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Hybrid Human-AI Business Models:
A Socio-Technical Framework for Artificial Intelligence-Driven Value Creation

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Abstrak
Artificial intelligence is increasingly reshaping how organizations create, deliver, and capture value in digitally mediated environments. Despite its rapid diffusion across industries, existing research remains conceptually fragmented in explaining how artificial intelligence interacts with human expertise to transform business model innovation. Prior studies on AI adoption emphasize algorithmic capabilities and automation, while business model research focuses on value creation architectures, leaving the socio-technical mechanisms linking these perspectives underexplored. This article addresses this gap by developing a conceptual framework explaining the emergence of hybrid human–AI business models. The study adopts a theory-building approach based on conceptual synthesis across three research streams: artificial intelligence in organizations, business model innovation, and socio-technical systems theory. Through cross-theoretical integration, the framework identifies three core mechanisms: cognitive augmentation, task reconfiguration, and adaptive value creation. These mechanisms explain how algorithmic capabilities interact with human expertise to reshape value proposition design, transform value delivery architectures, and enable the continuous adaptation of business models. The framework contributes by integrating fragmented literature and conceptualizing AI-enabled business models as hybrid socio-technical systems, while providing a foundation for future empirical research on human–AI collaboration and strategic transformation.

Keywords
artificial intelligence; business model innovation; human–AI collaboration; socio-technical systems; hybrid intelligence; digital transformation

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1. Introduction

Artificial intelligence (AI) is transforming how organizations create, deliver, and capture value. Across industries including digital platforms, financial services, healthcare, and manufacturing, AI systems increasingly shape decision processes, operational workflows, and customer interactions. This transformation reflects a structural shift in the digital economy in which data, algorithms, and intelligent systems function as core organizational resources and sources of competitive advantage (Brynjolfsson & McAfee, 2017; Davenport & Ronanki, 2018). As AI technologies evolve from specialized analytical tools into pervasive digital infrastructures, firms redesign their business models to leverage predictive analytics, algorithmic insights, and automated service delivery (Verhoef et al., 2021). Understanding how AI reshapes organizational value creation has therefore become a central issue in research on innovation, strategy, and digital transformation.

Recent research characterizes artificial intelligence as a general purpose technology capable of transforming organizational ecosystems rather than merely improving operational efficiency. Studies on digital innovation show that AI-driven analytics, machine-learning infrastructures, and algorithmic decision systems reshape how firms generate strategic insights, coordinate resources, and develop competitive advantage in digital markets (Mikalef et al., 2019; Nambisan et al., 2019; Cockburn et al., 2019). AI therefore functions not only as a technological tool but also as an enabling infrastructure that reconfigures the foundations of organizational value creation.

Scholarly attention has increasingly examined the strategic implications of AI adoption. Early research framed AI primarily as a technological capability supporting automation and advanced analytics that augment managerial cognition and improve operational performance (Davenport & Ronanki, 2018; Brynjolfsson & McAfee, 2017). At the same time, business model research emphasizes how organizations create, deliver, and capture value through specific configurations of resources, activities, and relationships (Teece, 2018; Foss & Saebi, 2017). These studies highlight that technological innovation generates economic value only when it becomes embedded within effective business model designs.

Recent studies extend this perspective by emphasizing broader organizational transformation. Research in digital strategy and innovation management shows that AI-driven capabilities influence firm-level innovation processes, dynamic capabilities, and digital platform ecosystems (Kraus et al., 2021; Vial, 2019; Bharadwaj et al., 2013). AI based analytics and algorithmic decision systems reshape organizational capabilities and business processes (Verhoef et al., 2021). At the same time, hybrid intelligence research highlights collaborative arrangements between humans and AI in complex decision environments where algorithmic insights complement human judgment and expertise (Dellermann et al., 2019; Raisch & Krakowski, 2021). These developments indicate a shift toward organizational systems in which human and artificial intelligence jointly contribute to decision-making and value creation.

Despite this progress, the literature remains conceptually fragmented in explaining the relationship between artificial intelligence, human collaboration, and business model innovation. Research on AI in organizations often focuses on algorithmic decision-making, automation, and performance outcomes while treating AI primarily as a technological artifact (Davenport & Ronanki, 2018; Raisch & Krakowski, 2021). In contrast, studies on human–AI collaboration examine micro-level interactions such as teamwork, decision augmentation, and cognitive complementarity between humans and intelligent systems (Dellermann et al., 2019; Jarrahi, 2018). Meanwhile, business model innovation research provides robust frameworks explaining value creation, value delivery, and value capture mechanisms but rarely incorporates the socio-technical dynamics of AI enabled organizational systems (Foss & Saebi, 2017; Teece, 2018). These research streams therefore evolve largely in parallel with limited theoretical integration.

This fragmentation reveals a significant theoretical gap. Although scholars increasingly recognize that AI transforms organizational capabilities and strategic processes, current research provides limited conceptual explanations of how interactions between humans and AI

reshape the architecture of business models. In particular, the literature rarely explains how socio-technical configurations that combine human expertise, algorithmic capabilities, and organizational processes generate new forms of value creation and delivery.

Addressing this gap requires integrating insights from artificial intelligence research, business model innovation literature, and socio-technical systems theory. Socio-technical systems theory conceptualizes organizations as systems in which social and technological elements must be jointly optimized to achieve effective outcomes (Trist & Bamforth, 1951; Pasmore et al., 2019). Applying this perspective to AI enabled organizations suggests that value creation increasingly emerges from interactions between human expertise and algorithmic intelligence embedded within organizational processes.

Building on this perspective, the present study develops a conceptual framework explaining the emergence of hybrid human–AI business models. The framework proposes that human–AI collaboration reshapes organizational value creation through three socio-technical mechanisms: cognitive augmentation, task reconfiguration, and adaptive value creation. Cognitive augmentation refers to the enhancement of human decision-making through algorithmic analytics and predictive insights. Task reconfiguration involves redistributing tasks between human actors and AI systems within organizational workflows. Adaptive value creation captures the ability of hybrid human–AI systems to continuously adjust value propositions and operational processes based on real-time data and feedback.

This study contributes to three streams of research. First, it advances research on artificial intelligence in organizations by conceptualizing AI as a component of socio-technical systems that interact with human expertise in shaping organizational outcomes. Second, it extends business model innovation literature by explaining how hybrid configurations of human and algorithmic capabilities influence value proposition design, value delivery architectures, and value capture mechanisms. Third, the framework integrates previously fragmented research streams including AI research, human–AI collaboration studies, and business model theory into a unified explanation of how intelligent technologies reshape organizational value creation. Through this integrative perspective, the study provides a theoretical foundation for understanding how AI-driven organizational systems generate new forms of business model innovation.

2. Theoretical Background: Artificial Intelligence and Business Model Innovation

This section synthesizes key theoretical foundations explaining how artificial intelligence reshapes organizational value creation and business model design. The analysis integrates three research streams: artificial intelligence in organizational and strategic research, business model innovation as a mechanism of strategic renewal, and emerging literature on AI-driven business model transformation. Comparative examination shows that existing studies provide valuable yet partial explanations of AI enabled organizational change. This synthesis clarifies theoretical limitations in current research and supports the need for a socio-technical perspective on hybrid human-AI business models.

2.1 Artificial Intelligence in Organizational and Strategic Research

The growing adoption of artificial intelligence in organizations has intensified scholarly attention in management and organizational research. Early studies conceptualize AI as a technological capability that enhances analytical processing, automation, and decision support (Brynjolfsson & McAfee, 2017; Davenport & Ronanki, 2018). AI systems process large volumes of data, generate predictive insights, and automate routine activities, improving operational efficiency and decision accuracy. Organizations therefore integrate algorithmic tools into managerial processes such as forecasting, resource allocation, and customer engagement.

Later research extends this view by emphasizing that AI contributes to competitive advantage when combined with complementary organizational resources. Studies in information systems and strategic management show that AI enabled analytics capabilities improve innovation performance by helping firms identify emerging opportunities and extract insights from large-scale datasets (Mikalef et al., 2019; Wamba et al., 2021). AI is therefore increasingly conceptualized as a strategic capability embedded within digital transformation processes rather than a standalone technological asset.

Strategic management literature further positions AI as a capability that shapes organizational performance and strategic decision-making. Machine-learning and AI based analytics enable firms to generate insights from complex datasets and strengthen innovation outcomes (Raisch & Krakowski, 2021). These technologies extend traditional information processing capabilities by revealing patterns and opportunities that remain difficult for human decision makers to detect. AI thus functions as a strategic resource that enhances organizational intelligence and supports adaptive strategy formulation.

Recent studies also examine how AI reshapes organizational structures, coordination mechanisms, and managerial roles. Research on algorithmic management and digital coordination shows that intelligent systems increasingly participate in decision processes, altering authority distribution and the nature of managerial work (Faraj et al., 2018; Raisch & Krakowski, 2021). AI becomes embedded in organizational routines and decision architectures rather than operating as a supporting tool. Scholars therefore highlight the importance of collaborative arrangements between human expertise and intelligent technologies.

Despite these advances, existing research often emphasizes technological capabilities while paying limited attention to organizational mechanisms through which AI transforms value creation (Berente et al., 2021; Dwivedi et al., 2023). Understanding the strategic implications of AI requires theoretical perspectives that connect technological capabilities with organizational design and business model transformation.

2.2 Business Model Innovation as a Mechanism of Strategic Renewal

Research on business models has become central in strategic management and innovation studies alongside the rise of artificial intelligence. A business model describes the architecture through which firms create, deliver, and capture value (Teece, 2018). Competitive advantage therefore depends not only on technological innovation but also on how organizations configure resources, activities, and relationships to commercialize innovation. Business models thus link technological capabilities with economic outcomes.

Recent scholarship conceptualizes business models as dynamic systems that integrate technological innovation with organizational and market structures. Business model innovation enables firms to convert technological capabilities into economic value by redesigning relationships among resources, activities, and stakeholders (Amit & Zott, 2020; Clauss, 2017). Technological change becomes economically meaningful when embedded in new configurations of value creation and value capture.

Within this literature, business model innovation is widely viewed as a mechanism of strategic renewal. Foss and Saebi (2017) define BMI as the development of novel configurations of value creation and capture. Such changes may involve redefining value propositions, redesigning value delivery systems, or introducing new revenue models. Firms frequently achieve competitive advantage not only through technological innovation but also by reconfiguring business models to exploit emerging opportunities.

Digital technologies further intensify business model transformation. In digitally mediated markets, firms increasingly rely on platform infrastructures, algorithmic analytics, and network effects to coordinate interactions among multiple stakeholders (Parker et al., 2016; Trabucchi & Buganza, 2020). Technological innovation and business model innovation therefore operate as interdependent processes.

Recent studies also link BMI to broader digital transformation. Data analytics, cloud computing, and digital platforms enable firms to experiment with new forms of value creation based on connectivity, data integration, and network effects (Verhoef et al., 2021). Digital platforms allow organizations to orchestrate ecosystems of producers, users, and complementors, expanding value creation beyond firm boundaries. Business models thus function as dynamic organizational designs integrating technological capabilities with strategic and operational processes.

Despite this progress, research has only recently begun to examine the specific role of artificial intelligence in business model innovation. Many BMI frameworks emerged before the widespread diffusion of AI and therefore overlook characteristics of intelligent systems such as autonomous learning, predictive analytics, and algorithmic decision-making. Further theoretical development is required to explain how AI reshapes business model architecture.

2.3 AI as a Driver of Business Model Transformation

As artificial intelligence technologies mature, scholars increasingly examine their role in transforming business models and organizational strategies. Recent research emphasizes that AI enables new forms of value creation based on data-driven insights and algorithmic capabilities (Verhoef et al., 2021). AI systems allow firms to analyze large datasets in real-time, personalize customer experiences, and optimize service delivery, creating new opportunities for innovation in products, services, and operational processes.

One emerging perspective conceptualizes AI as an infrastructure supporting data-driven business models. Within such models, data becomes a central strategic resource, while machine-learning algorithms transform raw data into actionable insights that guide strategic decisions and customer interactions. This transformation is particularly evident in digital platform ecosystems, where recommendation systems, dynamic pricing algorithms, and predictive analytics enable firms to orchestrate complex interactions among users and partners.

Another line of research highlights the role of AI in augmenting human decision-making. Rather than replacing human actors entirely, many AI systems operate as decision support technologies that complement human expertise. Raisch and Krakowski (2021) describe this phenomenon as the transition from algorithmic automation to algorithmic augmentation, where humans and artificial intelligence jointly contribute to organizational decision processes. Similarly, research on hybrid intelligence demonstrates that collaborative arrangements between humans and AI can produce superior outcomes compared to either operating independently (Dellermann et al., 2019).

These developments indicate that AI-driven transformation involves both technological and organizational change. Integrating algorithmic systems into organizational processes requires firms to redesign workflows, decision structures, and value creation mechanisms. Consequently, AI can act as a catalyst for business model transformation by enabling new forms of coordination, personalization, and service innovation.

2.4 Limitations of Current Research on AI-driven Business Models

Despite growing scholarly attention, research still shows several conceptual limitations in explaining how artificial intelligence transforms business models. First, many studies focus on technology adoption and implementation, examining organizational readiness and the operational impact of AI systems (Davenport & Ronanki, 2018). Such research explains technological diffusion but offers limited insight into how AI reshapes value creation architectures.

Second, artificial intelligence research and business model innovation literature have largely developed in parallel. AI research emphasizes algorithmic capabilities, data analytics, and automation, while business model research examines strategic configurations of value creation and value capture (Foss & Saebi, 2017; Teece, 2018). The interaction between intelligent technologies and organizational value creation systems therefore remains insufficiently

theorized. Few studies explain how AI capabilities become embedded within business model components such as value propositions, delivery systems, and revenue mechanisms.

Third, many studies overlook the socio-technical nature of AI enabled organizations. Artificial intelligence operates within systems shaped by human expertise, organizational routines, and institutional contexts. Existing literature often treats AI either as an autonomous technology or as a substitute for human decision-making. This view neglects collaborative arrangements in which human expertise and intelligent technologies jointly shape organizational outcomes (Dellermann et al., 2019; Raisch & Krakowski, 2021).

These limitations indicate that current literature provides only a partial explanation of AI-driven business model transformation. Prior research advances understanding of technological capabilities and business model design but lacks an integrated framework explaining how human and artificial intelligence interact within organizational value creation systems. Addressing this gap requires a theoretical perspective that integrates artificial intelligence research, business model innovation, and socio-technical systems theory to explain how hybrid human-AI configurations reshape business model architectures and generate new forms of organizational value creation.

Existing research offers important insights into artificial intelligence, human–AI collaboration, and business model innovation. However, these streams remain only weakly integrated. Figure 1 summarizes this fragmentation and clarifies the conceptual position from which the present framework is developed.

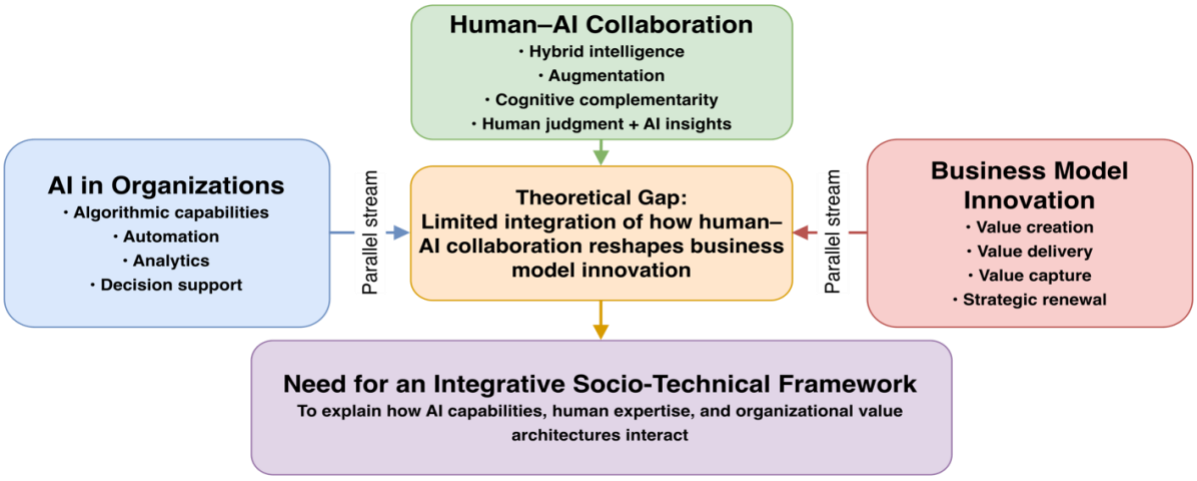

Figure 1. Conceptual Positioning of AI Research, Human–AI Collaboration, and Business Model Innovation
Source: Developed by the authors

The figure illustrates the fragmentation of prior literature and highlights the limited theoretical integration across the three research streams, thereby motivating the need for an integrative socio-technical framework for hybrid human–AI business models. The figure based on Brynjolfsson and McAfee (2017), Davenport and Ronanki (2018), Dellermann et al. (2019), Foss and Saebi (2017), and Teece (2018).

To further clarify the fragmentation illustrated in Figure 1, Table 1 synthesizes the main research streams relevant to artificial intelligence and business model innovation. The table summarizes key theoretical perspectives, core research focus, and major limitations identified in prior studies. This synthesis highlights that although significant progress has been made in understanding AI adoption, human–AI collaboration, and business model innovation, the integration of these domains remains limited. Consequently, existing literature does not yet provide a comprehensive explanation of how hybrid human–AI systems reshape business model architecture and organizational value creation.

Table 1. Major research streams on AI, human–AI collaboration, and business model innovation

Research Stream	Key Theoretical Perspectives	Core Focus in Existing Studies	Main Limitations

Artificial Intelligence in Organizations	Digital transformation theory; AI capability perspective	Adoption of AI technologies, algorithmic decision-making, data-driven management	Limited attention to human–AI interaction and organizational design
Human–AI Collaboration	Socio-technical systems theory; augmentation theory	Interaction between human expertise and intelligent systems in decision-making and problem-solving	Often focuses on task-level collaboration rather than organizational value creation
Business Model Innovation	Dynamic capabilities theory; value creation logic	How firms create, deliver, and capture value through new business model configurations	Rarely integrates artificial intelligence as a socio-technical driver of business model transformation
Digital Innovation and Platform Ecosystems	Platform theory; digital ecosystems perspective	Role of digital technologies in enabling new forms of innovation and platform-based business models	Insufficient explanation of human–AI collaboration mechanisms within business models

Source: Developed by the authors based on Brynjolfsson and McAfee (2017), Davenport and Ronanki (2018), Dellermann et al. (2019), Foss and Saebi (2017), Teece (2018), and Raisch and Krakowski (2021).

The table summarizes the main theoretical perspectives and research focuses within three major literature streams relevant to AI-enabled organizational transformation. The synthesis highlights the fragmentation across these research domains and identifies the limited theoretical integration between artificial intelligence adoption, human–AI collaboration, and business model innovation. This gap motivates the development of an integrative socio-technical framework explaining how hybrid human–AI systems reshape business model architecture.

3. Human–AI Collaboration and Socio-Technical Systems

The growing integration of artificial intelligence in organizations has increased scholarly attention to human and intelligent system interaction. Early studies emphasized automation and efficiency, whereas recent research highlights collaboration between human expertise and algorithmic systems. AI operates within environments where social actors, technologies, and organizational practices interact. Explaining AI's impact on value creation therefore requires perspectives integrating social and technical elements. Socio-technical systems theory provides such a framework by viewing organizations as systems where human and technological components must be jointly designed and optimized (Pasmore et al., 2019; Trist & Bamforth, 1951).

Recent research further shows that human-AI collaboration reshapes organizational decision-making. Many AI systems function as decision support technologies that complement human judgment rather than replace it. Combining computational capabilities with human contextual understanding improves analytical performance and decision quality in complex environments (Jarrahi, 2018; Raisch & Krakowski, 2021; Dellermann et al., 2019).

3.1 Foundations of Socio-Technical Systems Theory

Socio-technical systems theory emerged from organizational design research emphasizing the interdependence of social structures and technological systems in shaping organizational performance. Trist and Bamforth (1951) show that technological change often produces unintended consequences when implemented without considering work organization. Their study of coal mining demonstrates that technological innovation reshapes collaboration, autonomy, and task coordination. Organizational effectiveness therefore depends on the joint optimization of social and technical subsystems rather than technological efficiency alone.

This perspective aligns with research on digital work and algorithmic management highlighting growing interdependence between human expertise and intelligent technologies (Faraj et al.,

2018; Newell & Marabelli, 2015). As organizations integrate machine-learning into operational and strategic decisions, boundaries between human and technological actors become increasingly fluid.

Later developments extend socio-technical theory to broader organizational contexts. Organizational performance depends on alignment among human capabilities, technological infrastructures, and institutional arrangements coordinating collective action (Pasmore et al., 2019). Intelligent technologies such as machine-learning continuously learn and interact with human decision makers, increasing system complexity. Socio-technical theory therefore provides a useful framework for understanding digital transformation and intelligent organizations.

The theory also rejects technological determinism. Technological capabilities interact with social practices and organizational design rather than dictating outcomes. This perspective contrasts with technology centric views that treat digital technologies primarily as efficiency tools. Socio-technical theory instead explains how AI becomes embedded in organizational processes and reshapes coordination, decision-making, and value creation.

3.2 Human–AI Collaboration in Contemporary Organizations

Recent research increasingly examines collaboration between humans and artificial intelligence in organizations. Many AI systems complement human capabilities by providing predictive analytics and data-driven insights. This interaction is conceptualized as hybrid intelligence, where human cognition and artificial intelligence jointly support problem solving and decision-making (Dellermann et al., 2019). Humans contribute contextual understanding and judgment, while AI provides computational analysis and pattern recognition.

Empirical studies show that organizations increasingly combine human expertise with machine-learning systems to interpret complex data and support strategic decisions (Raisch & Krakowski, 2021). In areas such as healthcare, finance, and digital marketing, AI generates predictions that human experts interpret and validate. Organizational decision-making therefore depends on interaction between human cognition and algorithmic intelligence.

Human-AI collaboration also reshapes organizational design. Integrating intelligent systems requires redefining roles, responsibilities, and decision authority. Research on algorithmic coordination shows that AI can transform managerial control through automated monitoring and decision support mechanisms (Faraj et al., 2018).

3.3 Automation versus Augmentation Logic

A central debate in artificial intelligence research concerns whether AI replaces human labor or augments human capabilities. Early discussions emphasized automation logic, which views AI as substituting human labor by performing tasks more efficiently or accurately (Brynjolfsson & McAfee, 2017). Under this view, AI operates as a technological tool executing predefined tasks autonomously and reducing the need for human intervention.

Recent research increasingly challenges this perspective by emphasizing augmentation logic. AI technologies often enhance rather than replace human capabilities, enabling collaboration between human expertise and algorithmic intelligence. Organizations frequently deploy AI to support managerial decision-making instead of fully automating it (Raisch & Krakowski, 2021). Many organizational problems require contextual interpretation, ethical judgment, and creative reasoning that AI cannot independently replicate.

The distinction between automation and augmentation has significant implications for organizational design. Automation prioritizes efficiency and standardization, whereas augmentation emphasizes complementary strengths between humans and intelligent systems. In augmentation oriented systems, AI provides analytical insights and predictive recommendations that support human decision-making. Organizations must therefore design processes that facilitate effective interaction between human actors and algorithmic systems.

3.4 Toward Hybrid Human–AI Organizational Systems

The growing use of augmentation oriented AI applications suggests the emergence of organizational forms built on hybrid configurations of human and artificial intelligence. Organizational outcomes increasingly result from interaction among human expertise, algorithmic capabilities, and digital infrastructures. These hybrid systems shape not only decision processes but also coordination, service delivery, and value creation.

Hybrid human-AI systems reflect the distribution of organizational intelligence across human and technological actors. AI systems participate in activities such as predictive analytics, resource allocation, and customer engagement. As these technologies become embedded in organizational routines, boundaries between human and technological roles become increasingly fluid, requiring new approaches to organizational design and governance.

Despite their growing importance, research has not fully examined the implications of hybrid human-AI systems for business model design and strategic value creation. Existing studies focus mainly on decision-making and workplace interaction, offering limited explanation of how hybrid configurations influence mechanisms of value creation, delivery, and capture. Addressing this gap requires an integrated framework combining socio-technical systems theory, human-AI collaboration research, and business model innovation literature. Human–AI collaboration cannot be understood through a purely technological lens. Its organizational implications emerge from the interaction between social and technical subsystems. Figure 2 summarizes this socio-technical architecture and clarifies how hybrid human–AI systems operate within contemporary organizations.

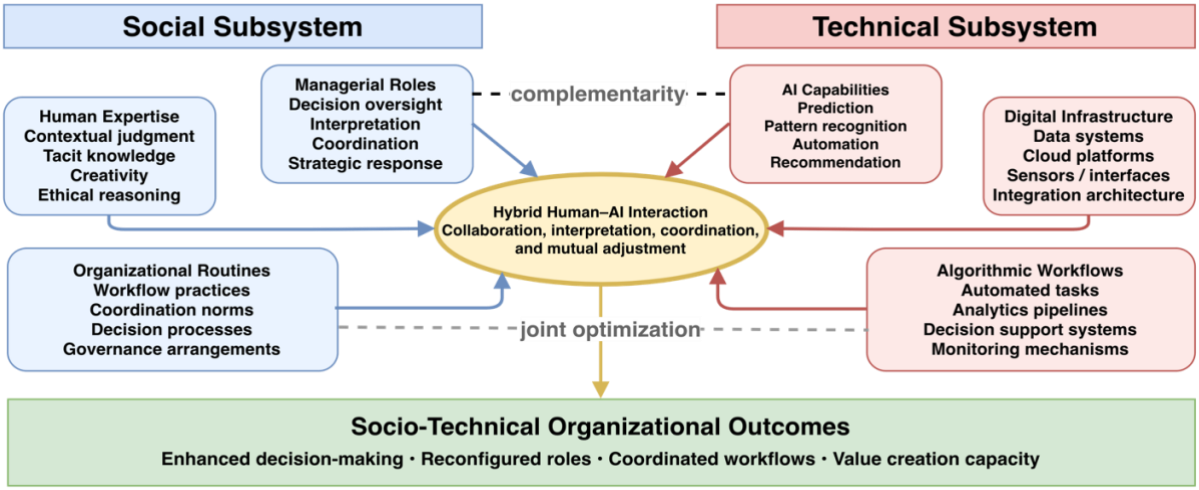

Figure 2. Socio-Technical Architecture of Hybrid Human–AI Organizational Systems
Source: Developed by the authors based on Trist and Bamforth (1951), Pasmore et al. (2019), Jarrahi (2018), and Raisch and Krakowski (2021).

The figure illustrates how social and technical subsystems jointly interact through hybrid human–AI collaboration, producing organizational outcomes that support coordinated decision-making, workflow redesign, and value creation capacity.

4. Conceptual Tensions and Research Gaps

Research on artificial intelligence, human-AI collaboration, and business model innovation has expanded rapidly but largely along separate theoretical trajectories. Each stream explains how intelligent technologies influence organizations, yet their conceptual integration remains limited. As AI becomes embedded in organizational processes and strategic decision-making, the lack of an integrative perspective restricts understanding of how technological capabilities generate new forms of value creation and business model transformation. Addressing this limitation requires examining conceptual tensions across these research streams and identifying theoretical gaps that constrain explanations of AI enabled organizational systems.

4.1 Fragmentation between AI Research and Business Model Literature

Research on artificial intelligence in organizations has largely focused on algorithmic capabilities, decision automation, and the performance implications of machine-learning systems. AI is typically conceptualized as a technological resource that enhances organizational intelligence through improved prediction accuracy and data-driven decision-making (Davenport & Ronanki, 2018; Raisch & Krakowski, 2021). These studies explain how organizations adopt and deploy AI technologies but rarely examine how AI reshapes organizational value creation architectures.

By contrast, business model research explains how firms design and reconfigure mechanisms of value creation, delivery, and capture (Foss & Saebi, 2017; Teece, 2018). This literature highlights how organizations connect technological capabilities with market opportunities and revenue models. However, technological change is often discussed broadly in terms of digitalization, leaving the distinctive role of artificial intelligence insufficiently specified.

This separation creates a conceptual disconnect between the two research streams. AI studies explain algorithmic capabilities and operational impacts, while business model research explains value creation systems without explicitly incorporating intelligent technologies. Existing literature therefore provides partial insights into AI-driven transformation but lacks an integrated framework linking AI capabilities with business model design.

4.2 Misalignment between Technological and Organizational Perspectives

A second conceptual tension arises from the divide between technology centered and organization centered perspectives. Artificial intelligence research often adopts a technological lens that emphasizes machine-learning capabilities, data infrastructures, and predictive analytics (Brynjolfsson & McAfee, 2017; Davenport & Ronanki, 2018). This perspective attributes AI's transformative potential to its capacity to process large volumes of data and generate analytical insights that improve decision efficiency.

Organizational and strategic management research instead emphasizes the role of structures, routines, and capabilities in shaping innovation outcomes. Technological capabilities alone rarely generate competitive advantage; firms must integrate technologies with complementary organizational processes and strategic resources (Teece, 2018). Digital transformation studies similarly show that technological change becomes economically valuable only when organizations redesign processes, structures, and value creation mechanisms (Verhoef et al., 2021).

This divergence creates a conceptual gap. Technology focused studies often assume that adopting advanced technologies automatically improves performance, while organization centered perspectives stress the need for structural and strategic alignment. Without integrating these views, explanations of how AI capabilities interact with organizational systems to generate value creation remain incomplete.

4.3 The Missing Link: Socio-Technical Configurations in Business Model Design

A key source of fragmentation is the limited attention to socio-technical configurations in business model research. Artificial intelligence systems operate through interaction with human expertise, organizational routines, and digital infrastructures that shape decision-making and value creation. Studies on human-AI collaboration show that hybrid intelligence systems combine algorithmic prediction with human judgment to improve organizational outcomes (Dellermann et al., 2019; Raisch & Krakowski, 2021). Organizational performance therefore increasingly depends on interaction between human and artificial intelligence rather than technological capability alone.

However, the implications of these hybrid arrangements for business model design remain underdeveloped. Research on human-AI collaboration focuses largely on micro-level processes such as teamwork, decision support, and task allocation (Jarrahi, 2018; Dellermann et al.,

2019). These studies explain task-level interaction but rarely examine how such collaboration reshapes the architecture of organizational value creation.

Socio-technical systems theory provides a foundation for addressing this gap. The theory conceptualizes organizations as systems where social and technological elements must be jointly designed to achieve effective outcomes (Pasmore et al., 2019; Trist & Bamforth, 1951). Applied to AI enabled organizations, this perspective suggests that business model transformation depends on how human expertise and algorithmic intelligence are configured within organizational systems to generate new forms of value creation.

4.4 Research Question and Conceptual Direction

Building on these conceptual tensions, this study develops an integrative framework explaining how socio-technical configurations of human and artificial intelligence shape hybrid business models. The research addresses the question: How do socio-technical configurations of human-AI collaboration enable the emergence of hybrid human-AI business models? Answering this question requires integrating three research streams: artificial intelligence in organizations, business model innovation, and socio-technical systems theory.

The study adopts a conceptual development and theory synthesis approach to combine key constructs from these literatures into a coherent framework. The analysis identifies mechanisms through which AI capabilities interact with human expertise and organizational processes to reshape value creation systems. Cross theoretical synthesis links concepts such as algorithmic capabilities, human expertise, and value creation mechanisms to explain emerging organizational configurations.

The proposed framework conceptualizes hybrid human-AI business models as systems where value creation emerges from interaction between human judgment and algorithmic intelligence. Socio-technical configurations connect AI capabilities with core business model components including value proposition, value delivery, and value capture. This perspective bridges the conceptual divide between AI research and business model innovation literature.

5. Methodological Approach: Conceptual Theory-building

Developing a robust conceptual framework requires systematic theory-building that integrates insights from multiple research traditions. Conceptual research advances management theory by synthesizing fragmented knowledge and articulating relationships among constructs (Jaakkola, 2020). In rapidly evolving fields such as artificial intelligence and digital transformation, conceptual development remains essential because empirical evidence often advances faster than theoretical explanation. This study therefore adopts a theory-building conceptual approach to integrate insights from artificial intelligence research, business model innovation, and socio-technical systems theory in order to explain how human-AI collaboration reshapes business model architectures and generates hybrid human-AI business models.

5.1 Conceptual Research Design

This study adopts a theory-building conceptual approach aimed at advancing theoretical understanding through the development of new conceptual relationships and explanatory frameworks (Jaakkola, 2020). Conceptual research differs from empirical inquiry because it emphasizes construct clarification, theoretical integration, and the identification of mechanisms that explain complex organizational phenomena. Conceptual contributions remain central in management research because they connect fragmented literature streams and provide theoretical foundations for subsequent empirical investigation.

The study applies a theory synthesis design that integrates insights from multiple research domains to explain AI-driven business model transformation. Three streams of literature form the analytical basis: artificial intelligence in organizations, human-AI collaboration, and business model innovation. Each stream offers insights into the organizational implications of intelligent

technologies, yet none independently explains how human and AI capabilities jointly shape business model design.

Integrating these perspectives enables the development of a conceptual framework that explains hybrid human-AI business models as socio-technical systems where value creation emerges from interactions between human expertise and algorithmic intelligence. This perspective shifts analysis beyond technology-centric explanations of AI adoption and focuses on mechanisms through which AI becomes embedded in organizational value creation systems.

5.2 Literature Selection and Analytical Strategy

The conceptual development is grounded in a systematic synthesis of relevant academic literature. The review draws on peer-reviewed studies published in leading international journals across management, information systems, innovation studies, and organizational theory. Priority is given to research published in the last five years, reflecting rapid advances in artificial intelligence, digital transformation, and human-AI collaboration. Foundational contributions, including socio-technical systems theory and business model innovation frameworks, provide theoretical grounding for the analysis.

The literature selection concentrates on three thematic domains central to the phenomenon examined. The first domain addresses artificial intelligence in organizations, particularly research on algorithmic decision-making, data-driven strategy, and the strategic implications of AI technologies (Davenport & Ronanki, 2018; Raisch & Krakowski, 2021). The second domain examines human-AI collaboration and hybrid intelligence systems, focusing on interactions between human expertise and algorithmic capabilities in decision-making and problem solving (Dellermann et al., 2019; Jarrahi, 2018). The third domain concerns business model innovation and digital transformation, explaining how firms design and reconfigure value creation and value capture mechanisms (Foss & Saebi, 2017; Teece, 2018; Verhoef et al., 2021).

The analysis synthesizes these domains through conceptual mapping and cross-theoretical comparison. This strategy identifies key constructs across the literature, including algorithmic capabilities, human expertise, socio-technical configurations, and value creation mechanisms, and examines how different theoretical perspectives explain their relationships. The comparison reveals areas of convergence and theoretical tension, highlighting opportunities for conceptual integration.

5.3 Conceptual Integration Process

The conceptual framework was developed through a multi-stage process of theory synthesis and conceptual integration. The first stage identified recurring constructs across the reviewed literature streams. Key constructs include artificial intelligence capabilities, human expertise, socio-technical configurations, and business model components such as value proposition, value delivery, and value capture. Identifying these constructs established a shared conceptual vocabulary that supports integration across fragmented research domains.

The second stage examined relationships among these constructs using insights from socio-technical systems theory. Organizational outcomes emerge from interactions between social and technological subsystems rather than technological capabilities alone (Pasmore et al., 2019; Trist & Bamforth, 1951). Applied to AI-enabled organizations, this perspective suggests that AI influences business models through the integration of algorithmic capabilities with human expertise and organizational processes.

The third stage identified mechanisms through which socio-technical integration shapes organizational value creation. Prior research on AI and organizations highlights mechanisms including cognitive augmentation, task reconfiguration, and adaptive value creation. These mechanisms explain how human-AI collaboration reshapes business model architecture and form the foundation of the integrative conceptual framework developed in this study.

The previous subsections discussed three socio-technical mechanisms through which human–AI collaboration reshapes organizational value creation. Although each mechanism highlights a distinct aspect of human–AI interaction, they collectively explain how intelligent technologies influence business model transformation. To clarify these mechanisms and their implications for business model architecture, Table 2 summarizes their core characteristics, underlying processes, and implications for organizational value creation.

Table 2. Socio-technical mechanisms of hybrid human–AI business model transformation

Socio-Technical Mechanism	Core Concept	Human Role	AI Role	Implications for Business Model
Cognitive Augmentation	AI enhances human cognitive capabilities in decision-making and problem-solving	Strategic interpretation, contextual judgment, creative reasoning	Data analytics, pattern recognition, predictive insights	Enables data-driven value propositions and more informed strategic decisions
Task Reconfiguration	Redistribution of tasks between human actors and AI systems	Oversight, coordination, complex judgment, relational interaction	Automation of routine tasks, algorithmic optimization, operational efficiency	Improves scalability and efficiency of value delivery processes
Adaptive Value Creation	Continuous adaptation of products, services, and strategies based on real-time data	Strategic adaptation, innovation, customer relationship management	Continuous learning from data, dynamic optimization of offerings	Enables adaptive business models capable of responding to rapidly changing environments

Source: Developed by the authors based on Jarrahi (2018), Dellermann et al. (2019), Raisch and Krakowski (2021), and Verhoef et al. (2021).

Table 2 illustrates that the transformation of business models in AI-enabled organizations emerges from complementary interactions between human expertise and algorithmic capabilities. Cognitive augmentation highlights how artificial intelligence enhances human analytical capabilities by providing data-driven insights. Task reconfiguration explains how organizational processes evolve as analytical and operational activities are redistributed between human actors and intelligent systems. Adaptive value creation further emphasizes the dynamic nature of AI-enabled organizations, where continuous data feedback enables firms to refine products, services, and strategies in real time. Together, these mechanisms provide the theoretical foundation for understanding how hybrid human–AI systems reshape business model architecture.

5.4 Criteria for Developing Theoretical Propositions

The theoretical propositions developed in this article follow established principles of conceptual theory development in management research. Propositions are derived from logical reasoning grounded in existing theory and supported by empirical insights from prior studies. In this study, propositions are formulated based on the mechanisms identified through the conceptual integration process, ensuring that each proposition reflects a theoretically grounded relationship between key constructs.

Two criteria guided the development of these propositions. First, each proposition is based on a clearly articulated causal mechanism that explains how interactions between human expertise and artificial intelligence influence specific components of business model design. Mechanism-based reasoning is particularly important in conceptual research because it clarifies the processes through which theoretical relationships operate (Foss & Saebi, 2017).

Second, the propositions are designed to be empirically testable, providing a foundation for future empirical research. Although the present article focuses on conceptual development, the framework is intended to guide subsequent studies examining how hybrid human–AI systems

influence organizational innovation, digital transformation, and competitive advantage. By articulating clear theoretical relationships among constructs, the propositions help translate the conceptual framework into a research agenda that can be explored through empirical investigation.

Through this methodological approach, the article establishes a systematic foundation for developing the conceptual framework presented in the next section. The following section builds on this synthesis to elaborate the mechanisms through which human–AI collaboration shapes the design of hybrid business models in contemporary digital organizations.

6. Conceptual Framework: Hybrid Human–AI Business Models

This study proposes a conceptual framework explaining how human-AI collaboration reshapes organizational value creation. Business models in AI-enabled organizations are conceptualized as hybrid socio-technical systems where value emerges from interactions between human expertise and algorithmic intelligence. Drawing on socio-technical systems theory (Trist & Bamforth, 1951; Pasmore et al., 2019), human-AI collaboration research (Dellermann et al., 2019; Raisch & Krakowski, 2021), and business model innovation literature (Foss & Saebi, 2017; Teece, 2018), the framework identifies three mechanisms of transformation: cognitive augmentation, task reconfiguration, and adaptive value creation.

Recent research on digital transformation supports this perspective, showing that the impact of artificial intelligence depends on organizational redesign that integrates human and algorithmic intelligence (Vial, 2019; Verhoef et al., 2021; Berente et al., 2021).

6.1 Foundational Assumptions of Hybrid Business Models

The framework rests on several assumptions about AI-enabled organizations and business model design. First, artificial intelligence functions as an organizational actor within socio-technical systems, interacting with human expertise, digital infrastructures, and organizational routines to generate outcomes (Pasmore et al., 2019; Trist & Bamforth, 1951).

Second, business models represent configurations of value creation that link organizational resources, activities, and relationships to market outcomes. Business model innovation therefore involves redesigning how firms create and capture value through new combinations of technological capabilities, organizational processes, and customer interactions (Foss & Saebi, 2017; Teece, 2018).

Third, human-AI collaboration is characterized by complementarity rather than substitution. Many organizational tasks require contextual interpretation, ethical judgment, and creative reasoning that remain human capabilities. Value creation therefore emerges from the interaction between human cognition and algorithmic intelligence (Dellermann et al., 2019; Raisch & Krakowski, 2021).

6.2 Mechanism 1: Cognitive Augmentation

Cognitive augmentation represents the first mechanism through which human-AI collaboration influences business models. It refers to the enhancement of human decision-making through algorithmic analysis and predictive insights. Artificial intelligence processes large volumes of data, detects complex patterns, and generates predictions that support managerial decisions (Raisch & Krakowski, 2021).

In organizations, cognitive augmentation occurs when machine-learning systems support managerial decision processes. Predictive analytics assists managers in forecasting markets, evaluating investments, and optimizing operations, while recommendation algorithms analyze user behavior to enable personalized services. These systems inform rather than replace human judgment.

From a business model perspective, cognitive augmentation enables more sophisticated value propositions. Data-driven insights allow firms to understand customer preferences with greater precision and develop personalized products, services, and experiences. Such capabilities expand strategic opportunities and support the emergence of innovative business models.

6.3 Mechanism 2: Task Reconfiguration

Task reconfiguration represents the second mechanism through which human-AI collaboration reshapes business models. It refers to the redistribution of tasks between human actors and artificial intelligence systems within organizational workflows. As AI technologies become embedded in operations, some tasks are automated while others remain human driven, transforming the structure of work rather than simply replacing human labor.

Research on algorithmic management shows that AI systems increasingly perform tasks involving data analysis, pattern recognition, and routine decision-making (Faraj et al., 2018; Raisch & Krakowski, 2021). Machine-learning systems may handle activities such as demand forecasting, fraud detection, or recommendation generation, while humans focus on interpretation, judgment, and interpersonal interaction.

Task reconfiguration reshapes the value delivery architecture of business models. When analytical and operational tasks shift to AI systems, organizations redesign processes to improve scalability, efficiency, and responsiveness. Hybrid arrangements such as automated customer service with human oversight illustrate how organizations combine algorithmic efficiency with human expertise.

6.4 Mechanism 3: Adaptive Value Creation

Adaptive value creation represents the third mechanism through which human-AI collaboration transforms business models. Hybrid human-AI systems enable organizations to adjust value propositions and processes based on real-time data and feedback. Artificial intelligence monitors customer behavior, market dynamics, and operational performance, while human expertise interprets insights and guides strategic responses.

This mechanism is particularly important in digital environments with rapidly changing customer preferences. AI-driven analytics detect behavioral patterns that allow firms to modify products, services, and pricing strategies in real-time. Digital platforms frequently rely on recommendation systems and dynamic pricing models, while managers interpret algorithmic outputs and steer strategic adaptation.

Adaptive value creation strengthens organizational dynamic capabilities by enabling firms to sense opportunities, seize market changes, and reconfigure resources (Teece, 2018). The integration of human judgment and algorithmic analytics therefore supports continuous business model innovation.

6.5 Integrative Conceptual Model of Hybrid Human–AI Business Models

The proposed conceptual model explains hybrid human-AI business models as socio-technical systems where AI capabilities interact with human expertise to transform organizational value creation. Artificial intelligence provides the technological foundation for data processing, insight generation, and decision support.

The preceding discussion identified three socio-technical mechanisms through which human–AI collaboration reshapes organizational value creation: cognitive augmentation, task reconfiguration, and adaptive value creation. Each mechanism explains how interactions between human expertise and algorithmic capabilities influence different aspects of business model design. While the previous subsections examined these mechanisms individually, their collective impact on business model transformation becomes clearer when considered as an integrated system. Figure 3 therefore presents the integrative conceptual model of hybrid human–AI business models developed in this study. The model illustrates how human expertise

and artificial intelligence capabilities jointly operate through socio-technical mechanisms that reshape core components of business models.

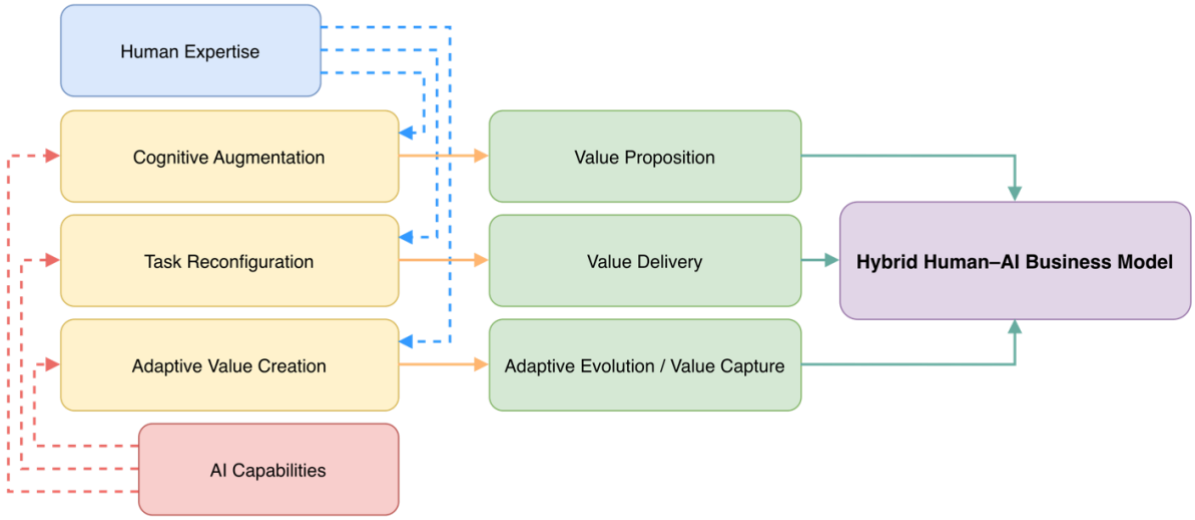

Figure 3. Integrative Conceptual Model of Hybrid Human–AI Business Models
Source: Developed by the authors based on Foss and Saebi (2017), Teece (2018), Dellermann et al. (2019), Raisch and Krakowski (2021), and Verhoef et al. (2021).

The model illustrates how human expertise and artificial intelligence capabilities jointly influence business model transformation through three socio-technical mechanisms: cognitive augmentation, task reconfiguration, and adaptive value creation. These mechanisms reshape key business model components including value proposition, value delivery, and adaptive business model evolution, ultimately leading to the emergence of hybrid human–AI business models.

The conceptual model highlights that the transformation of business models in AI-enabled organizations does not arise from artificial intelligence alone but from the interaction between algorithmic capabilities and human expertise within socio-technical systems. Human expertise provides contextual interpretation, strategic reasoning, and creative judgment, while AI contributes predictive analytics, pattern recognition, and automated processing of large datasets. Through cognitive augmentation, human decision-making is enhanced by algorithmic insights, enabling organizations to design more data-driven and personalized value propositions. Task reconfiguration redistributes analytical and operational tasks between human actors and intelligent systems, reshaping organizational workflows and improving the scalability and efficiency of value delivery. Adaptive value creation further enables organizations to continuously adjust products, services, and strategies based on real-time data and feedback.

Together, these mechanisms explain how human–AI collaboration reshapes the architecture of business models and enables new forms of organizational value creation. The integrative perspective presented in Figure 3 therefore provides the theoretical foundation for the research propositions developed in the following section. By clarifying how socio-technical mechanisms connect AI capabilities with core business model components, the framework establishes a basis for future empirical research examining hybrid human–AI systems in contemporary organizations.

7. Theoretical Propositions and Implications

This study develops research propositions explaining how human-AI collaboration shapes hybrid business models. The propositions derive from three socio-technical mechanisms: cognitive augmentation, task reconfiguration, and adaptive value creation, which influence key components of business model design (Jaakkola, 2020). Hybrid human-AI business models reflect broader shifts in digital value creation, where intelligent technologies reshape competitive dynamics through data-driven strategies (Brynjolfsson et al., 2021; Dwivedi et al., 2023).

7.1 Development of Research Propositions

The framework proposes that integrating human expertise and artificial intelligence reshapes organizational value creation through socio-technical mechanisms. The first mechanism, cognitive augmentation, enhances managerial decision-making through algorithmic analytics and predictive insights (Raisch & Krakowski, 2021). AI systems detect patterns in large datasets, enabling organizations to better understand customer behavior, market trends, and operational performance. These insights support more sophisticated and data-driven value propositions.

Proposition 1. *Cognitive augmentation enabled by artificial intelligence positively influences the development of data-driven and personalized value propositions within business models.*

The second mechanism, task reconfiguration, involves redistributing tasks between human actors and AI systems. Algorithmic systems increasingly perform routine analytical tasks, while humans focus on judgment, creativity, and social interaction (Faraj et al., 2018; Raisch & Krakowski, 2021). This redistribution reshapes value delivery by improving efficiency, scalability, and operational responsiveness.

Proposition 2. *The reconfiguration of tasks between human actors and artificial intelligence systems positively influences the efficiency and scalability of value delivery mechanisms in business models.*

The third mechanism, adaptive value creation, refers to the ability of hybrid human-AI systems to adjust value creation processes using real-time data and feedback. AI analytics monitor market dynamics and customer behavior, while human judgment guides strategic adaptation. This integration strengthens dynamic capabilities and supports continuous business model innovation (Teece, 2018).

Proposition 3. *Hybrid human-AI systems that enable adaptive value creation positively influence the capacity of organizations to continuously innovate and evolve their business models.*

Together, these propositions explain how human-AI integration reshapes business models through mechanisms affecting value proposition design, value delivery architecture, and the adaptive evolution of value creation.

7.2 Theoretical Contributions

The conceptual framework contributes to three research streams: artificial intelligence in organizations, business model innovation, and socio-technical systems theory.

First, the study advances AI and organizational research by shifting attention from technological capability to the interaction between human expertise and algorithmic systems. Existing studies often treat AI as a technological resource that improves decision-making and efficiency (Davenport & Ronanki, 2018; Raisch & Krakowski, 2021). The framework instead emphasizes hybrid human-AI collaboration as the driver of organizational outcomes within socio-technical systems.

Second, the study extends business model innovation research by explaining how AI reshapes value creation mechanisms. Prior literature focuses on configuring value proposition, value delivery, and value capture (Foss & Saebi, 2017; Teece, 2018) but rarely addresses the role of intelligent technologies. The concept of hybrid human-AI business models highlights socio-technical mechanisms through which AI transforms organizational value creation.

Third, the study contributes to socio-technical systems theory by applying its principles to AI-enabled organizations. Traditional socio-technical research emphasized alignment between human work systems and technological infrastructures (Pasmore et al., 2019; Trist & Bamforth, 1951). The framework extends this perspective by explaining how human expertise and intelligent technologies jointly shape organizational strategies and business models.

7.3 Implications for Future Empirical Research

The framework provides a basis for future empirical research on AI-driven business model innovation. Future studies may examine the socio-technical mechanisms identified in this framework, particularly how cognitive augmentation, task reconfiguration, and adaptive value creation operate across organizational contexts and influence business model outcomes.

Research may also investigate conditions under which hybrid human-AI business models improve organizational performance. Organizational capabilities, leadership practices, and digital infrastructures may shape the effectiveness of human-AI collaboration. Comparative studies across industries such as digital platforms, finance, healthcare, and manufacturing could clarify how institutional and technological environments influence adoption and effectiveness.

Longitudinal research may further explain how AI-enabled business models evolve over time. As organizations experiment with intelligent technologies, the interaction between human expertise and algorithmic systems may change, shaping the long term trajectory of business model innovation.

7.4 Managerial and Strategic Implications

The framework also offers managerial implications for designing AI-enabled business models. Strategic value from artificial intelligence depends not only on technological adoption but on integrating AI capabilities with human expertise. Organizations should therefore develop structures and processes that support effective human-AI collaboration.

AI adoption also requires reconfiguring organizational roles and workflows. Instead of replacing human labor, hybrid systems allow AI to perform analytical tasks while humans focus on interpretation, creativity, and strategic decision-making.

Organizations must also develop capabilities that support continuous adaptation in AI-enabled environments. Firms that translate algorithmic insights into strategic decisions are more likely to build adaptive and resilient business models.

7.5 Boundary Conditions of the Framework

The applicability of the proposed framework varies across organizational and industry contexts. It is most relevant in knowledge-intensive and data-rich sectors where artificial intelligence supports complex analysis and decision-making, including digital platforms, financial services, healthcare analytics, and technology-driven services.

The framework also applies primarily to organizations operating in digitally mediated environments where data availability and digital infrastructures enable close interaction between human actors and intelligent systems. In such settings, the integration of AI capabilities with organizational processes becomes a key driver of innovation and competitive advantage.

Its relevance may be lower in industries with limited digitalization or where decision-making relies largely on manual processes. Future research should examine how technological infrastructure, organizational capabilities, and institutional environments influence the adoption and effectiveness of hybrid human-AI business models.

8. Conclusion

This study examines how artificial intelligence reshapes business model innovation through interaction between human expertise and algorithmic systems. Prior research has generated insights on AI adoption, human–AI collaboration, and business model innovation, yet these streams remain weakly integrated. The study develops a socio-technical framework explaining the emergence of hybrid human-AI business models. Drawing on socio-technical systems theory, human-AI collaboration research, and business model innovation literature, the framework identifies three mechanisms through which AI transforms organizational value creation: cognitive augmentation, task reconfiguration, and adaptive value creation. These

mechanisms explain how AI capabilities become embedded in organizational systems and reshape value proposition, value delivery, and adaptive value creation processes.

The framework contributes to theory in several ways. First, it extends research on AI in organizations by conceptualizing AI as a socio-technical component that interacts with human expertise in shaping organizational outcomes. Second, it contributes to business model innovation literature by clarifying how AI-driven capabilities influence the architecture of value creation and value delivery mechanisms. The concept of hybrid human-AI business models explains how intelligent technologies and human capabilities jointly generate new forms of organizational value. Third, the framework extends socio-technical systems theory to AI-enabled organizations, showing how interaction between social and technological subsystems drives transformation of contemporary business models.

The conceptual propositions also create directions for future empirical research. Scholars may examine how the identified socio-technical mechanisms operate across industries, organizational contexts, and technological environments. Empirical work can investigate how cognitive augmentation, task reconfiguration, and adaptive value creation shape AI-enabled business models and organizational performance. Comparative and longitudinal designs may reveal how hybrid human-AI configurations evolve and how organizations adapt strategies and structures as AI technologies advance.

The findings highlight artificial intelligence as a driver of socio-technical transformation in organizations. As AI becomes embedded in operational processes and strategic decision-making, the future of business models will depend on how organizations integrate algorithmic capabilities with human expertise. Understanding this integration remains essential for advancing research on innovation and organizational transformation and for guiding organizations that seek resilient and adaptive business models in an AI-driven economy.

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