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Artificial Intelligence and Digital Literacy for Competitiveness and Sustainability of Bandung MSMEs

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ABSTRACT

This research aims to analyze the role of artificial intelligence (AI) in digital marketing and digital literacy on the competitiveness and sustainability of micro, small, and medium enterprises (MSMEs) in Bandung City during the platform economy era. The development of digital technology opens up great opportunities for MSMEs, but low digital literacy and limited utilization of AI still pose obstacles to increasing competitiveness. The research method uses a mixed methods approach with a survey of 150 MSME owners and in-depth interviews with some respondents. The sample selection was done purposively, while the quantitative data was analyzed using Structural Equation Modeling (SmartPLS 4) and the qualitative data was used for triangulation.

The research results indicate that the adoption of AI in digital marketing and digital literacy has a significant positive impact on the competitiveness of MSMEs. Stronger competitiveness is proven to support business sustainability. Additionally, digital literacy serves as a mediator that strengthens the effectiveness of AI-based marketing strategies. This research confirms that improving digital literacy and utilizing AI are crucial strategies for SMEs in facing the challenges of the platform economy. The research results are expected to contribute to the development of policies, business strategies, and academic literature related to the digital transformation of MSMEs in Indonesia.

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) are the backbone of the Indonesian economy, playing a very significant role in national growth. According to data from the Ministry of Cooperatives and Small and Medium Enterprises, the number of MSMEs in Indonesia exceeds 65.5 million business units, employing approximately 119 million workers, and contributing 61.9% to the national Gross Domestic Product (GDP) (ANTARA News, 2025). At the local level, Bandung City is known as a national creative economy center with over 460,000 MSMEs, covering sectors from culinary and fashion to digital creative industries (Open Data Jabar, 2021). With such a large economic base, the (Lukaszewski et al., 2024) digital transformation of SMEs in Bandung has significant implications for increasing regional competitiveness while also supporting national economic resilience.

Despite the wide-open opportunities for digitalization, many MSMEs still face serious obstacles in adapting to technology. The main obstacles frequently encountered include limitations in human resources, low digital literacy, and minimal utilization of advanced technologies such as Artificial Intelligence (AI) (Hidayat et al., 2025)(Kahveci, 2025). In fact, AI has the potential to support digital marketing strategies thru automation, big data analysis, and personalization of consumer recommendations, which have been proven to increase campaign effectiveness (Acatrinei et al., 2025). Previous research has shown that AI plays a crucial role in strengthening business performance, innovation, and organizational competitiveness(Dinh et al., 2025). However, most of these studies focus on large companies or developed country contexts. Studies on the application of AI in SMEs in developing countries, particularly Indonesia, are still relatively limited. This creates a gap in understanding regarding how small and medium-sized enterprises (SMEs) in creative cities like Bandung can adopt this technology into their digital marketing strategies.

Beside technology, digital literacy is a key determinant of the success of MSME transformation. Digital literacy not only encompasses technical skills in using applications but also managerial and strategic understanding related to integrating technology into business models (Daud Isaac Makhmut et al., 2023). Previous research confirms that low digital literacy is a barrier to the adoption of new technologies (Fitri et al., 2025)(Lisa et al., 2025)(Hamidah, 2024). Conversely, MSMEs with high digital literacy are able to utilize digital platforms to expand their markets, increase efficiency, and strengthen their competitiveness and business resilience (Munandar et al., 2025). In fact, digital literacy can serve as a mediator that strengthens the relationship between AI utilization and improved business performance.

On the other hand, the competitiveness and sustainability of MSMEs are becoming increasingly important issues in the digital age. Technology-based transformation has been proven to drive increased competitiveness thru product

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innovation, supply chain efficiency, and expanded access to global markets(da Silva et al., 2025). Stronger competitiveness is the main foundation for long-term business sustainability, encompassing economic, social, and environmental aspects (Munandar et al., 2025). Thus, the combination of AI utilization and digital literacy is believed to be able to strengthen competitiveness, ultimately supporting the sustainability of MSMEs.

Based on the description, there are several research gaps that need to be addressed. First, most studies highlight AI or digital literacy separately, so there hasn't been much research on integrating both within a single research framework. Second, the majority of previous studies were conducted on large companies in developed countries, while local research related to MSMEs in Indonesia is still very limited. Third, the simultaneous relationship between AI, digital literacy, competitiveness, and the sustainability of MSMEs has not been extensively tested empirically. Therefore, this research develops an integrative model to analyze the influence of AI utilization and digital literacy on competitiveness, as well as their impact on the sustainability of MSMEs in Bandung City. This research is expected to provide a theoretical contribution by enriching the literature on MSME digital transformation, as well as a practical contribution in the form of recommendations for business owners, local governments, and policymakers in strengthening the competitiveness and sustainability of MSMEs in Indonesia.

Formulation of the problem

Based on the background, literature review, and framework that have been compiled, the research problem can be formulated into several research questions as follows:

1. How does the use of Artificial Intelligence (AI) in digital marketing affect the competitiveness of MSMEs in Bandung City during the platform economy era?
2. How does digital literacy affect the competitiveness of MSMEs in Bandung City during the platform economy era?
3. How does competitiveness affect the sustainability of MSMEs in Bandung City?
4. Does digital literacy act as a mediator in the relationship between AI utilization and the competitiveness of MSMEs?
5. Does digital literacy act as a mediator in the relationship between AI utilization and the sustainability of MSMEs?

LITERATURE REVIEW

Artificial Intelligence (AI) in MSME Digital Marketing

Artificial Intelligence (AI) is a technology that mimics human intelligence through algorithms to analyze data, predict consumer behavior, and support decision-making (Madanchian, 2024)(Sowmya R, 2025). In the context of MSMEs, AI plays a role in improving personalization, marketing automation, and promotional efficiency (Acatrinei et al., 2025). The main dimensions of AI include automation, personalization, big data analytics, and business model innovation (Oktavianti & Ortiz, 2025). Indicators that can be used include the use of AI tools, product recommendations, digital campaign effectiveness, customer data analysis, and contributions to business innovation (Rampaul, 2025).

Digital Literacy as a Determining Factor for MSME Transformation

Digital literacy is the ability to access, understand, evaluate, and utilize digital technology effectively in the context of business management (Tinmaz et al., 2022). In the micro, small, and medium enterprise environment, digital literacy extends beyond technical mastery of devices or applications, but also encompasses cognitive and strategic abilities to utilize data as a basis for more informed decision-making (Kabakus et al., 2023). MSMEs with high levels of digital literacy are able to integrate technology into business strategies, communicate effectively through digital platforms, and adapt quickly to technological changes. Digital literacy also strengthens entrepreneurial resilience by helping entrepreneurs remain resilient in the face of market dynamics and digital disruption (Shatila et al., 2025). Thus, the dimensions of digital literacy encompass technical skills, strategic capabilities, digital communication, and adaptive resilience, which collectively form the primary foundation for accelerating digital transformation, increasing competitiveness, and maintaining the sustainability of MSMEs in the platform-based economy.

MSME Competitiveness in the Platform Economy Era

MSME competitiveness reflects the ability of business actors to create competitive advantages through innovation, operational efficiency, and the strategic use of digital technology. In the context of a platform-based economy, digitalization has opened up opportunities for MSMEs to expand market reach, increase productivity, and accelerate product and service innovation (Rampaul, 2025). Digital platforms also encourage broader business collaboration, enabling MSMEs to penetrate national and global markets through the integration of online ecosystems (Lesmana, 2025).

Research shows that digitalization and training-based empowerment are crucial factors in increasing the competitiveness of MSMEs in Indonesia (Sudirman et al., 2025). Strong competitiveness is reflected in the ability of business actors to optimize operational efficiency, develop sustainable innovation, and adapt to technological changes

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and market trends. Therefore, the dimensions of MSME competitiveness include efficiency, innovation, digital market access, and technological mastery. These four dimensions are essential foundations for building sustainable competitiveness and supporting the digital transformation of MSMEs in the platform economy era.

MSME Sustainability and the Role of Digital Technology

MSME sustainability reflects the ability of businesses to maintain long-term existence by balancing economic and social goals, and adapting to technological developments(Munandar et al., 2025). In the context of digital transformation, sustainability is not only related to profitability, but also the ability of MSMEs to innovate and utilize technology sustainably. The integration of artificial intelligence (AI) and digitalization has been shown to strengthen business sustainability through increased supply chain efficiency, resource savings, and market-responsive product and service innovation (Badghish & Soomro, 2024).

Other research confirms that the adoption of digital technology supports a balance between economic performance and social responsibility, as well as increasing business resilience amidst a changing business environment (Sudirman et al., 2025). Thus, the dimensions of MSME sustainability encompass economic, social, technological, and sustainable innovation aspects, reflected in indicators of business growth, operational efficiency, digital technology adoption, supply chain continuity, and commitment to long-term innovation. Building on these prior studies, this state of the art table 1. demonstrates that the adoption of digital technologies particularly AI, digital literacy, and digital platforms plays a strategic role in enhancing consumer engagement, business resilience, and MSME sustainability, thereby strengthening the conceptual framework of this study in explaining the relationships between independent, mediating, and dependent variables within the digital economy context.

Table 1. State Of The Art

No	Authors & Year	Research Focus	Main Findings	Relevance to Your Study
1	(Acatrinei et al., 2025)	AI in digital marketing	Artificial intelligence enhances consumer engagement and supports sustainable consumer behavior	Strengthens the role of AI in digital marketing
2	(Dinh et al., 2025)	Digital literacy of MSMEs	Low digital literacy is a major barrier to the effective use of digital technologies	Provides a foundation for digital literacy as an independent variable (X2)
3	(Shatila et al., 2025)	Digital literacy and business resilience	Digital literacy enhances adaptability and resilience of MSMEs	Supports digital literacy as a mediating variable
4	(Munandar et al., 2025))	MSME sustainability in Indonesia	Sustainability is influenced by efficiency and the adoption of digital technologies	Supports sustainability as the dependent variable (Y2)
5	(Troise et al., 2022)	Digital platforms and internationalization	Digital platforms expand market reach and facilitate MSME internationalization	Relevant to the platform economy era

This research is novel because it integrates four main variables the use of Artificial Intelligence (AI), digital literacy, competitiveness, and sustainability of MSMEs in a comprehensive research framework. Previous studies generally examined these variables separately, for example, the role of AI in digital marketing (Acatrinei et al., 2025), digital literacy as a driver of technology adoption, or MSME sustainability through efficiency and digitalization (Munandar et al., 2025). This research positions digital literacy not only as an independent variable but also as a mediator that strengthens the relationship between AI and MSME competitiveness and sustainability, a perspective that has not been widely explored in previous studies. Furthermore, the research's focus on MSMEs in Bandung City, as the center of Indonesia's creative economy, and the platform economy context provides a contextual contribution that differs from previous research, which has been predominantly conducted in developed countries. Thus, this research not only enriches the academic literature on MSME digital transformation but also offers practical implications for MSME policies and adaptive strategies in the platform-based economy era.

Framework

The platform economy era demands that MSMEs adapt to digital technology to remain competitive. One important innovation is the use of Artificial Intelligence (AI), which can enhance marketing personalization, process automation, and consumer data analysis to drive efficiency and innovation (Kedi et al., 2024). However, the use of AI in MSMEs remains relatively limited due to resource constraints, costs, and limited technological competency.

The effectiveness of AI adoption is significantly influenced by digital literacy. Digital literacy relates not only to technical skills but also encompasses managerial and strategic understanding in utilizing technology for business (Shatila et al., 2025). MSMEs with high levels of digital literacy are better able to optimize AI, integrate technology into business strategies, and adapt to changes in the business environment. Thus, digital literacy can act as both an independent variable and a mediator, strengthening the influence of AI on MSME business performance.

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The integration of AI and digital literacy, in turn, has implications for increasing MSME competitiveness. Competitiveness reflects the ability to create competitive advantage through operational efficiency, product innovation, and the strategic use of digital technology. Digitalization also opens up broader market opportunities, enabling digitally literate MSMEs that utilize AI to increase productivity and compete, both nationally and globally (Lesmana, 2025) (da Silva et al., 2025).

Furthermore, the sustainability of MSMEs is determined not only by economic factors, but also by their capacity for technological adaptation and sustainable innovation. Research shows that efficiency, resilience, and adoption of digital technology play a crucial role in maintaining the sustainability of MSMEs (Martínez-Peláez et al., 2023). Therefore, competitiveness serves as a bridge connecting the use of AI and digital literacy with business sustainability.

Based on this description, this research model links AI (X1) and digital literacy (X2) to competitiveness (Y1) and sustainability (Y2), with digital literacy and competitiveness serving as mediating variables. This framework is expected to provide theoretical contributions to the literature on MSME digital transformation and practical contributions to MSME adaptive strategies, particularly in Bandung City, the center of Indonesia's creative economy. Figure 1 illustrates the proposed conceptual framework showing the hypothesized relationships between artificial intelligence (X1) and digital literacy (X2) on MSME competitiveness (Y1) and MSME sustainability (Y2), including the direct and mediated effects represented by hypotheses H1–H6.

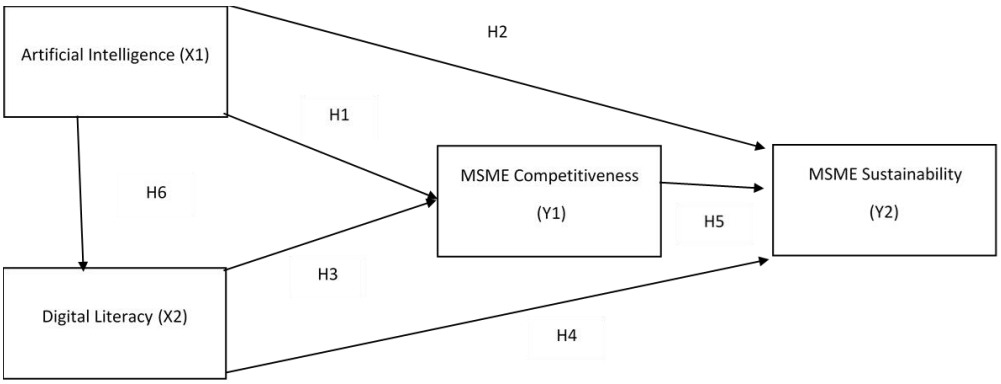


Figure 1. Research Framework

Research Hypotheses

H1: Artificial Intelligence (AI) has a positive effect on the competitiveness of MSMEs.
H2: Artificial Intelligence (AI) has a positive effect on the sustainability of MSMEs.
H3: Digital literacy has a positive effect on the competitiveness of MSMEs.
H4: Digital literacy has a positive effect on the sustainability of MSMEs.
H5: Competitiveness has a positive effect on the sustainability of MSMEs.
H6: Digital literacy mediates the effect of Artificial Intelligence (AI) on the competitiveness and sustainability of MSMEs.

METHOD

Research Methods

Research Design

This research uses a mixed methods approach with an explanatory sequential design. This approach allows for the systematic integration of quantitative and qualitative results. Quantitative analysis is conducted first to test the relationships between variables, followed by qualitative interviews to deepen the interpretation of the results (Creswell & Creswell, 2022). The focus of this research is to analyze the influence of Artificial Intelligence (AI) and digital literacy on the competitiveness and sustainability of MSMEs in Bandung City in the platform economy era.

Population and Sample

The research population includes all MSMEs in Bandung City that actively use digital platforms for marketing activities. The sampling technique used purposive sampling with the following criteria:

1. MSMEs that use digital media (social media, marketplaces, websites),
2. have been operating for at least one year, and
3. reside in the administrative area of Bandung City.

The sample size was determined based on the recommendations of Hair (Hair & Sarstedt, 2021), which is a minimum of ten times the number of the largest indicators in the research model. With a total of 15 indicators, the minimum sample size is 150 respondents (Hair, Hult, Ringle, & Sarstedt, 2021).

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Data Types and Sources

This study uses two types of data:

1. Primary data, obtained through questionnaires and in-depth interviews with MSMEs.
2. Secondary data, obtained from academic publications, government reports, and MSME statistics in Bandung City.
3. The questionnaire used a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), while interviews were conducted with 10 MSMEs selected to strengthen the quantitative results through empirical context.
4. Operasionalisasi Variabel. Table 2 presents the operational definitions of the research variables, outlining their dimensions and measurement indicators used to empirically test the proposed hypotheses in this study

Tabel 2. Operational Definition of Variables

Variable	Operational Definition	Dimensions	Indicators
Artificial Intelligence (X1)	The utilization of artificial intelligence–based algorithms and systems to support MSME digital marketing activities (Acatrinei et al., 2025); (Dinh et al., 2025)	1.Marketing automation 2.Personalization 3.Customer data analytics 4.Campaign efficiency 5.AI-driven innovation	- Use of chatbots/auto-reply systems- AI-based product recommendations- Utilization of consumer data analytics- Effectiveness of automated digital advertising- Adoption of AI for business innovation
Digital Literacy (X2)	The ability of MSME owners to understand, access, and utilize digital technologies in business operations (Shatila et al., 2025)(Tinmaz et al., 2022).	1.Technical skills 2. Strategic capability 3. Digital communication 4. Adaptive resilience	- Proficiency in digital business applications- Integration of technology into business processes- Use of data analysis for business decision-making- Communication through digital platforms- Adaptation to technological changes
Competitiveness (Y1)	The capacity of MSMEs to create competitive advantage through efficiency, innovation, and the utilization of digital technologies (da Silva et al., 2025)(Lesmana, 2025).	1.Efficiency 2. Innovation 3. Digital market access 4.Technological capability 5.Competitive performance	- Operational efficiency- Product/service innovation- Utilization of digital platforms and e-commerce- Mastery of digital technologies- Increased sales and market reach
Sustainability (Y2)	The ability of MSMEs to achieve long-term survival through efficiency, innovation, and digitalization (Munandar et al., 2025)(Badghish & Soomro, 2024).	1.Business growth 2.Operational efficiency 3.Continuous innovation 4.Digital adaptation 5.Business resilience	- Growth in revenue and customer base- Efficient use of resources- Commitment to continuous innovation- Long-term adoption of digital technologies- Resilience in facing crises and disruptions

Data Collection Techniques

Data collection techniques included:

1. A questionnaire survey, distributed online and directly to MSMEs in Bandung City.
2. In-depth interviews to gain contextual insights into the application of AI and digital literacy.
3. A literature review to strengthen the theoretical basis and framework of the research model.

The procedures were carried out in accordance with the standards of validity, reliability, and ethics of social research (Creswell & Creswell, 2022).

Data Analysis Techniques

Quantitative Analysis

Quantitative data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with the help of SmartPLS 4. The analysis included:

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1. Outer Model Evaluation: convergent validity (factor loading ≥ 0.70, AVE ≥ 0.50) and reliability (Composite Reliability ≥ 0.70).
2. Inner Model Evaluation: testing the relationships between latent variables based on R^2, Q^2, and path coefficients. Significance was tested through bootstrapping (5,000 subsamples, $p < 0.05$) (Hair & Sarstedt, 2021).

Qualitative Analysis

Interview data were analyzed using thematic analysis, including transcription, coding, categorization, and interpretation (Braun & Clarke, 2006; Qualitative Research in Psychology). Qualitative results were used to support and explain quantitative findings (data triangulation).

Instrument Validity and Reliability

Content validity was confirmed through expert judgment from academics and digital MSME practitioners. Convergent and discriminant validity tests followed the criteria of Fornell and Larcker (Mai et al., 2021). Internal reliability was tested using Cronbach's Alpha and Composite Reliability, with a value of ≥ 0.70 as the minimum threshold (Hair & Sarstedt, 2021).

Research Location, Timeline, and Ethics

The research was conducted in Bandung City, one of the national creative economy centers with a rapidly growing digital MSME ecosystem. Data collection took place in March–April 2025, followed by analysis and writing up of the results in May–June 2025. The entire process adhered to ethical principles of social research, including informed consent, confidentiality of respondent data, and the use of research results solely for academic purposes.

Research Model

The empirical model describes the relationship between variables as follows:
AI (X1) → Digital Literacy (X2) → Competitiveness (Y1) → Sustainability (Y2) with digital literacy and competitiveness as mediating variables that strengthen the indirect influence of AI on MSME sustainability.

RESULT

Respondent Characteristics

A total of 150 MSMEs in Bandung City participated in this study. The dominant business sectors were culinary (42%), fashion (33%), and crafts and creative industries (25%). The majority of respondents were aged 26–40 (58%), with at least a high school education (64%) and more than three years of business experience (55%).

In the context of digitalization, 78% of MSMEs have used social media such as Instagram, TikTok, and Facebook as their primary marketing channels, while 36% have integrated marketplaces like Tokopedia and Shopee. However, only 27% have actively utilized Artificial Intelligence (AI) features (e.g., chatbots, predictive analytics, and auto-ad targeting).

These findings indicate that AI adoption is still in its early stages, in line with literature confirming that MSMEs in developing countries are still in the exploratory phase of digitalization (Hidayat et al., 2025)(Kahveci, 2025). This indicates the need to improve digital literacy so that MSMEs are better prepared to utilize the potential of AI to enhance their competitiveness and business sustainability.

Measurement Model Evaluation (Outer Model)

Construct validity and reliability testing was conducted on four latent variables: Artificial Intelligence (AI), Digital Literacy, Competitiveness, and Sustainability.

The results showed that all indicator items had loading factor values ≥ 0.70, Average Variance Extracted (AVE) ≥ 0.50, and Composite Reliability (CR) ≥ 0.70 (Hair et al., 2021), thus all constructs were declared valid and reliable.

Table 3. Results of the Validity and Reliability Test of the Constructs

Variable	Number of Indicators	Loading Range	AVE	CR	Cronbach's α
Artificial Intelligence (X1)	5	0.74–0.88	0.64	0.89	0.84
Digital Literacy (X2)	5	0.72–0.90	0.66	0.91	0.86
Competitiveness (Y1)	5	0.75–0.89	0.68	0.92	0.87
Sustainability (Y2)	5	0.73–0.88	0.65	0.90	0.85

These values indicate that the indicators for each variable have good internal consistency and are able to represent the theoretical dimensions as explained in Chapter 3. For example, the AI indicator reflects the dimensions of automation, personalization, and AI-based innovation, while the digital literacy indicator strengthens the dimensions of technical skills, strategic capabilities, and digital communication.

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Structural Model Evaluation (Inner Model)

Table 4. The Goodness of Fit test shows that the research model has a good level of suitability.

Criteria	Value	Interpretation
R^2 (Competitiveness)	0.58	Strong model – artificial intelligence and digital literacy explain 58% of the variance in competitiveness
R^2 (Sustainability)	0.64	Strong model – competitiveness and digital literacy explain 64% of the variance in sustainability
Q^2 Predictive Relevance	0.42	The model demonstrates high predictive relevance
SRMR	0.061	The model shows a good fit (SRMR < 0.08)

This means that the developed conceptual model (AI → Digital Literacy → Competitiveness → Sustainability) has high predictive power and statistical fit.

Inter-Variable Relationship Test (Path Coefficient)

The results of the path coefficient test indicate that all inter-variable relationships are significant at the 95% confidence level ($p < 0.05$).

Table 5. Path Coefficient Results and Significance

Hypothesis Path	Path Coefficient (β)	t-value	p-value	Remarks
H1: Artificial Intelligence → Competitiveness	0.34	4.12	0.000	Significant
H2: Artificial Intelligence → Sustainability	0.21	2.45	0.015	Significant
H3: Digital Literacy → Competitiveness	0.41	5.27	0.000	Significant
H4: Digital Literacy → Sustainability	0.28	3.36	0.001	Significant
H5: Competitiveness → Sustainability	0.39	5.02	0.000	Significant
H6: Artificial Intelligence → Digital Literacy (indirect mediation effect)	0.25	3.87	0.000	Significant

Test Results Mediation

Bootstrapping tests indicate that digital literacy significantly mediates the effect of AI on competitiveness and sustainability. The indirect effect value of 0.10 ($p = 0.02$) indicates partial mediation, meaning AI still has a direct effect on the dependent variable. Furthermore, competitiveness also mediates the relationship between digital literacy and sustainability with an indirect effect of 0.16 ($p = 0.001$). This strengthens the conceptual framework in Chapter 3, which states that competitiveness acts as a bridge between digital capabilities and business sustainability**.**

Discussion

The results of this study indicate that the use of Artificial Intelligence (AI) in digital marketing has a significant positive effect on the competitiveness and sustainability of MSMEs. This finding aligns with Acatrinei (Acatrinei et al., 2025) and (Dinh et al., 2025), which assert that AI can improve marketing automation, customer personalization, and digital campaign efficiency.

Digital literacy emerged as the most dominant factor in increasing competitiveness ($\beta = 0.41$). MSMEs with strong strategic and technical digital capabilities are better able to integrate technology into business operations and accelerate innovation(Tinmaz et al., 2022).

Competitiveness plays a crucial role as a mediator between technology and sustainability. This supports da Silva et al.'s (2025) view that increased efficiency, innovation, and technological mastery are key to MSME sustainability in the platform economy era.

Qualitatively, interview results support the quantitative findings. For example, one fashion MSME in Dago stated that using AI analytics to monitor color and style trends increased sales by up to 30% in three months. However, most respondents stated that the main obstacles to adopting AI were implementation costs and low digital literacy.

Thus, the integration of AI, Digital Literacy, Competitiveness, and Sustainability forms a mutually reinforcing synergistic chain.

1. AI plays a role in increasing marketing efficiency and innovation.
2. Digital literacy strengthens adaptability and business strategy.
3. Competitiveness serves as a transformative mechanism linking digital capabilities to business sustainability.

Research Implications

1. Theoretical Implications:

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a. Confirms the conceptual model that digital literacy plays a dual role—as an independent variable and a mediator between AI and competitiveness.
b. Supports the theory of MSME digital transformation, which positions competitiveness as a link to business sustainability.

2. Practical Implications:
   The Bandung City Government needs to develop AI-based digital literacy training for MSMEs so they can utilize technology for marketing, customer analysis, and product innovation.
3. Policy Implications:
   Fiscal incentives, digital incubation, and academic-industry partnerships are needed to accelerate the adoption of AI technology among creative MSMEs.

Table 6. Summary of Research Findings

Hypothesis	Statement	Result
H1	Artificial Intelligence → Competitiveness	Accepted
H2	Artificial Intelligence → Sustainability	Accepted
H3	Digital Literacy → Competitiveness	Accepted
H4	Digital Literacy → Sustainability	Accepted
H5	Competitiveness → Sustainability	Accepted
H6	Digital Literacy mediates the effect of Artificial Intelligence on Competitiveness and Sustainability	Accepted (partial mediation)

DISCUSSION

The research results show that the model linking Artificial Intelligence (AI), Digital Literacy, Competitiveness, and MSME Sustainability has proven empirically and theoretically relevant. First, AI has a positive impact on MSME competitiveness and sustainability. The use of technologies such as chatbots, auto-ad targeting, and predictive analytics helps businesses improve marketing efficiency, innovation, and data-driven decision-making. This finding aligns with (Acatrinei et al., 2025) and (Dinh et al., 2025) who assert that AI strengthens the effectiveness of digital marketing and innovation for small businesses. Second, digital literacy is the most dominant factor in increasing competitiveness. The ability of MSMEs to understand and utilize digital technology has been shown to strengthen business strategies, market adaptation, and innovative capabilities. Digital literacy also acts as a mediator between AI and competitiveness and sustainability, confirming that technology adoption requires adequate digital competency (Tinmaz et al., 2022). Third, competitiveness serves as a strategic bridge to sustainability. MSMEs with efficiency, innovation, digital market access, and technological mastery tend to be more sustainable (da Silva et al., 2025)(Munandar et al., 2025). Contextually, these results illustrate that MSMEs in Bandung City have significant potential to develop AI-based digital strategies, but still face obstacles in digital literacy and implementation costs. Therefore, AI-based digital literacy training and policy support in the form of incentives or digital incubation are needed to accelerate transformation. Overall, this study confirms that AI is a driver of innovation, digital literacy is key to strengthening competencies, and competitiveness is a bridge to business sustainability. The synergy of these three is the main foundation for strengthening the position of MSMEs in the platform economy era.

CONCLUSION

Conclusion

This study aims to analyze the influence of the use of Artificial Intelligence (AI) and digital literacy on the competitiveness and sustainability of MSMEs in Bandung City in the platform economy era. Based on the results of the quantitative and qualitative analysis, the following conclusions can be drawn:

1. Artificial Intelligence (AI) has a positive and significant impact on the competitiveness and sustainability of MSMEs. The use of AI technologies, such as chatbots, predictive analytics, and auto-ad targeting, has been shown to increase marketing efficiency, product innovation, and the effectiveness of business actors' digital strategies.
2. Digital literacy has the most dominant influence in increasing the competitiveness of MSMEs. Business actors with technical skills, strategic capabilities, digital communication skills, and adaptive resilience are better able to utilize digital technology to expand markets and strengthen business performance.
3. Competitiveness acts as a mediating variable linking AI and digital literacy with business sustainability. MSMEs that are innovative, efficient, and adaptable to technology tend to have higher levels of economic and social sustainability.
4. Digital literacy also mediates the relationship between AI and competitiveness, indicating that technology adoption is insufficient without improving the digital competency of business actors.

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5. In general, this study confirms that AI is a driver of innovation, digital literacy is the foundation of adaptation, and competitiveness is a bridge to MSME sustainability. The synergy of these three is a key strategy in strengthening the position of MSMEs in the platform-based economy era.

Recommendations

1. For Regional Governments:
   Encourage AI-based digital literacy improvement programs through practical training, digital business mentoring, and providing technology incentives for MSMEs to accelerate the adoption of digital innovation.
2. For MSMEs:
   Improve digital and managerial competencies, and integrate AI into marketing and business management strategies to increase efficiency and sustainable competitiveness.
3. For Academics and Researchers:
   Further research is needed with broader regional and sectoral coverage, as well as the use of a longitudinal approach to assess the long-term impact of AI and digital literacy on MSME sustainability.
4. For Incubators and the Business Community:
   Strengthen collaboration with technology startups and universities to create an inclusive and sustainable digital innovation ecosystem for MSMEs.

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