

# AI Adoption in MSME Marketing: Literature Review on Trends, Obstacles, and Implementation Strategies

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## ABSTRACT

Artificial intelligence (AI) has become a key element in digital marketing, enabling businesses to automate customer interactions, analyze market data, and optimize advertising strategies. However, the adoption of AI by Micro, Small, and Medium Enterprises (MSMEs) is still limited due to constraints such as financial constraints, low digital literacy, and data security and regulatory issues. This study aims to analyze the trend of AI adoption in MSME marketing, identify the main challenges faced, and formulate implementation strategies that can improve the use of this technology. Using a Systematic Literature Review (SLR) approach, this study examines various studies published in reputable international journals from 2015 to 2025, using data sources from Scopus, Web of Science, and Google Scholar. The results of the study show that AI has been applied in various aspects of MSME marketing, such as chatbots for customer service, machine learning-based recommendation systems, and customer data analysis for market segmentation. However, the adoption of AI is still hampered by limited capital, inadequate technological infrastructure, and lack of workforce skills in operating AI systems. To overcome these barriers, several strategies can be implemented, including increasing digital literacy, using cloud-based AI solutions (AIaaS), collaborating with digital platforms, and supporting more inclusive government regulations and policies. With the right approach, AI has the potential to be an effective tool for MSMEs in increasing their competitiveness in the digital era.

**Keywords:** *AI, MSME Marketing, Technology Adoption, Digital Transformation, Implementation Strategy.*

## 1. INTRODUCTION

Micro, Small and Medium Enterprises (MSMEs) are vital to the global economy, especially in developing countries, where they represent more than 90% of businesses and contribute significantly to employment (Bright, 2025). However, their competitiveness in the digital era is challenged by limited adoption of advanced technologies, including artificial intelligence (AI) and digital marketing strategies (Basir, 2025; Hsb et al., 2025). Research shows that MSMEs can improve operational efficiency and market reach through digital transformation, leveraging tools such as e-commerce and social media (Hsb et al., 2025; Setiawan et al., 2024). Despite these opportunities, barriers such as inadequate digital infrastructure and lack of digital skills hinder their progress (Hsb et al., 2025; Setiawan et al., 2024). Therefore, cultivating a supportive digital ecosystem, including government and institutional collaboration, is essential for MSMEs to thrive and contribute to economic growth and job creation (Bright, 2025; Nor, 2024).

Artificial intelligence (AI) has profoundly transformed marketing strategies for micro, small and medium enterprises (SMEs) by improving operational efficiency and enabling personalized customer interactions. Key applications include chatbots for real-time engagement, big data analytics for consumer behavioral insights, and machine learning-based recommendation systems that drive sales through tailored suggestions (Bhattacharya, 2025; Cherian, 2025; Nwobodo, 2025). This technology facilitates precision targeting, optimizes digital advertising, and increases campaign effectiveness, ultimately leading to increased customer satisfaction and sales performance (Magrini, 2025; Wang, 2025). However, AI integration also raises ethical concerns, such as data privacy and algorithmic bias, which require responsible management to build consumer trust (Wang, 2025). By leveraging AI, SMEs can not only expand their market reach but also improve customer experience through data-driven strategies, positioning themselves competitively in an increasingly digital marketplace (Cherian, 2025; Magrini, 2025).

The adoption of artificial intelligence (AI) among Micro, Small and Medium Enterprises (MSMEs) in developing regions is hampered by several important factors, including financial constraints, inadequate technical skills and inadequate digital infrastructure (Kang, 2024; Rahman et al., 2024). Research shows that performance expectancy, which includes perceived benefits and increased productivity, alongside effort expectancy, which relates to ease of use, significantly influence the intention to adopt AI technology (Sengkalit et al., 2025). For example, SMEs that

integrate AI into their marketing strategies can experience substantial improvements, such as a 35% increase in sales and increased market reach (Firly, 2024). However, challenges remain, including cultural inertia and a lack of trust in the effectiveness of AI, stemming from a limited understanding of its benefits (Michael, 2024; Rahman et al., 2024). To facilitate AI adoption, targeted policies, accessible training programs, and improved funding mechanisms are critical to bridge the digital divide and promote innovation in the MSME sector (Kang, 2024).

AI adoption in the MSME sector faces significant challenges, primarily due to financial constraints, limited digital literacy, and inadequate technology infrastructure, which hamper its integration compared to larger enterprises (Nwagbala et al., 2025; Proietti & Magnani, 2025). Many SMEs do not have a clear understanding of the benefits of AI, which leads to reluctance in adopting marketing strategies (Firly, 2024). Despite these barriers, innovations in AI technology, such as chatbots and automated advertising, are becoming more accessible, offering potential solutions to improve operational efficiency and reduce costs (Nwagbala et al., 2025; Wang, 2025). Studies show that integrating AI can significantly improve marketing results, with reported sales increases of up to 35% in some cases (Firly, 2024). However, a comprehensive mapping of AI adoption trends, barriers, and effective strategies for MSMEs is still needed to fully leverage the potential of AI in marketing (Proietti & Magnani, 2025; Zong et al., 2025).

This study aims to examine trends, constraints, and strategies for implementing AI in MSME marketing through a systematic review of previous studies. Specifically, this study seeks to identify key trends in the implementation of AI by MSMEs, including the most frequently used technologies, the most impacted sectors, and the impact of AI on the effectiveness of MSME marketing and business growth. In addition, this study aims to analyze the constraints faced by MSMEs in adopting AI, both in terms of investment costs, limited digital infrastructure, lack of technical expertise, and regulatory and data privacy challenges. Furthermore, this study will propose strategies that can help MSMEs adopt AI more effectively, including through increasing digital literacy, collaboration with technology platforms, and policy interventions that support AI accessibility for MSMEs. Thus, this study not only provides academic contributions in understanding the dynamics of AI adoption in the MSME sector but also provides recommendations that can be used by MSME actors, policy makers, and other stakeholders in encouraging a more inclusive and sustainable AI-based digital transformation.

## 2. METHOD

This study uses a systematic literature review method to explore trends, constraints, and strategies for implementing artificial intelligence (AI) in MSME marketing. A systematic literature review was chosen because it allows researchers to identify, evaluate, and synthesize previous research results comprehensively to provide a deeper understanding of the phenomenon being studied. This approach also aims to ensure that the conclusions obtained are based on strong scientific evidence and have been verified in various previous studies. In the process, this study refers to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) method to compile systematic steps in selecting and analyzing literature.

The literature search process was conducted through various reputable academic databases, such as Scopus, Web of Science, IEEE Xplore, Google Scholar, and ScienceDirect. The keywords used in the search included a combination of terms such as "Artificial Intelligence in SME Marketing," "AI adoption in small business," "AI-based marketing strategies for SMEs," "challenges of AI adoption in SMEs," and "AI and digital transformation in micro-enterprises." These keyword variations were arranged to ensure a broad coverage of the literature and avoid bias in the selection of articles. The literature search was limited to the time span of 2015 to 2025 to ensure that the studies analyzed reflected the latest developments in AI implementation in the SME sector.

Literature selection was carried out in stages with several inclusion and exclusion criteria. The inclusion criteria used in this study include: (1) articles published in reputable journals or international conferences indexed by Scopus or Web of Science, (2) research that specifically discusses the implementation of AI in MSME marketing, both in the context of adoption, challenges, and implementation strategies, and (3) studies that present empirical data, conceptual reviews, or meta-analyses related to the topics studied. Meanwhile, the exclusion criteria include: (1) articles that are not available in English or Indonesian, (2) studies that only discuss AI in general without specific relevance to MSMEs or marketing, and (3) publications in the form of opinions or editorials that are not based on empirical research.

After the selection process, articles that met the criteria were analyzed using a content analysis approach to identify key patterns in previous research findings. Categorization was carried out based on three main aspects that are the focus of this study, namely the trend of AI adoption in MSME marketing, obstacles faced in implementing AI, and strategies that can be applied to increase AI adoption in this sector. In the analysis process, coding was carried out on key findings that were repeated across studies to identify similarities, differences, and relationships between relevant

concepts. In addition, the analysis was carried out by considering the geographic context and the MSME industry sector to understand the specific factors that influence AI adoption in various business environments.

To increase the validity of this literature review, source triangulation was conducted by comparing research results from various academic perspectives, including case studies, empirical surveys, and policy analysis related to the application of AI in MSME marketing. With this approach, this study not only provides a systematic mapping of the development of AI in MSME marketing, but also presents a critical synthesis of the challenges and opportunities that arise in the implementation of this technology.

### 3. RESULTS AND DISCUSSION

#### 3.1 AI Adoption Trends in MSME Marketing

The adoption of artificial intelligence (AI) in marketing is increasingly beneficial for small and medium-sized businesses (SMBs), enabling them to increase efficiency and competitiveness despite traditional resource constraints. AI technology facilitates automation of customer service, data analysis, and optimization of marketing strategies, leading to improved customer experience and sales performance (Cherian, 2025; Wang, 2025). For example, AI-based tools like chatbots and predictive analytics enable SMEs to personalize customer interactions and effectively predict purchasing behavior (Cherian, 2025; Omokhoa et al., 2025). However, adoption rates vary significantly across industries, influenced by factors such as technology readiness and digital ecosystem support (Omokhoa et al., 2025). Challenges remain, including data privacy issues and the need for an ethical framework to ensure the responsible use of AI (Wang, 2025). However, practical solutions such as AI-as-a-Service platforms can help SMEs overcome these barriers, driving sustainable growth in the digital economy (Omokhoa et al., 2025).

##### 3.1.1 Implementation of AI in Digital Marketing Strategy

AI has significantly transformed digital marketing for micro, small and medium enterprises (MSMEs) by enhancing customer engagement and optimizing marketing strategies. The adoption of AI-powered chatbots and virtual assistants enables MSMEs to provide immediate automated responses, thereby increasing customer satisfaction and reducing operational costs associated with human labor (Cherian, 2025; Thrimoorthy, 2025). Additionally, AI facilitates big data analysis, enabling MSMEs to collect and analyze customer data to distinguish behavioral patterns and preferences, leading to a more personalized marketing approach (Bhattacharya, 2025; Wang, 2025). This data-driven strategy not only increases customer engagement but also improves sales conversions by tailoring content and marketing efforts to individual consumer needs (Ahuja, 2024). Despite challenges such as data privacy issues and algorithmic bias, responsible AI integration can yield huge benefits, driving innovative marketing tactics and improving overall business performance (Cherian, 2025; Wang, 2025).

In addition, machine learning-based recommendation systems are also starting to be widely adopted by MSMEs, especially those operating in the e-commerce sector (Riswan et al., 2024). This technology allows MSMEs to offer more relevant products or services to customers based on their search and transaction history. With a smarter recommendation system, MSMEs can increase customer engagement and drive increased transaction value per customer (Putra et al., 2023). In addition, AI-based digital advertising optimization has helped MSMEs manage their marketing campaigns more efficiently. AI algorithms allow MSMEs to target more specific audiences based on demographics, online behavior, and customer interests, so that marketing budgets can be used more effectively.

##### 3.1.2 Development of AI Adoption in Various MSME Sectors

The adoption of AI in MSME marketing is not only limited to one business sector, but has penetrated various industries with different approaches (Andriana & Fadilah, 2024). In the e-commerce and retail sectors, AI has been used to enhance the customer shopping experience through product recommendation technology, customer service chatbots, and data-driven promotional personalization (Wang, 2025). MSMEs in this sector are also starting to utilize automated inventory management, where AI helps in managing stock in real-time based on market demand analysis.

In the service and hospitality sector, MSMEs are starting to adopt AI to improve operational efficiency and customer service. For example, small hotels and restaurants are now using chatbots and virtual assistants to handle bookings, answer customer questions, and manage online reviews. AI also allows MSMEs in this sector to analyze customer demand trends, so they can offer services that are more in line with market preferences.

Meanwhile, in the creative industry and manufacturing sectors, AI is used to support more innovative product marketing (Hanifa et al., 2023). For example, creative industry players such as graphic designers, photographers, and

content creators are starting to use AI to produce automated designs, edit images, and increase AI-based content production. On the manufacturing side, MSMEs engaged in small-scale production are starting to adopt predictive maintenance technology, where AI helps detect potential machine damage before it occurs, thereby reducing maintenance costs and increasing production efficiency.

### *3.1.3 The Impact of AI on MSME Marketing Performance*

The adoption of AI in MSME marketing has had a significant impact on business performance, especially in terms of marketing cost efficiency, increasing customer engagement, and business competitiveness (Cherian, 2025; Thrimoorthy, 2025). One of the main benefits of implementing AI is marketing cost efficiency. By using AI to automate various marketing processes, MSMEs can reduce labor costs and maximize the effectiveness of their marketing campaigns. AI allows MSMEs to run more accurate data-based marketing strategies, so that the budget spent on advertising and promotions can provide more optimal results (Andriana & Fadilah, 2024).

In addition, AI also contributes to improving customer engagement and user experience. With AI-based chatbots and recommendation systems, MSMEs can interact with customers in a more responsive and personal way. This better customer experience ultimately increases customer loyalty and the likelihood of customers making repeat purchases. AI also allows MSMEs to understand customer needs more deeply, so they can offer products and services that are more in line with their preferences.

From a competitiveness perspective, AI has helped MSMEs improve their competitiveness in the digital market. By utilizing AI technology for data analysis and smarter marketing strategies, MSMEs can make more informed decisions in designing marketing campaigns and adapting their strategies to changing market trends. This is very important for MSMEs, considering that competition in the digital era is getting tighter, especially with the presence of large companies that have greater resources. With AI, MSMEs can find unique competitive advantages and take advantage of market opportunities more effectively.

### *3.1.4 Challenges in Increasing AI Adoption in MSME Marketing*

Adoption of artificial intelligence (AI) among micro, small and medium enterprises (MSMEs) in developing regions is significantly hampered by a combination of low digital literacy and financial constraints. Many MSMEs lack an adequate understanding of AI applications, which limits their ability to effectively leverage the technology for marketing and operational improvements (Fajri et al., 2025; Juriah & Susilastuty, 2024). Despite general awareness of the potential benefits of AI, such as increased customer engagement and increased sales, only a small percentage of SMEs have implemented AI tools due to inadequate training and support (Firly, 2024; Juriah & Susilastuty, 2024). In addition, the initial investment required for AI technology, including software, hardware, and workforce training, poses a major barrier for capital-constrained MSMEs, especially when immediate benefits are not visible (Fajri et al., 2025; Firly, 2024). Addressing these challenges through targeted capacity building initiatives and government support is critical to fostering an enabling environment for AI adoption and maximizing its potential to drive growth and innovation in the sector (Fajri et al., 2025; Firly, 2024).

From a regulatory perspective, privacy and data security issues are also a major concern in the implementation of AI in the MSME sector. With the increasing use of AI in customer data analysis, concerns have arisen regarding the protection of personal data and the security of business information. Many MSMEs do not yet have adequate cybersecurity systems, making them vulnerable to the risk of data breaches and misuse of customer information.

Based on the above explanation, the trend of AI adoption in MSME marketing shows that this technology has great potential in increasing efficiency, personalization, and business competitiveness. Various AI technologies such as chatbots, recommendation systems, big data analysis, and digital advertising optimization have begun to be implemented in various MSME sectors with promising results. However, the level of AI adoption still faces various challenges, including financial limitations, lack of digital literacy, and issues of privacy and data security. Therefore, a more effective strategy is needed to increase the use of AI in MSME marketing, including increasing digital literacy, policy support, and collaboration with a wider digital ecosystem. Thus, AI can be a more inclusive and beneficial tool for the growth of MSME businesses in the digital era.

## *3.2 Obstacles to AI Adoption by MSMEs*

Although artificial intelligence (AI) has been proven to provide significant benefits in marketing strategies, its adoption rate among Micro, Small, and Medium Enterprises (MSMEs) is still relatively low. Various studies show that many MSMEs have difficulty implementing AI, both due to internal factors such as limited resources, and

external factors such as regulations and infrastructure challenges (Aini et al., 2024). Unlike large companies that have adequate technological and financial capacity, MSMEs often face more complex barriers in adopting AI as part of their business strategy. These barriers can be categorized into several main aspects, namely financial and infrastructure limitations, lack of digital literacy and competent human resources, data security and privacy issues, and challenges related to attitudes and trust in AI technology.

### *3.2.1 Financial and Infrastructure Barriers*

One of the main obstacles to AI adoption by MSMEs is financial constraints. AI implementation often requires large initial investments, either in the form of software and hardware purchases, workforce training, or integration of AI systems with existing infrastructure (Fahmi et al., 2024). Advanced AI technologies such as big data analysis, chatbots, and machine learning-based recommendation systems usually require high costs for development, implementation, and long-term maintenance. For MSMEs with limited capital, the allocation of funds for investment in AI is often considered a low priority compared to other operational needs, such as conventional production, distribution, and marketing (Nugroho et al., 2025).

In addition, limited technological infrastructure is also a challenge for MSMEs in adopting AI. Not all MSMEs have access to adequate computing devices or stable internet connectivity, especially in areas that still experience the digital divide. AI requires a reliable system to process large amounts of data, and for MSMEs that do not yet have a strong digital infrastructure, integrating AI into their business is a challenge. Limited access to affordable AI service providers also makes matters worse, as many MSMEs still rely on traditional marketing methods due to the difficulty of finding technology solutions that suit their needs and budget.

### *3.2.2 Lack of Digital Literacy and Competent Human Resources*

In addition to financial constraints, the lack of digital literacy among MSMEs is a major inhibiting factor in AI adoption. Many MSME owners do not yet have a sufficient understanding of how AI can be applied to their business or how this technology can improve marketing efficiency and effectiveness. The lack of education about the benefits of AI has caused many MSMEs to still be hesitant and reluctant to invest in this technology (Juwita & Handayani, 2022).

In addition, the implementation of AI requires a workforce with adequate technical skills. However, in many countries, especially in the MSME sector, there is a skills gap in programming, data analysis, and management of AI-based technology. Not all MSMEs have human resources capable of operating or managing AI systems optimally. Even if AI solutions are available in a more user-friendly form, such as platform-based chatbots or automated recommendation systems, a basic understanding of how to use them effectively is still needed. Training and capacity building of the workforce is a challenge for MSMEs, because most of the workforce in this sector is more familiar with traditional marketing methods than technology-based marketing.

### *3.2.3 Data Security and Privacy*

Data security and privacy issues are also a major concern in the adoption of AI by MSMEs. AI relies heavily on data to function optimally, including customer data, transaction data, and consumer behavior data. However, many MSMEs still have less secure data management systems, making them vulnerable to data leaks or misuse. Data security is a critical aspect of AI-based marketing, especially when it involves processing sensitive customer information.

In some countries, regulations regarding data protection such as the General Data Protection Regulation (GDPR) in Europe or similar rules in various other countries have required businesses, including SMEs, to comply with strict data security standards (Sirait, 2019). However, compliance with these regulations is often a challenge for MSMEs that do not yet have a strong data protection system. A lack of understanding of cybersecurity and an inability to manage the risk of data breaches makes many MSMEs reluctant to use AI in marketing, due to concerns about potential legal and reputational issues that can arise from customer data breaches.

In addition, customer trust in the use of AI in marketing is also a challenge. Many customers are still skeptical about how AI manages and uses their data. If MSMEs are not transparent in their AI-based data management practices, customers may lose trust and switch to other businesses that are considered safer. Therefore, building a strong security system and increasing literacy about data protection is one of the major challenges in implementing AI for MSMEs.

### *3.2.4 Beliefs and Attitudes Toward AI Technology*

In addition to technical and financial barriers, psychological and cultural factors also play a significant role in the adoption of AI by MSMEs. Many MSME owners are still skeptical about the effectiveness of AI and feel that this technology is more relevant for large companies than small businesses (Rahman et al., 2024; Wang, 2025). Some MSMEs also think that AI is a technology that is too complex and difficult to integrate into their business models.

The lack of experience in using AI-based technology makes many SMEs more comfortable with traditional marketing methods that have proven to work for them. Some SMEs are also concerned that adopting AI could reduce human interaction in their business, which has been a key advantage in building relationships with customers (Triwijayati et al., 2023). Fear of change and a lack of understanding of how AI can be adapted without losing the personal touch in customer service are factors that hinder the acceptance of this technology.

In addition, there is an information gap between AI solution providers and MSMEs. Many AI solutions are developed without considering the specific needs of MSMEs, so the products offered are not always relevant or easy to adopt by small businesses. If there is no proper socialization or education on how AI can be easily integrated into MSME businesses, the adoption rate will remain low.

Although AI has great potential to improve the marketing effectiveness of MSMEs, there are still various obstacles that hinder its adoption. The main obstacles faced by MSMEs in adopting AI include financial and technological infrastructure limitations, lack of digital literacy and human resource skills, and challenges related to data security and privacy. In addition, skepticism and low trust in AI technology are also contributing factors to the low adoption rate in the MSME sector. Therefore, a more comprehensive strategy is needed to overcome these obstacles, including increasing digital literacy, providing more affordable and user-friendly AI solutions, and policies that support AI adoption among MSMEs. With the right steps, MSMEs can be better prepared to adopt AI technology and use it as an effective tool in increasing their competitiveness in the digital era.

### ***3.3 AI Implementation Strategy in MSME Marketing***

Although the adoption of artificial intelligence (AI) in MSME marketing still faces various obstacles, there are a number of strategies that can be implemented to increase the use of this technology in the MSME sector. AI implementation strategies must focus on increasing digital literacy and human resource (HR) capacity, developing business models that support AI adoption, collaborating with digital ecosystems, and implementing regulations and policies that facilitate wider use of AI by MSMEs. By implementing these strategies systematically, MSMEs can optimize the benefits of AI to increase their competitiveness in an increasingly competitive market.

#### ***3.3.1 Improving Digital Literacy and Human Resources Capacity***

One of the main factors inhibiting the adoption of AI in MSME marketing is the low digital literacy among small and medium business actors (Hsb et al., 2025; Naveen, 2024). Therefore, increasing digital literacy and HR capacity is a strategic step that needs to be prioritized. Training and education programs on AI need to be expanded so that MSMEs can understand the benefits and how to integrate AI into their marketing strategies.

This training can be conducted through various methods, such as workshops, online courses, and technology-based business incubation programs. Governments, academic institutions, and technology companies can play an active role in providing training modules specifically designed for MSMEs. Training content should focus on the practical application of AI in marketing, such as the use of chatbots for customer service, the use of data analysis for more effective marketing strategies, and the management of AI-based digital advertising campaigns.

In addition, there needs to be support in the form of mentoring and assistance for MSMEs who want to start adopting AI. Mentorship programs involving AI experts or MSMEs who have successfully used AI can help provide practical guidance and share experiences on the best ways to implement this technology. With increased skills and a better understanding of AI, MSMEs will be more confident in adopting this technology in their marketing strategies.

#### ***3.3.2 Business Models That Support AI Adoption***

In addition to increasing digital literacy, developing a more flexible and adaptive business model for AI is an important factor in accelerating the adoption of this technology in the MSME sector. One solution that can be implemented is the use of Artificial Intelligence as a Service (AIaaS), where MSMEs can access cloud-based AI services without having to make large investments in hardware or develop their own systems (Bright, 2025; Hsb et al., 2025).

AIaaS allows MSMEs to use various AI features, such as chatbots, data analysis, and marketing automation at a more affordable cost. Several technology platforms have provided subscription-based solutions that allow MSMEs to access AI technology without having to spend a large initial investment. With this business model, MSMEs can more easily try and adapt AI according to their needs.

In addition, the government and financial institutions can play a role in providing financial incentives for MSMEs who want to adopt AI. Providing subsidies, soft financing schemes, or grant programs for MSME digitalization can help reduce the financial burden that is often a major barrier to AI adoption. With these incentives, more MSMEs can access AI technology and use it to improve their marketing efficiency.

### *3.3.3. Collaboration with Digital Ecosystem*

Another strategy that can be implemented to accelerate the adoption of AI in MSME marketing is through collaboration with the wider digital ecosystem. MSMEs need to establish partnerships with e-commerce platforms, technology service providers, and AI startups that can help them integrate AI into their businesses (Ahuja, 2024; Pandey et al., 2025).

Large e-commerce platforms such as Shopee, Tokopedia, and Amazon have provided various AI-based features that can be used by MSMEs, such as product recommendation systems, automated chatbots, and customer data analysis (Riswan et al., 2024). By utilizing these features, MSMEs can increase their market reach and optimize data-based marketing strategies.

In addition, collaboration with AI startups and technology companies can help MSMEs develop AI solutions that better suit their needs. For example, AI startups that focus on MSMEs can provide chatbot solutions that are easy to integrate into social media platforms or simpler and more user-friendly data analysis services. With this collaboration, MSMEs can more easily access AI technology without having to develop their own solutions from scratch.

MSMEs can also take advantage of the wider digital ecosystem by participating in technology-based business communities. Joining a business network or industry forum that discusses digital transformation can provide MSMEs with access to the latest information on AI as well as opportunities to collaborate with other businesses that have already adopted this technology.

### *3.3.4 Supporting Regulations and Policies*

To ensure that AI can be adopted by MSMEs more widely, government support is needed in the form of regulations and policies that encourage digital transformation (Hsb et al., 2025; Setiawan et al., 2024). Policies that support AI adoption must cover various aspects, from financial incentives, data protection regulations, to technical support programs for MSMEs. One important aspect of regulation is data protection and cybersecurity. The government needs to ensure that existing regulations can protect MSME customer data from the risk of privacy violations or misuse by third parties. Clear regulations regarding the use of AI in marketing will also help increase MSME trust in this technology, so that they are more willing to adopt it in their business.

In addition, the government can encourage the use of AI in the MSME sector through a national-scale digitalization program. These programs can include subsidized digital training, the provision of better technology infrastructure, and policies that encourage collaboration between MSMEs and technology companies. The government can also collaborate with academic institutions to develop research that focuses on the implementation of AI for MSMEs, so that it can produce more specific and applicable solutions. Support in the form of simplifying regulations and tax policies can also help MSMEs adopt AI. Many MSMEs still face administrative barriers in accessing digital technology, so more flexible policies are needed to support them in carrying out digital transformation.

The strategy for implementing AI in MSME marketing must involve various complementary approaches, starting from increasing digital literacy and HR capacity, developing business models that support AI adoption, collaborating with digital ecosystems, to more inclusive regulatory support (Firly, 2024; Juwita & Handayani, 2022). With the right training, flexible business models, access to digital ecosystems, and supportive policies, MSMEs will have a greater chance of adopting AI and using it effectively in their marketing strategies.

With proper implementation, AI can help MSMEs improve marketing efficiency, optimize customer interactions, and expand their business reach in the digital era. Therefore, all stakeholders, including the government, technology companies, academics, and business people, need to collaborate to create a conducive environment for MSMEs to adopt and utilize AI as part of their marketing strategy.

## CONCLUSION

The adoption of artificial intelligence (AI) in MSME marketing has great potential in increasing efficiency, personalization of marketing strategies, and competitiveness in the digital era. Although AI has begun to be applied in various aspects of marketing such as chatbots, recommendation systems, and data analysis, the adoption rate is still low due to obstacles such as financial limitations, lack of digital literacy, and data security issues. Therefore, a more systematic implementation strategy is needed so that MSMEs can utilize AI optimally.

To increase AI adoption, MSMEs need to improve digital literacy and utilize more affordable AI solutions, such as cloud-based services. Collaboration with digital ecosystems, including e-commerce platforms and AI startups, can also help in the process of AI integration without large costs. The government needs to provide financial incentives, strengthen digital infrastructure, and ensure regulations that support data security and protection for MSMEs in utilizing AI.

With support from various stakeholders, including the government, technology providers, and academics, MSMEs can more easily access and adopt AI as part of their marketing strategy. With the right steps, AI can be an inclusive and effective tool for MSMEs in facing the challenges and opportunities in the digital era, allowing them to grow and compete in an increasingly competitive market.

## REFERENCES

- Ahuja, P. R. (2024). Evaluating The Integration Of Ai In Digital Marketing Automation. *African Journal of Biomedical Research*, 10374–10379. <https://doi.org/10.53555/ajbr.v27i4s.5665>
- Aini, A., Safitri, E., Majalina, G., Abidin, M., & Khoiriawati, N. (2024). Analisis Peluang Dan Tantangan Teknologi Terhadap Pemberdayaan Umkm Di Indonesia. *SENTRI: Jurnal Riset Ilmiah*, 3, 2564–2571. <https://doi.org/10.55681/sentri.v3i5.2842>
- Andriana, D., & Fadilah, J. (2024). Implementasi Artificial Intelegence ( AI ) Dalam Perancangan Strategi Komunikasi Pemasaran Produk UMKM. *JIKA*, 11(2), 78–89.
- Basir, N. H. (2025). *Digital Marketing Strategies for SMEs: Enhancing Competitiveness in the Technological Era*. <https://doi.org/10.2139/ssrn.5086454>
- Bhattacharya, C. B. (2025). AI-Powered Predictive Models Transforming the Future of Digital Marketing and Customer Engagement. *Journal of Informatics Education and Research*, 5(1). <https://doi.org/10.52783/jier.v5i1.2015>
- Bright, R. (2025). Micro Small and Medium Enterprises: Driving Growth through Digital Transformation. *International Journal For Science Technology And Engineering*, 13(12), 1205–1209. <https://doi.org/10.22214/ijraset.2025.66282>
- Cherian, M. (2025). Leveraging AI for Predicting Marketing and Customer Insights-An Overview. *Journal of Informatics Education and Research*, 5(1). <https://doi.org/10.52783/jier.v5i1.2050>
- Fahmi, S., Tinggi, S., Ekonomi, I., & Malang, K. (2024). Pemanfaatan Teknologi Ai Untuk Menunjang Pemasaran Produk Umkm Di Kota Malang. *BERDAYA EKONOMI: Jurnal Pengabdian Masyarakat*, 2(2), 91–103. <https://www.jurnal.stiekma.ac.id/index.php/PkM/article/view/208>
- Fajri, F., Perdana, K. A., Manurung, D. U., Dharmawan, P. K. N., & Dewi, N. G. (2025). The Role of Early Adoption of Artificial Intelligence in Supporting the Growth of Micro and Ultra-Micro Enterprises in Indonesia: Challenges and Opportunities. *Jurnal Akuntansi Dan Bisnis*, 10(02), 133. <https://doi.org/10.47686/jab.v10i02.744>
- Firly, W. (2024). Transformasi Pemasaran Menggunakan Kecerdasan Buatan (AI) Untuk Mendorong Kemajuan UMKM Di Aceh Bireuen. *Jurnal Manajemen Dan Bisnis*, 3(2), 181–192. <https://doi.org/10.36490/jmdb.v3i2.1551>
- Hanifa, H., Sholihin, A., & Ayudya, F. (2023). Peran AI Terhadap Kinerja Industri Kreatif Di Indonesia. *Journal of Comprehensive Science (JCS)*, 2, 2149–2158. <https://doi.org/10.59188/jcs.v2i7.446>
- Hsb, A. F., Pramita, J. N., Hrp, N. A., & Nova, S. (2025). Peran Teknologi (Media Sosial) Terhadap UMKM yang Dapat Meningkatkan Pembangunan Ekonomi. *Jurnal Manajemen Dan Ekonomi Kreatif*, 3(1), 265–274. <https://doi.org/10.59024/jumek.v3i1.536>



- Juriah, S., & Susilastuty, D. (2024). Artificial Intelligence and the Future of Digital Marketing. *Devotion*, 5(12), 1569–1576. <https://doi.org/10.59188/devotion.v5i12.20692>
- Juwita, D., & Handayani, A. (2022). Peluang dan Tantangan Digitalisasi UMKM Terhadap Pelaku Ekonomi di Era Society 5.0. *Jurnal Inovasi Teknologi Dan Edukasi Teknik*, 2, 249–255. <https://doi.org/10.17977/um068v2i52022p249-255>
- Kang, W. (2024). *A Systematic Review: Bridging the Digital Divide in SME Digitalization*. 2024(2). <https://doi.org/10.62594/atom0002>
- Magrini, A. (2025). The Impact of Artificial Intelligence on Sales Strategies: Transforming the Sales Landscape. In *Social Science Research Network*. <https://doi.org/10.2139/ssrn.5005005>
- Michael, O. (2024). Maximising the Potentials of Small and Medium Scale Business Enterprises in Developing Nations Through the Use of Artificial Intelligence. *Advances in Business Strategy and Competitive Advantage Book Series*, 215–246. <https://doi.org/10.4018/979-8-3693-7362-0.ch009>
- Naveen, H. M. (2024). A Trend Analysis of Growth and Development of Micro, Small and Medium Enterprises (MSMEs) in India. *International Journal of Scientific Research in Science, Engineering and Technology*, 11(5), 208–213. <https://doi.org/10.32628/ijrsrset24115111>
- Nor, A. I. (2024). Small and medium-sized enterprises: A tool for socioeconomic development. *International Journal of Advanced and Applied Sciences*, 11(12), 116–128. <https://doi.org/10.21833/ijaas.2024.12.014>
- Nugroho, R. H., Kusumasari, I. R., Febrianto, V., & H, M. A. F. N. (2025). Strategi Teknologi Artificial Intelligence ( AI ) dalam Pengambilan Keputusan Bisnis di Era Digital. *Jurnal Bisnis Dan Komunikasi Digital*, 2(2), 1–7.
- Nwagbala, S. C., Ezeanokwasa, F. N., Nwachukwu, R., Uzodike, N. J., & Nwosu, O. P. (2025). AI adoption and sustainability of SMES in Africa: Opportunities and challenges. *International Journal of Science and Research Archive*, 14(1), 467–475. <https://doi.org/10.30574/ijrsra.2025.14.1.0009>
- Nwobodo, L. K. (2025). The Impacts of Big Data Analytics and Artificial Intelligence on Marketing Strategies. *Global Journal of Economic and Finance Research*, 02(01). <https://doi.org/10.55677/gjefr/05-2025-vol02e1>
- Omokhoa, H. E., Odionu, C. S., Azubuike, C., & Sule, A. K. (2025). Driving Business Growth and Market Expansion: AI and Market Research Strategies in Financial Institutions and SMEs. *International Journal of Research and Innovation in Social Science*, VIII(XII), 2994–3004. <https://doi.org/10.47772/ijriss.2024.8120248>
- Pandey, U., Pande, L., & Sengupta, S. (2025). Science, Technology, and Information in Indian Msmes: Status Quo and Challenges Faced. In *Social Science Research Network*. <https://doi.org/10.2139/ssrn.5065491>
- Proietti, S., & Magnani, R. (2025). *Assessing AI Adoption and Digitalization in SMEs: A Framework for Implementation*. <https://doi.org/10.48550/arxiv.2501.08184>
- Putra, D. A., Geraldi, G., Aldiawan, E., Virginia, C. M., & Marthin, B. (2023). Customer Relationship Management dan Rekomendasi untuk UMKM: Literature Review. *Al Qalam: Jurnal Ilmiah Keagamaan Dan Kemasyarakatan*, 17(4), 2381. <https://doi.org/10.35931/aq.v17i4.2300>
- Rahman, J., Ullah, N., Jalal, S., & Yousafzai, A. K. (2024). Understanding the Adoption and Impact of Artificial Intelligence in Small Businesses: A Case Study of the Pakistani Context. *Journal of Social & Organizational Matters*, 3(4), 248–259. <https://doi.org/10.56976/jsom.v3i4.141>
- Riswan, D., Putra, H., & Saputra, R. (2024). Pengembangan Sistem Rekomendasi Berbasis Kecerdasan Buatan Untuk Meningkatkan Pengalaman Pengguna Di Platform E-Commerce. *Jurnal Komputer Teknologi Informasi Dan Sistem Informasi (JUKTISI)*, 2, 572–580. <https://doi.org/10.62712/juktisi.v2i3.145>
- Sengkalit, D., Chair, U., & Abdullah, T. M. K. (2025). Factors Influencing Technology Adoption Among SMES: A Case Study of Youtap and The Role of Performance Expectancy and Effort Expectancy. *Syntax Literate : Jurnal Ilmiah Indonesia*, 10(1), 322–333. <https://doi.org/10.36418/syntax-literate.v10i1.17279>
- Setiawan, I., Rudianto, R., Inkiriwang, A., & Pakpahan, M. (2024). *Analysis of the Role of Digital Marketing in the Development of Micro, Small and Medium Enterprises (MSMEs) in Cibinong District*. 2(1), 1–18. <https://doi.org/10.61132/digitalinnovation.v2i1.141>

- Sirait, Y. (2019). General Data Protection Regulation (GDPR) Dan Kedaulatan Negara Non-Uni Eropa. *Gorontalo Law Review*, 2, 60. <https://doi.org/10.32662/golrev.v2i2.704>
- Thrimoorthy, D. N. (2025). Customer Service Chatbot With ML. *Indian Scientific Journal Of Research In Engineering And Management*, 09(01), 1–9. <https://doi.org/10.55041/ijjsrem40893>
- Triwijayati, A., Luciany, Y., Novita, Y., Sintesa, N., & Zahrudin, A. (2023). Strategi Inovasi Bisnis untuk Meningkatkan Daya Saing dan Pertumbuhan Organisasi di Era Digital. *Jurnal Bisnis Dan Manajemen West Science*, 2, 306–314. <https://doi.org/10.58812/jbmws.v2i03.564>
- Wang, S. (2025). The Influence of AI in Marketing. *Advances in Economics, Management and Political Sciences*, 151(1), 52–57. <https://doi.org/10.54254/2754-1169/2024.19326>
- Zong, Z., Anwar, M. S., Khan, S. A., Asmi, F., & Hussain, N. (2025). Big-data AI analytics in value-chain innovation and international marketing strategy: insights from SMEs in cultural and creative industries. *International Marketing Review*. <https://doi.org/10.1108/imr-02-2024-0049>