IJAFIBS, 13 (1) (2025) pp. 148-157

Published by: TRIGIN Publisher

International Journal of Applied Finance and Business Studies

Journal homepage: www.ijafibs.pelnus.ac.id

Implementing ai-driven digital marketing strategies in fashion MSMEs: An analysis of adoption and entrepreneurial practices

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ARTICLE INFO

Article history:

Received May 19, 2025
Revised May 22, 2025
Accepted Jun 20, 2025

Keywords:

Artificial Intelligence (AI);
Digital Marketing;
MSMEs.

ABSTRACT

In the era of digital transformation, Artificial Intelligence (AI) is reshaping marketing practices, offering new opportunities for Micro, Small, and Medium Enterprises (MSMEs) in the fashion industry to enhance competitiveness and customer engagement. This study investigates the implementation of AI-driven digital marketing strategies within Micro, Small, and Medium Enterprises (MSMEs) operating in the fashion sector. As digital transformation accelerates, AI technologies such as chatbots, automated advertising, and data analytics offer significant potential to enhance marketing effectiveness and customer engagement. Using a quantitative descriptive design, data were collected through structured questionnaires from 132 purposively selected MSME entrepreneurs. The findings reveal that while there is a relatively high level of adoption for specific tools particularly chatbots and AI-based advertising a considerable proportion of businesses have yet to embrace AI comprehensively. Key benefits identified include increased marketing efficiency, improved customer targeting, and higher conversion rates. However, barriers such as limited technical knowledge, high implementation costs, and inadequate training persist. The study contributes to the understanding of digital innovation in small business marketing and offers practical insights for policymakers and stakeholders aiming to foster AI readiness and capability among fashion MSMEs.

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1. INTRODUCTION

Technology integration into marketing strategies has emerged as a critical factor in determining competitiveness and sustainability in the age of rapid digital transformation, especially for micro, small, and medium-sized businesses (MSMEs). One of Indonesia's most prominent creative industries, the fashion industry has demonstrated encouraging growth dynamics. But it also has a lot of trouble adjusting to digital disruptions (Gungunawat et al., 2024). With tools like automation, content personalization, and predictive analytics that were previously unavailable to many MSMEs, the rise of artificial intelligence (AI) has created new chances to improve digital marketing strategies (Arun Kumar, 2021). Notwithstanding these developments, MSME actors' adoption and application of AI is still uneven and limited, particularly in the fashion sector(Ziakis & Vlachopoulou, 2023). The degree to which small business owners comprehend and make use of AI technologies' potential to support successful and long-lasting marketing strategies is a significant question raised

by this circumstance. Therefore, a thorough investigation of the dynamics of AI adoption and use in relation to digital marketing strategies among Indonesian fashion MSMEs is imperative(Saboune, 2024a).

Although the literature has widely recognized the potential of AI to support digital marketing strategies, numerous MSME actors continue to encounter challenges when attempting to implement such technologies(Ponomarenko et al., 2024). Major obstacles to AI adoption include inadequate human resources, inadequate digital literacy, and restricted access to pertinent technologies(ReachFirst, 2023). Additionally, a significant number of small business owners are unaware of the strategic potential of AI to improve customer interaction, market analysis, and marketing campaign optimization. The issue is further complicated by the scarcity of empirical studies that specifically address the adoption behaviours of AI within the context of MSMEs in the fashion sector(Sharma et al., 2023). Consequently, it is imperative to examine the obstacles, behaviours, and circumstances that influence the adoption and execution of AI-based digital marketing strategies by fashion MSME entrepreneurs in Indonesia.

This study provides a unique contribution to digital marketing by examining AI implementation in the often-overlooked context of fashion MSMEs. The study offers a thorough analysis by integrating strategic and technological perspectives, distinguishing it from prior research. This research is practically relevant due to its empirical insights into the actual conditions, challenges, and strategies employed by MSME stakeholders in incorporating AI into their marketing systems. The results are anticipated to enhance academic literature and provide a basis for evidence-based policymaking and capacity-building initiatives designed for the digital transformation requirements of MSMEs.

2. RESEARCH METHOD

The population in this study consisted of fashion MSME owners and managers who utilize digital marketing in their business operations. A total of 132 respondents were selected using a purposive sampling technique, with the following inclusion criteria: (1) business operation in the fashion sector for at least one year, (2) active use of digital marketing platforms (such as Instagram, Tokopedia, or Shopee), and (3) familiarity with or experience in using AI tools (e.g.,

A panel of academic experts in marketing, AI applications, and MSME studies was consulted to ensure the content validity of the items. Feedback from the panel was used to revise and improve the clarity, relevance, and alignment of each item with the research objectives. Before the main data collection, a pilot test was conducted on a sample of 30 respondents who met the same inclusion criteria as the main study. This pilot testing aimed to assess the clarity, consistency, and reliability of the instrument. Reliability of the instrument was measured using Cronbach's Alpha. A reliability coefficient (α) of 0.70 or higher was considered acceptable for internal consistency.

Table 1. Operationalization of variables

Variable	Indicator(s)
AI Adoption	Use of AI tools in marketing (chatbots, ads, analytics)
Perceived Usefulness	Efficiency, performance, accuracy
Perceived Ease of Use	Simplicity, user-friendliness, integration with platforms
Organizational Readiness	Skills, infrastructure, management support
Perceived Barriers	Cost, knowledge, technical limitations
Marketing Performance	Reach, engagement, conversion rates

Source: data processing results, 2025

The collected data were analyzed using descriptive statistical techniques, including frequency distribution, percentage, mean, and standard deviation. This analysis was conducted to describe the general trends, patterns, and perceptions among respondents regarding the adoption of AI-based digital marketing strategies. The results were presented in the form of tables and graphs to provide a clear overview of the findings.

3. RESULTS AND DISCUSSIONS

Respondents

To provide a contextual understanding of the data analysis, it is essential to first present the demographic and business-related characteristics of the respondents involved in this study. These characteristics offer valuable insights into the profile of MSME actors in the fashion sector who are currently engaged in digital marketing practices and have varying degrees of exposure to AI-based technologies. The descriptive data include gender, age, length of business operation, and the types of digital platforms used, all of which help to frame the patterns of AI adoption and utilization within this specific entrepreneurial context.

Table 2: Respondent characteristics

Respondent Characteristics	Category	Frequency	Percentage (%)
Gender	Male	42	31.8
	Female	90	68.2
Age	< 25 years	35	26.5
	25–35 years	59	44.7
	> 35 years	38	28.8
Length of Business Operation	< 1 year	20	15.2
	1–3 years	55	41.7
	> 3 years	57	43.1
Digital Platforms Used	Instagram	102	77.3
	Shopee/Tokopedia	76	57.6
	WhatsApp Business	88	66.7

Source: data processing results, 2025

From table 2 states 132 respondents who were owners or managers of fashion-based micro, small, and medium enterprises (MSMEs) that utilize digital marketing platforms. Based on gender distribution, the majority of respondents were female, accounting for 68.2% (n = 90), while male respondents comprised 31.8% (n = 42). This reflects the growing participation of women in digital-based fashion entrepreneurship. In terms of age, most respondents were within the productive age group of 25–35 years (44.7%), followed by those above 35 years (28.8%), and respondents under the age of 25 years (26.5%). These figures suggest that digital marketing strategies especially those based on AI are primarily adopted by relatively young entrepreneurs.

Regarding the duration of business operations, a considerable portion of respondents had been running their business for more than 3 years (43.1%), while 41.7% had 1–3 years of experience, and only 15.2% had been operating for less than a year. This indicates that the respondents possess relatively adequate experience in managing digital platforms for business purposes. With respect to digital platform usage, Instagram emerged as the most frequently used platform (77.3%), followed by WhatsApp Business (66.7%) and Shopee/Tokopedia (57.6%). These results highlight the central role of social media and e-commerce platforms in supporting digital marketing efforts among MSME actors in the fashion industry.

AI-Driven Digital Marketing Strategies

This section presents the integrated results of the study, focusing on five key dimensions related to the implementation of Artificial Intelligence (AI) among Micro, Small, and Medium Enterprises (MSMEs) in the fashion sector. The analysis includes the level of AI technology adoption, perceived benefits and ease of use, organizational readiness, barriers to strategy implementation, and the impact of AI on marketing performance. Each dimension is assessed based on respondents' perceptions using Likert-scale-based indicators, with results presented in terms of average scores and percentage distributions across high, medium, and low categories. The findings aim to provide a comprehensive overview of the current state of AI adoption and its implications for marketing effectiveness, operational efficiency, and strategic preparedness among fashion MSMEs.

Table 3: AI-driven digital marketing strategies

Indicators	Subindicators	Avarage score	Percentage
Level of AI Technology Adoption	Using chatbots to serve customers	3.78	High
	Using AI-based automated advertising	3.4	Medium

Indicators	Subindicators	Avarage score	Percentage
	Using automated data analytics from digital platforms	3.66	Medium
	Never used AI technology	2.05	Low
	Improves marketing efficiency	4.1	High
Perceived Benefits and Ease of Use of AI	Simplifies business operations	4	High
	Increases sales	3.85	High
	Easy to learn and use	3.55	High
	Low cost of implementation	2.8	Medium
	Human resources are competent in using AI	3.35	Medium
Organizational Readiness	Digital infrastructure is available	3.88	High
	Leadership supports technological innovation	4.05	High
	Lack of technical knowledge	4.15	Very High
Barriers in AI Strategy Implementation	High cost of technology implementation	3.9	High
	Lack of training or technical assistance	4.05	High
	Difficulty integrating with legacy systems	3.45	High
	Increases customer reach	4	High
	Enhances customer engagement	3.9	High
Impact of AI on Marketing Performance	Improves conversion rates	3.7	High
	Strengthens customer loyalty/retention	3.55	High

Source: data processing results, 2025

The findings reveal a varied yet generally positive landscape of AI strategy implementation among MSMEs in the fashion sector. In terms of AI technology adoption, a significant proportion of businesses have begun to integrate digital tools such as chatbots (mean score: 3.78), automated advertising (3.4), and data analytics (3.66), with adoption levels ranging from medium to high. However, the relatively low average score for those who have never used AI (2.05) highlights that while the digital shift is underway, there remains a portion of businesses yet to engage with AI technologies. In line with this, perceptions of AI's benefits and usability are overwhelmingly positive. High mean scores for improved marketing efficiency (4.1), operational simplicity (4.0), increased sales (3.85), and ease of use (3.55) indicate strong belief in AI's practical value. Nonetheless, the medium rating for implementation cost (2.8) suggests financial limitations are still a perceived barrier.

The analysis of organizational readiness shows high support from leadership (4.05) and the availability of digital infrastructure (3.88), although human resource competency is rated moderately (3.35), indicating a need for upskilling. The barriers to AI implementation reinforce this view, with technical knowledge gaps (4.15), lack of training (4.05), and high implementation costs (3.9) serving as major constraints. Integration challenges with legacy systems (3.45) also remain significant. Despite these challenges, the perceived impact of AI on marketing performance is notably strong. Businesses report high improvements in customer reach (4.0), engagement (3.9), conversion rates (3.7), and loyalty (3.55), underscoring the transformative potential of AI when properly integrated. These findings emphasize the importance of not only adopting AI tools but also investing in organizational capacity and training to ensure long-term success.

a. Level of AI Technology Adoption

This section presents the findings of the study regarding the adoption and utilization of AI-based digital marketing strategies among MSMEs in the fashion sector. The analysis focuses on the extent to which business actors implement various AI technologies, such as chatbots, automated advertising, and data analytics, as well as their general familiarity with AI tools. The data were collected through questionnaires and analyzed using descriptive statistics to determine patterns of high, medium, and low usage. The following tables and interpretations illustrate the distribution of adoption levels and offer insights into how these technologies are perceived and integrated by MSME actors.

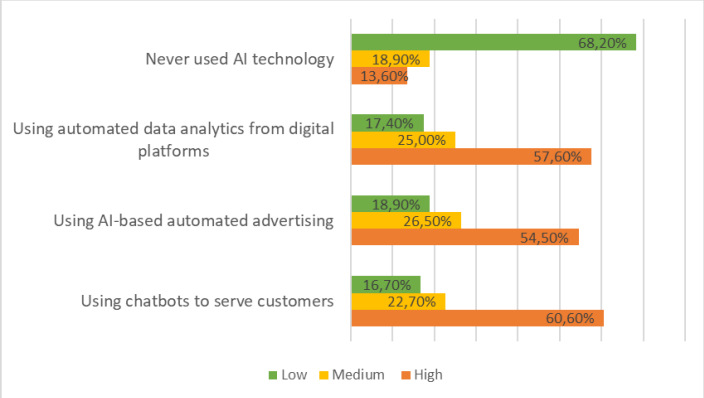

Figure1. Level of ai technology adoption

The findings suggest that fashion-sector MSMEs have a relatively high level of adoption of specific AI technologies. The adoption rate of chatbots to serve consumers was the highest, with 60.60% of respondents reporting high usage, 22.70% medium, and 16.70% low. This implies an increasing dependence on AI-powered customer service solutions to improve user experience and responsiveness. In the same vein, AI-based automated advertising was also extensively adopted, with 54.50% indicating high usage, 26.50% medium, and 18.90% low. In the interim, automated data analytics from digital platforms were employed at a high level by 57.60% of businesses, indicating that data-driven marketing strategies are becoming more prevalent among MSMEs. However, 25.00% of businesses maintained a medium usage level, and 17.40% maintained a low usage level.

Nevertheless, a substantial number of respondents (68.20%) reported that they had never used AI technology, which is classified as minimal usage, despite this positive trend. In this general context, only 13.60% reported high utilization, while 18.90% reported medium usage. This suggests that although specific AI tools have acquired popularity, a significant number of micro, small, and medium-sized enterprises (MSMEs) are either unfamiliar with or lack the resources to fully integrate AI. These results indicate that the MSME sector is experiencing a persistent digital divide and underscore the necessity of supportive measures, including targeted training, financial incentives, and policy support, to enable the more widespread and equitable integration of AI in small-scale fashion enterprises.

b. Perceived Benefits and Ease of Use of AI

Understanding how business actors perceive the benefits and usability of AI technologies is crucial in evaluating the potential for widespread adoption among MSMEs in the fashion industry. This section explores the perceptions of MSME owners regarding the effectiveness of AI in enhancing marketing efficiency, simplifying operations, boosting sales, and the ease with which such technologies can be implemented. By analyzing their responses, we gain insight into not only the attractiveness of AI tools but also the perceived challenges such as cost that may influence their willingness to adopt these innovations.

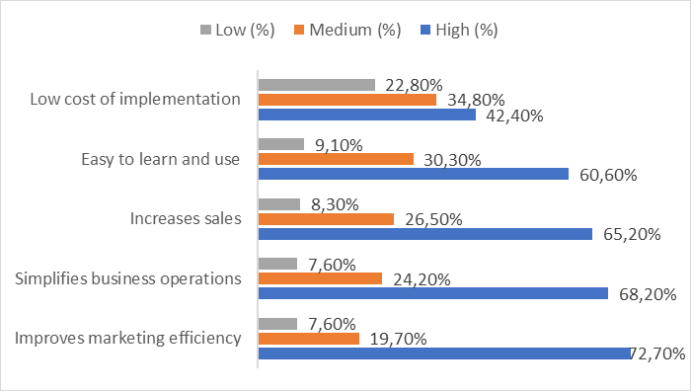

Figure 2. Perceived benefits and ease of use of ai

The data reveal that MSME actors in the fashion sector generally perceive AI as beneficial and The data reveal that MSME actors in the fashion sector generally perceive AI as beneficial and relatively easy to use. The highest level of agreement was observed in the statement that AI improves marketing efficiency, with 72.70% of respondents rating it high, while only 7.60% rated it low. Similarly, 68.20% agreed that AI simplifies business operations, reinforcing the notion that automation and intelligent systems contribute to operational streamlining. The indicator regarding the potential of AI to increase sales also received a strong positive response, with 65.20% selecting high, indicating that business owners associate AI usage with enhanced revenue outcomes.

In terms of usability, 60.60% of respondents considered AI technologies easy to learn and use, though 30.30% remained in the medium category, suggesting that while the tools are accessible, some users still face minor learning curves. Notably, the perception that AI is low in implementation cost garnered more mixed responses: only 42.40% rated it high, while 34.80% responded medium and 22.80% low. This suggests that although AI is viewed as functionally advantageous, cost remains a potential barrier for some MSMEs. These findings highlight the need for targeted support mechanisms, such as affordable technology solutions and practical training, to maximize adoption and impact.

c. Organizational Readiness

Assessing organizational readiness is essential to understand the internal capacity of MSMEs to adopt and implement AI-based digital marketing strategies effectively. This includes evaluating the availability of competent human resources, the presence of supporting digital infrastructure, and the level of leadership support for innovation. These factors play a pivotal role in determining whether a business can successfully integrate AI technologies into its marketing operations. The following section presents and discusses the extent to which MSMEs in the fashion sector demonstrate readiness across these key organizational dimensions.

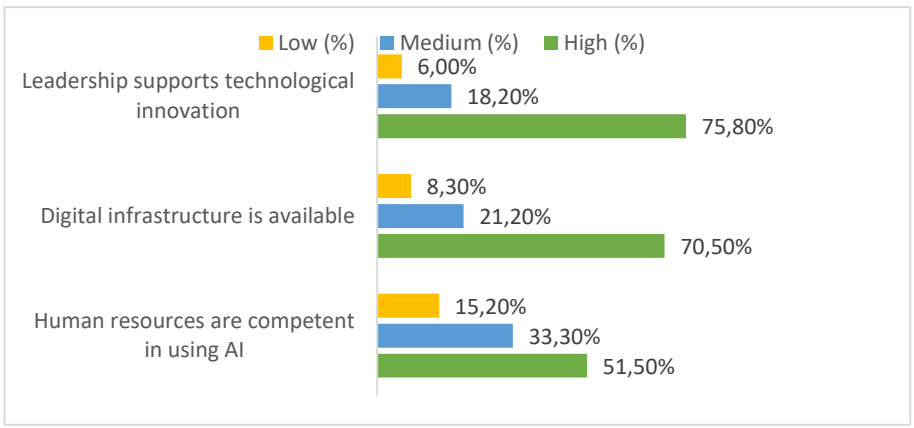

Figure 3. Organizational readiness

The findings related to organizational readiness indicate that most MSMEs in the fashion sector are relatively well-positioned to adopt AI-based digital marketing strategies, particularly in terms of infrastructure and leadership support. A significant 75.80% of respondents reported high levels of support from leadership for technological innovation, highlighting a conducive environment for the implementation of new technologies. Similarly, 70.50% agreed that digital infrastructure is readily available, suggesting that many businesses already possess the foundational tools necessary for AI integration.

However, perceptions regarding the competency of human resources in utilizing AI were more varied. Only 51.50% of respondents rated their human resource capability as high, while 33.30% rated it medium and 15.20% low. This points to a moderate readiness level in terms of skills and technical expertise, which may hinder optimal utilization of AI tools. These results suggest that while the organizational environment is largely supportive of AI adoption, investments in capacity building and staff training remain essential to ensure that AI strategies can be effectively

d. Implemented and sustained.

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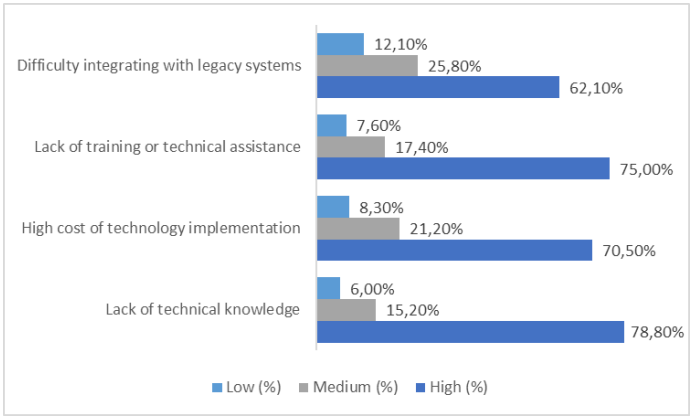

Figure 4. Barriers in ai strategy implementation

The results indicate that MSMEs in the fashion sector face several significant barriers in implementing AI-based digital marketing strategies. The most prominent obstacle is the lack of technical knowledge, with 78.80% of respondents identifying it as a high-level barrier. This finding suggests a widespread deficiency in AI-related skills and understanding among business owners and employees, which could impede effective technology adoption. Similarly, 75.00% of respondents perceive the lack of training or technical assistance as a major challenge, reinforcing the need for structured capacity-building programs and external support mechanisms.

In addition, 70.50% of respondents reported that the high cost of implementing AI technologies poses a substantial barrier, reflecting concerns about the financial feasibility of

transitioning to AI-driven systems, especially for small enterprises with limited budgets. The issue of integration with legacy systems is also notable, with 62.10% indicating this as a high barrier. This reflects the technical complexity involved in aligning new AI tools with existing business infrastructures. Collectively, these findings highlight the critical need for targeted interventions—such as affordable training, financial incentives, and technical support—to reduce these barriers and enable more widespread and effective adoption of AI in MSMEs.

e. Impact of AI on Marketing Performance

Evaluating the impact of AI on marketing performance is essential to understanding the tangible benefits AI adoption can bring to MSMEs in the fashion sector. By measuring outcomes such as customer reach, engagement, conversion rates, and customer retention, this section aims to provide insight into how AI-driven marketing tools contribute to business growth. The data collected reveal how MSME actors perceive the effectiveness of AI implementation in improving key marketing metrics.

The results demonstrate that AI implementation has had a notably positive impact on various aspects of marketing performance among MSMEs. A majority of respondents (69.70%) agreed that AI significantly increases customer reach, making it easier for businesses to connect with broader and more targeted audiences. Similarly, 66.70% of respondents indicated that AI enhances customer engagement, likely due to personalized content and real-time interaction enabled by intelligent systems.

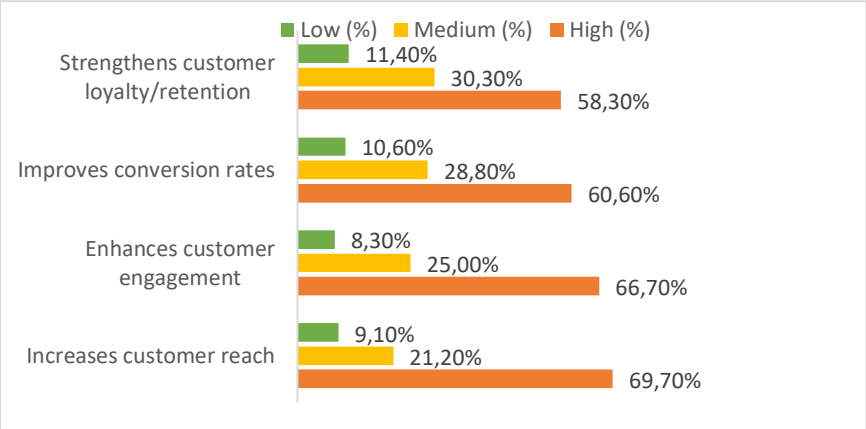

Figure 4. Impact of ai on marketing performance

Moreover, 60.60% of participants reported that AI tools improve conversion rates, suggesting that AI helps optimize marketing funnels and leads to better customer acquisition outcomes. Finally, 58.30% acknowledged that AI contributes to strengthening customer loyalty and retention, likely through improved customer experiences and ongoing engagement strategies. These findings underscore AI's strategic role in driving marketing effectiveness and strengthening competitiveness for MSMEs in the digital marketplace.

4. CONCLUSION

This study highlights the growing relevance and potential of AI-driven digital marketing strategies among fashion MSMEs. The findings indicate a generally high level of adoption of AI tools such as chatbots, automated advertising, and digital analytics, which have contributed positively to marketing efficiency, customer targeting, and business performance. However, the research also reveals notable challenges, including limited technical knowledge, high implementation costs, and insufficient training, which hinder broader and more effective AI adoption. To maximize the benefits of AI integration, there is a critical need for increased capacity building, supportive digital infrastructure, and policy interventions tailored to MSMEs' specific contexts. By addressing these barriers, fashion MSMEs can more fully harness the power of AI to innovate, compete, and grow

sustainably in an increasingly digital marketplace. Future research may explore longitudinal impacts and sectoral comparisons to provide a more comprehensive understanding of AI's role in small business development.

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