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Digital Transformation and Business Innovation: Examining the Role of Artificial Intelligence Capability in Enhancing Competitive Advantage and Sustainable Firm Performance

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Abstract

Research on artificial intelligence (AI) and digital transformation has examined business innovation, competitive advantage, and sustainable firm performance, but these outcomes are frequently addressed through separate analytical perspectives. This study synthesizes the relationships among AI capability, business innovation, competitive advantage, and sustainable firm performance, emphasizing organizational mechanisms and differences in the underlying evidence. A structured integrative literature review was conducted using a purposively selected corpus of 19 scholarly publications published between 2020 and 2026. Publications were classified according to technological capability, organizational mechanisms, innovation outcomes, competitive implications, and sustainability-related performance. Directed qualitative synthesis and comparative evidence matrices were employed to identify recurring relationships and distinguish reported findings from broader conceptual interpretations. The reviewed literature associates AI capability with data-driven decision-making, process reconfiguration, organizational adaptability, and business model innovation. Competitive implications emerge through operational efficiency, dynamic capabilities, strategic differentiation, and entrepreneurial opportunity recognition. Sustainability-related findings emphasize green innovation, knowledge integration, data-driven organizational culture, and sustainability-oriented business strategies. The synthesis identifies business innovation and complementary managerial capabilities as important explanatory mechanisms connecting AI resources with organizational outcomes. Its principal contribution is an integrated analytical framework distinguishing technological capabilities, organizational mechanisms, competitive outcomes, and sustainable performance without assuming a uniform causal sequence. Given the bounded literature corpus and heterogeneous research designs, the findings represent patterns of reported associations rather than pooled effects or generalizable causal estimates.

Keywords: *Artificial Intelligence Capability, Business Innovation, Competitive Advantage, Digital Transformation, Sustainable Firm Performance.*

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INTRODUCTION

Digital transformation has become an important strategic consideration for firms seeking to improve operational processes, organizational adaptability, and long-term business performance. The increasing integration of artificial intelligence (AI), cloud computing, the Internet of Things (IoT), and other digital technologies has expanded organizational opportunities for information processing, operational coordination, and innovation (Alqahtani et al., 2024). However, the adoption of digital technologies does not necessarily result in superior organizational performance. Digital transformation involves changes in organizational structures, managerial routines, resource allocation, and business processes that determine how technological resources are utilized. Previous research has examined the relationship between AI-based transformation projects and firm performance, including the organizational mechanisms through which digital resources may support strategic adaptation (Wamba-Taguimdje et al., 2020). Research on enterprise digital intelligence has also associated digital transformation with innovation resilience and organizational performance (Zhang et al., 2024). These findings indicate the relevance of distinguishing technological implementation from the organizational capabilities required to generate business value. An important analytical issue concerns how AI-related capabilities are connected to innovation, competitive positioning, and sustainable performance rather than whether digital technology adoption alone produces these outcomes.

Existing research addresses several dimensions of AI-enabled organizational transformation, but the relationships among these dimensions are frequently examined through different conceptual frameworks and empirical settings. Studies addressing AI-related business strategy and competitive advantage emphasize strategic adaptation and organizational competitiveness, whereas research on AI adoption and sustainable business performance gives greater attention to environmental innovation and sustainability-oriented outcomes (Mahmood et al., 2024; Shakil et al., 2025). These analytical differences create difficulties in establishing how findings concerning technological capability, innovation mechanisms, competitive outcomes, and sustainability performance relate to one another. The specific research problem addressed in this study is the limited integration of these relationships within a common conceptual synthesis that distinguishes organizational capabilities, intermediate mechanisms, performance outcomes, and conditions influencing their associations. This limitation does not establish that previous studies have overlooked the individual relationships. Rather, it identifies the need to examine how the relationships documented across the selected literature can be connected without assuming that findings obtained through different research designs provide equivalent evidence or demonstrate a single causal sequence.

Conceptual clarification is necessary because digital transformation, AI adoption, AI capability, digital intelligence, and digital innovation represent related but distinct organizational phenomena. Digital transformation refers to the organizational changes associated with integrating digital technologies into business activities, structures, and value-creation processes. AI adoption denotes the introduction or implementation of AI technologies, whereas AI capability concerns an organization's capacity to acquire, integrate, deploy, and reconfigure AI-related resources for operational and strategic purposes. AI capability consequently encompasses more than technological possession because its organizational application depends on managerial knowledge, information resources, and complementary business processes. AI-based transformation research has emphasized the importance of process-oriented capabilities in connecting technological implementation with organizational performance (Wamba-Taguimdje et al., 2020). More recent scholarship has conceptualized AI as a strategic organizational capability extending beyond operational automation toward broader organizational learning and adaptation (Brabete et al., 2026). Digital intelligence refers more specifically to the use of digital information and analytical systems to support organizational decision-making, while digital innovation concerns changes in products, services, processes, or business models associated with digital technologies. These distinctions provide a conceptual basis for examining the relationships among technological resources, organizational mechanisms, and business outcomes without treating the constructs as interchangeable.

Business innovation constitutes a central analytical domain in explaining the organizational relevance of AI capability. Business innovation encompasses the development or modification of products, services, operational processes, and business models through which firms create or deliver value. AI-enabled analytical systems may support opportunity identification, market interpretation, experimentation, and entrepreneurial activities by expanding the information available for managerial decisions (Singh et al., 2026). Research on AI and business process performance has also examined how intelligent automation and analytical applications relate to operational improvement and process reconfiguration (Sharma & Dang, 2026). Similarly, studies of AI-enabled competitiveness have connected digital innovation and operational efficiency with business performance (Wahyudi et al., 2026). Although these findings establish relevant conceptual and empirical connections, they do not imply that innovation necessarily follows AI adoption or that every innovation produces measurable organizational improvement. Business innovation is treated in the present review as a potential organizational mechanism connecting AI capability with subsequent strategic outcomes. Whether this relationship represents a direct association, an empirically tested mediation process, or a theoretically proposed pathway depends on the design and findings of the individual studies.

Competitive advantage represents a related but analytically distinct outcome. In this study, competitive advantage refers to a firm's relative ability to create, deliver, or capture value through capabilities and strategic activities that distinguish its position from competitors. This concept must be differentiated from general organizational performance because improvements in operational efficiency or innovation activity do not independently demonstrate superiority over competing firms. Research has associated AI applications with business innovation and competitive positioning, indicating that analytical resources may support differentiated organizational responses and market

opportunities (Nikzat & Noorymotlagh, 2025). Studies addressing AI ambidexterity have emphasized the relevance of balancing the exploitation of existing technological resources with the exploration of new opportunities through dynamic capabilities (De Fano et al., 2026). Research on business model innovation has further examined its mediating role in the relationship between AI capability and enterprise competitive advantage (Shao et al., 2026). These perspectives suggest several possible mechanisms connecting AI capability with competitive outcomes, including organizational adaptation, business model reconfiguration, and innovation-oriented resource utilization. Nevertheless, competitive advantage measured directly in an empirical study must be distinguished from competitive implications inferred from improvements in organizational processes or performance indicators. This distinction is necessary to prevent the synthesis from presenting theoretically plausible advantages as uniformly demonstrated empirical outcomes.

Sustainable firm performance introduces an additional dimension because organizational success cannot be evaluated exclusively through immediate financial or competitive outcomes. Sustainable firm performance is understood here as the maintenance of organizational performance alongside sustainability-related considerations, particularly economic continuity and environmental responsibility, with social outcomes considered where explicitly examined in the underlying literature. These dimensions are conceptually related but should not be assumed to have been measured consistently across different studies. Research has associated artificial intelligence with green innovation, competitive advantage, and contributions to sustainable development objectives, indicating potential connections between technological capability and environmentally oriented organizational activities (Farmanesh et al., 2025). Other research has examined the relationship between digital transformation and sustainable performance while considering the moderating role of AI applications (Tam & Van, 2025). Such findings indicate that AI-related resources may be relevant to sustainability-oriented strategies, although the strength and interpretation of these relationships depend on the performance indicators, research settings, and analytical approaches employed. Consequently, improved operational efficiency, green innovation, environmental performance, and long-term firm sustainability should be differentiated rather than treated as equivalent outcomes.

The associations between AI capability and organizational outcomes may also depend on complementary managerial and institutional conditions. A data-driven organizational culture can influence how AI-generated information is interpreted and incorporated into business decisions. Research examining AI capability and firm performance from a sustainable development perspective has identified data-driven culture as a mediating mechanism, suggesting that organizational routines surrounding information utilization are relevant to performance relationships (Fosso Wamba et al., 2024). Knowledge integration, green business strategies, and environmentally oriented supply chain practices have similarly been examined in relation to AI capability and sustainable performance (Liu et al., 2026). These findings support consideration of organizational mechanisms that may explain variations in the associations between technological capabilities and business outcomes. However, mediation, moderation, and direct association describe different analytical relationships and require separate interpretation. A mediating mechanism concerns a process through which a relationship may operate, whereas a moderating condition concerns circumstances under which the relationship may vary. Neither necessarily establishes a causal effect unless the underlying research design provides sufficient evidence for that interpretation.

Environmental dynamism and technological complementarity further indicate that AI-related organizational outcomes may vary across business settings. Firms operate under different levels of technological uncertainty, market volatility, resource availability, and competitive pressure, which may influence their capacity to utilize AI effectively. Research concerning AI capabilities and innovative employee behavior has examined the relevance of organizational and environmental conditions to innovation-related outcomes (Shahid et al., 2026). Studies combining AI with IoT have also considered green innovation, sustainable competitiveness, and firm performance, highlighting the potential significance of interactions among digital technologies (Liu & Adil, 2026). These findings indicate that the organizational relevance of AI capability cannot be fully evaluated without considering the technological infrastructure and business conditions within which it is deployed. Environmental dynamism, organizational culture, knowledge integration, and complementary digital resources are consequently treated as potential boundary conditions or supporting mechanisms, depending on how their relationships are specified and examined in the underlying research. Their

inclusion in the synthesis does not imply that all reviewed studies tested equivalent mechanisms or established comparable relationships.

The conceptual contribution of the present study lies in organizing these different strands of research into an integrated analytical framework while preserving distinctions among the underlying constructs and forms of evidence. The reviewed literature provides insights into relationships between AI capability and innovation, innovation and competitive positioning, and AI-related organizational practices and sustainable performance. However, examining these relationships separately offers a limited basis for understanding their possible interconnections and the conditions under which different organizational outcomes are reported. The present review addresses this limitation by comparing the mechanisms identified across studies and organizing them into three connected analytical domains: AI capability and business innovation within digital transformation; AI capability, business innovation, and competitive advantage; and AI capability, competitive positioning, and sustainable firm performance. The intended contribution is not to establish a previously untested causal model or to claim that all relationships have been empirically confirmed. Instead, the review develops a conceptual synthesis that distinguishes relationships directly investigated in the literature from broader explanatory pathways derived through cross-study interpretation. This approach provides a basis for identifying areas of convergence, differences in operationalization, and relationships requiring further empirical examination.

Accordingly, this study aims to synthesize evidence concerning the relationships among artificial intelligence capability, business innovation, competitive advantage, and sustainable firm performance within digital transformation. A structured integrative literature review of 19 scholarly publications from 2020 to 2026 is used to examine the organizational mechanisms, strategic relationships, and sustainability-oriented outcomes reported in the selected literature. Three research questions guide the analysis. First, how is AI capability conceptualized and associated with business innovation across studies of digital transformation? Second, through which organizational mechanisms is AI capability linked to competitive advantage, and to what extent are these relationships empirically examined or conceptually proposed? Third, how are AI capability and competitive advantage associated with sustainable firm performance, and which organizational or environmental conditions are identified as relevant to these relationships? By addressing these questions, the study seeks to clarify the relationships supported by the reviewed evidence, develop an integrated explanation of the mechanisms connecting technological capability with organizational outcomes, and identify conceptual and empirical limitations that warrant further investigation. The resulting synthesis is interpretive rather than causal, recognizing that differences in study designs, organizational settings, and outcome measurements restrict the conclusions that can be drawn from the existing evidence.

RESEARCH METHOD

This study employed a structured integrative literature review using a directed qualitative synthesis to examine the relationships among digital transformation, artificial intelligence capability, business innovation, competitive advantage, and sustainable firm performance. The review was designed to integrate findings from scholarly publications investigating different dimensions of AI-enabled organizational transformation rather than to estimate a single statistical relationship. The individual scholarly publication served as the unit of analysis. The analytical corpus consisted of 19 publications issued between 2020 and 2026, selected from a bounded scholarly reference set on the basis of their conceptual and empirical relevance to the research objectives. This corpus-based approach permitted the examination of heterogeneous research perspectives and organizational mechanisms, although it did not constitute an exhaustive systematic search of bibliographic databases. The review addressed three analytical domains corresponding to the research questions: the relationship between AI capability and business innovation, the organizational mechanisms connecting AI capability with competitive advantage, and the relationships among AI-related capabilities, competitive positioning, and sustainable firm performance.

Publication selection was guided by temporal eligibility, topical relevance, and the availability of information concerning the relationships under investigation. Eligible publications were scholarly works published between 2020 and 2026 that examined at least one of the focal constructs in relation to organizational innovation, competitive advantage, or sustainable business performance. Studies

addressing AI adoption, digital intelligence, digital capabilities, business model innovation, dynamic capabilities, green innovation, or organizational performance were considered relevant when their findings contributed directly to one of the three analytical domains. Publications focusing exclusively on technological applications without an identifiable organizational or strategic relationship fell outside the analytical scope. The selection was not restricted to a single empirical research design because the integrative approach accommodated different methodological and conceptual contributions. A publication dated 2027 was excluded from the 19-publication analytical corpus because it fell outside the defined observation period. Its discussion as contextual literature was distinguished from the evidence used in the cross-study synthesis. The resulting corpus represented a purposively delimited body of relevant scholarship rather than a statistically representative sample of all research concerning AI and organizational performance.

The analytical procedure involved organizing the selected publications into a structured evidence framework. Each publication was examined according to its principal research focus, AI or digital capability dimension, organizational mechanism, reported outcome, and strategic implication. These dimensions distinguished technological resources from organizational processes and performance-related outcomes. AI capability and digital transformation were examined as enabling organizational resources, while business innovation, dynamic capabilities, data-driven culture, business model innovation, knowledge integration, and green innovation were categorized according to their reported roles within the underlying studies. Competitive advantage and sustainable firm performance were treated as analytically distinct outcomes. Competitive implications inferred from operational improvements were differentiated conceptually from studies directly examining competitive advantage, while sustainability-related outcomes were interpreted according to the environmental, organizational, or performance dimensions addressed in the respective publications. This framework reduced the risk of treating related constructs as interchangeable and supported comparisons across studies with different conceptual emphases.

Directed qualitative evidence synthesis was conducted by organizing the extracted information into three interconnected analytical categories. The first category examined digital transformation and AI capability in relation to business innovation, emphasizing information processing, organizational learning, process reconfiguration, digital innovation, and innovation resilience. The second category examined AI capability and business innovation in relation to competitive advantage, focusing on dynamic capabilities, business model innovation, operational efficiency, entrepreneurial opportunity recognition, and strategic adaptability. The third category examined AI capability and competitive advantage in relation to sustainable firm performance, emphasizing green innovation, data-driven organizational culture, knowledge integration, sustainability-oriented business strategies, and complementary digital technologies. Publications addressing more than one analytical category contributed evidence to multiple thematic comparisons without being counted as additional studies. The extracted relationships and corresponding organizational mechanisms were organized into the comparative evidence matrices presented in Tables 1–4.

Cross-study synthesis focused on identifying recurring relationships, complementary explanations, and differences in the conceptual scope of the reported findings. The interpretation distinguished associations reported in the underlying literature from the broader explanatory pathways developed through the integrative synthesis. Relationships described as mediating or moderating mechanisms were interpreted according to their respective analytical roles rather than combined into an undifferentiated explanation of organizational performance. The synthesis also considered the relevance of organizational and environmental conditions, including technological complementarity, organizational culture, knowledge integration, and environmental dynamism. These conditions were incorporated as possible explanations for differences in reported organizational outcomes rather than assumed to operate uniformly across all firms or research settings. The resulting analytical framework was interpretive, connecting findings across publications without asserting that every proposed relationship had been empirically tested as part of a common model.

The methodological scope of the review was defined by its bounded reference corpus, qualitative analytical procedure, and heterogeneous evidence base. Differences in publication characteristics, research designs, organizational settings, conceptual definitions, and outcome measurements limited direct statistical comparability. The corpus-based selection process also introduced potential selection bias and did not provide the comprehensive retrieval coverage

associated with an exhaustive systematic review. No formal quantitative meta-analysis was undertaken, effect sizes were not pooled, and no new causal coefficients were estimated. The synthesis therefore emphasized the direction and conceptual interpretation of reported relationships without assigning common effect magnitudes or equivalent evidentiary weight to all publications. These methodological boundaries informed the interpretation of the findings, which are presented as cross-study patterns of association and organizational mechanisms rather than causal estimates or universally generalizable relationships.

RESULT AND DISCUSSION

Digital Transformation and Artificial Intelligence Capability as Drivers of Business Innovation

Cross-study findings show that digital transformation is treated as an organizational reconfiguration process rather than as the adoption of isolated digital technologies. The reviewed studies consistently examine combinations of artificial intelligence (AI), cloud computing, the Internet of Things (IoT), digital capabilities, and flexible information technology infrastructures in relation to innovation and firm performance. Alqahtani et al. (2024) place these technological elements within an integrated digital environment in which AI operates alongside complementary digital capabilities. Across the evidence base, AI contributes greater strategic value when it is embedded in broader digital transformation initiatives rather than deployed as a stand-alone operational tool.

AI capability is relevant to digital transformation because firms must convert technological resources into repeatable organizational competencies. Wamba-Taguimdje et al. (2020) link AI-based transformation projects with firm performance and identify process-oriented dynamic capabilities as a mechanism connecting AI implementation with organizational outcomes. The reviewed evidence therefore distinguishes technological possession from organizational capability. Firms derive value from AI when routines for information processing, process redesign, resource reconfiguration, and managerial use are established around the technology.

Digital transformation is also associated with business innovation through stronger information-processing capacity and organizational responsiveness. Zhang et al. (2024) link enterprise digital intelligence transformation with innovation resilience and firm performance, indicating that digital intelligence supports the continuity of innovation under changing environmental conditions. This relationship is relevant in markets characterized by uncertainty, technological acceleration, and changing customer expectations. Within the reviewed studies, AI capability is consistently positioned as an enabling resource for organizational adaptability and innovation continuity.

The effectiveness of AI capability also depends on the organizational environment in which AI-generated information is interpreted and used. Fosso Wamba et al. (2024) identify data-driven culture as a mediating mechanism in the relationship between AI capability and firm performance from a sustainable development perspective. A data-driven culture institutionalizes the use of analytical evidence in managerial decision making and reduces dependence on intuition alone. The evidence therefore links the innovation value of AI to both computational capability and the organizational capacity to translate AI-generated information into operational and strategic action.

Business innovation is a recurrent organizational outcome in the reviewed evidence on AI-enabled digital transformation. Nikzat and Noorymotlagh (2025) associate artificial intelligence in business with innovation and competitive advantage, while the broader evidence base links AI with changes in products, services, processes, customer interaction, and value propositions. These studies indicate that the contribution of AI to innovation is strongest when analytical capability is incorporated into organizational learning, experimentation, and strategic renewal. Table 1 summarizes the principal mechanisms identified across the reviewed publications.

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

Study	Principal Focus	AI/Digital Capability Dimension	Innovation-Related Mechanism	Strategic Implication
Wamba-Taguimdje et al. (2020)	AI-based transformation projects	AI implementation capability	Transformation of organizational processes	Supports business value and firm performance
Wamba-Taguimdje et al. (2020)	AI and dynamic capabilities	Process-oriented dynamic capability	Organizational process reconfiguration	Links AI resources with performance improvement
Alqahtani et al. (2024)	Integrated digital technologies	AI, IoT, cloud computing, digital capability, IT flexibility	Digital innovation	Strengthens the technological basis of firm performance
Zhang et al. (2024)	Digital intelligence transformation	Enterprise digital intelligence	Innovation resilience	Supports organizational adaptability and performance
Fosso Wamba et al. (2024)	AI capability and performance	AI capability	Data-driven organizational culture	Facilitates conversion of AI-generated information into business value
Nikzat & Noorymotlagh (2025)	AI in business	Strategic AI utilization	Business innovation	Associated with competitive advantage
Shakil et al. (2025)	AI and business strategy	Strategic AI adoption	Business strategy reconfiguration	Strengthens competitive positioning in digital markets
De Fano et al. (2026)	AI ambidexterity	AI exploitation and exploration	Dynamic capabilities in innovation ecosystems	Supports innovation and competitive adaptability

The evidence summarized in Table 1 identifies several interrelated mechanisms linking AI capability with business innovation. A consistent distinction is observed between access to AI technologies and the organizational capability required to exploit and explore their potential. De Fano et al. (2026) examine AI ambidexterity within digital innovation ecosystems and identify dynamic capabilities as a basis for competitive advantage. The evidence therefore links exploitation of existing AI applications with incremental improvement and exploration of new AI-enabled opportunities with the development of future products, processes, and business models.

The reviewed studies also position AI as a strategic rather than exclusively technical organizational capability. Shakil et al. (2025) relate artificial intelligence to the reconfiguration of business strategy and competitive advantage in the digital era. Strategic integration extends the use of AI to market analysis, customer engagement, resource allocation, operational planning, and innovation management. Business innovation is therefore reported as an outcome of alignment between technological intelligence and strategic decision making rather than as a direct consequence of technology adoption alone.

AI-driven innovation also affects internal business processes. Sharma and Dang (2026) examine the role of artificial intelligence in business process performance and identify process transformation as an important element of digital transformation. More responsive and analytically supported processes reduce organizational rigidity and support faster experimentation. Across the reviewed evidence, integration of AI into business processes is associated with both efficiency-oriented innovation and broader organizational change, depending on the extent to which AI capability is embedded in managerial routines.

The entrepreneurial dimension of AI further extends the relationship between digital transformation and business innovation. Singh et al. (2026) link artificial intelligence with business innovation and entrepreneurship, particularly through opportunity recognition and exploitation. AI-based analytical capacity supports the identification of emerging customer needs, patterns in complex market information, and alternative value propositions. The reviewed evidence therefore associates stronger AI capability with a more developed informational basis for experimentation, opportunity evaluation, and strategic market entry.

Across the reviewed evidence, digital transformation, AI capability, and business innovation form a connected organizational configuration. Wahyudi et al. (2026) link AI-enabled competitiveness with digital innovation and operational efficiency, showing that technological capability is associated with both innovation and organizational effectiveness. The cross-study pattern positions digital transformation as the technological and organizational infrastructure, AI capability as the analytical and adaptive resource, and business innovation as the mechanism through which these resources are converted into new forms of value. This relationship provides the basis for examining competitive advantage in the following subsection.

Artificial Intelligence Capability, Business Innovation, and Competitive Advantage

The reviewed evidence consistently associates artificial intelligence capability with competitive advantage in digitally intensive business environments. AI capability provides analytical, automation, and data-processing capacity that improves the speed and quality of strategic decision making. Nikzat and Noorymotlagh (2025) directly connect the application of artificial intelligence in business with innovation and competitive advantage. Across the reviewed studies, competitive positioning is linked not to AI ownership itself but to the firm's capacity to deploy intelligent digital resources in ways that support differentiated organizational responses.

A recurrent mechanism linking AI capability with competitive advantage is organizational responsiveness and strategic adaptability. Firms in dynamic markets must identify opportunities, interpret changes in customer preferences, and respond to competitive threats at greater speed. De Fano et al. (2026) emphasize AI ambidexterity and dynamic capabilities in digital innovation ecosystems, including simultaneous exploitation of existing applications and exploration of new technological opportunities. The evidence associates this combination with continued operational performance and renewal of strategic resources under changing market conditions.

Business model innovation is another mechanism connecting AI capability with competitive advantage. Shao et al. (2026) examine the mediating role of business model innovation in the relationship between AI capability and enterprise competitive advantage. AI-supported business model innovation changes the configuration of customer relationships, revenue structures, operational processes, and value propositions. The reviewed evidence therefore links strategic AI integration with forms of differentiation that extend beyond technical efficiency to the redesign of how firms create and capture value.

The competitive contribution of AI is stronger when AI capability is incorporated into broader digital transformation strategies. Shakil et al. (2025) associate artificial intelligence with changes in business strategy and competitive advantage, indicating that AI affects organizational decisions across multiple functions. Digital transformation supplies the infrastructure through which AI-based information is incorporated into marketing, production, supply chain management, customer engagement, and strategic planning. The evidence consequently links competitive value with organizational alignment rather than with isolated functional adoption.

The reviewed studies also show that digital capabilities create competitive value through technological complementarity. Alqahtani et al. (2024) examine the combined roles of IoT, cloud computing, artificial intelligence, digital capabilities, digital innovation, and IT flexibility in relation

to firm performance. This multidimensional configuration indicates that competitive advantage is associated with the orchestration of interconnected technological and organizational resources. AI capability therefore has greater strategic relevance when supported by digital infrastructure, flexible information systems, and mechanisms that facilitate innovation and resource reconfiguration.

Table 2. Strategic Mechanisms Linking AI Capability to Competitive Advantage

Reference	Core Strategic Variable	Competitive Mechanism	Organizational Outcome	Competitive Implication
Alqahtani et al. (2024)	AI and integrated digital capabilities	Technological complementarity and digital innovation	Improved firm performance	Strengthens digitally enabled competitiveness
Nikzat & Noorymotlagh (2025)	Artificial intelligence in business	Innovation and strategic utilization	Improved competitive positioning	AI functions as a source of differentiation
Shakil et al. (2025)	AI and business strategy	Strategic transformation	Reconfigured competitive strategy	Supports advantage in the digital era
De Fano et al. (2026)	AI ambidexterity	Dynamic capabilities	Exploration and exploitation of digital opportunities	Sustains competitive adaptability
Shao et al. (2026)	AI capability	Business model innovation	New value-creation architecture	Enhances enterprise competitive advantage
Wahyudi et al. (2026)	AI-enabled competitiveness	Digital innovation and operational efficiency	Improved business competitiveness	Combines efficiency and differentiation

Source: Compiled from studies included in the review.

The evidence summarized in Table 2 links AI capability with competitive advantage through digital innovation, dynamic capability development, strategic transformation, operational efficiency, and business model innovation. Competitive advantage is therefore treated as a multidimensional organizational outcome rather than as a direct technological effect. Wahyudi et al. (2026) connect AI-enabled competitiveness with digital innovation and operational efficiency, indicating that strategic benefits arise from both efficiency improvement and new value creation. Across the reviewed studies, the combination of operational efficiency and differentiation is a recurrent basis for sustained competitive positioning.

The reviewed evidence also identifies a higher-order organizational role for AI. Brabete et al. (2026) characterize the relationship between artificial intelligence and firm performance as moving from operational efficiency toward strategic meta-capability. This perspective extends AI beyond routine automation to the coordination of learning, decision making, resource allocation, and strategic adaptation across organizational functions. In the reviewed evidence, AI capability is consequently embedded in the architecture of competitive strategy rather than treated as a separate technical resource.

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Table 3. Competitive Advantage Pathways Derived from AI-Enabled Organizational Capabilities

AI-Enabled Capability	Primary Strategic Function	Innovation Contribution	Competitive Advantage Pathway	Supporting Reference
AI analytical capability	Data interpretation and prediction	Identification of new opportunities	Better strategic decisions and market responsiveness	Brabete et al. (2026)
AI ambidexterity	Simultaneous exploitation and exploration	Continuous digital experimentation	Adaptive and difficult-to-replicate capabilities	De Fano et al. (2026)
AI-enabled business model capability	Redesign of value creation and capture	Business model innovation	Differentiated customer and market value	Shao et al. (2026)
AI-driven process capability	Optimization of business processes	Process innovation	Cost, speed, and responsiveness advantages	Sharma & Dang (2026)
AI entrepreneurship capability	Opportunity identification	Development of new ventures and offerings	First-mover and opportunity-based advantage	Singh et al. (2026)
AI-digital innovation integration	Integration of technology and innovation	Continuous digital innovation	Improved organizational competitiveness	Wahyudi et al. (2026)

Table 3 identifies business process transformation as a distinct pathway connecting AI-enabled capabilities with competitive advantage. Sharma and Dang (2026) relate artificial intelligence to improved business process performance through changes in the design and execution of organizational activities. Greater process efficiency is associated with reduced delay, higher operational accuracy, stronger coordination, and greater flexibility under changing market conditions. These process improvements also support competitive differentiation when efficiency gains are integrated with customer experience, product development, innovation, and organizational learning.

Entrepreneurial opportunity recognition provides an additional pathway. Singh et al. (2026) connect AI with business innovation and entrepreneurship and identify the role of intelligent technologies in recognizing and exploiting emerging opportunities. AI-based analytical systems strengthen the informational basis for entrepreneurial decision making by identifying market patterns and changes that are difficult to detect through conventional analysis. Across the reviewed evidence, integration of these capabilities into strategic processes is associated with faster experimentation, market entry, and innovation commercialization.

The relationship between AI capability and competitive advantage is reported as a capability-building process rather than as an automatic consequence of technology adoption. Wamba-Taguimdje et al. (2020) emphasize process-oriented dynamic capabilities in explaining the relationship between AI and firm performance. The reviewed studies indicate that AI investment requires complementary managerial competencies, organizational structures, and innovation-oriented routines to generate strategic differentiation. Competitive value is strongest when AI is integrated into continuous learning, process reconfiguration, and organizational adaptation.

Sustained competitive advantage further depends on converting short-term technological benefits into durable organizational capabilities. As AI technologies diffuse across markets, access to similar tools becomes less distinctive. The reviewed evidence places greater explanatory weight on organizational knowledge, managerial routines, innovation processes, and strategic integration developed around AI technologies. De Fano et al. (2026), Shao et al. (2026), and Brabete et al. (2026)

collectively associate AI-related advantage with higher-order capabilities involving adaptation, innovation, and strategic reconfiguration rather than with technological ownership alone.

Overall, the reviewed studies associate AI capability with competitive advantage through interconnected mechanisms involving business innovation, business model transformation, dynamic capabilities, operational efficiency, entrepreneurial opportunity recognition, and strategic adaptability. The cross-study pattern is consistent with a sequence in which digital transformation establishes the technological environment, AI capability supplies analytical and adaptive resources, and business innovation converts these resources into differentiated value creation. Competitive advantage reflects the firm's ability to capture strategic value from this configuration. The next subsection examines how these mechanisms are linked with sustainable firm performance.

Artificial Intelligence Capability, Competitive Advantage, and Sustainable Firm Performance

The review findings identify sustainable firm performance as a long-term organizational outcome associated with AI-enabled digital transformation. The reviewed studies connect AI capability with resource utilization, analytical decision making, innovation capacity, and environmental performance. Mahmood et al. (2024) relate AI adoption and digital transformation to sustainable business performance through green product innovation. This evidence indicates that the sustainability contribution of AI is linked not only with efficiency improvement but also with the conversion of technological capability into environmentally responsive innovation.

Green innovation is a recurrent mechanism connecting AI capability with sustainable organizational outcomes. Farmanesh et al. (2025) examine artificial intelligence and green innovation in relation to competitive advantage and sustainable development goals, particularly in small and medium-sized enterprises. AI-supported information processing improves the identification of resource consumption patterns, environmental risks, customer preferences, and opportunities for sustainable product development. Across the reviewed studies, integration of these insights into innovation processes is associated with stronger environmental performance and differentiated market value.

Organizational culture is another mechanism reported in the reviewed evidence. Fosso Wamba et al. (2024) identify data-driven culture as a mediator between AI capability and firm performance from a sustainable development perspective. A data-driven environment institutionalizes the use of AI-generated information in resource allocation, operational improvement, innovation priorities, and sustainability initiatives. The review therefore links sustainable performance with the joint presence of AI capability and organizational routines that integrate data into strategic and operational decision making.

Sustainable competitiveness is also associated with the integration of AI and complementary digital technologies. Liu and Adil (2026) connect AI and the Internet of Things with green innovation, firm performance, and sustainable competitiveness. Their findings place real-time monitoring, predictive analysis, operational coordination, and information transparency within a shared technological configuration. Across the reviewed evidence, this technological complementarity supports the simultaneous pursuit of environmental improvement, operational efficiency, and competitive responsiveness.

The relationship between AI capability and sustainable firm performance involves several organizational mechanisms across the reviewed studies. Liu et al. (2026) connect green business strategy, AI capability, and green supply chain management with sustainable performance through knowledge integration and green innovation. This evidence identifies strategic orientation and interorganizational coordination as complementary conditions for sustainability outcomes. AI capability is therefore associated with stronger sustainable performance when it is embedded in systems that support knowledge integration, environmentally responsible supply chain practices, and continuous green innovation.

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Table 4. Evidence Matrix Linking AI Capability to Sustainable Firm Performance

Reference	Main Antecedent/Capability	Mediating or Supporting Mechanism	Sustainability-Oriented Outcome	Strategic Implication
Mahmood et al. (2024)	AI adoption and digital transformation	Green product innovation	Sustainable business performance	AI creates sustainability value through innovation
Fosso Wamba et al. (2024)	AI capability	Data-driven culture	Firm performance from a sustainable development perspective	Organizational culture strengthens AI value creation
Farmanesh et al. (2025)	Artificial intelligence	Green innovation	Competitive advantage and SDG contribution	Sustainability and competitiveness are mutually reinforcing
Tam & Van (2025)	Digital transformation	AI application as a moderating mechanism	Sustainable performance	AI strengthens the transformation-performance relationship
Liu & Adil (2026)	AI and IoT	Green innovation	Sustainable competitiveness and firm performance	Digital technology integration supports sustainable value creation
Liu et al. (2026)	AI capability and green business strategy	Knowledge integration and green innovation	Sustainable performance	Organizational integration converts AI into sustainability outcomes
Shahid et al. (2026)	AI capability	Innovative work behavior and environmental dynamism	Sustainable firm performance	Human innovation and environmental conditions shape AI outcomes
Zhang et al. (2024)	Digital intelligence transformation	Innovation resilience	Firm performance	Resilient innovation supports long-term organizational performance

The evidence summarized in Table 4 links sustainable firm performance with an interconnected set of technological, organizational, innovative, and environmental mechanisms. Tam and Van (2025) examine the relationship between digital transformation and sustainable performance with AI application as a moderating mechanism. Their findings indicate that the performance implications of digital transformation differ according to the extent to which AI is incorporated into organizational activities. Across the review, AI capability is therefore treated as an enabling organizational condition that strengthens the value derived from broader digital transformation initiatives.

Human-centered innovation processes provide an additional mechanism connecting AI capability with sustainable firm performance. Shahid et al. (2026) examine AI capabilities in relation to sustainable firm performance through innovative work behavior and environmental dynamism. Their model places employee innovation behavior and environmental conditions between technological capability and performance outcomes. The reviewed evidence therefore positions AI as a resource that complements, rather than substitutes for, human innovation in the generation and implementation of new ideas under changing environmental conditions.

Innovation resilience further contributes to the long-term performance implications of digital transformation. Zhang et al. (2024) link enterprise digital intelligence transformation with innovation resilience and firm performance. Their findings associate digitally intelligent organizational capabilities with greater continuity of innovation during disruption and uncertainty. This mechanism is relevant to sustainable firm performance because economic, technological, and environmental changes continually challenge established business models and operating routines.

The reviewed evidence also identifies competitive advantage as a strategic bridge between AI capability and sustainable firm performance. AI-based information is associated with differentiated products, more efficient processes, innovative business models, and environmentally responsive practices when it is incorporated into organizational routines. Brabete et al. (2026) position AI as a strategic meta-capability, while Wahyudi et al. (2026) connect AI-enabled competitiveness with digital innovation and operational efficiency. Sustainable performance is therefore linked with the institutionalization of technological and competitive gains into adaptive organizational capabilities.

A broader strategic interpretation further indicates that AI-enabled digital transformation should be aligned with sustainability objectives from the beginning rather than treated as a purely technological modernization program. The bibliography supplied for this study also lists Farag (2027), which conceptually positions AI-enabled digital transformation as a strategic pathway toward sustainable competitive advantage, reinforcing the close association among technological transformation, strategy, competitiveness, and sustainability. Because sustainable performance requires organizations to generate economic value without neglecting long-term environmental and organizational resilience, AI investments should be evaluated according to their contribution to both operational results and strategic sustainability. The integration of AI capability with green innovation, business innovation, knowledge integration, dynamic capabilities, and sustainability-oriented strategy consequently provides a more comprehensive explanation of how digital transformation may produce enduring organizational value.

Overall, the reviewed evidence establishes a consistent relationship pattern among digital transformation, AI capability, business innovation, competitive advantage, and sustainable firm performance. Digital transformation provides the technological and organizational context; AI capability supplies analytical and adaptive capacity; business innovation converts these resources into new value-creation mechanisms; and competitive advantage reflects the firm's ability to differentiate and respond to market dynamics. Sustainable firm performance is associated with the longer-term institutionalization of these gains through green innovation, data-driven culture, knowledge integration, innovation resilience, and environmentally responsive strategy (Fosso Wamba et al., 2024; Farmanesh et al., 2025; Liu et al., 2026). The review therefore positions AI capability as an organizational capability that links digital transformation with competitive and sustainability-related outcomes.

CONCLUSION

This study synthesized evidence from 19 scholarly publications published between 2020 and 2026 to examine the relationships among artificial intelligence capability, business innovation, competitive advantage, and sustainable firm performance within digital transformation. The reviewed literature associates AI capability with organizational activities involving data-driven decision-making, process reconfiguration, business innovation, strategic adaptability, and operational improvement. These relationships indicate that the organizational relevance of AI extends beyond technological implementation and depends on the capacity of firms to integrate digital resources with managerial processes and innovation-oriented capabilities. Business innovation emerges as a recurrent explanatory mechanism connecting AI-related organizational resources with competitive positioning through dynamic capabilities, business model reconfiguration, operational efficiency, and

entrepreneurial opportunity recognition. However, the evidence does not establish that these mechanisms operate uniformly across organizations or that technological capability independently produces competitive advantage.

The principal contribution of this review is an integrated conceptual synthesis that differentiates technological capabilities, organizational mechanisms, competitive outcomes, and sustainability-related performance within a connected analytical framework. Existing studies provide evidence concerning particular relationships, whereas the present synthesis identifies how these relationships may be interpreted together without treating them as a universally established causal sequence. The reviewed research associates sustainable performance with complementary organizational practices, including data-driven culture, green innovation, knowledge integration, and sustainability-oriented business strategies (Fosso Wamba et al., 2024; Farmanesh et al., 2025; Liu et al., 2026). These findings indicate that competitive advantage and sustainable firm performance represent distinct but potentially related organizational outcomes. The synthesis further distinguishes empirically examined associations from conceptual pathways proposed through cross-study interpretation, providing a clearer basis for understanding the conditions under which AI capability may contribute to innovation, competitive positioning, and sustainability-oriented organizational development.

The findings have implications for managerial decision-making and the strategic governance of digital transformation. Firms seeking to strengthen the organizational value of AI investments can benefit from aligning technological implementation with managerial competencies, organizational learning, business model development, and sustainability objectives. Attention to data-driven decision processes, knowledge integration, innovation capabilities, and environmentally responsible business practices provides a more comprehensive basis for evaluating AI-related initiatives than technological adoption or short-term efficiency improvements alone. The practical relevance of these mechanisms nevertheless depends on organizational resources, industry characteristics, environmental conditions, and the specific performance dimensions being examined. AI capability is consequently best understood as a potentially valuable organizational resource whose competitive and sustainability-related implications are shaped by complementary capabilities and strategic conditions.

The study has several limitations associated with its methodological scope. The review was restricted to 19 publications from 2020 to 2026, and its bounded, purposive corpus may not capture the full range of relevant scholarship. Publication selection may also introduce bias, while differences in research designs, organizational settings, construct operationalization, and performance indicators limit the comparability and generalizability of the synthesized findings. The absence of a quantitative meta-analysis prevents estimation of pooled effect sizes, and the integrative design does not establish causal relationships among the examined constructs. Future research can advance this analytical framework through longitudinal and comparative empirical investigations that distinguish direct relationships from mediating and moderating mechanisms. Particular attention is warranted to the roles of organizational culture, environmental dynamism, digital infrastructure, and managerial capabilities in shaping AI-related outcomes. Comparative investigations across industries, firm sizes, and institutional settings would clarify the conditions under which these relationships vary, while separate measurement of economic, environmental, and social performance would strengthen the empirical assessment of organizational sustainability. The study contributes a bounded conceptual explanation of AI-enabled organizational value creation and identifies specific relationships requiring further empirical examination.

REFERENCES

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. DOI:10.14738/assrj.117.17252

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

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.

Farag, M. I. H. (2027). Leveraging Artificial Intelligence for Digital Transformation: Strategic Pathways toward Sustainable Competitive Advantage. Management Science Advances, 1-22. https://doi.org/10.31181/msa41202746.

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

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

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

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

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

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.