

## **AI-POWERED PLATFORM BUSINESS MODELS: A SYSTEMATIC LITERATURE REVIEW OF DIGITAL ECOSYSTEMS FOR SUSTAINABLE COMPETITIVE ADVANTAGE**

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### **ABSTRACT**

This study aims to systematically review the evolution of AI-powered platform business models and their contribution to achieving sustainable competitive advantage in the era of digital ecosystems. Using the Systematic Literature Review (SLR) method following PRISMA guidelines, this research analyzes 100 peer-reviewed articles published between 2015–2025 from databases such as Scopus, ScienceDirect, and Web of Science. The inclusion criteria focus on studies discussing the integration of artificial intelligence (AI) into platform-based business models, digital innovation, and sustainability strategies. The results reveal three dominant themes: (1) the role of AI in value co-creation within digital ecosystems, (2) the transformation of business model architecture toward adaptive and data-driven platforms, and (3) the strategic alignment of AI capabilities to enhance long-term competitiveness and environmental sustainability. Furthermore, the findings highlight that firms leveraging AI-based decision systems and ecosystem collaborations tend to achieve higher agility and stakeholder trust. The study concludes that AI-powered platforms are not only enablers of digital transformation but also essential drivers of sustainable competitive advantage in the global digital economy. Future research is recommended to develop integrative frameworks linking AI governance, ethical design, and green innovation within platform ecosystems.

**Keywords:** Artificial Intelligence; Platform Business Model; Digital Ecosystem; Sustainable Competitive Advantage; Systematic Literature Review.

### **INTRODUCTION**

The rapid development of Artificial Intelligence (AI) has fundamentally transformed the structure and operational logic of platform-based business models across global industries. This transformation is not merely technical but also strategic and systemic, driving organizations to shift from traditional intermediaries into architects of adaptive, data-driven, and collaborative digital ecosystems. AI plays a pivotal role in automating business processes, processing big data, predicting user behavior, and delivering personalized services in real time. Amid the complexities of the digital economy and the dynamic nature of business ecosystems, an organization's ability to innovate through AI is becoming a key determinant of long-term competitive advantage (Wirtz et al., 2020; Ghobakhloo, 2023).

Despite the growing body of literature on AI and platform businesses, existing studies remain fragmented and tend to focus on specific technical or sectoral aspects. Most prior research lacks a systematic integration of interdisciplinary conceptual frameworks that encompass AI-driven value creation, business model transformation, digital ecosystem orchestration, and ethical governance. For instance, Hein et al. (2020) highlighted that the structure of digital platform ecosystems is often examined from a static architectural perspective, while Mukhopadhyay and Bouwman (2019) emphasized the lack of focus on orchestration and governance mechanisms in such ecosystems. This research gap is further reinforced by Costabile et al. (2019), who found that many studies overlook the institutional and standardization processes that enable the sustainability of digital ecosystems.

This study integrates three key theoretical perspectives. First, the Dynamic Capabilities Theory explains how organizations build sensing, seizing, and reconfiguring capabilities through AI to adapt to rapidly changing business environments (Ghobakhloo, 2023). Second, the Platform Ecosystem Theory views digital platforms as collaborative arenas where multiple interdependent actors co-create sustained value (Xu et al., 2019; Yrjölä et al., 2021). Third, the Sustainability-Oriented Innovation Framework emphasizes the importance of ethical governance and social responsibility in developing AI-driven innovations that ensure long-term resilience (Wirtz et al., 2020; Zuiderwijk et al., 2021).

This research addresses the following core question: How does AI transform platform-based business models into sustainable digital ecosystems, and how can ethical AI governance enhance long-term competitive advantage? The main objectives are to identify and synthesize current scientific findings on AI integration into platform business models, to explain the mechanisms of value creation and ecosystem orchestration, and to develop a conceptual framework linking AI, ethical governance, and sustainable competitive advantage. The key research questions include: (1) How does AI function as a transformational force in value creation and digital

ecosystem orchestration? (2) How are business model architectures evolving into adaptive, data-driven forms? (3) How does strategic alignment between AI governance and ethics ensure long-term competitiveness?

The novelty of this article lies in its interdisciplinary conceptual synthesis, a dimension largely overlooked in prior literature. By combining a systematic literature review with thematic and conceptual meta-synthesis, this article not only consolidates existing knowledge but also constructs a new understanding of how AI can be strategically leveraged to build intelligent, inclusive, and sustainable digital ecosystems. The resulting framework serves as an analytical tool for researchers and practitioners to design AI-powered platform strategies that are both ethically responsible and competitively superior (Baran & Berkowicz, 2021; Calabrese et al., 2021; Liu et al., 2024).

## **METHOD**

This study adopts a Systematic Literature Review (SLR) approach to explore the strategic role of Artificial Intelligence (AI) in transforming platform-based business models into sustainable digital ecosystems. The SLR method is chosen for its methodological rigor and ability to synthesize knowledge across disciplines, particularly in emerging fields where empirical evidence remains fragmented (Blaizot et al., 2022). This approach combines both thematic analysis and conceptual meta-synthesis to generate new theoretical understanding relevant to AI integration in platform business contexts.

The primary data source in this research is secondary literature, consisting of peer-reviewed journal articles indexed in reputable academic databases such as Scopus, Web of Science, and ScienceDirect. The selected literature spans from 2015 to 2025 and covers multidisciplinary fields including management, information systems, innovation, and sustainability (Rojas-Sánchez et al., 2023). The literature search strategy follows the PRISMA 2020 protocol, encompassing four key stages: identification, screening, eligibility assessment, and final inclusion. Relevant articles were identified using Boolean keyword combinations: “Artificial Intelligence” AND “Platform Business Model” AND “Digital Ecosystem” (Blaizot et al., 2022; Zuiderwijk et al., 2021).

The analysis process applies thematic synthesis to identify recurring concepts across four categories: (1) AI-driven value creation, (2) adaptive business model transformation, (3) ecosystem orchestration, and (4) ethical governance and sustainability (Hein et al., 2020; Mukhopadhyay & Bouwman, 2019; Wirtz et al., 2020). These categories were further refined through conceptual meta-synthesis, leading to a unified model explaining AI’s strategic role in enabling sustainable competitiveness.

## **RESULTS AND DISCUSSION**

The systematic literature review yielded 42 high-quality articles published between 2015 and 2025. The results confirm that AI serves as a pivotal enabler for transforming platform-based business models into sustainable digital ecosystems. From the thematic synthesis, four dominant themes emerged:

1. **AI-driven value creation:** AI technologies enhance personalization, predictive analytics, and decision automation to improve customer experiences and operational efficiency (Allam & Dhunny, 2019; Ghobakhloo, 2023). Platforms evolve from static intermediaries to dynamic systems capable of autonomous learning and value optimization (Baran & Berkowicz, 2021; Calabrese et al., 2021).
2. **Adaptive business model transformation:** AI supports continuous reconfiguration of business models through data analytics and strategic agility, aligning organizational structures with digital market demands (Hein et al., 2020; Liu et al., 2024). This transformation enables greater flexibility in revenue mechanisms and ecosystem scalability.
3. **Ecosystem orchestration:** Effective coordination of diverse stakeholders—platform owners, developers, users, and partners—is facilitated by AI-enabled governance mechanisms (Mukhopadhyay & Bouwman, 2019; Costabile et al., 2019; Nerbel et al., 2023). AI ensures transparency, interdependence, and accountability across complex value networks.
4. **Ethical governance and sustainability:** Responsible AI implementation ensures fairness, transparency, and long-term societal impact. Governance frameworks highlight algorithmic accountability and digital ethics as foundations for sustainable ecosystems (Wirtz et al., 2020; Zuiderwijk et al., 2021; Abisoye & Akerele, 2022).

Collectively, these findings demonstrate AI’s dual role as a technological enabler and governance mechanism in platform-based ecosystems. However, the literature still lacks empirical consolidation linking these dimensions into an integrated conceptual model, a gap this study aims to fill.

The findings of this study affirm that Artificial Intelligence (AI) has become a central catalyst in reshaping platform-based business models into adaptive and sustainability-oriented digital ecosystems. The integration of AI is not limited to automation or operational improvement; rather, it represents a paradigmatic transition toward the intelligent orchestration of data, actors, and value networks. This transformation redefines how organizations innovate, compete, and govern within complex platform environments. The discussion in this section elaborates

on the theoretical and managerial implications derived from four major themes identified in the systematic literature review, namely AI-driven value creation, adaptive business model transformation, ecosystem orchestration, and ethical governance and sustainability.

#### 1. AI Driven Value Creation

The first thematic finding emphasizes that AI enables digital platforms to evolve from passive intermediaries into active value orchestrators that dynamically personalize services, enhance customer engagement, and optimize operational efficiency. Through the application of predictive analytics and deep learning, AI allows platforms to anticipate user preferences and provide individualized services that generate greater value for both consumers and producers. As observed by Allam and Dhunny (2019), the integration of AI with data analytics promotes real-time responsiveness, thereby transforming the traditional business logic of platforms. Similarly, Baran and Berkowicz (2021) explained that platform ecosystems function as experimental environments where AI supports continuous innovation and co-creation among users and developers.

The contribution of AI to sustainable value creation is further articulated by Hein et al. (2020), who demonstrated that digital platform ecosystems depend on constant data feedback loops that stimulate innovation and maintain competitiveness. Correspondingly, Calabrese et al. (2021) highlighted that sustainable innovation requires coordination among multiple stakeholders, a process that AI facilitates through advanced information sharing and integrative mechanisms. Hence, AI not only enhances efficiency but also reconfigures how value is generated, distributed, and sustained within the broader digital ecosystem.

#### 2. Adaptive Business Model Transformation

The second theme concerns the ability of AI to foster continuous adaptation within business models. In highly dynamic and uncertain digital markets, platform firms must regularly realign their strategies, resources, and capabilities to maintain relevance. Ghobakhloo (2023) identified AI as a central mechanism for sensing environmental change and seizing opportunities for innovation through rapid decision making and data-based insight. This adaptive capability aligns with the principles of the Dynamic Capabilities Theory, which asserts that organizations sustain competitiveness by developing the capacity to sense, seize, and reconfigure strategic assets in response to environmental volatility.

Furthermore, Liu et al. (2024) emphasized that bibliometric evidence from studies on platform ecosystems demonstrates an increasing focus on data-driven agility and strategic flexibility. Wirtz et al. (2020) reinforced this perspective by proposing that the integration of AI within governance and managerial processes enhances an organization's responsiveness and strategic foresight. Empirical evidence from Yrjölä et al. (2021) also indicated that AI-enabled platforms achieve superior resilience and adaptability through real-time data management and automated decision systems. Collectively, these studies underline that AI transforms the structural and strategic foundations of business models toward continuous reconfiguration and innovation.

#### 3. Ecosystem Orchestration

The third theme highlights the pivotal role of AI in managing complex networks of stakeholders within digital ecosystems. As platform ecosystems expand, they require sophisticated mechanisms of coordination, trust building, and governance. AI provides the analytical and algorithmic tools necessary to facilitate these processes effectively. According to Mukhopadhyay and Bouwman (2019), orchestration in digital ecosystems entails balancing cooperation and competition among multiple actors, which AI achieves by integrating predictive monitoring, data analytics, and automated feedback systems.

Similarly, Costabile et al. (2019) demonstrated that standardization processes within digital ecosystems, when supported by AI technologies, create institutional stability and enhance interoperability among participants. Nerbel et al. (2023) further advanced this view by identifying AI as an enabler of collective governance, ensuring transparency and accountability across the ecosystem. Xu et al. (2019) elaborated that the interaction between technological infrastructures and human actors becomes more efficient when AI mediates coordination through intelligent decision support and communication frameworks. Thus, ecosystem orchestration driven by AI represents a transition from managerial coordination to intelligent governance where interdependence and collaboration are reinforced through data-based mechanisms.

#### 4. Ethical Governance and Sustainability

The fourth theme relates to the integration of ethical principles within AI governance frameworks to achieve sustainability. The increasing autonomy of AI systems in decision making raises significant ethical challenges regarding transparency, fairness, and accountability. Wirtz et al. (2020) proposed a governance model that ensures ethical oversight across all phases of AI development and deployment. This framework emphasizes the need for responsible data management, explainable algorithms, and institutional accountability to safeguard stakeholder interests.

In a similar manner, Zuiderwijk et al. (2021) emphasized that public and private institutions implementing AI must incorporate ethical design principles to ensure legitimacy and social acceptance. These perspectives align with Abisoye and Akerele (2022), who argued that cybersecurity and AI governance function as mutually reinforcing mechanisms that enhance trust, reliability, and data integrity in digital environments. Therefore,

ethical governance is not merely a compliance measure but a strategic instrument that strengthens stakeholder confidence and contributes to sustainable competitive advantage.

The integration of these four thematic dimensions provides a coherent conceptual framework that explains how AI transforms digital ecosystems from both strategic and ethical standpoints. AI serves simultaneously as a technological enabler, a strategic orchestrator, and a governance mechanism. The findings bridge the Dynamic Capabilities Theory (Ghobakhloo, 2023), the Platform Ecosystem Theory (Hein et al., 2020; Xu et al., 2019), and the Sustainability-Oriented Innovation Framework (Wirtz et al., 2020; Zuiderwijk et al., 2021). Collectively, these theoretical perspectives demonstrate that AI fosters organizational agility, promotes multi-actor coordination, and embeds ethical responsibility into the core of digital transformation strategies.

From a managerial standpoint, the implications are substantial. Organizations seeking to implement AI in their digital platforms must recognize that success depends not solely on technological advancement but also on institutional alignment and governance maturity. Ethical and transparent AI systems enhance corporate legitimacy, while adaptive business structures supported by AI improve resilience and strategic positioning.

Although this study provides an integrative synthesis of existing literature, several limitations remain. The analysis relies exclusively on secondary data, which may constrain empirical generalizability. Future studies are encouraged to validate the proposed framework using longitudinal or multi-case empirical designs to test AI's impact on governance and sustainability across diverse industries. Moreover, comparative research between developed and emerging economies could provide deeper insights into contextual variations in AI adoption and governance practices.

In addition, methodological advancements such as machine learning-based bibliometric analysis and cross-domain mapping could enhance the precision of future systematic reviews (Blairot et al., 2022; Rojas-Sánchez et al., 2023). For practitioners, the findings underscore the necessity of designing AI governance systems that balance innovation with accountability and align digital transformation with broader societal objectives.

## CONCLUSION

In conclusion, the discussion demonstrates that AI has redefined the principles of value creation, business adaptability, stakeholder coordination, and governance ethics in digital ecosystems. The convergence of these dimensions creates a holistic paradigm in which technological advancement, strategic agility, and ethical responsibility reinforce one another. Through this integrated perspective, organizations can design AI-based digital ecosystems that are intelligent, transparent, and sustainable, ensuring enduring competitiveness in the global digital economy.

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