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IDENTIFYING TRENDS AND GAPS IN EXPLAINING THE ROLE OF AI IN BUSINESS MODELS INNOVATIONS AND STRATEGIC DECISION MAKING – A LITERATURE REVIEW

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ABSTRACT

Purpose: *This study explores the transformative role of artificial intelligence (AI) in business model innovation (BMI), examining how AI enhances value creation, delivery, and capture. It identifies trends and research gaps to understand AI's influence on business modelling.*

Need for the Study: *AI is reshaping business practices and models across industries. The rapid pace of AI development necessitates prioritizing research on its most impactful aspects. Summarizing trends and identifying gaps while linking them to AI advancements highlights critical areas for future exploration.*

Methodology: *A literature review analysed academic papers and case studies from reputable databases. Core AI technologies, including Machine Learning, Natural Language Processing, Computer Vision, Robotics, Expert Systems, and Deep Learning, were examined concerning critical processes in business model innovation, namely, value creation, value capturing, and value delivery.*

Findings: *The review identified trends in AI-supported business modelling, such as operational efficiency, customer personalization, and strategic decision-making, with challenges like data privacy, algorithmic bias, and workforce adaptation remaining underexplored. Gaps include the absence of longitudinal studies, limited sector-specific analyses, and insufficient research on integrating AI with traditional business models.*

Practical Implications: *The findings emphasize the need for interdisciplinary research and ethical frameworks to guide AI adoption. Businesses should concentrate on scalable AI solutions, customer-centric innovation, and overcoming integration barriers to fully leverage AI's potential for sustainable growth. This study establishes a foundation for future research, highlighting the responsible and strategic implementation of AI in BMI.*

Keywords: literature review, business model, innovative business model, Artificial Intelligence, AI in business, innovation

JEL codes: O31, O32, M15, D83

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1. INTRODUCTION

In today's rapidly evolving business landscape, business model innovation (BMI) has become a crucial driver of long-term competitive advantage (Aagaard & Tucci, 2024). Organizations must continuously adapt their business models to respond to shifting market dynamics, technological advancements, and changing opportunities (Aagard, 2024). Artificial Intelligence (AI) has emerged as a powerful enabler in addressing these challenges, offering advanced tools and insights to support various aspects of business model innovation (Hamadaqa et al., 2024). AI empowers organizations to harness vast amounts of data, enabling them to identify opportunities, streamline operations, and refine their strategies with unprecedented precision (Olorunfemi et al., 2024). Its widespread adoption across industries reflects a broader shift toward technology-driven and intelligent management models, where innovation, responsiveness, and accountability are essential for success (Jorzik et al., 2024).

The rapid integration of AI into business models is not merely a technological shift but a societal imperative. As industries face mounting pressures from climate change, resource scarcity, and evolving consumer ethics, AI-driven innovations offer pathways to address these challenges while maintaining profitability. For instance, AI-powered circular economy models reduce waste in manufacturing, while predictive analytics enable energy-efficient supply chains. Framing AI's role within these macro-level challenges underscores its transformative potential beyond operational efficiency, aligning technological advancement with global sustainability goals. Additionally, AI is pivotal in supporting intelligent management by integrating information technologies, analytical tools, and automation to manage organizational resources and processes more effectively.

During the ideation and conceptualization phase, AI analyses market trends, evaluates competitors, and generates innovative ideas that align with consumer needs (Babatunde et al., 2024). It also uncovers hidden insights by analysing customer behaviour and interactions, helping organizations identify opportunities that may remain unnoticed (Choudhury et al., 2021). As companies progress to value proposition development, AI facilitates customer segmentation and personalization by leveraging behavioural and demographic data to design tailored products and services (Huang & Rust, 2020; Kumar et al., 2024). By predicting and adapting to market conditions, AI enables businesses to scale efficiently while mitigating risks (Bharadwaj et al., 2021). Machine learning algorithms further enhance the adaptability of business models, allowing them to evolve dynamically based on new data and insights (Wang et al., 2021).

By integrating AI into core processes, organizations innovate their business models and embrace intelligent management principles. This shift enables them to unlock new pathways to growth and resilience, positioning themselves for success in an increasingly complex world (Bharadwaj et al., 2021). The role of AI in business model innovation is rapidly expanding, with AI-driven models providing a competitive advantage while enhancing efficiency, customer engagement, and decision-making (Adesoga et al., 2024). However, gaps remain in understanding its full impact.

The broad assumptions regarding AI's role and potential in transforming business modelling have raised questions about the extent to which this role and potential are explored in scientific research and about early evidence of AI's impact on emerging business strategies and approaches. A comprehensive literature review was conducted to address these questions. By reviewing existing research, the article aims to understand current trends and identify gaps in our knowledge about AI's role in driving business model innovation.

2. THEORETICAL BACKGROUND

2.1. Business model and business model innovation

A business model describes how an organization creates value for its customers and how it shares in that value (Teece, 2010). It encompasses the core elements of a company's operations, including revenue generation, cost structure, customer relationships, and value proposition (Osterwalder, 2004). The term "business model" has been around since the 1950s (Vukanović, 2016); it gained significant prominence in the 1990s and 2000s with the rise of the Internet and the need for sustainable business models (Amit & Zott, 2001; Magretta, 2012), and it has been widely adopted in business settings and business-related analysis.

Business model innovation refers to designing, adapting, or redefining a business model's core structure and elements to unlock new value, seize market opportunities, and strengthen competitive advantage. It focuses on discovering new, previously unimagined approaches to generate revenue, deliver products or services, and maximize customer value (Zott & Amit, 2010). Business model innovation challenges conventional norms, industry standards, and existing assumptions to unveil fresh pathways for growth and profitability (Osterwalder & Pigneur, 2010).

Business model innovation may stem from changes in key business model processes, including core elements such as value creation, value delivery, and value capture. Table 1 explains these in greater detail.

Value creation is at the heart of sustainable business success, referring to the process by which companies develop products or services that offer meaningful customer benefits, ultimately generating value that exceeds the cost of inputs. Businesses focusing on value creation enhance customer satisfaction and loyalty by designing experiences beyond mere product offerings. It involves understanding customer preferences, addressing pain points, and continuously improving product quality and service delivery. Value creation is not solely about pricing or features but about delivering a comprehensive experience that meets or surpasses customer expectations. A well-crafted value proposition attracts customers, encourages repeat purchases, and fosters brand loyalty (Kumar & Reinartz, 2016).

Table 1. Key processes of Business Model Innovation

Business Model Innovation Key Processes	
Value Creation	This involves developing new ways to create value for customers, which include innovative products, services, or experiences that meet emerging needs (Łaszkiewicz, 2018)
Value Delivery	This component focuses on how the value is delivered to customers. It includes the channels and methods used to reach customers effectively and efficiently (Osterwalder & Pigneur, 2010)
Value Capturing	This refers to the mechanisms through which a business captures the value it creates, typically through revenue models, pricing strategies, and profit margins (Teece & Linden, 2017)

Source: own elaboration.

Value delivery focuses on the methods and channels a company employs to provide its value proposition to customers effectively and efficiently. This encompasses the entire supply chain, distribution networks, and customer service practices that ensure the created value reaches the intended audience promptly and satisfactorily. According to Osterwalder and Pigneur, the value delivery process involves several stages, including value proposition definition, value provision design, and value-in-use delivery. In each phase, iterative cycles of value creation and capture activities ensure successful alignment and progression to the next phase (Osterwalder & Pigneur, 2010).

Value capturing pertains to the mechanisms through which a company retains a portion of the value it has created, typically realized as profit. This involves pricing, cost management, and competitive positioning strategies that enable the firm to sustain its operations and fund future growth. Aligning value creation and capture is critical for developing commercially viable business models (Astrom et al., 2022).

The three processes described in Table 2 contribute to developing six primary components of a business model: customer segment, revenue model, key activities, key resources, key partnerships, and cost structure.

Understanding and redefining customer segments is crucial for business model innovation. Companies that successfully innovate often identify new target audiences or reposition their offerings to meet evolving customer needs better. This may involve expanding into previously untapped markets, personalizing products and services through data analytics, or repurposing existing solutions to appeal to different demographics. Businesses that recognize shifting consumer behaviours and tailor their value propositions are better positioned for long-term success. Modern companies increasingly adopt micro-

segmentation strategies rather than catering to a broad audience, offering highly specialized solutions that address niche demands (Amit & Zott, 2012; Bocken et al., 2014).

Table 2. Key components of Business Model Innovation.

Business Model Innovation Key Components	
Customer Segments	Identifying and understanding different customer groups is essential. Business model innovation often involves targeting new segments or redefining existing ones (Amit & Zott, 2012)
Revenue Model	This outlines how a business generates income, which can include various streams such as sales, subscriptions, or licensing (Ardley & Hardwick, 2024)
Key Activities	These are the critical actions a company must undertake to deliver its value proposition and operate its business model effectively (Christensen et al., 2016)
Key Resources	The essential assets required to implement the business model, including human, financial, and technological resources (Ramdani et al., 2019)
Key Partnership	Collaborations with other organizations, suppliers, or stakeholders that can enhance the business model's effectiveness and reach (Saqib & Satar, 2021)
Cost Structure	Understanding the costs associated with the business model is vital for ensuring profitability and sustainability (Chammassian & Sabatier, 2020)

Source: own elaboration.

A company's revenue model defines how it generates income, and innovation in this area can significantly impact financial stability. Businesses may shift from traditional one-time sales to more sustainable and predictable income streams, such as subscription-based services, which provide recurring revenue and foster stronger customer relationships. The freemium model, which offers basic services for free while charging for premium features, has become a popular approach in software and digital platforms. Similarly, usage-based pricing models, common in cloud computing and utilities, allow customers to pay based on consumption, increasing flexibility. Companies may also explore licensing, franchising, or ecosystem-driven monetization, where value is co-created with partners and third parties. Innovating the revenue model ensures financial resilience while enhancing customer loyalty and engagement (Fajardo-Vanega & Aguilar-Pazmiño, 2022; Teece, 2010).

The effectiveness of a business model depends on the key activities a company undertakes to deliver its value proposition. Business model innovation often involves rethinking these key activities to enhance efficiency, agility, and customer satisfaction. Digital transformation is crucial, as businesses leverage technology to automate processes, improve customer experiences, and scale operations. Many companies adopt agile methodologies to respond swiftly to market changes and continually enhance their products and services. Investing in research and development (R&D) is another strategic move, enabling companies to stay ahead of industry trends and create groundbreaking solutions (Christensen et al., 2016). Additionally, organizations increasingly focus on building ecosystems that integrate multiple stakeholders, fostering collaboration and value co-creation. By innovating key activities, businesses can streamline operations, increase productivity, and enhance overall competitiveness (Zott & Amit, 2010).

Key resources are essential for any business model to function effectively, including human talent, financial assets, technological capabilities, and intellectual property. Business model innovation in this area often involves developing proprietary technology to differentiate from competitors, acquiring and retaining top talent to enhance expertise, and leveraging data-driven insights for more informed decision-making (Ramdani et al., 2019). Protecting intellectual property is another crucial factor, as companies that safeguard their innovations maintain a competitive advantage. In recent years, businesses have increasingly turned to artificial intelligence and machine learning to optimize resources and maximize efficiency. Strengthening and innovating key resources ensures companies have the foundation to support long-term growth and adaptability (Schneider & Spieth, 2013).

Strategic collaborations with other organizations, suppliers, research institutions, or competitors can enhance business model innovation significantly. Companies often form partnerships to access new markets, share expertise, or accelerate product development. Collaborating with startups can introduce fresh innovation and expedite the adoption of emerging technologies. Co-creation with customers is

another growing trend, as businesses involve users in product development to create solutions that better address their needs (Saqib, N., & Satar, M. S., 2021). Joint ventures and alliances also provide opportunities to leverage complementary strengths and expand market reach. In today's interconnected economy, businesses that build strong partnerships can enhance their capabilities, reduce risks, and create value beyond what they could achieve alone (Foss & Saebi, 2017).

A well-optimized cost structure is critical for ensuring profitability and sustainability in any business model. Companies that innovate in this area focus on reducing operational costs, optimizing resource allocation, and improving financial efficiency. Many businesses adopt lean operations to eliminate waste and streamline workflows, while others shift toward more variable cost structures that enhance scalability. Automation and artificial intelligence play a key role in cost reduction by minimizing labor-intensive processes and improving accuracy. Additionally, businesses explore alternative sourcing and logistics strategies to lower supply chain expenses. Companies can achieve greater financial flexibility by continually refining their cost structure, allowing them to invest in innovation and long-term growth (Chammassian & Sabatier, 2020; Teece, 2010).

2.2. The concept and components of Artificial Intelligence

Artificial Intelligence (AI) is no longer a futuristic concept; it is a rapidly evolving technology already transforming various industries. At its core, AI aims to empower machines with human-like intelligence, enabling them to perform tasks that traditionally required human cognitive abilities (M. Gladden et al., 2022). The influence of AI is felt across various sectors, including public relations, product marketing, and business innovation. Its ability to analyse massive datasets, recognize patterns, and generate insightful predictions makes it a valuable asset for organizations seeking to optimize their operations and enhance customer engagement (Gavi & Olusegun, 2024; Ghosh, 2025). The intricate workings of AI are built upon a foundation of interconnected components, each playing a crucial role in enabling machines to think and act intelligently (Avasarala & Gopalakrishnan, 2016; Kietzmann & Angell, 2016; Vasudevan, 2024). Components of Artificial Intelligence and their potential business contribution are detailed further in Table 3.

While Table 3 delineates distinct AI components, their real-world impact often arises from integration. For example, robotics in logistics combines computer vision for navigation, NLP for human-robot communication, and machine learning for route optimization. Similarly, healthcare diagnostics merge deep learning for image analysis with expert systems to validate findings against medical databases. These cross-component synergies enhance value creation but introduce complexities such as interoperability and ethical trade-offs—areas that are underexplored in current literature. Recognizing these interdependencies is crucial for designing holistic AI-driven business models.

The components of AI work together seamlessly, enabling organizations to harness their transformative power across various functions. As AI evolves, its applications will expand, leading to further advancements in technology and business practices. We can anticipate AI playing an increasingly significant role in shaping the future, revolutionizing industries, and enhancing our lives unprecedentedly (Brynjolfsson & McAfee, 2021; Chui et al., 2020; Kaplan & Haenlein, 2020).

Given that intelligent management refers to the strategic integration of information technologies, analytical tools, and automation to enhance the effectiveness of managing resources and processes within an organization (Calof et al., 2017), it also concludes that Artificial Intelligence significantly enhances the process by providing advanced capabilities for data analysis, automation, and decision-making. This concept represents a shift from traditional, intuition-based management toward a more systematic, data-driven approach. By combining digital infrastructure with real-time analytics and automated systems, intelligent management allows organizations to monitor performance, optimize workflows, and make informed decisions faster and more accurately (Mohammed et al., 2019). At its core, intelligent management is about using technology to support operations and transform decisions and how value is created across the organization (Dass, 2016).

Table 3. Artificial Intelligence components

AI components	Description
Machine Learning (ML)	Machine learning is at the heart of AI, a powerful technique that allows computers to learn from data without explicit programming. ML algorithms are trained on vast datasets, enabling them to identify patterns, make predictions, and improve their performance over time. This capability is particularly valuable in public relations, where AI-powered tools can analyse public sentiment, track brand mentions, and automate responses to inquiries, ultimately enhancing reputation management (Burström et al., 2021; Krishnamurthy et al., 2024)
Natural Language Processing (NLP)	Serves as the bridge between humans and machines, enabling effective communication. It involves the ability to understand, interpret, and generate human language. This technology is crucial for creating chatbots and virtual assistants that can engage with customers naturally and personally, enhancing customer service and satisfaction in public relations (Supriyono et al., 2024; Zhang et al., 2020)
Computer Vision (CV)	This component empowers machines to "see" and interpret visual information. It enables the analysis of images and videos, identification of objects, and extraction of meaningful insights. In product marketing, computer vision analyses consumer behaviour through image recognition, allowing marketers to tailor their campaigns and effectively target specific demographics (Gujar, 2024; Zhang et al., 2021)
Robotics	AI is integrated into robotics, automating tasks and enhancing efficiency across various industries. Robots with AI capabilities can perform repetitive tasks with precision and speed, freeing human workers for more complex and creative endeavours. This automation is particularly advantageous in manufacturing and logistics, where robots can manage assembly, packaging, and material handling (Nitsche, 2021; Bock et al., 2022)
Expert Systems (ES)	These AI programs are designed to replicate human experts' knowledge and decision-making abilities. They are trained on extensive datasets and rules, enabling them to provide expert advice and recommendations in specific domains. Expert systems are applied in healthcare, finance, and other fields where complex decision-making is essential (Yang & Zhu, 2024; Chen et al., 2020)
Deep Learning (DL)	Deep learning is a powerful subset of machine learning that employs artificial neural networks with multiple layers to analyse data accurately. This technique is particularly effective in tasks such as image recognition, speech recognition, and natural language understanding. Deep learning is increasingly utilized across various applications, including personalized marketing, fraud detection, and medical diagnostics (Osuva, 2021; LeCun et al., 2020; Kelleher, 2021)

Source: own elaboration.

Through machine learning algorithms, AI enables organizations to process vast volumes of structured and unstructured data in real time, uncovering patterns and generating insights that would be difficult to detect manually. This analytical power supports more accurate forecasting, performance monitoring, and resource allocation. Furthermore, AI-driven automation streamlines repetitive tasks, reduces human error, and increases operational efficiency across departments. AI catalyzes responsiveness and adaptability in intelligent management systems, allowing businesses to anticipate changes, optimize workflows, and react swiftly to emerging challenges. By embedding AI into core management functions, organizations move toward more predictive, proactive, and personalized strategies, reinforcing the core objectives of intelligent management.

2.3. Artificial Intelligence for Business Model Innovation

AI revolutionizes business models by transforming how companies create, deliver, and capture value, ultimately driving innovation and a competitive advantage. AI empowers businesses to tailor products and services to individual customer preferences through personalization and predictive analytics while forecasting future market trends. By analysing vast customer data, AI enhances user experiences, fostering deeper engagement and brand loyalty. Predictive analytics enables companies to stay ahead of customer needs, allowing for proactive innovation and product development (Farayol et al., 2023). As AI continues to evolve, businesses that embrace its capabilities are expected to gain a significant

competitive edge in an increasingly digital economy. By leveraging AI for value creation, delivery, and capture, organizations can unlock new growth opportunities, improve customer experiences, and drive long-term success. Integrating AI into business models is not just a technological advancement; some authors argue that it is a fundamental shift that will define the future of commerce and industry (Jorzik, 2024; Sjödin, 2021).

During the value creation process, AI fosters strategic partnerships by facilitating collaborative platforms that connect businesses with complementary products and services. Companies can share AI-driven insights with partners, creating mutually beneficial relationships and unlocking new market opportunities. Furthermore, AI reshapes cost structures by reducing operational expenses through automation and optimizing resource allocation, ensuring investments yield the highest returns (Broekhuizen et al., 2023; Sjödin, 2021). Moreover, AI assists in financial planning by analyzing historical data and market conditions, enabling businesses to make informed decisions and reduce financial risks (Adeniran et al., 2024). AI analyses large datasets for customer segmentation to identify distinct customer groups based on behaviour, preferences, and demographics. This enables businesses to craft highly targeted marketing campaigns that resonate with specific segments, increasing conversion rates and customer engagement. Additionally, AI-driven insights allow businesses to optimize revenue models, such as subscription services and freemium models, by identifying which features to offer for free and which to monetize, ensuring sustainable revenue growth (Bhagat et al., 2024).

According to the value capturing, dynamic pricing models powered by AI enable businesses to adjust prices in real time based on demand, competitor pricing, and consumer behaviour, ensuring optimal pricing strategies that maximize revenue and market share (Anang et al., 2024). Furthermore, AI plays a crucial role by enhancing pricing strategies, predicting customer churn, and providing accurate revenue forecasting.

In value delivery, AI optimizes logistics by enhancing supply chain management, ensuring timely deliveries, and reducing operational inefficiencies. Additionally, AI-driven customer support solutions, such as chatbots and virtual assistants, provide 24/7 service, improving response times and customer satisfaction. By leveraging AI-driven insights, businesses can implement targeted retention strategies to sustain customer loyalty and long-term profitability (Agarwal et al., 2024).

AI technologies like Machine Learning (ML), Natural Language Processing (NLP), Computer Vision, Robotics, Expert Systems, and Deep Learning are revolutionizing business model innovation by transforming value creation, capture, and delivery. In value creation, AI automates processes, improves decision-making, and enables personalized customer experiences, driving data-driven products and services. For value capture, technologies such as Computer Vision and Robotics enhance operational efficiency, reduce costs, and optimize workflows in manufacturing and logistics, leading to higher profitability. In value delivery, Expert Systems and Deep Learning refine service offerings, improve customer support, and automate complex decisions, thus enhancing customer satisfaction, retention, and seamless interactions. Figure 1 summarizes the potential impact of AI components on business model innovation. This model will be used as a reference for further analysis.

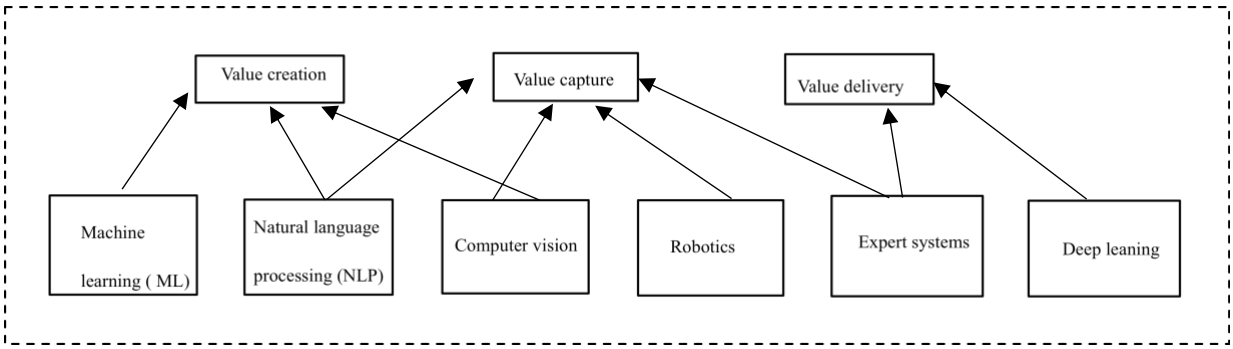

Figure 1. Relationship between the key elements of Business Model Innovation and AI components
Source: own elaboration.

3. METHODOLOGY

The assumptions explored regarding AI's role and potential in changing the landscape of business modelling have raised questions about how thoroughly this role and potential are examined in scientific research. What is the early evidence of AI's impact on new business strategies and approaches? To address these questions, an extensive literature review has been conducted.

The literature review explicitly aimed to explore the role of artificial intelligence (AI) in innovating business models. Its purpose was to provide a comprehensive understanding of how AI technologies influence business models and to identify current research trends and gaps. The approach taken in the review was primarily theoretical, focusing on understanding and analysing the relationships between key concepts such as AI, digital transformation, and business model innovation.

A range of reputable academic databases was used for the literature search, including Google Scholar, EBSCO, Elsevier, ResearchGate, Scopus, Web of Science, ProQuest, ScienceDirect, Publish or Perish, and WJARR. These platforms were selected because they comprehensively cover peer-reviewed articles, journals, and academic papers critical to the research. To identify literature that could provide insights into AI's role in business transformation, the keywords defined for the search process were: 'Business Model Innovation', 'Business Model', and 'Artificial Intelligence'. Furthermore, related terms were used, specifically: 'Digital Technologies', 'Innovation', 'Creativity', and 'Competitive Advantage', to broaden the scope of the literature collected.

The selection of literature was guided by well-defined criteria, ensuring that the chosen sources aligned with the primary objective of understanding the practical applications and implications of Artificial Intelligence (AI) in business model innovation. The first step involved prioritizing sources and clearly defining core concepts related to AI and its real-world applications in business. This focus was particularly important since it emphasized the practical impact of AI technologies on transforming business models.

Additionally, articles were selected based on their relevance to the research questions, credibility, and recency. Preference was given to works that explored the practical integration of AI into business processes, particularly those that demonstrated measurable outcomes, such as improvements in operational efficiency, customer engagement, and overall business performance. This approach ensured that the selected literature directly addressed the tangible benefits of AI adoption in business contexts.

Articles that did not meet these criteria were excluded from the review. For example, papers lacking practical case studies or focusing mainly on theoretical frameworks without demonstrating the real-world impact of AI on business models were omitted. Similarly, outdated sources or those that did not provide relevant and actionable insights were excluded in favour of more recent and applicable research.

Approximately 600 articles were identified in the initial phase based on their potential relevance to the intersection of AI and business model transformation. Inclusion and exclusion criteria were applied to streamline the selection process. The inclusion criteria focused on articles published in peer-reviewed journals or reputable conference proceedings, studies examining AI applications in business, decision-making, and value creation, and research discussing the challenges and opportunities of AI integration within business models. Additionally, preference was given to empirically based research, including case studies that highlight the practical implementation of AI. Articles published after 2015 were preferred unless they provided foundational insights critical to understanding AI's role in business.

The exclusion criteria included studies lacking empirical evidence or practical case studies, papers focused solely on AI technical development without addressing business implications, and sources that were outdated or irrelevant to the research scope. After applying these criteria, the abstracts and methodologies of the remaining articles were carefully reviewed, resulting in the final selection of 173 articles. These articles were considered the most relevant and could comprehensively address the research questions.

4. ARTIFICIAL INTELLIGENCE AND BUSINESS MODELLING: LITERATURE TRENDS AND GAPS ANALYSIS

Machine Learning (ML) is significantly transforming business model innovation, with several key trends emerging in the literature that can also greatly enhance intelligent management. One trend is adopting ML to support dynamic, agile business models that quickly adapt to market changes (Arora &

Khare, 2024; Batz et al., 2025; Rahman et al., 2024; Kumar et al., 2025). In this context, ML strengthens intelligent management by enabling organizations to make more accurate, data-driven decisions in real time, thus improving responsiveness and flexibility in resource and process management. Researchers have also noted the critical role of ML in personalizing products and services, which drives enhanced customer engagement and satisfaction (Patil, 2024; Arora & Khare, 2024; Potla & Pottla, 2024). It has been observed that Machine Learning enables value creation by optimizing operations, uncovering new revenue streams, and providing companies with a competitive advantage, particularly in industries like retail and finance (Rahman et al., 2024; Brackmann et al., 2023; Gao et al., 2024; Krishnamurthy et al., 2024). These efficiencies are vital to intelligent management, which relies on automated, insight-driven processes to allocate resources effectively and enhance operational performance. Additionally, some researchers argue that Machine Learning is contributing to the development of sustainable business models and fostering collaboration through open innovation frameworks that encourage partnerships with startups and third-party providers (Shaik et al., 2024; Moiana et al., 2023; Costa-Climent et al., 2023; Martinez, 2024). The role of ML in promoting sustainability is evident in the literature, emphasizing its support for the development of sustainability-driven business models (Ukoba et al., 2024; Kumar et al., 2025).

Nevertheless, significant gaps in the literature surrounding ML's role in business model innovation persist. First, there is a lack of longitudinal studies that explore the long-term impacts of ML on business models. While the short-term potential is well-documented, little is known about how ML-driven innovations evolve. Furthermore, although the benefits of ML are widely discussed, the challenges of implementing these technologies in business models are often overlooked. Data quality, integration costs, scalability, and the need for skilled personnel remain underexplored. Another gap is the lack of sector-specific analysis, as most studies adopt a broad approach without examining how ML is uniquely applied in different industries. Ethical concerns, including data privacy, algorithmic bias, and the potential for job displacement due to automation, are also inadequately addressed, and organizational and cultural barriers, particularly resistance to change within companies, hinder the adoption of ML. Finally, there is limited research on how ML can complement rather than disrupt traditional business models and how it can specifically contribute to sustainability. Addressing these gaps through more interdisciplinary research, longitudinal studies, and practical case studies would provide a more comprehensive review of ML's role in business model innovation.

One of the key trends in the literature on NLP and business model innovation is enhancing customer experiences through technologies such as chatbots, sentiment analysis, and automated customer support (Olujimi et al., 2023; Uzoka et al., 2024; Supriyono et al., 2024; Abiagom et al., 2024). For instance, research has analysed how customer feedback, reviews, and social media interactions help businesses deliver personalized services and improve engagement (Gladstan et al., 2024). Researchers found that NLP plays a critical role in personalizing products and services, enabling companies to tailor their offerings by understanding customer preferences and needs (Supriyono et al., 2024; Rane et al., 2024) and analysing social media data to create personalized marketing strategies and better service offerings (Babatunde et al., 2024; Rane et al., 2024; Ranjan et al., 2023). Moreover, a notable trend in the literature on the connection between NLP and BMI is the increasing use of NLP for automating business processes like document processing, contract analysis, and market research, leading to greater efficiency by minimizing human error, reducing operational costs, and saving time (Supriyono et al., 2024; Cofino et al., 2024; Oyewole et al., 2024). Automating these processes minimizes human error, cuts operational costs, boosts efficiency, and frees up resources for strategic initiatives. These outcomes align directly with the goals of intelligent management. It has been proven that sentiment analysis helps businesses understand customer sentiment and adjust their offerings to meet changing preferences; sentiment analysis powered by NLP allows businesses to gauge customer opinions, identify emerging trends, and adapt their strategies accordingly (Malik et al., 2023; Malakar et al., 2024; Shad et al., 2024). This facilitates real-time strategic adjustments and product development, aligning closely with the goals of intelligent management. Additionally, researchers suggest that NLP is integral to knowledge management and innovation within organizations, facilitating better information retrieval, data mining, and collaborative knowledge sharing, which help organizations make informed decisions and foster innovation (Just, 2024; Arnarsson et al., 2021). Combined with machine learning, these functions become increasingly adaptive and self-improving, enabling intelligent management systems to learn continuously and operate with greater autonomy and efficiency.

Despite the widespread application of NLP, several gaps in the literature impede a deeper understanding of its long-term impact on business model innovation. One significant gap is the absence of longitudinal studies that examine how NLP influences business models over time and their sustainability. More longitudinal research is necessary to evaluate the long-term effects of NLP on business models, particularly in relation to organizational change and business sustainability. Additionally, there is a lack of research regarding the challenges of integrating NLP into traditional business models, especially in industries with legacy systems that may not be compatible with advanced technologies. Many industries encounter notable difficulties when incorporating new technologies like NLP into existing systems, particularly in legacy-heavy sectors. Another gap is the insufficient interdisciplinary research linking NLP with fields such as business strategy, economics, and organizational studies, which would enhance understanding of its broader implications on business model transformation. There is a need for more interdisciplinary approaches that combine technical NLP studies with business strategy and organizational challenges. Ethical and social issues related to NLP, such as privacy concerns, algorithmic bias, and data security, remain underexplored, despite the growing use of NLP in processing sensitive data. These ethical concerns, including fairness and privacy, should be thoroughly examined to ensure the responsible use of NLP technologies. Furthermore, there is a lack of research on cultural barriers that may impede NLP adoption, such as employee resistance or mistrust of automated systems. Overcoming organizational and cultural resistance to technological adoption presents a significant challenge that requires further research. Finally, the role of NLP in promoting sustainable business models remains a relatively unexplored area, particularly in sectors focused on sustainability, such as healthcare, education, and green energy, despite its potential to initiate positive change in these industries. More research is warranted to understand how NLP can contribute to sustainable business models, especially in eco-friendly and sustainability-focused sectors.

One prominent trend in the literature regarding computer vision in business model innovation is its use in automated image and video analysis, which allows businesses to extract valuable insights from visual data, such as product recognition, quality control, and visual search (Dhabliya et al., 2023; Prasetyo et al., 2025; Peker et al., 2023; Xiong et al., 2024). These capabilities have transformed the retail, manufacturing, and security sectors (Malik et al., 2024; Rashid et al., 2024). Furthermore, the literature indicates that computer vision is playing an increasingly significant role in personalization, where image recognition tailors products and services to individual preferences (Kulkarni et al., 2023; Yang et al., 2024; Gujar, 2024; Raji et al., 2024). For instance, online retailers use computer vision to create personalized shopping experiences by recommending products based on customers' visual preferences (Nguyen et al., 2024; Patil, 2024). Another key trend noted is the impact of autonomous systems, including self-driving cars and drones, which rely heavily on computer vision for navigation, obstacle detection, and safety assurance (Bathla et al., 2022; Badrloo et al., 2022; Ali Y., 2023). These systems contribute to intelligent management by automating complex tasks, enhancing response times, and minimizing human error, particularly in the logistics, surveillance, and transport sectors. Facial recognition and gesture tracking are also emerging in the literature, demonstrating significant impacts on industries such as security, retail, and entertainment, thereby enabling improved customer interactions and personalized advertising (Keyser et al., 2021; Taskiran et al., 2020). The literature illustrates how computer vision aids in medical image analysis, assisting doctors in diagnosing conditions such as cancer by analyzing medical images and identifying patterns that may be invisible to the human eye (Jiang et al., 2023; Esteva et al., 2021; Olveres et al., 2020; Elyan et al., 2022). Many authors have also shown that integrating computer vision with augmented reality (AR) and virtual reality (VR) technologies drives innovations in industries such as gaming, education, and training, offering immersive and interactive experiences (Logeswaran et al., 2024; Al-Ansi et al., 2023; Dembe, 2024; Lopes et al., 2024; Shi, 2024). Computer vision enhances intelligent management by facilitating real-time monitoring, automation, predictive analytics, and human-computer interaction.

The literature also identifies gaps in computer vision applications for business model innovation. Research highlights challenges such as high initial costs, data privacy concerns, and integration difficulties (Lopes et al., 2024; Prasetyo et al., 2025; Raji et al., 2024). For instance, implementing machine learning and computer vision in manufacturing demands significant investment and faces hurdles in data collection and integration (N. Thompson et al., 2024). Additionally, the accuracy of computer vision systems heavily depends on the quality and quantity of data, and their use raises ethical and privacy issues (Khanh et al., 2024).

Moreover, while the research results demonstrate the potential of digitalization to enable business model innovation, the literature often highlights this potential without providing concrete frameworks for implementation. One significant gap in the literature is the lack of scalable, real-time solutions for complex computer vision tasks in dynamic environments, such as the challenges faced when deploying systems for autonomous vehicles in uncontrolled, real-world settings. These systems frequently struggle with variable lighting, weather conditions, and diverse objects. Furthermore, privacy concerns surrounding facial recognition and other personal data collection methods in the research community have sparked important ethical debates. However, research aimed at mitigating these concerns remains limited. While computer vision has the potential to enhance decision-making processes, a gap persists in understanding how to leverage these visual insights across various business functions, particularly in traditional industries like construction and agriculture. Another gap in the literature involves integrating computer vision with other emerging technologies, such as blockchain and IoT, especially in supply chain and inventory management, where cross-technology synergies could streamline operations and improve transparency. Additionally, insufficient research addresses the barriers to adoption, particularly in industries with low-tech infrastructure, where the costs and complexities of implementing computer vision solutions are prohibitive. The impact of computer vision on job displacement due to automation, particularly in manufacturing and retail, is another gap, as studies addressing the social implications of widespread AI adoption in these sectors are lacking. Finally, there is a pressing need for further investigation into sustainable business models in industries like agriculture, where computer vision could improve efficiency and reduce environmental impact. However, its full potential has yet to be thoroughly explored.

The field of robotics in value capture is brimming with exciting trends while facing significant literature gaps (Liu et al., 2024; Rahman et al., 2024). One of the most prominent trends is the integration of collaborative robots (cobots) into diverse industries, particularly manufacturing and logistics (Liu et al., 2024; George & George, 2023). Research highlights that cobots are increasingly integrated into fields such as manufacturing, healthcare, and logistics to enhance productivity and safety by working alongside human workers (Pauliková et al., 2021; Javaid et al., 2021; Keshvarparast et al., 2023; Aaltonen et al., 2020). These robots, designed to work in tandem with human employees, are revolutionizing operational efficiency and productivity (Licardo et al., 2024; Tripathi et al., 2024; Wang et al., 2024; Dhanda et al., 2024). Designed to complement human abilities rather than replace them, they are well-suited for tasks that require precision and repetition. Autonomous robots are also increasingly used in logistics and warehousing, transporting goods, managing inventory, and optimizing supply chain processes. By assessing this knowledge, we can better design our business model to be more efficient and innovative (Choudhary et al., 2025; De Simone et al., 2025; Odesanmi et al., 2022; Raj et al., 2024; Doncieux et al., 2022). This automation of routine processes supports intelligent management by improving resource utilization, minimizing human error, and facilitating data-driven decision-making.

Studies highlight the ability to automate repetitive tasks, freeing human workers to focus on more complex and value-added activities (Intahchomphoo et al., 2024; Zirar et al., 2023). This shift leads to increased productivity, reduced operational costs, and improved product quality (Sakeb et al., 2024; Campilho et al., 2023; Zhao et al., 2024; Javaid et al., 2021). In agriculture, robotics enables precision farming, with robots employed for tasks such as planting, harvesting, and monitoring crop health, which increases yields while reducing environmental impact (Cheng et al., 2022; Wakchaure et al., 2023; Shamshiri et al., 2018; Oliveira et al., 2021; Botta et al., 2022; Eissa, 2024). For instance, numerous studies published about robotics and AI investigate the implementation of collaborative robots across vehicle assembly, warehouse logistics, and agricultural operations, highlighting their role in enhancing operational efficiency and safety (Jacob et al., 2023; Smith, 2024; Malik et al., 2019; Keshvarparast et al., 2023). It has been demonstrated that robots play a significant role in construction by automating tasks like bricklaying and welding, which reduces human labor and improves the quality and speed of construction projects (Prodhan et al., 2025). Integrating robotics in this sector supports intelligent management by facilitating predictive maintenance, efficient scheduling, and workflow optimization. Another notable trend is the emergence of robotics in healthcare, where robots increasingly assist in surgeries, patient care, and even drug discovery (Deo et al., 2023; Cruz et al., 2024; Reddy et al., 2023; Agrawal et al., 2024; Morgan et al., 2022). Here, research results support the capacity of robots to perform complex procedures with precision and consistency, leading to improved patient outcomes and

shortened recovery times (Liu et al., 2024; Fairag et al., 2024; Reddy et al., 2023). Moreover, robots assist with tasks such as medication delivery and patient monitoring, allowing healthcare professionals to focus on more critical patient care (Wang et al., 2024; F. Wu et al., 2024; Raja et al., 2024; Cruz et al., 2024). These applications align closely with intelligent management by fostering automation, enhancing operational workflows, and enabling real-time decision-making supported by integrated data systems.

However, the literature on robotics in value capture still grapples with several critical gaps. One significant gap is the lack of robust frameworks for measuring the impact of robotics on value capture. While numerous case studies illustrate the successful implementation of robotics in various industries (Zhang et al., 2023), there is a dearth of research quantifying the actual benefits and ROI (return on investment) these systems provide. This absence of comprehensive measurement frameworks complicates the assessment of the real value generated by robotic systems and makes it challenging to compare their impact across different industries and applications. Another critical gap lies in the ethical considerations surrounding the use of robotics. As robots become more sophisticated and integrated into various aspects of our lives, questions about job displacement, transparency, and accountability become increasingly relevant. How can we ensure that the introduction of robots does not lead to widespread job losses and economic disruption? How can we ensure that robotic decision-making processes are transparent and accountable, particularly in critical areas like healthcare? These ethical considerations are often overlooked in the current literature, yet they are crucial for the responsible progression and deployment of robotics in value capture. The future of robotics in value capture is promising, but it requires continued research and development to address these gaps. Focusing on real-world applications, developing robust frameworks for measuring impact, and addressing ethical considerations will be crucial for realizing the full potential of robotics in delivering value across various sectors.

Despite the widespread adoption of robotics across various industries, several gaps in the literature regarding its integration into business models exist. One significant gap is the lack of scalability in many robotic solutions, as small and medium-sized businesses often struggle to afford the high upfront costs associated with robotics. At the same time, large-scale deployment continues to face challenges. The issue of integrating a robotic workforce is another critical gap, particularly in industries where human workers must be retrained to collaborate with robots. Research on effectively integrating robotics with the existing workforce and overcoming cultural and operational challenges remains limited. Regulatory and ethical concerns, such as safety standards, job displacement, and data privacy, are also underexplored in the context of robotics and automation, despite their growing importance as robots are increasingly deployed in sensitive sectors like healthcare and defence. Additionally, there is insufficient research into the long-term economic impact of robotics on business models, particularly regarding the potential for increased automation to lead to job losses or wage disparity in specific sectors. Furthermore, a gap exists in understanding the sustainability of robotic business models, particularly concerning energy consumption, environmental impact, and lifecycle management of robotic systems. Lastly, the reliability and robustness of robotic systems in complex, real-world environments, such as outdoor settings or hazardous areas, remain significant concerns, necessitating more research to enhance their adaptability to dynamic and unstructured settings.

The research landscape on expert systems (ES) in value capture is dynamic and follows specific trends. It has been documented that the use of software tools for building expert systems is rapidly increasing, fueled by the availability of powerful AI libraries and frameworks (Oloo, 2023; Matsuzaka & Yashiro, 2023). This growing usage leads to more sophisticated systems, often developed through a structured approach that includes requirements analysis, knowledge acquisition, system design, testing and refinement, and deployment and integration (Åström et al., 2022). The literature demonstrates how these systems utilize knowledge-based algorithms to simulate expert-level decision-making, enhancing the speed and quality of decisions in areas such as finance, marketing, and supply chain management (Anshu & Sharma, 2024; Inusuah & Amponsah, 2018; Sharipbay et al., 2024). There is increasing interest in applying ES to specific sectors like education, healthcare, and finance, enabling researchers to create tailored systems that address unique challenges and opportunities within those domains (Sayed, 2021; Islam et al., 2024; Yang & Zhu, 2024; Inusah, 2023; Yousef et al., 2023). The literature illustrates how expert systems are supporting clinical decision-making by analysing patient data and recommending treatments based on the vast amounts of medical knowledge they are trained on, thereby improving diagnostic accuracy and patient outcomes (Chen et al., 2023; Khosravi et al., 2024; Ruban et

al., 2024). Exploration of the role of expert systems (ES) in value delivery highlights an increasing integration of AI technologies, particularly machine learning and data analytics, into ES (Asemi et al., 2020; Choi et al., 2021; Håkansson & Zelano, 2022). This capability could support intelligent management by improving resource allocation, optimizing processes, and reducing reliance on manual oversight.

Now, there is a gap in understanding the long-term impact of expert systems on organizational structure and employee roles, as the automation of decision-making processes could lead to a shift in workforce responsibilities. While researchers are exploring the potential of ES for value capture (Oloo, 2023), more robust methodologies are needed to measure the actual value generated. Despite the documented potential of ES to enhance learning outcomes (Sayed, 2021; Ivanyshyn et al., 2023), there remains a gap in research regarding its practical applications in the educational sector, particularly focusing on developing systems that can personalize learning, provide individualized feedback, and support student engagement. A critical and visible gap is the lack of research on the adoption and implementation barriers of expert systems, especially in industries with low technological adoption or where the organizational culture resists change. While researchers are investigating the potential of ES to enhance efficiency, productivity, and decision-making (Inusah & Amponsah, 2018; Svoboda & Lande, 2024), more robust methodologies are also needed to quantify the actual value generated. It has been demonstrated that expert systems are increasingly being used for decision support (Kostopoulos et al., 2024; De-Arteaga et al., 2021), yet ethical concerns related to transparency, bias, and accountability still need to be addressed more deeply, particularly as these systems are tasked with making decisions that affect customers and employees.

Deep learning, a subset of machine learning, has seen widespread adoption in business model innovation due to its ability to process vast amounts of data and enhance decision-making processes. However, some of these concerns are addressed in the literature (Yang et al., 2021; Rane et al., 2024). First, the studies explore the level of DL adoption across various industries, including supply chain management and healthcare (Yang et al., 2021). In healthcare, the potential of DL to revolutionize the field, with applications ranging from drug discovery to medical imaging analysis, is being analysed (Rane et al., 2024). It also demonstrates how deep learning, combined with natural language processing (NLP), transforms the marketing, finance, and healthcare sectors by enabling sentiment analysis, automatic translation, and chatbot-based customer service (Ghosh, 2025). This contributes directly to intelligent management by allowing businesses to respond to customer preferences in real time and refine their strategies based on customer feedback and sentiments. Deep learning is a key driver of autonomous vehicles in the automotive industry, providing the algorithms necessary for object detection, path planning, and decision-making in self-driving cars (Chib & Singh, 2024; Zhang et al., 2025). Another vital area of literature analysis is predictive analytics in business operations, where deep learning models are used to forecast market trends, consumer behaviour, and supply chain demands, leading to more efficient decision-making and improved customer targeting (Lee et al., 2021). For instance, researchers are exploring the use of DL to optimize inventory management, predict delivery delays, and enhance demand forecasting accuracy (Shavaki & Ghahnavieh, 2023). The research results demonstrate how these applications leverage the ability of DL to analyse massive datasets and identify complex patterns, leading to more efficient and cost-effective operations.

At the same time, the literature on DL in value delivery continues to address several concerns. One crucial gap is the lack of comprehensive frameworks for measuring the actual impact of DL on value delivery. Another significant gap involves the ethical considerations surrounding the use of DL. As DL systems become more sophisticated and integrated into critical decision-making processes, concerns about bias, transparency, and accountability are increasingly prominent.

5. DISCUSSION AND CONCLUSIONS

The literature widely acknowledges AI as a critical enabler of innovation and a source of competitive advantage. Choi & Lee (2021) and Inusah & Acheampong (2018) agree that AI enhances business responsiveness, improves decision-making, and fosters competitive differentiation. However, while Choi & Lee (2021) emphasize AI's role in customer-centric innovations, Inusah & Acheampong (2018) focus on its contribution to sustainability and resource efficiency. Similarly, in the realm of

personalization, Kulkarni et al. (2023), Yang et al. (2024), and Gladstan et al. (2024) highlight AI's ability to enhance customer experience through predictive analytics and recommendation systems. While both agree on AI's effectiveness in improving customer engagement, Olujimi & Ade-Ibijola (2023) focus on its technical aspects, particularly in natural language processing. In contrast, Zhang et al. (2021), Malakar et al. (2024), and Dimple (2024) concentrate on its influence on customer loyalty and revenue generation.

Another central area of consensus is AI's integration with emerging technologies such as IoT, blockchain, and 5 G. Yarlagadda, V.K. (2024) and Zhang et al. (2023) both recognize that AI enhances operational efficiency and data-driven decision-making, particularly in logistics and healthcare. However, Yarlagadda (2024) and Bharadiya (2023) focus on AI's applications in manufacturing and smart city infrastructure, while Zhang et al. (2023) emphasize its role in improving transparency and security within blockchain-based business models. These advancements foster a foundation for intelligent management by enabling leaders to make proactive, accurate decisions across distributed systems and digital infrastructures. Ethical and social concerns surrounding AI are also widely acknowledged, with Binns (2020) and Pessach & Shmueli (2022) highlighting issues such as algorithmic bias, privacy risks, and the societal implications of automation. While both stress the importance of fairness and accountability in AI deployment, Binns (2020) delves deeper into algorithmic decision-making. In contrast, Pessach & Shmueli (2022) examine broader fairness issues in machine learning models.

Despite these agreements, notable areas of divergence exist in the literature. Metzler et al. (2021) argue that existing research lacks longitudinal studies on AI's sustained impact on business models. Nambisan et al. (2018) contend that AI's immediate transformative effects are already significant enough to study. This reflects a broader debate on whether the short-term benefits of AI are well documented or if more research is needed to assess its long-term strategic implications. Another key point of disagreement is the extent to which legacy businesses can effectively integrate AI. Zhang et al. (2021) suggest that sector-specific strategies can enable traditional businesses to adapt, while Nambisan et al. (2018) argue that outdated infrastructure and resistance to change present significant challenges. Additionally, Zhang et al. (2021) state that AI's role in industry-specific business models, such as healthcare, education, and agriculture, has been underexplored. In contrast, other scholars focus on AI's broader impact across various industries. These differences highlight gaps in the literature and suggest areas for further research, particularly in understanding AI's long-term effects, ethical considerations, and its application within specific industries. Collectively, these capabilities foster intelligent management by equipping businesses with real-time insights, responsive operational tools, and predictive capabilities that enhance strategic decision-making and streamline resource allocation.

The existing literature highlights the transformative role of Artificial Intelligence (AI) technologies—including Machine Learning (ML), Natural Language Processing (NLP), Computer Vision, Robotics, Expert Systems, and Deep Learning—in driving business model innovation. Current research emphasizes key trends such as AI-driven automation, personalization, operational efficiency, and data-driven decision-making, which are reshaping operations across various industries. Studies have explored how AI enhances value creation, optimizes business operations, and improves customer engagement, demonstrating its potential to revolutionize traditional and digital business models.

However, significant gaps remain in the literature, limiting a comprehensive understanding of AI's long-term implications for business models. One significant gap is the lack of longitudinal studies examining how AI-driven innovations evolve and affect business scalability, adaptability, and sustainability. While existing research extensively discusses the benefits of AI, it provides limited analysis of the challenges businesses face in integrating these technologies, including data quality issues, high implementation costs, workforce displacement, and ethical concerns such as algorithmic bias, privacy risks, and transparency. Much of the literature also takes a generalized perspective, lacking sector-specific insights into how different industries uniquely implement and adapt AI-driven solutions. The complexity of integrating AI within traditional business models, especially in industries that rely on legacy systems and resist technological change, remains underexplored.

Recent advancements in large language models illustrate a rapidly evolving landscape. For instance, models like ChatGPT have set the standard with robust text generation and refined reasoning abilities, enhanced by real-time web access and voice-enabled interactions in their premium versions. Meanwhile, DeepSeek has emerged as a strong open-source contender, demonstrating competitive reasoning and

technical prowess at a fraction of the cost. However, it currently lags in multimodal features such as voice and video. On the other hand, Anthropic's Claude focuses on delivering nuanced, context-aware responses with extended reasoning and a large context window. However, it is less integrated with voice and real-time search than ChatGPT. Other top systems continue to push boundaries in multimodality, with some models now capable of integrating visual inputs. Nevertheless, core competitive factors remain advanced text understanding and step-by-step reasoning.

Future research should address these gaps by conducting empirical studies that assess AI's long-term impact, industry-specific case analyses that capture the nuances of AI adoption and developing robust frameworks for measuring AI's influence on business model transformation. Ethical considerations must also be integrated into AI research to ensure responsible and sustainable implementation. Furthermore, the literature should explore how AI can complement rather than disrupt existing business models, helping organizations navigate digital transformation effectively. By filling these research gaps, future studies can provide deeper insights into AI's evolving role in business model innovation and explore the narratives of how AI can complement existing systems—thereby helping businesses transition through digital transformation while reinforcing stability, innovation, and intelligent management to guide businesses toward more strategic, ethical, and sustainable AI adoption.

The reviewed literature underscores the growing significance of Artificial Intelligence (AI) as a foundational element of intelligent management in business model innovation. AI technologies, particularly Machine Learning (ML), Natural Language Processing (NLP), and Computer Vision, are increasingly leveraged to facilitate real-time analytics, automate decision-making, and improve organizational responsiveness. These capabilities align closely with the principles of intelligent management, which emphasize data-driven control, adaptability, and continuous performance optimization. Nevertheless, existing studies focus on the operational applications of AI, with insufficient attention given to the strategic transformation of managerial processes. For instance, there is a lack of in-depth analysis regarding how AI integration redefines leadership roles, decision hierarchies, and the dynamics of organizational learning within intelligent management frameworks.

The prevailing literature is biased toward conceptualizing AI as a disruptive force, often overlooking its capacity to augment and evolve existing managerial paradigms. There is a dearth of empirical studies evaluating how AI can be incrementally embedded to support hybrid models of intelligent management, where human judgment and automated systems operate in a complementary fashion. Furthermore, the long-term impacts of AI-enabled intelligent management, particularly regarding strategic agility, organizational resilience, and sustainable value creation, have not been sufficiently addressed. Future research could potentially prioritize developing robust, longitudinal frameworks that assess AI's role in shaping adaptive and industry-specific models of intelligent management. This will be essential for guiding organizations through the complex transitions that digital transformation requires.

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