



10

AI-Driven Business Model Innovation: Pioneering New Frontiers in Value Creation

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Introduction

Digitalization and digital technologies significantly transform value creation in markets characterized by demand heterogeneity, influencing business model innovation and value creation in several key areas (e.g., Aagaard, 2019; Cennamo et al., 2020; Lanzolla et al., 2023; Lee et al., 2023; Lehmann et al., 2022). Firstly, they broaden the spectrum of products and services that vendors can present to consumers, enhancing customization and catering to diverse needs (Abou-Foul et al., 2023; Zhang et al., 2022). Secondly, they extend the reach of sellers, enabling them to connect with a more extensive array of potential buyers, thereby increasing market penetration and accessibility (Sullivan & Wamba, 2024). Thirdly, digitalization reduces the search costs involved in finding

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the optimal match between buyer and seller, streamlining transactions, and enhancing market efficiency (Benner & Waldfogel, 2023). Lastly, digitalization yields valuable insights into consumer preferences that are yet to be met, offering critical data that can drive product innovation and development (Kohli & Melville, 2019; Lanzolla et al., 2020; Nambisan et al., 2019). These dynamics indicate substantial opportunities for developing or refining theories on how digitalization impacts market scope, value chain reconfiguration, and business model innovation/reconfiguration (Massa & Tucci, 2013; Massa et al., 2017).

Understanding these effects is pivotal for academics and practitioners alike, as they navigate the evolving landscape of digital transformation in business. In the ever-evolving landscape of digitalization, Artificial Intelligence (AI) has emerged as a cornerstone, fundamentally reshaping some principles of business model innovation (Iansiti & Lakhani, 2020b; Jia et al., 2024; Lanzolla et al., 2021a; Mariani et al., 2023; Rammer et al., 2022). For one, Teece (2018) explains that AI is an enabling technology that can be integrated throughout a network of products and systems and can provide a beneficial service for customers in various parts of the value chain. Hence, AI is arguably the most important recent technological development and certainly a “pervasive economic and organizational phenomenon” (Von Krogh, 2018, p. 404) and stands at the confluence of revolutionary business model creation and the reengineering of innovation processes. This significant dual role of AI not only heralds the emergence of new value propositions but also epitomizes a paradigm shift in the methodologies employed to foster and implement business model innovation (Berente et al., 2021). Beyond spawning new business models, AI is instrumental in redefining the processes through which these innovations are conceived and realized, while increasing employee creativity (Jia et al., 2024; Liu et al., 2017).

The escalating significance of AI within the domain of innovation and business model innovation is manifest in the emergence of a dedicated research stream within innovation and management studies, as highlighted by seminal contributions such as Verganti et al. (2020), Iansiti and Lakhani (2020a), Lanzolla et al. (2021a), Krakowski et al. (2023), and Gama and Magistretti (2023). This burgeoning field has further been elucidated through systematic literature reviews, notably by

Haefner et al. (2021), Igna and Venturini (2023), and Mariani et al. (2023), underscoring the expanding scholarly interest. For example, Bahoo et al. (2023) delineate eight critical areas at the nexus of AI and corporate innovation, including its integration into business models, product innovation, open innovation, the innovation process, organizational innovation architecture, knowledge enhancement, market performance impact, and supply chain innovativeness.

Accordingly, AI and Industry 4.0 are pivotal in reshaping business model innovation, introducing advanced strategies such as “Bolt-On” AI systems that enhance existing CRM or ERP frameworks, enabling real-time data analysis and insights. In supply chain management, AI-driven asset tracking optimizes logistics and inventory control. Vertical process enhancements through AI, such as IBM Watson or H2O.AI, streamline specific business operations, offering bespoke solutions. For example, agriculture benefits from remote diagnostics, optimizing conditions for indoor growers. Generative AI is creating new content frontiers, from AI-generated podcasts to study materials. Moreover, Industry 4.0 introduces servitization and autonomous IoT services, such as Kespri drones for insurance inspections, transforming traditional business models into agile, responsive, and technologically integrated frameworks. This evolution underscores a strategic shift toward data-driven, customer-centric, and flexible business practices, heralding a new era of competitive advantage and innovation.

The critical role of data and AI in driving successful digital business model innovation has been explored by a number of researchers. For example, Ghasemaghahi and Calic (2019) document that firms having a greater capacity of exploiting data, in terms of volume, variety, and velocity, reveal larger innovation competences and performance. Furthermore, Bessen et al. (2022) illuminate the pivotal role of proprietary data in AI startups, underlining the strategic importance of data as a foundational asset in the AI-driven innovation landscape. In the study by Rammer et al. (2022) of AI in the context of the German corporate sector, adoption of highly automated, AI-driven methods plays a crucial role in fostering world-first product innovations. Accordingly, the studies by Akter et al. (2023) and Ferràs-Hernández et al. (2023) indicate that the dominant design for AI is based on business model

innovation as much as on technology, and where the dominant business model encompasses AI as a service. Collectively, these studies underscore the transformative potential of AI in redefining business models and innovation strategies, highlighting AI's capacity to not only enhance operational efficiency and productivity (Brynjolfsson et al., 2018, 2021; Noy & Zhang, 2023), but also to drive groundbreaking innovations that can redefine market landscapes (Pearlson et al., 2024). The dynamic and adaptive capabilities afforded by AI technologies facilitate a more agile, informed, and participative approach to business model innovation. However, despite the development of multiple definitions and typologies within the management discipline, as delineated by Davenport and Ronanki (2018) and Huang and Rust (2021), the research community has yet to fully apprehend the extensive array of opportunities that Generative AI (GenAI) presents for innovation and business model innovation research (Burström et al., 2021).

The Transformative Role of Artificial Intelligence on Business Innovation

In his historical AI research, Nilsson (2010, p. 13) defines AI as “that activity devoted to making machines intelligent, and intelligence is that quality that enables an entity to function appropriately and with foresight in its environment.” Thus, AI marks a pivotal advancement in data processing, enhancing computers’ and machines’ ability to augment human decision-making, problem-solving, and technological innovation. Consequently, AI has been recognized as a potentially transformative general-purpose technology, a notion supported by Brynjolfsson and McAfee (2017), Brynjolfsson et al. (2018, 2021) and Goldfarb et al. (2023). This evolution is primarily driven by significant advancements in machine learning, leading to a rapid decrease in prediction costs across multiple fields, as highlighted by Agrawal et al. (2018).

For instance, the use of AI in real-time data analytics allows for a more effective and nuanced understanding of market dynamics, enabling organizations to rapidly iterate and refine business model hypotheses. AI/digital technologies such as machine learning (ML), the Internet of

Things (IoT), automation, and intelligence-driven robotics are pivotal in redefining corporate structures and the innovation process. These advancements are also underscored by Bocquet et al. (2007) for their transformative role in facilitating more efficient operations and fostering innovation, significantly influencing traditional business practices.

By efficiently parsing complex datasets, leveraging sophisticated algorithms, and applying machine learning, AI uncovers insights previously out of reach, fundamentally transforming business innovation, operational efficiency, and strategic alignment with market shifts. Davenport and Ronanki (2018) delineated Artificial Intelligence into three distinct categories: process automation, cognitive insights, and cognitive engagement. Process automation, also known as robotic process automation (RPA), stands out for its cost-effectiveness and rapid ROI, automating routine tasks efficiently. Cognitive insights utilize algorithms and machine learning to analyze and find patterns in large datasets, offering deep analytical capabilities. Cognitive engagement, through natural language processing and machine learning, enhances interactions within and across organizational boundaries, including employee and customer engagement (Bankins et al., 2023). In a parallel framework, Huang and Rust (2021) categorized AI into mechanical, thinking, and feeling types, aligning with tasks that are routine, rule-based, or emotionally driven, respectively, further enriching the understanding of AI's multifaceted roles in innovation and beyond.

The innovation impact of AI significantly transforms firms across three key areas: product, service, and business model innovation; operational efficiency; and R&D. AI facilitates data-driven business models, enhancing product performance and enabling new services, such as autonomous driving and tailored healthcare, while also optimizing marketing through advanced user pattern analysis (Garbuio & Lin, 2019). In operational contexts, AI drives automation and supports human decision-making in diagnostics, predictive maintenance, and digital security, showcasing potential for substantial efficiency gains in both production and administrative processes (OECD, 2020). Furthermore, AI revolutionizes R&D by leveraging large datasets and predictive algorithms to accelerate and expand research activities, notably in pharmaceuticals, chemicals, and machinery, thereby redefining invention and

knowledge production processes through advanced prediction technologies and deep learning methods (Agrawal et al., 2018; Cockburn et al., 2018).

With the introduction to Generative AI, new innovative frontiers are ahead for business development. For instance, Generative AI facilitates a new level of personalization, termed hyper-personalization, empowering complementors to customize their products or services instantly to align with the unique preferences of every user. Since the launch of ChatGPT3 by OpenAI in 2022, Generative AI has seen accelerated growth. According to Gartner, it is projected that by 2025, 30% of outbound messages will be generated through synthetic means. According to *Forbes* (2023) the main difference between traditional AI and Generative AI lies in their capabilities and application. Where traditional AI systems are primarily used to analyze data and make predictions, Generative AI goes a step further by creating new data similar to its training data. Currently, corporate executives are actively integrating AI into business process reengineering, markedly shaping innovation practices worldwide (Burgess, 2018), and are adeptly merging AI technologies with their innovation processes to enhance operational capabilities and secure competitive advantages (Krakowski et al., 2023; Musiolik et al., 2020; Porter, 1985). Hence, the integration of AI in business practices not only deepens understanding of consumer behavior and streamlines supply chain operations, but also encourages the emergence of innovative business models in driving superior performance. Predictive analytics, a cornerstone of AI, equips businesses with the ability to foresee market trends, fostering agility in strategic adjustments (Haenlein & Kaplan, 2019). Furthermore, AI-driven process automation significantly cuts operational costs, boosts efficiency, and enhances service quality, illustrating AI's integral role in shaping future business landscapes. This synergy between human cognitive functions and machine-based analytics heralds a new era in business model innovation (Burström et al., 2021), which fosters the development of novel business strategies, optimizing operational efficiencies and creating unprecedented value propositions (Mishra & Tripathi, 2021; Mustak et al., 2021). Thus, Bresnahan (2021) emphasizes that integrating AI in business development requires significant organizational restructuring to be fully leveraged, a phenomenon

consistent with historical transformations initiated by analogous technologies. While AI constitutes a pivotal element for innovation within business models, mere investments in digital infrastructure, technology, and data are insufficient for its holistic integration.

However, there are critical voices that raise concerns about the use of AI in business development. The advent of AI necessitates a reevaluation of organizations and poses potential disruptions within the labor market, thereby underscoring the critical need for legislative bodies and labor unions to engage in thoughtful policy dialogue. Such deliberations aim to devise strategic interventions capable of alleviating the adverse employment effects engendered by the proliferation of AI technologies (Sarker et al., 2019; Mariani et al., 2023). Concerns surrounding the advancement of AI and its impact on organizations include the potential for job displacement as automation supplants roles traditionally held by humans (Bankins et al., 2023; Hunt et al., 2022). Furthermore, Generative AI risks exacerbating societal inequalities by advantaging those with access to the technology, thereby contributing to the emergence of a new digital divide (Balsmeier & Woerter, 2019), not to mention the fact that with fewer employees per “digital” company (compare the number of employees at a bank branch vs a digital bank, or automated robotic warehouse vs a traditional warehouse), the concentration of wealth is likely to increase further.

In response, the European Union has taken a leadership role with the introduction of the AI Act in 2023 (EU AI Act, 2023), creating a comprehensive regulatory framework for AI across various sectors, excluding military/defense, setting a benchmark not yet matched by most non-EU nations. This Act requires strict adherence from organizations involved in the development or use of AI systems, with regulations calibrated to the specific risks posed by each AI application (WEF, 2023). Despite these efforts, the AI Act faces criticism for its lack of robust enforcement mechanisms, ambiguous definitions of AI, and unclear assignment of responsibility for the negative consequences of AI usage. These critiques underscore the necessity for more precise regulatory frameworks to effectively address the multifaceted ethical and socio-economic challenges presented by AI (Wörsdörfer, 2023).

AI in Business Model Innovation: Transforming Value Creation

The integration of AI and digital technologies emerge as pivotal mechanisms for fostering business model innovation (BMI), enabling the development of new business models and the revitalization of existing ones, while generating new value creation and value capture pathways and enrich traditional ones (Aagaard, 2019; Brynjolfsson & McAfee, 2017; Kohli & Melville, 2019; Li, 2020; Mariani & Dwivedi, 2024; Mukherjee & Chang, 2023; Sjödin et al., 2020, 2021). AI and digital advancements have spurred innovative approaches to value generation and value capture (Lanzolla et al., 2021a), including extreme personalization, servitization, and novel pricing models such as subscriptions and pay-per-use (Bahoo et al., 2023; Burström et al., 2021; Kohtamäki et al., 2020), thereby enhancing revenue growth, competitive positioning, and performance (Correani et al., 2020; Krakowski et al., 2023). Hence, value creation and value capture with AI necessitates the development of new routines, skills, operational processes, and business models tailored to customer needs (Sjödin et al., 2021). Furthermore, AI catalyze rapid and nonlinear business model transformations, crucial for navigating crises by swiftly addressing technological shifts. This agility is essential in times of uncertainty, allowing organizations to respond effectively to challenges and avoid detrimental outcomes (Ardito et al., 2021).

Accordingly, the integration of Artificial Intelligence (AI) into the fabric of business models represents a paradigmatic shift, necessitating a fundamental reevaluation of the principles that govern the incorporation of AI technologies into the mechanisms of value offering. This shift extends beyond mere technological adoption, impacting the very essence of organizational roles, functions, and processes to ensure the seamless delivery of value and maintenance of competitive edge (Iansiti & Lakhani, 2020a, 2020b). The promise of AI extends across a spectrum of operational and strategic benefits, offering businesses the opportunity to significantly increase their innovation capabilities (Gama & Magistretti, 2023), while at the same time reduce costs, elevate the quality of services, enhance productivity and coordination, and thereby optimize delivery

efficiencies (Brynjolfsson et al., 2018, 2021; Davenport & Ronanki, 2018; Noy & Zhang, 2023).

In this transformative landscape, AI-driven business models serve as a catalyst for exploring innovative pathways of creating, delivering, and capturing value, fundamentally altering the competitive dynamics within industries (Iansiti & Lakhani, 2020a, 2020b; Leone et al., 2021; Mancuso et al., 2023; Nambisan et al., 2019). Organizations endowed with superior AI capabilities are uniquely positioned to redefine their value spaces, leveraging the power of automated insights derived from exhaustive analysis of industrial data. This facilitates the adoption of data-driven operational strategies and fosters a collaborative ecosystem for customer interaction, enriching the customer experience through personalized and interactive engagements (Jovanovic et al., 2022).

However, the journey from conceptualization to widespread application of AI in business models presents substantial challenges, notably the scalability of AI services. Transitioning from initial proofs of concept to applications that cater to larger customer segments requires meticulous planning and execution (Burström et al., 2021). Thus, there emerges a critical need for a deeper understanding of the foundational principles underpinning AI-enabled business model innovation. This entails a strategic integration of AI capabilities into the core business activities related to value creation, delivery, and capture, aiming for scalable growth and ensuring that AI's transformative potential is fully realized (Sjödín et al., 2021). However, Krakowski et al. (2023) discover that performance disparities in AI and hybrid settings are not solely attributed to humans or AI alone. They identify the emergence of a novel decision-making resource at the confluence of human and AI interaction, which is pivotal in driving performance outcomes but shows no correlation or a negative relationship with the innate abilities of humans. Hence, as businesses navigate this complex terrain, the strategic assimilation of AI into business models becomes imperative, demanding a holistic and human-centric approach that addresses the technological, organizational, and strategic facets of AI deployment for enduring success and competitiveness.

Accordingly, in elaborating further on the pathways of integrating AI into business model innovation and value creation, we develop an

archetype model presenting four different approaches (Table 10.1). This model positions the application of AI across two axes, degree of AI integration (Low to High) and impact on competitive advantage (Low to High). Hence the degree of AI integration represents the extent to which AI technologies are embedded within the company's operations, products, and services. Low integration denotes basic AI applications with minimal alterations to existing processes, while high integration indicates comprehensive, AI-driven transformations across the business model. The axis, impact on competitive advantage' assesses the contribution of AI applications to the company's competitive positioning within the market. Low impact refers to incremental improvements, whereas high impact signifies radical enhancements in value proposition, market differentiation, and customer engagement.

Navigating the landscape of business transformation underpinned by AI demands an intricate balance between strategic foresight, organizational adaptability, and technological innovation. The conceptual journey from initial AI applications to comprehensive business model transformation encapsulates a series of strategic shifts across distinct archetypes—each representing a unique blend of AI integration and competitive advantage impact. This evolution is not merely about leveraging AI for operational efficiency or customer engagement but encompasses a broader vision of redefining market patterns and establishing new norms of competitive leadership. A detailed understanding of the progression from one archetype to another within the context of business model innovation necessitates rigorous empirical research. Nevertheless, we propose several critical considerations for managers to contemplate as they navigate these transitions.

The pathway from being Incremental Optimizers to becoming Efficiency Enhancers signifies a foundational shift in approach. Initially focused on deploying AI for marginal improvements, companies must pivot toward embedding AI deeply within their operational fabric. This transition, characterized by substantial investments in AI technologies, necessitates a cultural metamorphosis toward data-driven decision-making and process automation, aiming for profound efficiency gains and cost reductions.

Table 10.1 The four archetypes of AI application in Business Model Innovation

Impact on competitive advantage	Degree of AI integration	
	Low	High
	Experience innovators (Low Integration, High Impact) Businesses apply AI in targeted, customer-facing functions to enhance the customer experience and engagement, thus creating a competitive edge Example: A healthcare provider using AI for personalized patient engagement through an intuitive app that tracks health metrics and offers customized health advice, markedly improving patient loyalty and satisfaction	Transformation leaders (High Integration, High Impact) Organizations that fully embrace AI, redefining their business models, value propositions, and market positioning. They leverage AI to create new products, services, and customer experiences, fundamentally altering the competitive landscape Example: Tesla's integration of AI in autonomous driving and battery management systems not only enhances vehicle performance but also establishes Tesla as a leader in electric and self-driving technology, significantly distinguishing it from competitors

(continued)

Table 10.1 (continued)

Degree of AI integration	
Low	High
Incremental optimizers (Low Integration, Low Impact) Companies in this quadrant use AI for minor improvements in operational efficiency and customer service Example: A retail company employing basic chatbots for customer inquiries, slightly improving customer satisfaction without fundamentally altering the value proposition	Efficiency enhancers (High Integration, Low Impact) Firms focus on internal processes, leveraging AI to streamline operations and reduce costs significantly, yet with limited external market differentiation Example: A manufacturing firm implementing AI-driven predictive maintenance across its production lines, achieving cost savings and operational reliability without directly enhancing its market offering

Conversely, some organizations might leapfrog directly from Incremental Optimizers to Experience Innovators, prioritizing customer-centric AI applications over internal optimization. This strategic choice underscores the importance of leveraging AI to craft personalized and engaging customer experiences, thus differentiating companies in a competitive marketplace. It requires a deep understanding of customer needs and behaviors as well as a lean experimentation approach, utilizing AI to tailor interactions and enhance satisfaction.

The evolution from Efficiency Enhancers to Transformation Leaders represents a pivotal moment in a company's strategic journey. Organizations adept at internal optimizations are challenged to leverage these AI-driven efficiencies to fundamentally innovate their value propositions. This involves a comprehensive rethinking of how AI can drive not just cost savings but also market differentiation and leadership, requiring a holistic application of AI across all facets of the business model. A corporate venturing approach embracing a portfolio of experiments to see which products/services/business models gain traction is a preferred approach, while at the same time remaining mindful that the experiments may cause friction or entail resistance from internal stakeholders (Chesbrough & Tucci, 2020).

Similarly, transitioning from Experience Innovators to Transformation Leaders demands an expansion of focus. Companies that excel in delivering superior customer experiences through AI must integrate these capabilities more broadly into their business models. This shift involves leveraging AI not only to enhance customer engagement but also to drive innovation in product and service offerings, thereby reshaping competitive dynamics. Embarking on this dynamic journey requires:

- **Strategic Clarity and Commitment:** Defining a coherent vision for AI within the organization and dedicating the necessary resources to achieve this vision.
- **Investment in AI Capabilities:** Committing to ongoing investments in AI technology, talent, and infrastructure to support the strategic application of AI.

- Cultural and Organizational Agility: Fostering a culture of innovation, flexibility, and experimentation, enabling the organization to adapt and thrive as it transitions through different archetypes.
- Ecosystem Engagement: Actively building and participating in ecosystems that provide access to AI insights, technologies, and innovations.

As organizations traverse this evolutionary path, they are compelled to continuously reevaluate and adapt their strategies considering emerging AI capabilities and market feedback. This journey from incremental optimization to transformative leadership in AI application is emblematic of the broader challenge of navigating digital transformation, underscoring the imperative for companies to remain agile, innovative, and forward-looking in an increasingly complex and AI-driven business environment.

AI's Impact on Redefining Business Model Components

The advent of AI is catalyzing a transformative shift across the spectrum of business modeling, redefining traditional patterns and ushering in an era of unprecedented innovation. As we delve into the integration of AI within the framework of the Business Model Canvas (Osterwalder et al., 2005), it becomes evident that AI's role in business model innovation transcends mere automation or efficiency gains; it represents a paradigm shift in how companies approach market opportunities, develop products and services, engage with customers, and compete in the digital age (Huang & Rust, 2021). Through sophisticated data analytics, machine learning algorithms, and cognitive technologies, AI enables businesses to harness deep insights, predict trends, and personalize interactions at scale. This profound integration of AI across business dimensions not only enhances operational capabilities but also redefines value propositions, customer relationships, and revenue streams, thereby enabling businesses to navigate the complexities of the modern market landscape with agility and foresight (Jorzik et al., 2024; Holland et al., 2024; Haefner et al., 2021; Sjödin et al., 2020). We explore specific,

real-world examples that illustrate the transformative potential of AI across each dimension (component) of the Business Model Canvas. These examples not only underscore the versatility and power of AI in driving business model innovation but also highlight the strategic imperatives for organizations seeking to leverage AI for sustainable competitive advantage.¹

Customer Segments

AI revolutionizes the identification and understanding of customer segments by employing sophisticated data analysis and pattern recognition techniques (Perez-Vega et al., 2021). Through machine learning algorithms, businesses can search, analyze, and recombine vast amounts of data from various touchpoints to identify nuanced customer behaviors, preferences, and unmet needs (Lanzolla et al., 2021b). This granular insight enables companies to tailor their offerings more precisely to different segments, or even individual customers, enhancing the customer experience and satisfaction significantly (Lehmann et al., 2022). A well-known case exemplifying this is Netflix, which employs AI to analyze viewing patterns, search histories, and ratings to cluster users into micro-segments. This segmentation allows for highly personalized content recommendations (see Villarroel et al., 2013), which not only enhances user engagement but also optimizes content acquisition and production strategies, making Netflix's offerings more aligned with user preferences.

Value Propositions

In the realm of value propositions, AI serves as a catalyst for creating differentiated and compelling offerings (Mustak et al., 2021). It does so by enhancing products and services with intelligent features, automating personalization, and enabling the creation of entirely new, AI-driven

¹ As in any Business Model Canvas analysis, the components are not mutually exclusive and there are some overlaps and interdependencies between components.

solutions (Abou-Foul et al., 2023). AI's predictive capabilities allow businesses to anticipate customer needs and offer proactive solutions, thus delivering exceptional value. Interesting case examples hereof are DeepMind's AI solutions for healthcare and its Streams app, which were developed to promptly identify patients at risk of acute kidney injury and showcase how AI can underpin new value propositions that significantly improve patient outcomes and operational efficiencies in healthcare settings (Garbuio & Lin, 2019).

Channels

AI transforms channels by optimizing how products and services are delivered and experienced (Bahoo et al., 2023). Virtual assistants and chatbots, powered by natural language processing (NLP) and machine learning, offer personalized and interactive customer service across digital platforms (Jovanovic et al., 2022). Moreover, AI enables the optimization of distribution channels by predicting the most effective pathways and timings for reaching customers. An example is Domino's Pizza using AI for its order-taking process through Dom, a virtual assistant that can take orders via voice or text through multiple channels. This not only streamlines the ordering process but also enhances the customer experience by providing a convenient and personalized service.

Customer Relationships

AI deepens customer relationships through personalized interactions and predictive customer service (Haenlein & Kaplan, 2019). By analyzing customer data, AI can help businesses anticipate customer needs and address them proactively. Additionally, AI-driven sentiment analysis tools can gauge customer emotions and satisfaction levels, enabling companies to tailor their engagement strategies more effectively (Wessel et al., 2023; Rane et al., 2023). One case example hereof is Sephora's Virtual Artist app that uses AI and augmented reality (AR) to offer customers

a virtual makeup try-on experience. This tool allows customers to see how products will look on them before purchase, fostering a more personalized and engaging shopping experience.

Revenue Streams

AI impacts revenue streams by enabling dynamic pricing models, personalized product offerings, and new service-based models (Kohtamäki et al., 2020). By analyzing market trends, customer behavior, and inventory levels, AI can optimize pricing strategies in real-time to maximize profits (Correani et al., 2020). Additionally, AI can identify upselling and cross-selling opportunities by recommending relevant products or services to customers. For example, Uber uses AI to implement surge pricing, which adjusts fares in real-time based on demand and supply conditions. This not only optimizes revenue but also ensures service availability by incentivizing drivers to meet demand. And any AI-based servitization model, such as anticipatory maintenance of Caterpillar earth-moving equipment, opens up new revenue streams.

Key Resources

In the context of key resources, AI technologies themselves become critical assets. Data, algorithms, computing infrastructure, and AI expertise are essential for developing and sustaining competitive advantage (Pearlson et al., 2024). Businesses invest in these resources to fuel their AI initiatives, drive innovation, and improve operational efficiencies (Noy & Zhang, 2023). As an example, the IBM Watson platform exemplifies how AI can serve as a key resource, offering businesses across industries AI-powered capabilities for data analysis, natural language processing, and machine learning to inform decision-making and innovation.

Key Activities

AI influences key activities by automating processes, enhancing decision-making, and driving research and development. Automation of routine tasks frees up resources for strategic activities, while AI-enhanced analytics improve decision-making accuracy and speed (Huang & Rust, 2021; Hunt et al., 2022). Furthermore, AI accelerates innovation by enabling rapid prototyping and testing of new ideas. An example is Zara using AI to optimize its supply chain and inventory management. By analyzing sales data, customer preferences, and fashion trends, Zara can swiftly adjust its production and distribution plans, ensuring that popular items are restocked quickly and efficiently.

Key Partnerships

AI reshapes key partnerships by fostering collaborations with AI technology providers, startups, academia, and research institutions (Nobari & Dehkordi, 2023). These partnerships are vital for accessing cutting-edge AI technologies and expertise and are often facilitated through platforms (Jovanovic et al., 2022; Wulf & Blohm, 2020). These collaborative efforts in AI research and development can lead to innovations that enhance business models and help to co-create new market opportunities (Leone et al., 2021). As an example, the partnership between NVIDIA and Audi to develop AI-powered autonomous vehicles demonstrates how collaborations can accelerate technological advancements. NVIDIA provides Audi with advanced AI and deep learning technologies that are specifically designed to process the vast amounts of data generated by the vehicle's sensors in real-time. This includes sophisticated algorithms for object detection, scene recognition, and decision-making processes crucial for autonomous driving.

Cost Structure

Finally, AI influences the cost structure by automating operations and optimizing resource allocation, leading to significant cost savings. While

the initial investment in AI technology can be high, the long-term efficiencies gained from automation and improved decision-making can drastically reduce operational costs (Agrawal et al., 2018; Mariani & Dwivedi, 2024). Moreover, AI can help identify areas where resources are being underutilized, enabling further cost optimizations. One case example hereof is JPMorgan Chase's COIN (Contract Intelligence) platform, which uses AI to automate the review of legal documents, a process that previously consumed thousands of human hours annually. This not only reduces costs but also accelerates the document review process, improving efficiency and reducing the potential for errors.

Summarizing the transformative impact of AI on business models, it is evident that AI redefines the dimensions of value creation and capture, positioning itself as a critical driver of competitive advantage. Through advanced analytics and cognitive technologies, AI enables a deeper understanding of customer segments, enriches value propositions with personalized and innovative solutions, and optimizes channels for enhanced delivery. Moreover, AI deepens customer relationships through tailored interactions and dynamically adjusts revenue streams, highlighting its pivotal role in reshaping how businesses engage with markets and stakeholders. As organizations adapt to this digital model, the strategic application of AI across business model dimensions is not just beneficial but essential for sustaining growth and navigating the complexities of the modern competitive landscape.

Implications of Generative AI on Value Creation Through Platform Ecosystems

Platform ecosystems drive value creation and digital business model innovation by orchestrating connections among diverse groups or sides of a market—for example, end users and complementors—fostering exchanges that revolutionize how goods and services are accessed and delivered beyond conventional market boundaries (Teece et al., 2023; Parker et al., 2017; Wulf & Blohm, 2020). Within the digital platform ecosystem, the advent of Generative AI holds the potential to fundamentally alter the dynamics between all stakeholders and

their interrelations. Generative AI, for instance, facilitates novel practices of hyper-personalization, empowering complementors to precisely customize their services in real-time to align with the unique preferences or needs of end users (Rane et al., 2023). Yet, this technological innovation does not come without its challenges for complementors, who may perceive Generative AI's capabilities as a disruptive force. Lysyakov and Viswanathan (2023) suggest that the deployment of Generative AI systems within a crowdsourcing context can lead complementors (crowd participants in this case) to reconsider their engagement with the platform. Specifically, they may opt to exit the platform or pivot their contributions toward more intricate contests, thereby circumventing direct competition with the AI system. This nuanced interplay underscores the transformative impact of Generative AI on the digital platform landscape, necessitating a reevaluation of strategies by complementors in the face of technological advancements (Wessel et al., 2023; Lehmann et al., 2022).

Accordingly, Generative AI emerges as a catalyst for change, redefining the landscape for complementors that are pivotal to the vibrancy and sustainability of digital platforms. Its role transcends the boundaries of advanced personalization, prompting a critical reassessment of the strategic, operational, and competitive dynamics that underpin complementor activities (Pearlson et al., 2024; Sacks, 2015). The democratizing effect of Generative AI, characterized by its ability to lower barriers to entry and streamline development processes, opens the digital innovation space to a broader spectrum of actors. This inclusivity, while fostering innovation and diversity, simultaneously engenders a heightened competitive milieu (Soh & Grover, 2022). Complementors, ranging from seasoned veterans to novices devoid of technical expertise, find themselves navigating a new reality where differentiation (Zhang et al., 2022)—or lead time—becomes paramount in a sea of AI-generated content. These dynamics naturally lead to a discussion on the enduring value of human creativity and strategic ingenuity in distinguishing oneself when everyone has access to the same technological infrastructure (Ameen et al., 2024).

Parallel to the shifts observed among complementors, the user experience on digital platforms is undergoing a transformation of equal

magnitude. Generative AI equips users with unprecedented creative tools, enhancing productivity and facilitating the effortless creation of content across varied formats such as text, images, and music (Noy & Zhang, 2023). As users leverage Generative AI to articulate their ideas and share their creativity with greater ease, a reflection on the shifting perceptions of quality and authenticity ensues. The disclosure of AI's role in content creation invites a reevaluation of value, authenticity, and distinction in the digital content landscape, raising pertinent questions about competition, differentiation, and the evolving criteria for excellence in platform markets (Wessel et al., 2023; Raj et al., 2023).

The ramifications of Generative AI extend to the very architecture and governance of digital platforms themselves. As platform providers grapple with the dual forces of empowerment and complexity ushered in by Generative AI, they confront a myriad of ethical, legal, and operational challenges (Figuroa-Armijos et al., 2023; Martin and Waldman, 2023). These include navigating the delicate balance between innovation and privacy, copyright adherence, and the mitigation of unethical applications (Chatterjee et al., 2015). Moreover, Generative AI holds promise for enhancing the governance and orchestration of digital platforms, potentially streamlining operations, and fostering more integrated and aligned ecosystems. Yet, the path to adopting Generative AI toward these ends is fraught with uncertainties and challenges (Cram et al., 2022). The quest to harness its potential for creating flourishing ecosystems, aligning stakeholder interests, and constructing open value networks necessitates a strategic and nuanced approach.

The management and control of Generative AI within platforms emerge as critical areas of inquiry, as providers seek to navigate the intricacies of fostering innovation while ensuring ethical integrity and stakeholder alignment. Consequently, in synthesizing these perspectives, it becomes evident that Generative AI is not merely a technological innovation but a transformative force that reconfigures the digital platform ecosystem. Its impact on complementors, users, and platform providers underscores the need for a comprehensive and multidisciplinary approach to understanding and navigating the challenges and opportunities it presents (Mariani and Dwivedi, 2024).

Managerial Implications of AI-Enabled Business Model Innovation

In the realm of business model innovation, the advent of AI serves as both a catalyst for transformation, reconfiguration and as a beacon that guides strategic reorientation. As organizations seek to navigate the complex interplay between technology and business, the role of management becomes pivotal in orchestrating a harmonious integration of AI within the corporate fabric. This necessitates a multifaceted approach, blending strategic foresight with tactical agility, underpinned by a profound commitment to ethical considerations and societal welfare. The strategic implications of AI for business model innovation cannot be overstated. Managers are tasked with the dual mandate of envisioning future landscapes shaped by AI while grounding their strategies in the pragmatic realities of today's technological capabilities and market dynamics. This involves a thorough reevaluation of the organization's strategic objectives, ensuring they are not only aligned with but also augmented by AI's potential to drive competitive advantage. The strategic process extends beyond mere alignment, requiring a dynamic and continuous adaptation to the rapidly evolving AI landscape. This adaptability is paramount, as the pace of AI development often outstrips traditional strategic planning cycles.

Central to the successful integration of AI into business models is the recalibration of organizational structures and processes. The conventional hierarchies and siloed departments that characterize many organizations are ill-suited to the cross-functional collaboration that AI initiatives demand. Therefore, managers must champion organizational redesigns that foster agility, promote cross-disciplinary teamwork, allow for sometimes uncomfortable experimentation, and facilitate seamless information flow. Such structural adjustments serve as the scaffolding upon which AI-driven innovation can thrive, enabling the rapid iteration and implementation of AI solutions. At the same time, the ecosystem within which organizations operate also undergoes a transformation in the age of AI. Hence, managers must navigate this expanded landscape, leveraging collaborations and partnerships that extend beyond traditional industry boundaries. The interconnectivity facilitated by AI

technologies enables organizations to tap into a wider network of knowledge, resources, and capabilities. Engaging with this broader ecosystem not only accelerates AI innovation but also amplifies the potential for business model reinvention/reconfiguration.

Finally, investing in human capital emerges as a critical component of this integration process. The dichotomy between the technical prowess required to develop and deploy AI technologies and the domain-specific expertise necessary to apply these technologies effectively presents a significant challenge. Managers must, therefore, spearhead efforts to bridge this gap through comprehensive talent development programs. This encompasses not only the acquisition of external AI expertise but also the upskilling of the existing workforce. Creating a culture of lifelong learning and intellectual curiosity is essential, as it equips employees with the skills and mindset needed to navigate the AI-augmented business landscape. Moreover, the ethical implications of AI deployment necessitate a principled approach to management. As AI technologies become increasingly embedded in organizational operations and decision-making processes, managers must ensure these systems are designed and utilized in a manner that upholds ethical standards and societal norms. This involves a commitment to transparency, accountability, and fairness, alongside proactive engagement with the broader ethical debates surrounding AI.

Future Research Avenues in AI-Facilitated Business Model Innovation

The integration of Generative AI into business model innovation stands at the forefront of academic inquiry, blending technological innovation with strategic business transformation. This emergent field beckons both junior and senior scholars to explore AI's pivotal role in redefining business practices against the backdrop of rapidly evolving digital platforms and economic landscapes. The pressing need for rigorous academic exploration into how AI reshapes business models and market dynamics is underscored by the technology's widespread deployment across sectors

such as healthcare and finance, exemplified by IBM's forays into these areas with Watson.

This exploration demands a multidisciplinary approach that merges insights from technology, management, sociology, and ethics, addressing the socio-economic and organizational shifts induced by AI. Such a comprehensive analysis is vital for unpacking the implications of AI-driven analytics, autonomous decisions, and personalized content on business strategies and market behavior. It also highlights the necessity of interdisciplinary strategies to navigate issues of trust, accountability, and inclusivity, aiming to forge AI-enabled BMIs that are not only technologically sound but also socially responsible and ethically aligned.

Moreover, AI's potential to drive sustainable business innovation forms a crucial research domain. Investigating how AI aids in achieving environmental, social, and governance (ESG) goals—such as optimizing renewable energy distribution—reveals the technology's capacity to balance technological growth with environmental care. Additionally, the ethical, legal, and governance challenges introduced by AI integration into business models call for scholarly focus. Developing ethical AI frameworks, exploring legal regulations around AI applications, and understanding regulatory standards highlight the need for global standards in AI ethics and governance, guiding organizations through regulatory and ethical complexities.

In addition, research into the organizational culture and change management essential for AI integration could uncover effective strategies for embedding AI within business practices. Studies on leadership roles in AI adoption, managing resistance, and cultivating digital transformation environments offer insights crucial for navigating AI implementation challenges. The scalability and adaptability of AI-enabled BMIs across various sectors and geographies present another vital research area. This includes examining technology transfer mechanisms, ecosystem dynamics including architectural control, and market conditions that influence AI innovation adaptability. Understanding the sustainability and evolution of AI-enabled BMIs over time is key to assessing their long-term viability and adaptability. Empirical validation and case studies are essential for connecting theoretical frameworks with real-world applications. These methodologies offer detailed insights into

the operational challenges and successes of AI integration, enriching our understanding of AI's business impact.

In conclusion, the intersection of AI and BMI offers a rich array of research opportunities spanning technological, strategic, ethical, and organizational fields. This multidisciplinary exploration is poised to provide valuable insights for practitioners, advance theoretical knowledge, and address the digital transformation's challenges and prospects. This scholarly endeavor is a call to action for navigating the unexplored territories of AI-enabled business model innovation, aiming for contributions that steer technology and business toward sustainable, ethical, and impactful futures in the digital economy. Thus, the integration of AI into business model innovation and value creation presents a complex array of challenges and opportunities for managers to navigate in, and for researchers to explore even further.

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