

From ESG orientation to sustainable enterprise value creation: the role of digital innovation capability

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Abstract

Purpose – Drawing on institutional, dynamic capability, and social cognitive theories, this study examines the effects of environmental, social, and governance (ESG) orientation, institutional pressure, and entrepreneurial self-efficacy on sustainable entrepreneurial outcomes through Digital Innovation Capability (DIC).

Design/methodology/approach – Data were collected from 673 entrepreneurs across manufacture and service sectors. The study employs various statistical analyses to analyse the proposed relationships and evaluate the mediation role of digital Innovation Capability in linking the antecedent factors to Sustainable Entrepreneurial Performance and Long-term Value Creation.

Findings – The findings confirm the mediation of digital innovation capability in the relationships between ESG orientation, institutional pressure, entrepreneurial self-efficacy, and the two outcome variables. Among the antecedents, ESG orientation exerts the strongest influence on digital innovation capability, followed by institutional pressure and entrepreneurial self-efficacy.

Practical implications – The study shows that long-term value creation depends on a distinct configuration of the same antecedents, in which institutional pressure retains a direct, legitimacy-based path alongside the capability-mediated route, indicating that durable value creation is not governed by the same mechanism as current-period performance.

Originality/value – The study advances understanding by differentiating a capability-mediated pathway from a legitimacy-mediated pathway through which ESG orientation, institutional pressure, and entrepreneurial self-efficacy contribute to sustainable performance and long-term value creation. The results indicate these pathways exert distinct effects across outcomes rather than functioning as a uniform explanatory mechanism.

Keywords Entrepreneurship, Enterprise sustainability, Value creation, Digital innovation capability

Paper type Research article

Introduction

The convergence of entrepreneurship and sustainability is increasingly shaping how firms create, deliver, and capture value. The adoption of the United Nations Sustainable Development Goals and the expansion of environmental, social, and governance (ESG) frameworks have positioned sustainability as a strategic imperative rather than a reputational concern (Tsalis *et al.*, 2020). Growing investor expectations reinforce the need for firms to integrate environmental and social priorities while maintaining economic performance. Evidence from small and medium enterprises (SMEs) suggests that embedding sustainability into core operations can simultaneously enhance social responsibility and firm performance

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(Pereira *et al.*, 2025). However, achieving this requires moving beyond symbolic commitments toward measurable and sustained outcomes (Aftab *et al.*, 2026).

Digital technologies play a central role in enabling this transition. Tools such as data analytics, platform systems, and process automation support the integration of ESG principles into core organisational processes, enhance transparency, and facilitate stakeholder engagement (Mehmood *et al.*, 2025; Salamzadeh *et al.*, 2025). Yet, despite these opportunities, implementation remains uneven. Many firms continue to rely on symbolic sustainability claims without developing the digital capabilities necessary to operationalise them. This highlights the importance of Digital Innovation Capability (DIC), defined as a firm's ability to integrate digital resources, analytics, and innovation processes to create strategic value. Digital Innovation Capability is defined as a resource-constrained MSME's capacity to purposefully integrate digital tools, data, and innovation routines to operationalise sustainability commitments, distinguishing substantive organisational reconfiguration from the mere adoption or use of digital technologies.

While prior research shows that Digital Innovation Capability can improve resource efficiency, transparency, and sustainability-oriented business models (George *et al.*, 2021; Xu *et al.*, 2022), findings are mixed. In resource-constrained firms, particularly MSMEs, digital investments often fail to deliver expected benefits due to capability gaps, weak data systems, and limited absorptive capacity (Li *et al.*, 2023; Durman *et al.*, 2025; Secundo *et al.*, 2026). These inconsistencies suggest that digital technologies alone are insufficient; their effectiveness depends on complementary organisational conditions. Thus, Digital Innovation Capability should be understood as a contingent mechanism requiring empirical validation. This tension reflects the paradox of digitalisation–performance: digital investment without facilitation of organisational capabilities does not translate automatically into performance. Recent evidence suggests that the performance outcomes of digital investment are neither uniform nor automatic (Bertacchini *et al.*, 2026). Returns vary substantially across different categories of digital investment, while AI adoption often entails an initial productivity decline as firms incur the costs of restructuring established routines and processes (Cranney *et al.*, 2025). Moreover, emerging research highlights that the value of digital technologies is realised through firms' capabilities to sense opportunities, seize them, and reconfigure organisational resources, making performance benefits contingent rather than direct (Abakpa and Dvouletý, 2025). Building on this perspective, we conceptualise Digital Innovation Capability as the organisational mechanism that enables resource-constrained MSMEs to translate ESG-oriented digital investments into sustainable performance outcomes.

In many emerging economies, the tension between external ESG expectations and internal implementation capability is particularly pronounced. Regulatory initiatives and industry certification schemes are increasingly extending ESG reporting and sustainability requirements across supply chains, including small and medium-sized enterprises. However, compliance with reporting requirements or certification standards does not, in itself, ensure that firms possess the organisational capabilities necessary to generate, interpret, and effectively act upon ESG-related data. Digital Innovation Capability is therefore conceptualised as a more narrowly defined construct than general organisational capability. Specifically, it refers to the digital infrastructure that enables firms to translate sustainability intentions and external pressures into actions that can be monitored, reported, and continuously improved, rather than serving as a comprehensive indicator of overall organisational capability.

Beyond firm-level capabilities, sustainability is also shaped by institutional pressures. Institutional pressure refers to external isomorphic forces that arise from an organisation's institutional field, impacting its structures and behaviours as it seeks legitimacy (DiMaggio and Powell, 1983; Li *et al.*, 2024). Regulatory requirements, industry norms, and peer practices create coercive, normative, and mimetic forces that influence sustainability adoption. However, evidence on their performance effects is inconclusive, with many firms adopting

compliance-oriented approaches rather than achieving substantive gains (Hojnik and Ruzzier, 2016). This issue is particularly pronounced in emerging economies, where sustainability demands often exceed organisational capabilities. Although prior research has focused on compliance and environmental practices, it remains unclear whether digital capability development is the mechanism linking institutional pressures to sustainable performance. This tension is increasingly evident in contexts where ESG reporting requirements and sustainability standards are expanding across supply chains. Regulatory mandates and industry certification schemes such as ISO 14001 create substantial pressures for firms to demonstrate ESG compliance, yet neither form of compliance necessarily guarantees the underlying capability required to generate, interpret, and act on the data being reported.

At the individual level, entrepreneurial self-efficacy also plays a critical role. Entrepreneurs shape how resources are allocated and strategies are implemented, and their confidence in managing uncertainty influences digital adoption and sustainability decisions (Malodia *et al.*, 2023; Shepherd and Patzelt, 2011). However, empirical evidence on how entrepreneurial self-efficacy contributes to the development of digital sustainability capabilities remains limited, particularly in resource-constrained contexts. Addressing this gap extends social cognitive theory by linking individual cognition to organisational capability development.

Despite growing interest in ESG orientation, institutional pressure, and entrepreneurial self-efficacy, these factors have largely been examined in isolation. Yet they represent distinct but interrelated levels of analysis, including organisational, environmental, and individual, that jointly shape sustainable value creation. Long-term value creation, which reflects sustained competitive advantage, stakeholder trust, and innovation capability, depends on the alignment of these dimensions rather than any single factor alone (Kurznack *et al.*, 2021; Zumente and Bistrova, 2021). The literature demonstrates a direct relationship between each antecedent and its corresponding outcome when examined in isolation: strategic intent enhances ESG performance, regulatory pressure promotes compliance, and organisational confidence facilitates action. However, a different pattern emerges when these antecedents are considered simultaneously. Their effects may not be fully realised without a shared foundation of organisational capability. Rather than operating as independent pathways, strategic intent, regulatory pressure, and organisational confidence draw upon the same finite organisational resources required for effective ESG implementation. This perspective reframes these antecedents from parallel predictors into competing claims on organisational resources, a dynamic that becomes visible only within an integrated analytical model.

Consistent with the foregoing discussion, the study aims to examine the relationships among ESG orientation, institutional pressure, entrepreneurial self-efficacy, digital innovation capability, and sustainable entrepreneurial performance. The research also evaluates the relative influence of these factors on capability development and long-term value creation. By examining the underlying causal pathways involved, the study moves beyond simple bivariate associations. The study provides an integrated perspective to address entrepreneurial sustainability and offers insights into how institutional processes can facilitate capability development beyond compliance; and for practitioners, it identifies actionable strategies to improve the effectiveness of sustainability initiatives in entrepreneurial contexts.

Theoretical background and hypotheses development

Institutional theory, dynamic capability and social cognition theories

Institutional theory (DiMaggio and Powell, 1983; Scott, 1995) explains organisational behaviour as a response to socially constructed pressures rather than technical demands. It identifies coercive, normative, and mimetic pressures from regulations, industry standards, and competitive imitation that drive firms to prioritise legitimacy (Suchman, 1995). In this study, these pressures encourage the development of Digital Innovation Capability (DIC) as firms respond to sustainability expectations and signal legitimacy to stakeholders, supporting long-term value creation. Although criticised for portraying organisations as passive,

institutional theory remains essential for explaining sustainability adoption and is complemented here by dynamic capability and social cognitive perspectives.

Dynamic capability theory (Teece *et al.*, 1997; Teece, 2018) explains how firms build higher-order capabilities to sense, seize, and reconfigure resources in changing environments. Digital Innovation Capability is conceptualised as a sustainability-oriented dynamic capability enabling firms to integrate digital technologies, stakeholder engagement, and process adaptation. This positions Digital Innovation Capability as a dynamic, not operational, capability in empirical analysis. It is not the routine use of a digital tool but the higher-order ability to sense sustainability-relevant opportunities, seize them through digital infrastructure, and reconfigure that infrastructure as requirements change. A firm may possess digital tools without possessing Digital Innovation Capability, and this distinction matters because tool adoption alone does not produce sustained performance gains (Li *et al.*, 2023). Digital investments often fail due to capability gaps and resource constraints (Li *et al.*, 2023; George *et al.*, 2021). Evidence from SMEs shows digital diffusion predicts innovation only when accompanied by absorptive capacity, while digital readiness depends on organisational sensemaking and agility rather than technology access alone (Hassan *et al.*, 2024; Pingali *et al.*, 2023). Thus, Digital Innovation Capability is a distinct mechanism linking sustainability orientation to performance outcomes.

Social Cognitive Theory (Bandura, 1982; 1997) complements this perspective by explaining differences in capability development. Entrepreneurial self-efficacy (ESE) influences how entrepreneurs invest in and utilise digital technologies, with higher self-efficacy driving persistence and adoption under uncertainty. These perspectives are not distinct explanations linked to predictors. Institutional pressure and ESG orientation are demand-side triggers; the former is externally imposed, the latter internally generated. However, neither leads to performance without the capability-building process outlined by dynamic capability theory. Entrepreneurial self-efficacy is not a fourth, parallel channel; rather, it influences how the capability-building process unfolds. Firms led by entrepreneurs with low self-efficacy face the same institutional and strategic pressures but convert them into capabilities more slowly and less completely. Consequently, institutional and strategic pressures determine the direction of capability investment, whereas self-efficacy dictates its pace and depth. This integrated model underscores that sustainability-driven value creation relies on the alignment of environmental pressures, organisational capabilities, and individual cognition (see Figure 1).

The three theories correspond to the framework as follows: Institutional Theory (DiMaggio and Powell, 1983) explicates Institutional Pressure as an external catalyst driven by legitimacy for capability investment and maintains a connection to long-term value creation through legitimacy. Dynamic Capability Theory (Teece, 2018) explains Digital Innovation Capability,

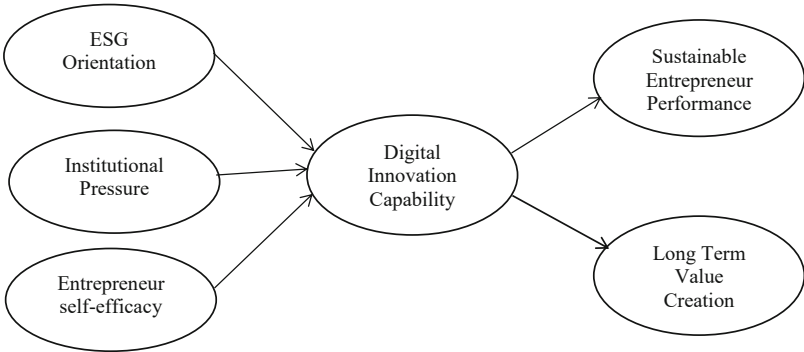


Figure 1. The proposed relationships in this study. **Source:** Authors’ own work

the primary mechanism converting pressure and intent into action. Social Cognitive Theory (Bandura, 1997) pertains to Entrepreneurial Self-Efficacy, affecting the pace and depth of capability-building rather than operating as an independent parallel channel. The three antecedents were selected because they represent organisational, environmental, and individual levels affecting the firm simultaneously. This model facilitates testing whether capability development is better explained by any single level or by their combined operation.

Hypothesis development

ESG orientation and digital innovation capability

ESG orientation is the extent to which environmental, social, and governance concepts are integrated into a venture's strategic rationale (Friede *et al.*, 2015; Velte, 2022). ESG Orientation refers to the extent to which MSME founders systematically incorporate ESG considerations into strategic decisions regarding product design, sourcing, and resource allocation, rather than simply expressing general sustainability preferences. Companies with high ESG orientation focus on measuring sustainability, stakeholder transparency, and resource stewardship, prioritising strategic intent over isolated actions. Ventures with strong ESG orientation integrate sustainability into product design, supplier selection, capital allocation, and stakeholder engagement, making ESG performance a central objective (He *et al.*, 2024). ESG orientation is a proactive, internally driven approach, distinct from reactive, externally imposed institutional compliance.

The mechanism linking ESG orientation to Digital Innovation Capability (DIC) is grounded in dynamic capability theory, where strategic intent triggers opportunity sensing. Mehmood *et al.* (2026a, b) contend that a firm's ability to identify opportunities is shaped by tactical commitments and search heuristics. Ventures with pronounced ESG orientation systematically seek digital tools to improve sustainability measurement, lower carbon intensity in production, and enhance stakeholder transparency (Xu *et al.*, 2022). This proactive search increases the likelihood of identifying suitable digital technologies and organisational willingness to invest in integration. ESG-oriented ventures create internal demand for digital lifecycle assessment tools, real-time environmental monitoring systems, and supplier sustainability scoring platforms (Mehmood *et al.*, 2026a, b; He *et al.*, 2024). Digital governance platforms improve transparency, accountability, and stakeholder communication, strengthening capability development in sustainability-oriented firms (Salamzadeh *et al.*, 2025). These capabilities are absent in ventures driven solely by institutional compliance. This internal demand generates a persistent investment signal, fostering digital innovation capability accumulation over time regardless of regulatory changes.

Empirical evidence supports these assertions. Nambisan *et al.* (2019) find that ventures under explicit sustainability mandates develop more robust digital entrepreneurship capabilities because such mandates create internal legitimacy demands for evidence-based sustainability claims that only digital infrastructure can substantiate. Del Vecchio *et al.* (2021) show that ESG commitment accelerates platform-based innovation in small and medium-sized enterprises (SMEs) by introducing novel problem frames suited to web platforms. Elia *et al.* (2020) further show that digital capability accumulation in innovation-driven firms is expedited when strategic objectives are specific and measurable. Although this evidence pertains to digital entrepreneurship capability and the broader accumulation of digital capability rather than specifically addressing Digital Innovation Capability (DIC), both constructs are grounded in the same fundamental principle: strategic intent enhances pursuit and investment in digital solutions. Direct evidence concerning Digital Innovation Capability, as defined in this context, remains scarce, which constitutes a significant contribution of this study.

Therefore, it is hypothesised that:

H1. ESG orientation is significantly related to digital innovation capability.

Institutional pressure and digital innovation capability

Institutional pressure encompasses three isomorphic mechanisms identified by [Lee et al. \(2025a, b\)](#): coercive pressures from regulatory authorities, normative pressures from professional networks, and mimetic pressures from peer organisations. In India, coercive pressure is represented by the Securities and Exchange Board of India's BRSR mandate, which requires listed companies and their MSME suppliers to report on environmental, social, and governance metrics. Normative pressure flows from industry certifications like ISO 14001 and BEE star ratings, while mimetic pressure arises when competitors attract ESG-linked capital by adopting digital sustainability measures ([Bhuiyan et al., 2023](#)). The theoretical mechanism connecting institutional pressure to digital innovation capability is organisational urgency arising from legitimacy threats. When ventures encounter compliance requirements, normative expectations, or mimetic pressures, they experience a legitimacy deficit requiring observable behavioural change ([Bhuiyan et al., 2023](#)). In digital sustainability, compliance with BRSR or ISO standards necessitates digital data collection and reporting systems, as manual processes cannot deliver the required accuracy or auditability. Similarly, adhering to industry norms demands transparent, real-time stakeholder engagement achievable only through digital platforms. Consequently, institutional pressures direct resources toward digital innovation capability investment as a matter of survival. [Zhang et al. \(2024\)](#) characterise this as institutional isomorphism, which leads to capability convergence among firms facing similar legitimacy demands.

Although institutional pressures encourage firms to pursue sustainability, organisations vary in their responses. Some engage in symbolic compliance, whereas others utilise Digital Innovation Capability to develop substantive responses through digital monitoring, data analytics, and reporting platforms. These capability-driven responses promote transparency, resource optimisation, and evidence-based decision making, thereby enhancing sustainability performance. While institutional research explains why firms face similar external pressures, it offers limited insight into the factors underlying variation in sustainability outcomes across organisations. Therefore, the role of digital innovation capability as a mechanism associated with institutional pressures corresponding to substantive sustainability outcomes remains insufficiently understood, though the cross-sectional design means this association cannot establish temporal precedence.

Empirical studies reinforce this theoretical perspective. [Pacheco et al. \(2010\)](#) document that regulatory pressure in environmental domains compels green ventures to develop monitoring capabilities that might otherwise be deprioritised. [Hojnik and Ruzzier \(2016\)](#), examining European SMEs, identify a strong positive relationship between regulatory stringency and eco-innovation investment. These findings support the assertion that institutional pressure creates a compliance-driven pathway to digital innovation capability, distinct from and likely less robust than the ESG orientation pathway, as it is externally imposed rather than internally motivated. [Wagner \(2025\)](#) argues that institutional isomorphism leads firms to converge on similar capabilities over time. This convergence is increasingly digital in the context of sustainability. [Ning and Shen \(2024\)](#) show that regulatory pressure compels green firms to develop monitoring capabilities, while [Hojnik and Ruzzier \(2016\)](#) find that stringent regulations are associated with greater investment in eco-innovation among SMEs. The findings pertain to monitoring capability and eco-innovation investment, rather than specifically addressing digital innovation capability. The inference to digital innovation capability is based on the premise that, within current regulatory environments, credible monitoring and eco-innovation are primarily implemented through digital means. Accordingly, the following hypothesis is offered:

H2. Institutional pressure is significantly related to digital innovation capability.

Entrepreneur self-efficacy and digital innovation capability

Entrepreneurial self-efficacy (ESE) refers to the entrepreneur's domain-specific belief in their ability to execute the tasks required to establish, develop, and grow a venture ([Tantawy et al.,](#)

2026a, b). Entrepreneurial Self-Efficacy is conceptualised as founders' confidence in identifying, adopting, and sustaining digital tools for sustainability management, distinguishing it from broader entrepreneurial confidence or general technological self-efficacy. Unlike general self-confidence, entrepreneurial self-efficacy is linked to specific task domains and is responsive to the venture's challenges. In digital sustainability, this domain includes the perceived capacity to identify, adopt, and implement digital tools for sustainability management, guide the organisation through disruptions associated with new digital capabilities, and present credible, data-supported sustainability claims to external stakeholders (Caliendo *et al.*, 2023). McGee *et al.* (2019) demonstrate that entrepreneurial self-efficacy predicts both founding intentions and post-founding performance, making it significant beyond the founding stage. Theoretical links between entrepreneurial self-efficacy and digital innovation capability operate through three processes identified in social cognitive theory (SCT).

Caliendo *et al.* (2023) shows that self-efficacy beliefs directly influence effort: entrepreneurs with high entrepreneurial self-efficacy invest more time, attention, and organisational resources in acquiring and embedding digital sustainability capabilities. They also persist more when facing setbacks in digital capability development, including failed technology implementations, staff resistance, or short-term cost overruns, viewing these challenges as solvable rather than evidence of incapacity (Abdelwahed *et al.*, 2025; McGee *et al.*, 2019). Third, entrepreneurial self-efficacy shapes goal-setting behaviour: entrepreneurs with high entrepreneurial self-efficacy set more ambitious digital capability targets and are more likely to pursue continuous improvement in digital innovation capability rather than minimal compliance. Tantawy *et al.* (2026a, b) support this mechanism empirically, while Abdelwahed *et al.* (2025) show that entrepreneurial self-efficacy moderates the relationship between environmental turbulence and entrepreneurial action, with high-entrepreneurial self-efficacy entrepreneurs responding to uncertainty by increasing capability investment rather than retreating strategically. In emerging economies, entrepreneurial self-efficacy is especially important because digital infrastructure is heterogeneous, skilled digital talent is limited relative to developed markets, and capability-building failures are costly for resource-constrained MSMEs (Malodia *et al.*, 2023). In these environments, entrepreneurial self-efficacy acts as a psychological resource that reduces perceived risks related to digital innovation capability investment and increases the likelihood that investment efforts will be sustained long enough to generate returns. Entrepreneurial self-efficacy (ESE) is also the belief in the ability to successfully undertake activities necessary to initiate and develop a business (Abdelwahed *et al.*, 2025; Adeniyi *et al.*, 2022). Existing literature primarily establishes the self-efficacy to effort and persistence pathway within general entrepreneurial contexts, rather than specifically addressing digital capability investment. Alka *et al.* (2025) addresses this gap by explicitly framing outcomes in digital terms, such as platform adoption, investment in data analytics, and IoT-based sustainability monitoring. Hence, the following hypothesis is offered:

- H3. The self-efficacy of entrepreneurs is significantly related to digital innovation capability.

Digital innovation capability and sustainable entrepreneurial performance

Sustainable Entrepreneurial Performance (SEP) is defined as the extent to which a venture achieves both commercially viable outcomes and measurable sustainability impact across five dimensions: environmental impact reduction (measured by carbon intensity, waste reduction, and resource efficiency gains), social value creation (measured by employment quality, community benefit, and supply chain inclusivity), financial sustainability (measured by revenue growth, margin stability, and access to capital), stakeholder fulfilment (measured by customer, employee, and supplier perceptions of the venture's sustainability commitment),

and innovation renewal (measured by the frequency and quality of sustainability-driven product and process innovations) (Kroh *et al.*, 2024). This multi-dimensional definition draws on Martínez-Peláez *et al.* (2023), who define sustainable entrepreneurship as the discovery and exploitation of opportunities that create economic, social, and ecological value, as well as Hockerts and Wustenhagen (2010), who distinguish between the commercial and impact dimensions of sustainable venture performance.

Dynamic capability theory posits that Digital Innovation Capability (DIC) influences Sustainable Entrepreneurial Performance (SEP) through three mechanisms: sensing, seizing, and reconfiguring (Le *et al.*, 2024). The sensing dimension, exemplified by digital environmental monitoring, enables real-time tracking of resource consumption, emissions, and supply chain sustainability metrics. This capability allows ventures to identify operational inefficiencies and environmental risks, thereby supporting targeted sustainability investments and reducing reliance on costly trial-and-error methods (Kroh *et al.*, 2024). The seizing dimension, represented by digital stakeholder engagement, enables ventures to credibly and promptly communicate sustainability outcomes to customers, investors, and regulators, converting sustainability investments into commercial benefits such as preference purchasing, lower capital costs, and reduced regulatory friction (Martínez-Peláez *et al.*, 2023). The reconfiguring dimension, operationalised through digital supply chain optimisation and iterative innovation, facilitates ongoing improvement in sustainability performance by restructuring supplier networks and production processes based on data-driven insights. Elia *et al.* (2020) provide empirical evidence that digital capability significantly mediates the relationship between innovation and environmental sustainability performance in technology ventures. Based on this, the following hypothesis is proposed.

- H4.* The digital innovation capability is significantly related to sustainable entrepreneurial performance.

Digital innovation capability and long-term value creation

Long-term value creation (LTVC) is the accumulation of durable, stakeholder-recognised value persisting beyond a single performance period. Drawing on stakeholder theory (Freeman, 1984) and the shared value framework (Kramer and Porter, 2011), long-term value creation refers to sustained value generated for both stakeholders and the firm. Long-term value creation encompasses four dimensions. First, sustainability leadership enhances brand equity by increasing customer trust, loyalty, and pricing power. Second, robust environmental and social practices improve talent attraction and retention, reflecting employees' preference for responsible employers. Third, credible ESG performance increases investor confidence and lowers capital costs. Fourth, effective sustainability performance fosters regulatory goodwill, reducing scrutiny and expediting approvals (Zhou *et al.*, 2022). Recent studies indicate that analytics-driven capabilities strengthen ESG integration and create lasting stakeholder value by improving decision-making and resource allocation (Kushwaha *et al.*, 2026). Long-term value creation is distinct from sustainable entrepreneurial performance: while the latter measures current-period performance, long-term value creation reflects competitive advantages generated by sustainability over multiple periods.

The theoretical connection between digital innovation capability (DIC) and long-term value creation (LTVC) is based on the reconfiguring and compounding effects of superior capabilities in dynamic capability theory. Teece (2018) argues that dynamic capabilities generate increasing returns over time as they accumulate as organisational knowledge, data assets, and routines that competitors cannot easily replicate. In sustainability, a venture's digital innovation capability compounds long-term value creation through two reinforcing dynamics. First, digital sustainability data accumulates with each monitoring cycle, stakeholder interaction, and supply chain audit, creating a proprietary dataset that enhances

the venture's understanding of its sustainability position and enables precise performance improvements (Zumente and Bistrova, 2021). This data serves as a durable competitive advantage. Second, platform-based network effects (Nambisan, 2017) apply to sustainability: ventures with advanced digital stakeholder engagement capabilities attract sustainability-oriented suppliers, customers, and partners, creating an ecosystem that strengthens the venture's position and increases barriers to entry.

H5. Digital innovation is significantly related to long-term value creation

Digital innovation capability as a mediator

Previous studies recognise that ESG orientation, institutional pressure, and entrepreneur self-efficacy affect firm performance, but the mechanisms by which these antecedents correspond to performance remain underdeveloped (Mehmood *et al.*, 2025; Wang *et al.*, 2025). Research tends to presume direct influences, neglecting the organisational strengths needed to convert intent to quantifiable results. This is a critical gap in digitally intensive settings where companies need to incorporate sustainability alongside technological adaptation. The ability to support digital innovation provides a viable mechanism, as it allows firms to operationalise ESG practices, address institutional requirements, and convert managerial confidence into scalable innovations (Wang *et al.*, 2025).

Mediation analysis assesses whether the effect of an antecedent on an outcome operates through a specific intermediate mechanism rather than directly. In this model, Digital Innovation Capability (DIC) is proposed as the principal mechanism through which ESG orientation, institutional pressure, and entrepreneur self-efficacy are linked to sustainable performance outcomes. The theoretical rationale is grounded in the previously outlined multi-level framework. Strategic intent (ESG orientation), environmental pressure (institutional pressure), and cognitive readiness (entrepreneur self-efficacy) are all essential antecedents of capability development, yet none, individually, yield performance outcomes. An ESG-oriented strategy that is not operationalised through digital capabilities remains aspirational rather than actionable (Avelar *et al.*, 2024). Institutional pressure addressed solely through compliance documentation, without substantive digital infrastructure, confers legitimacy but is not associated with performance advantages (Warner and Wäger, 2019). Similarly, high self-efficacy in the absence of organisational capability results in entrepreneurial confidence without corresponding organisational output (Malodia *et al.*, 2023). Digital innovation capability is theorised as the organisational-level mechanism through which these antecedents correspond to operational action and, in turn, performance, though the cross-sectional design means this sequence is inferred from the theoretical model rather than observed directly.

On theoretical grounds, institutional pressure is an external stimulus that forces firms to engage in sustainability practices, and entrepreneur self-efficacy is the willingness to engage in such practices (Wagner, 2025; Haldorai *et al.*, 2025). ESG orientation is a sign of strategic intent, and, unless it is supported by sufficient digital capability, can be merely symbolic. The digital innovation capability improves data integration, process efficiency, and stakeholder engagement, thereby corresponding to these antecedents' realisation actual outcomes, including sustainable entrepreneurial performance and long-term value creation.

H6a-c. Digital innovation capability has a mediation effect between (a) ESG orientation, (b) institutional pressure, (c) entrepreneur self-efficacy, and sustainable entrepreneurial performance.

H7a-c. Digital innovation capability has a mediation effect between (a) ESG orientation, (b) institutional pressure, (c) entrepreneur self-efficacy, and long-term value creation.

Methodology

Sample and data collection procedure

The target population comprised entrepreneurs operating in the manufacturing and service industries across three Indian states: Maharashtra, Gujarat, and Karnataka, which host the highest concentration of registered micro, small, and medium enterprises (MSMEs) in India. MSMEs were selected due to their position at the intersection of increasing sustainability expectations and significant resource constraints. In contrast to large corporations, MSMEs frequently lack dedicated sustainability departments, digital transformation teams, and formal environmental, social, and governance (ESG) reporting structures, which makes capability development particularly challenging (Abid *et al.*, 2024; Mokbel Al Koliby *et al.*, 2024). Simultaneously, MSMEs are subject to growing sustainability requirements arising from regulatory developments, supply chain expectations, and stakeholder demands. This context is therefore well-suited for examining the influence of ESG orientation, institutional pressure, and entrepreneurial self-efficacy on digital innovation capability and sustainable value creation. Recent studies indicate that capability development is especially important in shaping sustainability outcomes among resource-constrained firms, where strategic decisions regarding digital investments have significant performance implications (Avelar *et al.*, 2024; Vo Thai *et al.*, 2024).

Respondents were identified through multiple sources, including district-level MSME associations, incubation centres affiliated with seven public universities, and the Startup India database. A priori power analysis was conducted using G*Power for a linear multiple regression (fixed model, R^2 deviation from zero). With a statistical power of 80% ($1 - \beta = 0.80$), a significance level of $\alpha = 0.05$, a medium effect size ($f^2 = 0.15$), and a maximum of five predictors for any endogenous construct in the structural model, the analysis indicated a minimum required sample size of 59 respondents. The study subsequently gathered 673 valid responses, significantly exceeding this requirement. In addition to meeting the power-based threshold, the final sample provides a margin of error of approximately $\pm 3.8\%$ for proportions at 95% confidence (assuming a large population and $p = 0.5$). This margin is appropriate for survey-based entrepreneurship research and reduces the risk that statistical significance is attributed to an inadequate sample size rather than the magnitude of the observed effects. The final sample therefore provided adequate statistical power for testing the hypothesised relationships and reduces the likelihood that the statistical significance of the structural paths is attributable to insufficient sample size rather than the magnitude of the observed effects. To ensure adequate representation across sectors and venture maturity, operationalised as firm age measured in complete years since formal registration, a stratified random sampling approach was employed, with proportional representation based on industry type and firm age. Inclusion required that the respondent be the founder or a senior decision-maker of a formally registered MSME operating in the manufacturing or service sector within one of the three sampled states. Ventures without formal registration, and respondents without decision-making authority over sustainability or digital investment, were excluded prior to distribution.

Ethics clearance was obtained from one of the authors' institutions prior to the main data collection. A pilot study involving 52 respondents was conducted to refine the questionnaire.

The final survey was administered via both online and in-person channels through MSME associations, incubation centres, and entrepreneurial networks. A total of 991 questionnaires were distributed, and 731 were returned. After data screening, 58 responses were excluded due to substantial missing values, incomplete survey completion, duplicate submissions, or response patterns indicative of inattentive responding, such as straight-lining across scale items. The resulting dataset included 673 valid responses, yielding an effective response rate of 67.9%. In accordance with recommendations for survey-based entrepreneurship research, only questionnaires with complete responses across all study constructs were retained for analysis (Hair and Alamer, 2022). The unit of analysis was the venture, with the founder or senior decision-maker serving as the key informant for firm-level constructs. This single-

informant approach is consistent with prior entrepreneurship research on resource-constrained firms, where a single respondent typically holds direct knowledge of strategic and capability-related decisions.

Non-response bias was assessed using [Armstrong and Overton's \(1977\)](#) wave analysis. The results shown in [Table 1](#) indicated no significant differences between early and late respondents across key constructs ($p > 0.05$), suggesting that non-response bias is unlikely to be a concern. The final sample consisted of 63% male respondents, with 71% holding at least a bachelor's degree. Approximately 54% of respondents were from the manufacturing sector, and the firms represented had been operating for between 1 and 15 years ($SD = 3.1$).

Measures

The survey instrument was originally developed in English and subsequently translated into Hindi using the TRAPD protocol (translation, review, adjudication, pretesting, and documentation) to ensure linguistic and conceptual equivalence. Multi-item reflective scales anchored on a five-point Likert scale of 1 (strongly disagree) to 5 (strongly agree) were used to measure all constructs. ESG Orientation (4 items) was adopted from [Friede et al. \(2015\)](#) and [Velte \(2022\)](#). Institutional Pressure (3 items) adopted from the study of [Wagner \(2025\)](#). The Entrepreneur Self-Efficacy (3 items) scale was adapted from [Abdelwahed et al. \(2025\)](#). Digital Innovation Capability (DIC) was assessed as a firm-level capability, indicating the degree to which a firm can integrate digital technologies, digital resources, data analytics, and innovation processes to create novel solutions and generate strategic value. The measurement items, comprising four elements, were adapted from established literature on Digital Innovation Capability, specifically from the works of [Kroh et al. \(2024\)](#), [Nambisan et al. \(2019\)](#), and [Del Vecchio et al. \(2021\)](#), to reflect the specific context of digital innovation. The scale items were adapted to capture the integrative and reconfigurative dimensions of Digital Innovation Capability, specifically the firm's ability to combine digital resources with existing organisational routines and redesign processes around new digital tools. Content validity was established through a two-stage assessment. First, an expert panel comprising four academics and two senior MSME practitioners evaluated candidate items for relevance and clarity, identifying items that primarily captured technology ownership or usage. These

Table 1. Demographic information of the respondents

Variable	Category	n	%
Gender	Male	424	63.0
	Female	249	37.0
Age	Below 30	118	17.5
	31 to 40	276	41.0
	41 to 50	185	27.5
	Above 50	94	14.0
	Diploma	67	10.0
Education	Bachelor's	276	41.0
	Master's	276	41.0
	Doctorate	54	8.0
Sector	Manufacturing	363	54.0
	Service	310	46.0
Venture Age	Less than 2 Years	121	18.0
	3–5 Years	229	34.0
	6–8 Years	182	27.0
	9–11 Years	94	14.0
	>11 Years	47	7.0

Source(s): Authors' own work

items were subsequently revised or removed. Second, the retained items were pretested with 52 MSME respondents, with correlations and exploratory factor loadings to assess item suitability and refine the scale. One item was removed due to cross-loading on a broader technology-adoption dimension. The resulting four-item measure was then subject to formal measurement-model assessment in the main sample. The retained items are reported in [Appendix](#). The scale of Sustainable Entrepreneurial Performance (5 items) was a combination of [Shepherd and Patzelt \(2011\)](#) and [Hockerts and Wustenhagen \(2010\)](#) scales. The conceptualisation of stakeholder value proposed by [Freeman \(1984\)](#) and the dynamic value framework proposed by [Teece \(2018\)](#) were used to develop the Long-term Value Creation (4 items). [Appendix](#) contains all the scale items.

Common method bias

Due to the use of a single data source and a single time point, there is a risk of common-method bias. Procedural and statistical solutions were used to address this. To mitigate this concern, both procedural and statistical remedies were applied. From a procedural perspective, the survey employed randomisation of item order, utilised distinct rating scale formats for predictor and outcome constructs, and ensured participant anonymity. From a statistical perspective, Harman’s single-factor test was performed, revealing that the single factor accounted for 24.3% of the total variance, which is significantly below the 50% threshold ([Bhat et al., 2024](#)). Additionally, the marker variable technique ([Hair et al., 2024](#)), which involved a theoretically unrelated scale item, confirmed that inter-construct correlations remained largely unchanged after the marker variable was partialled out. These tests collectively provide reasonable assurance against common method bias. The marker variable technique developed by [Lindell and Whitney \(2001\)](#) was used, with the marker variable Reading and Entertainment Preference (REP), a three-item measure theoretically unrelated to the focal variables. The correlation between the marker variable and substantive constructs ranged from 0.02 to 0.07, indicating weak associations. Using the marker variable adjustment procedure, the average absolute change in inter-construct correlations was 0.01, and no change was greater than 0.03. Furthermore, all substantive relationships were statistically significant after covarying. The findings indicate that common method variance is unlikely to have significantly influenced the results.

Results

Measurement model

[Table 2](#) presents the descriptive statistics and zero-order correlations for all variables in the study. Constructs’ averages range from 2.58 (Long-term value creation) to 3.67 (digital innovation capability). The standard deviations ranged from 0.83 to 1.12, indicating sufficient

Table 2. Discriminant validity

Construct	M	SD	1	2	3	4	5	6
1. ESG Orientation	3.51	0.94	0.812					
2. Institutional Pressure	2.83	1.02	0.487	0.793				
3. Entrepreneur Self-Efficacy	3.31	0.83	0.391	0.449	0.778			
4. Digital Innovation Capability	3.67	1.08	0.565	0.511	0.467	0.834		
5. Sustainable Entrepreneurial Performance	2.72	1.12	0.526	0.475	0.435	0.639	0.828	
6. Long-term Value Creation	2.58	1.01	0.449	0.416	0.389	0.572	0.615	0.804
Note(s): Square root of AVE on diagonal $p < 0.01$ (two-tailed); M = Mean; SD= Standard Deviation								
Source(s): Authors’ own work								

variance. All inter-construct correlations were positive and significant ($p < 0.01$), consistent with the theoretical model.

The confirmatory factor analysis (CFA) results substantiated all six constructs shown in Table 3. The standardised factor loadings ranged from 0.76 to 0.88 (all $p < 0.001$), exceeding the recommended threshold of 0.70 (Hair *et al.*, 2024). Table 3 presents the composite reliability (CR), average variance extracted (AVE), and convergent validity statistics. The CR values ranged from 0.83 to 0.91, all surpassing the 0.70 benchmark. The AVE values ranged from 0.58 to 0.72, all exceeding the 0.50 threshold (Fornell and Larcker, 1981). The overall CFA model fit was exemplary: chi-square/df = 2.31, CFI = 0.962, TLI = 0.958, RMSEA = 0.051 [90% CI: 0.042, 0.061], SRMR = 0.048. All fit indices were within the recommended parameters (Bhat *et al.*, 2019). The Fornell-Larcker criterion was employed to assess discriminant validity. The square root of the AVE for each construct (as indicated on the diagonal of Table 2) exceeded its correlations with all other constructs, thereby confirming discriminant validity. The HTMT ratios ranged from 0.41 to 0.67, all below the conservative 0.85 threshold (Henseler *et al.*, 2015), providing an additional source of discriminant validity. Sustainable entrepreneurial performance and long-term value creation were conceptualised and validated as second-order constructs composed of multiple first-order dimensions. The higher-order factor analyses supported the distinctiveness of these constructs, indicating that although both capture sustainability-related outcomes, they represent different conceptual domains. Specifically, sustainable entrepreneurial performance reflects current-period sustainability performance, whereas long-term value creation captures the accumulation of longer-term value. Their discriminant validity was supported by both the Fornell-Larcker criterion, with the square roots of the AVEs exceeding the correlation between the constructs, and the HTMT ratio of 0.40, which remained well below recommended thresholds.

Hypothesis testing

The structural model fit was excellent: chi-square/df = 2.31, CFI = 0.962, TLI = 0.958, RMSEA = 0.051, SRMR = 0.048. Table 4 presents the standardised path coefficients, standard errors, t-values, and hypothesis test results for all structural paths.

The structural model results indicate that ESG orientation positively and significantly influences digital innovation capability ($\beta = 0.41$, $p < 0.003$), supporting H1. Similarly, institutional pressure demonstrates a positive, statistically significant association with digital innovation capability ($\beta = 0.37$, $p < 0.001$), supporting H2. Entrepreneurial self-efficacy also exerts a strong positive effect on digital innovation capability ($\beta = 0.29$, $p < 0.015$), supporting H3. These findings suggest that ESG orientation, institutional pressure, and entrepreneurial self-efficacy are all critical in fostering adaptive and innovative capabilities within firms. Furthermore, digital innovation capability has a strong positive effect on sustainable entrepreneurial performance ($\beta = 0.52$, $p < 0.000$), supporting H4, and a significant impact on long-term value creation ($\beta = 0.44$, $p = 0.008$), supporting H5. Collectively, these results underscore the importance of digital innovation capability as a key mechanism through which firms achieve high sustainable performance and long-term value creation.

To evaluate the potential impact of endogeneity on the relationship between digital innovation capability (DIC) and sustainable entrepreneurial performance (SEP), the Gaussian copula method as outlined by Park and Gupta (2012) was used. This method incorporates a copula term derived from the empirical distribution of the potentially endogenous predictor and examines its significance in the structural equation. The method's applicability necessitates that the focal predictor demonstrates non-normality, a condition confirmed for Digital Innovation Capability (Shapiro-Wilk $W = 0.953$, $p < 0.001$). The copula term related to Digital Innovation Capability was not statistically significant in the sustainable entrepreneurial performance equation ($\beta = -0.12$, $p = 0.632$), indicating an absence of statistical evidence for endogeneity in the Digital Innovation Capability – sustainable entrepreneurial performance relationship. Furthermore, the explained variance remained

Table 3. Measurement model results and construct reliability

Construct	FL	CR	AVE	MSV	MaxR (H)	α
<i>ESG Orientation</i>		0.88	0.65	0.38	0.89	0.87
Our firm integrates environmental considerations into its core business strategy	0.76					
Our firm actively monitors and reports on its social impact	0.81					
Governance transparency is a priority in our firm's decision-making	0.84					
Our firm sets measurable targets for ESG performance	0.79					
<i>Institutional Pressure</i>		0.85	0.66	0.31	0.86	0.84
Regulatory requirements in our industry compel us to adopt sustainable practices	0.77					
Industry norms and peer behaviour influence our sustainability decisions	0.83					
Stakeholder expectations push our firm to demonstrate sustainability compliance	0.8					
<i>Entrepreneur Self-Efficacy</i>		0.83	0.62	0.28	0.84	0.82
I am confident in my ability to identify and pursue digital sustainability opportunities	0.77					
I believe I can successfully implement new digital tools for sustainability management	0.82					
I have the skills needed to navigate the challenges of sustainability-oriented innovation	0.79					
<i>Digital Innovation Capability</i>		0.91	0.72	0.44	0.92	0.9
Our firm uses digital tools to monitor and improve sustainability performance in real time	0.79					
Our firm continuously develops digital capabilities to support sustainable innovation	0.85					
Our firm integrates digital technologies into its sustainability reporting processes	0.88					
Our firm uses data analytics to identify and act on sustainability opportunities	0.83					
<i>Sustainable Entrepreneurial Performance</i>		0.9	0.64	0.42	0.91	0.89
Our firm has reduced its environmental impact over the past year	0.77					
Our firm creates measurable social value through its products or services	0.82					
Our firm achieves financial sustainability alongside environmental objectives	0.84					
Our stakeholders are satisfied with our sustainability performance	0.8					
Our firm continuously renews its sustainability-oriented innovations	0.79					
<i>Long-term Value Creation</i>		0.87	0.62	0.39	0.88	0.86
Our firm builds long-term competitive advantage through sustainability leadership	0.76					
Our firm's ESG commitment enhances its ability to attract and retain talent	0.81					
Our firm's sustainability practices increase investor confidence and interest	0.83					
Our relationships with regulators are strengthened by our sustainability performance	0.78					

Note(s): CR = Composite Reliability; AVE = Average Variance Extracted; MSV = Maximum Shared Variance; MaxR(H) = Maximum Reliability, factor loadings significant at $p < 0.001$

Source(s): Authors' own work

Table 4. Structural path coefficients

Hypothesis	Path	Beta	SE	t-value	p	Supported
H1	ESG -> DIC	0.41	0.048	8.54	0.003	Yes
H2	IP -> DIC	0.37	0.051	7.25	0.0001	Yes
H3	ESE -> DIC	0.29	0.054	5.37	0.015	Yes
H4	DIC -> SEP	0.52	0.044	11.82	0.000	Yes
H5	DIC -> LTVC	0.44	0.046	9.57	0.008	Yes

Note(s): ESG = ESG Orientation; DIC = Digital Innovation Capability; IP = Institutional Pressure; ESE = Entrepreneur Self-Efficacy; SEP = Sustainable Entrepreneurial Performance; LTVC = Long-term Value Creation

R^2 (DIC) = 0.47; R^2 (LTVC) = 0.44. R^2 (SEP) = 0.52

Source(s): Authors' own work

nearly constant following the inclusion of the copula term ($R^2 = 0.435$ compared to 0.434 in the baseline model), suggesting that addressing potential endogeneity did not substantially affect the model's explanatory power. Consequently, the positive relationship between Digital Innovation Capability and sustainable entrepreneurial performance identified in the baseline PLS-SEM analysis appears to be robust against the Gaussian copula endogeneity assessment.

Mediation analysis

Table 5 presents the mediation analysis using 5,000 bootstrapped resamples. All the estimated indirect paths are statistically significant, i.e. the 95% bias-corrected confidence intervals do not exclude zero. The size of the indirect effects varies between 0.121 between entrepreneurial self-efficacy and long-term value creation through digital innovation capability and 0.213 between ESG and sustainable entrepreneurial performance through digital innovation capability. The indirect effect of ESG on sustainable entrepreneurial performance through digital innovation capability is positive and significant ($\beta = 0.213$, $SE = 0.031$, 95% CI [0.154, 0.277]), indicating partial mediation, as the direct effect remains significant after introducing the mediator. Similarly, digital innovation capability partially mediated the relationship between institutional pressure and long-term value creation ($\beta = 0.163$, $SE = 0.029$, 95% CI [0.108, 0.221]).

Table 5. Mediation analysis

Indirect path	Via DIC	SE	LL 95% CI	UL 95% CI	Outcome
ESG → DIC → SEP	0.213	0.031	0.154	0.277	Partial mediation
ESG → DIC → LTVC	0.181	0.028	0.127	0.236	Full mediation
IP → DIC → SEP	0.192	0.033	0.130	0.256	Full mediation
IP → DIC → LTVC	0.163	0.029	0.108	0.221	Partial mediation
ESE → DIC → SEP	0.151	0.035	0.084	0.220	Full mediation
ESE → DIC → LTVC	0.121	0.031	0.062	0.183	Full mediation

Note(s): LL = Lower Limit; UL = Upper Limit. CI = Confidence intervals not including zero indicate significant mediation. ESG = ESG Orientation; IP = Institutional Pressure; ESE = Entrepreneur Self-Efficacy; DIC = Digital Innovation Capability; SEP = Sustainable Entrepreneurial Performance; LTVC = Long-term Value Creation

Source(s): Authors' own work

Moreover, the indirect impact of ESG on long-term value creation through digital innovation capability is substantial ($\beta = 0.181$, SE = 0.028, 95% interval [0.127, 0.236]), whereas the direct impact becomes non-significant when digital innovation capability is included. Likewise, the indirect paths from institutional pressure to sustainable entrepreneurial performance ($\beta = 0.192$, SE = 0.033, 95% CI [0.130, 0.256]) and from entrepreneurial self-efficacy to both sustainable entrepreneurial performance ($\beta = 0.151$, SE = 0.035, 95% CI [0.084, 0.220]) and long-term value creation ($\beta = 0.121$, SE = 0.031, 95% CI [0.062, 0.183]) are significant, with non-significant direct effects, indicating full mediation. The results demonstrate that digital innovation capability serves as a key explanatory variable linking ESG orientation, institutional pressure, and entrepreneurial self-efficacy to both sustainable entrepreneurial performance and long-term value creation. Hypotheses H6a-H6c and H7a-H7c are supported, with partial mediation observed in H6a and H7b, and full mediation in the remaining relationships.

Discussion

This study examines whether Digital Innovation Capability mediates the relationships among ESG orientation, institutional pressure, and entrepreneur self-efficacy in shaping venture sustainable performance outcomes in emerging economies. The findings indicate that digital innovation capability mediates the effects of ESG orientation, institutional pressure, and entrepreneur self-efficacy, supporting the claim that sustainability outcomes do not arise directly from intent or pressure. Detailed discussion is as follows.

ESG orientation and digital innovation capability

The results of this study indicate that Environmental, Social, and Governance (ESG) orientation is the strongest predictor of Digital Innovation Capability (DIC). Ventures that embed environmental, social, and governance principles as a core strategic identity face a structural imperative: credible ESG reporting necessitates carbon analytics, stakeholder impact tracking, and supply chain audit systems, which together form the foundation of digital innovation capability. This identity-driven investment logic aligns with He *et al.* (2024), who demonstrate that sustainability-anchored strategic orientations systematically drive digital innovation investment, and with George *et al.* (2021), who contend that sustainability-driven ventures employ digital tools as primary mechanisms for scaling impact. Mehmood *et al.* (2026b) further report, in the context of SMEs, that entrepreneurial orientation toward sustainability is associated with ESG performance through data-driven digital pathways. Importantly, the dominance of ESG orientation over institutional pressure as an antecedent of digital innovation capability challenges the prevailing assumption that regulatory compliance is the principal driver of sustainability capability development (George *et al.*, 2021; Zhang *et al.*, 2024). The evidence, instead, indicates that ventures motivated by intrinsic sustainability convictions invest more deeply and sustainably in digital innovation capability than those primarily responding to external compliance mandates.

Institutional pressure and digital innovation capability

Institutional pressure was associated with a significant positive effect on digital innovation capability. The BRSR framework, ISO certification norms, and mimetic peer adoption pressures collectively generate compliance urgency, which is associated with firms' capability investment (Khalid *et al.*, 2025; Liang *et al.*, 2023). This finding aligns with Lee *et al.* (2025a, b), who demonstrate across multinational enterprises in eight emerging markets that regulatory, normative, and cognitive institutional pressures each independently predict ESG strategy. Similarly, Liang *et al.* (2023) provide SEM evidence from China indicating that institutional pressures drive digital business model innovation as a performance mechanism. Haldorai *et al.* (2025) report the existence of a parallel pathway in supply chains, showing that

institutional pressure associates with sustainable performance exclusively through capability-mediated channels. The full mediation of the institutional pressure to sustainable entrepreneurial performance path extends this logic, indicating that regulatory pressure is associated with performance *only* when it results in substantive digital innovation capability rather than symbolic disclosure compliance (Kuzey *et al.*, 2025).

Entrepreneur self-efficacy and digital innovation capability

Entrepreneurial self-efficacy produced the smallest but still significant antecedent effect on digital innovation capability. Entrepreneurs with higher self-efficacy absorb steeper digital learning curves, persist through platform implementation failures, and commit resources to unfamiliar sustainability tools. Malodia *et al.* (2023), using data from 369 Indian SME entrepreneurs, show that digital self-efficacy predicts both digital transformation depth and firm performance, the only India-specific study of this pathway. Tantawy *et al.* (2026a, b) further report, using social cognitive theory, that entrepreneurial self-efficacy mediates the digitalisation-to-resilience link in SMEs. Caliendo *et al.* (2023) demonstrate, using panel data, that self-efficacy independently predicts start-up performance beyond human capital, and Bachmann *et al.* (2024) establish that digital competencies activate entrepreneurial performance primarily through self-efficacy as the cognitive bridge. The lower beta reflects that individual beliefs are a distal antecedent of organisational capability, so strategic identity and institutional pressure shape the depth of that investment.

Digital innovation capability and sustainable entrepreneurial performance

Digital innovation capability showed the strongest structural effect on sustainable entrepreneurial performance, explaining 52% of the variance. Real-time monitoring enables rapid environmental corrective action; AI-driven supply chain tools reduce material intensity; digital stakeholder platforms build accountable performance loops. This corroborates Teece (2018), who identifies sensing and reconfiguring capacity as the primary source of competitive advantage in volatile environments, and Vo Thai *et al.* (2024), who demonstrate across 596 Vietnamese SMEs that dynamic capabilities mediated by digitalisation predict sustainable performance across economic, social, and environmental dimensions. Li *et al.* (2023) further show that digitalisation, jointly with network capability, drives sustainability performance through business model innovation in Chinese manufacturing firms. Le *et al.* (2024) confirm that digitalisation in listed firms drives sustainable corporate performance through green innovation and supply chain mechanisms. The 52% explained variance exceeds comparable direct-effects models in the prior literature (Elia *et al.*, 2020), indicating that integrated digital innovation capability, not single digitalisation indicators, captures the full set of antecedents of sustainability performance.

Digital innovation capability and long-term value creation

Digital innovation capability produced a significant positive effect on long-term value creation. This finding is consistent with recent evidence that data-driven organisational capabilities strengthen ESG implementation and contribute to sustainable value creation in small-business environments (Kushwaha *et al.*, 2026). The lower beta relative to sustainable entrepreneurial performance is theoretically expected: long-term value accumulates through compounding platform networks, data asset appreciation, and durable investor and regulatory goodwill, all of which are characteristically delayed returns. Avelar *et al.* (2024) demonstrate that the confluence of sustainability, innovation, and digitalisation drives long-run trajectories of SME performance beyond any single factor. Zumente and Bistrova (2021) synthesise the ESG-long-term value literature and identify the intervening mechanism as unspecified; the digital innovation capability -to- long-term value creation path provides that specification. Nichifor *et al.* (2026) report across industries that strategic digital integration in sustainable

business models generates compounding long-run performance advantages. [Kurznack et al. \(2021\)](#) formally model long-term value as distinct from current financial performance, distinguishing capability-generated from legitimacy-conferred value, a distinction this path operationalises in an Indian MSME context, extending [Kurznack et al.'s \(2021\)](#) framework beyond the large-firm settings in which it was originally developed.

DIC as mediator: antecedents to sustainable entrepreneurial performance

Institutional pressure and entrepreneurial self-efficacy generate sustainable entrepreneurial performance exclusively through digital innovation capability, consistent with compliance mandates and individual confidence beliefs requiring organisational digital capability as their transmission mechanism. [Bhuiyan et al. \(2023\)](#) confirm from an institutional theory perspective in an emerging economy that regulatory pressures are entirely capability-mediated in their performance effects. [Mondal et al. \(2024\)](#) show that entrepreneurial orientation translates into sustainable performance solely through innovation capability. [H6a](#) showed partial mediation: ESG orientation retained a direct path to sustainable entrepreneurial performance, reflecting the relational and reputational dimensions of authentic sustainability identity that generate stakeholder trust and customer loyalty independent of digital infrastructure. [Zhao et al. \(2021\)](#) show ESG-committed ventures earn moral legitimacy beyond operational performance, and [Mehmood et al. \(2025\)](#) demonstrate a dual-channel architecture, a capability pathway and a legitimacy pathway in ESG-oriented SMEs. The partial mediation thus clarifies the contribution by identifying a theoretically precise boundary condition: ESG commitment operates as a relational asset for near-term performance and as a capability driver for long-run advantage.

DIC as mediator: antecedents to long-term value creation

ESG orientation and entrepreneurial self-efficacy are linked to Long-term value creation entirely through digital innovation capability, consistent with durable advantage, compounding data assets and platform networks, being capability-mediated rather than legitimacy-conferred. [H7b](#) showed partial mediation: institutional pressure retained a direct path to long-term value creation, the study's most theoretically consequential finding. Regulatory compliance with BRSR and ISO standards directly confers pragmatic legitimacy that attracts patient capital and regulatory goodwill independently of digital innovation capability. [Pedersen et al. \(2021\)](#) establish that ESG compliance signals lower perceived risk and attracts long-horizon investor capital through legitimacy channels. [Wei et al. \(2024\)](#) confirm that ESG performance translates into long-run competitive advantage through both dynamic capabilities and direct legitimacy signalling, with the legitimacy channel dominant for long-horizon value metrics. [Wang et al. \(2025\)](#) further demonstrate that digital capability and ESG outcomes are jointly governed by organisational dynamics operating through market-oriented mechanisms. Together, [H6](#) and [H7](#) reveal a two-channel value architecture: a capability channel organised through digital innovation capability and a legitimacy channel organised through institutional compliance and authentic ESG identity. Ventures optimising both channels simultaneously will systematically outperform those investing in only one ([Aftab et al., 2026](#); [Mehmood et al., 2026a](#)).

Integrating institutional, cognitive, and capability perspectives

The results provide evidence for a multi-level explanation of sustainable entrepreneurial performance by integrating institutional, cognitive, and capability perspectives. The mediating role of digital innovation capability (DIC) demonstrates that institutional pressures, entrepreneur self-efficacy, and environmental, social, and governance (ESG) orientation influence sustainability outcomes primarily through capability development. The findings suggest that digital innovation capability is not driven by any single antecedent in isolation.

Rather, stronger digital innovation capability is associated with the combined presence of external institutional pressures, entrepreneurial self-efficacy, and sustainability-oriented strategic intent. This pattern highlights that capability development is shaped by the interplay of environmental, individual, and strategic factors, which together create conditions that support the integration of digital resources and organisational reconfiguration. In turn, higher digital innovation capability is associated with improved sustainable performance. These results highlight digital innovation capability as the central mechanism linking environmental conditions and entrepreneurial cognition to sustainability outcomes.

Theoretical implications

This study makes several important theoretical contributions. First, it extends dynamic capability theory by conceptualising Digital Innovation Capability (DIC) as a sustainability-oriented, cross-sector capability. While prior entrepreneurship research has largely focused on market and operational capabilities, exemplified by Warner and Wäger (2019), whose capability framework addresses competitive repositioning without incorporating a sustainability dimension. He *et al.* (2024) also conceptualise digital capability as an outcome of strategic orientation rather than as an independent mechanism. This study integrates sustainability into the dynamic capability framework, demonstrating how digital innovation capability is associated with firms' ability to convert sustainability-oriented intent into performance outcomes.

Second, the study advances institutional theory by moving beyond a direct-effect perspective. Existing research often treats institutional pressure as an immediate driver of sustainability performance, overlooking the underlying mechanisms. This study shows that institutional pressure primarily operates through the development of digital innovation capability, thereby bridging institutional theory with resource-based and capability perspectives. At the same time, the finding of partial mediation highlights that compliance can also function as a direct legitimacy signal to external stakeholders, generating value even in the absence of fully developed internal capabilities.

Third, by incorporating entrepreneurial self-efficacy alongside institutional and strategic factors, this research develops a multi-level framework linking individual, organisational, and environmental influences. In contrast to prior studies that typically focus on a single level of analysis, this study demonstrates how entrepreneurs' cognitive beliefs shape capability-building and strategic responses to external pressures.

Finally, the identification of partial scalar invariance offers a methodological contribution by revealing cross-context differences in how key constructs are interpreted. These findings suggest opportunities for refining measurement scales and highlight the importance of contextual sensitivity when studying ESG orientation and digital capabilities across industries.

Practical implications

This study offers several practical implications. For entrepreneurs, ESG orientation exerted a stronger effect on digital innovation capability ($\beta = 0.41$, $p = 0.003$) than institutional pressure ($\beta = 0.37$, $p = 0.001$), indicating that while both matter, internally driven strategic intent is a more powerful lever. As such, developing capabilities through a strong commitment to sustainability values, leadership development, and stakeholder collaboration is likely to be more effective than focusing solely on compliance. In practical terms, this approach necessitates targeted technology adoption rather than a broad digitalisation initiative. Examples include AI-based analytics for emissions and resource-use tracking, digital traceability and supply chain monitoring tools as examined by Le *et al.* (2024), and digital reporting dashboards that transform raw operational data into BRSR-compliant disclosures. Sustainability strategy should therefore be treated as a core organisational identity rather than a risk-management exercise. The findings suggest that Digital Innovation Capability is

associated with stronger sustainability performance and long-term value creation. As such, it may be considered alongside other organisational indicators when evaluating MSMEs. Accordingly, due diligence processes should assess digital infrastructure, monitoring systems, and the extent to which innovation processes are digitally enabled. Firms that demonstrate strong ESG rhetoric but weak digital innovation capability may struggle to convert that rhetoric into measurable sustainability outcomes.

For policymakers, the partial mediation of institutional pressure through digital innovation capability suggests that compliance mandates alone are insufficient to drive performance improvements, particularly in emerging economies. Policy effectiveness can be enhanced through complementary digital capability support, such as subsidised access to IoT monitoring tools, lifecycle assessment systems, and digital reporting platforms. For example, initiatives like India's BRSR mandate may deliver stronger outcomes when coupled with targeted digital capacity-building, especially for MSMEs. For management educators, the findings highlight the need to incorporate capability-focused training into sustainability entrepreneurship curricula, including digital data literacy, platform-based stakeholder engagement, supply chain digitisation, and agile innovation practices. Developing digital self-efficacy is particularly important, as it can help reduce performance gaps between resource-constrained and resource-rich firms.

Limitations and future research

Several limitations must be acknowledged when interpreting these findings. First, the cross-sectional design precludes definitive conclusions about causal relationships among the variables. Although the proposed model is theoretically grounded, alternative explanations and the possibility of reverse causality remain. For instance, firms with stronger sustainability performance may subsequently increase investments in ESG initiatives and digital innovation capabilities. Second, data collection relied on a single respondent at one point in time, which introduces the risk of common method variance despite the procedural and statistical remedies applied. Third, the study focused exclusively on MSMEs in three Indian states, potentially limiting the generalisability of the results to other institutional and economic contexts. Fourth, the use of multiple recruitment channels and data-collection modes may have introduced unobserved heterogeneity into the sample. Although this approach improved respondent diversity, founders from different contexts may vary in how they perceive and report key constructs. Accordingly, the findings should be interpreted as average associations across a heterogeneous MSME population. Fifth, firm size was not measured directly, with venture age serving as the only firm-level demographic indicator. As venture age does not necessarily correspond to organisational scale, MSMEs of different sizes may be represented within the same age category. Consequently, the findings should be interpreted as applying to the overall MSME sample rather than to specific micro, small, or medium enterprise segments, and any size-related differences remain beyond the scope of the present study. Future research employing longitudinal designs, multiple respondents, and objective performance indicators would offer more robust evidence regarding the temporal dynamics of sustainable value creation.

Ethics clearance

The research received ethical clearance prior to data collection.

Table A1. Measurement scales and scale items

Construct
<i>ESG Orientation</i>
Our firm integrates environmental considerations into its core business strategy
Our firm actively monitors and reports on its social impact
Governance transparency is a priority in our firm's decision-making
Our firm sets measurable targets for ESG performance
<i>Institutional Pressure</i>
Regulatory requirements in our industry compel us to adopt sustainable practices
Industry norms and peer behaviour influence our sustainability decisions
Stakeholder expectations push our firm to demonstrate sustainability compliance
<i>Entrepreneur Self-Efficacy</i>
I am confident in my ability to identify and pursue digital sustainability opportunities
I believe I can successfully implement new digital tools for sustainability management
I have the skills needed to navigate the challenges of sustainability-oriented innovation
<i>Digital Innovation Capability</i>
Our firm uses digital tools to monitor and improve sustainability performance in real time
Our firm continuously develops digital capabilities to support sustainable innovation
Our firm integrates digital technologies into its sustainability reporting processes
Our firm uses data analytics to identify and act on sustainability opportunities
<i>Sustainable Entrepreneurial Performance</i>
Our firm has reduced its environmental impact over the past year
Our firm creates measurable social value through its products or services
Our firm achieves financial sustainability alongside environmental objectives
Our stakeholders are satisfied with our sustainability performance
Our firm continuously renews its sustainability-oriented innovations
<i>Long-term Value Creation</i>
Our firm builds long-term competitive advantage through sustainability leadership
Our firm's ESG commitment enhances its ability to attract and retain talent
Our firm's sustainability practices increase investor confidence and interest
Our relationships with regulators are strengthened by our sustainability performance

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