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AI-Driven Strategic Decision-Making for Sustainable Business Transformation in the Manufacturing Industry

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ABSTRACT

Advances in digital technology and the increasing complexity of global competition have driven the manufacturing industry to integrate Artificial Intelligence (AI) into business processes and strategic decision-making to enhance competitiveness and achieve sustainable business transformation. Although various studies have examined the implementation of AI in improving operational efficiency and digital transformation, research that positions AI as a strategic capability in linking strategic decision-making with sustainable business transformation in the manufacturing industry remains relatively limited. Therefore, this study aims to analyze the role of AI-driven strategic decision-making in driving sustainable business transformation through a conceptual approach based on a literature synthesis. This study employs a qualitative approach using the Systematic Literature Review (SLR) method combined with thematic synthesis of various scientific literature on Artificial Intelligence, strategic decision-making, Dynamic Capabilities Theory, and sustainable business transformation in the context of the manufacturing industry. The results indicate that AI functions as a strategic capability that enhances the quality of decision-making through data analysis, predictive analytics, real-time information processing, and intelligent decision support systems. The findings also show that AI drives sustainable business transformation by improving operational efficiency, optimizing resource utilization, strengthening innovation, and integrating economic, social, and environmental aspects into manufacturing companies' strategies. This study makes a theoretical contribution by developing a conceptual framework that integrates artificial intelligence, strategic decision-making, and sustainable business transformation, and provides practical implications for manufacturing companies on how to leverage AI as a strategic capability to enhance competitiveness and achieve long-term business sustainability.

Keywords: Artificial Intelligence, Manufacturing Industry, Strategic Decision-Making, Sustainable Business Transformation, Dynamic Capabilities Theory.

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Introduction

Advances in digital technology, progress in Artificial Intelligence (AI), and the increasing complexity of global competition have driven significant transformation in the manufacturing industry. As we enter

the Industry 5.0 era, manufacturing companies are no longer focused solely on automating production processes; they are also required to integrate smart technologies capable of enhancing flexibility, innovation, and business sustainability (Leng et al., 2024). Changing customer preferences, disruptions in the global supply chain, and increasing demands for efficiency and sustainable business practices make a company's ability to adapt a critical factor in maintaining competitiveness. Under these conditions, rapid, accurate, and data-driven strategic decision-making has become one of the key elements determining the success of organizational transformation.

In line with these developments, Artificial Intelligence (AI) has evolved into one of the most influential technologies in supporting modern business processes (Mikalef & Gupta, 2021). AI is no longer viewed merely as an automation technology but has evolved into a strategic capability capable of supporting data analysis, machine learning, predictive analytics, and intelligent decision support systems. AI's ability to process big data, recognize patterns, predict various possibilities, and generate evidence-based recommendations enables manufacturing companies to improve the quality of their decision-making while accelerating their response to changes in the business environment. Therefore, the implementation of AI is increasingly viewed as a strategic investment that supports the creation of long-term competitive advantage.

In addition to improving the quality of decision-making, manufacturing companies also face the demand to achieve sustainable business transformation. Today, business transformation is no longer focused solely on increasing productivity and cost efficiency, but also encompasses changes to business models, operational processes, organizational culture, and corporate strategy in order to strike a balance between economic value, social responsibility, and environmental sustainability. In this context, AI has great potential to support this transformation by improving operational efficiency, optimizing resource utilization, strengthening innovation, and enhancing an organization's ability to respond to change more adaptively (Abdullah et al., 2023).

Various previous studies have shown that the implementation of AI contributes positively to operational efficiency, productivity, supply chain optimization, and the quality of decision-making in the manufacturing industry (Oluyisola et al., 2022; Elbasheer et al., 2022). Other studies also explain that the success of sustainable business transformation is influenced by an organization's ability to develop innovations, leverage digital technologies, and build organizational capabilities that are adaptive to changes in the business environment (Verhoef et al., 2021). These findings indicate that AI has great potential to support organizational transformation toward a more competitive and sustainable business.

Nevertheless, most previous research still positions AI as a technology focused on operational automation or digital transformation (Konopik et al., 2022). On the other hand, studies on strategic decision-making and sustainable business transformation have generally developed as two separate fields of research. As a result, there are still limitations in explaining how AI can function as a strategic capability that links strategic decision-making processes with sustainable business transformation, particularly in the context of the manufacturing industry. This gap highlights the need to develop a conceptual framework capable of integrating these three concepts more comprehensively.

This study uses Dynamic Capabilities Theory as a conceptual framework to explain how organizations maintain competitive advantage through their capabilities to sense, seize, and transform in the face of changes in the business environment (Ellström et al., 2022). From this perspective, AI is viewed as a strategic capability that strengthens manufacturing companies' ability to identify opportunities and threats, supports faster, data-driven decision-making, and facilitates continuous business process transformation. Thus, the integration of AI and Dynamic Capabilities Theory provides a stronger conceptual framework for explaining the relationship between strategic decision-making and continuous business transformation.

Based on the above discussion, this study aims to analyze the role of AI-driven strategic decision-making in driving sustainable business transformation in the manufacturing industry through a conceptual approach based on a Systematic Literature Review (SLR) and thematic synthesis. This study

is expected to make a theoretical contribution by developing a conceptual framework that integrates Artificial Intelligence, strategic decision-making, Dynamic Capabilities Theory, and sustainable business transformation into a single, comprehensive perspective. Additionally, this study provides practical implications for manufacturing companies in leveraging AI as a strategic capability to improve the quality of decision-making, strengthen competitiveness, and achieve long-term business sustainability.

Literature Review

Dynamic Capabilities Theory

Dynamic Capabilities Theory is one of the major theories in strategic management that explains how companies maintain a competitive advantage in a dynamic business environment (Teece, 2007). This theory was introduced as an extension of the Resource-Based View (RBV), emphasizing that competitive advantage is determined not only by the ownership of resources but also by a company's ability to integrate, build, and reconfigure those resources in response to changes in the business environment. This perspective is increasingly relevant to the manufacturing industry, which faces technological advancements, global competition, and sustainability demands.

According to Teece, (2007), dynamic capabilities consist of three main dimensions: sensing, seizing, and reconfiguring. Sensing describes a company's ability to identify opportunities and threats; seizing relates to the ability to capitalize on opportunities through strategic decision-making and resource allocation; and reconfiguring refers to an organization's ability to update its processes, structures, and business models to remain adaptable to change. These three dimensions enable companies to maintain their competitiveness while enhancing their ability to adapt in an ever-changing business environment (Qiu et al., 2022).

In the manufacturing industry, advancements in Artificial Intelligence (AI) are further reinforcing the relevance of Dynamic Capabilities Theory. AI supports sensing capabilities through real-time data analysis, strengthens seizing capabilities through predictive analytics and intelligent decision support systems, and accelerates reconfiguring capabilities through automation and business process innovation. Therefore, AI functions not only as an operational technology but also as a strategic capability that enhances the quality of strategic decision-making while driving sustainable business transformation (Sadraei et al., 2025). This perspective serves as the conceptual foundation of this study in explaining the relationship between AI, strategic decision-making, and sustainable business transformation in the manufacturing industry.

Artificial Intelligence in the Manufacturing Industry

Artificial Intelligence (AI) has evolved into one of the key technologies driving the transformation of the manufacturing industry in the digital age. AI is defined as the ability of computer systems to mimic human cognitive processes, such as learning, reasoning, pattern recognition, and decision-making. Supported by advancements in machine learning, deep learning, and big data analytics, AI is now applied in various manufacturing activities, including production planning, quality control, supply chain management, and strategic decision-making (Yang et al., 2021).

In the context of Industry 5.0, AI is no longer viewed merely as an automation technology, but as an enabler that strengthens collaboration between humans and technology to enhance efficiency, innovation, and sustainability (Abdel-Basset et al., 2025). The integration of AI with digital technologies enables manufacturing companies to analyze data in real time, optimize production processes, predict market demand, and increase operational flexibility. As such, AI plays a crucial role in helping companies respond to an increasingly dynamic business environment.

Various studies show that the implementation of AI provides strategic benefits for the manufacturing industry, such as improving operational efficiency, optimizing resource utilization, supporting predictive maintenance, and enhancing the quality of decision-making through data-driven

analysis (Yang et al., 2021; Leng et al., 2024). However, the success of its implementation is also influenced by the readiness of digital infrastructure, data quality, human resource competencies, and the organization's ability to integrate AI into its business strategy. Therefore, this study views AI not merely as an operational technology, but as a strategic capability that supports strategic decision-making and drives sustainable business transformation in the manufacturing industry.

AI-Driven Strategic Decision-Making

Strategic decision-making is a core process in strategic management that determines an organization's long-term direction, competitiveness, and sustainability. In the manufacturing industry, strategic decisions encompass various aspects, such as resource allocation, supply chain management, product innovation, technology investment, and sustainability strategies. The increasing complexity of the business environment, rapid market changes, and high levels of uncertainty require organizations to adopt a decision-making process that is faster, more accurate, and data-driven, rather than an approach that relies solely on managerial intuition (Bruzzone et al., 2020).

Advances in Artificial Intelligence (AI) have transformed the paradigm of strategic decision-making through its ability to process large amounts of data, recognize patterns, generate predictions, and provide recommendations based on predictive analytics and machine learning. These capabilities enable manufacturing companies to evaluate various strategic alternatives more objectively and support evidence-based decision-making. In practice, AI is used to forecast market demand, optimize production capacity, identify supply chain risks, and simulate various business scenarios before strategic decisions are implemented. Thus, AI not only improves the quality of information but also enhances the accuracy and speed of decision-making (Lorenz et al., 2024).

Various studies show that the use of AI in strategic decision-making contributes to increased organizational effectiveness, adaptability, and competitive advantage. However, the success of its implementation remains influenced by data quality, digital infrastructure readiness, human resource competencies, and management's ability to interpret AI analysis results. Therefore, this study views AI as a decision-augmentation technology that strengthens decision-makers' capabilities rather than replacing the human role. This perspective aligns with Dynamic Capabilities Theory, which positions AI as a strategic capability to improve decision quality while supporting sustainable business transformation in the manufacturing industry (Khan & Kribs, 2026).

Sustainable Business Transformation

Sustainable business transformation is a comprehensive process of organizational change aimed at striking a balance between economic performance, social responsibility, and environmental sustainability. In the manufacturing industry, this transformation focuses not only on improving operational efficiency but also encompasses changes to business strategy, production processes, operational models, and corporate governance to generate long-term value for all stakeholders. Growing concern about climate change, energy efficiency, and consumer demands for sustainable business practices have made this transformation a strategic priority for manufacturing companies (Bican & Brem, 2020).

Advances in digital technology, particularly Artificial Intelligence (AI), are accelerating this transformation by improving resource efficiency, optimizing production processes, and enabling data-driven decision-making. The integration of AI with other digital technologies such as the Internet of Things (IoT), cloud computing, and big data analytics enables companies to monitor energy consumption, reduce waste, improve product quality, and optimize supply chains more effectively. Thus, AI serves not only as an operational technology but also as a driver of business transformation toward sustainability (Leng et al., 2024).

Various studies show that the success of sustainable business transformation is heavily influenced by a company's ability to integrate digital technology with its organizational strategy. Companies that are able to strategically leverage AI tend to be more adaptive, innovative, and competitive, while also being able to create economic, social, and environmental value in a sustainable manner. Therefore, AI is increasingly viewed as a strategic capability that supports the achievement of sustainability goals while strengthening the long-term competitiveness of manufacturing companies (Vial, 2019).

AI as a Strategic Capability

Developments in the literature indicate a paradigm shift regarding the role of Artificial Intelligence (AI) in organizations, particularly in the manufacturing industry. Whereas AI was previously viewed primarily as a technology to enhance automation and operational efficiency, it is now increasingly positioned as a strategic capability capable of creating long-term competitive advantage (Mikalef & Gupta, 2021). The primary value of AI lies not only in its technological sophistication but also in a company's ability to integrate AI into decision-making processes, strategy development, innovation, and business transformation. Thus, AI serves as a source of capability that strengthens an organization's ability to respond to changes in the business environment more quickly and adaptively.

From the perspective of Dynamic Capabilities Theory, AI supports three main dimensions: sensing, seizing, and reconfiguring (Teece, 2007). AI helps companies identify opportunities and risks through real-time data analysis, strengthens decision-making processes through predictive analytics and decision support systems, and drives innovation in processes and business models that enhance organizational flexibility. In the manufacturing industry, these capabilities enable companies to improve the quality of strategic decisions, optimize resource utilization, accelerate innovation, and support the achievement of sustainability goals. Therefore, AI not only improves operational effectiveness but also strengthens an organization's ability to create economic, social, and environmental value in a sustainable manner.

Based on a literature review, most studies still discuss AI as a technology to improve operational efficiency or support digital transformation, while research on strategic decision-making and sustainable business transformation generally develops separately (Mikalef & Gupta, 2021). Research that positions AI as a strategic capability linking these two concepts, particularly in the context of the manufacturing industry, remains relatively limited. Therefore, this study develops a conceptual framework that positions AI as a strategic capability that strengthens AI-driven strategic decision-making in driving sustainable business transformation. This perspective is expected to enrich the development of strategic management theory while providing a conceptual foundation for manufacturing companies to build sustainable competitive advantage.

Method

Research Design

This study employs a qualitative research approach using the Systematic Literature Review (SLR) method combined with thematic synthesis to develop a conceptual understanding of the role of Artificial Intelligence (AI) in supporting strategic decision-making toward sustainable business transformation in the manufacturing industry. This approach was chosen because the study does not aim to test relationships between variables using empirical data, but rather to systematically integrate various theories, concepts, and findings from previous research to produce a comprehensive conceptual synthesis. Through this approach, the study seeks to identify patterns of relationships among concepts, develop theoretical perspectives, and construct a conceptual framework that explains how AI functions as a strategic capability in supporting decision-making and sustainable business transformation.

A systematic literature review was chosen because it provides a more systematic, transparent, and accountable procedure compared to a traditional literature review. Through this approach, various previous studies were analyzed in a structured manner, resulting in a more comprehensive synthesis of knowledge regarding the development of AI implementation in strategic management. Furthermore, the thematic synthesis method was used to identify the main themes emerging from the literature, allowing for a more in-depth explanation of the relationship between AI, strategic decision-making, and sustainable business transformation.

The research focuses on the manufacturing industry because this sector is one of those undergoing accelerated digital transformation through the implementation of artificial intelligence, automation, big data analytics, the Internet of Things (IoT), and Industry 5.0 technologies. In an increasingly dynamic business environment, manufacturing companies are required to enhance their adaptability, innovation, and data-driven decision-making capabilities in order to maintain competitiveness while achieving business sustainability. Therefore, the manufacturing industry context is considered relevant for explaining how AI can serve as a strategic capability that strengthens decision-making processes and drives sustainable business transformation.

Data Sources

The data sources for this study consist entirely of secondary data in the form of scientific articles published in reputable international journals. The literature was obtained through several highly credible academic databases, namely Scopus, Web of Science, ScienceDirect, SpringerLink, Emerald Insight, Taylor & Francis Online, and Wiley Online Library. The use of these various databases aimed to obtain high-quality references that had undergone a peer-review process and were relevant to research developments in artificial intelligence, strategic management, digital transformation, and business sustainability.

The literature search was conducted using a combination of several keywords, including Artificial Intelligence, AI-Driven Strategic Decision-Making, Strategic Decision-Making, Dynamic Capabilities Theory, Sustainable Business Transformation, Digital Transformation, and the Manufacturing Industry. This combination of keywords was designed to ensure that the retrieved literature is directly relevant to the research focus while also reflecting the latest developments in the implementation of AI in the manufacturing sector.

Most of the articles used were published between 2019-2026 to provide an overview of the latest research developments regarding the use of AI in strategic decision-making and business transformation. However, this study also draws on several classic works that have made fundamental contributions to theoretical development, particularly the Dynamic Capabilities Theory developed by Teece and colleagues. The use of a combination of classic and contemporary literature is expected to provide a strong theoretical foundation while reflecting the latest developments in the study of artificial intelligence and strategic management.

Literature Selection

The literature selection process was conducted systematically to ensure that all articles analyzed were of high academic quality and highly relevant to the research objectives. The initial stage involved identifying relevant articles based on predetermined keywords in each database. This was followed by a screening process based on the title, abstract, and scope of the research to eliminate articles unrelated to the focus of the study.

The selected articles are English-language scientific publications that have undergone a peer-review process and are available in full text. In addition, the articles must address one or more of the main research topics, namely Artificial Intelligence, strategic decision-making, Dynamic Capabilities Theory, sustainable business transformation, digital transformation, or the implementation of AI in the

manufacturing industry. Articles that lack substantial relevance to the research topics such as editorials, book reviews, or publications that do not provide the full text were excluded from the analysis.

After the selection process was completed, all articles were re-evaluated based on publication quality, theoretical contribution, methodological consistency, and their relevance to the development of the research's conceptual framework. This stage aimed to ensure that the literature used could provide a strong scientific foundation for explaining the relationship between Artificial Intelligence, strategic decision-making, and sustainable business transformation in the manufacturing industry.

Data Analysis

Data analysis was conducted using a thematic synthesis approach to integrate various findings from previous research into a comprehensive conceptual framework. This approach enabled the researchers to identify patterns of relationships among concepts, compare previous research findings, and develop new interpretations regarding the role of Artificial Intelligence (AI) as a strategic capability in supporting strategic decision-making and sustainable business transformation. Thus, the analysis process not only summarizes existing findings but also produces a more integrated conceptual synthesis.

The analysis phase began with an in-depth review of all articles that met the selection criteria, followed by the identification of key concepts related to Artificial Intelligence, Dynamic Capabilities Theory, strategic decision-making, and sustainable business transformation. Concepts that are interrelated are then grouped based on common themes to form broader conceptual categories. This grouping serves as the basis for understanding the relationships between concepts that consistently emerge in various previous studies.

Next, each theme was critically analyzed to identify similarities, differences, and research gaps in the literature. The synthesis process yielded three main themes, AI as a Strategic Capability Enabler, AI-Driven Strategic Decision-Making Enhancement, and AI-Driven Sustainable Business Transformation, which then served as the basis for the research findings and discussion sections. These three themes were subsequently integrated into a conceptual framework based on the Dynamic Capabilities Theory to explain the relationship between AI, strategic decision-making, and sustainable business transformation in the manufacturing industry.

Results

AI as a Strategic Capability in the Manufacturing Industry

The results of the thematic synthesis indicate that Artificial Intelligence (AI) has undergone a significant shift in its role within the manufacturing industry. AI is no longer viewed merely as a technology used to automate operational processes but has evolved into a strategic capability that supports organizations in navigating an increasingly complex business environment. Various studies analyzed indicate that manufacturing companies are beginning to integrate AI into strategic planning, information management, and decision-making processes to enhance competitiveness and ensure business sustainability.

Most of the literature confirms that AI strengthens an organization's ability to identify opportunities and threats through the use of big data analytics, machine learning, and predictive analytics. These capabilities enable manufacturing companies to obtain faster, more accurate, and more relevant information regarding market changes, customer behavior, technological developments, and supply chain dynamics. Consequently, organizations are better equipped to proactively respond to changes in the business environment compared to conventional approaches that still rely on manual analysis.

From the perspective of Dynamic Capabilities Theory, the findings indicate that AI contributes to strengthening three key organizational capabilities: sensing, seizing, and reconfiguring. AI supports the sensing process through its ability to detect changes in the business environment in real time,

strengthens the seizing process by providing data-driven recommendations for strategy selection, and accelerates the reconfiguring process through the integration of digital technology into business processes. Therefore, AI not only improves operational efficiency but also strengthens an organization's ability to adapt and innovate continuously.

In addition to enhancing adaptability, various studies also show that AI can strengthen the integration of information across organizational functions from production, marketing, and logistics to supply chain management. This integration results in more effective coordination, enabling organizations to develop strategies based on more comprehensive, evidence-based information. Thus, AI serves as a strategic capability that enhances the quality of decision-making while also serving as the foundation for sustainable business transformation in the manufacturing industry.

AI-Driven Enhancement of Strategic Decision-Making

A synthesis of the literature indicates that AI makes a significant contribution to improving the quality of strategic decision-making in the manufacturing industry. Various studies explain that AI enables organizations to quickly process large amounts of data, identify complex patterns, and generate more accurate information compared to traditional decision-making approaches. These capabilities help management obtain a stronger information foundation for formulating business strategies capable of addressing a dynamic and changing environment.

Research findings also show that the implementation of AI through predictive analytics, machine learning, and intelligent decision support systems enhances an organization's ability to evaluate various strategic alternatives more objectively. AI can predict changes in market demand, identify potential operational risks, optimize production capacity, and simulate various business scenarios before strategic decisions are made. Thus, AI helps reduce the level of uncertainty that often poses a challenge in the decision-making process within the manufacturing industry.

In addition to improving the accuracy of analysis, AI also accelerates the decision-making process by providing real-time information. The integration of data from various business functions enables organizations to gain a comprehensive overview of both the company's internal and external conditions, thereby making interdepartmental coordination more effective. This is particularly important in the manufacturing industry, which faces shifting market demand, supply chain disruptions, and rapid technological advancements.

Further analysis indicates that AI does not replace the role of decision-makers but serves as a capability that enhances managers' analytical abilities. The combination of human intelligence and artificial intelligence results in decisions that are more objective, evidence-based, and aligned with the organization's strategic objectives. Therefore, AI is a key factor in improving the quality of strategic decision-making as the foundation for sustainable business transformation.

AI-Driven Sustainable Business Transformation

The synthesis results show that the implementation of AI not only improves the quality of decision-making but also serves as a key driver of sustainable business transformation in the manufacturing industry. Various studies confirm that AI supports business model transformation, operational process optimization, innovation, and improved resource efficiency. This transformation enables companies to create greater economic value while meeting increasingly stringent sustainability requirements.

On the operational front, AI is utilized to improve production process efficiency through automation, predictive maintenance, data-driven quality control, and the optimization of energy and raw material usage. These implementations not only boost company productivity but also reduce production waste, energy consumption, and carbon emissions. These findings demonstrate that AI plays a crucial role in supporting the achievement of sustainability goals through the adoption of more efficient and environmentally friendly production processes.

Furthermore, the findings of the study show that AI accelerates the development of both product innovations and business processes. Customer needs analysis, digital simulations, and data-driven product development enable manufacturing companies to generate innovations that are faster, more targeted, and aligned with market dynamics. At the same time, AI helps organizations integrate economic, social, and environmental aspects into their business strategies so that the transformations undertaken are not only focused on increasing profitability but also on creating long-term value for all stakeholders.

Overall, the results of the thematic synthesis indicate that the relationship between Artificial Intelligence, strategic decision-making, and sustainable business transformation is mutually reinforcing. AI serves as a strategic capability that strengthens an organization's ability to manage information, improves the quality of strategic decisions, and accelerates business transformation toward a more adaptive, innovative, and sustainable organization. These findings reinforce the view that integrating AI into organizational strategy is a key factor in building competitive advantage while achieving long-term business sustainability in the manufacturing industry.

Table 1. Summary of Thematic Synthesis Findings

Theme	Key Findings	Strategic Implications
AI as a Strategic Capability	Enhances data analytics, information integration, and organizational adaptability.	Improves responsiveness to technological change, market dynamics, and competition.
AI in Strategic Decision-Making	Supports predictive analytics, intelligent decision support, and evidence-based decision-making.	Improves decision quality, reduces uncertainty, and minimizes strategic risk.
Sustainable Business Transformation	Enhances operational efficiency, innovation, resource optimization, and sustainability integration.	Strengthens long-term competitiveness and sustainable business performance.

Discussion

AI as a Strategic Enabler in the Era of Digital Transformation

Advances in digital technology have fundamentally transformed the way organizations particularly manufacturing companies develop strategies, conduct business operations, and maintain a competitive edge in an increasingly dynamic and complex environment. Growing global competitive pressures, shifting customer preferences, and the evolution of Industry 5.0 technologies require organizations to integrate digital technology into all business processes. In this context, Artificial Intelligence (AI) has emerged as one of the key technologies that not only improves operational efficiency but also shifts the paradigm of strategic decision-making toward a more data-driven approach.

The results of the literature review indicate that AI is no longer viewed merely as an automation tool, but rather as a strategic enabler capable of strengthening an organization's ability to develop adaptive, long-term strategies. Organizations that successfully integrate AI into their business processes are better able to interpret environmental changes, identify new opportunities, and respond to threats more quickly than organizations that still rely on conventional approaches. These findings suggest that the strategic value of AI stems not only from its technological sophistication but also from its ability to generate relevant information as a basis for decision-making.

This perspective aligns with the Dynamic Capabilities Theory proposed by Teece (2007), which posits that organizations must possess the capabilities of sensing, seizing, and reconfiguring to survive in a constantly changing environment. AI strengthens sensing capabilities through real-time data analysis and pattern recognition, supports the seizing process through predictive analytics and decision support systems, and accelerates reconfiguring through business process innovation and increased

organizational flexibility. Thus, AI serves as a strategic capability that helps manufacturing companies respond to change more quickly, accurately, and evidence-based.

In addition to enhancing adaptability, AI also strengthens cross-functional information integration, making organizational coordination more effective and the decision-making process more comprehensive. This integration enables companies to build organizations that are more agile, responsive, and capable of sustaining a competitive advantage over the long term. Overall, these findings indicate that AI has shifted from being merely a supporting technology to a strategic capability that supports adaptive decision-making, strengthens competitiveness, and drives sustainable business transformation in the Industry 5.0 era.

Strategic Decision-Making in an AI-Driven Environment

The complexity of the modern business environment has made the strategic decision-making process increasingly challenging. Manufacturing companies must contend with rapid changes in market demand, fluctuations in global supply chains, technological advancements, and mounting pressure for efficiency and sustainability. Under these conditions, decision-making that relies solely on experience and intuition is no longer sufficient; organizations therefore require the support of systems capable of generating information quickly, accurately, and based on data.

A synthesis of the literature indicates that AI enhances the quality of strategic decision-making through its ability to process big data, perform predictive analytics, and generate strategic recommendations based on various business scenarios. This technology enables management to obtain more comprehensive information compared to conventional analytical methods, allowing for a more systematic evaluation of decision alternatives. In addition to accelerating the decision-making process, AI also helps reduce uncertainty by identifying hidden patterns and predicting future market changes.

AI also enables organizations to simulate various scenarios (what-if analysis) before a decision is implemented. This capability provides a strategic advantage because management can assess risks, evaluate the impact of each decision alternative, and select the strategy that yields the most optimal results. Nevertheless, the effectiveness of AI is still influenced by managers' ability to interpret the analysis results generated by the system; thus, a combination of human intelligence and artificial intelligence is the most effective approach for making high-quality strategic decisions. The practical implications of these findings are summarized in Table 2, which shows how the use of AI impacts various managerial areas in manufacturing companies.

Table 2. Managerial Implications of AI Adoption

Managerial Area	Role of AI	Organizational Impact	Strategic Implication
Strategic Decision-Making	AI-driven data analytics	Faster and more accurate decisions	Strengthening a data-driven decision-making culture
Operational Efficiency	Business process automation	Improved productivity and operational efficiency	Optimizing production processes and supply chain management
Strategic Planning	Predictive analytics	More adaptive strategies	Scenario-based planning and forecasting
Sustainability Management	ESG data analytics	Enhanced sustainability performance	Integrating sustainability into business strategy

Table 2 shows that the use of AI has an impact that goes beyond improving operational efficiency. The integration of AI also strengthens decision-making processes, improves the quality of

strategic planning, and supports the achievement of sustainability goals through more comprehensive use of data. These findings indicate that AI plays a strategic role in helping manufacturing companies build adaptive and sustainable competitive advantages amid a changing business environment.

AI and Sustainable Business Transformation in Practice

One of the main findings of this study is that Artificial Intelligence (AI) plays a crucial role in supporting sustainable business transformation within the manufacturing industry. This transformation is not solely oriented toward improving profitability but also aims to achieve a balance between economic performance, social responsibility, and environmental sustainability. In this context, AI serves as a strategic technology that enables manufacturing firms to integrate business objectives with sustainability principles.

The findings of the thematic synthesis indicate that AI implementation enhances operational efficiency through process automation, resource optimization, and the use of real-time data to identify operational inefficiencies. AI also enables organizations to monitor energy consumption, carbon emissions, and raw material utilization more accurately, allowing sustainability strategies to be developed based on objective and data-driven insights. These capabilities help manufacturing firms implement corrective actions more promptly while improving the overall effectiveness of resource management across production processes.

Beyond improving operational efficiency, AI strengthens organizational capabilities for developing sustainability-oriented innovation. Through customer needs analysis, market trend forecasting, and data-driven product development, manufacturing firms can generate innovations that not only enhance economic value but also create positive social and environmental impacts. These findings suggest that AI acts as a catalyst for developing more adaptive, innovative, and sustainable business models.

Furthermore, integrating AI into corporate strategy enables organizations to simultaneously consider economic, social, and environmental dimensions during the strategic decision-making process. This approach is consistent with the triple bottom line concept, which emphasizes balancing profit, people, and planet as the foundation for creating long-term value. Therefore, AI not only improves operational efficiency but also strengthens the implementation of sustainability strategies while supporting the development of sustainable competitive advantage for manufacturing firms.

Strategic Integration of AI, Decision-Making, and Sustainability

Based on the overall findings of the thematic synthesis, this study demonstrates that the relationship between Artificial Intelligence (AI), strategic decision-making, and sustainable business transformation forms an integrated system. AI functions as a strategic capability that enhances organizational capacity to acquire valuable information, improve the quality of strategic decisions, and drive business transformation toward sustainability. This integration indicates that the strategic value of AI extends beyond operational functions by connecting data analysis, decision-making, and strategy implementation within a continuous and coordinated process.

The findings also align with the Dynamic Capabilities Theory, suggesting that AI strengthens organizations' capabilities for sensing, seizing, and reconfiguring. These capabilities enable manufacturing firms to respond more effectively to changing business environments while enhancing their long-term innovation capacity. Consequently, AI serves as a strategic mechanism that supports manufacturing firms in sustaining competitive advantage while achieving sustainability objectives in the Industry 5.0 era.

The conceptual framework derived from this study is presented in Table 3, illustrating the relationships among the dimensions of dynamic capabilities, the strategic roles of AI, the underlying mechanisms, and the resulting strategic outcomes. The framework demonstrates how AI supports each dimension of dynamic capabilities through data analytics, intelligent decision support systems, and

business process transformation. Accordingly, this framework provides a comprehensive conceptual explanation of the mechanisms through which AI enhances strategic decision-making and facilitates sustainable business transformation in the manufacturing industry.

Table 3. AI Strategic Capability Framework

Capability Dimension	Role of AI	Key Mechanisms	Strategic Impact
Sensing	Identifying environmental changes	Real-time analytics, pattern recognition, anomaly detection	Faster response to opportunities and threats
Seizing	Supporting strategic decision-making	Predictive analytics, decision support system, scenario analysis	More accurate and data-driven decisions
Reconfiguring	Supporting organizational transformation	Process automation, AI integration, digital optimization	Sustainable competitive advantage and long-term sustainability

Table 3 illustrates that AI functions as a bridging mechanism connecting an organization's ability to sense environmental changes, formulate strategic decisions, and implement sustainable business transformation. These findings reinforce the view that AI should be regarded not merely as a supporting technology but as a strategic capability that serves as a fundamental driver of competitive advantage in the manufacturing industry. In addition to contributing theoretically by integrating Artificial Intelligence, Strategic Decision-Making, Dynamic Capabilities Theory, and Sustainable Business Transformation into a unified conceptual framework, this study also provides practical implications for organizations in designing more adaptive and sustainable digital transformation strategies.

Conclusion

This study demonstrates that Artificial Intelligence (AI) plays a strategic role in enhancing strategic decision-making and sustainable business transformation within the manufacturing industry. Using a Systematic Literature Review (SLR) approach combined with thematic synthesis, the study reveals that AI has evolved beyond its traditional role as an operational support technology to become a strategic capability that strengthens organizational responsiveness to increasingly complex, competitive, and uncertain business environments. This shift highlights that AI implementation has become an integral component of organizational strategy for achieving sustainable competitive advantage.

The findings indicate that AI significantly improves the quality of strategic decision-making through advanced data analytics, predictive analytics, real-time information processing, and intelligent decision support systems. These capabilities enable manufacturing firms to make faster, more accurate, objective, and evidence-based decisions, thereby enhancing the effectiveness of strategic planning, reducing uncertainty, and strengthening organizational capabilities to anticipate changes in the business environment.

Beyond improving decision-making quality, AI also plays a crucial role in facilitating sustainable business transformation. The integration of AI into business processes enables manufacturing firms to enhance operational efficiency, optimize resource utilization, accelerate innovation, and incorporate economic, social, and environmental considerations into organizational strategies. Consequently, AI contributes not only to higher productivity and organizational performance but also to the development of more adaptive, responsible, and sustainability-oriented business models.

From a theoretical perspective, this study reinforces the relevance of Dynamic Capabilities Theory in explaining how AI enhances organizations' capabilities for sensing, seizing, and reconfiguring

in response to dynamic business environments. The study also contributes conceptually by integrating Artificial Intelligence, strategic decision-making, and sustainable business transformation into a comprehensive conceptual framework. From a practical perspective, the findings suggest that the successful implementation of AI depends not only on technology adoption but also on organizations' ability to integrate AI into strategic decision-making processes, business strategies, human resource development, and organizational cultures that foster innovation and continuous learning.

Nevertheless, this study has several limitations. First, it employs a conceptual approach based on a Systematic Literature Review, without empirically testing the proposed relationships among the identified constructs. Second, the analysis focuses exclusively on the manufacturing industry, limiting the generalizability of the findings to other industrial sectors. Therefore, future research is encouraged to empirically validate the proposed conceptual framework using quantitative, qualitative, or mixed-methods approaches, while extending the investigation to different industries to provide a more comprehensive understanding of the role of AI in supporting strategic decision-making and sustainable business transformation.

Recommendations

Based on the findings of this study, several strategic recommendations can be proposed for manufacturing firms to optimize the use of Artificial Intelligence (AI) in enhancing strategic decision-making and promoting sustainable business transformation. Manufacturing firms should integrate AI into strategic decision-making processes rather than limiting its application to operational automation. AI should be utilized to support predictive analytics, risk assessment, scenario planning, and intelligent decision support systems, enabling managers to make faster, more accurate, and evidence-based strategic decisions.

In addition, organizations should strengthen their data capabilities and digital infrastructure by developing integrated data management systems, improving data governance, and adopting advanced analytical technologies capable of generating reliable and relevant information. Manufacturing firms should also invest in developing AI literacy, data analytics capabilities, and digital competencies among managers and decision-makers to maximize the synergy between human expertise and AI-driven analytical capabilities, thereby improving the quality of strategic decision-making.

Furthermore, AI should be strategically integrated into sustainable business transformation initiatives by improving operational efficiency, optimizing resource utilization, reducing production waste, enhancing energy efficiency, and strengthening Environmental, Social, and Governance (ESG) practices. Organizations are also encouraged to establish a comprehensive AI governance framework to ensure that AI implementation is ethical, transparent, secure, and compliant with relevant regulations while minimizing algorithmic bias and protecting data security. Finally, manufacturing firms should strengthen collaboration with technology providers, higher education institutions, research organizations, and government agencies to accelerate AI-driven innovation, facilitate knowledge transfer, and support sustainable digital transformation across the manufacturing sector.

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References

Abdel-Basset, M., Mohamed, R., & Chang, V. (2025). A Multi-Criteria Decision-Making Framework to Evaluate the Impact of Industry 5.0 Technologies: Case Study, Lessons Learned, Challenges and Future Directions. *Information Systems Frontiers*, *27*(2), 791–821. https://doi.org/10.1007/s10796-024-10472-3

Abdullah, F. M., Al-Ahmari, A. M., & Anwar, S. (2023). A Hybrid Fuzzy Multi-Criteria Decision-Making Model for Evaluating the Influence of Industry 4.0 Technologies on Manufacturing Strategies. *Machines*, *11*(2). https://doi.org/10.3390/machines11020310

Bican, P. M., & Brem, A. (2020). Digital Business Model, Digital Transformation, Digital Entrepreneurship: Is there a sustainable "digital"? *Sustainability (Switzerland)*, *12*(13). https://doi.org/10.3390/su12135239

Bruzzone, A., Massei, M., & Sinelshnkov, K. (2020). Enabling strategic decisions for the industry of tomorrow. *Procedia Manufacturing*, *42*, 548–553. https://doi.org/10.1016/j.promfg.2020.02.028

Elbasheer, M., Longo, F., Nicoletti, L., Padovano, A., Solina, V., & Vetrano, M. (2022). Applications of ML/AI for Decision-Intensive Tasks in Production Planning and Control. *Procedia Computer Science*, *200*, 1903–1912. https://doi.org/10.1016/j.procs.2022.01.391

Ellström, D., Holtström, J., Berg, E., & Josefsson, C. (2022). Dynamic capabilities for digital transformation. *Journal of Strategy and Management*, *15*(2), 272–286. https://doi.org/10.1108/JSMA-04-2021-0089

Khan, C. N., & Kribs, J. D. (2026). Data-Driven Analytics in Smart Manufacturing: A Review of Methods, Applications, and Adoption Constraints. In *International Journal of Advanced Manufacturing Technology*. Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/s00170-026-17610-y

Konopik, J., Jahn, C., Schuster, T., Hoßbach, N., & Pflaum, A. (2022). Mastering the digital transformation through organizational capabilities: A conceptual framework. *Digital Business*, *2*(2). https://doi.org/10.1016/j.digbus.2021.100019

Leng, J., Zhu, X., Huang, Z., Li, X., Zheng, P., Zhou, X., Mourtzis, D., Wang, B., Qi, Q., Shao, H., Wan, J., Chen, X., Wang, L., & Liu, Q. (2024). Unlocking the power of industrial artificial intelligence towards Industry 5.0: Insights, pathways, and challenges. In *Journal of Manufacturing Systems* (Vol. 73, pp. 349–363). Elsevier B.V. https://doi.org/10.1016/j.jmsy.2024.02.010

Lorenz, R., Kraus, M., Wolf, H., Feuerriegel, S., & Netland, T. H. (2024). Selecting advanced analytics in manufacturing: a decision support model. *Production Planning and Control*, *35*(7), 711–724. https://doi.org/10.1080/09537287.2022.2126951

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

Oluyisola, O. E., Bhalla, S., Sgarbossa, F., & Strandhagen, J. O. (2022). Designing and developing smart production planning and control systems in the industry 4.0 era: a methodology and case study. *Journal of Intelligent Manufacturing*, *33*(1), 311–332. https://doi.org/10.1007/s10845-021-01808-w

Qiu, X., Holmen, E., Havenvid, M., De Boer, L., & Hermundsdottir, F. (2022). Open for business: Towards an interactive view on dynamic capabilities. *Industrial Marketing Management*, *107*, 148–160. https://doi.org/10.1016/j.indmarman.2022.09.027

Sadraei, R., J. Sadeghi, V., Marvi, R., & Yoruk, E. (2025). Strategic Adaptation in a Dynamic Global Environment: Unleashing the Power of Dynamic Capabilities for International Organizational Performance. In *Strategic Change*. John Wiley and Sons Inc. https://doi.org/10.1002/jsc.2675

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, *28*(13), 1319–1350. https://doi.org/10.1002/smj.640

Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Qi Dong, J., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*, *122*, 889–901. https://doi.org/10.1016/j.jbusres.2019.09.022

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. In *Journal of Strategic Information Systems* (Vol. 28, Number 2, pp. 118–144). Elsevier B.V. https://doi.org/10.1016/j.jsis.2019.01.003

Yang, T., Yi, X., Lu, S., Johansson, K. H., & Chai, T. (2021). Intelligent Manufacturing for the Process Industry Driven by Industrial Artificial Intelligence. *Engineering*, *7*(9), 1224–1230. https://doi.org/10.1016/j.eng.2021.04.023