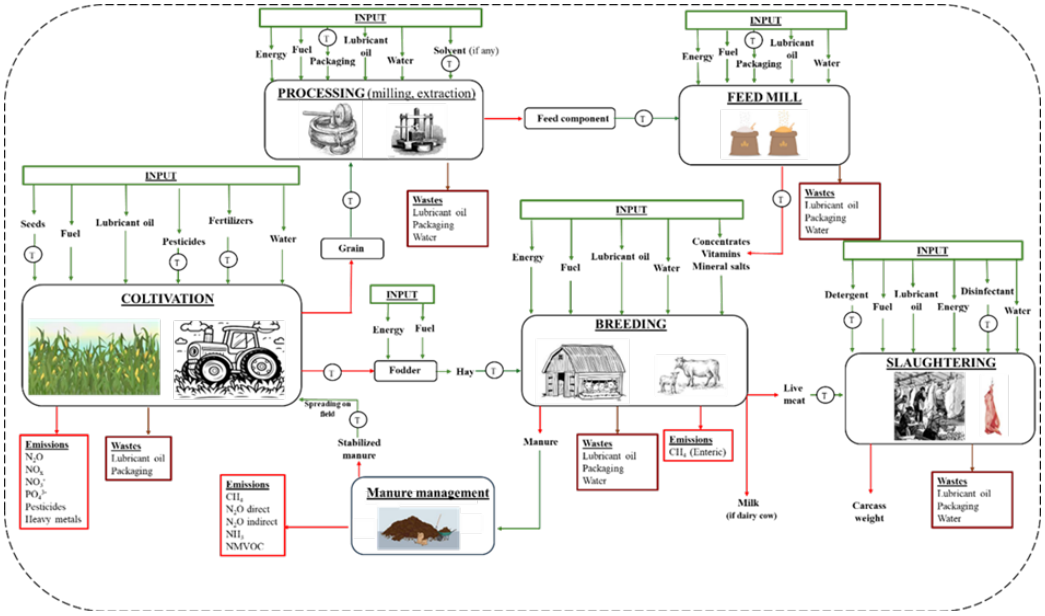


Figura 1. Confini del sistema e principali flussi della filiera bovina

In dettaglio, sono stati sviluppati:

- Produzione agricola dei foraggi e dei mangimi: 17 dataset nazionali, comprendenti colture di cereali, leguminose e foraggi, con informazioni dettagliate su input (energia, fertilizzanti, acqua, pesticidi), rese e consumi energetici, oltre alla modellizzazione dei principali output che coinvolgono emissioni in aria, acqua e suolo di fertilizzanti, fitofarmaci e metalli pesanti.
- Trasformazione delle materie prime in mangimi: 16 dataset nazionali, relativi alla lavorazione di cereali, legumi e sottoprodotti in alimenti per bovini, comprensivi di dati su energia, resa di processo e gestione dei co-prodotti.
- Allevamento: 213 dataset nazionali e 31 regionali, rappresentativi della diversità di razze, età, sesso e tipologie produttive, includendo sia la produzione di carne che di latte e co-prodotti, e considerando differenti sistemi di gestione (estensivo, semi-estensivo, semi-intensivo e intensivo).
- Macellazione: 17 dataset, comprendenti carne, sottoprodotti e flussi di scarto, con applicazione di un approccio di allocazione economica per la distribuzione degli impatti tra i diversi prodotti della filiera.

La costruzione degli inventari ha seguito rigorosi standard internazionali quali ISO 14040 e ISO 14044, assicurando trasparenza metodologica, coerenza e possibilità di riproduzione degli studi (ISO 2006a e ISO 2006b). Per garantire robustezza e rappresentatività dei dati, la costruzione degli inventari ha adottato un approccio statistico, integrando informazioni provenienti dai principali database italiani ed europei, da fonti scientifiche e letteratura tecnica, nonché da testi di settore (ISTAT, 2024; ISMEA, 2024; Ribaudo, 2017; Eurostat, 2024; Ecoinvent, 2022). Questo ha permesso di modellare in maniera accurata le diverse pratiche produttive, le caratteristiche delle razze e le condizioni regionali, fornendo un quadro realistico e dettagliato della filiera bovina italiana, utilizzabile sia per valutazioni ambientali che per supporto decisionale strategico da parte delle imprese e dei policymaker. Gli output degli inventari sono stati successivamente modellizzati utilizzando modelli internazionali riconosciuti, che hanno consentito di quantificare in modo rigoroso le principali emissioni generate lungo la filiera zootecnica (IPCC, 2019, EMEP, 2019; Notarnicola et al., 2023; Zampori e Pant, 2019). Allo stesso modo, è stato modellizzato l'intero fine vita dei materiali impiegati nelle diverse fasi produttive, garantendo una rappresentazione completa e coerente dei flussi ambientali associati al sistema analizzato (EC, 2021; CONOU, 2022).

3. Risultati e discussione

Gli inventari sviluppati sono stati utilizzati per la valutazione degli impatti ambientali della filiera bovina italiana, considerando le principali categorie di impatto previste dal metodo EF3.1, raccomandato dalla Commissione Europea, permettendo di identificare le fasi più critiche e di supportare interventi mirati per la riduzione degli impatti (EC, 2022).

L'analisi dei dati ha permesso di evidenziare come la fase di allevamento rappresenti l'anello più impattante dell'intera filiera, con il metano enterico individuato come hotspot principale. Questo risulta particolarmente rilevante nel contesto europeo, dove si stanno valutando misure di regolazione delle emissioni di metano, in cui alcuni Stati membri, come la Danimarca, hanno già introdotto tasse basate sul numero di capi, ma senza considerare le emissioni effettive dei singoli allevamenti (EC, 2024). L'approccio fornito dal progetto GRINS consente di contestualizzare gli impatti ambientali, offrendo un supporto diretto alle aziende per ottimizzare le pratiche di gestione del bestiame e ai policymaker per definire strumenti fiscali più equi ed efficaci.

L'analisi dei dati sviluppati dal progetto GRINS ha permesso di evidenziare come le diverse tipologie di allevamento e le caratteristiche delle razze influenzino significativamente gli impatti ambientali lungo la filiera bovina italiana. I sistemi estensivi, semi-estensivi, semi-intensivi e intensivi mostrano profili di emissioni e consumi di risorse molto differenziati, riflettendo le pratiche di gestione, l'alimentazione e l'accesso al pascolo.

Le razze tradizionali italiane, come Chianina, Marchigiana e Romagnola, allevate prevalentemente in sistemi semi-estensivi, beneficiano di accesso al pascolo e di stabulazione stagionale. Questo approccio favorisce la biodiversità e il mantenimento dei territori marginali, ma comporta una maggiore variabilità nei consumi alimentari e nelle emissioni di metano enterico, che emerge come hotspot ambientale in questi sistemi (Figura 2).

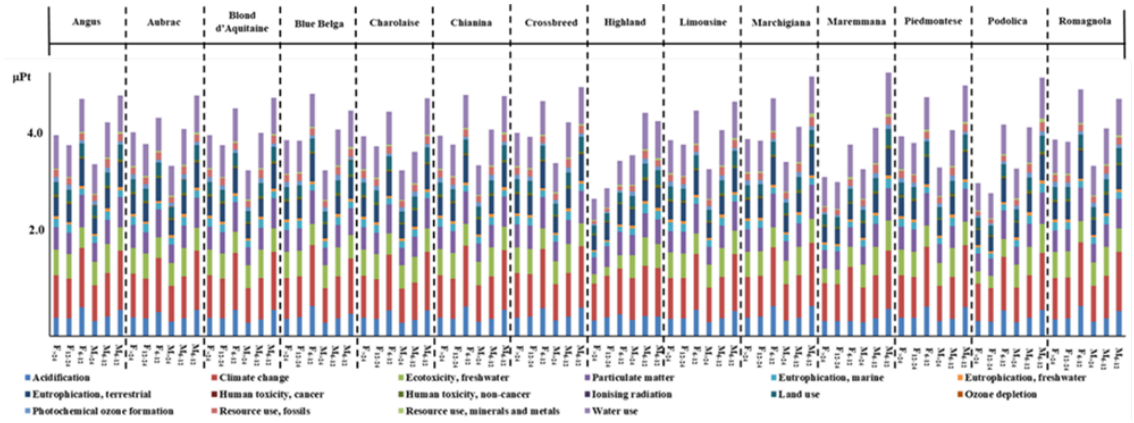


Figura 2. Analisi di impatti ambientale delle razze da carne analizzate

Al contrario, le razze importate per la produzione di carne, come Limousine e Charolaise, sono gestite principalmente in sistemi intensivi, con stabulazione permanente e razioni alimentari controllate. Questi sistemi permettono un accrescimento rapido e uniformità dei prodotti, riducendo la variabilità di produzione, ma presentano comunque impatti significativi legati all'allevamento e alla gestione delle deiezioni.

Le principali categorie di impatto ambientale identificate, considerando un cut-off del 5%, includono il cambiamento climatico, principalmente legato alle emissioni di metano biogenico derivanti dall'allevamento; l'utilizzo di risorse idrico, associato al fabbisogno idrico di colture largamente utilizzate nella preparazione della razione alimentare, come il mais; l'ecotossicità in acqua dolce, correlato all'uso di fertilizzanti e fitofarmaci; e altre categorie come acidificazione,

eutrofizzazione terrestre e particolato atmosferico, strettamente legate alle emissioni di ammoniaca e alla gestione dei reflui zootecnici.

Per quanto riguarda le razze da latte, come Frisona e Jersey, l'allevamento intensivo prevalente garantisce elevata produttività di latte e gestione controllata. L'andamento osservato risulta contrastante e perlopiù correlato con la produttività (elevata per la Frisona) e la stazza degli animali (minore per il Jersey) (Figura 3).

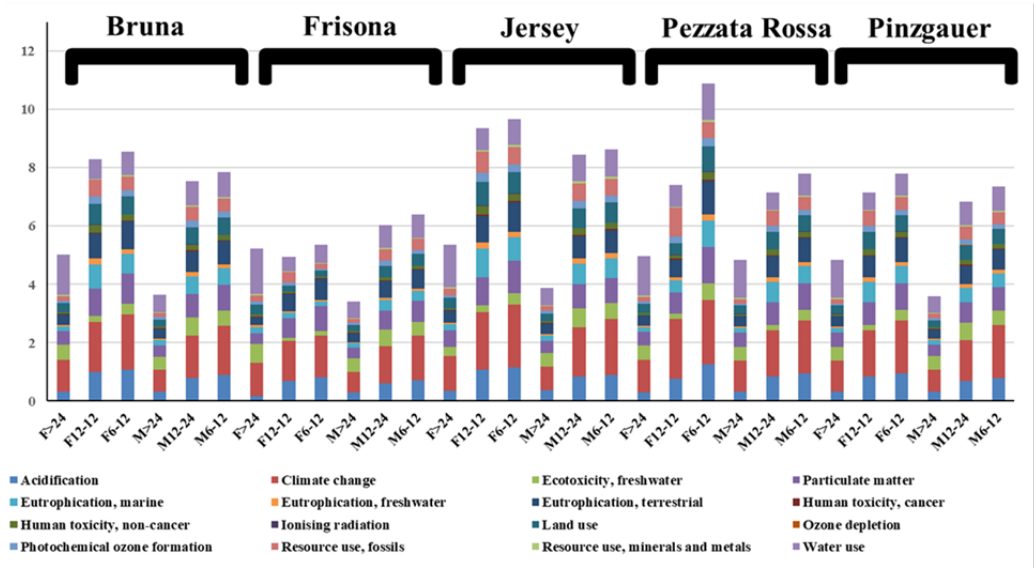


Figura 3. Analisi di impatto ambientale delle razze da latte analizzate

Le razze a doppia attitudine, come Pezzata Rossa, Pinzgauer, e Bruna, adottano sistemi semi-estensivi, combinando pascolo e stabulazione controllata, e mostrano un profilo intermedio in termini di emissioni e consumo di risorse.

Le stesse categorie di impatto, ma con diversa distribuzione, sono risultate significative anche per i bovini destinati alla produzione di latte, evidenziando come cambiamento climatico, consumo di risorse idriche, ecotossicità in acqua dolce, acidificazione, eutrofizzazione terrestre e formazione di particolato atmosferico rappresentino i principali fattori ambientali lungo l'intera filiera lattiero-casearia, con dinamiche analoghe a quelle osservate per la produzione di carne.

La diversa distribuzione delle varie categorie di impatto nel profilo ambientale dei sistemi analizzati è fondamentale per l'analisi del ciclo di vita, poiché consente di associare in maniera precisa ciascun profilo ambientali ai diversi sistemi produttivi e categorie di allevamento. I dati evidenziano come interventi mirati nell'alimentazione e nella gestione del letame possano ridurre significativamente le emissioni, offrendo alle aziende strumenti concreti per ottimizzare le pratiche di gestione e migliorare la sostenibilità complessiva. Inoltre, la disponibilità di informazioni dettagliate per le diverse razze e sistemi consente di progettare strategie di filiera più efficaci, bilanciando produttività, qualità dei prodotti e impatti ambientali, e fornisce un supporto diretto ai policymaker per definire regolazioni mirate.

Nella fase di macellazione, la categorizzazione degli animali in vitelli maschi di razze da latte, scottone, manze, vitelloni e bovini adulti permette di modellare in modo dettagliato i flussi di carne e co-prodotti, allocando correttamente i carichi ambientali. Questo livello di dettaglio è essenziale per le analisi LCA, poiché le emissioni e l'uso di risorse variano significativamente tra le varie categorie di età, genere e razza.

La disponibilità di dataset dettagliati per tutte le fasi della filiera e per ogni categoria bovina consente inoltre di comprendere le interazioni tra produzione agricola, alimentazione, gestione degli allevamenti e dei reflui zootecnici e macellazione, fornendo alle imprese uno strumento per

la pianificazione strategica, la riduzione dell'impronta ambientale e la comunicazione trasparente con il mercato. Le razze a doppia attitudine, come Pezzata Rossa, Pinzgauer, e Bruna, adottano sistemi semi-estensivi, combinando pascolo e stabulazione controllata, e mostrano un profilo intermedio in termini di emissioni e consumo di risorse.

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Nonostante i risultati significativi ottenuti dal progetto GRINS, permangono alcune limitazioni che richiedono ulteriori approfondimenti. In particolare, l'analisi delle razze meno diffuse e dei sistemi di allevamento marginali è ancora parziale, limitando la rappresentatività complessiva dei dati per alcune nicchie produttive. Inoltre, la variabilità stagionale dei sistemi produttivi e delle condizioni ambientali non è completamente catturata dai dataset attuali, così come alcune informazioni relative alla fase di macellazione, quali il consumo energetico specifico, l'utilizzo di co-prodotti e la gestione dei rifiuti, che necessitano di ulteriori dati empirici per garantire una stima più accurata degli impatti.

Gli sviluppi futuri del progetto prevedono un ampliamento dei dataset a livello regionale e temporale, con l'obiettivo di rappresentare in maniera ancora più precisa la diversità dei sistemi produttivi italiani e le dinamiche stagionali delle produzioni. Si prevede inoltre di estendere l'analisi ai processi downstream, includendo la trasformazione, il confezionamento e la distribuzione dei prodotti carne e latte, in modo da offrire una valutazione ambientale completa lungo l'intera filiera.

Parallelamente, è previsto un continuo allineamento con iniziative internazionali e standard metodologici, quali le linee guida ISO e le raccomandazioni della Commissione Europea, al fine di migliorare la coerenza, la comparabilità e l'applicabilità dei dati sia per la ricerca scientifica, sia per le decisioni strategiche delle aziende. Questa evoluzione consentirà alle imprese di utilizzare i dati per ottimizzare investimenti sostenibili, pianificare interventi mirati per la riduzione degli impatti ambientali, e rafforzare la trasparenza e la comunicazione con stakeholder, mercati e consumatori.

Infine, il miglioramento continuo della precisione e della copertura dei dati renderà gli inventari uno strumento sempre più robusto per supportare le politiche pubbliche e le strategie

aziendali nel settore zootecnico, contribuendo a favorire una produzione più sostenibile, resiliente e competitiva a livello nazionale ed europeo.

4. Conclusioni

Il progetto GRINS rappresenta un passo decisivo verso la sostenibilità della filiera bovina italiana, fornendo strumenti concreti e affidabili sia per le aziende del settore, sia per i policymaker. La piattaforma LCI sviluppata consente di misurare in maniera precisa gli impatti ambientali lungo tutta la filiera, dalla produzione delle materie prime per l'alimentazione dei bovini fino alla macellazione e alla gestione dei co-prodotti, offrendo una visione integrata e scientificamente robusta dei flussi materiali ed energetici.

Grazie ai dataset dettagliati e armonizzati, le imprese possono identificare le fasi più critiche e gli hotspot ambientali, come il metano enterico nella fase di allevamento, e pianificare interventi mirati per ridurre le emissioni e ottimizzare l'efficienza produttiva. Allo stesso tempo, i dati supportano scelte strategiche su investimenti sostenibili, gestione delle risorse naturali, razionamento e miglioramento dei sistemi di allevamento, contribuendo a creare vantaggi competitivi e a rispondere alle crescenti richieste di trasparenza e responsabilità da parte dei consumatori e dei mercati internazionali.

Dal punto di vista delle politiche pubbliche, gli inventari LCI forniscono un supporto solido per lo sviluppo di strumenti fiscali più equi ed efficaci, come eventuali tasse sulle emissioni di metano basate su dati reali e non solo sul numero di capi allevati, e per la definizione di linee guida e regolamenti orientati alla sostenibilità.

Infine, il progetto apre la strada a sviluppi futuri che integreranno dati più dettagliati a livello regionale e temporale, estendendo l'analisi ai processi downstream come trasformazione, confezionamento e distribuzione, e garantendo l'allineamento continuo con standard nazionali e internazionali.

Tra le certificazioni che le aziende possono ottenere per valorizzare il proprio impegno in termini di sostenibilità un ruolo importante a livello nazionale è occupato dalla certificazione Made Green in Italy, lo schema nazionale basato sulla metodologia PEF (Product Environmental Footprint) promosso dal Ministero dell'Ambiente. Tale certificazione, partendo da studi LCA, permette di attestare in modo trasparente le prestazioni ambientali dei prodotti lungo l'intero ciclo di vita, rafforzando la credibilità delle filiere e offrendo alle imprese un importante strumento per differenziarsi sul mercato attraverso qualità, tracciabilità e responsabilità ambientale.

In questo modo, GRINS non solo consolida la base scientifica per la valutazione ambientale della filiera bovina, ma diventa uno strumento strategico per guidare la transizione verso un settore agroalimentare più resiliente, innovativo e sostenibile, rafforzando la competitività delle aziende italiane a livello nazionale ed europeo.

Parole chiave: Life cycle assessment; filiera bovina; progetto GRINS; sostenibilità; metano enterico

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Circolarità per la decarbonizzazione: pratiche di transizione nelle supply chain tessili

Sara Toniolo[1], Ilenia Bravo[2], Ivan Russo[3], Raffaella Taddeo[4]

1. Introduzione

Per rispondere a un mercato globale sempre più orientato alla personalizzazione e al modello del fast fashion, il settore tessile presenta rilevanti criticità ambientali, tra cui il depauperamento delle risorse naturali e un'eccessiva produzione di rifiuti. L'implementazione dei principi dell'economia circolare, tra cui la riduzione dei consumi, il riutilizzo dei filati e la mitigazione degli impatti ambientali, è essenziale anche per garantire la sostenibilità sociale ed economica del settore.

Oggi il settore tessile è parte integrante dell'economia globale e deve adattarsi al cambiamento delle preferenze dei consumatori verso una maggiore personalizzazione e cicli di vendita sempre più brevi. L'industria dell'abbigliamento è inoltre influenzata dalla costante domanda di nuovi stili e dal rapido ricambio di design e materiali. Questa tendenza accelera il ciclo di vita del prodotto, riducendo spesso la durata utile dei capi e contribuendo a generare rifiuti tessili. Tale modello genera una produzione e un consumo eccessivi, ponendo sfide rilevanti in termini di gestione dei rifiuti e sostenibilità ambientale.

Nonostante gli sforzi di riciclo dei rifiuti tessili, molti autori concordano sul fatto che il 75% di essi finisca globalmente in discarica, mentre l'incenerimento, ampiamente utilizzato, contribuisce a rendere l'industria tessile uno dei settori a maggiore impatto ambientale, con un ruolo rilevante nell'inquinamento idrico e atmosferico (Juanga-Labayen et al., 2022; Hora et al., 2024).

In questo contesto, l'adozione di strategie di economia circolare è emersa come un approccio promettente per mitigare tali impatti, promuovendo metodi alternativi per estendere la vita utile dei capi e ridurre gli scarti (Solis et al., 2024). Questi approcci richiedono una rimodulazione pianificata delle pratiche produttive, finalizzata a ridurre gli effetti ambientali negativi, mantenere standard sociali adeguati e stimolare la crescita economica (Karim et al., 2024).

La supply chain tessile comprende diverse fasi di lavorazione, come la produzione di fibre e filati, la realizzazione dei tessuti, i trattamenti preliminari, la tintura, la stampa, il taglio e la confezione. Per raggiungere una supply chain sostenibile è necessario monitorare in modo consapevole tutti i processi di approvvigionamento, produzione, distribuzione e smaltimento. Il settore tessile si trova nella complessa posizione di dover conciliare la tradizione della moda con l'innovazione, le nuove tendenze di consumo e la necessità di decarbonizzazione. In questo contesto, la gestione dei rifiuti tessili rimane una delle sfide più pressanti.

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Ciò implica valutare l'intero ciclo di vita del prodotto, dall'acquisizione/approvvigionamento delle materie prime allo smaltimento, adottando misure per prevenire i danni ambientali, garantire condizioni di lavoro eque e sostenere il benessere delle comunità locali (Rashid et al., 2024).

Per quanto riguarda la produzione delle fibre, metodi agricoli rigenerativi (ad esempio evitando l'uso di input chimici) e/o il riutilizzo degli scarti generati durante la lavorazione possono contribuire alla riduzione dei rifiuti. Numerosi autori hanno esplorato l'associazione tra economia circolare e tecnologie digitali basate su automazione e scambio di dati nei processi di smart manufacturing (Aslam et al., 2024). Tali tecnologie includono robotica, intelligenza artificiale, blockchain, modellazione informativa tridimensionale, piattaforme digitali/marketplace e Internet of Things (Çetin et al., 2021). Esse consentono il monitoraggio dei flussi di prodotti e componenti e forniscono dati utili a migliorare la gestione delle risorse e a rafforzare i processi decisionali nelle diverse fasi del ciclo di vita. Questo comporta il duplice vantaggio di ridurre i consumi e gli errori di produzione, migliorando al contempo l'efficienza complessiva (Rajput e Singh, 2019).

Tecniche produttive basate su tecnologie digitali, come il taglio meccanizzato e i processi di tintura e stampa digitale, che consentono un'applicazione più precisa del colore, hanno ridotto lo spreco di inchiostri, sostanze chimiche e acqua. Inoltre, l'applicazione di misure di controllo qualità è essenziale per minimizzare i difetti durante cucitura e assemblaggio, massimizzare l'utilizzo dei filati e ridurre gli sprechi di tessuto, materie prime ed energia. L'esame dei materiali e degli accessori con particolare attenzione alla riciclabilità può portare a una minore produzione di rifiuti nelle fasi di assemblaggio e finitura. Altre strategie includono la progettazione di tessuti in monomateriale o con risorse facilmente separabili, oltre alla rimozione di componenti non riciclabili come bottoni metallici e accessori complessi, facilitando così il riciclo (Hora et al., 2023).

Progettare tessuti durevoli, minimizzare la sovrapproduzione ed estendere il ciclo di vita attraverso riparazione, rigenerazione o riutilizzo contribuisce alla creazione di un'economia circolare industriale (Din et al., 2025).

Iniziative come gli scambi di abiti, i negozi dell'usato e i programmi di donazione aiutano ulteriormente a deviare i tessili dalle discariche. Nei casi in cui vengono attivati loop di circolarità, la prospettiva di ciclo di vita risulta integrata nella supply chain tessile attraverso l'impiego delle principali metodologie basate sul life cycle per identificare pratiche e strategie di miglioramento; l'uso di approcci di mappatura finalizzati a rappresentare la supply chain o i flussi di scarto; l'applicazione di approcci qualitativi fondati sul life cycle thinking per far emergere pratiche e strategie di miglioramento; l'adozione di approcci quantitativi che includono analisi di ciclo di vita come strumento di valutazione delle prestazioni ambientali (Toniolo et al., 2024a). Attraverso la condivisione di standard di eccellenza è possibile promuovere l'innovazione e accelerare la transizione verso un'economia tessile circolare (Reike et al., 2023; Hora et al., 2023). Tuttavia, questa transizione verso una produzione ecosostenibile non è priva di sfide: mancanza di risorse finanziarie, resistenza al cambiamento, infrastrutture insufficienti e complessità delle supply chain nei Paesi emergenti rappresentano le barriere più comuni all'adozione di catene sostenibili (Vishwakarma et al., 2022).

Grandi marchi della moda, come Stella McCartney, Nike, H&M, Zara e Uniqlo, hanno adottato pratiche di moda sostenibile, lanciando prodotti a basso impatto ambientale e rafforzando le loro iniziative di responsabilità sociale d'impresa, oltre che di riduzione delle emissioni (Aras-Beger et al., 2020). Il settore del tessile è infatti responsabile non solo della generazione di ingenti quantità di rifiuti e di un consumo intensivo, spesso non necessario, di risorse, ma anche di rilevanti emissioni di gas serra lungo l'intero ciclo di vita dei prodotti; si stima, infatti, che generi il 2–8% delle emissioni globali di gas a effetto serra (UNEP, 2025), contribuendo così in maniera significativa alle pressioni ambientali e climatiche associate ai modelli produttivi e di consumo contemporanei.

Le principali criticità che ostacolano una gestione realmente circolare dei rifiuti tessili appaiono oggi connesse alla chiara definizione delle responsabilità lungo la filiera, alla creazione di piattaforme operative davvero efficienti e alla capacità degli attori maggiormente coinvolti di trattare flussi materiali eterogenei (Taddeo et al., 2023).

L'adozione di un modello di economia circolare consente di ridurre la domanda di materiali vergini e l'energia necessaria per estrazione e produzione, diminuendo così le emissioni di gas serra: in tal modo l'economia circolare diventa un elemento strategico per la decarbonizzazione e la mitigazione del cambiamento climatico (European Environment Agency, 2024). Lo scopo di questo studio, tuttora Work in Progress, è analizzare come le aziende impegnate in percorsi avanzati di decarbonizzazione affrontino o integrino pratiche di circolarità nell'intera supply chain, dando una risposta alle seguenti domande di ricerca:

RQ1. Quali pratiche di circolarità vengono adottate dalle aziende del settore tessile che presentano un forte impegno verso la decarbonizzazione?

RQ2. Quali schemi emergono tra il livello di impegno per la decarbonizzazione e l'adozione di pratiche di circolarità nelle aziende del settore tessile?

2. Metodo

Questo studio propone una lettura integrata tra decarbonizzazione ed economia circolare nelle supply chain tessili, spostando l'attenzione dall'adozione isolata di singole pratiche alla loro combinazione.

La novelty risiede in (i) un campione costruito a partire da target climatici scientificamente validati (SBTi) e con copertura degli scope 1, 2 e 3, che consente di analizzare le aziende con un commitment avanzato di decarbonizzazione; (ii) una mappatura sistematica delle pratiche di circolarità secondo i circular loops nel tessile; (iii) l'identificazione di configurazioni ricorrenti di pratiche circolari e di decarbonizzazione associata a diversi livelli di decarbonizzazione, alla copertura degli scope e all'orizzonte temporale dei target.

La scelta di analizzare le pratiche di circolarità risulta coerente con l'approccio consolidato nella letteratura, che frequentemente adotta l'esame delle pratiche aziendali come lente privilegiata per comprendere come le imprese traducano i principi della circolarità in azioni concrete lungo la supply chain (Toniolo et al., 2024b).

Al fine di rispondere alle due domande di ricerca, questo studio sviluppa un'analisi basata su un ampio insieme di business case raccolti attraverso fonti secondarie (documentazione pubblica, siti istituzionali, report di sostenibilità e materiali aziendali). L'approccio metodologico è coerente con quello adottato da Das e Bocken (2024), i quali esplorano pratiche e strategie rigenerative a partire da un'analisi sistematica di documenti aziendali di natura secondaria; analogamente, si ispira alla fase iniziale del lavoro di Henry et al. (2020), in cui una prima selezione derivante dalla letteratura e una successiva focalizzazione su specifiche categorie di imprese permettono di identificare i relativi modelli di business circolari.

La presente ricerca utilizza il database delle aziende aderenti alla Science Based Target Initiative (SBTi) come base empirica per l'identificazione delle aziende con un importante commitment nei confronti della decarbonizzazione. SBTi rappresenta infatti uno dei principali framework internazionali per la definizione e la validazione scientifica degli impegni di decarbonizzazione aziendale, anche nel settore del tessile (Science Based Target and World Resources Institute, 2019). Il database raccoglie esclusivamente organizzazioni che hanno assunto obiettivi climatici allineati agli scenari dell'Accordo di Parigi, sottoposti a un processo di verifica metodologica rigoroso e trasparente (Ben Amar et al., 2024).

Di conseguenza, la presenza delle aziende nel database SBTi costituisce un indicatore affidabile del loro effettivo commitment climatico, distinguendole da iniziative volontarie o dichiarazioni non validate. Tale caratteristica rende SBTi una fonte privilegiata per studi che intendono analizzare le pratiche di sostenibilità e, in particolare, le relazioni tra decarbonizzazione

e circolarità, poiché consente di selezionare un campione di imprese che già manifestano un livello elevato di impegno nei confronti della decarbonizzazione.

3. Analisi in corso

In una prima fase, dal database "Target Dashboard"1 (in cui sono presenti in totale 13081 business case) sono stati selezionati tutti i business case che presentano un impegno dichiarato nei confronti della decarbonizzazione, selezionando attraverso i filtri disponibili le aziende appartenenti al settore "Textiles, Apparel, Footwear and Luxury Goods" ottenendo un totale di 727 casi. Questi casi sono stati ulteriormente selezionati, mantenendo nel campione soltanto le aziende che hanno presentato degli impegni di riduzione lungo la supply chain, quindi in riferimento agli Scope 1, 2, 3 dello Standard ISO 14064 o del GHG Protocol, ottenendo in questo modo il campione finale di 156 business case. Ogni caso rappresenta una azienda, che potrebbe avere più target/obiettivi. Sono state selezionate esclusivamente le aziende che presentano obiettivi di riduzione delle emissioni negli Scope 1, 2 e 3, poiché tale configurazione consente di adottare una prospettiva realmente estensiva e multilivello sulla decarbonizzazione. In particolare, l'inclusione dello Scope 3, che comprende le emissioni indirette lungo l'intera supply chain, dai fornitori a monte fino all'uso e al fine vita dei prodotti, è fondamentale per acquisire una visione orientata alla supply chain. Questa scelta metodologica è motivata dal fatto che, nel settore tessile come in molti settori manifatturieri, la quota predominante delle emissioni totali deriva proprio da processi situati al di fuori dei confini operativi diretti dell'azienda. Pertanto, considerare soltanto gli Scope 1 e 2 offrirebbe una rappresentazione parziale e non consentirebbe di cogliere le pratiche aziendali, strategie di decarbonizzazione e dinamiche di circolarità distribuite lungo la filiera. Selezionando aziende che hanno assunto impegni formali e validati su tutti e tre gli Scope, è possibile analizzare attori che manifestano non solo un forte commitment climatico, ma anche una capacità, e volontà, di intervenire su processi di approvvigionamento, produzione, logistica, utilizzo e fine vita. In questo modo, il campione risulta più coerente con l'obiettivo del presente studio, che mira a investigare come le imprese impegnate in percorsi avanzati di decarbonizzazione affrontino o integrino pratiche di circolarità nell'intera supply chain.

L'analisi qualitativa dei 156 business case selezionati sarà condotta attraverso una procedura di codifica basata su criteri derivati dalla letteratura su economia circolare, supply chain sostenibile e modelli rigenerativi (Das and Bocken, 2024; Henry et al., 2020). La codifica è applicata alle informazioni pubblicamente disponibili per ciascuna azienda (descrizione del caso, siti web, report, comunicazioni istituzionali).

I criteri individuati attualmente per la codifica riguardano sia il commitment di decarbonizzazione, come per esempio presenza di riferimenti a sostenibilità, responsabilità ambientale, riduzione degli impatti, obiettivi specifici, esistenza di target misurabili, certificazioni o adesione a standard esterni, ampiezza dell'impegno in riferimento alla supply chain; sia il commitment e le pratiche di circolarità eventualmente messe in essere dall'azienda. Sarà quindi identificata la presenza di pratiche riconducibili ai principali principi dell'economia circolare utilizzando la classificazione dei cinque circular loops, closing, narrowing, intensifying, slowing, dematerializing (Geissdoerfer et al., 2017), lungo la supply chain (Hazen et al., 2021).

4. Conclusioni

La ricerca è attualmente in corso e, nella fase finora sviluppata, il lavoro si è concentrato prevalentemente sulla definizione dell'impostazione metodologica e sulla concettualizzazione dell'intersezione tra decarbonizzazione e circolarità, nonché sulla messa a punto dei criteri per l'individuazione del campione di imprese da analizzare. I prossimi passaggi consisteranno nell'esame sistematico della documentazione pubblicamente accessibile per ciascuna azienda selezionata, al fine di ricostruire in modo approfondito le pratiche ambientali adottate lungo la

filiera. A valle della codifica, sarà realizzata una matrice dei diversi casi, evidenziando il profilo di commitment alla decarbonizzazione (includendo anche copertura degli scope 1–2–3, orizzonte temporale del target SBTi) e il portafoglio di pratiche di circolarità riconducibili ai circular loops. L'analisi delle configurazioni sarà svolta in due passaggi: prima una analisi cross-case della matrice per individuare combinazioni di pratiche che emergono; successivamente una costruzione iterativa di configurazioni ricorrenti, attraverso confronto sistematico tra casi (similarità/differenze).

Parole chiave: Circolarità; decarbonizzazione; tessili

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Misurare e Comunicare la Sostenibilità del Settore Cartario Italiano: un'analisi dei Key Performance Indicators mediante il Bilancio di Sostenibilità

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1. Introduzione

Negli ultimi anni l'attenzione globale verso la sostenibilità ambientale e sociale è notevolmente aumentata. Questo interesse ha spinto i principali Paesi del mondo a collaborare attraverso piani d'azione comuni in ambito ESG (Environmental, Social and Governance). In questo contesto, il settore cartario assume un ruolo significativo, soprattutto in relazione agli obiettivi dell'Agenda 2030 dedicati al consumo e alla produzione responsabili (Obiettivo 12), alla lotta contro il cambiamento climatico (Obiettivo 13) e alla tutela della vita sulla terra (Obiettivo 15). Infatti, la crescente attenzione delle imprese verso la sostenibilità ambientale, sociale e di governance (ESG) sta determinando una trasformazione profonda anche dei modelli di misurazione delle performance aziendali e dei sistemi di rendicontazione. L'introduzione della Corporate Sustainability Reporting Directive (CSRD) e l'adozione dei nuovi European Sustainability Reporting Standards (ESRS) hanno ampliato gli obblighi informativi in materia di sostenibilità, imponendo alle imprese europee di integrare informazioni non finanziarie nei propri bilanci di sostenibilità e di sottoporle a verifica indipendente. Ciononostante, la normativa CSRD presenta ancora delle lacune e il framework degli ESRS è incompleto. Pertanto, le linee guida Global Reporting Directive (GRI) rappresentano ancora il punto di riferimento per la rendicontazione di sostenibilità e gli standard più utilizzati a livello globale (KPMG, 2022). Obiettivo di questo studio, che è in fase di completamento, è quello di individuare i principali temi materiali e gli indicatori GRI utilizzati dalle grandi aziende del settore cartario italiano nei loro report di sostenibilità. L'intento è comprendere quali indicatori e quali tematiche legate alla sostenibilità vengano maggiormente rendicontati. Attraverso un'analisi dei contenuti, la ricerca vuole cercare di rispondere a due domande fondamentali:

1. Quali sono gli indicatori chiave di sostenibilità più utilizzati dalle grandi aziende dell'industria della carta in Italia?
2. Quali sono i temi materiali più ricorrenti individuati nei loro report di sostenibilità?

I risultati dell'indagine potranno supportare i decisori aziendali nello stabilire le priorità nelle proprie strategie di sostenibilità in base all'impatto delle diverse questioni ESG e offrire alle imprese cartarie italiane un utile riferimento per affrontare le nuove sfide legate alla rendicontazione non finanziaria.

A seguito di questa breve introduzione, il resto dell'abstract è strutturato in tal modo: la Sezione 2 riguarda il quadro teorico di riferimento; la Sezione 3 illustra la metodologia di ricerca; la Sezione 4 presenta i risultati; la Sezione 5 fa riferimento alla discussione dei risultati; mentre le conclusioni sono riportate nella Sezione 6.

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2. Background

Nel corso del tempo si è consolidata a livello globale l'idea che le imprese debbano assumersi la responsabilità degli impatti che le proprie attività generano su stakeholder e società. In questo contesto, il bilancio di sostenibilità rappresenta uno strumento essenziale per comunicare in modo trasparente le proprie performance non finanziarie ed è, pertanto, anche uno strumento di supporto al raggiungimento degli obiettivi dell'Agenda 2030. Diversi studiosi hanno indagato la relazione tra reporting di sostenibilità e raggiungimento degli obiettivi dell'Agenda 2030 (Calabrese et al., 2021; Stefanescu, 2022; Whittingham, 2023), sottolineando come, da un lato, l'Agenda abbia influenzato la struttura e il contenuto dei report di sostenibilità; mentre, dall'altro, la presenza dei report di sostenibilità in cui dover rendicontare le proprie performance di sostenibilità abbia spinto le aziende ad impegnarsi maggiormente nel raggiungimento dei target stabiliti dalla suddetta Agenda.

Diversi studi hanno approfondito il legame tra sostenibilità e industria cartaria. Jones e Comfort (2017), analizzando i report di sostenibilità delle principali aziende del settore forestale e cartario, hanno osservato che la partecipazione delle imprese alle iniziative sostenibili è spesso motivata da esigenze economiche più che da un reale impegno ambientale o sociale. Pätäri et al. (2016), attraverso un'indagine condotta su esperti del settore della carta, hanno individuato tra i principali fattori che influiscono sulla sostenibilità dell'industria europea della carta l'aumento della domanda energetica, la volatilità dei mercati dei combustibili fossili e la scarsità di risorse naturali.

Altri studi si sono concentrati su aspetti più specifici: Wang et al. (2011) hanno dimostrato che in Cina l'introduzione di normative ambientali più rigorose ha migliorato l'efficienza ecologica dell'industria cartaria, mentre Scordato et al. (2018) hanno analizzato le politiche più efficaci per conciliare sostenibilità ambientale e competitività economica nel settore svedese. In Germania, Fleiter et al. (2012) hanno sviluppato modelli per stimare il risparmio energetico ottenibile attraverso nuove tecnologie produttive, con risultati simili a quelli di Xu et al. (2013) per il contesto americano.

Alcuni autori, invece, hanno cercato di elaborare indicatori sintetici di sostenibilità per il settore. Greiner (2001) ha definito le caratteristiche che un buon indicatore dovrebbe possedere, come la capacità di supportare le decisioni e misurare il raggiungimento degli obiettivi. Seguendo questo approccio, Fortuna et al. (2011) hanno proposto un insieme di indicatori riferiti a quattro aree principali: approvvigionamento responsabile delle fibre, produzione pulita, incremento dell'uso di materiale riciclato e riduzione dei consumi di carta. Tuttavia, il loro modello resta teorico e poco confrontato con la realtà industriale.

Papafloratus et al. (2023) hanno condotto un'analisi dei contenuti sugli argomenti di materialità discussi nei bilanci di sostenibilità delle grandi aziende dell'industria chimica, al fine di arricchire la ricerca scientifica relativa ai temi materiali di sostenibilità e al contenuto dei report di sostenibilità. Per rispondere alle loro domande di ricerca, gli autori utilizzano un approccio manuale con il quale identificano 15 temi materiali principali per le aziende del settore chimico e li classificano in base al numero di volte che sono richiamati nei report di sostenibilità. Il loro approccio non tiene conto delle scale di importanza con le quali molte aziende suddividono i propri temi materiali; pertanto, non offrono un discrimine tra temi che sono segnalati come secondari e temi che sono segnalati come primari. Karagiannis et al. (2023) studiano la valutazione di materialità nel settore del trasporto marittimo attraverso l'analisi dei contenuti e l'analisi dei dati, accompagnate da un sondaggio tra gli esperti del settore marittimo. Gli autori individuano inizialmente 544 temi materiali ESG in quanto discriminano anche i temi riconducibili alla medesima categoria ma con diversa denominazione; tuttavia, alla fine individuano gli aspetti ESG più significativi per le aziende del settore marittimo: salute e sicurezza sul lavoro, emissioni atmosferiche e gestione energetica. Léon e Salesa (2023) studiano

con approccio critico i temi di materialità di aziende nel settore spagnolo delle telecomunicazioni e dai loro risultati emerge che vi possono essere incongruenze tra analisi di materialità così come viene presentata dalle aziende e l'analisi degli indicatori GRI. Pertanto, è utile approfondire entrambi in maniera separata.

Infine, Pandey e Prakash (2018) hanno elaborato un indice di sostenibilità industriale applicandolo al comparto cartario per misurare il beneficio socioeconomico generato per unità di emissioni di CO_2. Pur essendo un contributo rilevante, questo indice non copre tutte le dimensioni della sostenibilità, trascurando altri temi materiali tipici del settore.

È a partire da questo quadro di riferimento che la sezione successiva sarà dedicata alla presentazione della metodologia di ricerca, in grado di supportare l'analisi degli indicatori e dei temi materiali scelti dalle aziende cartarie italiane nelle loro rendicontazioni di sostenibilità, al fine di rispondere adeguatamente alle domande di ricerca.

3. Il disegno metodologico

Per rispondere alle domande di ricerca iniziali, è stata condotta un'analisi dei contenuti sui report di sostenibilità di 29 grandi aziende italiane del settore cartario. Tra i vari approcci alla content analysis, è stato utilizzato un metodo qualitativo, che permette una classificazione strutturata e oggettiva dei dati, concentrandosi sulla codifica dei contenuti piuttosto che su un approccio narrativo. La codifica dei dati estratti dai report è stata eseguita manualmente seguendo una metodologia rigorosa.

Per selezionare i report oggetto di analisi, sono stati applicati alcuni criteri di eleggibilità:

- Dimensione aziendale: sono state considerate solo le aziende con fatturato superiore a 50 milioni di euro, individuando un cluster iniziale di 109 imprese.
- Disponibilità del report di sostenibilità: tra queste, solo 52 aziende pubblicano un report di sostenibilità.
- Presenza di duplicazioni: per gruppi aziendali con più società, è stato considerato solo il report consolidato, riducendo il cluster a 37 aziende.
- Uso degli standard GRI aggiornati al 2021: questo criterio ha migliorato la comparabilità dei dati e ha ridotto ulteriormente il campione a 29 report.

L'analisi dei contenuti si è concentrata su due principali aspetti: analisi GRI e analisi della materialità.

3.1. Analisi GRI

Per rispondere alla prima domanda di ricerca, è stata esaminata la tabella degli indicatori GRI contenuta nei report di sostenibilità. La sezione "GRI content index" è fondamentale nei report redatti secondo gli standard GRI, poiché guida il lettore verso i punti in cui ciascun tema di sostenibilità è trattato. Dopo uno screening qualitativo preliminare, è stato escluso un report perché i GRI erano riportati in forma sintetica. L'analisi finale è stata condotta su 28 report.

Seguendo l'approccio Triple Bottom Line di Elkington (1997), gli indicatori GRI sono stati classificati in tre macro-aree: economica, ambientale e sociale. In una matrice excel sono state inserite le aziende e gli indicatori GRI, rispettivamente tra le righe e le colonne della matrice. Esaminando i report di sostenibilità, per ciascuna azienda del campione è stato assegnato 1 punto in corrispondenza degli indicatori citati e 0 punti in corrispondenza degli indicatori non citati. I punteggi sono stati aggregati per dimensione (economica- ambientale-sociale). I risultati ottenuti sono poi stati ponderati in base al numero di indicatori presenti in ciascuna dimensione al fine di epurare i risultati in modo che il punteggio associato a ciascuna dimensione offrisse una rappresentazione dell'interesse complessivo delle aziende verso le tre aree.

3.2. Analisi di materialità

Per la seconda domanda di ricerca, è stata esaminata la sezione dei temi materiali dei report, dove le aziende indicano le questioni prioritarie per gli stakeholder, in linea con il GRI 3: Material Topics. Dopo uno screening qualitativo, sono stati esclusi 2 report che non definivano chiaramente i temi materiali, portando il campione a 27 report. Dall'analisi dei contenuti sui report di sostenibilità del campione sono stati individuati i temi materiali ricorrenti. È stato effettuato un ulteriore screening per evitare duplicazioni di temi simili o equipollenti. I temi individuati sono stati organizzati in tre dimensioni E-S-G: ambientale, sociale e di governance. A ciascun tema è stato assegnato un punteggio da 0 a 1 in corrispondenza di ogni azienda facente parte del campione: 1 punto per i temi classificati come principali, 0,66 punti per i secondari, 0,33 per quelli meno importanti e 0 se non menzionati. Il grado d'importanza riconosciuto dalle aziende del campione a ciascun tema materiale è stato desunto in maniera oggettiva in base alle indicazioni esplicite contenute nei report di sostenibilità analizzati. Laddove non è stato possibile distinguere un livello di importanza intermedio è stato assegnato 1 punto ai temi presentati nell'analisi di materialità e 0 punti ai temi che non erano citati nella matrice di materialità delle aziende oggetto d'indagine. La somma dei punteggi, divisa per il numero di aziende, ha fornito un punteggio medio rappresentativo del livello di priorità riconosciuto dai grandi operatori del settore cartario italiano a ciascun tema materiale.

$$\textbf{Material theme score} = \frac{\sum_{i=1}^{27} jx_i}{y}$$

j= livello di importanza attribuito all'argomento materiale dalle aziende. Dati estrapolati dall'interpretazione qualitativa delle informazioni rendicontate nei bilanci di sostenibilità del campione. $j \in [0,1]$.

y= numero totale di aziende

xi= aziende del campione

Infine, i risultati dell'analisi dei temi materiali sono stati anche categorizzati per area geografica, per valutare l'influenza del territorio sulle scelte delle aziende in materia di sostenibilità.



Figura 1. Approccio metodologico

4. Risultati preliminari

4.1. Analisi GRI

Dall'analisi degli indicatori GRI emerge che le aziende cartarie italiane riportano più frequentemente dati relativi all'ambiente, con un totale di 389 menzioni, seguite da indicatori

sociali (370) e da quelli economici, meno utilizzati (106). Ponderando i dati per il numero di indicatori associati dal sistema GRI ad ogni dimensione, l'area ambientale risulta la più rilevante, seguita dalla dimensione sociale e infine da quella economica. Questi risultati riflettono le peculiarità del settore, che è caratterizzato da: opportunità legate all'economia circolare, margini economici generalmente buoni e forte impatto ambientale della produzione di carta, in termini di consumo energetico ed emissioni.

Gli indicatori ambientali più utilizzati riguardano il consumo di energia all'interno dell'azienda e le emissioni dirette e indirette di gas serra, oltre alla gestione dei rifiuti prodotti. Il GRI 302-1 "Consumo di energia all'interno dell'organizzazione" ha ottenuto un punteggio di 22; i GRI 305-1 "Emissioni dirette di gas serra (Scope 1)" e 305-2 "Emissioni indirette di energia (Scope 2)" hanno entrambi totalizzato 24 punti. Il GRI 306-3 "Rifiuti generati" ha ottenuto un punteggio di 21. Gli indicatori meno riportati concernono la biodiversità (GRI 304, GRI 304-1, GRI 304-2, GRI 304-4), l'energia consumata al di fuori dell'organizzazione (GRI 302-2) e gli impatti ambientali lungo la filiera dei fornitori (GRI 308-2).

Nella dimensione sociale, i temi più presenti riguardano la salute e sicurezza sul lavoro (GRI 403-1 e GRI 403-2), la formazione dei dipendenti (GRI 403-5) e gli infortuni professionali (GRI 403-9). Indicatori meno usati includono il rispetto dei diritti dei popoli indigeni (GRI 411-1), la libertà di associazione (GRI 417-1) e la partecipazione politica (GRI 415-1).

Infine, la dimensione economica è quella meno rappresentata. Gli indicatori più riportati riguardano il valore economico diretto generato e distribuito e gli episodi confermati di corruzione, mentre indicatori relativi alla trasparenza fiscale sono quasi del tutto assenti.

4.2. Analisi di materialità

La maggior parte delle aziende ha utilizzato un'analisi di materialità di impatto. Solo una minoranza delle aziende ha adottato un approccio di doppia materialità, valutando non solo l'impatto delle attività aziendali sull'ambiente e sulle persone, ma anche gli effetti dei rischi ESG sulle performance finanziarie aziendali.

L'analisi dei temi materiali mostra che la dimensione ambientale è la più rilevante per le politiche di sostenibilità delle aziende cartarie italiane (ha ottenuto un punteggio di 0,54), seguita da quella sociale (punteggio di 0,41) e infine da quella di governance (punteggio di 0,38). Tra i temi ambientali più discussi emergono il cambiamento climatico (ottiene un punteggio di 0,9), l'uso delle materie prime e delle risorse idriche. Per la dimensione sociale, i temi prioritari sono la salute e sicurezza sul lavoro (punteggio di 0,81), la diversità e inclusione e la tutela dei diritti umani. In ambito governance, i temi più trattati sono etica e integrità, qualità dei prodotti e controllo della catena di fornitura.

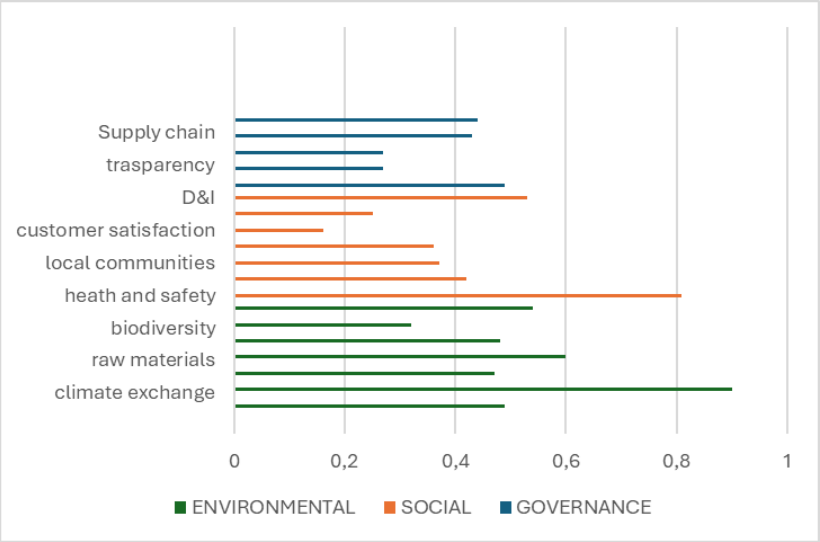


Figura 2. Principali temi materiali

L'analisi territoriale evidenzia differenze legate alla localizzazione delle aziende. Le imprese del Nord Italia, storicamente le più sviluppate del settore cartario, mostrano una forte attenzione ai temi ambientali e sociali, con particolare focus su salute e sicurezza, gestione dei rifiuti e economia circolare. Le aziende del Centro Italia attribuiscono maggiore importanza ai temi di governance, come qualità dei prodotti, etica e controllo della filiera, mentre i temi sociali risultano leggermente meno rilevanti. Le aziende del Sud Italia, pur limitate nel numero, mostrano come prioritari il cambiamento climatico, la salute e sicurezza sul lavoro e la gestione dei rifiuti, con minore attenzione ad altri temi sociali e di governance.

In sintesi, le aziende cartarie italiane mostrano un focus sui temi ambientali e sociali, con i temi relativi alla governance generalmente meno trattati. Inoltre, è possibile confermare che la scelta dei temi materiali è condizionata anche dalla collocazione geografica delle imprese.

5. Discussione e implicazioni

I risultati della content analysis sui GRI mostrano che gli indicatori più frequentemente utilizzati sono GRI 305-1, GRI 305-2 e GRI 306-3, relativi alla dimensione ambientale, GRI 403-1, GRI 403-2 e GRI 403-5, relativi alla dimensione sociale. Gli indicatori economici più utilizzati sono GRI 201-1 e GRI 205-3. Il GRI 305-1 e il GRI 305-2 riguardano le emissioni dirette e indirette di gas serra (GHG) in atmosfera. Gli indicatori sociali più utilizzati riguardano la "Gestione della Salute e Sicurezza sul Lavoro" (GRI 403-1), che si realizza attraverso la "Formazione dei Lavoratori" (GRI 403-5) e la "Valutazione dei Rischi" (GRI 403-2), come attività preventive, e il "Monitoraggio degli Infortuni sul Lavoro" (GRI 403-9) come attività di controllo.

Nel complesso, i risultati dell'analisi di materialità sono coerenti con quelli dell'analisi GRI ed evidenziano che le aree ESG strategiche per le grandi aziende dell'industria cartiera sono quelle ambientali, seguite da quelle sociali. In particolare, il cambiamento climatico e la salute e la sicurezza dei lavoratori sui luoghi di lavoro sono considerati come temi prioritari. Le aziende della carta sono aziende energivore e pertanto hanno interesse a ridurre le proprie emissioni in atmosfera. Molte aziende del settore hanno investito in sistemi di cogenerazione e trigenerazione il che fa aumentare le emissioni GHG Scope 1 ma fa diminuire più che proporzionalmente le emissioni GHG indirette, Scope 2 (Tomasin, 2012). Nel caso della salute e sicurezza sui luoghi di lavoro, le stringenti leggi sul tema in Italia hanno indotto gli imprenditori ad aumentare il controllo e la qualità dei sistemi di controllo della sicurezza. Ciò è particolarmente vero nelle

imprese di più grandi dimensioni (Cagno et al., 2014). Una scarsa attenzione è dedicata alla biodiversità, sebbene quest'industria abbia effetti diretti e indiretti sulla biodiversità come: l'uso eccessivo delle risorse legnose, la deforestazione, l'inquinamento delle acque, l'erosione del suolo (Dutta and Dutta, 2024; Jaworska et al., 2020; Liu et al., 2023; Tripathy et al., 2022). La tutela della biodiversità rientra tra gli obiettivi dell'Agenda 2030 e non dovrebbe essere trascurato dalle aziende dell'industria cartiera. Allo stesso tempo, gli autori avendo notato uno scarso interesse generale sui temi di governance relativi alla supply chain, si aspettano che ciò cambi a seguito dell'evoluzione della normativa europea sancita dall'approvazione della CSDDD (Corporate Sustainability Due Diligence Directive) in merito al controllo di matrice ESG che le aziende che superano determinati parametri dimensionali saranno obbligate ad effettuare lungo tutta la propria filiera di appartenenza.

6. Conclusioni

Le recenti normative europee impongono alle grandi imprese di rendicontare informazioni non finanziarie nei propri report di sostenibilità, spinte anche dalle crescenti aspettative degli stakeholder. Il settore cartario, particolarmente sensibile ai temi ESG per l'elevato consumo energetico e le significative emissioni (Amandio et al., 2022), riveste un ruolo strategico in Italia: con 8,16 miliardi di euro di fatturato e 19.000 occupati, è il secondo in Europa dopo la Germania (Assocarta, 2024) e leader nella produzione di carte igieniche e per uso domestico.

Alla luce di ciò, la ricerca è volta ad individuare gli indicatori di sostenibilità maggiormente utilizzati dalle imprese cartarie italiane nei loro report. A tal fine, è stata condotta un'analisi del contenuto dei principali report di sostenibilità del settore, articolata in due approcci di codifica manuale: il primo basato sul modello del Triple Bottom Line e sugli indicatori GRI, il secondo sull'analisi di materialità secondo la prospettiva ESG condivisa con gli stakeholder.

Il percorso metodologico adottato ha garantito un'interpretazione solida dei dati, ma ha evidenziato alcune criticità. Il campione, composto da 29 report di sostenibilità, è stato selezionato secondo criteri rigorosi (dimensione aziendale, adesione agli standard GRI 2016-2021, disponibilità di dati dettagliati), garantendo comparabilità ma limitando la varietà di prospettive. La codifica manuale, pur accurata, resta soggetta a un certo grado di soggettività tipico dell'analisi qualitativa.

Meno della metà delle aziende del campione ha certificato i propri report, e solo il 30% tramite società di revisione delle Big Four, riducendo la credibilità e affidabilità delle informazioni (Aureli et al., 2020; Elalfy et al., 2020) e aumentando il rischio di greenwashing. Infine, il sistema di ponderazione dei temi di materialità, seppur metodologicamente corretto, potrebbe essere migliorato in future ricerche con misure quantitative aggiuntive o validazioni indipendenti.

Questo studio apre nuove prospettive di ricerca. I risultati mostrano che solo una parte limitata delle aziende ha certificato i propri report di sostenibilità, evidenziando la necessità di ulteriori studi sull'attendibilità delle informazioni contenute nei report. Le evidenze possono inoltre contribuire allo sviluppo di politiche pubbliche più efficaci in ambito di sostenibilità. Il lavoro valorizza un approccio metodologico ancora poco utilizzato – la qualitative content analysis dei report di sostenibilità – che, grazie ai criteri di selezione, alla codifica manuale e all'uso degli standard GRI e delle matrici di materialità, può essere replicato in altri settori o contesti geografici per costruire confronti e benchmark comparativi.

Essendo un work in progress, la ricerca è in fase di completamento. Pertanto, le successive fasi prevederanno:

- l'utilizzo di strumenti di text mining per migliorare la comparabilità e la robustezza statistica dei risultati;
- la definizione di grafici e tabelle;
- l'approfondimento, in fase di valutazione, del nesso tra area geografica e materialità.

Parole chiave: GRI standard; ESG; report di sostenibilità; matrice di materialità; agenda 2030a

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Turismo resiliente nelle montagne biellesi: la terza attitudine della Pezzata Rossa d'Oropa

Luca Salvai[1], Alessandro Bonadonna[2]

1. Sviluppo concettuale

Le attività agricole nelle aree montane europee affrontano sfide sistemiche che ne minano la sostenibilità economica e sociale, portando all'abbandono dei terreni e alla perdita di biodiversità (Dax et al., 2021). In risposta a queste sfide, emerge la necessità di nuovi modelli di sviluppo che integrino la produzione primaria con servizi ad alto valore aggiunto (Velenik et al., 2007). Questi modelli si concentrano sulla valorizzazione delle risorse endogene, trasformando i vincoli territoriali in opportunità di mercato (Montrasio et al., 2017).

Il presente lavoro seleziona come caso studio il territorio della Provincia di Biella (Alpi Occidentali Italiane), in quanto epicentro del suo principale asset di biodiversità zootecnica: la Pezzata Rossa d'Oropa (di seguito PRO). Questa razza bovina autoctona, ufficialmente classificata dalla Regione Piemonte e dalle misure dell'Unione Europea come "razza a rischio di estinzione" (SRA 14 | ACA 14 – Allevatori custodi dell'agrobiodiversità), si definisce per le sue caratteristiche di robustezza e capacità di valorizzare pascoli magri, rendendola un elemento co-evolutivo inscindibile dal suo territorio (Lucchesi, Mattiello, 2008). Come verrà dimostrato empiricamente nella sezione "Risultati Conseguiti" (cfr. Tabella 1), l'analisi dei dati dell'Associazione Nazionale Allevatori Razza Bruna (ANARB) giustifica questa delimitazione, evidenziando come il Biellese ospiti l'assoluta maggioranza (59,21%) delle aziende allevatrici nazionali.

La simbiosi tra animale e ambiente rilevabile sul territorio genera due corollari fondamentali. In primo luogo, le produzioni da essa derivate (siano esse lattiero-casearie o di carne) acquisiscono un carattere di unicità e specificità territoriale. In secondo luogo, la razza stessa diventa un elemento paesaggistico attivo: la sua diffusa e quasi esclusiva presenza in alpeggio è il principale strumento di manutenzione contro l'imboschimento e il dissesto idrogeologico, preservando l'attrattività estetica e la fruibilità turistica del territorio.

Storicamente, la PRO possedeva tre attitudini: la prima lattiero-casearia, la seconda legata alla carne, e una terza, legata al lavoro nei campi. Con la meccanizzazione agricola del secondo dopoguerra, questa terza attitudine è divenuta obsoleta ed è di fatto scomparsa, senza essere sostituita.

Questo studio ipotizza che il vuoto possa essere colmato attraverso un'efficace strategia di place branding (Acharya et al. 2016), intesa come veicolo per una moderna 'terza attitudine' turistica. Tale approccio mira a replicare nel contesto biellese le dinamiche di successo di consolidati modelli alpini (quali quelli di Bolzano, Trento e Aosta), capaci di accoppiare promozione comunicativa e offerta di prodotti tipici per generare ricchezza diffusa. Il branding territoriale, in questi scenari, ha valorizzato senza stravolgere le organizzazioni socio-economiche tradizionali, dimostrando come l'autenticità possa divenire un motore economico sostenibile.

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2. Obiettivo

L'obiettivo primario di questa ricerca, attualmente in divenire, è esplorare le condizioni di fattibilità per l'attivazione di una "terza attitudine" turistica per la filiera della PRO.

La domanda di ricerca centrale è la seguente: È possibile stimolare e strutturare un'attitudine turistica (didattico-gastronomica) per gli allevamenti di Pezzata Rossa d'Oropa, utilizzando le produzioni lattiero-casearie e di carne come leve di valorizzazione esperienziale e territoriale?

Per rispondere a questa domanda, lo studio si prefigge i seguenti obiettivi secondari:

- Mappare il sistema produttivo esistente (allevatori, consistenze, trasformatori) e il sistema turistico parallelo (poli attrattori, flussi, ricettività).
- Indagare la visione, i desiderata e le barriere percepite dagli stakeholder chiave della filiera, utilizzando un approccio qualitativo strutturato.
- Identificare strategie di sviluppo differenziate, basate sulla segmentazione degli allevatori (per dimensione, posizionamento geografico e vocazione produttiva).
- Proporre un modello metodologico per favorire l'allineamento strategico (governance) tra gli attori pubblici e privati del territorio.

La promozione turistica in questo contesto può esplicitarsi attraverso una gamma diversificata di attività, la cui fattibilità dovrà essere validata dagli stakeholder. Esempi di possibili strategie sono: la vendita diretta (in azienda e in alpeggio), la creazione di "strade del formaggio" o itinerari tematici che colleghino i produttori ai sentieri escursionistici, lo sviluppo di esperienze agrituristiche (come "casaro per un giorno", visite guidate in stalla o fattorie didattiche), l'attivazione di partnership con il settore Ho.Re.Ca. locale (ristoranti, rifugi) per la creazione di menu a "filiera cortissima", e, infine, l'integrazione della narrazione (o storytelling) della PRO nel marketing territoriale dell'ATL Biellese.

3. Quadro metodologico

Per affrontare la complessità del sistema socio-tecnico in esame, si è adottato un approccio a metodi misti (mixed-method), che combina l'analisi spaziale quantitativa con un'indagine qualitativa approfondita basata sulla visione degli stakeholder (Duglio et al. 2019).

Fase 1: Mappatura quantitativa e analisi apaziale (work in progress)

Il primo passo consiste nella costruzione di un data-base geo-riferito che mappa due sistemi paralleli:

- Il Sistema Produttivo: Utilizzando i dati dell'Anagrafe Zootecnica (ANARB), si mappano la localizzazione (coordinate) e la consistenza (numero capi) di tutti i 164 allevamenti di PRO in provincia di Biella, nonché dei 3 principali trasformatori industriali.
- Il Sistema Turistico: Si procede alla mappatura dei principali attrattori e delle infrastrutture ricettive.

Questa mappatura non è solo descrittiva, ma propedeutica all'analisi strategica (cfr. Risultati Attesi), che utilizzerà queste variabili per modellare la "pressione logistica" (Analisi delle Isocrone) e l'opportunità di mercato (Analisi di Prossimità Turistica).

Fase 2: Indagine qualitativa (metodo Delphi, primo round)

Per analizzare criticamente la realtà territoriale, sono state predisposte interviste semi-strutturate nel solco del Metodo Delphi (Adler et al., 1996). Questa tecnica permette di raccogliere e aggregare in modo strutturato le opinioni di un panel di esperti (stakeholder), favorendo la convergenza attraverso round multipli e anonimi.

Gli stakeholder sono stati segmentati in:

- Stakeholder Primari: I produttori (allevatori) e i trasformatori (caseifici industriali e artigianali).
- Stakeholder Secondari: I rivenditori (negozianti), gli enti, le agenzie e le amministrazioni pubbliche e le associazioni civili radicate sul territorio e storicamente attive nella sua promozione-sviluppo.

Il primo round di interviste Delphi, attualmente in corso, prevede un'intervista semi-strutturata per indagare tre direttrici di discorso principali: la razza e i suoi prodotti, il territorio provinciale e la collaborazione interna. Il contenuto delle domande viene adattato qualitativamente in base al ruolo dello stakeholder (Primario o Secondario), al fine di mappare in modo olistico le visioni e i desiderata dei vari attori territoriali.

Per raggiungere tale obiettivo di mappatura, l'architettura dell'intervista semi-strutturata è stata progettata per coprire queste diverse dimensioni in modo sistematico. Nello specifico, il questionario si articola attorno alle tre direttrici di discorso precedentemente menzionate, il cui contenuto è stato differenziato come segue.

La prima direttrice, La Razza e i suoi Prodotti, indaga il valore intrinseco. Agli Stakeholder Primari vengono poste domande focalizzate sulle criticità tecniche e interne: le performance della razza, i costi di produzione in ambiente montano (validando qualitativamente i dati quantitativi sull'orografia), la costanza qualitativa della materia prima (latte) e le barriere burocratiche percepite. Per gli Stakeholder Secondari, l'indagine si sposta sulla percezione esterna e di mercato: la riconoscibilità del marchio PRO, gli argomenti di storytelling che giustificano un premium price (es. il legame con l'alpeggio), e le debolezze in termini di packaging o standardizzazione.

La seconda direttrice, Il Territorio Provinciale, analizza il contesto operativo. Con gli Stakeholder Primari, si indagano le barriere logistiche, indagando l'impatto dei tempi di percorrenza reali sui costi e sulla sostenibilità economica dell'autoproduzione e/o della raccolta industriale. Con gli Stakeholder Secondari, si mappano le opportunità turistiche: la domanda specifica dei turisti (locali vs. esterni), la consapevolezza della vicinanza tra produttori e poli attrattori e quali prodotti esperienziali siano richiesti dal mercato.

La terza direttrice, La Collaborazione, valuta la governance del sistema. Attraverso domande omogenee per entrambi i gruppi, si indaga la qualità delle relazioni di filiera (verticali: fiducia tra produttori e trasformatori; orizzontali: frammentazione tra pari) e la percezione del ruolo degli enti di promozione. Infine, per omogeneizzare la percezione delle priorità strategiche, viene posta a tutti gli stakeholder una domanda chiave di ripartizione del budget, formulata come segue: "Dovendo allocare un budget ideale di 100 euro tra le seguenti tre macro-aree – (1) Infrastrutture fisiche, (2) Marketing territoriale e (3) Creazione di Rete (collaborazione) – come distribuirebbe l'investimento?".

Fase 3: Analisi dati e sviluppo (Delphi Round 2 e NGT)

A valle del primo round, le risposte qualitative verranno analizzate e codificate. L'analisi mirerà a individuare le percezioni e i desiderata più frequenti, prestando particolare attenzione a differenziare le risposte in funzione della dimensione dell'allevamento.

L'analisi qualitativa consentirà di modulare il secondo round di interviste Delphi. In questa fase si proporranno agli stakeholder delle strategie mirate, emerse dal Round 1 (approccio bottom-up), mostrando un atteggiamento propositivo e mai impositivo, al fine di testare il livello di consenso.

Infine, data la natura "compressa" delle relazioni interpersonali nella provincia, si è pianificato di far seguire al Metodo Delphi una Nominal Group Technique (NGT) (Harvey et al., 2012). L'NGT è un workshop strutturato che guida un gruppo (in presenza) dalla generazione di idee alla loro prioritizzazione tramite voto. L'obiettivo è trasformare il "consenso" emerso dal

Delphi in un allineamento strategico su azioni concrete, neutralizzando le dinamiche di dominanza e i campanilismi che spesso affliggono le realtà locali.

4. Risultati conseguiti e attesi

Fase 1: Mappatura quantitativa e analisi spaziale

Come primo risultato della mappatura quantitativa, l'analisi dei dati nazionali ANARB (detentore dei Registri Anagrafici) ha permesso di validare empiricamente la scelta metodologica di delimitare il campo d'indagine. L'analisi distributiva, illustrata nella [Tabella 1], evidenzia come il territorio biellese rappresenti l'epicentro indiscusso della razza, ospitando da solo il 59,21% del totale delle aziende allevatrici a livello nazionale.

Provincia	**N° Aziende**	**% Rispetto al Totale**
Alessandria	5	1,81%
Cuneo	22	7,94%
Novara	6	2,17%
Verbano Cusio Ossola	52	18,77%
Biella	**164**	**59,21%**
Vercelli	23	8,30%
Bergamo	1	0,36%
Como	2	0,72%
Varese	1	0,36%
Roma	1	0,36%

Tabella 1. Distribuzione provinciale PRO. Fonte:Elaborazione personale, dati ANARB

Sebbene le province limitrofe di Verbano-Cusio-Ossola (18,77%) e Vercelli (8,30%) presentino consistenze significative, la loro esclusione da questa fase dello studio è motivata da una fondamentale eterogeneità istituzionale. Questi territori, infatti, pur condividendo un assetto morfo-produttivo e tecniche di allevamento assimilabili, afferiscono a enti di promozione turistica, gestione sanitaria e sviluppo territoriale differenti. Tale omogeneità istituzionale è invece un prerequisito per un'efficace analisi del modello di governance. I territori esclusi costituiscono, tuttavia, un ideale terreno per future repliche del modello di analisi qui proposto.

Focalizzando dunque l'analisi sui 164 allevamenti biellesi, si è proceduto alla mappatura delle sedi aziendali. Come evidenziato dalla mappa [Figura 1], le sedi aziendali mostrano una distribuzione capillare sull'intero territorio provinciale, sviluppandosi "a raggiera" dal polo urbano di Biella sia verso le valli montane sia verso le aree planiziali. Sebbene questa rappresentazione fornisca un'immagine chiara della diffusione della PRO, essa presenta un limite metodologico fondamentale: la non coincidenza tra la sede legale (l'indirizzo fiscale registrato, spesso l'abitazione dell'allevatore) e la sede operativa (l'ubicazione fisica della stalla).

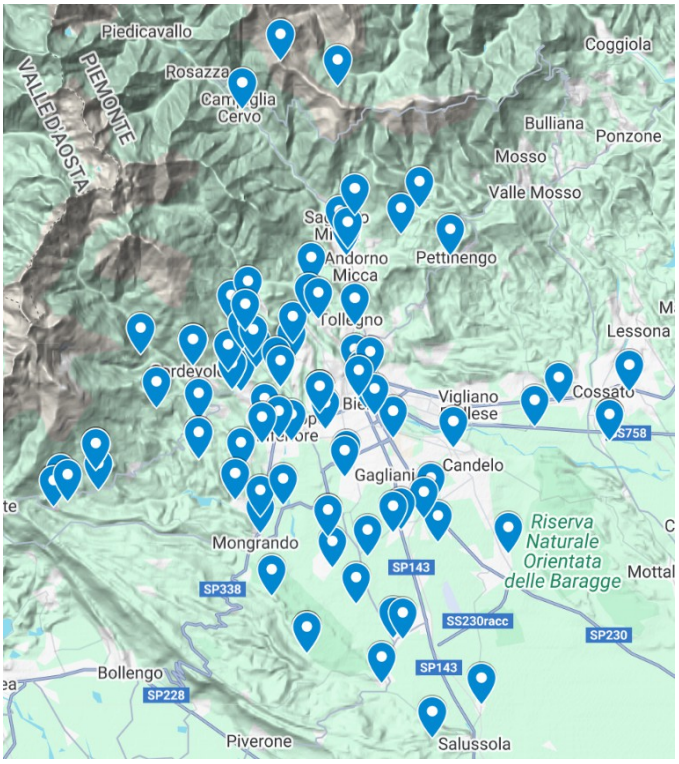


Figura 1. Mappa della distribuzione delle sedi aziendali degli allevamenti di PRO[3]

Questo limite è aggravato dalla natura stessa degli indirizzi rurali biellesi, che non aderiscono alla toponomastica standard (via/numero civico) ma si basano su riferimenti locali (toponimi, nomi di frazioni o cascine). Tali indirizzi, pur funzionali alla comunità locale, risultano incomprensibili ai sistemi di geo-codifica automatica. Ad oggi, questo approccio ha permesso di mappare con certezza 93 allevamenti sui 164 totali, evidenziando la necessità di una validazione manuale "in campo" per consolidare il database geografico delle sedi operative.

Parallelamente, sono stati mappati i tre principali trasformatori di latte organizzati a livello industriale. Si tratta di stabilimenti di trasformazione e stagionatura che non possiedono allevamenti propri e che, come mostra (in rosso) la Figura 2, sono tutti ubicati in un cluster in prossimità del capoluogo. Tale prossimità geografica implica, presumibilmente, dinamiche logistiche e di mercato simili; fattore che se da un lato può facilitare un coordinamento strategico, dall'altro acuisce la competizione sulla raccolta della materia prima. La presenza di soli tre attori industriali rende, tuttavia, l'analisi della governance di filiera un obiettivo cruciale e pragmaticamente approcciabile.

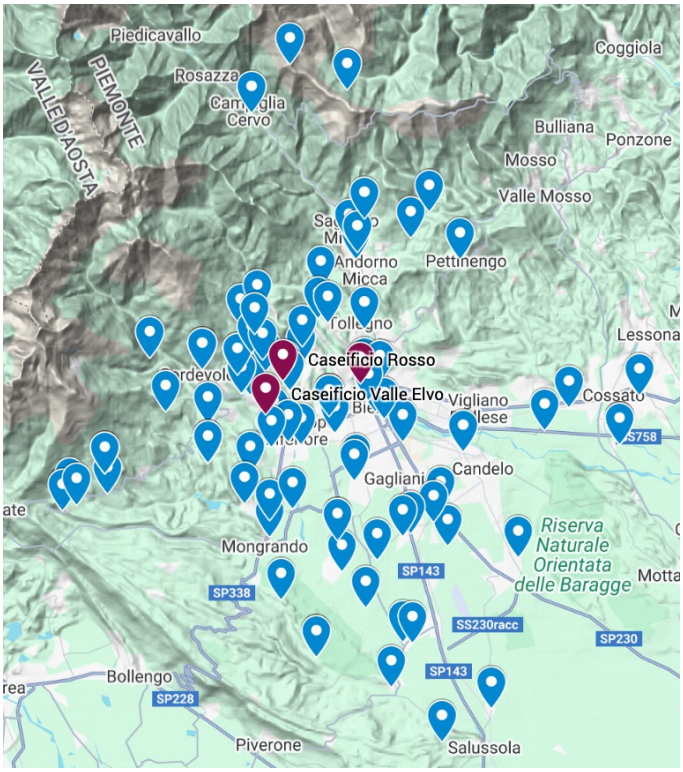


Figura 2. Mappa degli allevamenti (BLU) e dei trasformatori (ROSSO)

Per superare i limiti della mappatura statica (le stalle invernali) e mappare l'effettivo utilizzo del territorio – i.e. l'areale di pascolo effettivo – è in fase di definizione una collaborazione con l'Azienda Sanitaria Locale (ASL-BI). L'obiettivo è ottenere l'ubicazione dei pascoli estivi (alpeggi), fondamentali per mappare la "filiera stagionale" e permettere l'effettiva intersezione tra le aree di presenza della PRO (maggio-ottobre) e i punti di interesse turistico.

Per quanto riguarda la mappatura del sistema turistico, il processo di sistematizzazione si è rivelato meno lineare. In assenza di un database aggregato, si sta procedendo alla raccolta di dati secondari frammentati (es. catasto sentieri, elenchi rifugi). Sorprendentemente, l'indagine Delphi (Fase 2) si sta rivelando uno strumento euristico fondamentale: interrogando gli stakeholder secondari, oltre a richiedere indicazioni su dove reperire dati strutturati (come elenchi di rifugi o catasti sentieri), si stanno recuperando iniziative di valorizzazione passate, permettendo di inquadrare l'evoluzione comunicativa del territorio.

Fase 2: Indagine qualitativa (metodo Delphi, primo round)

Come fase preliminare del primo round Delphi, si è testato il questionario semi-strutturato su un campione pilota di stakeholder.

Dai Produttori (Stakeholder Primari), è emersa una forte componente identitaria: la scelta di allevare la PRO non risponde a logiche di massimizzazione produttiva, ma a ragioni di prosecuzione generazionale e tradizione territoriale. Emerge con trasparenza che i contributi europei – come l'intervento SRA 14 (Allevatori custodi dell'agrobiodiversità, ex-Misura 10) e l'intervento SRB 01 (Sostegno alle zone con svantaggi naturali montani, ex-Misura 13) – sono cruciali per la sostenibilità economica dell'allevamento. Interpretiamo questo dato come un'indicazione di ricettività verso la diversificazione del reddito, come quella offerta dalla "terza attitudine" turistica.

Sul fronte del prodotto, la domanda locale per le produzioni lattiero-casearie a latte crudo è talmente alta da superare l'offerta, portando a una stagionatura breve (max 6 mesi) e a una scarsa notorietà extra-provinciale. Paradossalmente, è la stessa alta domanda locale, unita alla cronica assenza di cooperazione tra produttori che non ha mai favorito alcuna forma di standardizzazione o promozione collettiva, a mantenere il prezzo medio relativamente basso e a limitare il potenziale di valorizzazione del prodotto al di fuori dei confini biellesi.

Per quanto riguarda l'attitudine "carne", sebbene le sue proprietà organolettiche la rendano meno competitiva sul mercato del fresco rispetto ad altre razze piemontesi, le interviste hanno evidenziato un grande successo nelle iniziative di ristorazione locale. In contesti in cui la razza è visibile e valorizzata (come rifugi o agriturismi in alpeggio), la promozione di piatti tipici a base di PRO riscuote un forte richiamo, legandosi a un consumo esperienziale. Questo successo narrativo si trasferisce ai prodotti trasformati e confezionati (come bresaola e ragù in vasetto). Per questi prodotti, uno sforzo comunicativo mirato che leghi il prodotto al territorio permette di ottenere buoni margini, sebbene i quantitativi siano destinati a una distribuzione di nicchia (vendita diretta, rivenditori locali) e non alla Grande Distribuzione Organizzata. Il principale fattore che limita lo sviluppo di questa filiera è il recente e drastico aumento del prezzo delle vacche a fine carriera (+56% secondo dati dell' Istituto di Servizi per il Mercato Agricolo Alimentare (ISMEA), riferito alla PRO), che contrae la disponibilità di materia prima per queste produzioni di nicchia.

Dalle interviste svolte, è emersa la possibilità di segmentare gli allevamenti secondo tre classi dimensionali che riflettono diverse logiche imprenditoriali:

- Artigianale (< 25 capi): L'allevamento non è la fonte di reddito primaria. Prevale una logica di integrazione al reddito, autoconsumo o "custodia" del territorio.
- Professionale (25-40 capi): È la dimensione che permette all'allevatore di trarre uno stipendio primario dalla conduzione personale e autonoma della stalla.
- Strutturata (> 40 capi): L'organizzazione del lavoro cambia radicalmente, seguendo logiche imprenditoriali più complesse, con dipendenti e spesso integrate nella filiera industriale.

Abbiamo quindi interrogato il nostro database per categorizzare gli allevamenti in questo senso, ottenendo:

Tipologia di allevamento	**Quantità**	**% del Totale Complessivo**
Artigianale (< 25 capi)	63	38%
Professionale (25-40 capi)	37	23%
Strutturata (> 40 capi)	64	39%
Totale complessivo	164	100%

Tabella 2. Classificazione dimensionale allevamenti PRO. Fonte: Elaborazione personale, dati ANARB

Nonostante ci sembri essere una distribuzione quasi proporzionale nelle tre classi, va notato che, considerando la popolazione degli allevamenti della provincia di Biella, la mediana della consistenza di un allevamento (32,5) è decisamente inferiore rispetto alla media (41). Ciò testimonia che poche grandi aziende "trascinano" la media, mentre il tessuto produttivo è primariamente composto da realtà medio-piccole (artigianali e professionali). Quest'utile informazione logistica, ci permette di poter tenere in considerazione che le risposte e i desiderata degli allevatori che a mano a mano intervisteremo è più che verosimile che varino al variare della classe dimensionale di appartenenza.

Dagli Stakeholder Secondari emerge un fattore limitante cruciale: l'alta faziosità e la storica resistenza a forme di aggregazione. Tuttavia, emerge anche un dato incoraggiante: tutti i precedenti tentativi di collaborazione sono percepiti come viziati da interessi particolari, mentre

un approccio super partes guidato dalla ricerca universitaria (come quello in essere) viene visto come un'opportunità inedita per superare i campanilismi.

In conclusione, oltre a seguire i tre filoni tematici (la razza e i suoi prodotti, il territorio provinciale e la collaborazione), queste interviste mirano indirettamente a mappare i Punti di Forza (Strengths) e i Punti di Debolezza (Weaknesses) come attualmente percepiti dagli operatori in situ, nonché le Opportunità (Opportunities) e le Sfide (Challenges) che si percepiscono in questo momento storico-legislativo (Analisi SWOC). Le stesse matrici SWOC, poi, potrebbero anche essere create per ciascuna attitudine, fornendo del materiale operativo su cui basare le strategie di sviluppo territoriale future.

Non si esclude la possibilità che ci sia stato un sample bias (distorsione del campione) per cui si sia partito da allevatori e attori particolarmente ben disposti rispetto agli obiettivi della ricerca. Si potrebbe inoltre argomentare che, procedendo per interviste semi-strutturate, sia difficile comparare le risposte ottenute in maniera rigorosa. Confrontandoci a valle di questi test, ci siamo risposti che questo approccio aiuta a valorizzare l'intervistato come protagonista di un cambiamento di cui sarà, sperabilmente, attore e non ricettore passivo. Dati i passati fallimenti di collaborazione, cogliere le sfumature individuali nelle risposte è cruciale per acquisire una maggiore consapevolezza nell'approccio e nei modi in cui portare avanti questa ricerca.

Fase 3: Analisi dati e sviluppo (risultati attesi)

Trattandosi di un work in progress, i risultati di questa fase sono attesi e di natura strategica. Per rispondere alla nostra domanda di ricerca – se sia possibile o meno riattivare una terza attitudine per la PRO – l'obiettivo non è fornire una soluzione unica, ma una "mappa strategica" che permetta la segmentazione e l'identificazione di percorsi di sviluppo differenziati.

Per oggettivizzare l'analisi e sfruttare la mappatura quantitativa (Fase 1), si procederà alle seguenti analisi spaziali, che metteranno in relazione la mappa produttiva e quella turistica:

- Analisi di Densità Kernel Ponderata (Weighted Kernel Density): Per identificare gli hotspot produttivi, ovvero i "bacini" dove la concentrazione di capi (non solo di aziende) è massima, superando i confini amministrativi.
- Analisi delle Isocrone (Isochrone Analysis): Per mappare la pressione logistica, calcolando i tempi di percorrenza reali dagli allevamenti ai trasformatori, identificando così gli allevatori "remoti" (logisticamente svantaggiati) e quelli "accessibili" rispetto ai trasformatori.
- Analisi di Prossimità Turistica (Tourism Proximity Analysis): Per mappare l'opportunità di mercato, incrociando la posizione degli allevatori (in particolare quelli "remoti" e "artigianali") con la rete sentieristica e ricettiva per identificare chi è già posizionato per intercettare i flussi turistici.

L'output finale sarà una matrice di strategie differenziate. Ad esempio, un allevatore "remoto" (>40 min), ma "prossimo" ai sentieri (<1 km) e di tipo "Artigianale" (<25 capi), sarà un candidato ideale per una strategia di filiera corta esperienziale (vendita diretta, agriturismo). Al contrario, un allevatore "accessibile" (<20 min) e "Strutturato" (>40 capi) sarà indirizzato verso una strategia di valorizzazione della filiera lunga, in partnership con i trasformatori e la ristorazione locale (Ho.Re.Ca.).

Questi risultati verranno poi re-inseriti nel processo Delphi. Seguirà infatti un secondo round in cui tali tendenze e la matrice strategica verranno proposte agli stakeholder. Lo scopo è duplice: allargare le loro visioni individuali a quelle "mediane" del territorio e testare la fattibilità percepita delle strategie proposte.

Per costruire infine un modello di governance e favorire l'allineamento strategico, si utilizzerà la Nominal Group Technique (NGT). Questa fase trasla la ricerca da interviste individuali a "tavole rotonde" (workshop) strutturate. L'NGT, tramite la generazione di idee e un voto palese o segreto, trasforma il consenso qualitativo del Delphi in una lista di priorità operative condivise, neutralizzando le dinamiche di dominanza e i campanilismi.

Il successo della "terza attitudine" non dipende infatti dai singoli, ma dalla capacità del sistema territoriale di agire in modo coeso: è fondamentale che gli enti di promozione supportino questo modello, che le amministrazioni facilitino la transizione, e che le associazioni civili accompagnino il processo con una narrativa positivistica.

In conclusione, questo studio risponde alla domanda di ricerca dimostrando che la "terza attitudine" turistica non solo è possibile, ma è necessaria per la sostenibilità della filiera. Attraverso la mappatura socio-spaziale parallela (Fase 1), lo studio identifica dove si trovano le risorse produttive e turistiche. Attraverso l'indagine qualitativa (Fase 2), si comprende perché il sistema attuale è bloccato e come gli attori sono disposti a muoversi. Infine, attraverso l'analisi strategica e la NGT (Fase 3), si definisce cosa fare, fornendo una matrice di interventi differenziati.

Questo lavoro pone le basi per un modello metodologico scalabile, applicabile ad altri territori marginali europei. Dimostra come un approccio socio-spaziale possa supportare lo sviluppo di produzioni iper-locali, oggi minacciate da dinamiche di spopolamento, emarginazione e concorrenza globale. La perdita di queste produzioni non è solo economica, ma rappresenta una perdita irreversibile del patrimonio culturale e della biodiversità che animano il territorio europeo.

Parole chiave: Marketing territoriale; sviluppo locale sostenibile; multifunzionalità zootecnica; governance della filiera; metodo Delphi

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Welfare, Innovation and NetWorking: Systemic interrelationship between businesses and new socio-environmental perspectives (WIN.WIN)

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1. Introduction

The concept of welfare is becoming increasingly central to organisational policies in Italy (e.g., Gasparri, 2021; Ascoli, Natali, Pavolini, 2018), partly due to the introduction of laws that progressively support and encourage its implementation.

The benefits of welfare measures extend well beyond the economic and legal advantages that often drive their adoption. When effectively integrated into corporate strategies, welfare policies lead to greater employee satisfaction, increased productivity, and enhanced company attractiveness, which helps to identify and retain talent in the area. There are various classifications of welfare assets, which can be traced back to four main pillars. The first is "welfare" in its strict sense, meaning actions aimed at the redistribution of resources. The second is equal opportunities, which guarantee fair access to resources and protect against all forms of discrimination. The third pillar is quality of life, referring to interventions that improve sustainability in environmental and social dimensions. Lastly, organisational well-being includes actions that promote the physical, mental, and emotional well-being of an organisation's human capital.

Despite this growing interest, few studies systematically map which actions companies actually implement, which methods are used to detect needs, and which issues must be addressed. Moreover, the available studies rarely employ collaborative methodologies, in which scientists,

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companies, and sector organisations contribute to formulating the project idea, collecting data, and discussing the results. The aim of the research we present, currently in progress, is to address both these gaps, which represents the most original feature of this contribution.

2. The W.I.N W.I.N project

The project examines the welfare initiatives implemented by companies in the province of Biella, north-west Italy.

The project is developed through joint planning by UIB (Unione Industriale Biellese), University of Torino and other partners, such as Cassa di Risparmio di Biella. In particular, the Management Department of the University of Turin is the scientific leader of the project. The Department of Psychology, ESOMAS Department, Department of Law, Department of Foreign Languages and Literatures and Modern Cultures, Department of Culture, Politics and Society, and Department of Neuroscience also collaborate in various phases of the research.

The heterogeneity of partners ensures multidisciplinary perspectives and methodologies. The heterogeneity of perspectives, both theoretical and practical, presents a challenge as it requires mediation between different languages and methodologies. At the same time, it enables a greater understanding of complex realities such as the one of interest.

The Biella area, through UIB (Unione Industriale Biellese) and other partners such as Cassa di Risparmio di Biella promoted this project for several important reasons.

The province of Biella has a long history of industrial excellence, but as the IV Annual Report 2024 by Osserva Biella clearly highlights, a profound transformation of companies in response to new competitive challenges – including increasing globalisation, digitalisation, and the ecological transition – requires innovative drive to foster industry, employment, and sustainability.

This integrates environmental, social, and economic aspects (the so-called ESG criteria) into daily strategies and operations to create long-term value for all stakeholders, not just profit.

To achieve this, companies must focus on a long-term, ethical, and transparent vision, worker well-being, responsible innovation, resource efficiency, and open communication with the community and dependants.

Innovation, sustainability, and investment in human capital are key factors in meeting these challenges and strengthening the position of Biella companies in the markets. Welfare actions can enhance the value of people within the company, who are a true driving force of innovation, and increase the attractiveness of the entire industrial area.

3. Aim and methodology

The aim of this research is to develop an innovative corporate welfare model by integrating dialogue among businesses, academia, and stakeholders in the civil economy with sustainable and replicable strategies that enhance organisational well-being and workers' quality of life, thereby contributing to sustainable and inclusive growth.

The first step to achieving this ambitious goal is to establish a participatory dialogue in which the voice of companies is not only heard but also considered as a guide. In the first part, indeed, semi-structured interviews with entrepreneurs or managerial figures working in the Province of Biella are conducted to understand which welfare actions have been implemented so far in their corporation.

In the second part, a questionnaire is developed based on the literature and interview results. The questionnaire will be administered to employees of the companies included in the study. The results of the interviews and questionnaires will be combined in a summary of guidelines and best practice.

4. Semistructured interviews

In the first part, semi-structured interviews with entrepreneurs or managerial figures working in the Province of Biella are conducted to understand which actions have been implemented so far in their corporation.

The study is currently scheduled from November 2025 to March 2026.

All participants are informed that participation in the study is voluntary and that no compensation is provided. Interviews are recorded, subject to the participants' written consent. Each interviewee is informed in advance about the purposes of the research and privacy considerations. Anonymity and confidentiality of the collected material – used exclusively for educational and research purposes – as well as the possibility to terminate the interview at any time, will be guaranteed.

UIB has more than 400 subsidiary companies. 167 companies were selected. They are distributed across six production sectors: food and beverages (8), spinning (34), mechanics (37), wool mills (20), ennoblement (41), technological services (17), tourism and culture (4), other (6).

Although time-consuming, we chose to conduct this first phase of the research through interviews to gain in-depth knowledge of each productive reality.

All interviews will be conducted by the same person, an expert in qualitative methods in order to provide the best uniformity in data collection.

The interviews are audio-recorded and transcribed verbatim.All participants are contacted by telephone to arrange a date for the interview so as not to interfere with the companies' activities. Everyone receives the interview questions in advance via email.

The questions asked to respondents are as follows:

- Please provide a brief description of your business.
- What welfare initiatives has your company implemented in recent years? How did you select these initiatives over others? What were the funding sources?
- What were the main outcomes? For example, the number of workers involved, level of satisfaction, etc.
- Have any of these initiatives involved other local businesses?
- To what extent do welfare initiatives contribute to the attractiveness of your business and the local area?

Interviews take less than half an hour. Great care is taken to remain within this time frame to ensure the process is manageable, given the often very busy schedules of companies. Many interview requests have been ignored by prospective participants precisely because of the numerous requests for interviews and questionnaire completion.

The interview transcriptions will be analysed using Alceste software. Alceste 6.0 is software for textual and statistical analysis, suitable for large volumes of qualitative data, such as written texts or verbalised conversations. The software performs several operations on the text, creating a word frequency matrix, assigning semantic categories to words, analysing word groups, and generating graphs and tables to display the results. Alceste processes the text data using descending hierarchical classification (DHC). The text is first divided into elementary context units (EUA) and then into homogeneous classes. Alceste proposes an analysis of the internal structure of the corpus, which is not determined by the post-coding grids chosen by the researcher, but results from the distribution of words used by participants to discuss a given topic The software identifies the most homogeneous classes in terms of content, which therefore have a different lexical-semantic universe from the others. The use of certain words seems to convey the conceptual context of the topic to which they belong, as well as the situation in which they are used. Thus, if a particular word is used frequently, it means that the underlying argument acquires particular thematic significance. In contrast, if a particular word is used infrequently, it may mean that it is not relevant to the topic or that the speaker is not predisposed to use that word.

The software also makes it possible to highlight recurring segments, i.e. the associations of the most frequent words in a class and the classes associated with the selected variables. These

are called illustrative variables and contain additional information about the text corpus that allows the researcher to identify the specific characteristics that define individuals who share the same semantic universe.

5. Preliminary data emerging from the interviews

Below, we report the preliminary results of pilot interviews conducted to test the quality of the interview plot.

The questions are relevant and allow the interview to be completed within the indicated time frame (approximately 20 minutes).

Ten people were interviewed, all HR managers from different companies. Eight companies have more than 50 employees (the other two have less than 50 employees). They belong to the seven identified sectors (two are spinning mills). Six are family-run companies and two are multinationals.

The results we present are only preliminary and will be supplemented by further interviews in the coming weeks.

Welfare measures taken (an overview)

Before Covid, welfare measures appeared to focus on shopping vouchers, fuel cards, or tickets restaurant. After the pandemic, many companies began to incorporate medical services. Initially, medical services included reimbursement for treatment or specialistic visits, whereas now many companies incorporate prevention initiatives, cancer screening, nutrition programmes, and mental health services.

Some companies (the largest) provide insurance that provides financial support to families in the event of the death of the employee and other forms of income support in the event of serious illness or injury.

Welfare actions designed to reconcile family and working life are not uncommon: support for nurseries, for the purchase of textbooks, or for summer camps.

Little attention is paid to the needs of families with grown children (e.g. financial support for university studies, for off-site rentals, for driving school payments). No welfare measures were mentioned to support caregiving, nor for children with disabilities or for the spouse or parent needing constant help.

To blue-collar workers it is difficult to ensure flexible hours and smart working, while these measures are regularly adopted for administrative staff.

A highly appreciated service is the possibility of making the tax return with professionals made available by and in the company itself.

Needs analysis

Needs analysis is conducted through the involvement of unions, internal anonymous surveys, and input from the entrepreneur.

How are providers chosen?

All companies state that they prefer welfare service providers closely connected to the local area. Some previously used large agencies based in big cities, but later returned to local providers. This choice was made for two reasons: to make it easier for employees to use the services and to support the growth of the local economy.

Companies with a high percentage of blue-collar workers and people over 50 said they chose simple delivery methods that require minimal use of digital or web platforms. These tools, although advanced, encounter significant resistance.

Can welfare measures contribute to attractiveness?

All the interviewees consider welfare measures important for contributing to attractiveness. Family-based companies appear to place more emphasis on worker retention than on recruitment.

In the second part of the research, a questionnaire will be developed basing on the literature and interview results. The questionnaire will be administered to employees of the companies included in the study and analyzed through SPSS software. The results of the interviews and questionnaires will be combined in a summary of guidelines and best practice.

This second part of the project will only be launched in the Spring 2026.

6. Expected results

From the interviews, we expect to be able to map the welfare actions implemented in companies of the Biella area. We are particularly interested in analysing the steps taken by different production entities to identify the welfare needs of their employees. In addition, it will be possible to identify the drivers, beyond the fiscal advantages, that motivate these actions. We expect good practices and pilot projects to emerge.

The mapping could also reveal any critical issues or implementation difficulties. Finally, we are interested in understanding whether companies are able to build dialogue and networks on these issues. We also believe that simply answering the interview questions encourages important reflection on the topics discussed. Finally, we hope that the good practices identified can help increase the attractiveness of the area's business fabric.

It should be noted that the expected number of interviews represents a significant methodological effort, which nevertheless enables a comprehensive mapping of the existing reality. The large number of interviews also makes it possible to analyse the corpus by sector, allowing any specificities of each sector to be highlighted.

The collected data collected through the questionnaires will provide a different perspective, that of the employees and will provide quantitative information.

Mapping of this kind provides an accurate snapshot of production reality and serves as an important benchmarking tool not only for academia, but also, and perhaps above all, for the local industrial fabric. Looking ahead, it may also serve as a valuable tool for larger territorial areas.

7. The innovative of this project

The methodological approach, which involves data collection from both those who design and provide the service (the enterprise) and those who use it (the enterprise’s employees).

The initiation of a dialogue that will highlight best practices which not only have an impact on public image (for example, in public opinion) but are also positively evaluated by the beneficiaries themselves.

These aspects will enable the improvement of practices for the benefit of users (for example, by increasing the pool of potential users of a given service or by changing the criteria for inclusion in initiatives).

8. Limitation

The main limitation of this study is its narrow geographical focus on the Province of Biella. Although this area is an industrial district of great historical and economic. Its specific

characteristics may however limit the generalisability of the results. The methodology (both the interviews and the resulting questionnaire) can be easily replicated and favoured for possible extensions over time.

Keywords: Welfare; interview; guidelines; attractiveness; territorial welfare

Acknowledgments

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Verso un consumo responsabile e sostenibile: un'analisi dei fattori che guidano lo spreco alimentare in ambito domestico

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1. Introduzione

Lo spreco alimentare rappresenta una delle principali sfide ambientali, economiche e sociali del nostro tempo. Secondo uno studio realizzato da WWF, il 40% del cibo prodotto a livello globale va sprecato (WWF, 2021). Lo spreco alimentare si riferisce alla rimozione dalla filiera alimentare di cibo ancora adatto al consumo umano. Ciò avviene sia per scelta sia perché il cibo si deteriora o per negligenza e si verifica tipicamente a livello di vendita al dettaglio e di consumo (Rezaei and Liu, 2017).

Le conseguenze di questa pratica sono profonde e riguardano dimensioni ambientali, climatiche e sociali. Anzitutto, lo spreco alimentare comporta un enorme dispendio di risorse naturali, acqua, suolo ed energia, utilizzate lungo l'intera filiera produttiva per alimenti che, alla fine, non vengono consumati. Inoltre, con-tribuisce in modo significativo al cambiamento climatico, i rifiuti organici in discarica rilasciano metano. Infine, rappresenta una seria ingiustizia sociale, poiché avviene in un contesto globale in cui milioni di persone soffrono la fame (WWF, 2021). Il principio dello "zero waste" rappresenta uno dei pilastri dell'economia circolare, che si fonda sulla riduzione dei rifiuti, sulla circolazione continua di prodotti e materiali e sulla rigenerazione dei sistemi naturali (Ellen MacArthur Foundation, 2024). In questo quadro, diventa importante analizzare anche l'impegno del consumatore, il cui contributo è decisivo per il raggiun-gimento di tali obiettivi (Karpen et al., 2023).

Secondo un report di Capgemini, ogni anno circa 931 milioni di tonnellate di cibo vengono sprecate nelle fasi di vendita al dettaglio e di consumo. La maggior parte dello spreco che avviene nelle parti finali della filiera viene generato dalle famiglie (circa il 61%) evidenziando quanto comportamenti, abitudini e atteg-giamenti dei consumatori incidano in modo determinante sul fenomeno (Capgemini 2022).

Dal momento che i consumatori contribuiscono in modo significativo allo spreco alimentare complessivo, la riduzione a livello domestico è riconosciuta come una delle azioni più cruciali per il miglioramento della sostenibilità ambientale e della sicurezza alimentare (Stancu et al., 2016). Allo stesso tempo, la maggio-ranza dei consumatori considera lo spreco alimentare un

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problema rilevante e vorrebbe avere una più am-pia conoscenza sulle conseguenze e sulle soluzioni per ridurlo (Gaiani et al., 2018). La maggior parte delle persone prova disagio o senso di colpa quando spreca cibo, perché lo percepisce sia come uno spreco di denaro sia come un problema morale e di ingiustizia sociale. Tuttavia, questa consapevolezza non si tradu-ce necessariamente in un impegno concreto a ridurlo, ciò accade perché, nelle scelte quotidiane, entrano in gioco altre priorità e gerarchie di valori che spesso prevalgono (Van Geffen et al., 2020). Il Waste and Re-sources Action Programme distingue gli sprechi alimentari domestici in tre categorie principali. La prima comprende i rifiuti evitabili, cioè alimenti ancora perfettamente commestibili che vengono comunque get-tati, come carne, pane o frutta e verdura leggermente danneggiate. La seconda riguarda i rifiuti possibil-mente evitabili, ovvero parti di cibo che alcune persone consumano e altre no, come bucce o gambi. Infi-ne, vi sono i rifiuti inevitabili, costituiti dagli scarti non commestibili, come gusci d'uovo (Waste and Re-sources Action Programme, 2009; Ministero della Salute, 2017).

Alla luce di queste evidenze, il presente studio mira a comprendere le cause che portano i consumatori a sprecare cibo e a individuare strategie efficaci per ridurre lo spreco domestico, inteso come l'insieme degli alimenti scartati nelle abitazioni tra il momento dell'acquisto e quello del consumo.

Per raggiungere l'obiettivo della ricerca è stata condotta un'indagine empirica adottando un approccio quantitativo. Un questionario strutturato è stato somministrato a un campione di 319 cittadini. I dati raccolti sono stati analizzati mediante tecniche statistiche descrittive. L'originalità del presente studio risiede nell'approfondimento delle prospettive dei consumatori su un tema di crescente rilevanza ovvero la ridu-zione della produzione di rifiuti, con particolare attenzione allo spreco alimentare. Allo stesso tempo la ri-cerca contribuisce anche al raggiungimento dell'Obiettivo 12 dell'Agenda 2030 e, in particolare, del target 12.3, volto a dimezzare lo spreco pro capite lungo l'intera filiera alimentare (United Nations, 2015). La restante parte dell'articolo è organizzata come segue: dopo questa introduzione viene presentata la metodo-logia, seguita dalla descrizione dei risultati, e infine vengono esposte le discussioni e le conclusioni insieme alle implicazioni della ricerca, ai limiti dello studio e alle direzioni per futuri approfondimenti.

2. Metodologia

Per indagare le abitudini, le percezioni e la consapevolezza dei consumatori in merito allo spreco alimenta-re, è stato condotto in Italia uno studio empirico (work in progress) basato su un approccio quantitativo, mediante la somministrazione online di un questionario a 319 rispondenti. L'utilizzo di metodi quantitativi consente di individuare pattern generalizzabili all'interno di popolazioni più ampie (Backman et al., 2025). Pur trattandosi di un campionamento non probabilistico, il campione di convenienza è stato ritenuto ade-guato alla natura esplorativa dello studio (Toni et al., 2021) e idoneo al raggiungimento degli obiettivi co-noscitivi entro i limiti operativi esistenti (Di Pietro et al., 2015).

La struttura del questionario è stata definita a partire da un'approfondita revisione della letteratura su con-tributi analoghi ed è articolato in sette sezioni, per un totale di 40 domande. La Tabella 1 riporta i dettagli di ciascuna sezione. Le risposte sono state misurate utilizzando una scala Likert a 5 punti. I dati sono stati analizzati impiegando tecniche di statistica descrittiva tramite l'ausilio del software Minitab. Nella presen-te fase della ricerca sono state condotte e qui riportate le analisi descrittive dei dati raccolti, integrata dai test non parametrici, dal test del chi quadrato e dal coefficiente di Spearman al fine di esplorare le associa-zioni tra variabili. Le ulteriori analisi inferenziali, quali analisi fattoriale, cluster analysis e regressione multipla, sono attualmente in corso e saranno approfondite nelle fasi successive dello studio.

SEZIONE	**N. ITEM**
ABITUDINI DI ACQUISTO Questa sezione del questionario mira a raccogliere informazioni sul comportamento dei consumatori, focalizzandosi sulla frequenza di acquisto e sui criteri di scelta dei prodotti.	9
GESTIONE DEL CIBO Questa parte analizza come i rispondenti gestiscono l'organizzazione, la conservazione e il consumo degli alimenti, includendo le pratiche quotidiane e i comportamenti legati all'uso delle risorse alimentari.	3
CONSAPEVOLEZZA SULLO SPRECO ALIMENTARE Questa sezione analizza le conoscenze, la consapevolezza, le opinioni e i comportamenti dei consumatori in relazione allo spreco alimentare.	7
SOLUZIONI E BARRIERE PER LA RIDUZIONE DELLO SPRECO ALIMENTARE Questa parte mira a individuare strategie per ridurre lo spreco alimentare e a identificare gli ostacoli che limitano comportamenti più responsabili nella gestione del cibo.	6
GOVERNO, IMPRESE E TECNOLOGIE In questa sezione del questionario sono stati analizzati i ruoli di governo, imprese e tecnologie nella gestione e riduzione dello spreco alimentare.	2
SCENARIO In questa sezione del questionario si è indagato il comportamento dei rispondenti in uno scenario ipotetico di spreco alimentare, in cui, dopo aver cucinato in abbondanza per una cena con amici, rimangono degli avanzi destinati a essere gettati	4
PROFILAZIONE Raccolta di informazioni sociodemografiche	9

Tabella 1. Sezioni del questionario

3. Risultati

3.1. Descrizione del campione

Il campione è composto da 319 rispondenti, prevalentemente maschi (198), con età compresa tra i 25 e i 35 anni. La maggioranza proviene dal Centro e Sud Italia. Per quanto riguarda la condizione occupaziona-le, il campione include principalmente studenti (166) e lavoratori (119), mentre i restanti 34 partecipanti risultano non occupati.

3.2. Abitudini di acquisto e gestione domestica del cibo

La frequenza con cui i consumatori si disfano degli avanzi si colloca su valori medio-alti. Il test non para-metrico (Figura 1) evidenzia una mediana pari a 3,5, significativamente superiore

alla mediana ipotizzata (2; $p < 0.05$), indicando comportamenti di spreco ricorrenti, spesso connessi alla percezione soggettiva del-la non commestibilità degli alimenti.

Test

Null hypothesis	H_0: $\eta = 2$
Alternative hypothesis	H_1: $\eta > 2$

Sample	N for Test	Wilcoxon Statistic	P-Value
Butto via gli avanzi o il cibo che non considero più buono	256	32048,00	0,000

Descriptive Statistics

Sample	N	Median
Butto via gli avanzi o il cibo che non considero più buono	319	3,5

Figura 1. Test non parametrico sulla frequenza di spreco

Emergono differenze sociodemografiche significative. L'età risulta inversamente correlata allo spreco: i soggetti più giovani mostrano frequenze più elevate (Figura 2). Il test di Kruskal-Wallis indica inoltre dif-ferenze tra generi, con uomini che riportano mediane di spreco maggiori (4) rispetto alle donne (2) ($p < 0.05$) (Figura 3). Anche la situazione lavorativa incide: il test chi quadrato mostra che gli studenti presen-tano un'incidenza di spreco elevato superiore alle attese e una minore frequenza di spreco basso, indicando una tendenza più marcata allo spreco (Figura 4). I principali alimenti che vengono gettati via sono: latticini (come latte, formaggio, ecc.), frutta, verdura e pane (Figura 5).

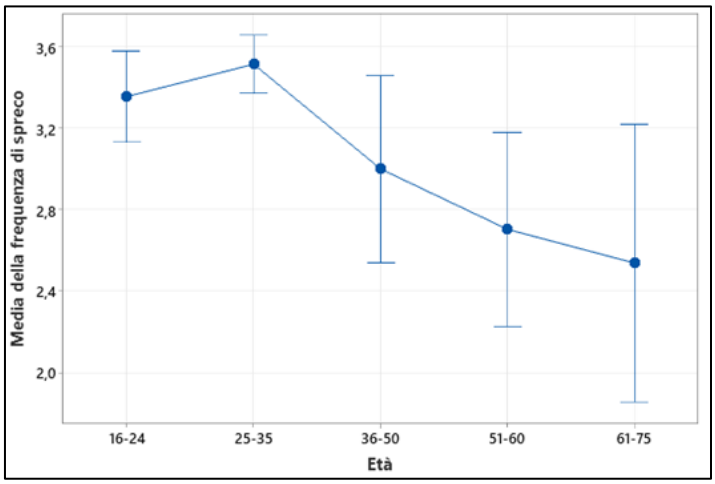


Figura 2. Frequenza di spreco in base all'età

Test

Null hypothesis	H_0: All medians are equal
Alternative hypothesis	H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	1	74,41	0,000
Adjusted for ties	1	80,24	0,000

Descriptive Statistics

Sesso	N	Median	Mean Rank	Z-Value
Donna	121	2	103,0	-8,63
Uomo	198	4	194,8	8,63
Overall	319		160,0	

Figura 3. Test non parametrico per confrontare lo spreco tra uomini e donne

	Disoccupato	Occupato	Studente	All
1	2 1,71 0,245	9 5,97 1,608	5 8,33 -1,708	16
2	10 6,71 1,497	35 23,50 3,344	18 32,78 -4,162	63
3	12 9,49 1,017	31 33,20 -0,568	46 46,31 -0,078	89
4	7 11,72 -1,803	28 41,03 -3,175	75 57,24 4,187	110
5	3 4,37 -0,743	16 15,29 0,244	22 21,34 0,223	41
All	34	119	166	319

Chi-Square Test

	Chi-Square	DF	P-Value
Pearson	29,669	8	0,000
Likelihood Ratio	30,401	8	0,000

Figura 4. Test del chi quadrato per verificare l'associazione tra le variabili "Spreco" e "Situazione lavorativa"

Statistics

Variable	N	N*	Mean
Con quale frequenza butti il latte	319	0	2,6928
Con quale frequenza butti il formaggio	319	0	2,0219
Con quale frequenza butti lo yogurt	319	0	2,3417
Con quale frequenza butti la carne rossa	319	0	1,3699
Con quale frequenza butti la carne bianca	319	0	1,3950
Con quale frequenza butti le uova	319	0	1,9216
Con quale frequenza butti i legumi	319	0	1,3668
Con quale frequenza butti il pesce	319	0	1,5047
Con quale frequenza butti la frutta	319	0	2,7931
Con quale frequenza butti il pane	319	0	2,1317
Con quale frequenza butti la verdura	319	0	2,7367
Con quale frequenza butti la pasta	319	0	1,7367
Con quale frequenza butti i grassi e oli	319	0	2,1160
Con quale frequenza butti gli snack salati	319	0	1,4013
Con quale frequenza butti i dolci	319	0	1,4859
Con quale frequenza butti l'aglio e la cipolla	319	0	1,8621
Con quale frequenza butti i tuberi	319	0	2,0094

Figura 5. Media di spreco degli alimenti (risultati su scala Likert, da 1 (non spreco mai) a 5 (spreco sempre))

3.3. Consapevolezza e percezioni sullo spreco alimentare

L'esposizione al tema risulta ampia ma non omogenea: il 43,6 % dichiara di venire a conoscenza del tema occasionalmente, il 22% regolarmente, mentre solo il 2,2% non ne sente mai parlare (Figura 6). Un test non parametrico conferma un livello significativo di consapevolezza (Figura 7).

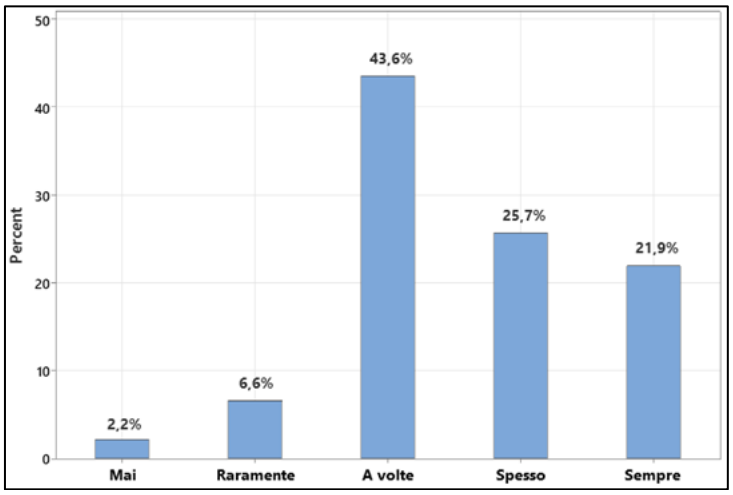


Figura 6. Frequenza con cui si sente parlare di spreco alimentare

Test

Null hypothesis	$H_0: \eta = 3$
Alternative hypothesis	$H_1: \eta > 3$

Sample	N for Test	Wilcoxon Statistic	P-Value
Sono consapevole del problema dello spreco alimentare	229	21448,00	0,000

Descriptive Statistics

Sample	N	Median
Sono consapevole del problema dello spreco alimentare	319	4

Figura 7. Test non parametrico sulla consapevolezza del problema dello spreco alimentare

Tuttavia, il 43,3 % dei rispondenti afferma di non essere pianamente consapevole della quantità reale di cibo sprecato (Figura 8). Solo il 17,2% si definisce molto preoccupato dal fenomeno, mentre una quota consistente esprime indifferenza (27,6%) o bassa preoccupazione (30,1%) (Figura 9). Le emozioni più as-sociate allo spreco sono preoccupazione e senso di colpa, mentre l'indifferenza risulta correlata a una maggiore frequenza di spreco (Figura 10 e 11).

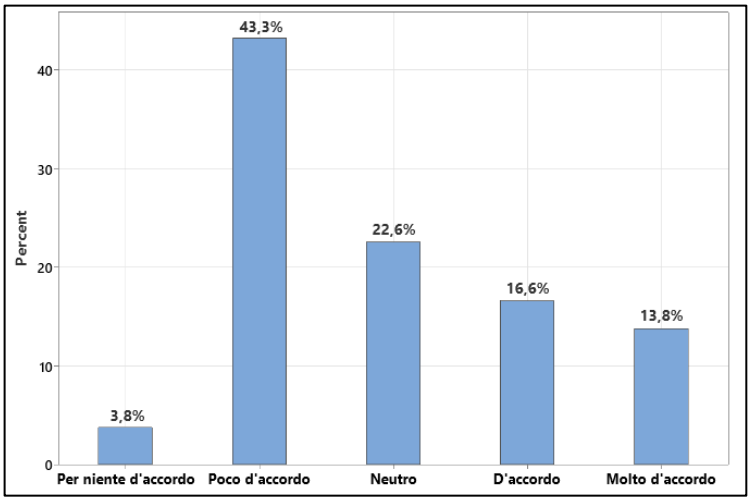


Figura 8. Consapevolezza rispetto alla quantità di cibo sprecato

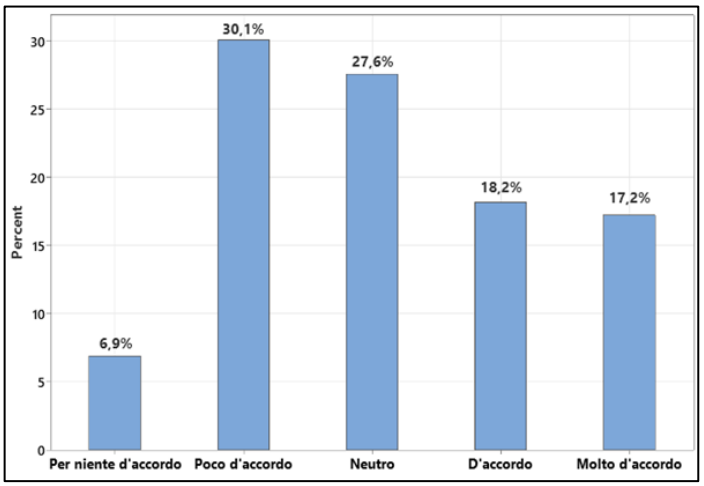


Figura 9. Preoccupazione per lo spreco alimentare

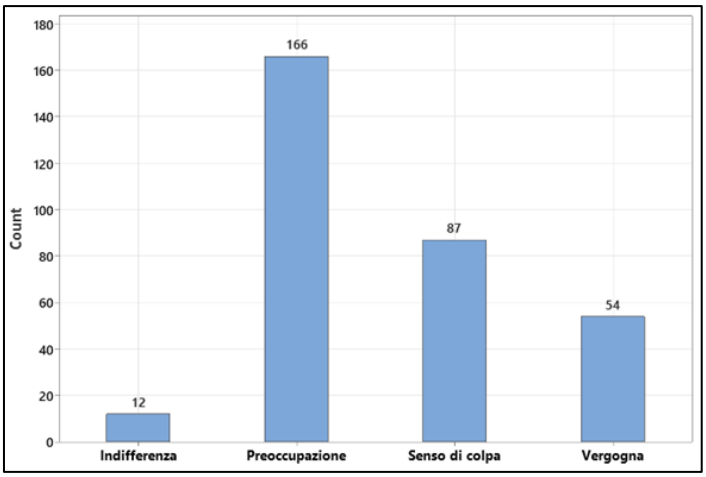


Figura 10. Emozioni suscitate dallo spreco alimentare

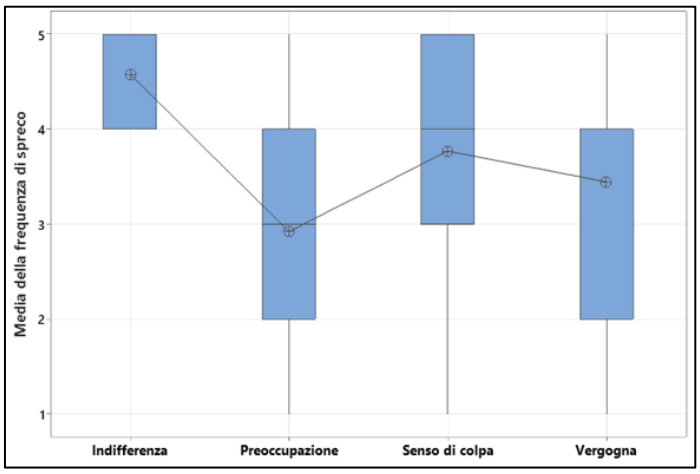


Figura 11. Media della frequenza di spreco in base alle emozioni

L'impegno dichiarato nel ridurre lo spreco è variabile: il 37,3% è poco incline a adottare comportamenti concreti, mentre il 17,9% si dichiara d'accordo e il 22,6% molto d'accordo a intraprendere azioni di ridu-zione (Figura 12). La correlazione di Spearman conferma una

relazione positiva significativa tra preoccu-pazione e impegno alla riduzione ($\rho = 0.555$, $p < 0.05$) (Figura 13).

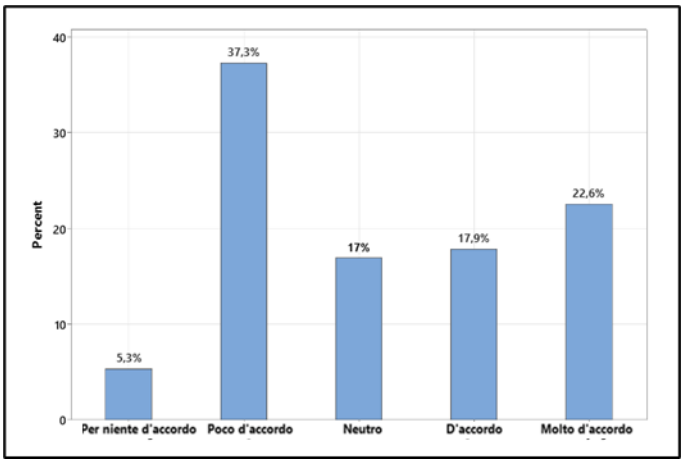


Figura 12. Impegno nel ridurre lo spreco alimentare

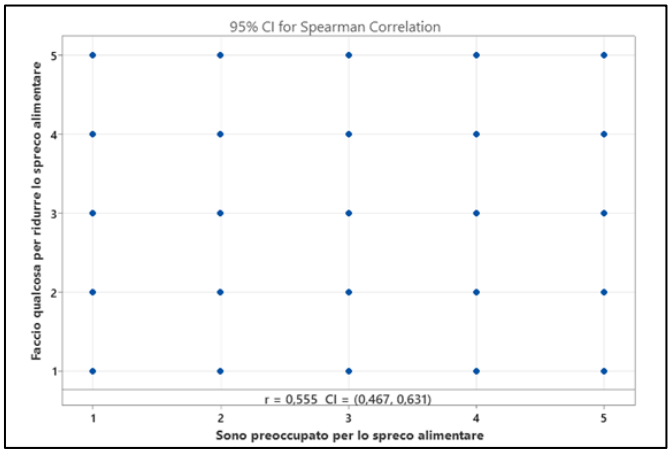


Figura 13. Correlazione tra impegno a ridurre lo spreco e preoccupazione per lo spreco

3.4. Soluzioni e barriere allo spreco alimentare

Le cause maggiormente riconosciute come origine dello spreco includono: cattivo odore o sapore, scaden-za degli alimenti, rimanenze dei pasti, presenza di muffa e porzioni eccessive (Figura 14).

Statistics

Variable	N	N*	Mean
Cibo scaduto	319	0	3,3856
Presenza di muffa sul cibo	319	0	3,1160
Presenza di cattivo odore/sapore nel cibo	319	0	3,6050
Rimanenza di cibo da un pasto	319	0	3,3041
Acquisto in eccesso di un prodotto	319	0	2,5517
Confezione troppo grande	319	0	2,1755
Scarse capacità culinari	319	0	1,4796
Conservazione errata del prodotto	319	0	2,3605
Porzioni a casa troppo abbondante	319	0	2,8589
Alimenti non graditi o che non rispecchiano le aspettative	319	0	1,7085

Figura 14. Media delle cause di spreco alimentare

Le strategie giudicate più efficaci per ridurlo sono: pianificazione dei pasti, acquisti consapevoli, corretta conservazione, donazione delle eccedenze, educazione sullo spreco alimentare e riutilizzo degli avanzi in nuove preparazioni (Figura 15).

Variable	N	N*	Mean
Penso sia utile pianificare i pasti	319	0	3,8245
Penso sia utile acquistare solo ciò che serve	319	0	3,7712
Penso sia utile conservare correttamente il cibo	319	0	4,0251
Penso sia utile donare cibo in eccesso	319	0	3,9122
Penso sia utile educare riguardo lo spreco alimentare	319	0	4,2038
Penso sia importante utilizzare gli avanzi in altre preparazioni	319	0	4,1818

Figura 15. Medie delle strategie per ridurre lo spreco alimentare

Tra le leve motivazionali, il fattore economico risulta particolarmente rilevante: molti consumatori dichia-rano che ridurrebbero lo spreco se dovessero pagare in base ai rifiuti generati. Anche una maggiore infor-mazione sugli impatti ambientali ed economici dello spreco emerge come incentivo importante (Figura 16).

Variable	N	N*	Mean
Sprecheresti meno cibo se fossi più informato sugli impatti negativi dello spreco alimentare sull'ambiente e sull'economia	319	0	3,6082
Sprecheresti meno cibo se fossi più informato sulla quantità di denaro che spreco	319	0	3,7806
Sprecheresti meno cibo se il cibo fosse più costoso	319	0	3,3386
Sprecheresti meno cibo se dovessi pagare in base alla quantità di spreco che genero	319	0	4,2226
Sprecheresti meno cibo se fossi più abituato a pianificare gli acquisti e i pasti	319	0	3,4545
Sprecheresti meno cibo se avessi maggior accesso a strumenti per conservare meglio il cibo	319	0	3,0125
Sprecheresti meno cibo se avessi confezioni più piccole o adattabili	319	0	2,8871

Figura 16 - Media dei motivi di minor spreco

Riguardo alle barriere, il test non parametrico indica che i rispondenti non concordano con l'idea che non esistano barriere (mediana = 2 < 3; $p < 0.05$) (Figura 16). Il tempo limitato non è percepito come un osta-colo rilevante. Lo sono invece la mancanza di informazioni, la scarsa motivazione o attenzione, e le abitudini consolidate difficili da modificare (Figure 17-20).

Test

Null hypothesis	H_0: $\eta = 3$
Alternative hypothesis	H_1: $\eta < 3$

Sample	N for Test	Wilcoxon Statistic	P-Value
Non esistono barriere che impediscono la riduzione dello spreco alimentare	267	4685,50	0,000

Descriptive Statistics

Sample	N	Median
Non esistono barriere che impediscono la riduzione dello spreco alimentare	319	2

Figura 17. Test non parametrico sull'esistenza delle barriere che ostacolano la riduzione dello spreco

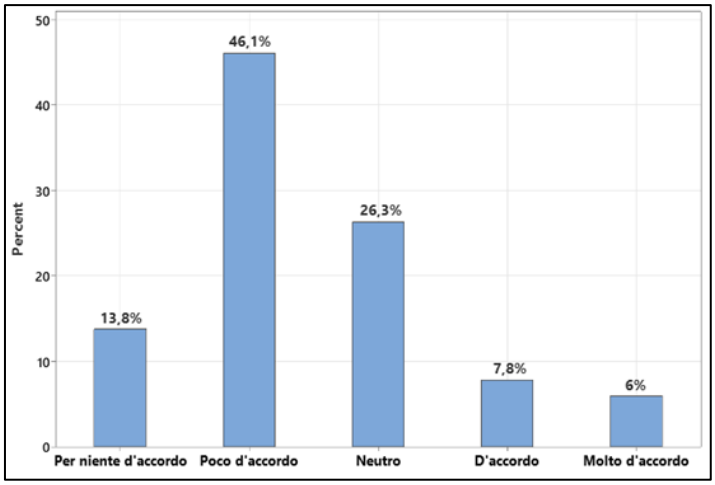


Figura 18. Opinioni dei consumatori sul tempo limitato per preparare i piatti come ostacolo alla riduzione dello spreco

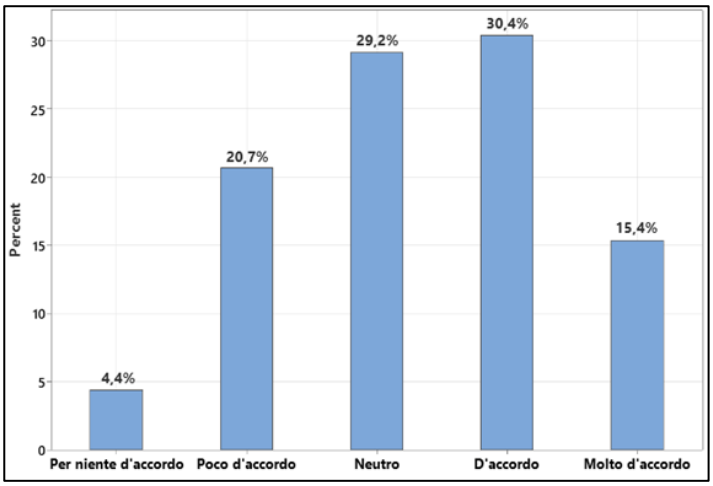


Figura 19. Opinioni dei consumatori sulla mancanza di informazioni come ostacolo alla riduzione dello spreco alimentare

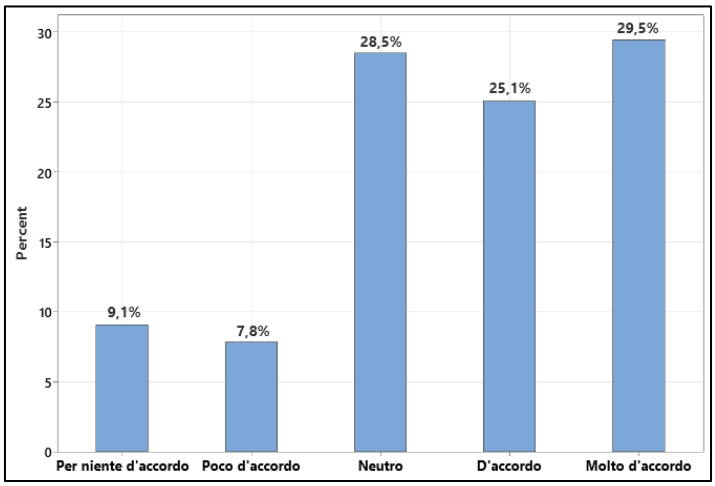


Figura 20. Opinioni dei consumatori sulla mancanza di motivazione o attenzione nella gestione del cibo come ostacolo alla riduzione dello spreco alimentare

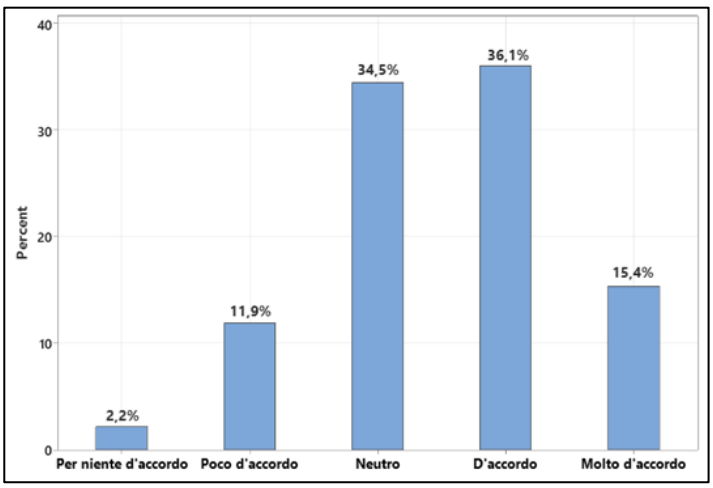


Figura 21. Opinioni dei consumatori sulle abitudini consolidate come ostacolo alla riduzione dello spreco alimentare

3.5. Ruolo percepito di governo, imprese e tecnologie

In merito al livello di fiducia nei confronti di vari attori (come governi, imprese e ristoranti) rispetto agli sforzi per ridurre lo spreco alimentare, emerge un quadro critico. Il 45,5% è poco d'accordo riguardo all'impegno del governo nel contrastare lo spreco; percentuali simili emergono per imprese (54,9%) e ri-storanti (43,3%) (figure 22-23-24).

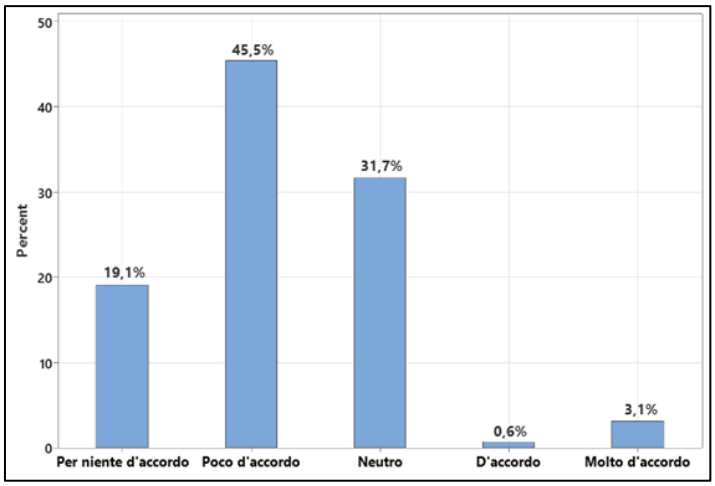


Figura 22. Opinioni dei consumatori sull'impegno del governo riguardo lo spreco alimentare

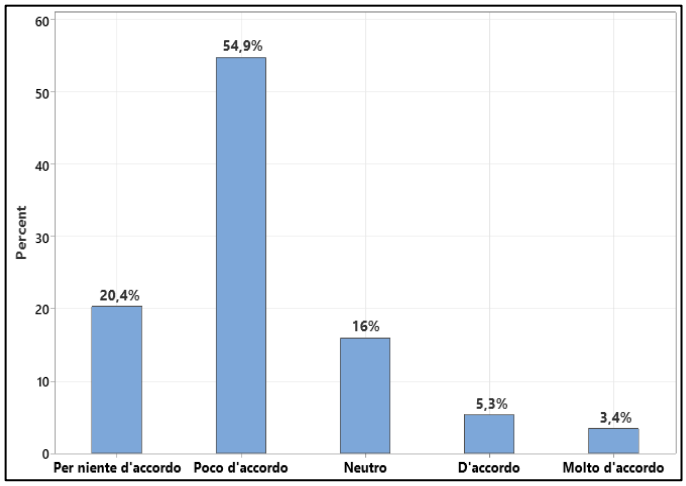


Figura 23. Opinioni dei consumatori sull'impegno delle imprese riguardo lo spreco alimentare

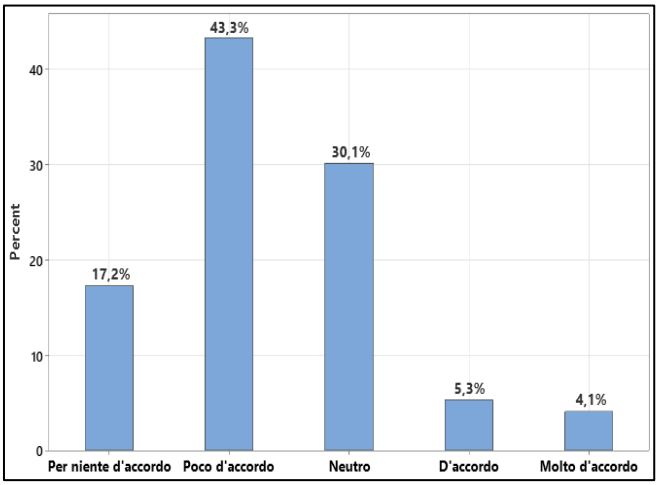


Figura 24. Opinioni dei consumatori sull'impegno dei ristoranti riguardo lo spreco alimentare

La tecnologia, al contrario, è percepita come un alleato importante: il 46% ritiene che possa contribuire in maniera significativa alla riduzione dello spreco, e il 19% è molto d'accordo con tale affermazione (Figura 25).

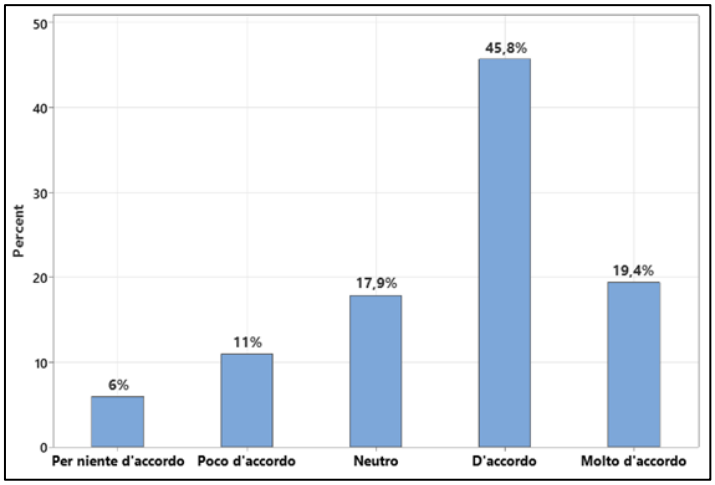


Figura 25. Opinioni dei consumatori sull'importanza della tecnologia per ridurre lo spreco alimentare

3.6 Scenario realistico di spreco

Per analizzare le sensazioni e gli atteggiamenti dei consumatori dopo aver generato spreco alimentare, è stato creato uno scenario realistico. Si è simulata una cena tra amici, in cui il consumatore, per fare buona impressione e soddisfare tutti, acquista e cucina in eccesso. Alla fine della serata, però, si accorge che molto cibo è avanzato e dovrà essere buttato. Sulla base di questo racconto, è stato chiesto ai consumatori di riflettere sulle loro emozioni e atteggiamenti in quel contesto.

Dai dati raccolti emerge che i rispondenti hanno sperimentato un livello moderato ma significativo di sen-so di colpa (mediana 3,5; $p < 0.05$; Figura 26).

Test

Null hypothesis	H_0: $\eta = 2$
Alternative hypothesis	H_1: $\eta > 2$

Sample	N for Test	Wilcoxon Statistic	P-Value
Mi sento in colpa	283	39606,00	0,000

Descriptive Statistics

Sample	N	Median
Mi sento in colpa	319	3,5

Figura 26 - Test non parametrico sul sentirsi in colpa dopo un'azione di spreco

La *maggior* parte dichiara l'intenzione di modificare i propri comportamenti per ridurre lo spreco (Figura 27), con differenze significative tra generi: le donne mostrano un'intenzione maggiore rispetto agli uomini (mediana = 4 vs. 3; $p < 0.05$; Figura 28).

Null hypothesis	H_0: $\eta = 3$
Alternative hypothesis	H_1: $\eta > 3$

Sample	N for Test	Wilcoxon Statistic	P-Value
Dalla prossima volta cercherò di cambiare comportamento e stare più attento allo spreco	197	16766,50	0,000

Statistics Descriptive

Sample	N	Median
Dalla prossima volta cercherò di cambiare comportamento e stare più attento allo spreco	319	3,5

Figura 27 - Test non parametrico sull'intenzione a cambiare comportamento

Test

Null hypothesis	H_0: All medians are equal
Alternative hypothesis	H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	1	33,47	0,000
Adjusted for ties	1	36,76	0,000

Descriptive Statistics

Sesso	N	Median	Mean Rank	Z-Value
Donna	121	4	198,2	5,79
Uomo	198	3	136,6	-5,79
Overall	319		160,0	

Figura 28 - Test non parametrico sulla differenza nel cambiamento del comportamento tra uomini e donne

La correlazione di Spearman ($\rho = 0.634$, $p < 0.05$) indica che livelli più elevati di senso di colpa sono as-sociati a una maggiore propensione futura alla riduzione dello spreco (Figura 29).

Infine, un ulteriore test evidenzia una scarsa attenzione alla quantità di cibo sprecato quotidianamente (mediana = 3,5; $p < 0.05$) (Figura 30).

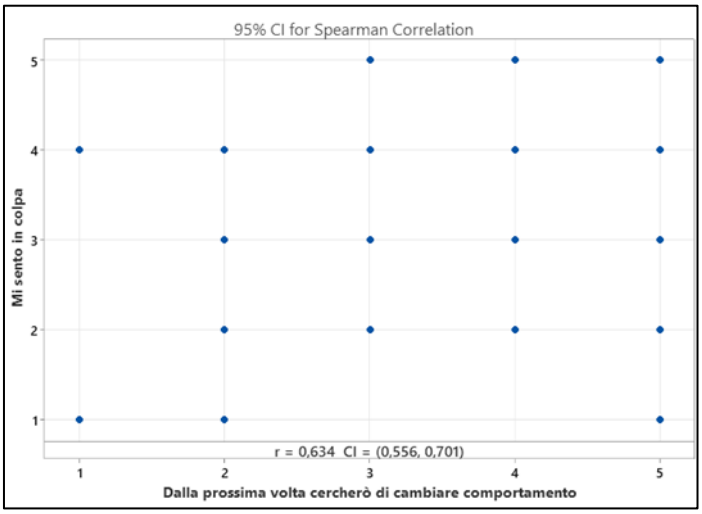


Figura 29. Correlazione tra il sentirsi in colpa e l'intenzione di ridurre lo spreco

Test

Null hypothesis	H_0: $\eta = 3$
Alternative hypothesis	H_1: $\eta > 3$

Sample	N for Test	Wilcoxon Statistic	P-Value
Non faccio caso al cibo che butto	232	16169,00	0,005

Descriptive Statistics

Sample	N	Median
Non faccio caso al cibo che butto	319	3,5

Figura 30. Test non parametrico riguardo alla non curanza sul cibo gettato

4. Discussione e conclusioni

Il presente studio si propone di analizzare il fenomeno dello spreco alimentare, con un focus specifico sul-le principali cause che si manifestano in ambito domestico, e di individuare strategie efficaci per orientare e migliorare le abitudini di consumo. A tal fine, sono stati approfonditi i fattori che influenzano sia le deci-sioni di acquisto sia le modalità di gestione e consumo degli alimenti.

L'analisi mette in luce diversi comportamenti significativi dei consumatori rispetto allo spreco alimentare. Un primo aspetto riguarda il livello di consapevolezza, sebbene circa il 25,7% degli intervistati dichiari di sentir parlare spesso di questo problema, il 43,3% ammette di non

avere una reale percezione della quanti-tà di cibo che viene sprecata nella propria quotidianità. Questo dato mette in luce una discrepanza tra la conoscenza teorica del fenomeno e le pratiche concrete di gestione degli alimenti nelle abitazioni.

Dal punto di vista emotivo, la maggior parte delle persone associa lo spreco alimentare a emozioni negati-ve. Si nota una correlazione tra le emozioni provate e la frequenza con cui si spreca il cibo, chi affronta il problema con indifferenza tende ad avere abitudini meno virtuose, con un livello di spreco piuttosto eleva-to. Al contrario, chi vive il tema con maggiore coinvolgimento emotivo, mostra comportamenti più attenti e una frequenza di spreco sensibilmente più bassa.

In generale, i partecipanti tendono a gettare via alimenti che giudicano non più buoni, anche se spesso questi potrebbero essere ancora commestibili o facilmente riutilizzabili in altri pasti. Questo comportamen-to, tuttavia, sembra ridursi con l'avanzare dell'età, le persone più adulte mostrano una maggiore attenzione e una minore propensione allo spreco rispetto ai più giovani. Analizzando le differenze di genere, emerge che gli uomini tendono a sprecare più frequentemente rispetto alle donne, suggerendo una possibile mag-giore sensibilità femminile verso la gestione degli alimenti. Anche la situazione lavorativa sembra incidere su questi comportamenti, gli studenti risultano essere tra la categoria più incline allo spreco.

Più della metà dei partecipanti tende a minimizzare la gravità del problema o, comunque, non lo considera una priorità nella propria quotidianità. Solo una minoranza – il 17,2% – esprime una preoccupazione nei confronti dello spreco alimentare, segnalando un coinvolgimento emotivo più marcato. Questo dato sugge-risce che ci sia ancora molto lavoro da fare in termini di sensibilizzazione e cambiamento culturale e quin-di la necessità di rafforzare le campagne educative e di sensibilizzazione per motivare comportamenti più responsabili nella vita quotidiana.

Lo spreco alimentare domestico è spesso il risultato di abitudini quotidiane che, con un po' di attenzione, potrebbero essere facilmente corrette. Tra le cause più frequenti indicate dai partecipanti emergono la con-vinzione che un alimento sia "andato a male" anche quando potrebbe ancora essere consumato, la scarsa pianificazione dei pasti e la difficoltà nel dosare correttamente le porzioni. Tutto ciò evidenzia l'importanza di promuovere una maggiore educazione alimentare, mirata a fornire strumenti pratici per aiutare nella riduzione degli sprechi nella vita di tutti i giorni.

La maggior parte delle persone concorda sul fatto che esistano effettivamente ostacoli o barriere che ren-dono difficile ridurre lo spreco alimentare nella vita quotidiana. Tra i principali fattori individuati dagli in-tervistati emergono la carenza di informazioni utili su come gestire al meglio gli alimenti, la mancanza di motivazione o di attenzione durante la preparazione e conservazione del cibo, e l'influenza di abitudini consolidate che risultano difficili da cambiare.

Tra le strategie considerate più efficaci per ridurre lo spreco alimentare in ambito domestico spiccano una maggiore educazione sul tema e il riutilizzo creativo degli avanzi in nuove ricette. In molti riconoscono l'importanza di ricevere informazioni più chiare e accessibili su come evitare gli sprechi.

Esiste un diffuso scetticismo tra i consumatori rispetto all'impegno di governi, aziende e ristoranti nella lotta contro lo spreco alimentare. Questi attori non vengono percepiti come sufficientemente attivi nella riduzione del problema, indicando un problema di fiducia che potrebbe ostacolare l'efficacia delle politi-che e delle iniziative in questo contesto. Al contrario, la tecnologia è percepita come un alleato strategico nella lotta contro lo spreco alimentare. I consumatori nutrono una certa fiducia nell'innovazione, ritenendo che possa fornire soluzioni pratiche e concrete.

In conclusione, vi è una certa consapevolezza da parte dei consumatori riguardo al problema dello spreco alimentare, ma emerge come molti sottostimano la quantità effettiva di cibo che viene sprecata, conside-rando erroneamente gli alimenti scaduti come cibo da buttare. Questo fenomeno è in gran parte dovuto a una carenza di informazione e educazione sul tema così come alla

presenza di linee guida pratiche a sup-porto, che rende difficile un cambiamento reale nei comportamenti di acquisto e consumo, ostacolando co-sì gli sforzi per ridurre lo spreco a livello domestico.

Come tutti gli studi, anche questa ricerca presenta alcune limitazioni che possono essere superate attraver-so future analisi. In particolare, l'indagine ha coinvolto un solo Paese (Italia) e ricerche future potrebbero estendere l'analisi ad altre aree geografiche e contesti. Inoltre, il campione potrebbe essere ulteriormente ampliato e analisi successive potrebbero considerare anche le prospettive di altri attori del sistema, come le imprese, per comprendere cosa avviene nelle altre fasi della filiera. Infine, lo studio potrebbe essere repli-cato per indagare il fenomeno dello spreco alimentare anche in altri ambiti come quello alberghiero e della ristorazione.

Parole chiave: Food waste; household food waste; agenda 2030; SDG 12

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Soluzioni circolari e sostenibili nel vitivinicolo: un caso studio

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1. Introduzione

Sebbene sempre più iniziative mirino a favorire la transizione verso un'economia circolare, la circolarità di una soluzione non ne determina necessariamente la maggiore sostenibilità, che andrebbe invece valutata caso per caso (Schaubroeck, 2020; Deutz et al., 2025).

Il Progetto PRIN2022 "Towards circular and sustainable agrifood systems: metrics for assessment (CIRCULAGRIS)" (finanziato dall'Unione Europea - Next Generation EU, Missione 4, Componente 2, CUP D53D23011220006) mira ad approfondire la dibattuta relazione tra circolarità e sostenibilità, attraverso la misurazione del grado di circolarità e la valutazione della sostenibilità di soluzioni circolari adottate nel settore agroalimentare con riferimento a filiere strategiche per l'economia italiana, tra cui quella vitivinicola (Raggi et al., 2024).

L'Italia, infatti, secondo le stime riferite al 2024, è il Paese dell'Unione Europea con il più alto valore aggiunto agricolo (ISTAT, 2025) e tra i maggiori produttori di vino a livello mondiale (OIV, 2024). Il settore agricolo determina impatti significativi a livello economico, ambientale e sociale (Rodino et al., 2023; Santagata et al., 2021; Turi et al., 2014) e quello vitivinicolo ne è uno dei più critici comparti, generando considerevoli quantità di residui, con connessi elevati impatti ma anche con un grande potenziale in termini di circolarità (Coelho et al., 2020).

Nell'ambito del progetto, con riferimento specifico a soluzioni circolari adottate nelle filiere vitivinicole, la misurazione della circolarità sarà effettuata tramite indicatori scelti, tenendo conto dello specifico settore di applicazione e della tipologia di soluzione, all'interno del set di indicatori per la misurazione della circolarità nel settore agroalimentare oggetto di precedente ricerca e selezione volta a individuare quelli più idonei a tal fine (Raggi et al., N.D.).

La valutazione della sostenibilità sarà invece condotta attraverso l'applicazione delle metodologie con approccio al ciclo di vita, quali la Life Cycle Assessment (LCA), la Social Life Cycle Assessment (S-LCA) e il Life Cycle Costing (LCC), riconosciute in letteratura come particolarmente idonee a tal fine (Roos Lindgreen et al., 2021; Walker et al., 2021).

Più in particolare, lo studio LCA, già oggetto di implementazione nel settore agroalimentare per aumentare la sostenibilità delle filiere (Notarnicola et al., 2016), consentirà di valutare i potenziali impatti ambientali del prodotto analizzato (ISO, 2006a; ISO, 2006b).

La LCA consiste, infatti, nella compilazione e valutazione degli input, degli output e dei potenziali impatti ambientali di un sistema di prodotto lungo il suo ciclo di vita (ISO 2006a). Il framework metodologico si articola in quattro fasi tra loro interconnesse, parte di un processo iterativo: definizione degli obiettivi e del campo di applicazione; analisi dell'inventario del ciclo di vita; valutazione dell'impatto del ciclo di vita; interpretazione del ciclo di vita (ISO, 2006a; ISO, 2006b).

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La S-LCA permetterà invece di valutare, in un'ottica di ciclo di vita, gli aspetti sociali e socioeconomici del prodotto analizzato che incidono, positivamente e negativamente, sugli stakeholder coinvolti. La S-LCA è, infatti, una "una metodologia per valutare gli impatti sociali dei prodotti e dei servizi durante il loro ciclo di vita" (UNEP, 2020b, p. 20), anch'essa già oggetto di applicazione ai prodotti agroalimentari (Petti et al., 2018; Tragnone et al., 2022), il cui framework metodologico, originariamente definito dalle Guidelines for Social Life Cycle Assessment of products and organizations 2020 (UNEP, 2020) e oggi dettato dallo standard ISO 14075:2024 (ISO, 2024a), si basa su quello proposto per la LCA ed è quindi strutturato nelle stesse quattro fasi, sebbene con alcuni adattamenti.

La metodologia LCC, infine, consentirà di valutare i costi del prodotto analizzato durante il suo intero ciclo di vita (Hunkeler et al. 2008) sulla base, in assenza di standard di riferimento, di un codice di condotta (Swarr et al., 2011).

Tramite l'applicazione delle richiamate metodologie life cycle-based, nell'ambito del progetto CIRCULAGRIS saranno oggetto di valutazione, come caso di studio, le soluzioni circolari implementate da un'azienda vitivinicola in Emilia-Romagna per la coltivazione biosimbiotica e per il packaging del vino così prodotto.

Più in particolare, la coltivazione biosimbiotica adottata mira a nutrire il terreno e le piante senza ricorrere a sostanze chimiche, riducendo l'impatto ambientale e migliorando la salubrità, la fertilità e la pulizia del suolo, favorendo la coltivazione di piante più resistenti agli stress ambientali e alla siccità, aumentandone la capacità di assorbire l'acqua e le altre sostanze nutritive presenti nel suolo (ARGEA, 2024). La viticoltura biosimbiotica, infatti, si basa sull'inoculazione di microrganismi fungini, le micorrize, che instaurano un'associazione positiva con le radici della pianta, nutrendo il suolo e creando un ambiente favorevole ai microrganismi utili alla crescita delle piante e, al contrario, sfavorevole agli agenti patogeni e ai parassiti (ARGEA, 2024).

D'altra parte, il packaging, progettato in un'ottica di ecodesign, privilegia materiali parzialmente derivati da scarti delle filiere agroalimentari, con un alleggerimento complessivo degli imballaggi e l'abbandono di materie prime di origine fossile. Specificamente, la soluzione che sarà oggetto di studio prevede la sostituzione delle componenti precedentemente impiegate con le seguenti: una bottiglia in vetro bordolese standard più leggera; una capsula in gommalacca totalmente naturale a base di cera d'api; un tappo tecnico microgranulato realizzato interamente con materiali naturali senza l'uso di fonti fossili, caratterizzato dall'utilizzo di un legante per unire la microgranina ottenuto da residui della filiera di lavorazione dei cereali; un'etichetta composta per il 15% da cellulosa estratta da residui della lavorazione dell'uva della zona del Prosecco, per il 40% da carta riciclata e per il restante 45% da carta certificata Forest Stewardship Council (FSC) (ARGEA, 2025).

Le soluzioni descritte sono in linea con la più ampia nozione di economia circolare proposta dallo standard ISO 59020:2024 (ISO, 2024b) e confermata dal recente aggiornamento della specifica tecnica UNI/TS 11820:2024 (UNI, 2024).

La sostenibilità del vino biosimbiotico sarà valutata considerandone l'intero ciclo di vita (studio stand-alone) e, quindi, comparando gli scenari pre- e post-implementazione del nuovo packaging (studio comparativo). Tale analisi consentirà di comprendere i potenziali impatti sociali (S-LCA), ambientali (LCA) ed economici (LCC) di entrambi gli scenari.

Al fine di garantirne la coerenza, gli studi saranno condotti utilizzando la stessa unità funzionale (una bottiglia di vino biosimbiotico da 0,75 L) e adottando gli stessi confini del sistema, dalla fase agricola all'imbottigliamento (from cradle to gate), con un focus sulla sola fase di imbottigliamento per gli studi comparativi.

Per quanto riguarda la valutazione della performance ambientale, lo studio LCA di tipo stand-alone avrà l'obiettivo di identificare i punti critici e le categorie di impatto più influenzate nel ciclo di vita di una bottiglia di vino biosimbiotico. I confini del sistema includeranno la fase agricola, la vinificazione, l'affinamento e l'imbottigliamento, considerando, per la prima fase, anche i prodotti impiegati esclusivamente nella viticoltura biosimbiotica. Invece, nella LCA

comparativa i confini del sistema includeranno la sola fase di imbottigliamento per le due opzioni pre- e post-ecodesign, con un focus sulle scelte dei materiali, confrontando quelli tradizionali e quelli circolari.

Lo studio sarà basato su dati site-specific forniti dall'azienda produttrice del vino biosimbiotico. La raccolta dati, attualmente in corso, si avvale di schede elaborate dal gruppo di ricerca all'esito di ripetuti colloqui con i referenti aziendali e di visite in sede, al fine di tenere conto delle varie fasi del ciclo di vita e delle specifiche caratteristiche di ciascuna di esse. Alcuni dei dati già forniti hanno richiesto ulteriore elaborazione sulla base di documenti integrativi e di schede tecniche dei prodotti e dei macchinari impiegati nei processi produttivi analizzati.

Sulla base dei dati acquisiti, una prima applicazione della metodologia LCA (Arzoumanidis et al., 2025) è stata effettuata con l'obiettivo di valutare la performance ambientale della soluzione di packaging pre- e post-ecodesign con riferimento ai soli materiali dello stesso, escludendo i flussi energetici ed idrici. Per tale studio sono stati utilizzati il software SimaPro (Pré, 2025), la banca dati Ecoinvent (Ecoinvent Association, 2025) e, per quanto riguarda il metodo di valutazione degli impatti (Life Cycle Impact Assessment), il ReCiPe Midpoint (H) (Huijbregts et al., 2017).

I risultati preliminari della valutazione, a livello di caratterizzazione, mostrano come l'imballaggio post-ecodesign risulti più performante per tutte le categorie di impatto analizzate, tranne una (eutrofizzazione marina), che comunque presenta una performance molto simile tra le due soluzioni. Invece, per quanto riguarda i risultati a livello di normalizzazione, la categoria di impatto maggiormente influenzata risulta essere il consumo idrico (water consumption), seguita da tossicità cancerogena per l'uomo (human carcinogenic toxicity) e da ecotossicità terrestre (terrestrial ecotoxicity). Analizzando nel dettaglio i risultati per le tre categorie di impatto citate, si evince come il maggior contributo agli impatti potenziali, per tutte le categorie e per entrambe le opzioni (pre e post-ecodesign), derivi dalla produzione del vetro utilizzato per la bottiglia. L'opzione post-ecodesign mostra impatti ambientali inferiori rispetto a quelli pre-ecodesign, e quindi un miglioramento della performance ambientale, grazie alla sostituzione della bottiglia di vetro con una versione di peso ridotto, pur mantenendo invariato il volume.

Infatti, per il consumo idrico, la versione pre-ecodesign presenta per il vetro un valore pari a 0,8867 m^3, mentre per quella post-ecodesign il valore scende a 0,4926 m^3 (con una riduzione del 44%). Un miglioramento analogo si osserva per la tossicità cancerogena per l'uomo, che diminuisce del 44% (da 0,00418 a 0,00232 kg 1,4-DCB), e per l'ecotossicità terrestre, anch'essa ridotta del 44% (da 0,8763 a 0,4869 kg 1,4-DCB). Tuttavia, il trasporto del vetro rimane una fase impattante, soprattutto nell'opzione post-ecodesign. Infine, l'utilizzo del cartone per l'imballaggio incide in misura minore in entrambe le opzioni, pur registrando una riduzione nella versione post-ecodesign.

Con riferimento invece allo studio S-LCA, in ragione dell'obiettivo di valutare la sostenibilità sociale della soluzione circolare di packaging rispetto a quella utilizzata prima della sua implementazione, essendo tutti i correlati processi imputabili ad aziende diverse da quella produttrice del vino biosimbiotico oggetto dello studio e parte della sua supply chain, la valutazione degli aspetti sociali sarà condotta focalizzando l'attenzione sui processi di background con l'ausilio del Product Social Impact Life Cycle Assessment (PSILCA) database (Hamed et al., 2025) in openLCA (openLCA, 2025).

Il sistema di prodotto sarà quindi modellizzato ad hoc su software utilizzando dati site-specific forniti dall'azienda produttrice del vino biosimbiotico per costruire il foreground. A tal fine, la connessione tra i processi di foreground e di background sarà effettuata considerando la quantità di ogni singolo input nei processi di foreground come input monetario dei corrispondenti processi generici in PSILCA.

Più in particolare, l'inventario sarà costruito su quello dello studio LCA e integrato con dati generici (a livello di settore e Paese) per i singoli indicatori sociali presenti nel database, che saranno raccolti appositamente considerando l'anno di riferimento di ciascuno dei processi

modellizzati, con i costi e la provenienza geografica di ciascun input e con le ore di lavoro effettuate per ciascun processo.

Tale impostazione dello studio consentirà di calcolare i rischi sociali associati alla produzione biosimbiotica e alla soluzione circolare adottata nel packaging, anche in comparazione con quelli della soluzione pre-ecodesign, anch'essa oggetto di modellizzazione e successiva valutazione tramite database.

Infine, sarà condotto uno studio LCC volto a valutare i costi associati al ciclo di vita del vino biosimbiotico. A tal fine la raccolta dati sarà integrata con gli ulteriori costi necessari.

L'applicazione delle metodologie richiamate consentirà di valutare l'effettiva sostenibilità della soluzione circolare analizzata e, quindi, di comprendere se e in che termini la sua implementazione si traduca in un miglioramento delle performance ambientali, sociali ed economiche, nonché di identificare i trade-off tra le dimensioni della sostenibilità.

Sebbene, infatti, le scelte oggetto di studio siano adottate in un'ottica di maggiore sostenibilità, non ci si attende un risultato che esprima necessariamente un miglioramento in tutte le sue dimensioni e, all'interno di ciascuna di esse, per tutte le categorie di impatto analizzate.

D'altra parte, l'utilizzo di indicatori di circolarità appositamente selezionati consentirà di misurare il grado di circolarità della soluzione analizzata, tenendo conto degli aspetti relativi alle risorse materiche ed energetiche.

Parole chiave: Economia circolare; sostenibilità; Life Cycle Assessment

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L'intelligenza artificiale come infrastruttura cognitiva per l'economia circolare: capacità dinamiche e riconfigurazione dei modelli di business

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1. Introduzione

La transizione dal modello tradizionale lineare "prendere, produrre e smaltire" a configurazioni economiche improntate alla circolarità rappresenta oggi una delle traiettorie più rilevanti – e al tempo stesso più sfidanti – dei percorsi di sostenibilità delle imprese. La letteratura sull'economia circolare (EC) ha messo in luce come tale paradigma miri a disaccoppiare la crescita economica dal consumo di risorse e dagli impatti ambientali, promuovendo la chiusura dei cicli materiali, l'estensione della vita utile dei prodotti, il riuso e il recupero di valore lungo le filiere.

In questo quadro, i modelli di business circolari (circular business models, CBM) sono concepiti come architetture di creazione e cattura del valore che incorporano principi di progettazione per il riuso e la rigenerazione, logiche di servizio in sostituzione della mera vendita di prodotto e nuove forme di relazione con clienti e altri attori dell'ecosistema orientate alla riduzione strutturale di rifiuti e sprechi (Bocken et al.,2016; Geissdoerfer et al.,2017; Lüdeke-Freund et al.,2019).

L'implementazione dell'economia circolare risulta ancora discontinua e spesso confinata a progetti pilota o iniziative sperimentali, in particolare nelle imprese incumbent inserite in filiere lunghe e complesse. Diventa pertanto fondamentale esplorare come i modelli di business circolare possano essere effettivamente progettati, implementati e resi sostenibili nel tempo per superare i meccanismi di "path dependency", ovvero la "dipendenza" delle traiettorie di sviluppo dalle scelte, dalle pratiche e dalle routine sedimentate nel tempo, che sovente generano vincoli o meccanismi di lock-in rispetto a possibili percorsi di cambiamento sistemico.

Nel contesto dell'EC, la path dependency non si esaurisce in vincoli tecnologici o infrastrutturali, ma rimanda a un intreccio di routine operative, standard produttivi, sistemi di misurazione, competenze "situate" e riferimenti istituzionali sedimentatisi nel tempo attorno al paradigma lineare. In molti settori, le infrastrutture fisiche sono progettate per flussi unidirezionali di materiali, le catene di fornitura privilegiano volumi elevati e la riduzione dei costi unitari, mentre i sistemi di controllo di gestione restano ancorati a indicatori economico-finanziari di breve periodo. Ne deriva un insieme di meccanismi "autorinforzanti" che restringono lo spazio

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percepito per la sperimentazione circolare e agiscono a più livelli, intrecciando vincoli organizzativi, dinamiche di filiera e assetti istituzionali. Le path dependencies assumono, in questo senso, una duplice natura materiale e cognitivo-istituzionale: radicate nei processi produttivi, nelle routine organizzative e negli schemi cognitivi dei manager, limitano la capacità di introdurre innovazioni radicali e di generare cambiamenti strategici (Vergne e Durand,2011).

In risposta a tali vincoli, la prospettiva delle dynamic capabilities ha assunto un ruolo di primo piano per spiegare come le imprese possano riorientare le proprie traiettorie di sviluppo in contesti ad alta complessità e incertezza. Queste ultime, tipicamente articolate nelle dimensioni di sensing, seizing e reconfiguring, rinviano alla capacità di individuare e interpretare segnali di cambiamento, tradurli in scelte strategiche e in nuovi modelli di business, e riconfigurare intenzionalmente risorse, strutture e relazioni per sostenere nel tempo logiche differenti di creazione di valore (Teece et al.,1997; Teece,2007). Applicate ai percorsi di EC, tali capacità consentono di leggere la transizione circolare non come una mera adozione di pratiche "verdi", bensì come un processo dinamico di costruzione e ricombinazione di asset materiali e immateriali, di ridefinizione delle value proposition e di rinegoziazione dei ruoli lungo la filiera (Reim et al.,2021; Santa-Maria et al.,2022).

Parallelamente, la crescente attenzione per l'artificial intelligence (AI) ha aperto un filone di ricerca che interpreta l'EC alla luce delle trasformazioni digitali. Numerosi contributi hanno evidenziato come l'AI, integrata in più ampie architetture di digitalizzazione (Internet of Things, big data analytics, piattaforme cloud), possa supportare la progettazione e la gestione di sistemi circolari, migliorando la tracciabilità dei flussi di materiali, ottimizzando l'uso delle risorse, abilitando strategie di manutenzione predittiva e di product-as-a-service, nonché favorendo l'emersione di marketplace per il riuso e la valorizzazione di scarti e sottoprodotti (Rosa et al.,2020; Kristoffersen,2021). In particolare, il contributo di Tutore et al. (2024) mostra come l'AI sia già impiegata a supporto di molte azioni riconducibili al framework ReSOLVE e propone un modello articolato in quattro fasi – ottimizzazione del sistema, ridisegno del sistema, ridisegno del modello di business e innovazione di ecosistema – suggerendo che il potenziale dell'AI non si esaurisce nelle applicazioni operative, ma può estendersi fino alla ridefinizione strategica dei modelli di business e delle relazioni di ecosistema. In una prospettiva complementare, Sjödin et al. (2023) concettualizzano le capacità percettive, predittive e prescrittive dell'AI come leve abilitanti per nuove forme di circular business model innovation in contesti di digital servitization, collegandole a specifiche configurazioni di dynamic capabilities.

Questi contributi suggeriscono che l'AI possa operare come "infrastruttura cognitiva" e organizzativa, capace di potenziare i processi di sensing, seizing e reconfiguring orientati alla circolarità. Nonostante tali potenzialità, la letteratura sull'intersezione tra AI ed EC presenta ancora significative lacune. Da un lato, la maggior parte degli studi adotta un approccio prevalentemente tecnologico e ingegneristico, concentrandosi su applicazioni algoritmiche in ambiti quali il riciclo, la selezione dei rifiuti o l'ottimizzazione dei processi produttivi (Wu et al.,2024; Kroell et al.,2024). Dall'altro lato, risultano meno approfonditi i contributi che indagano come l'AI venga effettivamente integrata nei processi gestionali e strategici e in che modo essa possa favorire la riconfigurazione dei modelli organizzativi e delle logiche di creazione del valore (Ronaghi,2023; Jabbour et al.,2019). Rimangono poco esplorati i processi attraverso cui l'AI viene incorporata nelle routine e nei processi decisionali che sostengono l'innovazione dei modelli di business circolari, nonché il ruolo delle competenze contestuali di coordinamento e di "traduzione" tra attori e linguaggi differenti nel rendere possibile un uso effettivamente trasformativo delle tecnologie di AI. I contributi che combinano dynamic capabilities, AI ed EC richiamano esplicitamente l'esigenza di studi empirici in grado di chiarire come le imprese costruiscano e mettano in atto capacità di sensing, seizing e reconfiguring orientate alla circolarità a partire dall'impiego dell'AI.

Partendo da tali premesse, il presente lavoro, che si configura esplicitamente come "ricerca in corso", vuole analizzare in profondità come l'AI venga mobilitata nel contesto di un'impresa

incumbent impegnata nell'innovazione dei propri modelli di business in senso circolare, al fine di comprendere in che modo essa contribuisca: (a) allo sviluppo di capacità dinamiche orientate alla circolarità; (b) all'allentamento dei vincoli di path dependency; (c) alla configurazione di competenze contestuali di coordinamento e traduzione tra attori, linguaggi e logiche d'azione eterogenee in una prospettiva ecosistemica. In termini più specifici, la ricerca è guidata dalle seguenti domande:

- RQ1: In che modo le applicazioni di intelligenza artificiale contribuiscono a sviluppare e articolare le dynamic capabilities di sensing, seizing e reconfiguring nelle imprese impegnate nell'innovazione dei modelli di business circolari?
- RQ2: Come l'uso dell'intelligenza artificiale interagisce con i vincoli di path dependency, sia sul piano materiale sia su quello cognitivo-istituzionale, e quali competenze contestuali di coordinamento e traduzione emergono per renderne possibile un impiego trasformativo?
- RQ3: In che misura e attraverso quali meccanismi le configurazioni organizzative e relazionali abilitate dall'intelligenza artificiale contribuiscono a ridefinire il posizionamento delle imprese all'interno degli ecosistemi di riferimento, sostenendo percorsi di trasformazione circolare?

Per rispondere a tali interrogativi, il lavoro adotta un approccio qualitativo di impostazione interpretativista, basato su un singolo caso di studio approfondito mediante la tecnica narrativa. L'impresa analizzata è un gruppo multinazionale con un posizionamento consolidato nelle tecnologie per il recupero delle risorse e la gestione circolare dei materiali, che impiega in modo estensivo soluzioni di intelligenza artificiale per ottimizzare i flussi di materiali, migliorare la tracciabilità dei rifiuti e supportare strategie di manutenzione predittiva, facilitando la transizione verso modelli di business circolari. Grazie a tali tecnologie, l'azienda è in grado di adattarsi rapidamente ai cambiamenti del contesto e di riorganizzare le proprie risorse per promuovere soluzioni sostenibili, configurandosi come un caso particolarmente adatto per esplorare l'intersezione tra AI, capacità dinamiche e circolarità.

Sul piano teorico, il lavoro intende integrare in un unico quadro interpretativo la letteratura sui modelli di business circolari, quella sulle dynamic capabilities e i recenti sviluppi sugli impieghi dell'intelligenza artificiale nei contesti di sostenibilità, mostrando come l'AI possa operare come infrastruttura cognitiva e relazionale attraverso cui le imprese rinegoziano i propri percorsi di sviluppo e i propri ruoli all'interno degli ecosistemi. Sul piano manageriale e di policy, la ricerca mira a offrire, una volta completata l'analisi empirica, indicazioni per la progettazione e il governo di percorsi di adozione dell'AI coerenti con gli obiettivi di circolarità, valorizzando in particolare le competenze di coordinamento e traduzione necessarie a superare la dipendenza dal percorso e ad attivare forme di innovazione circolare a livello organizzativo, inter-organizzativo e territoriale.

2. Theoretical framework

Il quadro teorico di riferimento mira a combinare tre prospettive interagenti – modelli di business circolari, dynamic capabilities e il ruolo dell'AI nelle configurazioni ecosistemiche – per la costruzione di una lente unitaria e "multilivello" sui processi di trasformazione e di implementazione dei modelli di business in chiave circolare.

Gli studi sull'EC hanno chiarito come il passaggio da logiche lineari a configurazioni circolari implichi una ridefinizione delle modalità di creazione e diffusione del valore. In tale prospettiva, i CBM vengono concettualizzati come configurazioni che consentono di "chiudere" e "rallentare" i flussi di risorse attraverso strategie di estensione della vita utile dei prodotti, riuso, remanufacturing, riciclo e rigenerazione dei materiali, nonché forme di offerta basate su servizi e performance anziché sulla mera vendita dell'output fisico (Bocken et al., 2016; Geissdoerfer et

al., 2017; Lüdeke-Freund et al., 2019). Su questa base, alcuni contributi hanno proposto tassonomie che ordinano la varietà dei CBM, mostrando come la circolarità si declini su più dimensioni – proposta di valore, struttura di filiera, relazioni con i clienti, meccanismi di pricing – configurate in modo interdipendente (Pieroni et al., 2019; Geissdoerfer et al., 2020).

Per comprendere come le imprese possano rinegoziare tali traiettorie, la prospettiva delle dynamic capabilities rappresenta un ambito fertile per il riconoscimento dei percorsi di sviluppo. Queste ultime consentono di leggere la trasformazione dei CBM come una sequenza di processi in cui l'impresa individua e interpreta segnali di cambiamento riconducibili all'EC (pressioni regolatorie, aspettative degli stakeholder, opportunità tecnologiche), seleziona e mette in atto nuove value proposition, e infine riconfigura risorse, strutture e relazioni per sostenere nel tempo le nuove logiche di creazione di valore (Reim et al., 2019; Sandberg e Hultberg, 2021; Santa-Maria et al., 2022). In tale prospettiva, le dynamic capabilities rappresentano il meccanismo attraverso cui le imprese possono, almeno in parte, "disancorarsi" dai vincoli di path dependency e riorganizzare il proprio CBM in senso circolare.

L'AI si inserisce in questo quadro come potenziale infrastruttura abilitante – e talora vincolante – di tali capacità dinamiche. Alcuni studi recenti, già richiamati precedentemente, evidenziano come le soluzioni AI-based, agiscano su diversi livelli, rendendo possibile una lettura più efficace dei flussi di risorse e delle interdipendenze lungo la filiera, supportando forme di sperimentazione e apprendimento continuo sui modelli di offerta e, al tempo stesso, incidendo sulle modalità con cui le imprese interagiscono con clienti, fornitori e altri attori dell'ecosistema (Rosa et al., 2020; Jabbour et al., 2019; Tutore et al., 2024). In questa prospettiva, l'AI diviene uno dei principali dispositivi attraverso cui le imprese configurano e mobilitano AI-enabled dynamic capabilities, poiché orienta ciò che può essere "visto", "simulato" e "valutato" nei percorsi di trasformazione circolare (Sjödin et al., 2023; Neri et al., 2023). Ne deriva un'interpretazione dell'AI non come fattore esterno ai processi di sensing, seizing e reconfiguring, bensì come loro componente costitutiva, legata ai sistemi informativi, agli algoritmi e alle infrastrutture digitali sviluppate e rese operative (Neri et al., 2023; Warner e Wäger, 2019).

Allo stesso tempo, l'integrazione dell'AI nei processi decisionali introduce nuove dipendenze da specifiche infrastrutture di dati, da standard tecnici e da sistemi algoritmici, che possono a loro volta generare forme inedite di path dependency digitale e di lock-in. In tal senso, l'AI si configura come leva potenzialmente abilitante, ma anche come elemento che ridefinisce i vincoli e le traiettorie di sviluppo dei CBM in chiave ecosistemica.

Non in ultimo, gli studi sulle competenze contestuali, sul coordinamento interfunzionale e sugli ecosistemi di innovazione consentono di ricondurre queste dinamiche a pratiche situate e a specifiche configurazioni relazionali (Nan e Huang, 2025; Sjodin et al. 2024). In tale prospettiva, la letteratura sulla gestione della conoscenza, sui confini inter-funzionali e sui boundary objects (Williams, 2002) evidenzia come l'innovazione sistemica richieda figure e pratiche in grado di mettere in relazione linguaggi e logiche d'azione differenti – tra funzioni tecniche, controllo di gestione, sostenibilità, marketing, attori pubblici e comunità locali – e come tali processi di traduzione siano decisivi per trasformare dati e algoritmi in decisioni organizzative e cambiamenti di modello di business (Feldman, 1989; Nonaka e Takeuchi, 1995; Carlile, 2002). Parallelamente, i contributi sugli ecosistemi di innovazione e sulle transizioni socio-tecniche sottolineano che la creazione di valore in chiave circolare tende sovente a svilupparsi in reti di attori interdipendenti, in cui imprese, fornitori, clienti, piattaforme digitali e istituzioni co-producono soluzioni (Adner, 2017; Jacobides et al., 2018; Kanda et al., 2021). Ne discende che le dynamic capabilities abilitate dall'AI si dispiegano in competenze di coordinamento e "traduzione di linguaggi" operanti nell'intersezione tra funzioni e organizzazioni, e che l'evoluzione dei CBM circolari vada letta in chiave ecosistemica più che meramente intraorganizzativa.

È possibile, dunque, interpretare il legame tra CBM, dynamic capabilities e intelligenza artificiale come un processo coevolutivo e multilivello, in cui i tre ambiti non rappresentano compartimenti stagni, ma si collocano su piani diversi e si influenzano reciprocamente. In primo

luogo, il CBM rappresenta "l'architettura operativa" esistente, definendo il modo in cui l'impresa crea e distribuisce valore, gli attori coinvolti, i flussi di risorse fisiche e di informazioni attivate. Tale modello, sovente segnato da meccanismi di path dependency, configura quel pattern di premesse decisionali che retroagiscono sul campo organizzativo condizionando i processi organizzativi, l'infrastruttura digitale e informativa disponibile e, di conseguenza, le applicazioni di AI inizialmente concepibili e considerate accettabili. Su tale sfondo, le dynamic capabilities agiscono come meccanismo processuale di trasformazione. In quest'ottica, le capacità di sensing, seizing e reconfiguring fungono da "cerniera" tra la configurazione iniziale dei CMB e le traiettorie di cambiamento, mentre i sistemi di AI intervengono come "infrastruttura cognitiva" e meccanismo abilitante in grado di potenziare e riconfigurare tali capacità. Ad esempio, l'AI può estendere l'ambito del sensing (attraverso analisi predittive sui flussi di materiali, sugli usi dei prodotti, sulle prestazioni degli impianti), rendere possibili modalità di seizing più sperimentali e data-driven (come nuove value proposition "circolari") e sostenere processi strutturati di reconfiguring organizzativo o a livello di filiera (mediante ridisegno dei contratti, dei meccanismi di pricing o finanche riconfigurazione dei confini organizzativi con processi di integrazione a monte o a valle). In tale logica, l'AI non è solo uno strumento a supporto delle dynamic capabilities, ma ne diviene parte costutiva e "abilitante": ciò che l'impresa è in grado di percepire come opportunità o minaccia, le opzioni strategiche che riesce a valutare e implementare, il modo in cui può riconfigurare risorse e relazioni dipendono dalle capacità percettive, predittive e prescrittive incorporate nei sistemi AI.

L'esito di tale processo, benché contingente e "idiosincratico", è una trasformazione progressiva del CBM, in cui le informazioni generate dai sistemi di AI, filtrate e tradotte in risorse organizzative attraverso l'azione delle dynamic capabilities e delle competenze di coordinamento e "traduzione", si cristallizzano in nuove architetture di valore circolari. Il nuovo CBM, a sua volta, genera ulteriori dati e cicli di retroazione, ridefinisce le interfacce tecniche e organizzative e apre spazi per applicazioni successive di AI, attivando un circuito di feedback in cui la configurazione di business, le capacità dinamiche e l'infrastruttura digitale coevolvono e si alimentano a vicenda.

In sintesi, il framework integrato, così presentato, identifica i CBM come il livello strutturale di fondo dell'offerta e delle relazioni di valore, in cui le dynamic capabilities costituiscono il meccanismo abilitante che potenzialmente consente di riorientare tali strutture e di sperimentare percorsi di sviluppo. In tale quadro, i sistemi di AI agiscono come infrastruttura cognitiva e organizzativa che alimenta e riconfigura le dynamic capabilities, permettendo all'impresa di superare, almeno in parte, i vincoli di path dependency, intraprendendo traiettorie di innovazione circolare a livello sia organizzativo sia ecosistemico.

3. Metodologia

L'impostazione metodologica si colloca in un'ottica qualitativa e interpretativista, volta a comprendere in profondità i processi attraverso i quali l'AI viene mobilitata nei percorsi di innovazione dei CBM. Coerentemente con questo obiettivo, la ricerca adotta un disegno di studio di caso, in linea con le indicazioni di Eisenhardt (1989) e Yin (2014) sulla costruzione di teorie a partire dai casi, nonché con l'approccio applicato ai fenomeni complessi in contesti reali. La scelta di un caso singolo in profondità risponde al criterio di "methodological fit" proposto da Edmondson e McManus (2007), secondo cui fenomeni emergenti e ancora poco strutturati richiedono disegni esplorativi, flessibili e fortemente ancorati alla specificità del contesto empirico.

L'impresa oggetto di analisi è un gruppo multinazionale con un posizionamento consolidato nelle tecnologie per il recupero delle risorse e per la gestione circolare dei materiali. L'azienda sviluppa e fornisce sistemi di raccolta e selezione automatizzata basati su sensori lungo diverse fasi della catena del valore, posizionandosi esplicitamente come abilitatore tecnologico dell'EC.

Tali caratteristiche rendono il caso particolarmente adatto a indagare come l'intelligenza artificiale e l'analisi avanzata dei dati siano integrate nei modelli di business circolari, non solo a livello di singolo impianto o processo, ma anche nelle relazioni di ecosistema che collegano attori industriali e istituzionali.

La raccolta dei dati si basa su una combinazione di fonti, in un'ottica di triangolazione. La componente principale è costituita da interviste semi-strutturate in profondità rivolte a membri del top management, responsabili di divisione e di linea di business, figure tecniche coinvolte nello sviluppo di soluzioni AI-based e ruoli di interfaccia con clienti, partner e attori pubblici. Le interviste mirano a ricostruire le traiettorie di sviluppo delle soluzioni tecnologiche, le interpretazioni interne del legame tra AI e circolarità, le tensioni tra eredità lineari e nuove logiche circolari e le trasformazioni del modello di business in corso. A questa fonte primaria si affianca l'analisi della documentazione interna ed esterna, con l'obiettivo di integrare prospettive diverse e rafforzare la robustezza interpretativa.

L'analisi dei dati segue una logica abduttiva e iterativa, ispirata alle procedure di costruzione della teoria a partire da studi di caso proposte da Eisenhardt (1989). In una prima fase, le trascrizioni e i documenti vengono sottoposti a una codifica aperta, volta a identificare episodi chiave, pratiche ricorrenti e configurazioni organizzative relative all'uso dell'AI nei processi di sensing, seizing e reconfiguring, nonché riferimenti a vincoli di path dependency e a dinamiche di ecosistema. In una seconda fase, la codifica assume un carattere più teoretico-informativo, articolando le categorie emergenti in dialogo con il quadro concettuale relativo ai modelli di business circolari, alle dynamic capabilities e alle AI-enabled capabilities. L'obiettivo non è la verifica di ipotesi precostituite, ma la progressiva elaborazione di un modello concettuale capace di descrivere come una grande impresa tecnologica utilizzi l'intelligenza artificiale per negoziare la propria transizione verso modelli di business circolari.

4. Risultati attesi

In coerenza con la natura del lavoro in corso e con il disegno qualitativo adottato, i risultati attesi non vanno intesi come una verifica di ipotesi precostituite, bensì come esito di un processo di elaborazione teorica guidato dall'analisi del caso. In primo luogo, ci si attende che lo studio consenta di descrivere in modo articolato le modalità con cui l'AI viene progressivamente incorporata nei processi di sensing, seizing e reconfiguring dell'impresa, in relazione alle diverse linee di attività considerate. La presenza di soluzioni basate su sensori, algoritmi e analisi avanzate dei dati in ambiti eterogenei dovrebbe consentire di identificare diverse configurazioni di AI-enabled capabilities, orientate all'ottimizzazione operativa, alla sperimentazione di nuove value proposition circolari e allo sviluppo di offerte data-driven centrate su servizi e insight. Si prevede che, a partire dal confronto tra tali configurazioni, emerga un quadro processuale in cui l'AI non assume un significato univoco, ma contribuisce in modo differenziato alla trasformazione del modello di business circolare in funzione delle combinazioni di risorse, attori e obiettivi di circolarità in gioco.

Un secondo ambito di risultati attesi riguarda la relazione tra l'uso dell'AI e i vincoli di path dependency. Il caso selezionato, per la combinazione tra una forte eredità industriale e un posizionamento esplicito sull'EC, appare particolarmente adatto a mettere in luce l'ambivalenza dell'AI rispetto ai percorsi storici dell'impresa. L'analisi dovrebbe consentire di individuare situazioni in cui le tecnologie AI-based vengono impiegate principalmente per raffinare e rendere più efficienti assetti esistenti, accanto a contesti in cui esse sostengono processi di problematizzazione delle metriche di performance, di ridefinizione dei confini della filiera e di sperimentazione di nuove forme di relazione con clienti e partner.

Un terzo filone di risultati attesi riguarda l'emersione e la caratterizzazione delle competenze contestuali di coordinamento e di traduzione come "microfondamenti" delle dynamic capabilities orientate alla circolarità. La natura multitecnologica e multiattore del caso lascia prevedere il

ruolo cruciale di figure ibride, team interfunzionali e pratiche di mediazione tra linguaggi differenti — tecnico, economico-finanziario, ambientale, istituzionale — nella trasformazione dei dati e degli output algoritmici in decisioni su investimenti, configurazioni di offerta e modalità di collaborazione con gli stakeholder. L'analisi dovrebbe consentire di comprendere come tali competenze si formino e si consolidino in relazione a specifici contesti progettuali e settoriali, mostrando in che modo esse contribuiscano a integrare l'AI nei processi di sensing, seizing e reconfiguring e a tradurre l'orientamento all'EC in scelte di modello di business.

Infine, un quarto insieme di risultati attesi riguarda la ridefinizione del posizionamento dell'impresa all'interno degli ecosistemi in cui è inserita. La struttura multiattore dei contesti analizzati suggerisce che l'integrazione di soluzioni AI-based possa incidere non solo sui processi interni, ma anche sui ruoli che l'impresa assume a livello di sistema. L'analisi dovrebbe contribuire a chiarire se e in che modo l'impresa evolva da semplice fornitore di tecnologia a nodo informativo centrale e, potenzialmente, a orchestratore di dati e standard di circolarità. In questa prospettiva, i risultati attesi mirano a illuminare il nesso tra le trasformazioni del modello di business circolare, le configurazioni di AI-enabled capabilities e i processi di "salita di ruolo" ecosistemica, evidenziando le implicazioni in termini di responsabilità e di contributo alla governance delle transizioni verso l'EC.

5. Contributo potenziale

Il contributo potenziale del lavoro è duplice. Sul piano teorico, il primo avanzamento atteso riguarda l'elaborazione di una lettura integrata dell'AI come componente interna alle dynamic capabilities orientate alla circolarità. L'analisi del caso dovrebbe mostrare come specifiche configurazioni tecnologiche concorrano a strutturare i processi di sensing, seizing e reconfiguring, incidendo su ciò che viene percepito come rilevante, negoziabile e realizzabile nei modelli di business circolari. In questo senso, il lavoro si inserisce nel dibattito sulle dynamic capabilities e sulle AI-enabled capabilities, contribuendo a chiarirne i "microfondamenti" in un contesto in cui l'EC costituisce il fulcro del posizionamento strategico.

Un secondo contributo teorico atteso riguarda la qualificazione del rapporto tra AI e path dependency, evidenziandone l'ambivalenza, ovvero come strumento di rafforzamento e razionalizzazione di logiche lineari esistenti, ma anche potenziale leva di problematizzazione e di riposizionamento. Rendendo visibili le condizioni organizzative, culturali e istituzionali associate a esiti differenti, il lavoro mira a superare visioni semplicistiche della tecnologia come intrinsecamente "disruptive" o "abilitante" e a mostrare come l'uso trasformativo dell'AI dipenda dal modo in cui essa viene inscritta in assetti di governance, sistemi di misurazione, relazioni con gli stakeholder e narrazioni identitarie. In parallelo, l'attenzione alle competenze contestuali di coordinamento e traduzione contribuisce a mettere in luce il ruolo di figure ibride, di team interfunzionali e di pratiche di mediazione nella traduzione degli output algoritmici in scelte di modello di business e nella ridefinizione del ruolo dell'impresa negli ecosistemi circolari.

Sul piano manageriale, la distinzione tra configurazioni dell'AI orientate alla mera efficienza e configurazioni capaci di abilitare nuove logiche di creazione del valore può supportare scelte più consapevoli in termini di investimenti, strutture organizzative e profili professionali da sviluppare. Infine, per i policy maker, il caso può contribuire a identificare condizioni abilitanti – in termini di infrastrutture di dati, standard e schemi di collaborazione pubblico-privato – favorevoli all'emersione di attori capaci di orchestrare reti circolari supportate dall'AI, con ricadute sulla progettazione di politiche per l'EC maggiormente allineate alle dinamiche organizzative ed ecosistemiche osservate.

Parole chiave: Intelligenza artificiale; economia circolare; dynamic capabilities

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Dalla gestione dei residui alla creazione di valore condiviso: simbiosi industriale e transizione circolare nel settore agroalimentare italiano

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1. Introduzione

A livello globale, i sistemi alimentari sono responsabili di circa un terzo delle emissioni totali di gas serra, considerando produzione, trasformazione, distribuzione e consumo (Crippa et al., 2021). L'agricoltura utilizza circa il 70% dell'acqua dolce disponibile a livello mondiale, rappresentando la principale fonte di consumo idrico antropico (FAO, 2018). Oltre un terzo (≈ 33%) della superficie terrestre globale è oggi dedicata alla produzione di alimenti, con significative implicazioni in termini di perdita di biodiversità e deforestazione (IPBES, 2019). Circa il 17% del cibo prodotto a livello mondiale viene perso o sprecato prima di essere consumato, aggravando i costi ambientali dell'intero sistema alimentare (UNEP, 2021). In Italia, il settore agroalimentare contribuisce per circa l'8–9% delle emissioni totali di CO_2 equivalente, considerando produzione primaria, trasformazione e distribuzione. In Italia, la raccolta differenziata dei rifiuti organici ha raggiunto circa 7,5 milioni di tonnellate annue, evidenziando l'esistenza di grandi flussi di materia organica potenzialmente valorizzabili in ottica circolare (ISPRA, 2022). Studi e applicazioni sperimentali condotti da ENEA hanno dimostrato significative opportunità di simbiosi industriale in Italia, tra cui la valorizzazione di scarti agroalimentari in compost, biomassa ed energia rinnovabile (Cutaia et al., 2018). Diversi studi di caso condotti in Italia mostrano come la simbiosi industriale possa svilupparsi anche in contesti agro-alimentari e in cluster produttivi esistenti, evidenziando opportunità concrete di valorizzazione dei flussi organici in chiave circolare (Taddeo et al., 2017; Cutaia et al., 2018; Hamam et al., 2023).

Il settore agroalimentare italiano rappresenta un comparto produttivo strategico per rilevanza economica e occupazionale (Istat, 2024). Allo stesso tempo, lungo le fasi di coltivazione, trasformazione e distribuzione si generano impatti ambientali rilevanti, che contribuiscono alla pressione sui sistemi naturali e sulle emissioni globali associate ai sistemi alimentari (Crippa et al., 2021). La riduzione degli sprechi e la valorizzazione dei residui sono oggi priorità centrali

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nelle politiche europee di transizione circolare (European Commission, 2020; Ellen MacArthur Foundation, 2019). Inoltre, la produzione e il trattamento dei residui organici costituiscono una componente rilevante dei flussi materiali nazionali, con margini significativi di valorizzazione in ottica circolare (ISPRA, 2022).

In tale prospettiva, l'economia circolare si configura come paradigma volto a superare la logica lineare produzione–consumo–scarto, promuovendo la rigenerazione dei flussi materiali e la massimizzazione del valore attraverso il riutilizzo, il riciclo e la valorizzazione dei residui (Ellen MacArthur Foundation, 2019; European Commission, 2020). All'interno di questo quadro, la simbiosi industriale rappresenta una delle principali modalità di implementazione operativa della circolarità, basata sullo scambio inter-organizzativo di materiali, energia, acqua, sottoprodotti e competenze, con l'obiettivo di ottimizzare l'uso delle risorse e ridurre gli impatti ambientali lungo i cicli produttivi (Chertow, 2000; Chertow & Ehrenfeld, 2012). Studi recenti confermano la crescente rilevanza della simbiosi industriale come strategia per l'attuazione della transizione circolare, evidenziandone il potenziale nel favorire collaborazioni tra attori e migliorare l'efficienza nell'utilizzo delle risorse (Palagonia et al., 2025).

In questo quadro, il settore agroalimentare risulta particolarmente idoneo a processi simbiotici, data l'elevata generazione di residui organici e materiali secondari valorizzabili lungo l'intera filiera produttiva (European Commission, 2020; Cutaia et al., 2018). La letteratura evidenzia tuttavia barriere istituzionali, culturali e logistiche che ne ostacolano la diffusione sistemica, richiedendo una maggiore integrazione tra attori, infrastrutture abilitanti e strumenti di coordinamento territoriale (Boons & Spekkink, 2014; Chertow & Ehrenfeld, 2012).

2. Background teorico e sviluppo concettuale

La teoria della simbiosi industriale (IS) affonda le sue radici nell'ecologia industriale, disciplina che mira alla creazione di sistemi produttivi assimilabili a ecosistemi naturali, in cui gli scarti di un processo diventano risorse per un altro (Frosch & Gallopoulos, 1989; Chertow, 2000). La definizione classica di IS identifica tale pratica come il coordinamento tra imprese distinte per lo scambio di materiali, energia, acqua e sottoprodotti, con l'obiettivo di ottenere un vantaggio competitivo collettivo (Chertow, 2000). In questo quadro, la prossimità geografica facilita la fattibilità operativa dello scambio di risorse e riduce i costi logistici relativi al trasferimento dei materiali secondari (Jacobsen, 2006; Chertow, 2000; Lombardi & Laybourn, 2012).

L'economia circolare (CE), invece, si presenta come modello sistemico che mira alla rigenerazione dei materiali e alla chiusura dei cicli produttivi, sostituendo il concetto di fine vita del prodotto con riuso, riciclo e recupero (Kirchherr et al., 2017). Tale paradigma si posiziona come trasformazione strutturale rispetto al modello lineare "take–make–dispose", promuovendo la massima valorizzazione delle risorse e la minimizzazione delle perdite di materia (World Economic Forum, 2014). Nel quadro europeo, l'economia circolare è riconosciuta come strategia chiave per la competitività sostenibile, con l'Unione Europea che la definisce come un sistema di condivisione, riutilizzo, riparazione e riciclo dei materiali esistenti il più a lungo possibile (European Commission, 2023).

In ambito agroalimentare, la connessione tra IS e CE assume una rilevanza specifica data l'abbondanza di residui organici lungo le supply chain, generando opportunità concrete in termini di produzione di biomassa, compost, energia rinnovabile e fertilizzanti (Cutaia et al., 2018; Hamam et al., 2023; Taddeo et al., 2017). Tale potenziale è confermato da ricerche recenti che indicano come i sistemi agroalimentari siano altamente predisposti all'implementazione di ecosistemi simbiotici e scambi intersettoriali di materia. Nonostante ciò, la letteratura evidenzia anche una frammentazione degli approcci, con una prevalenza di analisi tecniche e carenza di studi sulle dimensioni relazionali, comunicative e istituzionali della simbiosi industriale nel settore alimentare (Hamam et al., 2023).

Ulteriori analisi indicano che la diffusione dell'IS è spesso ostacolata da barriere normative, incertezza regolativa sulla distinzione tra rifiuto e sottoprodotto e limitata fiducia tra attori della filiera alimentare (Cutaia et al., 2018). Tali difficoltà contribuiscono a limitare la maturazione di ecosistemi simbiotici stabili, nonostante i benefici ambientali ed economici dimostrati in numerosi contesti internazionali — tra cui Kalundborg, Śmiłowo, British Sugar e altri cluster agroindustriali (Jacobsen, 2006; Hamam et al., 2023; Lombardi & Laybourn, 2012).

3. Obiettivi di ricerca e questioni esplorative

L'obiettivo generale della ricerca è analizzare come pratiche di simbiosi industriale possano facilitare la transizione verso modelli circolari nel settore agroalimentare italiano, favorendo il recupero e la valorizzazione di residui organici e sottoprodotti lungo la filiera di produzione, trasformazione e distribuzione (Hamam et al., 2023).
La ricerca intende approfondire le dinamiche relazionali e collaborative all'interno delle reti di attori coinvolti, ponendo particolare attenzione al ruolo della fiducia, della condivisione informativa e delle condizioni istituzionali e organizzative che abilitano lo scambio reciproco di risorse (Cutaia et al., 2018).
Inoltre, l'indagine mira a individuare le barriere normative, culturali, logistiche ed economiche che ostacolano la diffusione della simbiosi industriale nel contesto agroalimentare nazionale e la transizione verso forme più avanzate di circolarità settoriale.
Infine, lo studio intende contribuire allo sviluppo teorico proponendo un possibile modello interpretativo della simbiosi industriale applicata all'agroalimentare italiano, capace di integrare dimensioni tecniche, organizzative e relazionali nell'analisi dei processi di recupero funzionale dei sottoprodotti.

Alla luce di tali obiettivi, le seguenti domande di ricerca guidano il lavoro:

- RQ1: In che modo si formano e si sviluppano le reti collaborative di scambio di materiali, energia e sottoprodotti nel settore agroalimentare italiano?
Tale domanda mira a comprendere le logiche di configurazione delle relazioni inter-organizzative e dei flussi di risorse, analizzando le condizioni di prossimità, interdipendenza e mutuo vantaggio tra gli attori (Chertow, 2000).
- RQ2: Quali attori svolgono funzioni strategiche nella facilitazione degli scambi simbiotici e quali ruoli assumono nell'ambito della rete?
Il quesito si concentra su soggetti quali imprese leader, cooperative, consorzi di filiera, enti pubblici o organismi intermedi che possono svolgere funzioni di coordinamento, governance e matching informativo (Lombardi & Laybourn, 2012).
- RQ3: Quali barriere e criticità limitano la piena implementazione della simbiosi industriale nel settore agroalimentare italiano, e quali fattori ne favoriscono invece l'adozione?
La ricerca esplorerà sia gli elementi abilitanti (incentivi economici, innovazioni tecnologiche, piattaforme digitali) sia gli ostacoli (incertezze regolative, scarsa fiducia tra attori, costi logistici) (European Commission, 2023).
- RQ4: In che misura il contesto istituzionale, culturale e territoriale italiano influenza l'emergere di ecosistemi simbiotici efficaci e duraturi?
Questa domanda permette di interrogare l'ipotesi secondo cui la territorialità, le tradizioni produttive locali e la natura delle relazioni tra imprese influenzano la configurazione della simbiosi (Hamam et al., 2023).

4. Metodologia

La ricerca adotterà un approccio metodologico misto (*mixed method*), combinando una componente qualitativa esplorativa con una componente quantitativa descrittiva al fine di sviluppare una comprensione articolata e triangolata del fenomeno (Creswell & Plano Clark,

2011). L'analisi qualitativa costituirà l'asse principale dell'indagine e si baserà su interviste semi-strutturate rivolte ad attori coinvolti nei processi di valorizzazione dei sottoprodotti agroalimentari (Kvale, 2008), integrate da osservazione diretta e analisi documentale di report ambientali, dati aziendali e documenti di filiera (Bowen, 2009). Parallelamente, laddove disponibili, saranno raccolti dati quantitativi relativi ai volumi di output residuali, alle quantità di materia recuperata e alla frequenza degli scambi simbiotici, con l'obiettivo di supportare la componente qualitativa con evidenze numeriche descrittive.

A tale impostazione si affianca una fase preliminare di analisi bibliometrica e revisione sistematica della letteratura, finalizzata a mappare l'evoluzione degli studi su simbiosi industriale, economia circolare e recupero funzionale dei sottoprodotti nel settore agroalimentare. L'analisi bibliometrica consente l'individuazione di cluster tematici, traiettorie di sviluppo e reti di co-citazione (Donthu et al., 2021), mentre la revisione sistematica permette di definire le lacune concettuali e metodologiche rilevanti per la successiva indagine empirica (Tranfield et al., 2003).

La selezione dei casi di studio seguirà i criteri metodologici suggeriti da Eisenhardt & Graebner (2007), cioè un approccio teorico-pragmatico per la costruzione di case studies robusti. I contesti selezionati saranno scelti tra imprese agroalimentari italiane che mostrano potenziali pratiche di simbiosi industriale o scambio inter-impresa di risorse. In continuità con la fase analitica preliminare, sarà inoltre costruito un repertorio di pratiche rilevanti di simbiosi industriale e modelli circolari nel comparto agroalimentare, con finalità comparativo-esplorative e di supporto alla definizione di categorie interpretative. Tale repertorio fungerà da base metodologica per la successiva analisi cross-case.

In particolare, l'analisi si focalizzerà su quattro configurazioni rilevanti:

- Caviro Group — tramite la sua divisione Caviro Extra — rappresenta un esempio significativo di economia circolare nel comparto vitivinicolo italiano: attraverso la trasformazione di sottoprodotti e residui di vinificazione in bioetanolo, acido tartarico, biocarburanti, energia rinnovabile, fertilizzanti e compost, il gruppo dichiara un tasso di recupero prossimo al 99 % e una significativa riduzione degli scarti (Caviro Group 2024; sito Caviro Extra, 2025).
- ENEA – Symbiosis Users Network (SUN): piattaforma nazionale di simbiosi industriale che supporta le imprese nella mappatura dei flussi, nell'identificazione di opportunità di scambio dei materiali secondari e nella facilitazione di reti collaborative, incluse filiere agroalimentari territoriali (Symbiosis Users Network, 2025).
- Food Crossing District (Emilia-Romagna): progetto pilota che connette attori come Barilla e Casalasco per la valorizzazione di residui come bucce di pomodoro e crusca di frumento, mediante piattaforma digitale di matching delle risorse (ENEA, 2024).
- Simbiosi Srl (Lombardia) rappresenta un esempio di iniziativa privata orientata alla valorizzazione circolare delle risorse attraverso soluzioni integrate per acqua, energia, recupero di residui organici e rigenerazione dei suoli. Secondo la documentazione aziendale, il modello sviluppato mira a creare ecosistemi territoriali ad elevata simbiosi tra attori e flussi materiali (Simbiosi, 2025).

L'analisi qualitativa sarà condotta mediante codifica tematica, con l'obiettivo di identificare ricorrenze, categorie concettuali e pattern interpretativi emergenti dalle interviste e dalla documentazione raccolta. La successiva analisi comparata tra i casi selezionati consentirà di evidenziare convergenze e divergenze nelle dinamiche di scambio, nelle configurazioni relazionali e nei meccanismi di coordinamento, supportando lo sviluppo di una tipologia interpretativa delle configurazioni simbiotiche nel sistema agroalimentare italiano.Tale processo prevede la lettura sistematica del materiale empirico, l'assegnazione di codici ai segmenti rilevanti e la successiva aggregazione in temi ricorrenti, confrontando risultati e narrazioni tra attori e contesti al fine di evidenziare somiglianze, divergenze e relazioni strutturali. L'approccio metodologico si fonda sui principi della thematic analysis e dello sviluppo induttivo dei costrutti teorici, ampiamente adottati negli studi organizzativi e nei contesti di innovazione sostenibile (Braun & Clarke, 2006; Gioia, Corley & Hamilton, 2013).

I risultati qualitativi saranno integrati con ulteriori evidenze documentali e settoriali attraverso triangolazione metodologica, così da incrementare l'affidabilità e la solidità interpretativa delle analisi (Jick,1979). La ricerca è attualmente in fase di implementazione; pertanto, gli esiti qui discussi rappresentano anticipazioni e aspettative basate sulla letteratura esistente e sulle osservazioni iniziali, nel rispetto della natura *work-in-progress* del progetto.

5. Risultati attesi (work in progress)

I risultati attesi si configurano come esiti preliminari e non derivano ancora da analisi empirica definitiva, in coerenza con la natura qualitativa esplorativa della ricerca. In linea con le recenti riflessioni sul potenziale circolare dei sistemi agroalimentari (Hamam et al., 2023), ci si attende di individuare dinamiche collaborative emergenti tra imprese interessate alla valorizzazione dei sottoprodotti e alla riduzione degli scarti di lavorazione. Tali relazioni potrebbero manifestarsi in forma di alleanze informali, accordi di scambio e coordinamenti di filiera basati sulla prossimità funzionale e sull'identificazione reciproca di opportunità di recupero di risorse (Chertow, 2000). Si prevede inoltre che possano emergere attori "centrali" (hub) all'interno delle reti di simbiosi industriale, chiamati a svolgere funzioni cruciali di coordinamento, facilitazione degli scambi e aggregazione della domanda e dell'offerta dei materiali secondari e residui. Tale ipotesi trova supporto nella letteratura più recente sulle dinamiche di rete e sui modelli organizzativi delle piattaforme di simbiosi industriale (Akrivou et al., 2021; Sellitto et al., 2024). Parallelamente, è plausibile che emerga una segmentazione dei ruoli tra imprese produttrici di residui organici, imprese trasformative secondarie e operatori specializzati nella valorizzazione o conversione dei flussi residuali, secondo logiche di complementarità funzionale osservate nello sviluppo di reti simbiotiche in cluster produttivi italiani (Taddeo et al., 2017). È ragionevole ipotizzare che la rete collaborativa di simbiosi industriale presenti una configurazione flessibile e dinamica nel tempo, in cui l'intensità delle relazioni e la partecipazione degli attori possano variare in funzione di determinanti economico-organizzativi (es. redditività, disponibilità di sottoprodotti), nonché in relazione a fattori di fiducia, percezione del rischio e condizioni istituzionali. Questa ipotesi si fonda su una concezione estesa di simbiosi industriale, che considera la rete come un sistema sociotecnico in continua evoluzione (Lombardi & Laybourn, 2012). Si prevede che la ricerca contribuirà alla comprensione delle condizioni che favoriscono la generazione di valore condiviso attraverso lo scambio circolare di risorse e, sulla base delle evidenze derivanti dai casi studio, potrà proporre un modello interpretativo suscettibile di essere replicato in altri contesti agro-industriali italiani. La plausibilità di tale contributo trova riscontro nella letteratura recente sulla potenzialità e le barriere dell'industrial symbiosis (Neves et al., 2019).

6. Valore scientifico potenziale e contributo alla letteratura

La ricerca si propone di contribuire all'analisi degli aspetti organizzativi e relazionali delle reti di simbiosi nel settore agroalimentare, rispondendo a un crescente interesse della letteratura che evidenzia come molti studi sull'industrial symbiosis in ambito agri-food si siano tradizionalmente concentrati sui flussi materiali e tecnologici, dedicando minore attenzione alle dimensioni di governance, coordinamento e interazione tra attori. Lo studio si colloca nella prospettiva che interpreta la simbiosi industriale come fenomeno reticolare e socialmente costruito, ponendo attenzione alle dinamiche inter-organizzative, ai meccanismi di coordinamento e ai processi relazionali che ne abilitano l'efficacia (Lombardi & Laybourn, 2012). La ricerca adotta la prospettiva della network theory per analizzare le relazioni inter-organizzative tra imprese all'interno della rete di simbiosi, considerando la struttura dei legami, la posizione degli attori e le dinamiche di coordinamento come determinanti della capacità della rete di veicolare scambi di risorse e creare sinergie (Borgatti & Halgin, 2011). Attraverso un approccio

empirico qualitativo, la ricerca mira a sviluppare categorie interpretative emergenti dalle evidenze raccolte, con l'obiettivo di offrire un possibile quadro analitico utile anche ad altri contesti produttivi caratterizzati da flussi residui valorizzabili e logiche collaborative (Glaser & Strauss, 1967).

Infine, la ricerca mira a contribuire alla comprensione del ruolo delle imprese agroalimentari all'interno di reti simbiotiche territoriali, non solo in termini di scambio fisico di risorse, ma anche rispetto alle condizioni organizzative e di coordinamento che ne abilitano la collaborazione (Taddeo et al., 2017).

7. Conclusioni e stato della ricerca (work in progress)

La ricerca si colloca in uno stadio intermedio di sviluppo: l'impostazione teorica è stata delineata, il disegno metodologico definito e la fase di selezione dei contesti di studio e di raccolta qualitativa delle evidenze empiriche è attualmente in corso. Data la natura esplorativa e qualitativa dell'indagine, i risultati presentati sono da considerarsi preliminari e riflettono aspettative basate su evidenze scientifiche consolidate e osservazioni iniziali, piuttosto che conclusioni definitive. La prosecuzione del lavoro consentirà di affinare il quadro concettuale e verificare empiricamente le ipotesi emergenti, contribuendo a consolidare una comprensione sistematica dei meccanismi di collaborazione che abilitano la simbiosi industriale nel settore agroalimentare italiano. L'obiettivo finale del progetto è contribuire all'avanzamento della riflessione scientifica nei campi dell'economia circolare, dell'organizzazione industriale e della gestione sostenibile delle risorse, offrendo una prospettiva integrata sulle condizioni che favoriscono la riconfigurazione circolare dei sistemi produttivi e dei modelli di collaborazione inter-impresa.

Parole chiave: Simbiosi industriale; economia circolare; settore agroalimentare; valorizzazione dei residui; reti collaborative

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L'organisational misconduct nelle imprese italiane: analisi organizzativa dei casi di amministrazione giudiziaria avviati dalla Procura di Milano

Marta Ingaggiati[1], Tea Maistro[2]

1. Introduzione

Negli ultimi anni si sta diffondendo, in diversi ordinamenti giuridici, l'uso di strumenti alternativi per la risoluzione dei casi di comportamento illegale delle organizzazioni (definiti come organizational misconduct), adottando approcci di "giustizia preventiva" al posto dei procedimenti penali tradizionali (Markoff, 2013). In paesi come Stati Uniti, Canada, Inghilterra, Galles e, più recentemente, Francia ((Arlen, 2020; Grasso, 2016), la definizione dei casi di criminalità d'impresa avviene sempre più spesso tramite pretrial diversion agreements, tra cui i deferred prosecution agreements (DPA). Tali accordi consentono alle imprese di evitare il processo e la prosecuzione penale, a condizione che rispettino specifiche misure correttive concordate con la procura. Queste misure possono includere l'ammissione dei fatti, il pagamento di sanzioni ridotte, il risarcimento delle vittime o la riforma dei programmi di compliance. In tal modo, i pubblici ministeri lasciano alle organizzazioni un certo margine di discrezionalità nella definizione delle modalità di riparazione.

Questi interventi riflettono una visione più evoluta del misconduct, che non è più attribuito alla "mela marcia", ma al "barile marcio": non il singolo individuo, bensì le strutture e le dinamiche organizzative possono favorire comportamenti devianti. Tuttavia, la loro efficacia è oggetto di ampio dibattito. Da un lato, questi strumenti consentono di evitare la "morte organizzativa" e le conseguenze economiche devastanti di un processo, potendo così preservare occupazione e valore economico, e, in alcuni casi, generare cambiamenti diffusi. Dall'altro lato, diversi studi ne evidenziano l'efficacia limitata, a causa delle frequenti recidive (De Vita & Vozza, 2024). Diversi Autori sostengono che gli accordi pre-processuali, oltre a essere intrinsecamente iniqui, rischiano di erodere la responsabilità penale delle imprese, indebolire lo Stato di diritto e fallire nella deterrenza dei comportamenti illeciti.

Dal punto di vista organizzativo, la diffusione di questi strumenti solleva ulteriori questioni. Quando il discorso giuridico viene tradotto in termini organizzativi, alle imprese è lasciata un'ampia discrezionalità su come attuare le azioni correttive. Tali interventi richiedono infatti una cooperazione attiva tra organizzazioni e procure, che può comportare la riforma dei programmi di compliance, il cambiamento dei vertici o la creazione di meccanismi di monitoraggio delle riforme concordate. Tuttavia, queste azioni possono essere implementate in modo accomodante, affrontando in modo sostanziale le rivendicazioni degli stakeholder e le cause profonde del problema, oppure in modo difensivo, attraverso azioni simboliche che tutelano i manager o le risorse organizzative, dando solo l'apparenza di un cambiamento (Hersel et al., 2019).

Alla luce di ciò, la nostra ricerca si interroga su una questione centrale: quando un'organizzazione ha un certo grado di discrezionalità nell'attuare le azioni correttive dopo un episodio di misconduct, quale tipo di cambiamento produce? Si tratta di un cambiamento accomodante e sostanziale, oppure difensivo e simbolico? E, soprattutto, perché?

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Per rispondere a questa domanda ci focalizziamo sul caso italiano in quanto, negli ultimi anni, anche in Italia – e in particolare presso la Procura di Milano – si è fatto ricorso a un istituto analogo: l'Amministrazione Giudiziaria (art. 34 C.A.). Si tratta di una misura di prevenzione volta alla "bonifica" di organizzazioni che abbiano agevolato fenomeni di sfruttamento del lavoro. Tale bonifica è affidata a un amministratore nominato dal giudice, che esercita i poteri spettanti ai titolari dei diritti sui beni e sulle imprese oggetto della misura.

2. Framework teorico

2.1. Organizational misconduct

Il misconduct rappresenta un fenomeno complesso. È definito come "qualsiasi comportamento all'interno di un'organizzazione che viola norme morali, etiche o legali ampiamente accettate, e che minaccia il benessere di individui, gruppi o dell'organizzazione stessa, indipendentemente dal fatto che sia intenzionale o meno" (Mayer et al., 2010).

Come sottolinea Palmer (2012), tale fenomeno non deve essere considerato un'eccezione, bensì una componente normale e strutturale dell'agire organizzativo. In questa prospettiva, il comportamento deviante non deriva da singoli individui "cattivi", ma è radicato negli stessi processi e strutture che rendono le organizzazioni efficienti e performative. Le persone che lo perpetrano sono spesso soggetti ordinari che operano in contesti in cui logiche di efficienza, competizione e lealtà interna possono entrare in tensione con i principi della moralità. Questa concezione comporta un'importante implicazione teorica: la prevenzione del misconduct non può limitarsi alla sostituzione dei singoli individui, ma deve riguardare la revisione delle strutture, dei processi e della cultura organizzativa. La letteratura individua diversi fattori antecedenti al misconduct (Vaughan, 1999), che possono essere classificati come segue:

- Fattori ambientali: condizioni esterne che generano pressioni o incertezze sistemiche tali da favorire errori, cattive condotte. Ad esempio, l'elevata competizione per risorse scarse, l'incertezza ambientale, la regolazione inefficace o la dipendenza da poteri esterni, nonché pressioni istituzionali e culturali per ottenere legittimità.
- Fattori organizzativi strutturali: caratteristiche che favoriscono la devianza routinaria, come la divisione del lavoro e la conseguente "segretezza strutturale", l'eccessiva centralizzazione o formalizzazione, le gerarchie che scoraggiano la segnalazione di errori e la goal displacement, ossia la sostituzione degli obiettivi originari con fini distorti.
- Fattori organizzativi processuali: dinamiche interne che trasformano pressioni esterne in pratiche deviate, come conflitti di potere tra subunità, incentivi alla violazione delle regole, trappole decisionali che amplificano gli errori, ritualizzazione o negazione dell'errore.
- Fattori tecnologici e di compito: caratteristiche delle tecnologie o delle attività lavorative che creano rischi intrinseci, come la complessità tecnica e l'accoppiamento stretto dei processi, la conoscenza tacita e la flessibilità interpretativa che possono generare incomprensioni.
- Fattori sociali e culturali: norme, valori e significati condivisi che modellano la percezione della devianza, come la normalizzazione delle pratiche scorrette, la cultura del successo a ogni costo o la giustificazione delle violazioni in nome della performance.
- Fattori individuali e cognitivi: limiti cognitivi e processi interpretativi che portano a decisioni deviate, come la razionalità limitata, gli errori di sensemaking, la giustificazione post hoc e la routine che genera "incapacità addestrata".

A seguito della scoperta di comportamenti illeciti, le organizzazioni possono subire conseguenze significative: perdita di legittimità, riduzione della produttività e della soddisfazione lavorativa, boicottaggi da parte dei consumatori, cali del valore azionario e sanzioni legali. Tuttavia, la letteratura ha posto crescente attenzione anche sulle azioni correttive che i manager e le organizzazioni intraprendono dopo un episodio di misconduct. Le azioni correttive sono comportamenti organizzativi volti a mitigare gli effetti negativi del misconduct sull'impresa e sui suoi stakeholder. Hersel et al. (2019) distinguono tre principali tipologie di azioni correttive:

- Sostituzione dei vertici (executive dismissal), che consiste nella rimozione e sostituzione dei leader responsabili, come il CEO o i membri del consiglio di amministrazione, per riaffermare la legittimità organizzativa.
- Comunicazioni organizzative (organizational accounts), attraverso cui le imprese spiegano o reinterpretano il proprio ruolo nel misconduct, offrendo giustificazioni o ammettendo responsabilità.
- Cambiamenti di policy, che includono modifiche strategiche, strutturali o procedurali — come l'aggiornamento dei codici etici, l'introduzione di programmi di formazione sull'etica o l'adozione di nuovi meccanismi di controllo.

Le modalità di implementazione di tali azioni possono variare notevolmente. In particolare, Hersel et al. (2019) distinguono tra risposte accomodanti e risposte difensive. Le risposte accomodanti affrontano in modo sostanziale le preoccupazioni degli stakeholder, offrendo soluzioni tangibili ai problemi emersi e impegnandosi in un cambiamento reale. Ad esempio, la rimozione dei manager responsabili o la revisione dei meccanismi di governance possono rappresentare segnali di autentica assunzione di responsabilità. Analogamente, modifiche di policy volte a ridurre gli incentivi al misconduct (come nuovi standard operativi, procedure di whistleblowing o maggiore coinvolgimento degli stakeholder) indicano un impegno verso il cambiamento organizzativo profondo. Le risposte difensive, al contrario, mirano a prendere le distanze dal misconduct agli occhi degli stakeholder e a limitare le perdite reputazionali o strategiche dell'impresa. Queste includono lo scapegoating dei responsabili, la negazione del coinvolgimento, la minimizzazione della gravità del comportamento o l'adozione di cambiamenti formali facilmente reversibili.

2.2. Evoluzione dei sistemi giudiziari

In diversi ordinamenti giuridici, è ormai comune che i casi di corporate misconduct vengano risolti al di fuori del processo penale tradizionale, attraverso strumenti di composizione alternativa come i pretrial diversion agreements.

Il dibattito attorno a questi accordi si è sviluppato prevalentemente nell'ambito della letteratura giuridica, concentrandosi sui loro vantaggi e svantaggi sotto il profilo del diritto penale e dell'efficacia deterrente. Tuttavia, tali strumenti assumono una rilevanza crescente anche dal punto di vista organizzativo e manageriale, poiché incidono sulle dinamiche interne delle imprese coinvolte e sulle modalità con cui queste attuano le azioni correttive successive al misconduct.

I deferred prosecution agreements (DPA) rientrano nella più ampia categoria degli alternative dispute resolutions, ovvero negoziazioni tra procura e impresa finalizzate alla risoluzione dei casi penali al posto del processo. Attraverso un DPA, la procura sospende temporaneamente l'azione penale in cambio dell'impegno dell'organizzazione a realizzare specifiche riforme o azioni riparative: l'implementazione di programmi di compliance, la ristrutturazione della governance, o la collaborazione attiva alle indagini.

La letteratura è tuttavia divisa circa la loro efficacia. Alcuni autori ritengono che i DPA rappresentino uno strumento adeguato a gestire il corporate misconduct (Parker & Dodge, 2023), mentre altri ne evidenziano i limiti come deterrente rispetto ai crimini d'impresa (Uhlmann, 2013). In particolare, De Vita & Vozza (2024) sostengono che, sebbene tali accordi offrano un trattamento preferenziale alle grandi imprese multinazionali, essi falliscono nel prevenire la recidiva e nel generare un cambiamento reale nei comportamenti organizzativi.

Le evidenze mostrano dunque che gli esiti di questi accordi dipendono fortemente dalla complessità del contesto legale e dal grado di discrezionalità lasciato alle organizzazioni. Quando le imprese sono chiamate a implementare autonomamente le misure correttive, la natura del cambiamento — sostanziale o simbolico, accomodante o difensiva — dipende in larga misura dal modo in cui interpretano e gestiscono tale margine di autonomia.

3. Obiettivo e domande di ricerca

Alla luce del quadro teorico e delle esperienze internazionali discusse, questo studio intende analizzare se e in che modo strumenti di natura non punitiva, come l'Amministrazione Giudiziaria (AG), possano generare un cambiamento effettivo all'interno delle organizzazioni coinvolte in casi di misconduct, oppure se producano prevalentemente effetti cosmetici o simbolici.

L'Amministrazione Giudiziaria, introdotta in Italia con l'art. 34 del Codice Antimafia, è una misura di prevenzione che mira alla "bonifica" di organizzazioni che abbiano agevolato fenomeni di illegalità, in particolare quelli legati allo sfruttamento del lavoro. Essa prevede la nomina di un

amministratore giudiziario incaricato di esercitare, per un periodo limitato, i poteri gestionali e decisionali dell'impresa, al fine di ristabilire la legalità e ripristinare condizioni operative conformi alla legge.

Pur rappresentando un'innovazione significativa nel panorama della giustizia economica italiana, l'Amministrazione Giudiziaria solleva interrogativi cruciali circa la natura del cambiamento organizzativo che produce. In particolare, il nostro obiettivo è comprendere se tale strumento induca:

- un cambiamento di tipo accomodante, ossia sostanziale e orientato al miglioramento dei processi, della cultura e delle relazioni con gli stakeholder; oppure
- un cambiamento di tipo difensivo, volto principalmente ad adempiere formalmente agli obblighi imposti, senza modificare in profondità le logiche organizzative che hanno originato il misconduct.

Per esplorare tali aspetti, la ricerca si concentra sull'applicazione dell'Amministrazione Giudiziaria nei settori della moda e della logistica in Italia — due ambiti frequentemente oggetto di intervento da parte della Procura di Milano — e si propone di rispondere alle seguenti domande di ricerca:

1. L'Amministrazione Giudiziaria produce un cambiamento di tipo difensivo o di tipo accomodante?
2. Perché?

4. Metodologia

La ricerca si fonda su un approccio qualitativo, volto a esplorare in profondità le modalità attraverso cui l'Amministrazione Giudiziaria (AG) produce cambiamento nelle organizzazioni coinvolte.

4.1. Raccolta dei dati

Sono state condotte 11 interviste semi-strutturate con tre categorie di attori chiave:

- 6 Amministratori Giudiziari, direttamente coinvolti nella gestione delle imprese sottoposte alla misura;
- 3 rappresentanti sindacali, impegnati nella tutela dei lavoratori nei settori interessati;
- 2 rappresentanti aziendali, appartenenti a organizzazioni oggetto della misura.

A supporto delle interviste, è stata condotta un'ampia analisi documentale su 7 provvedimenti giudiziari di disposizione e di revoca dell'Amministrazione Giudiziaria, per un totale di 564 pagine.

I casi analizzati appartengono a due settori ad alta incidenza di interventi di AG:

- Settore logistica: BRT, Ceva, Geodis, Uber

- Settore moda: Alviero Martini, Armani, Dior

4.2. Analisi dei dati

L'analisi dei dispositivi di revoca ha permesso di identificare le azioni correttive intraprese dalle imprese durante il periodo di Amministrazione Giudiziaria e di classificarle in relazione ai fattori antecedenti del misconduct individuati dalla letteratura (Vaughan, 1999; Hersel et al., 2019). Questa categorizzazione ha consentito di valutare se le azioni implementate agiscano su dimensioni strutturali e processuali (ad esempio, modelli organizzativi e sistemi di controllo) o su dimensioni sociali e culturali (norme, valori e significati condivisi), permettendo di inferire la natura del cambiamento: difensiva o accomodante. In parallelo, l'analisi delle interviste ha consentito di comprendere le logiche e le motivazioni che guidano tali trasformazioni, con particolare attenzione ai vincoli istituzionali, alla durata del mandato, alla cooperazione tra attori e al grado di coinvolgimento degli stakeholder esterni.

5. Risultati

Domanda di ricerca 1: l'amministrazione giudiziaria produce un cambiamento di tipo difensivo o di tipo accomodante?

Dall'analisi dei dispositivi di revoca è emerso che le azioni correttive intraprese dalle imprese durante il periodo di Amministrazione Giudiziaria si sono concentrate prevalentemente su livelli organizzativi strutturali e processuali, e solo in minima parte su aspetti sociali e culturali. In particolare, gli interventi osservati hanno riguardato principalmente la creazione o revisione dei modelli organizzativi di controllo, come l'adozione di un modello 231, la nomina di un organismo di vigilanza, la designazione di società di revisione contabile e la costituzione di comitati per la valutazione dei fornitori. Tali azioni, sebbene rilevanti sul piano formale, sono prevalentemente orientate all'adempimento e non incidono sui valori, le norme e le culture che orientano l'agire organizzativo. Questo orientamento suggerisce che la risposta prodotta dall'Amministrazione Giudiziaria sia principalmente di tipo difensivo, in quanto mira a introdurre modifiche strutturali e procedurali per garantire la conformità normativa, piuttosto che promuovere un cambiamento sostanziale e durevole nei comportamenti o nelle logiche organizzative.

Livello	Definizione sintetica	Riscontro fattuale nei dispositivi di revoca
Ambientale		
Organizzativo – Strutturale	Caratteristiche strutturali che generano devianza routinaria per effetto della complessità, gerarchia o frammentazione dell'informazione.	creazione di un modello organizzativo; adozione di un modello 231; nomina organismo di vigilanza; nomina di società di revisione legale dei conti; creazione di un comitato di valutazione dei fornitori che esamini i profili di rischio; rimozione dei contratti con imprese che fanno caporalato; interruzione del rapporto con i fornitori evidenziati nel decreto di

		disposizione
Organizzativo – Processuale	Dinamiche interne e interazioni che trasformano pressioni esterne in pratiche deviate o in errori sistematici.	aggiornamento del sistema di controlli; aggiornamento delle condizioni generali di contratto e dei codici di condotta; ; definizione di standard operativi nei confronti dei lavoratori; rispetto della privacy dei lavoratori
Organizzativo – Task/tecnologico	Le caratteristiche delle tecnologie e delle attività di lavoro come fonti intrinseche di rischio e incertezza.	
Sociale / Culturale	Norme, valori e significati condivisi che modellano la percezione della devianza e la definizione di situazioni rischiose o accettabili.	comunicazione del nuovo sistema di controlli
Individuale / Cognitivo		

Tabella 1. Risultati preliminari

Domanda di ricerca 2: perché?

L'analisi delle interviste con amministratori giudiziari, rappresentanti sindacali e aziendali consente di identificare una serie di fattori di contesto e di design istituzionale che spiegano l'esito prevalentemente difensivo degli interventi.

- Ambiguità del mandato e natura legale delle competenze. Il mandato dell'Amministrazione Giudiziaria è definito in termini prevalentemente giuridici, e le competenze mobilitate da Procura e Amministratori sono anch'esse di natura legale. Ne deriva una marginalizzazione delle competenze organizzative e manageriali, che restano prerogativa dell'impresa ma raramente vengono attivate.
- Assenza di un coinvolgimento multilaterale degli stakeholder. L'attuazione dell'Amministrazione Giudiziaria avviene come un processo "chiuso", privo di dialogo con soggetti esterni come i sindacati o le autorità locali.

o I sindacati possiedono competenze utili per supportare processi di cambiamento accomodante e per sensibilizzare i lavoratori ai vantaggi della regolarizzazione; tuttavia, vengono raramente coinvolti.

o Le autorità locali, che beneficiano economicamente della presenza delle aziende logistiche, potrebbero essere attori chiave nel sostegno alla trasformazione, ma restano generalmente escluse dal processo.

- Temporalità breve e assenza di follow-up. Il mandato dell'Amministrazione Giudiziaria è limitato nel tempo e non prevede momenti di verifica successiva, né con la Procura né con gli stakeholder, favorendo un approccio episodico e orientato ai risultati immediati.
- Pressione mediatica e reputazionale. L'alta visibilità pubblica dei casi induce tutti gli attori coinvolti — Procura, Amministratori e imprese — a privilegiare azioni dimostrative e risultati rapidi: le prime per consolidare la propria immagine pubblica, le seconde per "sparire dal radar".
- Focalizzazione sulla singola impresa e non sul contesto settoriale. Gli interventi si concentrano sull'organizzazione specifica "inciampata" nel misconduct, senza considerare i fattori ambientali e sistemici che rendono ricorrenti tali episodi nei medesimi settori (moda e logistica). Ciò suggerisce che l'Amministrazione Giudiziaria possa rappresentare, metaforicamente, "la risposta giusta al livello sbagliato": efficace sul singolo caso, ma incapace di intervenire sulle cause strutturali e ambientali del problema.

6. Conclusioni e implicazioni

L'Amministrazione Giudiziaria rappresenta un dispositivo innovativo nel panorama italiano, in quanto introduce una forma di intervento che, invece di punire l'impresa responsabile di misconduct, mira a promuovere la rigenerazione dell'organizzazione attraverso un'azione di "bonifica" interna. Tuttavia, i risultati di questa ricerca mostrano che, pur generando un cambiamento tangibile, l'Amministrazione Giudiziaria tende a produrre trasformazioni di tipo difensivo, orientate alla conformità formale più che a un apprendimento sostanziale. Le azioni implementate si concentrano su dimensioni strutturali e procedurali — come la creazione di modelli di controllo, la definizione di procedure e la revisione dei sistemi di monitoraggio — mentre incidono solo marginalmente sugli aspetti culturali e valoriali dell'organizzazione.

Le ragioni di questo esito risiedono in alcuni elementi di design istituzionale che caratterizzano l'Amministrazione Giudiziaria:

- la natura ambigua del mandato e la prevalenza di competenze giuridiche rispetto a quelle manageriali;
- la mancanza di coinvolgimento degli stakeholder esterni (sindacati, autorità locali, comunità);
- la breve durata dell'intervento e l'assenza di momenti di verifica o follow-up;
- la pressione mediatica che incentiva risultati rapidi e visibili;
- la focalizzazione sul singolo caso piuttosto che sui fattori sistemici e ambientali che alimentano il misconduct nei settori interessati.

Alla luce di tali evidenze, appare necessario riformulare le aspettative circa il potenziale trasformativo dell'Amministrazione Giudiziaria. Essa può costituire un importante strumento di risanamento, ma solo a condizione che venga ripensata in chiave più ampia e sistemica, superando la logica episodica e reattiva che ne limita oggi l'impatto. In questa prospettiva, sarebbe auspicabile integrare le competenze organizzative e manageriali nel mandato dell'Amministratore Giudiziario; istituzionalizzare momenti di monitoraggio successivi alla revoca della misura; promuovere una maggiore partecipazione degli stakeholder per favorire processi di apprendimento collettivo; e infine, estendere l'attenzione dai singoli casi alle dinamiche di settore e di filiera, per affrontare le cause strutturali del misconduct. L'Amministrazione Giudiziaria, dunque, fa un passo importante nella direzione di una giustizia preventiva e rigenerativa, ma per

realizzare appieno il suo potenziale deve evolvere da strumento di compliance formale a leva di apprendimento organizzativo di più ampio respiro.

Parole chiave: Misconduct; amministrazione giudiziaria; cambiamento organizzativo

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SDG Coherence: From Disclosure to Performance

Diletta Vianello[3], Rebecca Miccini[4], Giovanni Liberatore[5]

1. Introduction

Over the past decade, the corporate sustainability landscape has been shaped by the rapid institutionalization of the Sustainable Development Goals (SDGs) as a global framework for responsible business conduct. Since their adoption by the United Nations in 2015, the SDGs have become a central reference for firms seeking to communicate their contribution to sustainable development through sustainability and non-financial reporting. However, while the diffusion of SDG-related disclosures suggests a growing corporate commitment to global sustainability, a growing body of literature warns that such references often remain largely symbolic (Costa et al., 2025; Del Río et al., 2024). The phenomenon of SDG washing—analogous to greenwashing—emerges when companies emphasize symbolic references to the SDGs without implementing aligned actions or measurable outcomes.

This study introduces the concept of SDG coherence as a metric to evaluate the alignment between a company's stated commitment to the SDGs and its actual environmental, social, and governance (ESG) performance. While the number of SDGs mentioned in corporate reports serves as a proxy for disclosure, coherence is assessed through objective, sector-relevant ESG indicators, such as board diversity and training investments.

By bridging the gap between narrative and action, this approach aims to contribute to a more evidence-based evaluation of corporate sustainability, shedding light on firms that integrate SDGs into their operational model, the so-called "greenwalking" versus those that engage in performative disclosure, the so-called "SDG-washing".

2. Theoretical framework

The proliferation of frameworks and standards—ranging from the Global Reporting Initiative (GRI) to the SDG Compass—has increased heterogeneity in corporate approaches to SDG integration, raising questions about the comparability and reliability of reported information.

This concern has given rise to the notion of SDG-washing, a process whereby companies selectively disclose or exaggerate their contributions to the SDGs without demonstrating substantive, measurable progress (Van Zanten & Van Tulder, 2021). Much like greenwashing, SDG-washing can be understood as a legitimacy-seeking behavior in which firms use sustainability narratives to align with stakeholder expectations while maintaining business-as-usual operations (Bebbington & Unerman, 2018). The resulting misalignment between discourse and performance undermines both corporate accountability and the transformative ambition of the 2030 Agenda.

This study introduces the concept of SDG coherence, defined as the degree of alignment between a company's stated commitment to the SDGs (disclosure) and its measurable performance (action). The central research question is:

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Is there a misalignment between the extent of SDG disclosure in corporate reports and the actual performance of firms?

By operationalizing SDG coherence as a quantitative construct, this study contributes to bridging the gap between symbolic and substantive corporate engagement with the SDGs.

The theoretical foundations of this work draw from both legitimacy theory (Suchman, 1995) and stakeholder theory (Freeman, 1984). From a legitimacy perspective, organizations use sustainability disclosure as a communicative mechanism to seek stakeholders' approval, thus emphasizing symbolic alignment with the SDGs. In contrast, stakeholder theory posits that genuine alignment between strategic intent, operational action, and transparent reporting can create shared value and strengthen stakeholder relationships (Donaldson & Preston, 1995). The tension between these two perspectives, i.e. legitimacy-seeking versus stakeholder-engaged behavior, frames the conceptual terrain of SDG coherence.

The study also builds on the analytical framework proposed by Del Río et al. (2024), who distinguished between ex ante and ex post indicators of SDG engagement. Ex ante (bottom-up, stakeholder-driven) indicators, such as those embedded in the SDG Compass (United Nations, 2021), are designed as internal learning and planning tools that orient corporate action towards the SDGs. They reflect organizational intentions and are typically qualitative in nature. Conversely, ex post (top-down, expert-driven) indicators, such as the SDG Compliance assessment, represent external evaluations of firms' sustainability performance. Del Río et al. (2024) demonstrated that inconsistencies between these two types of indicators create fertile ground for greenwashing and SDG-washing, as firms may selectively report or emphasize those indicators that portray them in the most favorable light.

Drawing inspiration from this dual-indicator framework, our study develops SDG coherence as an integrated measure of alignment between narrative disclosure (ex ante commitment) and objective performance (ex post evidence). In this conceptualization, coherence reflects the convergence of intention and outcome. Firms that exhibit high coherence demonstrate a consistent relationship between their SDG-related discourse and ESG performance, indicating substantive engagement or "greenwalking". Those with low coherence display a wide gap between stated goals and measurable actions, suggesting performative or symbolic commitment.

3. Empirical design

The empirical analysis adopts a mixed-methodology research design, combining the content analysis technique with quantitative statistical analyses. The dataset is composed by English and Italian companies that disclose GRI-based non-financial reports in the period 2022-2023; the database of companies was extracted from LSEG Datastream and from the Italian DNF Observatory . For coherence reasons, we analyzed only companies that disclose SDG-related information according to the GRI standards.

We extracted data from two complementary sources of information. First, SDG disclosure data were extracted from GRI-based sustainability reports and non-financial statements. Each firm received a disclosure score ranging from 0 to 1 based on the number of SDGs explicitly referenced compared to the maximum number of SDG indicators (17). Secondly, we created two SDG presence-score respectively called: SDG5, which assumed value of 1 if a company disclosed the SDG 5 and 0 otherwise, and SDG4, which assumed value of 1 if a company disclosed the SDG 4 and 0 otherwise.

Then, quantitative indicators relevant to key SDGs were obtained from the financial statements and from the AIDA database. For instance, the proportion of women on the board of directors served as a proxy for SDG 5 (Gender Equality), while training expenses as a share of revenue captured engagement with SDG 4 (Quality Education). These indicators serve as proxies for the companies' actual engagement (performance) with the sustainability goals they report.

To quantify coherence, we will build a coherence matrix to compare disclosure intensity with performance outcomes and assess the alignment between disclosure and performance. Each performance indicator will be scored on a 0–2 scale (0 = no evidence; 1 = partial alignment; 2 = full alignment) and aggregated into an overall SDG Coherence Score ranging from 0 to 6. Firms will then be classified into three categories: high coherence (4–6), medium coherence (2–3), and low coherence (0–1). Statistical analyses, including descriptive statistics, correlation analysis, and one-way ANOVA, will be conducted to explore the relationship between disclosure, performance, and contextual variables such as industry and company size (Galeazzo et al., 2024; García-Meca & Martínez-Ferrero, 2022).

4. Expected results, contributions and future research

We expect our results to reveal a discrepancy between disclosure and actual performance. Specifically, we expect firms to disclose a large number of SDGs in their reports, but with a measurable outcome disclosed only for a limited subset of goals. This "SDG inflation" mirrors findings by Mengistu and Panizzolo (2022), who identified an overabundance of indicators used to demonstrate progress toward the SDGs. The analysis may suggest that companies frequently highlight those SDGs that are easiest to integrate into existing CSR activities or that align with reputational priorities, while neglecting others that require deeper systemic change.

We believe that cross-sectoral comparisons will indicate that industries characterized by high regulatory scrutiny, such as finance, utilities, and energy, display the highest disclosure levels but relatively low coherence scores. In contrast, firms in manufacturing and industrial sectors, though less vocal in their SDG reporting, tend to exhibit stronger alignment between communication and performance (García-Meca & Martínez-Ferrero, 2022). These findings echo Del Río et al. (2024), who identified sectoral patterns in the gap between SDG Compass (ex ante) and SDG Compliance (ex post) indicators.

At the governance level, we expect that companies with diverse and independent boards, the presence of sustainability committees, and a long-term strategic orientation show higher coherence. This supports the view that governance structures play a pivotal role in translating symbolic commitments into measurable outcomes (García-Sánchez et al., 2022). Conversely, firms with concentrated ownership or short-term financial incentives are more prone to SDG-washing, using disclosures primarily as legitimacy tools.

Theoretically, we expect our findings to reinforce the insights of legitimacy theory by illustrating how firms may use SDG discourse to construct a socially acceptable narrative without substantive behavioral change (Bebbington & Unerman, 2018; Del Río et al., 2024). However, the introduction of SDG coherence extends this framework by quantifying the degree to which legitimacy is grounded in measurable performance. In doing so, it also operationalizes the stakeholder theory proposition that long-term value creation depends on the alignment between stakeholder expectations, corporate strategy, and verifiable outcomes (Freeman, 1984; Donaldson & Preston, 1995).

The results may help highlight different typology of firms based on their coherence profiles. High-coherence firms are those who exhibit a strategic integration of SDGs into their business models, supported by tangible ESG metrics. These firms engage in "greenwalking," demonstrating both narrative and operational alignment. Medium-coherence firms are those who display partial consistency, often constrained by limited data availability or weak measurement systems. Lastly, low-coherence firms are those who engage in SDG-washing, prioritizing symbolic communication over actual performance. This typology offers a nuanced lens through which scholars and practitioners can evaluate corporate sustainability maturity.

Beyond theoretical contribution, the study may offer several practical implications. First, the SDG Coherence Score provides regulators, investors, and analysts with a replicable and transparent tool for evaluating the authenticity of corporate SDG engagement. As sustainability

disclosures increasingly influence access to capital and stakeholder trust, coherence can serve as a diagnostic measure to identify firms whose sustainability narratives are substantiated by evidence. Second, the findings underscore the need for integrated reporting frameworks that explicitly link SDG disclosure to quantifiable ESG metrics. Regulatory initiatives such as the European Union's Corporate Sustainability Reporting Directive (CSRD) and the Sustainable Finance Disclosure Regulation (SFDR) can benefit from incorporating coherence-based assessments to mitigate risks of symbolic compliance.

The study also identifies avenues for future research. While our current analysis employs two ESG indicators to operationalize coherence, future studies should expand the indicator set to include environmental metrics (e.g., carbon intensity, waste reduction) and social dimensions (e.g., employee well-being, community investment), in line with Ferrón Vílchez et al. (2022). Moreover, longitudinal analyses could trace how coherence evolves over time, revealing whether firms transition from symbolic to substantive SDG engagement. Comparative research across institutional contexts could further elucidate the role of regulation, culture, and stakeholder pressure in shaping coherence.

In conclusion, this study may contribute to the growing discourse on corporate accountability and the SDGs by introducing and empirically testing the concept of SDG coherence. Grounded in legitimacy and stakeholder theories and informed by the ex ante/ex post framework of Del Río et al. (2024), it provides a novel methodological approach to assessing the authenticity of corporate sustainability efforts. The findings may suggest that the proliferation of SDG references in corporate reports does not necessarily equate to substantive progress. Instead, what truly matters is the degree of alignment between disclosure and performance which mirrors the coherence between what companies claim and what they achieve.

By transforming this alignment into a measurable construct, SDG coherence bridges the divide between symbolic communication and tangible performance, offering scholars, practitioners, and policymakers a tool to evaluate and promote genuine contributions to sustainable development. It invites organizations to reconceptualize sustainability not as a communicative exercise but as an operational reality, thus advancing the transition from disclosure to performance, from legitimacy-seeking to value creation, and from SDG-washing to SDG coherence.

Keywords: Sustainable Development Goals (SDGs); ESG performance; sustainability reporting; non-financial disclosure; SDG-washing

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A ten-years empirical analysis (2015-2026) on companies listed in the two most digitalized European Countries. Danis and Finnish blue-chip firms

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1. Introduction

Over the past ten years, Artificial Intelligence (AI) has undergone a remarkable evolution – from aspirational prototypes and proof-of-concept pilots to integrated, high-stakes systems deployed across finance, manufacturing and services. This shift has expanded the domain of risk and oversight: beyond classic financial or regulatory risk, firms now confront algorithmic bias, data governance failures, opacity and accountability gaps. In this context, corporate boards are increasingly judged not only by their strategic vision, but by how they govern and supervise AI itself.

However, despite the proliferation of frameworks and normative prescriptions for AI governance, the empirical record remains thin on how boards structurally adapt over time. Do boards rearrange their internal governance architecture (for instance, creating committees with explicit mandates over technology or AI)? Do they revise charters or adopt clearer accountability lines? Do they recruit directors with scientific, computing, or AI expertise? And – crucially – how do these changes unfold over a longer horizon, especially straddling regulatory inflection points such as the adoption of the EU's AI Act in 2024?

This study seeks to address that gap by examining a decade-long trajectory (2015-2025) of Danish and Finnish listed firms. Denmark and Finland are compelling cases: both are among the leading EU nations in AI uptake, with robust digital infrastructure and high institutional capacity. For example, in 2023, approximately the 66.22% of Danish Larger Enterprises and 51.17% of Finnish Larger Enterprises reported "using any AI technology" – well above the EU average (28.41%). These countries thus serve as relevant 'laboratories' for observing board-level adaptation in mature digital economies (Eurostat, 2024).

We focus on firms within the OMXC25 (Denmark) and OMX Helsinki 25 (Finland). By tracking changes in committee mandates and board expertise across this decade, we aim to document how corporate governance bodies respond, gradually or abruptly, to evolving AI exposure and regulation. Our analysis is descriptive and comparative, avoiding premature claims of causality, but structured enough to detect systematic patterns.

In doing so, we situate recent developments not as isolated responses but as part of a continuum of governance adaptation, thereby providing a more robust baseline for interpreting future shifts as the AI Act's obligations deepen.

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2. Theoretical background

Bridging two literatures – AI governance and board governance – this research draws on foundational and contemporary contributions.

On the AI governance side, scholars increasingly emphasize that AI adoption must be governed through structural arrangements, relational dynamics, and procedural safeguards. Papagiannidis et al. (2025) articulates such a layered framework, arguing that responsible AI adoption requires coherent arrangements from top to bottom. Batool, Zowghi & Bano (2025), in a systematic review, underscore that while governance mechanisms (e.g. audit trails, risk committees, model oversight frameworks) are well articulated, we see few studies that trace their adoption over time within corporate boards.

This gap – between prescriptive governance design and longitudinal empirical observation – is exactly what our study seeks to address.From the perspective of board governance and IT oversight., the notion that boards should retain accountability over technology is long established. Nolan & McFarlan (2005) urged boards to consider information technology as strategically critical, not just an operational support function.

Subsequent empirical works, such as Turel, Liu & Bart (2017), have shown that board-level IT governance practices – such as committee structures, charters and oversight processes – are meaningful associated with firm performance and risk mitigation, particularly when aligned with organizational maturity.

More recently, Caluwe et al. (2024) warn against isolating technology oversight in silos, advocating instead for embedding AI or IT oversight within the board's core architecture and ensuring coherence across committees. Their argument is particularly relevant in a context where AI is both pervasive and cross-cutting: governance cannot rest in a single committee disconnected from strategic, risk, or audit oversight.

Layered on top of this is the literature on algorithmic accountability, ethics, and governance pressures. Mittelstadt (2019) incisively critiques the idea that broad principles (e.g. fairness, transparency) are suffice without robust implementation structures. Jobin, Ienca & Vayena (2019) map the landscape of AI ethics guidelines globally but caution that norms without enforcement mechanisms risk being symbolic. Kroll et al. (2017) dive deeper into the notion of 'accountable algorithms', arguing that for algorithmic systems to be held to account, oversight lines must be clear and enforceable, often necessitating formal structures like audits or governance committees. Together, these literatures suggest that boards confronting AI exposure must move beyond rhetorical buy-in to structural and processual reform.

By integrating these streams, we reason that boards under increasing AI exposure may gradually (or in punctuated shifts) redesign committee architectures, revise charters to explicitly reference AI oversight, and recruit directors with digital or AI credentials. Yet, exactly how these shifts unfold over time – especially in comparable settings – is largely uncharted, which underscores our study's contribution.

3. Research Question and Exploratory Hypotheses

To clarify scope and evaluability, we formulate our research question as follows:

[RQ]: How have board committees structures and board-level digital/AI expertise evolved in Danish and Finnish blue-chip firms between 2015 and 2025, reflecting governance adaptation to technological and regulatory pressures?

We operationalize board adaptation along these measurable dimensions:

(i) committee architecture: number and type of committees with explicit AI/technology/data mandates; establishment dates, renaming, or scope expansions;

(ii)mandate revisions: formal charter updates mentioning AI, data governance, algorithmic risk, or digital oversight responsibilities;

(iii) board human capital: percentage and number of directors with backgrounds in IT, AI, computer science, data science, or tech leadership.

To guide the analysis, we develop exploratory hypotheses:

[H1]: Formal charter revisions referencing AI/data governance will cluster around 2024-2025, following the EU AI Act's adoption;

[H2]: Technology-intensive sectors (ICT, telecom, energy, industrial engineering) will show higher rates of new committee creation than financial services, where AI oversight will be integrated into existing audit/risk committees;

[H3]: The proportion of directors with digital/AI expertise will increase gradually over 2015-2025, with accelerations after regulatory or institutional milestones (e.g. AI Act 2024);

[H4]: Firms disclosing higher AI adoption levels will exhibit more extensive board adaptation (committees, mandates, expertise) than peers with limited AI engagement.

These hypotheses will allow empirical evaluation while preserving the study's exploratory character.

4. Methodological approach

To address our research question, we conduct a longitudinal qualitative document analysis covering all firms in the OMXC25 and the OMXH25 indices for each year from 2015 through 2025. Following the methodological guidelines from Bowen (2009) and Morgan (2022), we systematically select, appraise, code, and synthesize the documents under analysis.

The OMXC25 Index (OMX Copenhagen 25) includes the 25 most actively traded and largest companies listed on the Nasdaq Copenhagen Stock Exchange. It is a free-float market capitalization- weighted index with a capping mechanism designed to prevent any single company from exerting excessive influence. The index composition is reviewed periodically to maintain both liquidity and market representativeness.

Similarly, the OMXH25 Index (OMX Helsinki 25) comprises the 25 most actively traded companies on the Nasdaq Helsinki Stock Exchange. It is also capitalization-weighted, with a maximum weight cap of 10% per company to limit excessive concentration. The composition of the index is reviewed semi-annually, while the weights are rebalanced quarterly.

Both indices therefore serve as representative benchmarks for the Danish and Finnish markets, respectively, and are widely employed in empirical research and financial analysis. Our focus on firms listed in these indices is motivated by two complementary considerations. First, companies admitted to trading on a regulated market and meeting the capitalization, liquidity, and governance criteria required for index inclusions are, by definition, classified as 'Large Enterprises' under European Union terminology. These firms typically exhibit mature corporate structures, greater administrative resources, and advanced reporting capabilities. Second, listed companies are subject to strict transparency and disclosure requirements, both financial and non-financial, including those under the Transparency Directive, the MAR regulation, and the forthcoming CSRD Rules. These obligations ensure that financial statements, management reports, sustainability disclosures, and other corporate communications are made public and accessible.

By focusing on companies included in the two indices, we maximize the likelihood of obtaining reliable, comparable, and sufficiently comprehensive information to support both longitudinal and cross-sectional analyses with methodological rigor.

We construct a balanced panel of 50 firms – 25 OMXC25 constituents and 25 OMXH25 constituents – and maintain this sample across the entire 2015-2025 period under investigation. The reference set is defined as of 30 June 2025, corresponding to the index constituents at the midpoint of the year, and we then track these same firms retrospectively throughout the preceding decade.

This approach follows established practices in panel data analysis, where maintaining a balanced panel ensures that all firms are observed in each period, thereby improving comparability and simplifying longitudinal inference. In financial market research, the 'fixed-constituent approach' has been widely adopted in European and Nordic studies examining stock market indices, provided the ex-post sample selection biases – in particular, survivorship and look-ahead biases – are acknowledged and appropriately mitigated.

As highlighted by Vaihekoski (2023) in his review of Nordic index construction methodologies, fixing the sample ex post is methodologically acceptable if accompanied by robustness checks, suchas point-in-time analyses or alternative weighting schemes. These measures ensure that findings are not unduly influenced by the peculiarities of surviving firms or by retrospective knowledge of index composition. Consistent with this guidance, our empirical strategy includes sensitivity analyses to assess the stability of results under alternative sample definitions, thereby enhancing the credibility of our conclusions and mitigating concerns about potential biases.

The documentary sources employed in our study include:

- Annual Reports and Corporate Governance disclosures;
- Board Committee Charters, Renewal Amendments, and Committee Descriptions;
- Biographical Profiles of Directors;
- Governance Statements or ad hoc updates concerning board or industry transformations.

As previously stated, our methodology consists of a longitudinal qualitative document analysis applied to all firms within the indices under review.

According to Corbin and Strauss (2008), document analysis constitutes "a systematic procedure for reviewing or evaluating documents – both printed and electronic. Like other analytical methods in qualitative research, document analysis requires that data be examined and interpreted in order to elicit meaning, gain understanding, and develop empirical knowledge". While document analysis is frequently combined with other qualitative methods for purposes of triangulation – "the combination of methodologies in the study of the same phenomenon" (Denzin, 1970, p. 217) – the exploratory and descriptive nature of the present study does not necessitate the adoption of additional methodologies. At the same time, it is worth noting that document analysis has often been employed as a 'stand-alone' methodology; indeed, several significant qualitative studies have relied exclusively on documentary sources (e.g. McMahon et al., 2009).

As emphasized by Bowen (2009), documentary materials serve five specific functions, among which our study focuses on the fourth: using documents as a "means of tracking change and development".

Where multiple versions of the same document are available, researchers can compare them to identify alterations over time. Even minor revisions may signal important organizational or governance changes (Yin, 1994). Moreover, the analysis of periodic and final reports – where accessible – enables the researcher to obtain a comprehensive view of how a company or a program evolved over time (Bowen, 2009).

5. Institutional Context and Reasoned Expectations

Denmark and Finland are among the EU's more advanced economies in terms of digital readiness and AI diffusion. Eurostat's data show that in 2023, the 66.22% of the Large Enterprises in Denmark and the 51.17% of Large Enterprises in Finland reported "using any AI technology", significantly above the European Union average which was of the 28.41%. Actually, 2023 was the first year that the European Commission started to measure how companies in Europe were using artificial intelligence tools. Therefore, we used 2023 as the year for this study. This high base suggests that large firms in these jurisdictions face mounting expectations for internal governance refinement.

The EU AI Act, which came into force on 1 August 2024, established a phased regime that introduces accountability, auditability, transparency, and risk management obligations for AI systems – particularly high-risk ones – with many obligations coming into force in 2025-2026. The AI Act, thus represents a potential regulatory tipping point for boards, raising the salience of formal oversight.

From our theoretical framing, we might reasonably expect adaptation to accelerate post-2022, with more frequent charter revisions and committee redefinitions in 2024-2025, as firms reposition governance in light of regulation. We also anticipate sectoral differentiation: technology, telecommunications, industrial engineering, or clean energy sectors may lead in establishing dedicated oversight committees, whereas financial services firms may respond by expanding scope in audit/risk committees rather than creating standalone boards.

Still, these expectations remain provisional until coding is complete.

6. Contribution and Significance

This research, aims to offer three central contributions:

(i) empirical depth over time: by mapping board-level AI adaptation over a full decade, we move beyond snapshots to reveal how governance evolves gradually, accelerates, or stalls in response to adoption and regulation;

(ii) theory bridging: we connect high-level AI governance frameworks (structural, relational, procedural) with observable board design decisions (committees and human capital), providing a practical bridge between normative prescriptions and corporate practice;

(iii) practical and normative relevance: in a period of heightened regulatory scrutiny (AI Act era), our findings can guide boards, investors, regulators, and standard-setters. Board may benchmark their own AI oversight maturity; regulators or exchanges can better understand how structural constraints and institutional legacies influence governance responses.

Moreover, by focusing on two advanced but distinct Nordic markets, the study offers comparative insight into how institutional context conditions adaptation.

7. Limitations and Paths Forward

Because our design relies on publicly disclosed documents, it may omit internal or informal governance arrangements that are not visible externally. Furthermore, this descriptive design does not allow us to infer causality – we cannot definitively say adoption of AI caused governance change, or vice versa.

To deepen insight, future extensions might include semi-structured interviews with board chairs, governance committees, or corporate secretaries to understand the drivers, barriers, and dynamics of adaptation. Another route is to expand the study to additional European markets to test generalizability. Finally, correlating changes in committee design or director expertise with firm-level outcomes (innovation, AI adoption success, risk incidents) would allow stronger inference about the performance implications of governance adaptation.

Keywords: AI Governance; Corporate Governance Adaptation; Board-Level Expertise

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Startups' Adoption of Growth Hacking: An Empirical Study in Tunisia

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1. Introduction

It has become widely recognized that entrepreneurship plays a fundamental role in addressing the social and economic challenges facing the African continent, as well as in promoting job creation, technological advancement, and economic diversification. Tunisia is considered a vital hub for innovation in Africa, despite the structural challenges and limited resources faced by entrepreneurs. In Tunisia, pioneering legislative initiatives such as the 2018 Startup Law have helped create a favorable environment offering tax incentives, distinctive branding, and seed funding (Sold, 2018). However, the Tunisian entrepreneurial ecosystem continues to face numerous obstacles, such as limited access to venture capital, uneven levels of digital infrastructure, and regulatory uncertainty that may restrict startups' global expansion. In these circumstances, characterized by a lack of creativity, marketing innovation has become a necessity. This study examines how Tunisian startups use digital marketing strategies, including growth hacking techniques, to support their startups.

Tunisian startups find themselves under pressure to expand rapidly despite severe financial constraints. In this context, digital marketing and growth hacking emerge as vital tools that allow them to overcome traditional barriers to market entry and turn constraints into opportunities thanks to digital agility. Therefore, this study explores the fundamental processes of this transformation within the Tunisian ecosystem and highlights the unique adaptation strategies developed by local entrepreneurs to achieve success despite the obstacles. Digital marketing has become the cornerstone of modern growth strategies. It encompasses a diverse range of tools and techniques, such as the strategic use of social media, search engine optimization (SEO), content marketing, email campaigns, and online advertising. The goal is to boost brand visibility, attract new customers, and retain existing ones at costs that are often lower compared to traditional marketing (Tiago & Veríssimo, 2014; Olivieri & Testa, 2024). At the same time, the field of growth hacking has emerged as a flexible and experimental discipline that combines elements of marketing, engineering, and data analysis.

Unlike traditional marketing strategies, growth hacking focuses on unconventional and often cost-effective methods that rely on experimentation to significantly increase user numbers and improve key performance indicators (KPIs) (Bohnsack & Liesner, 2019; Bargoni et al., 2024). Recent academic studies indicate that growth hacking fosters a culture of rapid experimentation and iterative learning. However, most empirical research focuses on well-developed systemic environments such as Silicon Valley, London, or Berlin, where startups have robust data systems, easy access to specialized consultants, and abundant venture capital (Macca et al., 2024; Cavallo et al., 2023). Theoretical frameworks often rely on the presence of advanced digital platforms and highly skilled teams conditions that may not always reflect the reality faced by Tunisia. In fact, African startups typically operate in environments characterized by limited access to digital platforms, underdeveloped technological infrastructure, and scarce specialized skills (Kabengele & Hahn, 2025).

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In Tunisia, most startups are run by small teams that often lack formal training in marketing and find themselves operating in a fragmented market with limited resources. For this reason, this research seeks to address the current academic gap by posing the following question: *How do Tunisian entrepreneurs adopt digital marketing strategies and growth hacking within a resource-constrained environment?* The objective is to determine whether growth hacking, in its adapted form, can foster sustainable development and provide a competitive advantage in the context of an emerging economy despite structural difficulties. To explore this complex issue and investigate the details of entrepreneurial practices, we adopted a qualitative approach centered on multiple case studies. This approach is particularly well-suited for conducting an in-depth analysis of decision-making processes, entrepreneurial behaviors, and adaptation strategies within their original context, facilitating the capture of the complexities and nuances of the individuals' experiences. The dataset comprises 19 semi-structured interviews conducted between November 2024 and July 2025.

Participants were selected to ensure a diversity of perspectives and representation of various aspects of the Tunisian entrepreneurial landscape. The group included 10 startup founders from diverse sectors such as agritech (e.g., smart irrigation), edtech (e.g., educational platforms), tourism (e.g., tech-enabled travel), culture, biotechnology, and digital services; as well as 5 experts from the ecosystem, including business incubator directors, entrepreneurship coaches, and strategic marketing consultants. Four end-users who interact with innovations in urban transportation, agritech, or educational services were also included. This multi-perspective approach contributed to improving the quality of the research and increasing the credibility of the results. The interviews, which lasted approximately 30 to 45 minutes, were recorded with the participants' consent, then transcribed verbatim and analyzed using NVivo 14.

We adopted the Gioia method (Gioia et al., 2013), which involves detailed and iterative data analysis, with the aim of transforming raw information into core concepts, then into sub-themes, and finally into integrated dimensions. This strategy ensures scientific integrity while preserving the depth of personal narratives. The qualitative study revealed three integrated dimensions that reflect the complex landscape of marketing in Tunisian startups. The most striking observation is that many Tunisian entrepreneurs start with an insufficient understanding of their target customers. Since they typically come from technical fields, they tend to prioritize the appeal of their technical innovations over a comprehensive assessment of customer needs. This problem is often exacerbated by the lack of reliable and accessible market data in Tunisia (Chakraborti et al. Nevertheless, there are rapid shifts toward adaptation. When facing difficulties with initial sales, founders begin to leverage customer insights to develop or improve their products.

This customer-centric approach represents an early stage of growth hacking: they experiment, face challenges, learn, and make adjustments. Startups rely on prototypes and minimum viable products (MVPs) to test their assumptions in practical, often informal, but effective ways. The study indicates that the most successful entrepreneurs are those who can translate customer feedback into product improvements. This rapid response mechanism is at the heart of growth hacking. In this way, agility becomes a substitute for costly market research (Kaffka & Krueger, 2024). Although its value has increased by 205% according to some recent studies (Siddiqui, 2024), the Tunisian landscape remains fragmented. Entrepreneurs who participated in the survey pointed to a lack of coordination among various support structures. Although business incubators provide general assistance, they often lack mentors with advanced skills in digital marketing, data analysis, or growth hacking strategies.

This fragmentation leads to the emergence of so-called "blind spots," where startups are forced to make critical strategic decisions on their own (Sold, 2018). This drives entrepreneurs to become "self-taught marketers." They seek online courses, webinars, or networking with peers to acquire essential skills. Findings show that the most successful startups are those that manage to integrate into global expert networks or growth-oriented initiatives. There is also a clear gap between university curricula and the immediate operational skills required in digital marketing

for startups. The experts interviewed emphasized the need to strengthen cooperation between the public and private sectors. Although the Startup Act represents a major development, its practical application in the field of marketing remains limited. Support systems should be developed to become true hubs for technological and strategic resources (Lay & Tafese, 2025). Despite the widespread availability of digital tools, their use is often superficial. Platforms such as Facebook, Instagram, and LinkedIn are the most preferred for gaining visibility. WhatsApp Business is also commonly used for customer relationship management.

However, most marketing campaigns lack in-depth analysis. Growth hacking is often seen as more of a trend than a systematic approach. Nevertheless, entrepreneurs unconsciously engage in "hacking" out of necessity: organic growth, collaborations with influencers, and referral initiatives. The fundamental problem remains in measuring performance. Only a handful of startups use advanced analytics tools or conduct A/B tests regularly. Budget decisions are often driven by intuition rather than specific metrics such as customer acquisition cost (CAC) or lifetime value (LTV). This lack of data-driven thinking hinders startups' ability to optimize their campaigns and validate their spending (Agarwal & Sharma, 2024). This research contributes to the literature on entrepreneurship in resource-constrained environments. It demonstrates that digital marketing frameworks and growth hacking strategies designed specifically for developed markets are not always directly applicable. In Tunisia, marketing is adopted within a strategic improvisation (Baker & Nelson, 2005).

We propose to redefine the concept of growth breakthrough in developing countries so that it is not viewed merely as an accumulation of advanced technological resources, but rather as an advanced educational capacity (Teece, 2007). The lack of financial resources is compensated for by enhancing flexibility and the ability to leverage informal social networks. This study also contributes to enriching the theory of marketing capabilities by illustrating how entrepreneurial instinct and adaptability, under certain conditions, can compensate for the lack of official data.

The findings of this study offer actionable recommendations. For entrepreneurs, it is essential to move beyond the tech bubble and adopt a data-driven mindset. For business incubators and accelerators, support must be more detailed and tailored. Policymakers, meanwhile, need to reinforce startup legislation with initiatives that enhance access to marketing expertise and digital infrastructure (Sanasi et al., 2023). In short, this study reveals the paradox in startup marketing in Tunisia: where remarkable innovation and strong adaptability coexist alongside a lack of organization and formality.

While an ad-hoc strategy has led to tangible achievements, the long-term sustainability and international expansion of Tunisian startups depend on their ability to implement professional expansion strategies. This study faces certain limitations due to the small sample size which limits the generalizability of the results. Moreover, the research was conducted only in a single country at a specific point in time. Future research could adopt a longitudinal perspective and compare results across different African countries. Furthermore, quantitative studies are necessary to gain a deeper understanding and confirm this phenomenon on a broader scale. Ultimately, growth hacking in Tunisia represents much more than just a marketing strategy; it embodies a new generation of entrepreneurs who are transforming the economic landscape thanks to smartphones and their innovative ideas. Innovation is not just a matter of financial investment; rather, it is fundamentally based on intellectual talent and the ability to adapt and learn faster than competitors.

Keywords: Africa; digital marketing; entrepreneurship; growth hacking; startups; Tunisia

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