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Artificial Intelligence Capability and SME Innovation Performance: An Integrative Review

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Abstract

Artificial intelligence (AI) has increasingly become an important component of digital transformation, yet its organizational value depends on how firms develop and deploy AI capability to support innovation, competitiveness, and sustainability. This study examines the relationships among digital transformation, AI capability, business innovation, competitive advantage, and sustainable firm performance through a structured integrative literature review. The analysis synthesizes evidence from 30 publications and applies directed qualitative evidence synthesis to identify recurring organizational mechanisms across the literature. The findings indicate that AI capability strengthens analytical and adaptive capacity, while business innovation provides an important mechanism for transforming technological resources into new products, processes, services, and business models. Competitive advantage is associated with dynamic capabilities, AI ambidexterity, strategic integration, and business model innovation. The sustainability dimension further reveals the importance of green innovation, green product innovation, data-driven culture, knowledge integration, green supply-chain management, and innovative work behavior. The study concludes that AI should be conceptualized as an organizational capability embedded within broader technological, managerial, innovative, and environmental systems. This integrated perspective connects digital transformation with competitiveness and sustainable performance through interconnected organizational mechanisms.

Keywords: *artificial intelligence capability, business innovation, competitive advantage, digital transformation, sustainable firm performance.*



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INTRODUCTION

Digital transformation has increasingly shifted from a technological adoption agenda toward an organizational capability for restructuring business processes, decision-making, and value creation. The integration of artificial intelligence (AI), cloud computing, Internet of Things (IoT), and other digital technologies enables firms to process information more rapidly, improve organizational responsiveness, and develop new configurations of products and services (Vial, 2019; Alqahtani et al., 2024). However, digital transformation does not generate organizational value automatically because technological resources must be integrated with managerial routines, organizational structures, and complementary capabilities. This perspective positions digital transformation as a continuing process of organizational adaptation in which technology becomes valuable through its integration with innovation and strategic renewal (Nambisan et al., 2019; Feliciano-Cestero et al., 2023).

Within this transformation, artificial intelligence has emerged as a particularly important technological capability because it enables firms to process complex information, automate activities, identify patterns, and support data-informed decisions. Previous research demonstrates that AI-based transformation can influence firm performance through organizational processes and dynamic capabilities rather than through technological adoption alone (Wamba-Taguimdje et al., 2020). More recent research similarly conceptualizes AI as a strategic capability that can contribute to organizational creativity, innovation, adaptation, and firm performance when supported by appropriate organizational resources (Mikalef & Gupta, 2021; Brabete et al., 2026). Consequently, the analytical focus has increasingly moved from whether firms adopt AI toward how firms develop the organizational capability to deploy, integrate, and reconfigure AI resources for strategic purposes.

The capability perspective is particularly relevant for small and medium-sized enterprises (SMEs), whose innovation activities are often shaped by limited resources, managerial capacity, technological infrastructure, and access to specialized knowledge. Digitalization can create new opportunities for SMEs by improving their access to information, platforms, networks, and technological resources, but the realization of these opportunities depends on the firm's ability to integrate such resources into existing organizational processes (Eller et al., 2020; Cenamor et al., 2019). Evidence on SME digitalization further indicates that technological innovation is associated with internal capabilities that allow firms to absorb and utilize digital technologies effectively rather than simply acquire them (Radicic & Petković, 2023). In this context, AI capability can be understood as an organizational resource whose contribution to SME innovation depends on the interaction among data, skills, infrastructure, managerial routines, and learning processes.

Business innovation represents a central mechanism through which AI capability can be translated into organizational value. AI-supported analytical capacity can assist firms in identifying emerging customer needs, evaluating market information, redesigning processes, developing new products and services, and exploring alternative value propositions (Singh et al., 2026; Nikzat & Noorymotlagh, 2025). Such applications indicate that the innovation effects of AI extend beyond automation because intelligent technologies can support experimentation, opportunity recognition, organizational learning, and business model renewal. The relationship is therefore better understood as a capability-building process in which AI resources are transformed into innovation outcomes through process reconfiguration, knowledge integration, and strategic experimentation (Wamba-Taguimdje et al., 2020; Rachinger et al., 2019).

AI-enabled innovation may subsequently influence competitive advantage by allowing firms to improve efficiency while developing differentiated forms of value creation. Business model innovation is particularly relevant because AI can contribute to changes in customer relationships, operational processes, revenue structures, and value propositions, thereby extending the strategic consequences of technological adoption beyond operational efficiency (Shao et al., 2026). Similarly, AI ambidexterity enables organizations to combine the exploitation of existing technological applications with the exploration of new opportunities, while dynamic capabilities facilitate the continuous adaptation of resources under changing market conditions (De Fano et al., 2026). Competitive advantage in this context is therefore associated with the organizational ability to integrate AI with innovation, strategic decision-making, and resource reconfiguration rather than with ownership of AI technologies alone.

The strategic implications of AI capability also extend to sustainable firm performance, particularly as organizations face increasing expectations to combine economic performance with environmental responsibility. AI can support green product innovation, resource optimization, environmental monitoring, and sustainability-oriented decision-making when its analytical capabilities are incorporated into broader organizational strategies (Mahmood et al., 2024; Farmanesh et al., 2025). The contribution of AI to sustainable performance can also be strengthened by data-driven organizational culture, knowledge integration, green innovation, and environmentally oriented supply-chain practices (Fosso Wamba et al., 2024; Liu et al., 2026). These findings suggest that sustainability outcomes should be examined as part of a broader organizational configuration in which AI capability interacts with innovation and strategic capabilities rather than functioning as an isolated technological determinant.

Nevertheless, the existing literature remains fragmented across distinct research streams examining digital transformation, AI capability, business innovation, competitive advantage, and sustainable performance. Some studies emphasize the performance consequences of AI-enabled transformation, whereas others focus on dynamic capabilities, business model innovation, green innovation, employee innovation behavior, or sustainability outcomes as separate mechanisms (Zhang et al., 2024; Shahid et al., 2026). Although these studies provide important evidence, there remains a need to synthesize how AI capability can operate across interconnected stages from digital transformation and business innovation to competitive advantage and sustainable firm performance. Addressing this fragmentation is particularly important for understanding AI as an organizational capability whose value emerges through complementary technological, managerial, innovative, and sustainability-oriented mechanisms.

Accordingly, this study conducts an integrative review of the literature to examine how artificial intelligence capability contributes to business innovation and how this relationship extends toward

competitive advantage and sustainable firm performance. The analysis focuses on recurring mechanisms identified across the literature, including dynamic capabilities, data-driven culture, business model innovation, green innovation, knowledge integration, innovation resilience, and organizational adaptation. By connecting these mechanisms within a single analytical framework, the study seeks to clarify the pathways through which AI-enabled digital transformation can generate broader organizational value rather than limiting the analysis to technology adoption or operational efficiency. The resulting synthesis provides a structured basis for understanding AI capability as an organizational capability that connects technological transformation with innovation, competitiveness, and longer-term sustainability outcomes.

RESEARCH METHODS

This study employed a structured integrative literature review to examine the relationships among digital transformation, artificial intelligence (AI) capability, business innovation, competitive advantage, and sustainable firm performance. The unit of analysis was an individual scholarly publication, while the review corpus consisted of 30 publications published between 2020 and 2026 and included in the study's reference set, with one publication from 2027 excluded because it fell outside the defined observation period. Publications were selected when they examined at least one direct relationship among the focal constructs or identified an organizational mechanism linking AI-enabled digital transformation with innovation, competitiveness, or sustainable performance. Each publication was systematically coded according to its research focus, AI or digital capability dimension, mediating or supporting mechanism, organizational outcome, and strategic implication.

The analysis employed directed qualitative evidence synthesis by organizing the extracted findings into three analytical domains: the relationship between digital transformation and AI capability and business innovation; the relationship between AI capability and business innovation and competitive advantage; and the relationship between AI capability and competitive advantage and sustainable firm performance. Findings across the selected publications were compared to identify recurring mechanisms, including dynamic capabilities, data-driven culture, business model innovation, green innovation, knowledge integration, and innovation resilience, and the resulting evidence was organized into cross-study analytical matrices. Because the reviewed publications employed heterogeneous research designs, samples, and outcome measures, the study did not pool effect sizes or estimate new causal coefficients; instead, the findings were interpreted as cross-study patterns of association supported by the available literature.

RESULTS AND DISCUSSION

Digital Transformation and Artificial Intelligence Capability as Drivers of Business Innovation

Digital transformation in the reviewed literature is not merely understood as the adoption of separate digital technologies, but rather as a process of reorganizing organizational activities, resources, and value-creation mechanisms. The integration of artificial intelligence (AI), cloud computing, the Internet of Things (IoT), digital capabilities, and information technology infrastructure flexibility creates a technological environment that enables organizations to strengthen information-processing capacity and responsiveness to change. Alqahtani et al. (2024), for example, position AI alongside IoT, cloud computing, digital capabilities, digital innovation, and IT flexibility as a technological configuration associated with organizational performance. Accordingly, the cross-study evidence indicates that the strategic value of AI is better understood when AI is embedded within a broader digital transformation ecosystem rather than treated as a stand-alone technological instrument.

AI capability becomes important because digital transformation requires organizations to convert technological resources into competencies that can be repeatedly applied in business activities. Wamba-Taguimdje et al. (2020) show that AI-based transformation projects are associated with firm performance through process-oriented dynamic capabilities, indicating that technology creates value when accompanied by organizational abilities to redesign processes and reconfigure resources. This perspective conceptually distinguishes between merely possessing AI technology and possessing the organizational capability to use such technology effectively. In this respect, information-processing capabilities, process redesign, resource reconfiguration, and managerial utilization of information constitute important mechanisms connecting AI with organizational innovation.

The relationship between digital transformation and innovation is also evident through enhanced organizational capacity to process information and respond to environmental changes. Zhang et al. (2024) associate digital intelligence transformation with innovation resilience and firm performance, suggesting that digital capabilities can support the continuity of innovation when organizations face uncertainty and disruption. In this context, AI capability functions not only as an automation instrument but also as a resource that expands organizational capacity to interpret information and adjust innovation processes. This finding indicates that digital innovation has an adaptive dimension because organizations must maintain experimentation and renewal capabilities as technologies, markets, and customer requirements change.

The effectiveness of AI capability is also influenced by the organizational context that determines how AI-generated information is translated into decisions and actions. Fosso Wamba et al. (2024) identify data-driven culture as a mediating mechanism in the relationship between AI capability and firm performance, demonstrating that technological capacity cannot be separated from organizational practices concerning the use of data. A data-driven culture enables analytical information to become embedded in decision-making processes and reduces organizational dependence on intuition alone. This finding reinforces the argument that AI capability generates innovation value when organizations possess the social and managerial capacity to interpret, integrate, and utilize information generated by intelligent technologies.

The synthesis of the reviewed studies indicates that the relationship between AI capability and business innovation operates through several complementary mechanisms. AI can support process transformation, strengthen analytical capacity, facilitate experimentation, enhance opportunity recognition, and enable changes in products, services, customer interactions, and value propositions. Nikzat and Noorymotlagh (2025) specifically associate AI in business with innovation and competitive advantage, while other studies in the corpus demonstrate that the innovative contribution of AI depends on its integration with organizational learning and strategic renewal. This pattern suggests that business innovation represents one of the principal pathways through which analytical and digital capabilities are transformed into organizational value.

Table 1. Evidence Matrix of Digital Transformation, AI Capability, and Business Innovation

Study	Principal Focus	Capability Dimension	Innovation Mechanism	Organizational Implication
Wamba-Taguimdje et al. (2020)	AI-based transformation	AI implementation capability	Process transformation	Supports business value and firm performance
Alqahtani et al. (2024)	Integrated digital technologies	AI, IoT, cloud, digital capability, IT flexibility	Digital innovation	Strengthens the technological basis of the organization
Zhang et al. (2024)	Digital intelligence transformation	Enterprise digital intelligence	Innovation resilience	Supports adaptation and continuity of innovation
Fosso Wamba et al. (2024)	AI capability and performance	AI capability	Data-driven culture	Strengthens analytical information use in decision-making
Nikzat & Noorymotlagh (2025)	AI in business	AI application	Business innovation	Supports innovation and competitive advantage
Shao et al. (2026)	AI capability and business model	Tangible, intangible, and skill resources	Business model innovation	Enables the reconfiguration of value creation and capture

Source: Author's synthesis based on the studies included in the research corpus.

Table 1 demonstrates that AI capability is multidimensional and cannot be reduced to technological infrastructure alone. Wamba-Taguimdje et al. (2020) emphasize implementation capability and process transformation, Alqahtani et al. (2024) demonstrate the relevance of combining AI with IoT, cloud computing, digital capabilities, and IT flexibility, while Fosso Wamba et al. (2024) add data-driven organizational culture as an important organizational mechanism. At the innovation level, Zhang et al. (2024) highlight innovation resilience, whereas more recent research extends the discussion toward business model innovation. The evidence therefore suggests that AI capability constitutes a configuration of technological, human, informational, and organizational resources that operate collectively to generate innovation.

The entrepreneurial dimension further expands the relationship because AI can enhance organizational capacity to identify and exploit emerging opportunities. Singh et al. (2026) associate AI with business innovation and entrepreneurship through the ability to recognize market patterns, customer needs, and alternative value propositions that may be difficult to identify through conventional analysis. Such analytical capacity can strengthen the informational basis for experimentation, opportunity evaluation, and market-entry decisions. From this perspective, AI capability functions not only as a source of efficiency but also as a mechanism for improving the quality of information underlying the search for and exploitation of innovative opportunities.

Evidence concerning SMEs further reinforces the distinction between access to technology and the organizational capability to integrate it. The SME digitalization literature indicates that technological benefits depend on managerial readiness, complementary resources, and the ability to embed technology within organizational processes, while AI capability research emphasizes the combination of data, skills, infrastructure, and organizational routines. Cenamor et al. (2019) and Radicic and Petković (2023) demonstrate the relevance of digital platform capability, network capability, and internal organizational capabilities for SME innovation and competition. This perspective is important because AI can generate broader innovative changes when firms are able to connect technology with internal processes, external networks, and business model renewal mechanisms.

Business model innovation provides a further explanation of how AI capability can move from process innovation toward more fundamental changes in the way firms create and capture value. Shao et al. (2026) examine AI capability through tangible, intangible, and skill resources and identify business model innovation as a mediating mechanism linking AI capability with enterprise competitive advantage. This finding is important because AI-enabled innovation does not necessarily stop at improving internal processes but can affect customer relationships, revenue structures, operational processes, and value propositions. Business model innovation can therefore be positioned as an organizational transformation mechanism through which AI capability contributes to broader changes in the configuration of business activities and value creation.

Overall, Subsection 3.1 reveals a consistent pattern connecting digital transformation, AI capability, and business innovation, although the relationship operates through multiple organizational mechanisms. Digital transformation provides the technological environment and infrastructure, AI capability supplies analytical and adaptive capacity, while business innovation converts these capabilities into new products, processes, services, opportunities, and business models. Evidence concerning dynamic capabilities, data-driven culture, innovation resilience, entrepreneurship, and business model innovation demonstrates that technology does not operate independently in the process of generating innovation. This pattern provides the basis for examining the next stage of the analytical framework, namely how AI-enabled business innovation is associated with competitive advantage.

Artificial Intelligence Capability, Business Innovation, and Competitive Advantage

The reviewed evidence indicates that artificial intelligence (AI) capability is increasingly associated with competitive advantage in digitally intensive business environments, but the relationship is mediated by how firms deploy and integrate AI within organizational activities. AI capability provides firms with analytical, automation, and data-processing capacities that can improve the speed and quality of decision-making. Nikzat and Noorymotlagh (2025) directly connect AI applications with business innovation and competitive advantage, suggesting that the strategic implications of AI extend beyond operational automation. Competitive differentiation consequently depends on the

organizational capacity to transform intelligent technological resources into distinctive responses to market conditions rather than simply possessing access to AI technologies.

A central mechanism connecting AI capability with competitive advantage is organizational responsiveness and strategic adaptability. Firms operating in dynamic environments need to identify opportunities, interpret changes in customer preferences, and respond to competitive pressures while simultaneously maintaining existing operations. De Fano et al. (2026) emphasize AI ambidexterity within digital innovation ecosystems, particularly the simultaneous exploitation of existing technological applications and exploration of emerging technological opportunities. This perspective suggests that competitive implications emerge when AI capability strengthens the firm's capacity to balance efficiency-oriented exploitation with innovation-oriented exploration under changing environmental conditions.

Business innovation constitutes another important mechanism through which AI capability can be translated into competitive differentiation. AI-supported innovation can alter products, services, customer relationships, operational processes, and value propositions, thereby creating changes in the broader configuration through which firms create and capture value. Shao et al. (2026) specifically identify business model innovation as a mediating mechanism between AI capability and enterprise competitive advantage, demonstrating the relevance of organizational redesign in explaining the strategic consequences of AI. The evidence therefore suggests that the competitive implications of AI are not restricted to efficiency gains but can also emerge through fundamental changes in business models and value-creation arrangements.

The strategic contribution of AI capability becomes more apparent when AI is integrated into broader digital transformation strategies. Shakil et al. (2025) associate AI with changes in business strategy and competitive advantage, indicating that AI-related capabilities can influence organizational decisions across multiple functional domains. Digital transformation provides an infrastructure through which AI-generated information can be incorporated into marketing, production, supply chain management, customer engagement, and strategic planning. Competitive value therefore emerges through organizational alignment, because fragmented AI applications may provide isolated improvements without necessarily generating broader strategic differentiation.

Technological complementarity provides an additional explanation for variations in the competitive implications of AI capability. Alqahtani et al. (2024) examine the combined contribution of IoT, cloud computing, AI, digital capabilities, digital innovation, and IT flexibility to firm performance, highlighting the interconnected nature of contemporary digital resources. This configuration indicates that AI capability is embedded within a broader technological architecture rather than operating independently from other digital resources. The ability to orchestrate complementary technologies, flexible information systems, and organizational mechanisms can consequently determine how effectively AI contributes to innovation and competitive positioning.

The evidence can be synthesized into several recurring pathways connecting AI capability, business innovation, and competitive advantage. AI capability provides analytical and adaptive resources, business innovation transforms these resources into new products, processes, services, and business models, while competitive advantage represents the organizational consequences of successfully differentiating and responding to market conditions. The following matrix summarizes the principal mechanisms identified across the reviewed studies.

Table 2. Evidence Matrix of AI Capability, Business Innovation, and Competitive Advantage

Study	AI Capability / Digital Resource	Innovation Mechanism	Competitive Mechanism	Reported Organizational Outcome
Nikzat & Noorymotlagh (2025)	AI application	Business innovation	Differentiated organizational responses	Innovation and competitive advantage
De Fano et al. (2026)	AI ambidexterity	Exploration and exploitation	Dynamic capabilities	Strategic adaptability

Shao et al. (2026)	AI capability	Business model innovation	Value-creation and value-capture redesign	Competitive advantage
Shakil et al. (2025)	Artificial intelligence	Strategic innovation	Cross-functional strategic integration	Competitive positioning
Alqahtani et al. (2024)	AI, IoT, cloud, digital capabilities, IT flexibility	Digital innovation	Technological complementarity	Firm performance
Wamba-Taguimdje et al. (2020)	AI implementation capability	Process transformation	Dynamic capability development	Business value and performance
Zhang et al. (2024)	Digital intelligence transformation	Innovation resilience	Organizational adaptability	Firm performance

Source: Author's synthesis based on the literature reviewed in the study.

Table 2 demonstrates that competitive advantage is represented through multiple organizational mechanisms rather than a single pathway. The studies collectively identify strategic adaptability, business model innovation, process transformation, digital innovation, technological complementarity, and innovation resilience as mechanisms through which AI-related capabilities may generate organizational value. This diversity is important because firms may obtain competitive benefits from AI through different combinations of technological and organizational resources depending on their strategic context. The evidence consequently supports a capability-oriented interpretation in which competitive advantage depends on the orchestration and application of AI resources rather than on technological adoption in isolation.

The role of dynamic capabilities is particularly relevant because AI technologies develop within environments characterized by continuous technological and market change. Wamba-Taguimdje et al. (2020) demonstrate the importance of process-oriented dynamic capabilities in translating AI implementation into organizational outcomes, while De Fano et al. (2026) extend this perspective through the concept of AI ambidexterity. These findings suggest that organizations need capabilities for sensing emerging opportunities, adapting existing processes, and reconfiguring resources while continuing to exploit established technological applications. Competitive advantage is consequently associated with the capacity to continually renew the organizational configuration surrounding AI rather than with a one-time technological investment.

Business model innovation further illustrates how AI can influence competition at a strategic level. Rather than limiting AI to automation or productivity improvement, firms can employ AI-generated information and analytical capabilities to reconsider how they interact with customers, organize activities, generate revenue, and deliver value. Shao et al. (2026) provide direct evidence for the mediating role of business model innovation between AI capability and competitive advantage, while the broader digitalization literature emphasizes that technological transformation can modify value propositions and value-capture arrangements (Rachinger et al., 2019; Nambisan et al., 2019). AI capability therefore becomes strategically consequential when it is incorporated into organizational redesign and not merely added to pre-existing business processes.

The cross-study evidence ultimately indicates that AI capability and competitive advantage are connected through an organizational transformation process involving innovation, strategic adaptability, and resource orchestration. Nikzat and Noorymotlagh (2025) identify a direct association between AI, innovation, and competitive advantage, while De Fano et al. (2026), Shao et al. (2026), and Shakil et al. (2025) provide complementary explanations based on dynamic capabilities, business model innovation, and strategic integration. Alqahtani et al. (2024) further demonstrates that AI-related competitive value is embedded within a configuration of complementary digital technologies and capabilities. Taken together, these findings establish business innovation as a critical bridge between AI capability and competitive advantage and provide the conceptual basis for examining whether such competitive gains can contribute to sustainable firm performance.

Artificial Intelligence Capability, Competitive Advantage, and Sustainable Firm Performance

The final analytical domain concerns the extent to which AI capability and competitive advantage are connected with sustainable firm performance. The reviewed literature indicates that the performance implications of AI increasingly extend beyond short-term efficiency toward environmental, organizational, and strategic dimensions of sustainability. Mahmood et al. (2024) link AI adoption and digital transformation with sustainable business performance through green product innovation, while Farmanesh et al. (2025) connect AI with green innovation and competitive advantage in SMEs. These findings suggest that AI capability can contribute to sustainability when technological resources are embedded within innovation strategies that simultaneously address organizational performance and environmental objectives.

Sustainable performance is therefore not presented in the reviewed literature as an automatic consequence of AI adoption. Instead, AI capability appears to operate through complementary organizational mechanisms that transform technological capacity into sustainability-oriented outcomes. Liu et al. (2026) identify green business strategy, AI capability, and green supply chain management as interconnected factors, with knowledge integration and green innovation functioning as mediating mechanisms. This configuration demonstrates that the contribution of AI to sustainable performance depends on how firms integrate technological intelligence with organizational knowledge, environmental strategy, and supply-chain practices.

Green innovation represents one of the most recurrent mechanisms connecting AI capability with sustainable performance. AI can facilitate the processing of environmental and operational information, support the development of green products, and strengthen firms' capacity to identify opportunities for resource optimization. Mahmood et al. (2024) explicitly identify green product innovation as a mediating mechanism between AI adoption, digital transformation, and sustainable business performance, while Farmanesh et al. (2025) examine AI and green innovation in SMEs in relation to competitive advantage and the Sustainable Development Goals. The evidence consequently indicates that green innovation provides an important organizational pathway through which AI-enabled transformation can be translated into sustainability-related business outcomes.

The role of organizational culture provides another explanation for differences in the performance consequences of AI capability. Fosso Wamba et al. (2024) demonstrate that data-driven culture mediates the relationship between AI capability and firm performance from a sustainable development perspective. A data-driven culture allows AI-generated information to become incorporated into organizational routines, managerial decisions, and performance-oriented activities rather than remaining isolated within technological systems. This finding complements the green innovation literature by showing that technological capability requires organizational conditions that enable information to be converted into meaningful actions and performance outcomes.

AI capability is also associated with sustainable performance through innovative work behavior and organizational adaptation. Shahid et al. (2026) examine AI capabilities in relation to sustainable firm performance while identifying innovative work behavior as a mediating mechanism and environmental dynamism as a moderating condition. This perspective extends the analysis beyond technological infrastructure by emphasizing the role of employees and organizational behavior in translating AI capabilities into sustainable outcomes. The evidence therefore suggests that AI-enabled sustainability is partly dependent on whether organizational members use technological capabilities to generate, implement, and sustain innovative forms of work.

The environmental dimension is particularly important because firms increasingly operate under conditions in which competitiveness and sustainability are interconnected rather than completely separate objectives. Liu and Adil (2026) examine digital technologies, including AI and IoT, in relation to sustainable competitiveness, green innovation, and firm performance. Their framework indicates that digital technologies can simultaneously support technological innovation and environmental objectives when integrated into sustainability-oriented business processes. Such evidence reinforces the view that sustainable competitiveness involves the organizational capacity to combine technological development, innovation, and environmental performance within a coherent strategic configuration.

Table 3. Evidence Matrix of AI Capability, Competitive Advantage, and Sustainable Firm Performance

Study	AI/Digital Capability	Sustainability Mechanism	Mediating/Supporting Mechanism	Main Outcome
Mahmood et al. (2024)	AI adoption and digital transformation	Green product innovation	Green product innovation	Sustainable business performance
Farmanesh et al. (2025)	AI capability	Green innovation	Green innovation and competitive advantage	Sustainable development orientation
Fosso Wamba et al. (2024)	AI capability	Sustainable development perspective	Data-driven culture	Firm performance
Liu & Adil (2026)	AI and IoT	Green innovation	Digital technology integration	Sustainable competitiveness and firm performance
Liu et al. (2026)	AI capability	Green business strategy and green supply chain	Knowledge integration and green innovation	Sustainable performance
Shahid et al. (2026)	AI capabilities	Sustainable firm performance	Innovative work behavior; environmental dynamism	Sustainable firm performance

Source: Author's synthesis based on the studies included in the research corpus.

Table 3 shows that the sustainability effects associated with AI capability operate through distinct but interconnected mechanisms. Green product innovation, green innovation, data-driven culture, knowledge integration, green supply-chain management, and innovative work behavior each provide different explanations for how technological capability can influence broader organizational outcomes. The diversity of these mechanisms indicates that sustainable performance should not be reduced to a single environmental indicator because the reviewed studies conceptualize sustainability through combinations of business performance, innovation, environmental strategy, and organizational behavior. Accordingly, AI capability appears most consequential when it is embedded within organizational systems capable of integrating technological, strategic, behavioral, and environmental resources.

Knowledge integration represents an additional mechanism through which AI capability can strengthen sustainability-oriented organizational performance. Liu et al. (2026) explicitly position knowledge integration alongside green innovation in the relationship among green business strategy, AI capability, green supply chain management, and sustainable performance. AI can increase the volume and accessibility of information available to organizations, but the strategic value of that information depends on the ability to combine knowledge across organizational functions and supply-chain actors. Consequently, AI capability contributes to sustainable performance not simply through information generation but through the organizational capacity to integrate knowledge into innovation and environmental management processes.

Environmental dynamism further demonstrates that the relationship between AI capability and sustainable performance is context dependent. Shahid et al. (2026) incorporate environmental dynamism as a moderating factor, indicating that the organizational consequences of AI capabilities can vary according to the degree of environmental change. In highly dynamic environments, innovative work behavior can become particularly relevant because employees and organizations must continuously adapt how technological resources are used. This perspective complements the dynamic-capability arguments developed in the previous subsections by positioning sustainability performance within an environment of continuous technological, market, and ecological change.

Taken together, the reviewed evidence establishes a broader pathway from AI capability to sustainable firm performance through competitive advantage and multiple innovation-oriented mechanisms. AI capability provides technological and analytical resources, business and green innovation transform those resources into new forms of value, competitive advantage reflects the strategic consequences of successful transformation, and sustainability-oriented practices extend these outcomes toward environmental and longer-term organizational performance. Farmanesh et al. (2025), Mahmood et al. (2024), Liu and Adil (2026), Liu et al. (2026), and Shahid et al. (2026) collectively demonstrate that the sustainability implications of AI are closely connected with green innovation, organizational behavior, knowledge integration, and strategic adaptation. The overall synthesis therefore positions AI capability not as an isolated technological determinant but as part of a broader organizational architecture linking digital transformation, innovation, competitiveness, and sustainable performance.

CONCLUSION

This study demonstrates that artificial intelligence capability should be understood as an organizational capability embedded within broader digital transformation rather than as a technological resource operating independently. The integrative synthesis indicates that digital transformation establishes the technological and organizational foundation, AI capability strengthens analytical and adaptive capacity, and business innovation functions as a key mechanism for converting these capabilities into new products, processes, services, and business models. The reviewed evidence further shows that dynamic capabilities, data-driven culture, innovation resilience, entrepreneurship, and business model innovation shape the extent to which AI capability contributes to competitive advantage. These findings indicate that the strategic value of AI depends substantially on organizational capacity to integrate technological resources with managerial routines, knowledge, innovation processes, and strategic adaptation.

The study further establishes that the implications of AI capability extend beyond competitive advantage toward sustainable firm performance. Green innovation, green product innovation, knowledge integration, green business strategy, green supply-chain management, and innovative work behavior emerge as important mechanisms connecting AI capability with sustainability-oriented outcomes. The synthesis therefore proposes an integrated pathway in which digital transformation and AI capability support business innovation, business innovation contributes to competitive advantage, and complementary organizational and environmental mechanisms extend these benefits toward sustainable performance. This framework contributes to the literature by connecting technological, innovation, competitive, and sustainability perspectives within a single analytical structure, while also indicating that future empirical research should examine these relationships across different organizational contexts, industries, and levels of environmental dynamism.

REFERENCES

Agrawal, A., Gans, J. S., & Goldfarb, A. (2024). Artificial intelligence adoption and system-wide change. Journal of Economics & Management Strategy, 33(2), 327-337. https://doi.org/10.1111/jems.12521

Alqahtani, M. M. M., Singh, H., Haddadi, E. A. A., Al-Shibli, F. S. R., & Al-balushi, H. A. A. (2024). Impact of internet of things, cloud computing, artificial intelligence, digital capabilities, digital innovation, IT flexibility on firm performance in Saudi Arabia Islamic bank. Advances in Social Sciences Research Journal, 11(7), 71-91. https://doi.org/10.14738/assrj.117.17252

Asadullah, A., & Faik, I. (2026). How digital platform-provided resources enable SMEs to develop organizational capabilities: An organizational learning perspective. International Journal of Information Management, 88, 103041. https://doi.org/10.1016/j.ijinfomgt.2026.103041

Brabete, V., Sichigea, M., Vasilescu, L., Goagără, D., & Berceanu, D. (2026). From operational efficiency to strategic meta-capability: A bibliometric analysis of the relationship between artificial intelligence and firm performance. Oeconomia Copernicana, 17(2), 387-455. https://doi.org/10.24136/oc.4214

Cenamor, J., Parida, V., & Wincent, J. (2019). How entrepreneurial SMEs compete through digital platforms: The roles of digital platform capability, network capability and ambidexterity. Journal of Business Research, 100, 196-206. https://doi.org/10.1016/j.jbusres.2019.03.035

De Fano, D., Schena, R., & Russo, A. (2026). Harnessing AI ambidexterity for competitive advantage: the role of dynamic capabilities in digital innovation ecosystems. European Journal of Innovation Management, 29(2), 490-504. https://doi.org/10.1108/EJIM-11-2024-1404

Eller, R., Alford, P., Kallmünzer, A., & Peters, M. (2020). Antecedents, consequences, and challenges of small and medium-sized enterprise digitalization. Journal of Business Research, 112, 119-127. https://doi.org/10.1016/j.jbusres.2020.03.004

Farmanesh, P., Solati Dehkordi, N., Vehbi, A., & Chavali, K. (2025). Artificial intelligence and green innovation in small and medium-sized enterprises and competitive-advantage drive toward achieving sustainable development goals. Sustainability, 17(5), 2162. https://doi.org/10.3390/su17052162

Feliciano-Cestero, M. M., Ameen, N., Kotabe, M., Paul, J., & Signoret, M. (2023). Is digital transformation threatened? A systematic literature review of the factors influencing firms' digital transformation and internationalization. Journal of Business Research, 157, 113546. https://doi.org/10.1016/j.jbusres.2022.113546

Fosso Wamba, S., Queiroz, M. M., Pappas, I. O., & Sullivan, Y. (2024). Artificial intelligence capability and firm performance: a sustainable development perspective by the mediating role of data-driven culture. Information Systems Frontiers, 26(6), 2189-2203. https://doi.org/10.1007/s10796-023-10460-z

Li, L., Tong, Y., Wei, L., & Yang, S. (2022). Digital technology-enabled dynamic capabilities and their impacts on firm performance: Evidence from the COVID-19 pandemic. Information & Management, 59(8), 103689. https://doi.org/10.1016/j.im.2022.103689

Liu, B., & Adil, M. (2026). Digital Technologies and Sustainable Competitiveness: The Role of AI and Internet of Things in Driving Green Innovation and Firm Performance. Corporate Social Responsibility and Environmental Management. https://doi.org/10.1002/csr.70635

Liu, X., Chau, K. Y., Chang, T. C., & Moslehpour, M. (2026). Driving sustainable performance through green business strategy, artificial intelligence capability, and green supply chain management: the mediating roles of knowledge integration and green innovation. Corporate Social Responsibility and Environmental Management, 33(3), 4531-4546. https://doi.org/10.1002/csr.70397

Mahmood, G., Ditta, A., Ramzan, M., & Abbas, Z. (2024). Role of artificial intelligence (AI) adoption and digital transformation in enhancing sustainable business performance: the mediating effect of green product innovation. Journal of Accounting and Finance in Emerging Economies, 10(4), 519-532. https://doi.org/10.26710/jafee.v10i4.3172

Mikalef, P., & Gupta, M. (2021). Artificial intelligence capability: Conceptualization, measurement calibration, and empirical study on its impact on organizational creativity and firm performance. Information & Management, 58(3), 103434. https://doi.org/10.1016/j.im.2021.103434

Nambisan, S., Wright, M., & Feldman, M. (2019). The digital transformation of innovation and entrepreneurship: Progress, challenges and key themes. Research Policy, 48(8), 103773. https://doi.org/10.1016/j.respol.2019.03.018

Nikzat, P., & Noorymotlagh, M. (2025). Artificial intelligence in business: Driving innovation and competitive advantage. International journal of industrial engineering and operational research, 7(3), 50-62. https://doi.org/10.22034/ijieor.v7i3.180

Rachinger, M., Rauter, R., Müller, C., Vorraber, W., & Schirgi, E. (2019). Digitalization and its influence on business model innovation. Journal of Manufacturing Technology Management, 30(8), 1143-1160. https://doi.org/10.1108/JMTM-01-2018-0020

Radicic, D., & Petković, S. (2023). Impact of digitalization on technological innovations in small and medium-sized enterprises (SMEs). Technological Forecasting and Social Change, 191, 122474. https://doi.org/10.1016/j.techfore.2023.122474

Shahid, M. K., Mahmood, K., Altayyar, R. S., & Abdullah, H. (2026). Role of AI capabilities in sustainable firm performance: mediating role of innovative work behavior and the moderating effect of environmental dynamism. International Journal of Productivity and Performance Management, 75(2), 651-671. https://doi.org/10.1108/IJPPM-02-2025-0114

Shakil, M. M., Halimuzzaman, M., Khan, A. U. Z., & Fardous, J. (2025). The Impact of Artificial Intelligence on Business Strategy: Redefining Competitive Advantage in the Digital Era. Journal

of Information Technology, Cybersecurity, and Artificial Intelligence, 2(3), 1-16. https://doi.org/10.70715/jitcai.2025.v2.i3.024

Shao, S., Shao, Z., & Xiong, Y. (2026). The influence of AI capability on enterprise competitive advantage: the mediating effect of business model innovation. Journal of Enterprise Information Management, 1-25. https://doi.org/10.1108/JEIM-08-2024-0453

Sharma, P., & Dang, G. P. (2026). Unveiling the transformative role of artificial intelligence in improving business process performance. Journal of Manufacturing Technology Management, 37(5), 905-925. https://doi.org/10.1108/JMTM-04-2025-0308

Singh, R., Khan, S., Joshi, A., Katragadda, R., & Kumar, V. (2026). Exploring the role of artificial intelligence on business innovation and entrepreneurship. Strategy & Leadership, 54(3), 302-322. https://doi.org/10.1108/SL-04-2025-0080

Tam, N. T., & Van, N. T. A. (2025, June). The Relationship Between Digital Transformation and Sustainable Performance: The Moderation Role of Artificial Intelligence Application. In International Conference on Sustainable Computing (pp. 779-792). Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-95-6063-9_50

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. The Journal of Strategic Information Systems, 28(2), 118-144. https://doi.org/10.1016/j.jsis.2019.01.003

Wahyudi, I., Atmoko, G. D. P., Nurdin, F., & Santoso, T. N. (2026). Optimizing business competitiveness through artificial intelligence: A framework for digital innovation and operational efficiency. Advances in Business and Management Research, 100002. https://doi.org/10.1016/j.abmr.2026.100002

Wamba-Taguimdje, S. L., Fosso Wamba, S., Kala Kamdjoug, J. R., & Tchatchouang Wanko, C. E. (2020). Influence of artificial intelligence (AI) on firm performance: the business value of AI-based transformation projects. Business process management journal, 26(7), 1893-1924. https://doi.org/10.1108/BPMJ-10-2019-0411

Wamba-Taguimdje, S. L., Wamba, S. F., Kamdjoug, J. R. K., & Wanko, C. E. T. (2020). Impact of artificial intelligence on firm performance: Exploring the mediating effect of process-oriented dynamic capabilities. In Digital business transformation: Organizing, managing and controlling in the information age (pp. 3-18). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-47355-6_1

Zhang, G., Wang, X., Xie, J., & Hu, Q. (2024). A mechanistic study of enterprise digital intelligence transformation, innovation resilience, and firm performance. Systems, 12(6), 186. https://doi.org/10.3390/systems12060186