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Developing an Artificial Intelligence-Based Business Model for MSMEs to Support the Future Economy

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A B S T R A C T

Digital transformation encourages MSMEs to develop adaptive business models through the use of artificial intelligence, but its implementation still faces limitations in knowledge, resources, and organizational readiness. This research aims to analyze the process of integrating artificial intelligence in the development of MSME business models and its implications for efficiency, service innovation, and competitiveness. The research uses a qualitative approach with a case study design. Data were collected through semi-structured interviews with 15 informants consisting of MSME actors, business assistants, and technology practitioners, and analyzed using thematic analysis. The results show that artificial intelligence supports operational automation, marketing personalization, and data-driven decision-making. The study concludes that the success of artificial intelligence-based business model development is determined by digital literacy, resource readiness, and gradual implementation strategies

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INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) play a strategic role in job creation, income equity, and strengthening the local economy. Indonesia has around 65.4 million MSMEs or almost 99% of all business units, with a contribution of around 61% to gross domestic product based on 2022 data (INDEF, 2024). However, changing consumer behavior, digital competition, and technological developments require MSMEs to update the way they create, deliver, and capture value. Artificial Intelligence (AI) offers automation capabilities, data analysis, service personalization, market prediction, and decision-making support, but its implementation is still constrained by digital literacy, infrastructure, capital, customer data, and organizational readiness (Mardiana et al., 2024; Salam & Imilda, 2024).

From a business administration perspective, AI deals with the functions of planning, resource organization, information management, marketing, service, operational control, and decision-making. The Technology–Organization–Environment framework explains that technology adoption is influenced by technological suitability, organizational readiness, and business environment, while the Resource-Based View places digital capabilities, data, knowledge, and skills as strategic resources. Sulaiman et al. (2021) emphasized that the digital transformation of MSMEs requires the integration of technology, organization, environment, and e-business innovation. It is also related to dynamic capabilities in recognizing changes, seizing opportunities, and adjusting resources, which has been proven to support business performance (Apsari & Rofiaty, 2023).

Previous research has shown that AI can improve efficiency, information processing, and business development (Amira & Nasution, 2023). MSMEs have also begun to use chatbots, electronic commerce, and digital applications to support customer communication and business activities (Mardiana et al., 2024). In marketing, AI helps with consumer analysis, content development, and message personalization (Andriana et al., 2024). Although technology can expand the market and increase competitiveness, its application still faces limitations in digital literacy, technical skills, infrastructure, and financing (Faturrahman et al., 2025; Salam & Imilda, 2024).

However, Indonesian research still discusses AI as a tool to improve efficiency or marketing communication and has not empirically explained the overall changes in the elements of the business model, such as value propositions, customer relationships, key activities, cost structures, and revenue sources. Xie et al. (2022) show that digital platforms drive business model innovation through capability reconfiguration, while Arroyabe et al. (2024) find that digital capabilities and internal innovation are more determinative of AI adoption. Jorzik et al. (2024) also stated that AI-based business model innovation research is still fragmented. However, these international studies are generally conducted in developed countries or use quantitative approaches and systematic reviews, so they do not fully describe the experience of Indonesian MSMEs.

Based on these gaps, this study aims to analyze the process of AI integration in the development of MSME business models and its implications

for operational efficiency, service innovation, marketing personalization, decision-making quality, and competitiveness. The research also identifies supporting and inhibiting factors, especially digital literacy, human resource readiness, data availability, financing, infrastructure, and implementation strategies. The research used a qualitative approach with a case study design through semi-structured interviews with 15 informants consisting of MSME actors, business assistants, and technology practitioners, then analyzed using thematic analysis.

Theoretically, this study expands the study of business administration by integrating dynamic capability theory, Resource-Based View, and Technology–Organization–Environment framework in explaining the development of AI-based business models. AI is positioned as an administrative and strategic capability that affects resource management, value creation, customer relationships, and decision-making. Practically, this research is expected to produce a framework for the gradual implementation of AI for MSMEs and become the basis for the government, accompanying institutions, universities, and technology providers in developing AI literacy, managerial training, infrastructure, and an inclusive and sustainable MSME digital ecosystem.

LITERATURE REVIEW

MSMEs Business Model in the Perspective of Business Administration

The business model describes how an organization creates, delivers, and derives value through the management of resources, key activities, customers, costs, and revenue. In business administration, business models also include planning, organizing, supervising, managing information, and decision-making. MSMEs have high flexibility, but often face limited capital, technology, data, and human resources.

Digital transformation is the basis for the development of artificial intelligence-based business models. Sulaiman et al. (2021) explained that the digital transformation of MSMEs requires the integration of aspects of technology, organization, environment, resources, and e-business innovation. Qohar and Darmawan (2024) show that the adoption of digital platforms does not directly result in business model innovation. Technology must be followed by changes in value propositions, customer service, operational processes, and revenue sources.

Artificial Intelligence as a Strategic Capability of MSMEs

Artificial intelligence enables data processing, predictions, recommendations, and automation of business activities. In MSMEs, this technology can be used for chatbots, customer analysis, content creation, inventory management, financial analysis, and decision-making. Thus, AI can be positioned as a strategic capability rather than just a technical tool.

Amira and Nasution (2023) explain that AI can improve operational efficiency, customer personalization, product innovation, and financial analysis. Mardiana et al. (2024) also demonstrate the benefits of AI in automation, customer analysis, supply chain, demand prediction, and inventory

management. However, the study has not explained in depth the selection process and integration of AI into the MSME business model.

The utilization of AI does not always require an expensive system. MSMEs can start from simple applications for marketing, customer service, sales analytics, and customer relationship management. The strategic value of AI lies in its ability to solve business problems, reduce costs, speed up services, and improve the quality of decisions.

Technological, Organizational, and Environmental Readiness

AI adoption can be explained through the Technology–Organization–Environment framework. The technology dimension includes benefits, costs, complexity, security, and infrastructure. Organizational dimensions include owner support, workforce competence, financial readiness, culture of innovation, and data quality. The environmental dimension relates to competition, consumer behavior, governments, technology providers, and digital ecosystems. Sulaiman et al. (2021) emphasized that the success of digital transformation depends on the integration of technological, organizational, environmental, innovation, and resource factors.

Organizational readiness is different for each MSME. Gumilang and Mahfudz (2025) found that MSMEs in Bandung are still in the early stages of Industry 4.0 readiness, mainly due to limited financing and digital workforce. Therefore, the application of AI needs to be carried out in stages according to business capabilities.

Data readiness also determines the quality of AI deployment. Transaction, customer, inventory, and marketing data must be recorded in a structured manner to produce accurate analysis. The development of AI-based business models therefore needs to begin with improving administration, data standardization, security, and access arrangements.

Dynamic Capabilities and Resource Orchestration

Dynamic capabilities describe an organization's ability to recognize change, seize opportunities, and adjust resources. Apsari and Rofiaty (2023) found that managerial skills and dynamic capabilities have a positive effect on the performance of MSMEs. Technology therefore still requires human abilities in planning, evaluation, and decision-making.

Peretz-Andersson et al. (2024) explained that the implementation of AI in SMEs takes place through the procurement, merging, and utilization of technology, data, knowledge, and skilled personnel. The success of AI is not determined by a single technology, but by the ability of organizations to manage people, processes, data, and technology in an integrated manner.

In MSMEs, resource orchestration can be done by selecting priority functions, determining applications, training users, and setting success indicators. AI can handle repetitive tasks and information processing, while humans still carry out creativity, interpretation, social relationships, and strategic decisions.

AI, Marketing, and Customer Personalization

Marketing is the easiest field to adopt AI because MSMEs have used social media, marketplaces, and conversational applications. AI can help with content

creation, customer segmentation, purchase analysis, promotion timing, and service through chatbots.

Andriana et al. (2024) show that AI supports personalization, consumer data analysis, automation, product innovation, and marketing communication. However, its implementation also faces privacy issues, bias, limited resources, and low user knowledge. Therefore, the use of AI still requires human oversight and data management rules.

AI also needs to maintain the authenticity of MSMEs. Automated content risks losing cultural context and emotional closeness. Therefore, AI should be used to support ideation and analysis, while business actors still determine the brand identity and final form of communication.

Operational Efficiency and Decision Making

AI can automate routine tasks, predict inventory, analyze sales, compile reports, and manage transactions. Amira and Nasution (2023) and Mardiana et al. (2024) show that AI can support operations, finance, inventory, marketing, and customer service. This efficiency allows MSMEs to focus more on innovation, business relationships, and market expansion. In decision-making, AI converts data into predictions or recommendations. However, the quality depends on the completeness of the data and the suitability of the context. Therefore, the human-in-the-loop principle is still necessary for humans to interpret, verify, and determine final decisions.

Business Model Innovation and Value Creation

Business model innovation occurs when organizations change the way they create, deliver, and derive value. AI can drive new services, personalization, automation, digital channels, data-driven pricing, and new revenue streams. However, Qohar and Darmawan (2024) show that the use of digital platforms alone is not enough because technology must change business logic and value creation processes.

Merín-Rodrigáñez et al. (2024) found that business model innovation mediates the relationship between digital transformation and SME performance. As such, new AI makes an impact when translated into changes in value propositions, processes, customer relationships, and revenue sources. Jorzik et al. (2024) show that AI can link business model innovation with sustainability. For MSMEs, AI can reduce waste, optimize production and distribution, and adjust products to demand. AI-based business models therefore need to support efficiency, resilience, inclusivity, and sustainability.

AI Risk, Ethics, and Governance

The application of AI has risks in the form of privacy breaches, data security, bias, reliance on technology providers, and misrecommendations. Andriana et al. (2024) emphasized privacy issues, algorithmic bias, and social responsibility in the use of AI for marketing. Amira and Nasution (2023) also highlight data security and legal uncertainty as challenges for MSMEs. AI governance needs to be adjusted to the level of risk. MSMEs must regulate the type of data used, access rights, inspection of results, and transparency in the use of automated systems. The greater the impact of AI decisions, the stronger the need for human oversight.

Literature Synthesis and Research Position

Previous studies have shown that AI has the potential to improve efficiency, marketing, customer relations, innovation, and decision quality. However, the benefits are influenced by technological readiness, managerial capabilities, data quality, financing, human resource competence, and environmental support. Indonesian research still discusses the benefits of AI, digital transformation, marketing, and technology readiness separately. Meanwhile, international studies are more about business model innovation, resource orchestration, and sustainability. There is still limited research that explains in depth the process of integrating AI into the overall business model of Indonesian MSMEs.

This research positions AI as an administrative and strategic capability formed through the interaction of technology, humans, data, processes, and the business environment. The development of an AI-based business model is understood as a gradual process that includes problem identification, readiness assessment, technology selection, competency improvement, process integration, and value evaluation. The position is in accordance with a qualitative approach involving 15 informants from MSME actors, business assistants, and technology practitioners to analyze AI integration and its implications for efficiency, service innovation, marketing personalization, decision-making, and competitiveness.

METHODOLOGY

Types of Research

This study uses a qualitative approach with a case study design. This approach was chosen because the research seeks to understand in depth the process of integrating artificial intelligence in the MSME business model, including the experience of business actors, changes in administrative processes, benefits obtained, and obstacles to its implementation. The research case is limited to the use of AI in operational activities, marketing, customer service, information management, and decision-making. A qualitative approach allows these phenomena to be analyzed contextually based on the informant's views and the natural conditions of the organization (Fadli, 2021; Waruwu, 2023).

Population and Sample

The research population is understood as a social situation involving MSME actors using AI, business assistants, and technology practitioners. Informants were selected using a non-probability sampling technique with a purposive sampling approach. The study involved 15 informants consisting of 10 MSME owners or managers, three business assistants, and two technology practitioners. MSME actors are selected based on the criteria of having been running a business for at least two years, using at least one AI-based application for six months, and being directly involved in business decision-making. Companions and practitioners are selected based on their experience in assisting or implementing digital technology in MSMEs. This number is considered adequate to obtain a variety of perspectives and achieve information saturation; empirical studies show that saturation in focused interview research can generally be achieved through about 9–17 interviews (Hennink & Kaiser, 2022).

Research Instruments

The main instrument of the research is the researcher, while the supporting instrument is in the form of semi-structured interview guidelines, observation sheets, and documentation checklists. The interview guidelines are developed based on elements of business models, Technology–Organization–Environment frameworks, Resource-Based View, and dynamic capabilities. Questions include forms of AI use, changes in activities and value propositions, operational efficiency, marketing personalization, service innovation, decision-making, competitiveness, resource readiness, and risks of AI deployment. The validity of the content of the guidelines was examined by two experts in the field of business administration and digital transformation, then tested on two MSME actors outside the main informant. Statistical reliability is not used because research is qualitative. The validity of the data is maintained through source triangulation, technical triangulation, member checking, audit trail recording, and inter-stakeholder discussions (Saadah et al., 2022; Husnullail et al., 2024).

Data Collection Procedure

The research began with a literature review, determination of the focus of the case, preparation of informant criteria, and development of interview guidelines. After the informant expresses consent, primary data is collected through semi-structured face-to-face or online interviews with a duration of about 45–60 minutes. The interview was recorded with the consent of the informant and transcribed verbatim. Interview data is strengthened through observation of the use of AI applications and documentation in the form of marketing materials, sales reports, application screenshots, or relevant business process documents. Data collection is carried out in stages until additional interviews no longer produce new substantive information. Furthermore, a summary of the interview results is sent to the informant to ensure the suitability of the meaning and reduce misinterpretation. Triangulation and re-examination of informants are needed to increase the credibility of qualitative research results (Saadah et al., 2022; Husnullail et al., 2024).

Data Analysis Techniques

The data was analyzed using reflective thematic analysis with stages: understanding the whole data, compiling the initial code, grouping the code into themes, reviewing the inter-theme relationships, defining and naming themes, and compiling the interpretation of the results. The coding process is carried out deductively based on the concept of business models and technology adoption, as well as inducively to capture new patterns that emerge from the informant's experience. The main themes are geared towards the process of AI integration, operational efficiency, service innovation, marketing personalization, data-driven decision-making, competitiveness, resource readiness, and gradual implementation strategies. The analysis was assisted by NVivo 14 software to manage transcripts, compile code, compare the views of informant groups, and build a theme matrix. However, the final interpretation is still carried out by the researcher because the software only functions as a data organizing tool. This procedure follows the principles of thematic analysis that emphasizes

consistency between research questions, coding processes, theme development, and data interpretation (Braun & Clarke, 2021; Hartono et al., 2025).

RESEARCH RESULT

Thematic analysis of interview data yielded six main themes, namely: gradual patterns of AI integration, operational efficiency, personalization of marketing and service innovation, data-driven decision-making, changes in business models and competitiveness, and resource readiness and human supervision. Informants of MSME actors are given the code U1–U10, business companions P1–P3, and T1–T2 technology practitioners.

Table 1. Summary of Main Themes and Indications of Findings for MSME Business Model Development Based on Artificial Intelligence

Tema utama	**Indications of findings**
Gradual integration of AI	Starting from simple functions, especially content creation and customer service
Operational efficiency	Time savings, acceleration of administrative work, and reduction of repetitive tasks
Personalization and service innovation	Content is more customer-friendly and service response is faster
Data-driven decisions	Sales and customer interaction data begins to be used to determine business actions
Changes in business models	There are changes to key activities, customer relationships, marketing channels, and value propositions
Readiness and supervision	Digital literacy, data quality, cost, and human verification determine the success of AI use

Source: Results of interview data analysis, 2026.

AI Integration Starts from a Simple Business Need

The results of the interviews show that the use of AI in MSMEs does not start through complex technology planning. Most business actors are familiar with AI through text creation applications, promotional design, social media management, chatbots, and recommendation features on the marketplace. Initial use is generally driven by the need to speed up marketing work and reduce the burden of administrative tasks.

"*Initially, I used AI just to find caption ideas. Sometimes when there are many orders, I don't have time to think about promotional words. After trying, it turns out that it can also be used to compile customer replies*." (U1, interview, February 8, 2026)

"*I didn't immediately think I wanted to change the business model. At that time, the need was simple, how to keep the content running even though our resources were limited*." (U4, interview, February 12, 2026)

"*MSME actors usually don't come with the phrase 'I want to implement AI'. They come up with problems, for example inconsistent content, often out of stock, or old customers getting replies*." (P1, interview, February 17, 2026)

The use of AI then develops after business actors feel the benefits in the initial function. Some informants began using it to compile product descriptions, group customer inquiries, analyze sales patterns, create promotional variations, and estimate inventory needs. However, the utilization rate differs between MSMEs. Some have integrated AI into some business activities, while others are still limited to digital marketing.

"*After getting used to creating content, I started to use it to read product patterns that are often asked. From there, I knew which items should be displayed more often*." (U6, interview, February 21, 2026)

"*Some have used AI to help decisions, but there are also those who are still limited to copying AI results for captions. So the depth is very different*." (T1, interview, February 24, 2026)

The findings show that AI integration is gradual. The first stage focuses on easy, low-risk tasks. Once users gain experience, their application begins to expand to customer service, information management, and decision-making.

AI Improves Operational Efficiency

Operational efficiency is the most often conveyed benefit by informants. AI helps speed up the creation of promotional materials, compiling customer answers, creating sales summaries, recording product ideas, and grouping information. Efficiency is especially felt by MSMEs that have a limited number of workers and their owners carry out several business functions at once.

"*In the past, I used to make one promotional material for more than an hour because I started from scratch. Now the draft is about a few minutes, and then I just have to adjust the language*." (U2, interview, February 10, 2026)

"*What is most noticeable is not the immediate increase in sales, but the work is completed faster. I have time to check the stock and serve customers who do need to be explained directly*." (U7, interview, February 25, 2026)

"*We usually receive recurring inquiries, such as price, size, color options, and how to order. AI helps prepare initial answers, so customers don't have to wait too long*." (U9, interview, March 2, 2026)

Nonetheless, the time savings do not always occur in the early stages of use. Some informants need time to learn to structure commands, check results, and adjust AI outputs to the character of the business. Undirected use can actually add to the work because the results produced are too common or not as needed.

"*At first, it felt like a long time because the results were too formal. I had to learn to explain who my customers were and what the store's language style was like*." (U5, interview, February 19, 2026)

"*If users don't know their needs, AI doesn't automatically make work more efficient. The results can be many, but not all of them are useful*." (T2, interview, March 6, 2026)

The data shows that efficiency is not only determined by the availability of AI applications, but also by the ability of users to provide instructions, select relevant outcomes, and integrate them into workflows. Once the process is established, AI reduces repetitive work and allows MSME actors to focus on activities that require human interaction.

Marketing Personalization and Customer Service Innovation

The use of AI is changing the way MSMEs structure marketing messages. Before using AI, some informants said that promotional materials were made in general and used for all customers. After using AI, businesses begin to create a variety of messages based on customer groups, product types, promotional times, and media characters used.

"*Now I don't make one caption for all. For old customers, the language is more familiar, while for new customers, the explanation is more complete*." (U3, interview, February 14, 2026)

"*If it is promoted on Instagram, the language is lighter. If it is sent via WhatsApp to regular customers, I make it more personal and direct to the products they usually buy*." (U8, interview, February 28, 2026)

"*AI helps businesses understand that communication doesn't have to be the same for every customer. However, customer data must still be organized first so that the personalization does not originate*." (P2, interview, March 4, 2026)

In addition to marketing, AI is driving changes in customer service. Some informants use automated answers as an initial response, while more complex questions are still handled directly. The pattern speeds up services without completely eliminating human interaction.

"*If the questions are standard, the system can help. But if customers complain or ask for special products, I still go down directly because I need to understand their emotions*." (U10, interview, March 8, 2026)

"*Customers are happy that they are quick to respond, but they still want to talk to people when the problem is not simple*." (U4, interview, February 12, 2026)

Some MSMEs have also started to use customer input to develop a variety of products and services. AI is used to summarize frequently raised questions, complaints, and requests. This information helps business actors identify unmet needs.

"*I put in a record of customer inquiries for a few weeks. From there, it can be seen that many are looking for smaller packaging. Finally we tried to make a new size*." (U6, interview, February 21, 2026)

"*Previously, customer complaints were only resolved as conversations. Now those conversations are starting to be seen as data to improve the product*." (P3, interview, March 11, 2026)

The findings show that the use of AI not only speeds up communication, but also supports the establishment of more responsive services. However, effective personalization still requires structured customer data and human assessment of the context of the communication.

Data-Driven Start-Up Decision-Making

Before using digital devices and AI, business decisions in some MSMEs were more based on the experience and intuition of the owners. Once sales data, promotional activity, and customer interactions begin to be recorded, AI is used to help summarize patterns and devise alternative actions.

"*In the past, I felt that certain products would sell well because I thought they were good. After examining the data, it turned out that the most often purchased products were products with medium prices*." (U1, interview, February 8, 2026)

"*I still use experience, but now there is a comparison. If the AI shows sales are down on a certain day, I check again before making a promotion*." (U7, interview, February 25, 2026)

"*The important change is that owners are starting to ask, 'what does the data show?' It's not just, 'what do you think?'*(P1, interview, February 17, 2026)

AI is also used to help determine the products being promoted, the amount of stock, the upload time, and the customer's goals. However, not all recommendations are implemented directly. Informants generally compare these recommendations with market conditions, production capabilities, and information obtained through direct interaction.

"*The system once suggested increasing stock because sales were rising. I didn't immediately participate because the raw materials were hard to come by. So it still has to be adjusted to real conditions*." (U5, interview, February 19, 2026)

"*AI can read patterns from available data, but it doesn't always know if there's a local event, bad weather, or a supplier is having a problem*." (T1, interview, February 24, 2026)

The quality of record-keeping is an important factor in the use of AI for decision-making. MSMEs that already have transaction records are relatively easier to obtain useful analysis results. Instead, inconsistent data leads to less relevant recommendations.

"*Our problem turns out to be not the application, but the data. The name of the product is sometimes written differently, so when analyzed the results are confusing*." (U9, interview, March 2, 2026)

"*Before talking about AI, MSMEs need to tidy up data. AI cannot correct decisions if the material provided from the beginning is incomplete*." (T2, interview, March 6, 2026)

These results show a shift from decisions that are entirely intuition-based to decisions that combine owner experience and data analysis. AI serves as an auxiliary tool, while the final decision remains with the business actor.

Changes in Business Models and Competitiveness of MSMEs

AI integration results in changes to several elements of the business model, especially key activities, customer relationships, marketing channels, value propositions, and cost structures. The most obvious changes are seen in the way MSMEs run marketing, serve customers, and manage information. However, not all informants have undergone changes to the source of income or business structure as a whole.

"*In the past, we only sold products. Now we also sell conveniences, for example, customers can get product recommendations according to their needs*." (U3, interview, February 14, 2026)

"*The value we offer so it's not just goods, but also quick response and choices that better suit customers*." (U8, interview, February 28, 2026)

"*In some MSMEs, AI has only improved activities. Not all of them have changed the way businesses earn income*." (P2, interview, March 4, 2026)

Changes to key activities are seen when some marketing and administrative tasks are shifted to AI applications. This changes the division of labor in the business. The workforce is not completely replaced, but the tasks are shifting

from repetitive work to results inspections, customer service, and product development.

"*Employees who used to write all replies are now checking answers more and dealing with customers who need specific explanations*." (U2, interview, February 10, 2026)

"*AI doesn't make us reduce people. Instead, the job changed, from typing the same thing over and over again to taking care of relationships with customers*." (U10, interview, March 8, 2026)

In terms of competitiveness, informants feel an increase in service speed, promotion consistency, and ability to keep up with market changes. However, the increase in sales does not always happen directly. Some actors said that the initial benefits of AI are more visible in the regularity of business processes.

"*Now the store looks more active and customers are informed faster. The sales have not jumped big, but the process is much more organized*." (U4, interview, February 12, 2026)

"*Competitiveness is not always immediately visible from turnover. Sometimes what changes first is speed, quality of service, and the ability to read the market*." (P3, interview, March 11, 2026)

The findings show that there are two levels of change. At the first level, AI improves the efficiency of existing activities. At the second level, AI begins to change the value offered, the relationship with customers, and the way MSMEs respond to the market. Only some informants have consistently reached the second level.

Digital Literacy and Resource Readiness Are the Main Obstacles

The barriers to using AI are not only related to the cost of technology. Informants more often cite limited knowledge, difficulty compiling instructions, lack of structured data, reliance on internet connections, and doubts about the accuracy of results.

"*The application is free, but we still have to learn. The challenge is not just to buy technology, but to understand how to use it*." (U6, interview, February 21, 2026)

"*Sometimes the results look convincing, but after checking it turns out that there is information that does not match our products*." (U5, interview, February 19, 2026)

"*Many business actors are quick to try, but not all of them have the habit of double-checking. This is what needs attention*." (P1, interview, February 17, 2026)

Workforce limitations also affect the sustainability of AI use. MSMEs with a small number of employees often rely on one person who understands technology. When the person is unavailable, the use of the app becomes inconsistent.

"*The only one who can operate now is me. If I was focusing on production, the use of AI also stopped*." (U9, interview, March 2, 2026)

"*MSMEs need to share knowledge. Don't let all digital processes depend on one person*." (P2, interview, March 4, 2026)

Another issue has to do with data security and privacy. Some informants do not yet have specific rules regarding data that can be entered into AI applications. Technology practitioners emphasize that customer data, financial information, and internal documents need to be treated with care.

"*In the past, I had entered complete customer data because I wanted to be analyzed. After getting an explanation, now I always lose my name and phone number*." (U7, interview, February 25, 2026)

"*MSMEs often focus on convenience, but forget to ask where the data is stored and what it is used for*." (T2, interview, March 6, 2026)

These results show that organizational readiness includes technical capabilities, division of responsibilities, quality of records, data security, and commitment of business owners. The availability of applications alone is not enough to guarantee the sustainable use of AI.

Phased Implementation and Human Supervision

The entire group of informants emphasized the importance of implementing AI gradually. MSME actors tend to get clearer results when the use of AI starts from one specific problem, then is evaluated before being applied to other activities.

"*We started from one thing first, namely promotional content. Once the team gets used to it, it is only used for customer service. If everything is changed immediately, we are even confused*." (U8, interview, February 28, 2026)

"It's *better to pick one process that is the most burdensome, and then measure whether AI really helps. There's no need to use a lot of apps right away*." (P3, interview, March 11, 2026)

"*Successful implementations are usually not the most sophisticated, but the obvious ones are the problem, the data is clear, and it's clear who's responsible*." (T1, interview, February 24, 2026)

Human supervision is still needed for all functions that use AI. Informants do not place AI as a substitute for business owners' decisions. AI is used to generate drafts, summaries, patterns, or recommendations, while humans check language suitability, business conditions, risks, and customer needs.

"*I think of AI as an assistant. He helps prepare the materials, but I decide whether the materials are used or not*." (U1, interview, February 8, 2026)

"*When it comes to prices, complaints, and customer data, it should not be fully automated. Someone has to check*." (U10, interview, March 8, 2026)

"*The advantage of MSMEs lies in the proximity to customers. AI should reinforce that proximity, not replace it*." (P2, interview, March 4, 2026)

Based on the overall findings, the process of developing an AI-based MSME business model takes place through five stages. The first stage is the identification of business problems, such as delays in services or marketing irregularities. The second stage is the selection of applications that are in accordance with business capabilities. The third phase includes testing on limited activities. The fourth stage is the integration of AI into work processes and the division of responsibilities. The last stage is the evaluation of the benefits, risks, and possible expansion of its use.

Summary of Key Findings

The results show that AI was used for marketing and customer service for the earliest because both functions are easily accessible and provide benefits that are quickly felt. Utilization then progresses to information management, sales

analysis, inventory, and decision-making support. AI increases efficiency mainly through reducing administrative tasks and accelerating information preparation. At the same time, AI supports communication personalization, the development of service variety, and the use of customer data as the basis for product improvement.

Business model changes have not taken place uniformly. Some new MSMEs are using AI to improve their existing activities, while others are starting to change their value proposition, customer relationships, marketing channels, and division of labor. The success of AI integration is influenced by digital literacy, data quality, workforce readiness, owner support, information security, and gradual deployment. In the entire process, the final decision still requires human judgment so that the use of AI is in accordance with the business character and customer needs.

DISCUSSION

The results of the study show that the application of artificial intelligence in MSMEs takes place gradually, starting from simple needs such as content creation, product descriptions, and initial customer service, then progressing to sales analysis, inventory management, and decision-making. This pattern shows that AI adoption is a learning process that is influenced by technological suitability, organizational readiness, and environmental conditions. These findings are in line with Sulaiman et al. (2021), who emphasized that the digital transformation of MSMEs requires the integration of technology, organization, resources, environment, and e-business innovation. The gradual process also supports Peretz-Andersson et al. (2024), who explain that the application of AI depends on the ability of businesses to combine technology, data, knowledge, labor, and business procedures.

The initial benefits of AI are most clearly seen in operational efficiency. AI helps speed up the preparation of promotional materials, summarize information, prepare customer responses, and reduce repetitive administrative work. These findings support Amira and Nasution (2023) and Mardiana et al. (2024), which show that AI can help MSME efficiency, automation, customer analytics, inventory management, and business processes. However, efficiency is not always gained directly because business actors need time to learn the preparation of instructions, examine the results, and adjust them to business needs. This suggests that there is a learning cost before AI actually increases productivity.

Increasing efficiency also does not always result in direct turnover growth. The initial benefits are more visible in the regularity of the process, the consistency of marketing, the speed of service, and the availability of time for work that requires human creativity. New efficiencies can improve financial performance when translated into product innovation, better service, customer loyalty, or market expansion. Therefore, the success of AI should not only be judged through increased revenue, but also through changes in the quality and effectiveness of business processes.

AI has also changed marketing communication to be more personalized because MSME actors can adjust messages based on customer characteristics, products, media, and promotional times. These results are in line with Andriana et al. (2024), who explain that AI supports consumer analytics, message personalization, marketing automation, and MSME communication strategies. Customer conversations are also starting to be used as a source of data to improve products and services. However, services cannot be completely left to AI because complaints, negotiations, and special needs still require human empathy and judgment.

The next finding shows a shift from predominantly intuition-based decisions to decisions that combine owner experience with data analysis. AI helps identify sales patterns, potential products, promotion times, and stock needs, but the final decision still takes into account supplier conditions, production capacity, and market situation. In the Resource-Based View perspective, data, digital skills, and managerial experience must be combined to produce excellence. This supports Apsari and Rofiaty (2023), who found that managerial ability and dynamic capabilities have a positive effect on business performance.

Data quality is an important factor because inconsistent recording results in less relevant analysis and recommendations. MSMEs need to improve administration through transaction recording, product standardization, customer grouping, access regulation, and information protection. These findings show that the application of AI is not only a technological transformation, but also a change in information governance and business administration.

AI integration results in changes to key activities, customer relationships, marketing channels, division of labor, and value propositions. In the early stages, AI only enhances existing activities, while in the advanced stages, AI begins to change the way businesses create and deliver value. However, changes in sources of income have not occurred evenly. These findings are in line with Qohar and Darmawan (2024), who show that the adoption of digital platforms does not directly result in business model innovation if it is not followed by changes in the value creation process.

The results of the study also support Xie et al. (2022), who explain that digital technology influences business model innovation through capability reconfiguration. In this study, reconfiguration can be seen from changes in the division of labor, data use, marketing process, and labor transition from routine tasks to service and product development. Jorzik et al. (2024) also emphasized that AI-based business model innovation has a dynamic dimension. Based on the results of the research, the process can be divided into three stages, namely task augmentation, process integration, and business model update. Not all MSMEs have reached the final stage because some are still using AI as operational tools.

The success of AI integration is influenced by digital literacy, data quality, owner commitment, workforce competence, financing, infrastructure, and gradual implementation strategies. Gumilang and Mahfudz (2025) show that the digital readiness of MSMEs is still in the early stages due to limited financing and

manpower. The findings of this study expand on these results by showing that constraints also stem from dependence on a single user, weak logging, and lack of habit of checking AI outputs. Thus, a cheap or free application does not necessarily provide benefits if the organization is not ready to manage it.

This study did not test the statistical hypothesis because it used a qualitative approach. However, the proposition that AI improves efficiency, service innovation, decision quality, and competitiveness gains contextual support. This influence does not take place directly because it depends on digital literacy, data quality, resource readiness, and managerial ability. The finding that differs from the initial expectations is that there has not been an increase in turnover and sources of income for all MSMEs. These differences can be caused by the limited duration of utilization, depth of use, business scale, market character, and the ability to convert efficiency into commercial value.

Theoretically, this study shows that AI is not only a technological resource, but can be a strategic capability when combined with humans, data, administration, and decision-making processes. The integration between the TOE framework, Resource-Based View, and dynamic capabilities explains that AI transformation takes place from task augmentation to process integration and business model updates. Practically, MSMEs need to start from a specific problem, assess the readiness of data and workforce, conduct trials, evaluate the results, and then expand the implementation gradually.

This study has limitations because it only involves 15 informants in the case study design so the results cannot be generalized statistically. Informants have also been using AI for at least six months, so the experience of MSMEs that fail, refuse, or stop using it has not been represented. Data sourced from informant perceptions have the potential to contain bias, while changes in financial performance have not been observed longitudinally. The differences in sectors, regions, business sizes, and types of applications have also not been specifically compared.

Further research is recommended using a multi-case design involving MSMEs from various sectors and regions, including users, non-users, as well as businesses that stop AI. Longitudinal research is needed to observe changes from the experimental stage to business model innovation. A blended approach can also be used to test the relationship between AI literacy, organizational readiness, data quality, business model innovation, and business performance. The next research needs to include data on transactions, costs, service time, marketing conversions, customer satisfaction, as well as privacy governance, transparency, bias, and responsibility for the use of AI.

CONCLUSIONS AND RECOMMENDATIONS

This study concludes that the application of artificial intelligence in the development of MSME business models takes place gradually, starting from simple utilization for content creation, customer service, and administrative work, then progressing to marketing personalization, sales analysis, inventory management, and data-driven decision-making. AI has been proven to help improve operational efficiency, accelerate service, strengthen marketing

consistency, and drive change in key activities, customer relationships, marketing channels, and value propositions. However, the use of AI has not evenly resulted in an increase in turnover or a change in revenue sources as the benefits are influenced by digital literacy, data quality, managerial capabilities, workforce readiness, owner support, and depth of technology integration. Thus, AI not only functions as an automation tool, but can develop into a strategic capability when combined with human resources, information governance, and business processes that are adaptive and remain under human supervision.

Based on these findings, MSME actors are advised to implement AI gradually by starting from the most real business problems, organizing data recording and security, improving workforce competence, and evaluating the benefits of using technology through indicators of efficiency, service quality, innovation, and business performance. The government, universities, accompanying institutions, and technology providers need to strengthen AI literacy programs, business needs-based training, data management assistance, and the provision of affordable technology. Further research is suggested using a multi-case design or mixed method by involving MSMEs from different sectors, regions, and adoption levels, including businesses that fail or stop using AI. Longitudinal research is also needed to assess the impact of AI on costs, revenue, customer loyalty, business model innovation, and the competitiveness of MSMEs in the long term.

ADVANCED RESEARCH

The next research is suggested to use a multi-case design or mixed method by involving MSMEs from various sectors, regions, and levels of AI adoption. Longitudinal studies are also needed to measure the impact of AI use on cost efficiency, revenue growth, customer loyalty, business model innovation, and long-term competitiveness. Future research also needs to examine data governance, security, algorithmic bias, and the sharing of responsibilities between humans and technology.

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