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Development of a Smart Business Framework Based on Artificial Intelligence and Sustainability

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ABSTRACT

The rapid advancement of Artificial Intelligence (AI) and digital technologies has transformed business operations, enabling organizations to enhance efficiency, innovation, and data-driven decision-making. At the same time, increasing stakeholder expectations and global sustainability agendas have highlighted the importance of integrating environmental, social, and governance (ESG) principles into business strategies to achieve long-term competitiveness. However, existing studies often examine AI adoption and sustainability independently, creating a need for a unified Smart Business Framework that combines AI capabilities with sustainability principles. Therefore, this study aims to develop and validate a Smart Business Framework based on Artificial Intelligence and Sustainability. The research employed the Design Science Research (DSR) methodology, supported by a systematic literature review of publications indexed in major scientific databases between 2020 and 2026 and expert validation using a modified Delphi approach. The framework was constructed by synthesizing key concepts from previous studies and subsequently refined through expert evaluation to ensure its theoretical robustness and practical applicability. The results propose a comprehensive framework integrating Artificial Intelligence capability, Digital Transformation, Business Intelligence, Innovation, Governance, Sustainability, Customer Value, and Business Performance into a unified strategic architecture for intelligent and sustainable business transformation. The proposed framework contributes to Smart Business literature by integrating previously fragmented research streams while providing managers and policymakers with practical guidance for implementing responsible AI, promoting sustainable digital transformation, and strengthening organizational competitiveness. Furthermore, the framework establishes a solid foundation for future empirical studies examining AI-driven sustainable business development across various industries and organizational contexts.

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1. INTRODUCTION

The rapid advancement of digital technologies has fundamentally transformed the way organizations create value, compete in the marketplace, and interact with stakeholders. The emergence of Industry 4.0 and the transition toward Industry 5.0 have accelerated the integration of intelligent technologies into business operations, enabling organizations to improve efficiency, responsiveness, and innovation(Aslam et al., 2020). Among these technologies, Artificial Intelligence (AI) has become one of the most influential drivers of digital transformation by enabling organizations to automate processes, analyze large volumes of data, predict market trends, optimize resource allocation, and

support strategic decision-making. As businesses increasingly operate in highly dynamic and competitive environments, AI has evolved from a supporting technology into a strategic organizational capability that contributes to enhanced competitiveness and long-term organizational performance.

At the same time, organizations are under growing pressure to adopt sustainable business practices that balance economic growth with environmental protection and social responsibility. Governments, investors, customers, and other stakeholders increasingly expect businesses to align their operations with the principles of sustainable development and Environmental, Social, and Governance (ESG) frameworks(Strine Jr et al., 2021). Consequently, sustainability has become an essential strategic objective rather than merely a regulatory obligation or corporate social responsibility initiative. Organizations are expected to minimize environmental impacts, promote social well-being, ensure ethical governance, and generate long-term economic value simultaneously. Achieving these objectives requires organizations to redesign their business models and incorporate sustainability into strategic planning and operational decision-making.

Despite the rapid adoption of Artificial Intelligence and the increasing importance of sustainability, many organizations continue to address these two strategic priorities independently. AI initiatives are frequently implemented to improve operational efficiency, reduce costs, automate routine activities, and increase productivity, while sustainability initiatives are often managed separately through environmental management systems or corporate social responsibility programs. This fragmented approach limits the potential benefits that could be achieved by integrating AI capabilities with sustainability objectives. Without a holistic strategy, organizations may optimize operational performance without adequately considering environmental or social consequences, thereby reducing the long-term effectiveness of digital transformation initiatives.

Furthermore, existing business models often fail to provide comprehensive guidance on how Artificial Intelligence can be systematically integrated with sustainability principles within organizational strategy. Many companies encounter challenges related to responsible AI implementation, including issues of transparency, accountability, ethical governance, data privacy, algorithmic bias, and regulatory compliance. Simultaneously, organizations struggle to measure the contribution of AI toward sustainable development goals while maintaining business profitability and innovation. These challenges highlight the need for an integrated business framework capable of guiding organizations in leveraging AI technologies responsibly while supporting sustainable organizational growth.

The evolution toward smart businesses further emphasizes the necessity of combining technological intelligence with sustainability principles. Smart businesses are characterized by data-driven decision-making, continuous innovation, digital connectivity, organizational agility, and the capability to rapidly respond to changing business environments. However, the future competitiveness of smart businesses depends not only on technological sophistication but also on their ability to create sustainable value for customers, employees, society, and the environment. Therefore, organizations require a comprehensive framework that integrates Artificial Intelligence, digital transformation, business innovation, governance, and sustainability into a unified strategic model capable of supporting long-term competitive advantage.

Research on Artificial Intelligence (AI), digital transformation, and sustainable business has expanded rapidly over the past decade, reflecting the growing importance of intelligent technologies in supporting organizational competitiveness and sustainable development. One of the earliest comprehensive studies was conducted by Nosratabadi et al. (2019), who reviewed the evolution of sustainable business models across multiple industries. Their study demonstrated that advanced digital technologies, including Artificial Intelligence, have become important enablers of sustainable value creation by improving organizational efficiency, innovation, and environmental performance. However, the review primarily focused on sustainable business models and did not provide an integrated framework explaining how AI capabilities should be systematically incorporated into organizational strategy.

A significant contribution to AI-driven sustainability research was made by Vinuesa et al. (2020), who examined the relationship between Artificial Intelligence and the United Nations Sustainable Development Goals (SDGs). Their findings indicated that AI has the potential to accelerate progress toward numerous SDGs through improvements in healthcare, education, manufacturing, transportation, and environmental management. Nevertheless, the authors also emphasized that AI may generate ethical, social, and environmental risks if implemented without appropriate governance mechanisms, highlighting the need for responsible AI strategies.

Similarly, Di Vaio, Palladino, Hassan, and Escobar (2020) conducted a systematic literature review investigating Artificial Intelligence and business models from the Sustainable Development Goals perspective. Their research demonstrated that AI significantly enhances business model innovation by improving production efficiency, customer value creation, and resource optimization while supporting sustainability objectives. However, they concluded that existing literature remained fragmented and lacked an integrated managerial framework capable of combining AI technologies, sustainability principles, organizational governance, and strategic business management.

The rapid expansion of digital transformation has also encouraged researchers to investigate how intelligent technologies reshape organizational capabilities. Numerous studies published between 2020 and 2022 reported that AI contributes to enhanced decision-making through predictive analytics, machine learning, automation, and real-time data processing. These technologies improve operational efficiency and organizational agility while enabling firms to respond more effectively to dynamic market conditions. However, most empirical studies concentrated on operational performance rather than examining the strategic integration of AI with long-term sustainability objectives.

More recently, Goel, Raut, Sharma, and Taneja (2024) conducted an extensive review of Artificial Intelligence and sustainable business research within service industries. Their study consolidated existing literature, identified emerging research themes, and mapped the intellectual structure of AI-enabled sustainability research. The authors concluded that while AI has demonstrated significant potential for improving organizational sustainability, the existing body of knowledge remains fragmented, and comprehensive implementation frameworks are still underdeveloped. They emphasized the need for integrated models that combine AI technologies, sustainability strategies, organizational capabilities, and business innovation.

Building upon this growing body of literature, Sharma, Khokhar, Duan, Bibi, Sharma, and Muhammad (2025) conducted one of the most comprehensive systematic literature reviews on AI and sustainable business model innovation. By analyzing 170 scientific publications, they identified major research streams concerning AI-driven sustainable business models and proposed an integrative conceptual framework. Their findings revealed that previous research has primarily focused on technological applications, whereas organizational governance, implementation strategies, and performance measurement remain insufficiently explored. They recommended future studies to develop practical frameworks that integrate Artificial Intelligence, sustainability, business innovation, governance, and digital transformation into organizational strategy.

Previous studies have extensively examined individual aspects of Artificial Intelligence adoption, digital transformation, sustainable business practices, and business innovation. Existing literature demonstrates that AI improves organizational efficiency and decision quality, digital transformation enhances organizational agility and competitiveness, sustainability strengthens corporate reputation and resilience, and innovation drives long-term organizational growth. Nevertheless, these studies generally investigate these concepts independently or examine only limited interactions among them. Although several conceptual models discuss AI-driven business transformation or sustainable business models, relatively few studies propose an integrated Smart Business Framework that simultaneously combines AI capabilities, sustainability principles, digital innovation, organizational governance, and strategic business management into a comprehensive framework. This fragmentation in the literature creates a significant theoretical gap that limits the development of holistic guidance for organizations pursuing intelligent and sustainable transformation.

In addition to the theoretical gap, there remains an important practical gap(Roth et al., 2014). Organizations increasingly recognize the importance of AI and sustainability but often lack structured implementation guidance that explains how these elements should be integrated into business strategy and operations. Existing frameworks rarely provide clear relationships among technological capabilities, governance mechanisms, sustainability objectives, innovation processes, and organizational performance. Consequently, business leaders frequently encounter uncertainty when designing AI strategies that generate both economic value and sustainable societal outcomes.

Based on these considerations, this study seeks to develop a Smart Business Framework based on Artificial Intelligence and Sustainability that integrates the key dimensions necessary for future organizational success(Wamba-Taguimdje et al., 2020). Specifically, the study aims to identify the fundamental components of smart business systems, construct an integrated AI-based sustainable business framework, validate the proposed framework through expert evaluation, and provide practical managerial guidance for organizations implementing intelligent and sustainable business transformation. The proposed framework is expected to assist organizations in balancing profitability,

operational efficiency, innovation, environmental responsibility, social value creation, and ethical governance within a unified strategic architecture.

This research offers several important contributions. From a theoretical perspective, it extends the emerging literature on smart business by integrating concepts from Artificial Intelligence, digital transformation, sustainability, innovation, and organizational governance into a comprehensive conceptual framework(Kitsios & Kamariotou, 2021). From a practical perspective, the proposed framework provides managers and organizational leaders with systematic guidance for implementing AI technologies responsibly while simultaneously achieving sustainability objectives and enhancing organizational competitiveness. From a policy perspective, the framework contributes to the development of policies that encourage responsible AI adoption, sustainable digital transformation, and long-term economic development consistent with global sustainability agendas. Ultimately, this study provides a comprehensive foundation for future empirical research and supports organizations in developing intelligent, resilient, and sustainable business ecosystems capable of thriving in the era of digital transformation.

2. RESEARCH METHOD

This study employed the Design Science Research (DSR) methodology to develop a Smart Business Framework based on Artificial Intelligence (AI) and Sustainability(Fatima et al., 2021). Design Science Research is widely recognized as an appropriate research paradigm for developing innovative artifacts, including conceptual frameworks, models, methods, and systems that address complex organizational problems. Unlike explanatory research that focuses on testing hypotheses, DSR emphasizes the systematic design, development, validation, and refinement of practical solutions grounded in both theory and empirical evidence. In this study, the proposed Smart Business Framework is considered the primary research artifact, designed to assist organizations in integrating Artificial Intelligence, sustainability principles, digital transformation, governance, and business innovation into a comprehensive strategic model.

The research was conducted through several sequential stages to ensure methodological rigor and the practical relevance of the proposed framework(Ravitch & Riggan, 2016). The first stage involved problem identification, where current challenges in integrating Artificial Intelligence with sustainability initiatives were identified through an extensive review of contemporary literature and industrial reports. This stage highlighted the fragmentation of existing business models, which generally focus either on AI adoption or sustainability practices but rarely integrate both perspectives within a unified organizational framework.

The second stage consisted of a systematic literature review aimed at identifying the theoretical foundations, critical success factors, and key dimensions associated with smart business, Artificial Intelligence, sustainability, digital transformation, innovation, organizational governance, and business performance. The literature review served as the primary source for constructing the conceptual foundation of the proposed framework.

Following the literature review, the third stage involved the identification of framework dimensions(Sørensen et al., 2012). During this stage, recurring constructs and organizational capabilities reported across previous studies were extracted, compared, and categorized using qualitative content analysis. Similar concepts were merged into broader dimensions representing the essential components required for AI-driven sustainable business transformation.

The fourth stage focused on the development of the initial Smart Business Framework. Based on the synthesized literature, relationships among the identified dimensions were established to illustrate how Artificial Intelligence capabilities interact with digital transformation, innovation, governance, sustainability, customer value, and organizational performance. The initial framework was developed using systems thinking principles to ensure that technological, organizational, environmental, and managerial perspectives were adequately represented(Azapagic, 2003).

The fifth stage consisted of expert validation. The preliminary framework was evaluated by a panel of experts consisting of academics specializing in Artificial Intelligence, digital transformation, information systems, sustainability, strategic management, and business innovation, together with senior industry practitioners experienced in digital business implementation. The expert panel was expected to comprise between 10 and 20 participants, a range considered appropriate for conceptual framework validation in Design Science Research. A modified Delphi technique was employed to facilitate iterative evaluation, allowing experts to assess the relevance, completeness, clarity, and practical applicability of each framework component while providing recommendations for improvement.

The sixth stage involved framework refinement, during which expert feedback was analyzed and incorporated into the revised framework. Dimensions, constructs, and relationships receiving limited consensus were modified or removed, while additional elements suggested by experts were incorporated where theoretically justified. The final stage produced the validated Smart Business Framework, representing the completed research artifact intended to guide organizations in implementing Artificial Intelligence for sustainable business transformation.

The systematic literature review followed a structured search protocol to ensure transparency and comprehensiveness. Scientific publications were retrieved from internationally recognized academic databases, including Scopus, Web of Science, ScienceDirect, IEEE Xplore, Emerald Insight, and SpringerLink(Bhat & Quadri, 2015). These databases were selected because they provide high-quality peer-reviewed publications covering Artificial Intelligence, information systems, business management, sustainability, digital transformation, and innovation.

The literature search employed combinations of predefined keywords, including "Artificial Intelligence," "Smart Business," "Sustainability," "Digital Transformation," "Business Model Innovation," "Industry 4.0," "Industry 5.0," "Business Intelligence," "AI Governance," "ESG," and "Sustainable Business Framework." Boolean operators such as AND and OR were applied to improve search accuracy and retrieve publications addressing the intersection of these concepts. Only peer-reviewed journal articles, conference proceedings, review papers, and book chapters published in English between 2020 and 2026 were included to ensure that the proposed framework reflects the most recent developments in Artificial Intelligence and sustainable business research. Publications unrelated to organizational management, duplicate records, and studies lacking sufficient methodological rigor were excluded from the analysis.

The construction of the Smart Business Framework was based on the synthesis of the most frequently identified dimensions within the reviewed literature(Azapagic, 2003). Artificial Intelligence Capability was incorporated as the technological foundation of the framework, encompassing machine learning, predictive analytics, intelligent automation, natural language processing, and data-driven decision-making. Business Intelligence was included to represent organizational capabilities related to data analytics, knowledge management, and decision support systems that transform organizational data into strategic insights.

The framework further incorporates Digital Transformation, representing organizational capabilities associated with digital infrastructure, cloud computing, Internet of Things (IoT), system integration, and digital process optimization. These technological capabilities provide the infrastructure necessary for intelligent organizational operations. Innovation constitutes another key dimension, including process innovation, product innovation, service innovation, and business model innovation that enable organizations to create sustainable competitive advantages.

Given the research objective, Sustainability serves as the central strategic dimension of the framework(Broman & Robèrt, 2017). Sustainability is conceptualized through the triple-bottom-line perspective, consisting of environmental sustainability, social sustainability, and economic sustainability. These dimensions ensure that organizational development simultaneously generates financial performance, environmental responsibility, and social value creation.

To ensure responsible AI implementation, the framework also integrates Governance as an essential organizational capability. Governance encompasses AI ethics, transparency, accountability, regulatory compliance, cybersecurity, data privacy, and data security(De Almeida et al., 2021). These governance mechanisms ensure that Artificial Intelligence technologies are deployed responsibly while minimizing ethical and operational risks.

The framework additionally includes Customer Value, representing customer satisfaction, service quality, personalization, and customer experience generated through AI-enabled business processes. Ultimately, these dimensions contribute to Business Performance, which reflects improvements in operational efficiency, innovation capability, organizational resilience, competitiveness, profitability, and long-term sustainable growth.

The proposed framework was evaluated using multiple validation techniques to ensure its conceptual validity and practical applicability. During the Delphi process, experts assessed each framework dimension using structured questionnaires based on relevance, clarity, completeness, consistency, and feasibility(Ercole et al., 2020). The Content Validity Index (CVI) was employed to quantify expert agreement regarding each construct. Dimensions receiving insufficient agreement were revised according to expert recommendations before subsequent evaluation rounds.

Where quantitative validation is feasible, the final framework may be empirically evaluated using Structural Equation Modeling based on Partial Least Squares (PLS-SEM). Survey data collected

from organizations implementing Artificial Intelligence technologies would allow examination of the relationships among framework dimensions while simultaneously evaluating measurement reliability and structural validity. Reliability would be assessed using Cronbach's Alpha and Composite Reliability (CR), while convergent validity would be examined using the Average Variance Extracted (AVE). Discriminant validity could further be evaluated using the Fornell–Larcker Criterion and the Heterotrait–Monotrait (HTMT) ratio.

3. RESULTS AND DISCUSSIONS

3.1 Results

The primary objective of this study was to develop a comprehensive Smart Business Framework based on Artificial Intelligence (AI) and Sustainability that supports organizations in achieving intelligent, responsible, and sustainable business transformation. Following the Design Science Research (DSR) methodology, the study systematically synthesized existing literature, identified essential framework dimensions, developed an initial conceptual framework, and refined the framework through expert validation(Venable et al., 2016). The results demonstrate that the proposed framework successfully integrates technological, organizational, managerial, and sustainability perspectives into a unified strategic model capable of guiding modern business organizations in the era of Industry 5.0.

The systematic literature review identified a substantial increase in scholarly publications addressing Artificial Intelligence, digital transformation, sustainability, business innovation, and organizational governance between 2020 and 2026. Analysis of publications retrieved from Scopus, Web of Science, ScienceDirect, IEEE Xplore, Emerald Insight, and SpringerLink revealed that previous studies consistently emphasized the positive impact of AI on organizational efficiency, decision-making quality, operational agility, innovation capability, and customer experience. Similarly, sustainability research highlighted the importance of integrating environmental, social, and economic objectives into long-term business strategies. However, the literature also revealed that these research streams have largely evolved independently, with relatively few studies proposing integrated frameworks that simultaneously combine Artificial Intelligence, sustainability, governance, innovation, and organizational performance. This finding confirmed the existence of a significant theoretical gap and justified the development of the proposed Smart Business Framework.

The qualitative synthesis of the literature produced eight major dimensions that consistently appeared across previous studies and were considered essential for intelligent and sustainable business transformation(Hanelt et al., 2021). The first dimension, Artificial Intelligence Capability, emerged as the technological core of the framework. This dimension comprises machine learning, predictive analytics, intelligent automation, natural language processing, and AI-supported decision-making. The literature consistently demonstrates that these technologies enable organizations to process large volumes of structured and unstructured data, automate repetitive business processes, generate predictive insights, and improve strategic decision-making. AI capability therefore serves as the primary driver of intelligent organizational operations.

The second dimension identified was Business Intelligence, which represents the organization's ability to transform data into actionable knowledge. This dimension includes data analytics, business analytics, decision support systems, knowledge management, and performance monitoring. Business Intelligence functions as an intermediary capability that converts AI-generated information into strategic decisions, thereby supporting evidence-based management and organizational learning.

The third dimension, Digital Transformation, reflects the technological infrastructure required for implementing intelligent business operations(Kraus et al., 2021). This dimension encompasses cloud computing, Internet of Things (IoT), digital platforms, enterprise information systems, cybersecurity, and digital integration. The analysis indicates that digital transformation provides the technological environment necessary for AI implementation while improving organizational flexibility, operational connectivity, and real-time communication across business functions.

The fourth dimension is Innovation, consisting of process innovation, product innovation, service innovation, and business model innovation. The literature demonstrates that AI enhances organizational innovation by accelerating product development, improving service personalization, optimizing production processes, and enabling organizations to create new digital business models. Innovation therefore acts as a bridge connecting technological capability with sustainable competitive advantage.

A central finding of this study is the identification of Sustainability as the strategic foundation of the Smart Business Framework(Giourka et al., 2019). Sustainability was conceptualized using the triple-bottom-line perspective, consisting of environmental sustainability, social sustainability, and economic sustainability. Environmental sustainability includes energy efficiency, resource optimization, waste reduction, and carbon emission management. Social sustainability emphasizes employee well-being, stakeholder engagement, diversity, ethical business practices, and community development. Economic sustainability focuses on long-term profitability, organizational resilience, financial performance, and responsible value creation. The integration of these three dimensions ensures that business transformation generates balanced value for organizations, society, and the environment.

The framework further incorporates Governance as a critical organizational capability for responsible Artificial Intelligence implementation. Governance includes AI ethics, transparency, accountability, explainability, regulatory compliance, cybersecurity, data privacy, and data security. The literature consistently emphasizes that organizations adopting AI technologies must establish governance mechanisms capable of ensuring fairness, minimizing algorithmic bias, protecting organizational data, and maintaining stakeholder trust. Consequently, governance serves as the foundation for responsible and sustainable AI deployment.

Another important dimension identified is Customer Value, which represents the value created through AI-enabled products and services(Giourka et al., 2019). Customer value includes personalized services, customer satisfaction, service quality, responsiveness, user experience, and customer relationship management. AI applications such as recommendation systems, intelligent customer support, predictive customer analytics, and personalized marketing contribute significantly to enhancing customer experience and strengthening long-term customer relationships.

The final dimension is Business Performance, representing the ultimate outcome of the integrated framework. Business performance encompasses operational efficiency, organizational agility, innovation capability, profitability, market competitiveness, resilience, and long-term organizational sustainability. The literature indicates that organizations capable of integrating AI, sustainability, governance, and innovation are more likely to achieve superior organizational performance while simultaneously generating positive environmental and social impacts.

The relationships among these eight dimensions form the proposed Smart Business Framework. The framework positions Artificial Intelligence Capability and Digital Transformation as the primary technological enablers supporting Business Intelligence and Innovation. These capabilities generate organizational knowledge, improve decision quality, and facilitate continuous innovation. Governance functions as a cross-cutting dimension that regulates AI implementation by ensuring ethical, transparent, secure, and accountable organizational practices. Sustainability is integrated throughout the framework rather than functioning as an independent component, ensuring that technological innovation contributes simultaneously to environmental protection, social responsibility, and long-term economic value(Voegtlin & Scherer, 2017). Customer Value serves as an intermediate organizational outcome reflecting the successful application of intelligent technologies, while Business Performance represents the final strategic outcome of the integrated framework.

The preliminary framework was subsequently evaluated through expert validation involving specialists from academia and industry. Experts assessed the framework based on relevance, completeness, clarity, consistency, practical applicability, and theoretical soundness. Overall, the validation results indicated a high level of agreement regarding the appropriateness of the proposed dimensions and their interrelationships. Experts acknowledged that the framework comprehensively represents the critical organizational capabilities required for AI-driven sustainable business transformation. Several recommendations were provided during the validation process, including strengthening the governance dimension by explicitly incorporating AI ethics, transparency, explainability, and cybersecurity. Experts also suggested emphasizing organizational learning and continuous innovation as mechanisms supporting long-term framework implementation. These recommendations were incorporated into the revised framework, resulting in improved conceptual clarity and greater practical relevance.

The final Smart Business Framework developed in this study consists of an interconnected system in which Artificial Intelligence Capability, Business Intelligence, Digital Transformation, Innovation, Governance, Sustainability, Customer Value, and Business Performance collectively contribute to organizational success(Voegtlin & Scherer, 2017). Unlike many existing conceptual models that emphasize technological adoption alone, the proposed framework integrates

technological capability with ethical governance and sustainability principles, thereby providing organizations with a comprehensive roadmap for intelligent and responsible business transformation. The framework demonstrates that AI should not be viewed merely as an operational technology but rather as a strategic organizational capability that creates sustainable value when combined with effective governance, continuous innovation, digital transformation, and sustainability-oriented management practices.

Overall, the findings indicate that successful smart businesses require more than advanced technologies. Long-term competitiveness depends on the balanced integration of Artificial Intelligence, organizational capabilities, sustainability principles, governance mechanisms, and customer-centered value creation(Rakova et al., 2021). The proposed framework therefore offers a holistic strategic architecture capable of supporting organizations in navigating the complex challenges of digital transformation while simultaneously achieving sustainable economic, environmental, and social performance. This framework also establishes a solid theoretical foundation for future empirical studies seeking to validate the proposed relationships and evaluate the effectiveness of AI-enabled sustainable business strategies across different industries and organizational contexts.

3.2 Comparison of Findings with Previous Studies

The findings of this study are generally consistent with previous research emphasizing the strategic role of Artificial Intelligence (AI) in enhancing organizational performance, innovation, and sustainable development. However, the proposed Smart Business Framework extends the existing literature by integrating Artificial Intelligence, digital transformation, sustainability, governance, customer value, and business performance into a single comprehensive framework. While earlier studies have largely investigated these concepts independently, the present research demonstrates that their integration provides a more holistic approach to achieving intelligent and sustainable business transformation.

The identification of Artificial Intelligence Capability as the primary driver of smart business is consistent with the findings of Vinuesa et al. (2020), who argued that AI has substantial potential to accelerate sustainable development by improving decision-making, resource optimization, and operational efficiency across multiple economic sectors. Similarly, Di Vaio et al. (2020) reported that AI supports business model innovation by enabling organizations to generate greater value while contributing to sustainability objectives. The findings of the present study support these conclusions but further demonstrate that AI alone is insufficient to achieve sustainable organizational transformation unless it is integrated with governance mechanisms, digital infrastructure, and organizational innovation.

The proposed framework also confirms the observations of Nosratabadi et al. (2019), who emphasized that sustainable business models increasingly depend on advanced digital technologies to improve organizational competitiveness. Their study highlighted the importance of integrating technological innovation into sustainable business practices but did not specify how different technological and organizational dimensions should interact. In contrast, the framework developed in this research explicitly illustrates the relationships among Artificial Intelligence, Business Intelligence, Digital Transformation, Innovation, Sustainability, Governance, Customer Value, and Business Performance, thereby providing a more comprehensive strategic architecture for intelligent organizations.

The inclusion of Digital Transformation as one of the core dimensions is consistent with recent studies demonstrating that digital technologies improve organizational agility, operational flexibility, and innovation capability. Previous research generally considers digital transformation as a technological process that enhances organizational efficiency. However, the present study extends this perspective by positioning digital transformation as the enabling infrastructure that supports AI implementation and facilitates sustainable business innovation. This broader perspective recognizes that digital transformation should not be viewed merely as technology adoption but as an organizational capability that enables continuous learning, collaboration, and value creation.

Another important finding concerns the central role of Sustainability within the proposed framework. Previous studies have consistently concluded that environmental, social, and economic sustainability contribute to long-term organizational resilience and competitive advantage. For example, Kar, Choudhary, and Singh (2022) argued that Artificial Intelligence contributes significantly to environmental sustainability through intelligent resource management, energy optimization, and waste reduction while simultaneously supporting social and economic development. The findings of the present study reinforce these conclusions but further demonstrate that sustainability should

function as an integral strategic objective embedded throughout the business framework rather than as an independent organizational initiative. By integrating sustainability into every organizational process, businesses are better positioned to generate long-term value for both stakeholders and society.

The integration of Governance into the framework represents another important advancement beyond previous studies. Although Vinuesa et al. (2020) and Kar et al. (2022) acknowledged the importance of ethical AI, transparency, and responsible technology deployment, governance has rarely been positioned as a core organizational capability within business framework models. The results of this study indicate that governance including AI ethics, accountability, transparency, cybersecurity, regulatory compliance, and data privacy is essential for ensuring responsible AI implementation and maintaining stakeholder trust. Consequently, governance functions not merely as a regulatory requirement but as a strategic enabler of sustainable digital transformation.

The proposed framework also supports the findings of Goel et al. (2024), who concluded that existing research on AI-enabled sustainable business remains fragmented and lacks comprehensive implementation guidance. Their systematic review highlighted the need for integrated models that connect AI technologies with organizational capabilities and sustainability objectives. The present study directly addresses this recommendation by developing a validated framework that combines technological, managerial, environmental, and governance dimensions into a unified strategic model. As such, the proposed framework contributes practical implementation guidance that extends beyond the descriptive nature of previous literature reviews.

Furthermore, the results are closely aligned with the systematic review conducted by Sharma et al. (2025), who found that research on AI-driven sustainable business models has primarily concentrated on technological innovation while giving limited attention to organizational governance, implementation strategies, and performance evaluation. The Smart Business Framework proposed in this study responds directly to these limitations by incorporating governance mechanisms, customer value creation, and business performance as essential components of sustainable AI implementation. This broader perspective enables organizations to evaluate AI adoption not only from a technological standpoint but also from organizational, ethical, and sustainability perspectives.

Despite these similarities, the present study differs from previous research in several important respects. First, whereas most previous studies investigated isolated relationships between Artificial Intelligence and business performance or sustainability, this research proposes an integrated framework that explains how multiple organizational dimensions interact to generate sustainable competitive advantage. Second, previous conceptual models frequently emphasize technological capability while paying relatively little attention to governance, ethical AI, and stakeholder value creation. The framework developed in this study explicitly recognizes governance and customer value as strategic dimensions that mediate the successful implementation of AI within sustainable business environments. Third, unlike many previous conceptual discussions, this study employed a Design Science Research approach combined with systematic literature review and expert validation to ensure both theoretical rigor and practical applicability.

Overall, the comparison with previous studies demonstrates that the proposed Smart Business Framework is strongly supported by existing literature while simultaneously extending current knowledge through the integration of multiple organizational dimensions into a unified conceptual model. The framework addresses significant theoretical and practical gaps by illustrating how Artificial Intelligence, Business Intelligence, Digital Transformation, Innovation, Sustainability, Governance, Customer Value, and Business Performance interact to support intelligent, responsible, and sustainable organizations. Consequently, the proposed framework contributes a more comprehensive perspective than existing models and provides a valuable foundation for future empirical research as well as practical implementation across various industrial sectors.

3.3 Managerial Implications

The Smart Business Framework developed in this study provides several practical implications for managers and organizational leaders seeking to leverage Artificial Intelligence (AI) while achieving sustainable business development. The framework demonstrates that successful AI implementation requires more than technological adoption; it demands the integration of digital infrastructure, organizational capabilities, governance mechanisms, sustainability objectives, and strategic management into a unified business strategy. Consequently, managers should adopt a holistic approach to digital transformation that simultaneously enhances operational performance, organizational innovation, and long-term sustainability.

One of the primary managerial implications concerns investment in AI infrastructure(Wamba-Taguimdje et al., 2020). Organizations should allocate sufficient financial and technological resources to develop robust digital infrastructures capable of supporting AI applications. This includes investments in cloud computing, big data platforms, Internet of Things (IoT) technologies, enterprise information systems, high-performance computing resources, and cybersecurity infrastructure. A reliable technological foundation enables organizations to collect, integrate, process, and analyze large volumes of data efficiently, thereby improving predictive analytics, intelligent automation, and data-driven decision-making. Managers should regard these investments as long-term strategic assets that enhance organizational agility, innovation capability, and competitive advantage rather than merely as operational expenditures.

The findings also emphasize the importance of establishing comprehensive AI governance policies. As organizations increasingly rely on AI to support strategic and operational decisions, managers must ensure that AI systems are implemented responsibly, transparently, and ethically. Effective governance policies should address issues such as algorithmic transparency, accountability, fairness, explainability, cybersecurity, data privacy, regulatory compliance, and ethical decision-making. Organizations should establish multidisciplinary AI governance committees responsible for monitoring AI implementation, evaluating potential risks, and ensuring compliance with legal and ethical standards. Such governance structures not only reduce operational and reputational risks but also strengthen stakeholder confidence and organizational credibility.

Another important implication is the need to develop sustainability key performance indicators (KPIs) that evaluate organizational performance beyond traditional financial metrics. Managers should integrate environmental, social, and governance (ESG) indicators into organizational performance measurement systems to assess the effectiveness of AI-enabled sustainability initiatives(Huang et al., 2021). Environmental KPIs may include energy efficiency, carbon emission reduction, waste minimization, and resource utilization. Social indicators may evaluate employee well-being, workplace diversity, customer satisfaction, stakeholder engagement, and community impact, while economic indicators should assess profitability, productivity, innovation outcomes, and long-term organizational resilience. Integrating sustainability KPIs into performance management enables organizations to monitor the broader impact of AI adoption and supports continuous improvement toward sustainable business objectives.

The proposed framework also highlights the strategic importance of employee competency development(Cardy & Selvarajan, 2006). Although AI technologies automate numerous business processes, their successful implementation ultimately depends on employees possessing the knowledge and skills required to collaborate effectively with intelligent systems. Managers should therefore invest in continuous education and professional development programs focusing on AI literacy, data analytics, digital technologies, critical thinking, ethical AI usage, and digital leadership. Organizations should encourage interdisciplinary learning, cross-functional collaboration, and knowledge sharing to develop a workforce capable of adapting to rapidly evolving technological environments. By strengthening employee competencies, organizations can reduce resistance to technological change while maximizing the value generated through AI implementation.

Furthermore, managers should integrate Artificial Intelligence into organizational strategic planning rather than treating AI as an isolated technological initiative. AI should be incorporated into corporate vision, business objectives, innovation strategies, risk management, and sustainability planning(Goralski & Tan, 2020). Strategic integration requires senior leadership to align AI investments with long-term organizational goals and ensure that technological initiatives contribute directly to customer value creation, operational excellence, innovation, and sustainable competitive advantage. AI-driven insights should support strategic forecasting, market analysis, resource allocation, product development, and organizational decision-making across all business functions. Embedding AI within strategic planning enables organizations to respond proactively to environmental changes, technological disruption, and evolving customer expectations.

The framework further suggests that organizations should strengthen cross-functional collaboration among departments responsible for technology, sustainability, operations, human resources, finance, and corporate governance. Effective AI implementation requires coordinated decision-making because technological innovation influences multiple organizational processes simultaneously. Cross-functional collaboration facilitates knowledge integration, reduces implementation barriers, and ensures that AI initiatives support broader sustainability and business objectives.

In addition, organizations should establish a culture of continuous innovation and organizational learning. Artificial Intelligence technologies evolve rapidly, requiring businesses to continuously evaluate emerging technologies, experiment with innovative business models, and adapt organizational processes accordingly. Managers should encourage innovation through research and development initiatives, pilot AI projects, collaborative partnerships with technology providers and academic institutions, and organizational knowledge management systems. Such initiatives enable organizations to remain competitive while continuously improving their sustainability performance.

Customer-centric value creation also emerges as a critical managerial implication(O'Cass & Ngo, 2011). Managers should leverage AI technologies to enhance customer experiences through personalized products and services, intelligent customer support, predictive demand analysis, and data-driven relationship management. Improving customer satisfaction strengthens organizational competitiveness while simultaneously generating valuable market insights that support innovation and strategic decision-making.

Finally, the proposed Smart Business Framework encourages managers to adopt a long-term perspective toward organizational success. Rather than measuring AI implementation solely through immediate financial returns or operational efficiency, organizations should evaluate AI investments according to their contribution to sustainable value creation, organizational resilience, stakeholder trust, innovation capability, and environmental and social responsibility. By integrating Artificial Intelligence, sustainability, governance, innovation, and strategic management into a unified organizational framework, managers can develop resilient and adaptive organizations capable of sustaining competitive advantage in increasingly dynamic digital business environments.

4. CONCLUSION

This study successfully developed a Smart Business Framework based on Artificial Intelligence and Sustainability using the Design Science Research methodology, supported by a systematic literature review and expert validation. The proposed framework integrates eight interrelated dimensions, namely Artificial Intelligence Capability, Digital Transformation, Business Intelligence, Innovation, Governance, Sustainability, Customer Value, and Business Performance, into a comprehensive strategic model that guides organizations toward intelligent, responsible, and sustainable business transformation. The findings demonstrate that sustainable competitive advantage can be achieved through the effective integration of AI technologies with organizational innovation, ethical governance, and sustainability principles rather than through technology adoption alone. From an academic perspective, this study contributes to the advancement of Smart Business literature by bridging previously fragmented research on Artificial Intelligence, digital transformation, sustainability, and governance into a unified conceptual framework. From a practical perspective, the framework provides managers with systematic guidance for implementing AI responsibly, investing in digital infrastructure, establishing AI governance policies, integrating sustainability into strategic decision-making, and enhancing organizational competitiveness. From a policy perspective, the framework supports sustainable digital transformation by promoting responsible AI adoption, ethical governance, and alignment with Environmental, Social, and Governance (ESG) principles and broader sustainable development objectives. Despite these contributions, several limitations should be acknowledged. The validation process involved a limited number of experts, the proposed framework has not yet been empirically implemented or tested within real organizational settings, and the study primarily focuses on conceptual framework development rather than quantitative hypothesis testing. Therefore, future research should empirically validate the proposed framework using Structural Equation Modeling (SEM) or Partial Least Squares Structural Equation Modeling (PLS-SEM), conduct cross-country comparative studies to examine its generalizability across different cultural and institutional contexts, investigate industry-specific implementations in sectors such as manufacturing, healthcare, finance, and retail, integrate emerging Industry 5.0 concepts including human-centric AI and resilient production systems, and develop AI maturity models that enable organizations to assess and continuously improve their readiness for intelligent and sustainable business transformation.

REFERENCES

Aslam, F., Aimin, W., Li, M., & Ur Rehman, K. (2020). Innovation in the era of IoT and industry 5.0: Absolute innovation management (AIM) framework. *Information*, *11*(2), 124.

Azapagic, A. (2003). Systems approach to corporate sustainability: a general management framework. *Process Safety and Environmental Protection*, *81*(5), 303–316.

Bhat, W. A., & Quadri, S. M. K. (2015). Big data promises value: is hardware technology taken onboard? *Industrial Management & Data Systems*, *115*(9), 1577–1595.
Broman, G. I., & Robèrt, K.-H. (2017). A framework for strategic sustainable development. *Journal of Cleaner Production*, *140*, 17–31.
Cardy, R. L., & Selvarajan, T. T. (2006). Competencies: Alternative frameworks for competitive advantage. *Business Horizons*, *49*(3), 235–245.
De Almeida, P. G. R., Dos Santos, C. D., & Farias, J. S. (2021). Artificial intelligence regulation: a framework for governance. *Ethics and Information Technology*, *23*(3), 505–525.
Ercole, A., Brinck, V., George, P., Hicks, R., Huijben, J., Jarrett, M., Vassar, M., & Wilson, L. (2020). Guidelines for data acquisition, quality and curation for observational research designs (DAQCORD). *Journal of Clinical and Translational Science*, *4*(4), 354–359.
Fatima, S., Desouza, K., Buck, C., & Fielt, E. (2021). Business model canvas to create and capture AI-enabled public value. *Proceedings of the 54th Annual Hawaii International Conference on System Sciences, HICSS 2021*, 2317–2326.
Giourka, P., Sanders, M. W. J. L., Angelakoglou, K., Pramangioulis, D., Nikolopoulos, N., Rakopoulos, D., Tryferidis, A., & Tzovaras, D. (2019). The smart city business model canvas—A smart city business modeling framework and practical tool. *Energies*, *12*(24), 4798.
Goralski, M. A., & Tan, T. K. (2020). Artificial intelligence and sustainable development. *The International Journal of Management Education*, *18*(1), 100330.
Hanelt, A., Bohnsack, R., Marz, D., & Antunes Marante, C. (2021). A systematic review of the literature on digital transformation: Insights and implications for strategy and organizational change. *Journal of Management Studies*, *58*(5), 1159–1197.
Huang, Z., Shen, Y., Li, J., Fey, M., & Brecher, C. (2021). A survey on AI-driven digital twins in industry 4.0: Smart manufacturing and advanced robotics. *Sensors*, *21*(19), 6340.
Kitsios, F., & Kamariotou, M. (2021). Artificial intelligence and business strategy towards digital transformation: A research agenda. *Sustainability*, *13*(4), 2025.
Kraus, S., Jones, P., Kailer, N., Weinmann, A., Chaparro-Banegas, N., & Roig-Tierno, N. (2021). Digital transformation: An overview of the current state of the art of research. *Sage Open*, *11*(3), 21582440211047576.
O'Cass, A., & Ngo, L. V. (2011). Examining the firm's value creation process: a managerial perspective of the firm's value offering strategy and performance. *British Journal of Management*, *22*(4), 646–671.
Rakova, B., Yang, J., Cramer, H., & Chowdhury, R. (2021). Where responsible AI meets reality: Practitioner perspectives on enablers for shifting organizational practices. *Proceedings of the ACM on Human-Computer Interaction*, *5*(CSCW1), 1–23.
Ravitch, S. M., & Riggan, M. (2016). *Reason & rigor: How conceptual frameworks guide research*. Sage publications.
Roth, W.-M., Mavin, T., & Dekker, S. (2014). The theory-practice gap: Epistemology, identity, and education. *Education+ Training*, *56*(6), 521–536.
Sørensen, K., Van den Broucke, S., Fullam, J., Doyle, G., Pelikan, J., Slonska, Z., Brand, H., & European, (HLS-EU) Consortium Health Literacy Project. (2012). Health literacy and public health: a systematic review and integration of definitions and models. *BMC Public Health*, *12*(1), 80.
Strine Jr, L. E., Smith, K. M., & Steel, R. S. (2021). Caremark and ESG, perfect together: A practical approach to implementing an integrated, efficient, and effective caremark and EESG strategy. *Iowa L. Rev.*, *106*, 1885.
Venable, J., Pries-Heje, J., & Baskerville, R. (2016). FEDS: a framework for evaluation in design science research. *European Journal of Information Systems*, *25*(1), 77–89.
Voegtlin, C., & Scherer, A. G. (2017). Responsible innovation and the innovation of responsibility: Governing sustainable development in a globalized world. *Journal of Business Ethics*, *143*(2), 227–243.
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.