

THE INNOVATION ENGINE: HOW AI IS RESHAPING BUSINESS MODELS AND ORGANIZATIONAL EFFICIENCY

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ABSTRACT

Today's digital transformation is heavily influenced by the presence of artificial intelligence (AI), which significantly changes the way businesses run while improving organizational efficiency. This research explores the utilization of AI in various industries, as well as the extent to which AI plays a role in driving business model innovation and improving company operational performance. By combining several approaches, this research systematically reviews scholarly articles from 2019 to 2024 as well as related digital book literature. The results show that AI has three main roles. First, it improves organizational efficiency through automation, smarter data processing, and cost savings. Second, driving business model change through service personalization, demand prediction, and integration with digital platforms. Third, it accelerates organizational learning in the process of business innovation. In addition to the technological and economic benefits, the study also highlights the importance of ethical aspects and participation in the application of AI, in order to minimize risks such as algorithm bias and potential decline in public trust. In conclusion, AI is not just a technological tool, but a strategic piece that can reshape organizational structures and business patterns. To effectively implement AI, organizations need to build digital capabilities, cultivate learning, and implement responsible governance.

Keywords: Artificial intelligence, Business model, Organizational efficiency, Digital transformation, Innovation, Organizational learning

INTRODUCTION

The development of artificial intelligence (AI) technology is now one of the main drivers in changing business models and improving organizational efficiency in various industrial sectors. AI is no longer just a technical tool, but has become an innovation engine that fundamentally changes the way organizations create, deliver, and capture business value (Sjödin et al., 2021; ZEBEC, 2024). In practice, AI is driving changes in the way organizations work through process automation, data-driven decision-making, and creating more personalized customer experiences. For example, in the manufacturing industry, AI can improve efficiency by predicting demand, detecting production errors early, and optimizing the

supply chain (Gajić et al., 2024). In the service and e-commerce sectors, these technologies power recommendation systems, interactive chatbots, and more adaptive logistics, which in turn increase productivity and customer loyalty (Bezditnyi, 2024; Markin et al., 2024). The case study raised by (Lee et al., 2019) even shows how companies can successfully utilize AI to improve the recruitment process, process historical employee data, and develop more effective human resource management strategies. By utilizing machine learning algorithms, organizations can gain new insights into employee performance patterns that were previously difficult to detect through conventional means. In other words, AI plays a role not only in improving internal

efficiency, but also in helping companies adapt to the dynamics of global competition.

In addition to technological factors, readiness for change and transformational leadership also play an important role in ensuring organizational effectiveness in facing the Industrial Revolution 4.0 era. (Asbari et al., 2021) asserts that individual and organizational readiness is the main key for technological innovations such as AI to run optimally. In other words, successful AI implementation requires a synergy between technical capabilities, readiness for change, and leadership capable of driving organizational culture change. However, the implementation of AI in reality does not always go smoothly. Many organizations face challenges in aligning this technology with business interests, corporate culture, and stakeholder expectations (Tjondronegoro et al., 2022). On the other hand, there are also ethical risks such as algorithm bias and the spread of disinformation that need to be seriously anticipated (Markin et al., 2024). As a result, there is often a gap between the strategic potential of AI and the readiness of organizations to manage digital transformation as a whole. Based on this background, this study aims to analyze the role of AI in driving business model innovation and improving organizational efficiency, by examining its practices, approaches, and impacts in various industry sectors. The main focus is on how AI capabilities are built, integrated into business processes, and contribute tangibly to overall organizational performance.

RESEARCH METHODOLOGY

The methodology used is to integrate a mixed methods approach combined with a combination of qualitative (literature and case study) and quantitative (survey and SEM) approaches, as reflected in the 13 journals and 2 books used as references in writing this journal. Described clearly and in detail in table 1.

Table 1. Research Methodology

Aspects	Description
Research Design	This research uses a mixed methods approach to gain a comprehensive understanding of how artificial intelligence (AI) is

Aspects	Description
	reshaping business models and improving organizational efficiency. The research design is divided into two main stages: 1. Qualitative Phase: Systematic literature review and case studies to identify key themes and theoretical frameworks related to AI adoption, business model transformation, and organizational efficiency. 2. Quantitative Phase: Survey analysis using a quantitative approach to test the relationship between variables identified in the qualitative stage through Structural Equation Modeling (SEM) method.
Data Source	This research was sourced from: 1. 13 scientific journal articles (2019-2024), which include empirical studies, literature reviews, and case studies across sectors (manufacturing, media, e-commerce, public services, finance, hospitality). 2 recent academic books, namely: Aagaard & Tucci (2024) and Bartczak (2024), which present the latest theories, conceptual frameworks and survey results related to the application of AI and digital platforms.
Data Collection Technique	By doing: 1. Systematic literature review: Using a content analysis approach with an open coding method to extract key themes related to AI capabilities, business model transformation, and organizational efficiency. 2. Online Survey: Data was collected from 448 executives and technology managers in EU companies that have adopted AI. Data collection was conducted using Computer-Assisted Telephone Interviewing (CATI) as described in Bartczak's study (2024).
Data Analysis Technique	By using: 1. Qualitative Analysis: Narrative synthesis and thematic analysis of the literature and case studies (Sjodin et al., 2021; Tjondronegoro et al., 2022; Aagaard & Tucci, 2024). 2. Quantitative Analysis: Survey data were analyzed using Structural Equation Modeling (SEM) and Categorical Regression (CATREG) to evaluate the influence of variables such as AI adoption, process innovation, organizational learning, and operational efficiency.
Research Variables	By using: 1. Independent Variables: AI adoption, digital integration, technology capability.

Aspects	Description
	2. Mediating Variables: Process innovation (incremental and radical), organizational learning
	3. Dependent Variables: Organizational efficiency, business performance, customer satisfaction
Theoretical Framework	This research refers to two main frameworks, namely: <ol style="list-style-type: none"> 1. Resource-Based View (RBV): Placing AI as a strategic resource in the creation of competitive advantage. 2. Dynamic Capabilities Theory: Explains how organizations develop the ability to learn, adapt, and innovate in a dynamic business environment.
Validity and Reliability	By using the following: <ol style="list-style-type: none"> 1. Qualitative validation conducted through literature triangulation and case studies. 2. Quantitative validation was conducted through Construct Validity, Reliability Analysis, and Goodness of Fit tests of the SEM model.

More in-depth analysis techniques are described in Table 2, with explanations as follows: First, Thematic Analysis is the process of grouping and interpreting qualitative data (data from interviews, documents, or articles) by identifying recurring main themes related to the research question. Second, Narrative Synthesis is the process of compiling information from various studies into a structured written summary to answer the research question holistically. Third, Descriptive Analysis is an analytical method used to describe, summarize, and present data systematically without drawing causal or predictive conclusions. Its primary focus is to provide a general and detailed overview of the data or phenomenon being studied. Four, Narrative Analysis is a method in qualitative research used to understand, interpret, and analyze stories or narratives conveyed by individuals or recorded in texts, interviews, documents, or other media. Five, Analysis Framework is a conceptual framework or guide used in research to organize, explain, and analyze the data or phenomena being studied. Six, SEM (Structural Equation Modeling) is a multivariate statistical analysis method used to test the relationships between latent variables (not directly measurable) in a

complex theoretical model. Seven, Narrative and Applicative, where Narrative refers to the presentation of information in the form of a story, narrative, or logical and chronological description. Applied: practical, applicable, or having direct benefits in real life or the workplace. Eight, SEM (Structural Equation Modeling) and CFA (Confirmatory Factor Analysis) are CFA: confirmatory factor analysis used to test construct validity, ensuring that indicators (questions/questionnaires) accurately measure the intended latent variables. Nine, Thematic Analysis is a method in qualitative research used to identify, analyze, and report patterns (themes) emerging from data, such as interviews, documents, articles, or transcripts. Ten, Inferential Statistics is a statistical method for drawing conclusions, testing, or predicting phenomena in a population based on information from a sample. Eleven, Econometric Regression is the application of regression techniques (particularly linear regression) in economics and business to analyze relationships between economic variables and test hypotheses based on real data. Twelve, SEM (Structural Equation Modeling), Thirteen: Narrative Synthesis, Fourteen, Case Study Analysis is a process of in-depth and comprehensive investigation of a particular case, which can be an individual, group, organization, or event. Fifteen, CATREG (Categorical Regression) and ANOVA (Analysis of Variance), CATREG: a regression technique used to analyze the relationship between a dependent variable and one or more independent variables that are categorical (nominal or ordinal). ANOVA: a statistical method used to compare the means of two or more groups.

Table 2. Analysis Techniques

No.	Author&Year	Analysis Techniques
1.	(Sjödín et al., 2021)	Thematic analysis
2.	(Bezditnyi, 2024)	Narrative synthesis
3.	(Markin et al., 2024)	Descriptive analysis
4.	(Holgersson et al., 2024)	Narrative analysis
5.	(Tjondronegoro et al., 2022)	Analysis framework
6.	(Gajić et al., 2024)	SEM (SmartPLS/AMOS)
7.	(Rane et al., 2024)	Narrative& applicative
8.	(ZEBEC, 2024)	SEM & CFA

9.	(Al Naqbi et al., 2024)	Thematic analysis
10.	(Dwi & Alif Hidayatullah, 2024)	Inferential statistics
11.	(Rosário & Raimundo, 2024)	Econometric regression
12.	(Aagaard, 2024)	Case study analysis
13.	(Bartczak, 2024)	CATREG, ANOVA
14.	(Asbari et al., 2021)	(SEM), (PLS), convergent validity test, discriminant validity test, reliability test, and direct and indirect effect hypothesis testing
15.	(Lee et al., 2019)	Exploratory qualitative analysis, in-depth descriptive analysis based on case studies

RESULTS AND DISCUSSION

This study reveals that artificial intelligence (AI) plays a significant role in redesigning business models and improving organizational efficiency. The findings are classified into three main themes, namely: 1. AI Capabilities as the Foundation of Innovation, (Sjödin et al., 2021) identifies three key AI capabilities that are prerequisites for organizational digital transformation: (1) efficient data pipelines, (2) development of intelligent algorithms, and (3) democratization of AI across organizational functions. These three aspects accelerate business model innovation, particularly through a digital servitization approach, where physical products are combined with value-added digital services. Integrating AI into the organizational ecosystem enables innovation processes to become faster and more collaborative. (Holgersson et al., 2024) emphasize that AI expands open innovation capacity through real-time processing of external data, enabling organizations to access cross-border knowledge in a more adaptive manner. 2. Impact of AI on Organizational Efficiency, AI has proven to enhance operational efficiency through the automation of repetitive tasks, reduction of process cycle times, and optimization of resource utilization. (Rosário & Raimundo, 2024); (Gajić et al., 2024). Technologies such as machine learning and computer vision have been implemented in functions such as production defect detection, logistics planning, and automated customer processing.

(ZEBEC, 2024), through a quantitative approach, shows that AI adoption has a positive effect on organizational efficiency, but this relationship is mediated by organizational learning and business process innovation. This underscores that AI does not operate automatically but must be combined with internal capabilities that support learning and adaptation processes. 3. AI-Based Business Model Transformation, AI has driven organizations to transition from traditional business models to data-driven and predictive technology-based models. Innovation occurs across various dimensions: revenue models, customer relationships, and more personalized value propositions. (Lee et al., 2019); (Dwi & Alif Hidayatullah, 2024). For example, media companies like Netflix and Spotify have integrated AI for content personalization and recommendation optimization, while the e-commerce sector leverages AI for demand forecasting and dynamic inventory management. (Markin et al., 2024); (Bezditnyi, 2024). However, challenges also arise in the form of ethical risks, such as algorithmic bias, privacy threats, and misinformation. (Tjondronegoro et al., 2022) suggest a human-centered framework that prioritizes stakeholder participation, ethical principles, and transparency as key elements for successful AI implementation.

Overall, the research findings indicate that AI plays a dual role: as a tool to enhance efficiency and as a catalyst for strategic innovation. The impact of AI is not linear but depends on an organization's readiness in terms of data culture, dynamic capabilities, and an ethical approach to digital transformation. These findings have practical implications for organizations seeking to integrate AI optimally: investment is needed in data infrastructure, digital training, and business process redesign so that AI is not merely a technological solution but also a long-term transformative force. The results of the literature review from the research conducted by the author can be seen in the research citations in Table 3.

Table 3. Research Quotes

No.	Author&Year	Research Results
1.	(Sjödin et al., 2021)	Three key AI capabilities (data pipeline, algorithms, AI democratization) drive

		business model innovation through co-evolution.
2.	(Bezditnyi, 2024)	AI enhances personalization, demand forecasting, recommendation systems, and logistics efficiency in the e-commerce sector.
3.	(Markin et al., 2024)	AI accelerates content production and media personalization, but also poses risks of misinformation
4.	(Holgersson et al., 2024)	AI memperkuat praktik open innovation melalui integrasi outside-in dan inside-out innovation berbasis data.
5.	(Tjondronegoro et al., 2022)	AI strengthens open innovation practices through outside-in and inside-out data-driven innovation integration. AI must be developed with ethical principles: human-centered design, trust, privacy-by-design.
6.	(Gajić et al., 2024)	The synergy of AI and IoT improves operational efficiency, sustainability, and customer satisfaction in the hospitality sector.
7.	(Rane et al., 2024)	Digitalization and AI enhance efficiency through lean processes in business innovation and service.
8.	(ZEBEC, 2024)	AI adoption improves efficiency when mediated by organizational learning and process innovation.
9.	(Al Naqbi et al., 2024)	Human-AI collaboration enhances performance but requires clear work ethics and role boundaries.
10.	(Dwi & Alif Hidayatullah, 2024)	Trust in AI declines if systems are not transparent or fair. Accountable design is necessary.
11.	(Rosário & Raimundo, 2024)	AI drives productivity growth through automation and decision-making optimization.
12.	(Aagaard, 2024)	Identify four AI transformation archetypes in business models: Optimizers, Transformers, Innovators, Leaders.
13.	(Bartczak, 2024)	The use of AI-based digital technology platforms (DTP) enhances corporate efficiency and innovation.

14.	(Asbari et al., 2021)	1. Transformational leadership positively influences readiness for change and employee performance. 2. Readiness for change mediates the relationship between transformational leadership and employee performance.
15.	(Lee et al., 2019)	1. AI drives business model innovation through changes in HR strategy and data-driven decision-making. 2. Integrating symbolic AI and neural AI enhances the effectiveness of business innovation. keputusan berbasis data.

CONCLUSION

The rapid development of artificial intelligence (AI) has fundamentally changed the way organizations operate and innovate. This research shows that AI is not just a technological tool, but has evolved into a strategic driver in business model transformation and organizational efficiency improvement. The uses of AI are as follows: First, AI significantly contributes to operational efficiency by automating routine processes, accelerating decision-making, and minimizing human error. Technologies such as machine learning, natural language processing, and computer vision have been adopted across sectors, including manufacturing, e-commerce, media, and financial services, to respond to market needs in a more adaptive, rapid, and precise manner (Gajić et al., 2024). Second, AI enables organizations to create and adopt new data-driven business models. This transformation involves personalized services, new revenue models (such as pay-per-use or subscription-based), and the integration of digital platforms that enhance customer engagement. The innovation process becomes more inclusive through an open innovation approach supported by AI in accessing external knowledge and accelerating cross-organizational collaboration (Holgersson et al., 2024); (Aagaard, 2024). Third, this study found that effective AI implementation

heavily depends on an organization's internal readiness, such as data culture, organizational learning, transformational leadership, and digital adaptability, which are prerequisites for success. Organizational learning has proven to be an important mediator linking AI adoption to improved performance and business process innovation (ZEBEC, 2024).

However, AI adoption is not without challenges and risks. Ethical issues such as algorithmic bias, data privacy, and digital disinformation are serious concerns that must be anticipated from the design and implementation stages of the system. Therefore, AI implementation must be accompanied by a responsible and human-centered governance framework, as proposed by (Tjondronegoro et al., 2022). Overall, this study concludes that AI is a strategic innovation engine capable of accelerating digital transformation, creating new business value, and significantly improving organizational efficiency. However, long-term success is highly dependent on the extent to which organizations can build dynamic capabilities, manage change, and balance technological ambition with ethical responsibility. Thus, today's organizations are required not only to adopt AI as a technology but also to strategically integrate it into sustainable business models and decision-making processes. This approach will ensure that AI is not just a temporary solution but a transformative foundation for organizational competitiveness in the digital age. The research conducted by the author is illustrated in Table 4, which outlines the hierarchy of AI's contributions to business models and organizational efficiency, from technical-operational foundations to long-term strategic transformation, accompanied by explanations for each level: One, Level 1 (Technological Foundation): Organizations begin adopting AI for initial digitalization, such as chatbots and routine task automation. Two, Level 2 (Efficiency): AI begins to deliver value by optimizing costs, improving accuracy, and accelerating processes. Three, Level 3 (Internal Capabilities): Significant organizational learning occurs—AI is mediated by internal learning and innovation culture. Four, Level 4 (Process & Service Innovation): AI drives open innovation,

creates new service models, and accelerates product development. Five, Level 5 (New Business Strategy): AI becomes central to reshaping business models through digital archetypes and platforms. Accompanied by an ethical and risk foundation: AI success is highly dependent on ethical governance and organizational social readiness. Thus, the results of this study are expected to provide conceptual and practical contributions to the development of organizational strategies for effectively and responsibly adopting artificial intelligence technology.

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