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Algorithmic Orchestration and Platform Business Model Innovation in Generative AI Ecosystems

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Abstrak

Artificial intelligence, particularly generative AI, is increasingly reshaping how digital platforms organize economic activity and create value within complex ecosystems. Despite growing scholarly attention, existing research offers fragmented explanations of how AI capabilities influence platform-based business models, often emphasizing technological capabilities while overlooking the mechanisms through which algorithmic systems coordinate ecosystem interactions. This article addresses this theoretical gap by developing a mechanism-based conceptual framework explaining how generative AI enables platform business model innovation. Drawing on an integrative synthesis of literature on platform ecosystems, artificial intelligence, and business model innovation, the study conceptualizes algorithmic orchestration as the coordination of ecosystem interactions through AI-enabled decision infrastructures embedded within digital platforms. The framework identifies four orchestration mechanisms—algorithmic complementor coordination, data-driven ecosystem governance, intelligent interaction mediation, and algorithmic value capture optimization—that translate generative AI capabilities into ecosystem-level coordination processes. These mechanisms reshape how value is created, delivered, and captured within platform environments. By integrating previously disconnected research streams, the article advances theory on digital platforms and AI-driven innovation while offering a structured research agenda for future empirical studies examining algorithmic coordination in digital ecosystems.

Keywords

generative AI; algorithmic orchestration; platform ecosystems; business model innovation; digital platforms; AI-enabled coordination

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1. Introduction

Artificial intelligence (AI), particularly generative AI, is transforming how organizations create and capture value in the digital economy. Advances in machine learning, large language models, and data analytics enable firms to automate complex decisions, personalize services at scale, and coordinate economic activity across digital infrastructures. AI increasingly functions as strategic infrastructure rather than merely an operational tool, shaping organizational strategy and market structures (Brynjolfsson & McAfee, 2017; Dwivedi et al., 2023). This transformation is especially visible in digital platform ecosystems where algorithmic systems mediate interactions among users, producers, and complementors. Digital marketplaces, application ecosystems, and AI-enabled services demonstrate how algorithmic infrastructures coordinate distributed value creation and position AI as a driver of strategic innovation in contemporary organizations (Nambisan et al., 2019; Verhoef et al., 2021).

Platform ecosystems have emerged as a dominant organizational form in the digital economy. Platform firms create value by orchestrating interactions among multiple stakeholder groups through digital infrastructures that facilitate exchange and innovation (Parker et al., 2016; Jacobides et al., 2018). Strategic management research conceptualizes platforms as ecosystems where value arises from coordinated interactions among distributed actors rather than from a single firm. Business model innovation shapes how firms configure value propositions, delivery mechanisms, and revenue structures within these ecosystems (Foss & Saebi, 2017; Teece, 2018). Understanding how technological capabilities influence platform business model architecture has therefore become central to research on digital transformation and innovation strategy.

Recent studies increasingly examine how artificial intelligence transforms digital platforms and business models. AI-driven analytics, recommendation systems, and predictive algorithms allow platforms to match supply and demand efficiently, personalize user experiences, and coordinate ecosystem interactions in real time (Raisch & Krakowski, 2021; Dwivedi et al., 2023). AI also enables data-driven business models characterized by dynamic pricing, automated services, and continuous feedback loops between users and digital infrastructures (Trabucchi & Buganza, 2021; Sjödin et al., 2023). Generative AI further expands these dynamics by enabling new forms of content creation, innovation, and service interaction within digital ecosystems (Dwivedi et al., 2023). These developments suggest that AI-driven capabilities are reshaping the foundations of value creation in platform environments.

Despite growing attention, research remains conceptually fragmented in explaining how artificial intelligence transforms platform-based business models. AI studies often emphasize technological capabilities such as analytics, machine learning, and automation while focusing on operational outcomes or decision support (Berente et al., 2021; Raisch & Krakowski, 2021). Platform ecosystem research concentrates on governance structures, complementor relationships, and network effects but rarely incorporates algorithmic infrastructures as coordination mechanisms (Jacobides et al., 2018; Tiwana, 2014). Business model innovation research explains how firms redesign value creation architectures but frequently treats digital technologies as contextual drivers rather than embedded coordination mechanisms (Foss & Saebi, 2017). These research streams therefore evolve largely in parallel.

This fragmentation reveals a critical theoretical gap. Existing studies acknowledge that artificial intelligence influences digital ecosystems and business model innovation but provide limited explanation of the mechanisms through which AI-enabled systems coordinate interactions among platform actors and reshape business model architectures. Current research rarely explains how algorithmic infrastructures organize ecosystem activity or influence value creation, delivery, and capture across distributed actors. Without

mechanism-based explanations, interpretations of AI-driven transformation remain largely technology-centric or descriptive.

This limitation has important implications for research on strategy, innovation, and digital ecosystems. Platform ecosystems depend on coordinated interactions among heterogeneous actors to generate value (Adner, 2017; Jacobides et al., 2018). As artificial intelligence increasingly mediates these interactions through algorithms, recommendation systems, and predictive analytics, theoretical explanations must address how algorithmic infrastructures shape ecosystem governance and coordination. Without such development, the literature lacks a coherent account of how AI capabilities translate into systemic changes in platform business models and digital value creation.

Addressing this gap requires integrating insights from platform ecosystem theory, artificial intelligence research, and business model innovation literature. This study introduces the concept of algorithmic orchestration, defined as the coordination of ecosystem interactions through AI-enabled decision infrastructures that mediate relationships among platform actors. Algorithmic orchestration allows platform firms to allocate resources, match participants, regulate interactions, and capture value through automated decision systems embedded in digital infrastructures. Conceptualizing AI as a mechanism of ecosystem orchestration rather than merely a technological capability provides a theoretical lens for explaining how AI reshapes platform-based value creation systems.

This study contributes in three ways. First, it extends platform ecosystem theory by conceptualizing algorithmic orchestration as a mechanism through which platforms coordinate ecosystem actors and manage complex interactions. Second, it integrates artificial intelligence research with business model innovation literature by explaining how algorithmic infrastructures reshape value creation, delivery, and capture within digital ecosystems. Third, it develops a mechanism-based conceptual framework explaining how generative AI capabilities enable new forms of platform business model innovation, advancing theoretical understanding of AI-driven strategic transformation.

The next section reviews literature on platform ecosystems, artificial intelligence, and business model innovation to establish the theoretical foundation of the study. The following section identifies key conceptual tensions and research gaps. Building on this analysis, the study develops a conceptual framework explaining the mechanisms of algorithmic orchestration in platform ecosystems and translates the framework into theoretical propositions for future empirical research. The final section discusses implications for research on digital innovation, platform strategy, and AI-driven business model transformation.

The visual framework below clarifies the theoretical architecture linking generative AI capabilities with platform business model innovation. The structure emphasizes that AI does not influence business models directly; instead, its strategic effects emerge through algorithmic orchestration mechanisms that coordinate ecosystem interactions among platform participants.

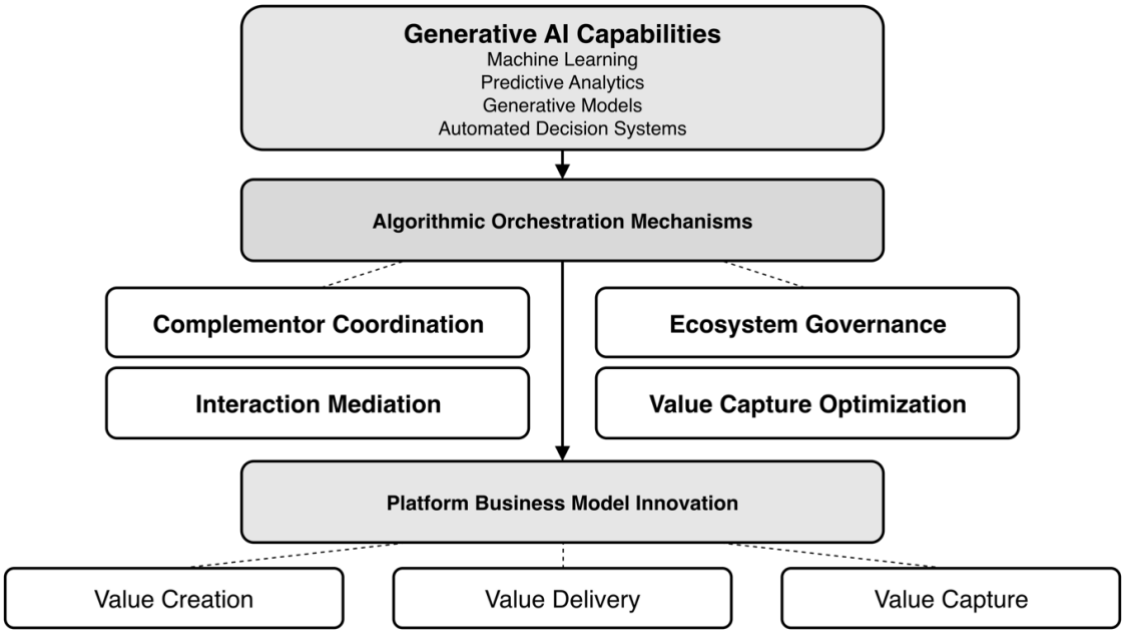

Figure 1. Conceptual Architecture of AI-Enabled Algorithmic Orchestration in Platform Business Model Innovation
Source: Author's conceptualization

The framework articulated in Figure 1 clarifies how generative AI capabilities influence platform business model innovation through algorithmic orchestration mechanisms. Generative AI technologies provide the computational infrastructure enabling platforms to analyze data, generate predictions, and automate decisions. These capabilities are translated into ecosystem coordination through four orchestration mechanisms: complementor coordination, ecosystem governance, interaction mediation, and value capture optimization. Through these mechanisms, AI-enabled infrastructures reshape how value is created, delivered, and captured within digital platform ecosystems, thereby enabling platform business model innovation.

2. Theoretical Background

Understanding how artificial intelligence reshapes platform-based business models requires integrating insights from strategic management, innovation studies, and information systems. Existing research explains platform ecosystems, digital coordination, and business model innovation, but these perspectives often evolve separately. As a result, explanations of how AI influences ecosystem governance and value creation remain fragmented. This section synthesizes platform ecosystem theory, artificial intelligence research, and business model innovation literature to clarify the conceptual foundations of AI-driven platform innovation and explain how algorithmic infrastructures shape coordination and value creation in digital ecosystems.

2.1 Platform Ecosystem Theory and Ecosystem Orchestration

Platform ecosystem research provides a central theoretical foundation for explaining digital value creation. Platform firms operate as orchestrators of ecosystems where multiple actors interact through shared technological infrastructures. Platform ecosystem theory conceptualizes digital platforms as multi-sided markets in which value emerges from interactions among producers, users, and complementors mediated by a technological architecture (Parker et al., 2016; Jacobides et al., 2018). This perspective shifts analysis from firm-centric production toward network-based value creation in which coordination across distributed actors becomes the primary source of competitive advantage.

A core insight concerns the orchestrator role of platform leaders. Platform firms control ecosystem architecture, governance rules, and technological interfaces that enable interaction among participants (Adner, 2017; Jacobides et al., 2018). These mechanisms coordinate complementor activities such as those of developers, service providers, and content creators whose innovations expand ecosystem value. Governance mechanisms therefore regulate participation while aligning complementor activities with platform objectives (Tiwana, 2014; Cennamo, 2021).

Platform research also emphasizes boundary resources, including technological interfaces such as application programming interfaces (APIs), software development kits (SDKs), and platform tools that enable external innovation. Boundary resources allow complementors to extend platform functionality while maintaining architectural coherence (Tiwana, 2014). Ecosystems evolve through ongoing interactions between platform owners and complementors, generating dynamic processes of innovation and value co-creation (Nambisan et al., 2019; Cennamo, 2021).

Despite its explanatory strength, platform ecosystem theory typically conceptualizes coordination through institutional rules or architectural design rather than algorithmic infrastructures. As platforms increasingly rely on artificial intelligence to manage interactions among ecosystem participants, explaining how algorithmic systems contribute to ecosystem orchestration has become an important research frontier.

2.2 Artificial Intelligence as an Algorithmic Infrastructure

Artificial intelligence has expanded organizational capacity to analyze data, automate decisions, and coordinate complex activities across digital environments. AI research increasingly conceptualizes intelligent systems as infrastructures that support organizational coordination and decision-making rather than merely analytical tools (Berente et al., 2021; Raisch & Krakowski, 2021). Machine learning, predictive analytics, and automated decision systems enable organizations to process large-scale data and generate insights that guide strategic and operational processes.

AI also functions as a coordination infrastructure that enables algorithmic management of economic activity. Research on algorithmic management shows how machine-learning systems allocate resources, monitor performance, and coordinate interactions among distributed actors (Kellogg et al., 2020; Raisch & Krakowski, 2021). In digital platforms, algorithms mediate interactions among users, producers, and service providers through recommendation systems, search rankings, and dynamic pricing mechanisms, embedding coordination rules within computational infrastructures.

Predictive analytics strengthens data-driven decision-making in digital organizations. AI-driven systems analyze behavioral data generated through digital interactions to forecast demand, detect patterns, and optimize operations (Dwivedi et al., 2023). Decision processes that previously relied on managerial judgment increasingly depend on algorithmic insights generated by machine-learning models.

Generative artificial intelligence further expands this transformation. Large language models and deep learning architectures enable systems to generate content, code, and knowledge artifacts at scale (Dwivedi et al., 2023). These technologies increasingly operate as ecosystem infrastructures that support innovation, communication, and service delivery within digital platforms, extending the role of AI from analytical decision support toward broader ecosystem coordination and service innovation.

2.3 Business Model Innovation in Digital Platform Contexts

Business model innovation research explains how firms translate technological capabilities into economic value. Business models describe the architecture through which firms create, deliver, and capture value by coordinating resources, activities, and relationships within an economic system (Teece, 2018). Business model innovation occurs when firms redesign

these configurations to exploit technological opportunities or respond to changing market conditions (Foss & Saebi, 2017).

In digital platforms, business model innovation differs because value creation arises from interactions among ecosystem participants rather than from the activities of a single firm. Multi-sided platforms generate value by facilitating exchanges between user groups and leveraging network effects that increase platform value as participation grows (Parker et al., 2016). Platform strategies therefore emphasize participation and interaction among complementary actors.

Platform monetization research identifies several mechanisms for capturing value from ecosystem interactions, including transaction fees, subscriptions, advertising, and data monetization (Trabucchi & Buganza, 2021). Because digital platforms generate extensive user data, monetization increasingly relies on data-driven insights to personalize services and optimize pricing strategies.

Platform business models also involve ecosystem-based value capture. Platforms often extract value not only from end users but also from complementors that develop products or services within the ecosystem (Cennamo, 2021). This perspective highlights that value capture depends on governance structures and coordination mechanisms shaping interactions among ecosystem actors.

Despite these insights, business model innovation research often treats digital technologies as enabling conditions rather than mechanisms embedded within value creation processes. Consequently, existing literature provides limited explanation of how algorithmic infrastructures influence platform business model architecture or how AI-driven coordination mechanisms reshape ecosystem interactions.

2.4 Artificial Intelligence in Platform-Based Value Creation

Recent research increasingly examines how artificial intelligence shapes value creation in digital platform ecosystems. A prominent stream focuses on AI-driven recommendation systems that analyze user behavior to personalize content, products, and services. These algorithms improve user engagement and transaction efficiency by matching users with relevant offerings (Raisch & Krakowski, 2021; Dwivedi et al., 2023). Through such mechanisms, AI reshapes how value propositions are delivered within platform environments.

Another mechanism involves algorithmic matching and pricing. Platforms use machine-learning systems to match supply and demand in real time, such as pairing riders with drivers in ride-sharing services or buyers with sellers in digital marketplaces. These systems also enable dynamic pricing that adjusts to demand fluctuations (Chen et al., 2021). Algorithmic matching and pricing therefore play a central role in coordinating interactions and optimizing value creation within digital ecosystems.

Artificial intelligence also enables data-driven ecosystem services that extend beyond traditional platform functionalities. AI-driven analytics support predictive insights, automated services, and personalized experiences that enhance platform value creation (Sjödin et al., 2023). Examples include predictive maintenance in industrial platforms and personalized content delivery in digital media ecosystems.

Despite these developments, existing studies often examine isolated AI applications rather than explaining how AI-enabled coordination mechanisms reshape platform business models. Consequently, the literature offers fragmented insights into how artificial intelligence influences ecosystem value creation and governance.

The literature reviewed above highlights complementary but weakly integrated perspectives. Platform ecosystem research explains governance and complementor relationships, AI research examines algorithmic decision systems, and business model innovation studies focus on value creation architectures. Few studies explain how AI-enabled algorithmic

infrastructures coordinate ecosystem interactions and reshape platform business models. This gap highlights the need for an integrative conceptual framework explaining how artificial intelligence functions as a mechanism of ecosystem orchestration and enables new forms of platform business model innovation.

The table below provides a concise overview of the key constructs used in the conceptual framework and their analytical roles. The structure prioritizes clarity and parsimony while maintaining alignment with the theoretical logic of the article.

Table 1. Key Constructs in AI-Enabled Platform Ecosystem Orchestration

Construct	Definition	Role in the Framework
Generative AI Capabilities	AI technologies enabling large-scale data analysis and automated decision-making.	Technological foundation of the framework.
Algorithmic Orchestration	AI-enabled coordination of interactions among platform ecosystem actors.	Core mechanism linking AI capabilities with ecosystem processes.
Complementor Coordination	Algorithmic matching and resource allocation among ecosystem participants.	Expands ecosystem participation and innovation.
Ecosystem Governance	AI-driven monitoring and rule enforcement in digital platforms.	Maintains stability and trust in ecosystem interactions.
Interaction Mediation	Personalized recommendations and AI-driven user interfaces.	Shapes user engagement and digital service interactions.
Value Capture Optimization	Data-driven monetization and dynamic pricing mechanisms.	Enhances platform revenue generation.
Platform Business Model Innovation	Redesign of value creation, delivery, and capture in platform ecosystems.	Strategic outcome of algorithmic orchestration.

Source: Developed by the authors.

Table 1 clarifies the main constructs used in the conceptual framework and summarizes their analytical roles. By presenting the key concepts concisely, Table 1 improves conceptual transparency and helps readers understand how AI capabilities, orchestration mechanisms, and platform business model innovation are theoretically connected.

3. Conceptual Tensions and Research Gap

Prior literature on artificial intelligence, platform ecosystems, and business model innovation offers important insights into digital value creation and organizational coordination. Platform ecosystem theory explains how firms orchestrate interactions among heterogeneous actors through governance structures and technological architectures (Jacobides et al., 2018; Cennamo, 2021). Artificial intelligence research shows how machine learning, predictive analytics, and algorithmic decision systems enable data-driven coordination and innovation (Berente et al., 2021; Raisch & Krakowski, 2021). Business model innovation research explains how firms redesign value creation, delivery, and capture mechanisms in response to technological change (Foss & Saebi, 2017; Teece, 2018). Despite these contributions, the three streams remain weakly integrated, limiting explanations of AI-driven platform transformation. This section identifies these tensions and outlines the theoretical gaps motivating the proposed conceptual framework.

3.1 Technology-Centric versus Ecosystem-Centric Explanations

Artificial intelligence research advances understanding of how machine-learning technologies enhance organizational capabilities and decision-making. Studies in information systems and digital innovation show that AI enables organizations to analyze complex datasets, automate routine decisions, and generate predictive insights that support innovation and strategic decisions (Raisch & Krakowski, 2021; Dwivedi et al., 2023). This

literature conceptualizes AI as a technological capability embedded in digital infrastructures that improves operational efficiency and enables data-driven innovation.

Platform ecosystem research adopts an ecosystem-centric perspective emphasizing governance, coordination, and value co-creation among distributed actors. Digital platforms are conceptualized as orchestrated ecosystems where value emerges from interactions among users, complementors, and platform owners (Jacobides et al., 2018; Cennamo, 2021). Rather than focusing on technological capabilities, this literature highlights governance rules, boundary resources, and architectural structures that regulate ecosystem interactions.

These perspectives emphasize different analytical focal points. AI research foregrounds technological capabilities and algorithmic systems, whereas platform research emphasizes governance mechanisms and ecosystem relationships. Consequently, the relationship between algorithmic infrastructures and ecosystem coordination remains underdeveloped. Existing studies rarely integrate these perspectives to explain how algorithmic systems function as mechanisms of ecosystem orchestration.

This study addresses this divide by integrating technology-centric and ecosystem-centric perspectives through the concept of algorithmic orchestration. The proposed framework conceptualizes algorithmic infrastructures as mechanisms that coordinate interactions among ecosystem actors. This perspective explains how AI-enabled decision infrastructures mediate relationships among platform participants and reshape ecosystem governance.

3.2 Static Views of Platform Business Models

Business model innovation research explains how firms redesign value creation architectures in response to technological change. Foundational studies conceptualize business models as systems of interdependent activities through which organizations create, deliver, and capture value (Zott & Amit, 2010; Teece, 2018). In platform contexts, research shows how multi-sided platforms facilitate exchanges among user groups and capture value through transaction fees, subscriptions, and data monetization (Parker et al., 2016; Trabucchi & Buganza, 2021). These studies clarify the structural components of platform business models and the mechanisms through which digital platforms generate economic value.

Much of this literature, however, treats platform business models as relatively stable configurations rather than dynamic systems evolving through technological and organizational change. Studies often identify archetypal models such as marketplace, innovation, or data-driven platforms without explaining how these models transform over time (Foss & Saebi, 2017; Cennamo, 2021). Although recent work acknowledges digital transformation, explanations of how technological infrastructures reshape platform business models remain limited.

This limitation becomes more pronounced with the rise of artificial intelligence. AI-driven analytics and generative technologies reshape how platforms coordinate interactions, personalize services, and allocate resources across ecosystems (Dwivedi et al., 2023; Sjödin et al., 2023). Existing frameworks therefore capture the outcomes of platform innovation but provide limited explanation of the mechanisms enabling platform business models to evolve in AI-enabled environments.

This study addresses this gap by conceptualizing platform business model innovation as a dynamic process driven by algorithmic coordination mechanisms embedded within digital infrastructures. Linking artificial intelligence capabilities with platform orchestration processes explains how algorithmic systems reshape value creation, delivery, and capture within digital ecosystems. This perspective moves beyond static descriptions of platform business models and offers a mechanism-based explanation of AI-driven platform evolution.

3.3 Limited Understanding of Algorithmic Coordination

Recent research recognizes the growing role of algorithms in coordinating interactions within digital environments. Studies on algorithmic management show that AI-driven systems allocate tasks, monitor performance, and regulate interactions among distributed actors in digital platforms and gig-economy settings (Kellogg et al., 2020; Raisch & Krakowski, 2021). Research on digital platforms similarly demonstrates how recommendation algorithms, search rankings, and dynamic pricing systems shape user behavior and mediate interactions between buyers and sellers (Dwivedi et al., 2023). These findings indicate that

Despite this recognition, the mechanisms through which algorithms coordinate platform ecosystems remain underdeveloped. Existing research often examines specific applications such as recommendation engines or pricing algorithms rather than explaining their systemic role in organizing ecosystem interactions. As a result, algorithms are frequently treated as operational tools embedded in platform infrastructures rather than as mechanisms of ecosystem coordination.

This limitation restricts theoretical understanding of AI-driven platform transformation. If algorithms shape user interactions, match complementors with consumers, and allocate value among ecosystem participants, they function as coordination mechanisms structuring digital ecosystems. Without explicitly theorizing this role, the literature cannot fully explain how AI-enabled platforms manage complex interactions among distributed actors.

This study addresses this gap by introducing the concept of algorithmic orchestration, which explains how AI-enabled decision infrastructures coordinate interactions among ecosystem participants. Conceptualizing algorithms as orchestration mechanisms rather than isolated technological tools provides a systemic explanation of how artificial intelligence shapes governance and value creation within digital platforms.

3.4 Research Question and Conceptual Direction

The conceptual tensions identified above highlight the need for a framework integrating artificial intelligence research, platform ecosystem theory, and business model innovation literature. AI studies show how intelligent systems enable data-driven decision-making and digital innovation (Dwivedi et al., 2023). Platform ecosystem research explains how firms orchestrate interactions among complementors and users within digital infrastructures (Jacobides et al., 2018). Business model innovation research clarifies how firms redesign value creation architectures in response to technological change (Foss & Saebi, 2017). Despite these contributions, the three streams remain weakly integrated, limiting explanations of AI-enabled platform transformation.

These tensions reflect three limitations in existing literature: technology-centric explanations of AI, ecosystem-centric explanations of platforms, and static treatments of platform business models. Current frameworks therefore provide limited insight into how AI-enabled infrastructures coordinate ecosystem interactions and reshape platform business models.

Addressing this limitation requires conceptualizing artificial intelligence as a coordination infrastructure embedded in digital ecosystems rather than merely a technological capability. Building on this perspective, this study develops an integrative framework explaining how generative AI enables algorithmic orchestration mechanisms that coordinate ecosystem interactions and drive platform business model innovation.

This study therefore addresses the following research question: How does generative AI enable algorithmic orchestration mechanisms that drive platform business model innovation? To answer this question, the next section develops a conceptual framework explaining how algorithmic infrastructures coordinate ecosystem interactions and reshape value creation architectures within AI-enabled digital platforms.

4. Methodological Approach: Conceptual Theory Building

Explaining how artificial intelligence reshapes platform business models requires a methodological approach capable of integrating fragmented research streams and developing new conceptual relationships. Conceptual theory-building is particularly appropriate in emerging domains where technological developments evolve faster than the theories used to explain them (Jaakkola, 2020). In fields such as digital innovation, platform ecosystems, and artificial intelligence, empirical studies often accumulate around specific applications while underlying theoretical mechanisms remain underdeveloped. A conceptual approach therefore enables scholars to synthesize dispersed insights, clarify constructs, and propose mechanism-based explanations for future empirical research.

This study adopts a conceptual theory-building approach to integrate insights from platform ecosystem research, artificial intelligence studies, and business model innovation literature. Rather than collecting primary empirical data, the study synthesizes existing theoretical and empirical knowledge to identify mechanisms explaining AI-driven platform transformation. Through this integration, the study develops a framework explaining how generative AI enables algorithmic orchestration mechanisms that reshape value creation architectures in platform ecosystems.

4.1 Conceptual Research Design

This study adopts a theory-building conceptual design to explain AI-driven platform transformation. Conceptual research advances theory by clarifying constructs, integrating fragmented knowledge, and developing explanatory frameworks linking key concepts (Jaakkola, 2020). Such approaches are appropriate in rapidly evolving technological domains where empirical evidence expands faster than theoretical explanation.

Research on artificial intelligence and digital platforms often examines specific technologies or industry cases. Although these studies provide valuable insights, they rarely explain how AI-enabled infrastructures reshape organizational coordination and platform business model innovation across digital ecosystems (Dwivedi et al., 2023; Raisch & Krakowski, 2021). Conceptual theory building therefore enables integration of dispersed insights and identification of mechanisms connecting AI capabilities with platform-based value creation.

The study follows an integrative synthesis approach that combines insights from platform ecosystem theory, artificial intelligence research, and business model innovation literature (Jaakkola, 2020). This synthesis develops a framework explaining how algorithmic infrastructures coordinate ecosystem interactions and enable platform business model innovation.

4.2 Literature Selection Strategy

The conceptual development in this study is grounded in a systematic synthesis of peer-reviewed academic literature across several interrelated research domains. Literature selection focused on high-quality studies published in leading international journals in fields including strategic management, information systems, innovation studies, and digital transformation. Particular emphasis was placed on recent research published within the last five years in order to capture the rapidly evolving nature of artificial intelligence and digital platform ecosystems.

Three primary streams of literature form the theoretical foundation of the analysis. The first stream concerns platform ecosystem research, which examines how digital platforms orchestrate interactions among heterogeneous actors and create value through ecosystem coordination (Jacobides et al., 2018; Cennamo, 2021). This body of literature provides insights into ecosystem governance, complementor relationships, and platform-based value creation mechanisms.

The second stream focuses on artificial intelligence in organizations, particularly studies examining algorithmic decision-making, machine-learning capabilities, and data-driven innovation processes. Research in this domain highlights how AI technologies enhance

analytical capabilities, automate decision processes, and reshape organizational coordination mechanisms (Berente et al., 2021; Raisch & Krakowski, 2021; Dwivedi et al., 2023).

The third stream addresses business model innovation, which explains how firms redesign value creation architectures in response to technological and market changes. This literature provides conceptual frameworks for understanding how organizations create, deliver, and capture value through new configurations of activities and resources (Foss & Saebi, 2017; Teece, 2018). Integrating these three streams enables a more comprehensive explanation of how AI-driven technologies reshape value creation processes within digital platform ecosystems.

4.3 Analytical Framework Development

The conceptual framework proposed in this article was developed through a multi-stage analytical process designed to synthesize insights across the identified literature streams. The first stage involved identifying key constructs that recur across the literature on digital platforms, artificial intelligence, and business model innovation. Core constructs identified in this process include artificial intelligence capabilities, platform ecosystem orchestration, algorithmic coordination mechanisms, and business model components such as value creation, value delivery, and value capture.

The second stage involved cross-theoretical comparison, in which constructs and relationships identified within different research streams were compared and evaluated. This comparative analysis revealed several conceptual tensions, including the divergence between technology-centric explanations in AI research and ecosystem-centric explanations in platform studies. Identifying these tensions helped clarify areas where theoretical integration was necessary to explain AI-driven platform transformation.

The final stage focused on mechanism identification, which aimed to specify the processes through which artificial intelligence capabilities influence platform ecosystems and business model innovation. Mechanism-based reasoning is essential in conceptual research because it explains how relationships between constructs operate rather than merely identifying correlations among variables (Foss & Saebi, 2017). Through this process, the concept of algorithmic orchestration emerged as a central mechanism connecting AI capabilities with platform ecosystem coordination and business model transformation.

4.4 Criteria for Proposition Development

The theoretical propositions developed in this article follow established principles of conceptual theory development in management research. Each proposition is grounded in mechanism-based reasoning that explains how artificial intelligence capabilities influence platform ecosystem coordination and business model innovation. Mechanism-based explanations are particularly important in conceptual research because they clarify the processes through which theoretical relationships operate and enable scholars to develop more precise theoretical predictions (Foss & Saebi, 2017).

The development of propositions in this study was guided by two key criteria. First, each proposition is derived from the conceptual mechanisms identified through the analytical framework development process. This ensures that propositions are theoretically grounded and logically consistent with the integrative framework proposed in the article. By linking algorithmic orchestration mechanisms with platform business model components, the propositions articulate specific relationships that explain how artificial intelligence reshapes value creation systems within digital ecosystems.

Second, the propositions are designed to be empirically testable in future research. Although the present article focuses on conceptual theory building, the framework is intended to guide empirical studies examining how generative AI influences platform governance, ecosystem coordination, and business model innovation. Empirical research could test the proposed

relationships through quantitative studies of digital platform ecosystems, case studies of AI-enabled platforms, or longitudinal analyses of platform business model transformation.

Through this methodological approach, the article establishes a systematic foundation for developing the conceptual framework presented in the next section. By integrating insights from platform ecosystem theory, artificial intelligence research, and business model innovation literature, the study develops a mechanism-based explanation of how generative AI enables algorithmic orchestration and drives platform business model innovation.

5. Mechanisms of Algorithmic Orchestration in Platform Ecosystems

Artificial intelligence increasingly operates as a coordination infrastructure in digital platform ecosystems. Algorithms embedded in digital infrastructures analyze behavioral data, automate decisions, and regulate interactions among users, producers, and complementors, reshaping how platforms coordinate activity and allocate value. Building on platform ecosystem theory, artificial intelligence research, and business model innovation literature, this study introduces algorithmic orchestration as mechanisms through which AI-enabled decision infrastructures coordinate ecosystem interactions and enable platform business model innovation.

5.1 Foundational Assumptions of AI-enabled Platform Ecosystems

The conceptual framework developed in this study rests on two assumptions about digital platforms and artificial intelligence. First, platforms function as socio-economic coordination systems that facilitate interactions among heterogeneous actors. Platform ecosystems connect users, developers, service providers, and complementors whose interactions generate value through network effects and collaborative innovation (Jacobides et al., 2018; Cennamo, 2021). The central strategic challenge for platform firms is therefore orchestrating these interactions to sustain coordinated value creation.

Second, artificial intelligence increasingly operates as an orchestration infrastructure embedded in digital platforms. Rather than serving only analytical functions, AI systems participate directly in ecosystem coordination by processing behavioral data, generating predictions, and automating decisions regulating actor interactions (Raisch & Krakowski, 2021; Dwivedi et al., 2023). Machine-learning algorithms influence product visibility, participant matching in marketplaces, and dynamic pricing adjustments, thereby shaping platform ecosystem dynamics.

These assumptions imply that platform orchestration increasingly occurs through computational infrastructures mediating ecosystem interactions. Algorithmic systems process real-time data from digital interactions and translate it into decisions that distribute resources, information, and opportunities across the ecosystem. Explaining AI-driven platform transformation therefore requires analyzing the mechanisms through which algorithmic systems coordinate these interactions.

5.2 Mechanism 1: Algorithmic Complementor Coordination

The first mechanism of algorithmic orchestration is algorithmic complementor coordination, which refers to AI-driven systems that match ecosystem participants and allocate resources within the platform environment. Platform ecosystems rely on complementors who provide products, services, or content that expand platform value (Jacobides et al., 2018). Coordinating these actors is therefore essential for sustaining innovation and ecosystem growth.

Artificial intelligence enables automated matching between complementors and users. Recommendation algorithms, search rankings, and machine-learning models analyze behavioral data to match supply with demand (Raisch & Krakowski, 2021). Digital

marketplaces use such systems to connect buyers and sellers, while application platforms rely on ranking algorithms to determine application visibility.

AI also enables dynamic resource allocation across platform ecosystems. Machine-learning systems distribute computing resources, advertising exposure, and marketplace visibility based on predictive demand and performance signals. These mechanisms shape which complementors gain access to platform resources and opportunities.

Artificial intelligence further supports complementor discovery by identifying emerging ecosystem participants. Data-driven analytics help platforms detect promising developers, creators, or service providers whose contributions expand ecosystem value. Through these mechanisms, AI-driven coordination increases ecosystem scale and diversity while maintaining organized interactions.

5.3 Mechanism 2: Data-Driven Ecosystem Governance

The second mechanism of algorithmic orchestration is data-driven ecosystem governance, referring to the use of artificial intelligence to regulate interactions among platform participants. Platform ecosystems require governance mechanisms that ensure fair participation, enforce rules, and maintain trust among ecosystem actors (Tiwana, 2014; Cennamo, 2021). As digital ecosystems grow in scale and complexity, governance increasingly relies on automated systems rather than institutional rules or manual monitoring.

Artificial intelligence enables algorithmic monitoring of ecosystem activity through analysis of behavioral data generated by digital interactions. Machine-learning systems detect anomalies, identify fraudulent behavior, and monitor policy compliance across large volumes of transactions in real time. These capabilities allow platforms to maintain stability and enforce rules more effectively than manual oversight.

AI-driven governance also supports access control and rule enforcement within digital ecosystems. Algorithms determine which actors can participate, how activities are ranked or displayed, and whether behavior complies with platform guidelines. Automated moderation systems regulate user-generated content, while algorithmic reputation systems influence seller visibility in digital marketplaces.

Artificial intelligence further enables dynamic governance by adapting rules to evolving ecosystem behavior. Machine-learning systems update decision rules using new data, allowing platforms to respond to changing user activity, market demand, and strategic behavior. This adaptive capability helps maintain ecosystem stability while supporting innovation and experimentation.

5.4 Mechanism 3: Intelligent Interaction Mediation

The third mechanism of algorithmic orchestration is intelligent interaction mediation, through which AI systems shape interactions among ecosystem participants and platform infrastructures. Interaction mediation structures how users and complementors experience digital environments. Artificial intelligence strengthens this capability by enabling adaptive and personalized interaction mechanisms.

Recommendation systems are a core component of interaction mediation. These algorithms analyze user behavior to personalize content, products, and services presented on digital platforms. By predicting preferences and presenting relevant options, recommendation systems shape consumption patterns and user engagement within platform ecosystems (Raisch & Krakowski, 2021).

Advances in generative AI extend this mediation role. Generative technologies enable conversational interfaces, intelligent assistants, and automated content generation that reshape user interaction with digital services (Dwivedi et al., 2023). These capabilities transform platforms from static marketplaces into interactive service environments.

Artificial intelligence also enables real-time personalization of interfaces and services. Machine-learning systems analyze behavioral data to refine recommendations and adapt digital interactions to individual preferences. Through these mechanisms, intelligent interaction mediation strengthens user engagement and enhances platform value propositions.

5.5 Mechanism 4: Algorithmic Value Capture Optimization

The final mechanism of algorithmic orchestration is algorithmic value capture optimization, which refers to the use of artificial intelligence to enhance platform monetization. Platform business models capture value from ecosystem interactions rather than direct product sales (Parker et al., 2016; Foss & Saebi, 2017). Artificial intelligence expands these capabilities by enabling data-driven monetization strategies across digital ecosystems.

One mechanism involves dynamic pricing, where machine-learning algorithms adjust prices in response to real-time demand. Platforms such as ride-sharing services, online marketplaces, and digital advertising networks use predictive analytics to optimize pricing and maximize revenue (Chen et al., 2021). These systems analyze behavioral data, market conditions, and transaction histories to determine optimal prices.

Artificial intelligence also enables data monetization, generating value from data produced through platform interactions. Platforms analyze behavioral data to support targeted advertising, personalized services, and strategic decisions (Trabucchi & Buganza, 2021). Machine-learning algorithms convert these data into insights that create additional revenue streams.

AI further enables automated revenue distribution within platform ecosystems. Algorithms allocate revenue among platform owners, complementors, and service providers based on ecosystem activity. These mechanisms improve efficiency and transparency in value distribution across multi-actor platforms.

Together, four mechanisms define algorithmic orchestration: algorithmic complementor coordination, data-driven ecosystem governance, intelligent interaction mediation, and algorithmic value capture optimization. Embedding these mechanisms in platform infrastructures allows generative AI to reshape platform orchestration and enable new forms of platform business model innovation.

The following visual specifies the internal structure of algorithmic orchestration within AI-enabled platform ecosystems. Rather than presenting a high-level architecture, this framework disaggregates orchestration into four coordination mechanisms through which algorithmic infrastructures regulate ecosystem interactions among users, complementors, and platform operators.

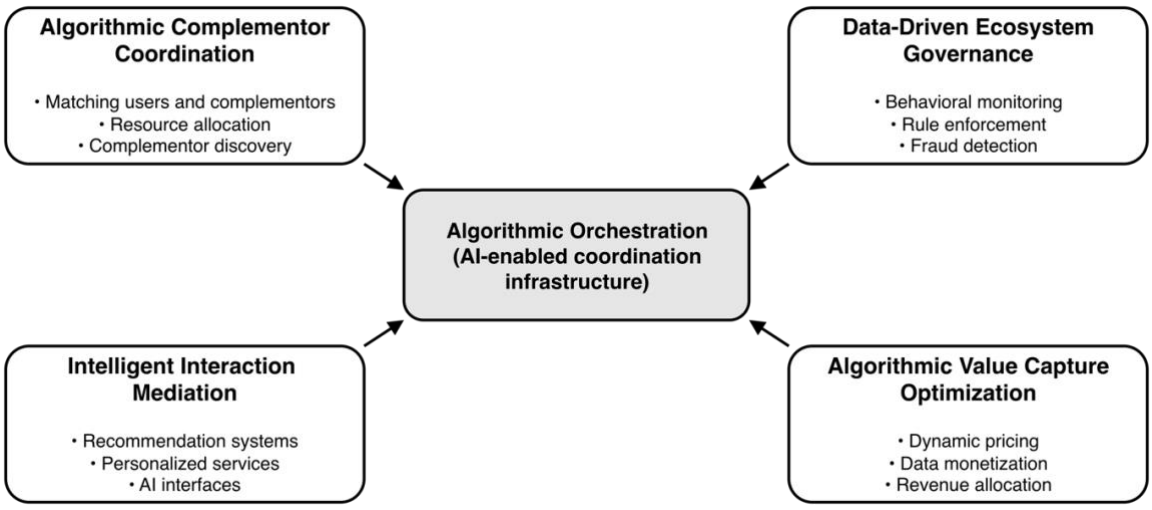

Figure 2. Mechanisms of Algorithmic Orchestration in AI-Enabled Platform Ecosystems

Source: Developed by the authors

Figure 2 clarifies the internal architecture of algorithmic orchestration as the coordination mechanism structuring AI-enabled platform ecosystems. The framework identifies four mechanisms through which algorithmic infrastructures regulate ecosystem activity. Algorithmic complementor coordination matches ecosystem participants and allocates resources across the platform. Data-driven ecosystem governance monitors interactions and enforces participation rules to maintain stability and trust. Intelligent interaction mediation structures user engagement through personalized services and recommendation systems. Algorithmic value capture optimization enables platforms to monetize ecosystem activity through dynamic pricing and data-driven revenue mechanisms. Together these mechanisms explain how algorithmic infrastructures organize complex ecosystem interactions within digital platforms.

6. Integrative Conceptual Model of AI-Driven Platform Business Model Innovation

Building on the mechanisms of algorithmic orchestration discussed previously, this study proposes an integrative conceptual model explaining how generative artificial intelligence reshapes platform business model innovation. The model integrates insights from platform ecosystem theory, artificial intelligence research, and business model innovation literature to clarify how AI-enabled infrastructures influence value creation in digital ecosystems. Artificial intelligence is conceptualized not as an isolated technological capability but as an enabling infrastructure operating through algorithmic orchestration mechanisms that reshape platform business model architectures. This perspective offers a systemic explanation of how AI-driven technologies transform value creation, delivery, and capture within digital ecosystems.

6.1 Architecture of the Conceptual Framework

The conceptual framework consists of three interconnected analytical layers explaining the transformation of platform business models in AI-enabled ecosystems.

The following framework specifies how algorithmic orchestration translates AI-enabled coordination into transformations of platform business model architecture. The visual emphasizes the three core dimensions of business model innovation—value creation, value delivery, and value capture—and clarifies how orchestration mechanisms reshape each dimension within digital platform ecosystems.

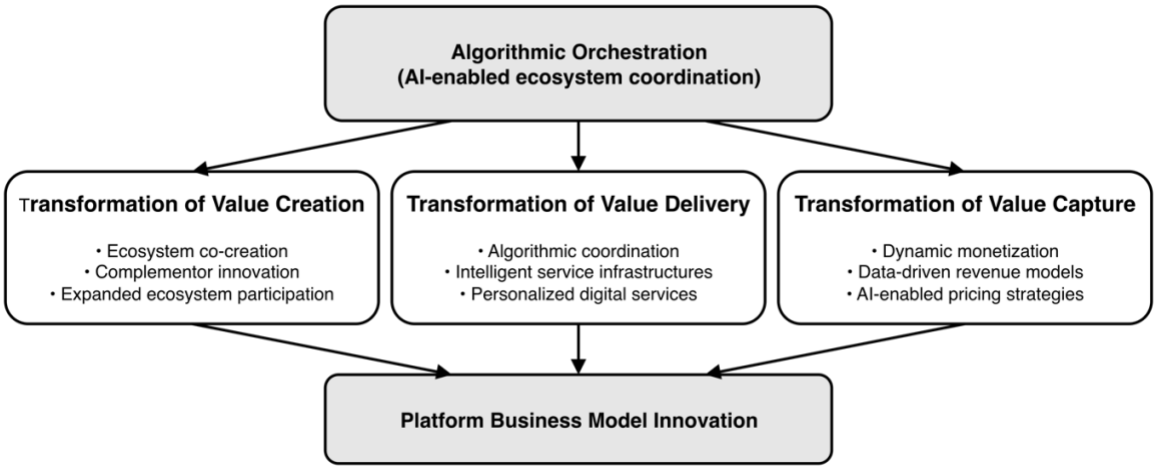

Figure 3. AI-Driven Transformation of Platform Business Model Architecture
Source: Developed by the authors

Figure 3 reorients the analysis toward the strategic consequences of algorithmic orchestration for platform business models. The visual clarifies how AI-enabled orchestration

mechanisms reshape three core dimensions of business model architecture: value creation, value delivery, and value capture. Algorithmic coordination expands ecosystem-based value creation through complementor participation and collaborative innovation. Intelligent infrastructures transform value delivery by enabling personalized and automated services across digital platforms. At the same time, algorithmic monetization mechanisms enhance value capture through dynamic pricing and data-driven revenue models. Together, these transformations explain how AI-enabled orchestration drives platform business model innovation in digital ecosystems.

The first layer represents generative AI capabilities, including machine-learning algorithms, predictive analytics systems, and generative models that support large-scale data processing and automated decision making. These capabilities provide the technological foundation for algorithmic decision infrastructures within digital platforms (Dwivedi et al., 2023; Raisch & Krakowski, 2021). Generative AI extends traditional analytics by enabling content generation, complex information processing, and interactive digital services.

The second layer comprises algorithmic orchestration mechanisms that translate AI capabilities into ecosystem coordination processes. These mechanisms include algorithmic complementor coordination, data-driven ecosystem governance, intelligent interaction mediation, and algorithmic value capture optimization. Through these mechanisms, AI systems coordinate interactions among ecosystem participants, regulate participation, and shape information and resource flows across the ecosystem. Algorithmic orchestration therefore functions as the mediating mechanism linking technological capabilities with business model transformation.

The third layer represents platform business model innovation as the strategic outcome of algorithmic orchestration. Business model innovation occurs when firms redesign how value is created through ecosystem interactions, delivered through digital infrastructures, and captured from those interactions (Foss & Saebi, 2017; Teece, 2018). The framework therefore positions generative AI capabilities as the technological foundation, algorithmic orchestration as the coordination mechanism, and platform business model innovation as the strategic outcome.

6.2 Transformation of Value Creation

The first dimension of platform business model innovation concerns the transformation of value creation within digital ecosystems. Traditional firms create value primarily through internal production activities, whereas platform firms generate value by orchestrating interactions among ecosystem participants. Artificial intelligence enhances this process by enabling more efficient coordination among diverse actors and facilitating collaborative innovation within digital platforms (Jacobides et al., 2018; Cennamo, 2021).

AI-enabled platforms support ecosystem co-creation, where value emerges from interactions among users, developers, service providers, and complementors. Algorithmic coordination mechanisms match participants efficiently, recommend complementary services, and facilitate collaboration among ecosystem actors. These processes expand ecosystem participation and increase the value generated within platform environments.

Artificial intelligence also strengthens complementor innovation by providing development tools, data resources, and digital infrastructures that support the creation of new products and services. Application platforms supply APIs and development environments that enable complementors to extend platform functionality. Generative AI further accelerates this process through automated code generation, data analysis, and creative content production, expanding the innovation capacity of digital ecosystems.

6.3 Transformation of Value Delivery

The second dimension of platform business model innovation concerns the transformation of value delivery mechanisms. Value delivery refers to how platforms facilitate interactions

among ecosystem participants and ensure efficient service provision. Artificial intelligence transforms these processes by enabling algorithmic coordination and intelligent service infrastructures.

Algorithmic coordination represents a key mechanism through which machine-learning systems dynamically match participants, allocate resources, and regulate interactions within digital ecosystems. These systems continuously analyze behavioral data to predict demand patterns, match users with relevant services, and manage large-scale digital interactions. Such capabilities allow platforms to operate efficiently even when processing millions of transactions simultaneously.

Artificial intelligence also supports intelligent service infrastructures that enable automated and adaptive service delivery. AI-driven platforms increasingly rely on predictive analytics, automated decision systems, and intelligent interfaces to provide personalized services to users (Raisch & Krakowski, 2021). These infrastructures allow platforms to deliver services at scale while maintaining high levels of customization and responsiveness.

6.4 Transformation of Value Capture

The third dimension of platform business model innovation involves the transformation of value capture mechanisms. Value capture refers to how firms appropriate economic value generated within platform ecosystems. Digital platforms commonly rely on monetization mechanisms such as transaction fees, subscription models, advertising revenues, and data monetization strategies (Parker et al., 2016; Trabucchi & Buganza, 2021). Artificial intelligence enhances these mechanisms by enabling more dynamic monetization strategies.

Dynamic monetization represents a central mechanism through which machine-learning algorithms adjust pricing strategies and revenue structures based on real-time data. Dynamic pricing systems allow platforms to respond rapidly to supply and demand fluctuations, improving revenue optimization and market efficiency. These strategies are widely implemented in digital marketplaces, ride-sharing platforms, and online advertising networks.

Artificial intelligence also supports platform data economies in which behavioral data generated through ecosystem interactions becomes a strategic resource for value capture. Platforms analyze large volumes of user data to generate insights about consumer behavior, market trends, and operational efficiency. These insights support targeted advertising, personalized services, and data-driven strategic decision making (Trabucchi & Buganza, 2021). AI-driven analytics therefore enable platforms to convert data into economic value.

6.5 Boundary Conditions

The effectiveness of AI-driven platform business model innovation depends on contextual conditions that shape ecosystem dynamics.

Ecosystem complexity represents an important boundary condition referring to the number and diversity of actors participating in the platform environment. Highly complex ecosystems benefit more from algorithmic coordination because AI systems manage large-scale interactions more efficiently than traditional governance mechanisms (Jacobides et al., 2018).

Data intensity represents another critical condition. Artificial intelligence systems rely on large volumes of behavioral data to generate accurate predictions and support automated decision processes. Platforms operating in data-rich environments, including e-commerce marketplaces, digital media platforms, and online service ecosystems, are therefore better positioned to leverage algorithmic coordination mechanisms.

Complementor diversity further influences orchestration effectiveness. Ecosystems with heterogeneous complementors create stronger opportunities for innovation but also increase coordination complexity. Algorithmic systems facilitate coordination by matching actors and allocating resources efficiently across the ecosystem.

These boundary conditions indicate that the effectiveness of AI-driven platform business model innovation depends not only on technological capabilities but also on ecosystem characteristics shaping algorithmic coordination processes. The conceptual model therefore provides a systemic explanation of how generative AI capabilities, algorithmic orchestration mechanisms, and ecosystem conditions interact to reshape value creation within digital platform ecosystems.

7. Theoretical Propositions and Research Agenda

The conceptual model explains how generative artificial intelligence reshapes platform business model innovation through algorithmic orchestration. Rather than treating AI as a generic technological capability, the framework conceptualizes algorithmic orchestration as the mechanism through which AI infrastructures coordinate ecosystem actors and restructure value creation architectures. Strategic impact arises not only from computational capabilities but from algorithmic coordination of interactions among users, complementors, and platform owners within digital ecosystems. Linking generative AI capabilities to platform business model innovation through orchestration mechanisms clarifies how AI transforms platform-based markets.

7.1 Algorithmic Coordination and Ecosystem Value Creation

Platform ecosystems create value through coordinated interactions among multiple actors rather than through the internal activities of a single firm (Jacobides et al., 2018; Parker et al., 2016). The proposed framework extends this perspective by positioning algorithmic systems as core coordination mechanisms within digital ecosystems. Artificial intelligence processes large-scale behavioral data, identifies user preference patterns, and matches ecosystem participants more efficiently than traditional coordination mechanisms (Raisch & Krakowski, 2021). Algorithmic coordination therefore strengthens the ability of platforms to orchestrate interactions among users and complementors.

Recent research shows that AI-driven analytics significantly enhance platform innovation ecosystems. AI-powered recommendation systems and matching algorithms improve the discovery of complementary services and facilitate collaboration among ecosystem participants (Dwivedi et al., 2023). Efficient coordination expands opportunities for complementor innovation and strengthens ecosystem value creation. These mechanisms align with the ecosystem view of digital innovation, which highlights distributed actors as key sources of collaborative value creation (Nambisan et al., 2019).

The conceptual framework proposes that algorithmic coordination strengthens ecosystem value creation by improving interaction efficiency and scalability among platform participants. AI-enabled matching systems support complementor discovery, allocate opportunities, and optimize resource distribution across ecosystem actors. These processes increase the innovation capacity of digital ecosystems and enable platforms to support larger complementor networks.

Proposition 1: Algorithmic complementor coordination enabled by generative AI positively influences ecosystem value creation by facilitating complementor discovery, resource allocation, and collaborative innovation within platform ecosystems.

7.2 AI-Enabled Governance and Platform Control

Platform firms must maintain governance structures that regulate participation and stabilize ecosystem interactions. Platform research highlights governance mechanisms such as access rules, monitoring systems, and incentive structures that regulate complementor and user behavior (Tiwana, 2014; Cennamo, 2021). Artificial intelligence increasingly strengthens these mechanisms through algorithmic monitoring and automated rule enforcement.

AI-driven governance systems analyze behavioral data generated within platform interactions and detect patterns associated with rule violations or opportunistic behavior. Algorithmic monitoring enables platforms to enforce governance rules at scale while reducing the costs of manual oversight (Raisch & Krakowski, 2021). Empirical studies show that automated moderation systems and algorithmic reputation mechanisms increasingly regulate participation across digital marketplaces, social media platforms, and sharing economy environments (Dwivedi et al., 2023).

Embedding governance rules within algorithmic infrastructures allows platforms to implement adaptive governance mechanisms. Machine learning models continuously update decision rules based on new behavioral data, enabling platforms to respond dynamically to evolving ecosystem conditions. This capability supports trust and coordination in complex digital ecosystems.

Proposition 2: AI-enabled ecosystem governance strengthens platform control by enabling algorithmic monitoring, adaptive rule enforcement, and dynamic governance of ecosystem interactions.

7.3 Algorithmic Mediation and User Interaction

Platform business model innovation also depends on mechanisms that mediate interactions between users and digital services. Platforms rely on digital interfaces and recommendation systems that structure how users engage with products, services, and ecosystem participants. Artificial intelligence enhances these interaction mechanisms by enabling personalized experiences and adaptive service interfaces.

Recommendation algorithms represent one of the most prominent mechanisms through which AI shapes digital interactions. These systems analyze behavioral data to predict user preferences and personalize content or services (Raisch & Krakowski, 2021). Personalization improves user engagement and increases interaction efficiency within digital platforms. Empirical research shows that AI-driven recommendation systems significantly influence consumer behavior and demand patterns in digital marketplaces and media platforms (Dwivedi et al., 2023).

Generative AI technologies expand this mediation function by enabling conversational interfaces, intelligent assistants, and AI-generated content. These technologies transform platforms from static marketplaces into interactive service environments where users interact with adaptive intelligent systems.

Proposition 3: Algorithmic mediation enabled by generative AI enhances user interaction within platform ecosystems by enabling personalized services, adaptive interfaces, and intelligent recommendation systems.

7.4 Algorithmic Monetization and Value Capture

Artificial intelligence also reshapes how digital platforms capture value from ecosystem interactions. Traditional platform monetization mechanisms include transaction fees, subscription models, and advertising revenues (Parker et al., 2016). AI expands these mechanisms by enabling dynamic monetization strategies based on real-time data analytics.

Dynamic pricing systems illustrate how AI influences platform value capture. Machine learning algorithms analyze supply, demand, and behavioral data to determine optimal pricing strategies in digital marketplaces (Chen et al., 2021). Continuous price adjustment improves revenue optimization while maintaining market efficiency.

Artificial intelligence also supports the emergence of platform data economies. Behavioral data generated through platform interactions becomes a strategic resource for targeted advertising, personalized services, and predictive analytics (Trabucchi & Buganza, 2021). These mechanisms convert ecosystem data flows into new revenue streams.

Proposition 4: Algorithmic value capture optimization enabled by generative AI positively influences platform business model innovation by enabling dynamic monetization models and data-driven revenue mechanisms.

7.5 Algorithmic Orchestration as Mediator

The conceptual framework emphasizes algorithmic orchestration as the mechanism linking generative AI capabilities with platform business model innovation. AI capabilities alone do not transform platform business models. Strategic impact emerges when algorithmic infrastructures coordinate ecosystem interactions.

This mediating perspective aligns with research in digital strategy that highlights organizational processes as mechanisms translating technological capabilities into strategic outcomes (Verhoef et al., 2021). Within digital platforms, algorithmic orchestration translates AI capabilities into coordination processes that reshape ecosystem value creation architectures. Complementor coordination, ecosystem governance, interaction mediation, and value capture optimization represent key orchestration mechanisms.

Positioning algorithmic orchestration as a mediator provides a systematic explanation of AI-driven platform transformation. AI-driven innovation therefore represents a process of ecosystem reconfiguration enabled by algorithmic coordination mechanisms.

Proposition 5: Algorithmic orchestration mediates the relationship between generative AI capabilities and platform business model innovation by coordinating ecosystem interactions and enabling new value creation architectures.

7.6 Boundary Conditions

The effectiveness of algorithmic orchestration depends on contextual conditions shaping digital ecosystems. Ecosystem complexity represents an important boundary condition because platforms operating with numerous and heterogeneous actors require more advanced coordination mechanisms (Jacobides et al., 2018). Algorithmic coordination becomes particularly valuable in such environments because AI systems manage large-scale interactions more efficiently than traditional governance mechanisms.

Data intensity represents another critical condition. Artificial intelligence relies on large volumes of behavioral data to generate accurate predictions and optimize decisions. Platforms operating in data-rich environments such as e-commerce marketplaces and digital media ecosystems therefore gain stronger benefits from algorithmic orchestration.

Complementor diversity further influences orchestration effectiveness. Ecosystems with heterogeneous complementors offer stronger innovation potential but require more sophisticated coordination mechanisms. Algorithmic systems facilitate coordination by matching actors and allocating resources efficiently across the ecosystem.

Proposition 6: The positive effect of algorithmic orchestration on platform business model innovation is stronger in ecosystems characterized by high ecosystem complexity.

Proposition 7: The relationship between generative AI capabilities and platform business model innovation is strengthened in contexts with high data intensity and complementor diversity.

7.7 Future Empirical Research Directions

The framework opens several avenues for empirical research. One direction involves AI-driven platform ecosystems where generative AI functions as a core coordination infrastructure. Empirical studies could examine how algorithmic orchestration operates in platforms built around AI services such as AI development platforms or data-driven marketplaces.

The following table consolidates the theoretical propositions derived from the conceptual framework and clarifies the mechanisms through which generative AI influences platform business model innovation. Presenting the propositions in a structured form improves analytical transparency and highlights how each proposition relates to the orchestration mechanisms identified in the framework.

Table 2. Summary of Theoretical Propositions on AI-Driven Platform Business Model Innovation

Proposition & Core Mechanism		Theoretical Logic	Expected Effect
P1	Algorithmic Complementor Coordination	AI-enabled matching systems facilitate complementor discovery, allocate ecosystem resources, and support collaborative innovation among platform participants.	Strengthens ecosystem value creation by expanding complementor participation and innovation capacity.
P2	Data-Driven Ecosystem Governance	AI-based monitoring and rule enforcement regulate platform participation, detect opportunistic behavior, and stabilize ecosystem interactions.	Enhances platform control and governance effectiveness in complex digital ecosystems.
P3	Intelligent Interaction Mediation	AI-driven recommendation systems and adaptive interfaces personalize user experiences and structure digital interactions within the platform environment.	Improves user engagement and interaction efficiency within platform ecosystems.
P4	Algorithmic Value Capture Optimization	Machine-learning algorithms enable dynamic pricing, data monetization, and automated revenue allocation within digital platforms.	Strengthens platform monetization and supports new data-driven revenue models.
P5	Algorithmic Orchestration as Mediator	Algorithmic coordination mechanisms translate generative AI capabilities into ecosystem-level coordination processes.	Mediates the relationship between AI capabilities and platform business model innovation.
P6	Ecosystem Complexity as Boundary Condition	Platforms operating in ecosystems with many heterogeneous actors require advanced coordination mechanisms.	The positive effect of algorithmic orchestration becomes stronger in highly complex ecosystems.
P7	Data Intensity and Complementor Diversity as Boundary Conditions	Data-rich environments and diverse complementor ecosystems enhance the effectiveness of AI-driven coordination mechanisms.Proposition	Core Mechanism

Source: Developed by the authors.

Table 2 synthesizes the theoretical propositions derived from the conceptual framework and links each proposition to the orchestration mechanisms that structure AI-enabled platform ecosystems. By consolidating the propositions into a single analytical overview, Table 2 clarifies the causal logic of the framework and facilitates future empirical testing of the relationships proposed in the study. The table also highlights how algorithmic orchestration operates as the central mechanism translating generative AI capabilities into platform business model innovation.

Another direction concerns generative AI ecosystems where developers, organizations, and users interact through AI-centered platforms. These ecosystems provide opportunities to examine how algorithmic coordination influences complementor participation, innovation dynamics, and ecosystem value creation.

Future studies could also examine digital marketplaces where AI coordination systems manage large-scale interactions between users and service providers. Quantitative research could test the proposed relationships by analyzing how AI adoption influences ecosystem growth, governance structures, and platform business model innovation.

8. Conclusion

This study explains how generative artificial intelligence reshapes platform business model innovation in digital ecosystems. Drawing on platform ecosystem theory, artificial intelligence research, and business model innovation literature, the study develops a mechanism-based framework showing how generative AI capabilities influence platform business models through algorithmic orchestration. The framework conceptualizes AI-enabled infrastructures as coordination systems that organize interactions among ecosystem participants and reshape value creation, delivery, and capture in platform environments. Four orchestration mechanisms are identified: algorithmic complementor coordination, data-driven ecosystem governance, intelligent interaction mediation, and algorithmic value capture optimization. These mechanisms explain how AI-enabled platforms restructure ecosystem interactions and enable new forms of platform-based value creation.

The study contributes to the literature in three ways. First, it advances platform ecosystem research by positioning algorithmic orchestration as a central mechanism coordinating interactions among users, complementors, and service providers. Second, the framework integrates fragmented research on artificial intelligence, platform ecosystems, and business model innovation by clarifying how AI infrastructures translate technological capabilities into ecosystem-level coordination processes. Third, the model offers a mechanism-based explanation of AI-driven platform transformation that links algorithmic coordination with changes in value creation, delivery, and value capture mechanisms. This perspective provides a clearer theoretical explanation of how AI-driven infrastructures reshape the strategic foundations of platform business models.

The framework also establishes a foundation for future empirical research on AI-driven platform ecosystems. The proposed propositions can be examined in digital platforms relying on algorithmic coordination, including AI development platforms, generative AI ecosystems, and digital marketplaces. Future research may investigate how orchestration mechanisms influence ecosystem innovation, complementor participation, and platform governance across industries. Longitudinal studies may analyze how generative AI technologies shape the evolution of platform business models, while comparative research may examine how ecosystem complexity, data intensity, and complementor diversity influence orchestration effectiveness.

The framework also highlights managerial and policy implications of artificial intelligence in digital ecosystems. As algorithmic systems increasingly mediate ecosystem interactions, platform firms must design governance mechanisms that ensure transparency, fairness, and accountability in AI-driven decision processes. Managers must balance algorithmic efficiency with responsible governance in complex platform ecosystems. By clarifying the mechanisms through which AI reshapes platform business models, the study provides insight into the strategic and organizational implications of artificial intelligence in the digital economy.

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