Proceedings of the International Conference on Education, Economics, Business, Entrepreneurship, and Finance (ICEBEF)
Volume 4 (2026)

THE UTILIZATION OF ARTIFICIAL INTELLIGENCE IN PROMOTING MSME SUSTAINABILITY: A SYSTEMATIC LITERATURE REVIEW

Firda Fitriyanti[1], Purnama Sari[2], Nur Cahayu Baitunnisa[3], Yana Rohmana[4], Fazar Nuriansyah[5]
[12345]Faculty of Economics and Business, University Pendidikan Indonesia, Jalan Dr. Setiabudi No.229
E-mail: firdafy20@upi.edu; purnamasari21@upi.edu; nurcahayu.baitunnisa@upi.edu; rohmanayana@upi.edu; fazar@upi.edu

ABSTRACT

This study aims to identify the role and contribution of Artificial Intelligence (AI) in supporting the sustainability of Micro, Small, and Medium Enterprises (MSMEs) in Indonesia. The method is a Systematic Literature Review (SLR): an initial population of 200 articles retrieved via Publish or Perish was screened for topical relevance and methodological quality, resulting in 16 selected articles; purposive sampling was applied, records of search procedures were kept; data were extracted from article texts and analyzed using thematic synthesis to derive core themes (AI application areas, enabling/barrier factors, and sustainability impacts). Findings reveal three dominant themes: (1) optimization of digital marketing and chatbots to enhance customer interaction and sales (e.g., omnichannel marketing & AI marketing trainings). (2) strengthening local branding and AI-driven content production to expand market reach and MSME capabilities. (3) AI integration for financial inclusion/credit scoring and operational digitalization that supports governance and financing access. Adoption success is conditioned by digital literacy, organizational readiness, and policy support. In conclusion, AI has significant potential to reinforce MSME economic, social, and environmental sustainability, but scaling impact requires training programs, enabling policies, and multi-stakeholder collaboration. Recommendations include field empirical studies and the development of context-sensitive adoption models for MSMEs.

Key words: Artificial Intelligence; MSMEs; Sustainability; Digitalization; Systematic Literature Review

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) have become the main pillar of Indonesia's economy, playing a vital role in expanding regional economies and creating job opportunities. With more than 64 million units spread across the archipelago, MSMEs contribute significantly to reducing unemployment, improving community welfare, and providing a major contribution to the national Gross Domestic Product (GDP) (Ferdinan, 2023). However, amid the rapid pace of global digitalization and the growing demand for a green economy, MSMEs face serious challenges such as limited capital, low digital literacy, and restricted access to advanced technology. These issues impact business productivity and competitiveness in a technology-driven economy. In this context, Artificial Intelligence (AI) significantly enhances efficiency through the automation of routine tasks, data-driven decision-making, and optimization of resource management (Hayati et al., 2024).

AI plays a significant role in improving the operational efficiency of MSMEs, as well as in personalizing marketing through a deeper understanding of consumer behavior. AI also has the potential to enhance the quality of decision-making (Lathifah et al., 2024). In addition, the use of AI-based chatbots and credit scoring systems enables automated customer service and expands financial access for small business owners. These three applications not only promote economic efficiency but also contribute to social and environmental aspects as key pillars of sustainability.

Despite its great potential, most studies on AI in the MSME context still focus on improving business efficiency and productivity without systematically examining the relationship between AI and business sustainability. Therefore, this study aims to identify various AI applications implemented in MSMEs, analyze their contributions to sustainability, and categorize trends, challenges, and opportunities for implementation in Indonesia and globally. This review is expected to develop a conceptual framework linking AI and MSME sustainability and provide policy recommendations to achieve an inclusive and sustainable digital economy.

METHOD

Literature Search Strategy This study uses a Systematic Literature Review (SLR) approach to examine the contribution of Artificial Intelligence (AI) technology to the sustainability of Micro, Small, and Medium Enterprises (MSMEs). The review procedure follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, which are internationally recognised as the standard for reporting systematic studies (Moher, Liberati, Tetzlaff, & Altman, 2009; Page et al., 2021). The literature search was conducted on three main databases, namely Google Scholar, ScienceDirect, and SINTA (categories 1–3), with publications ranging from 2015 to 2024. The keywords used included: "Artificial Intelligence" OR "AI" OR

"Machine Learning" AND "UMKM" OR "MSMEs" OR "Small Business" AND "Sustainability" OR "Sustainable Development". From the initial search process, 200 articles were obtained. A total of 12 articles were eliminated because they were not fully accessible.

Articles included in the analysis must meet the following inclusion criteria: (i) written in English or Indonesian; (ii) discussing the application of AI in the context of MSME sustainability; (iii) originate from scientific journals or proceedings that have undergone peer review and are indexed by Scopus or SINTA; and (iv) contain empirical or conceptual data relevant to the dimensions of economic, social, or environmental sustainability. The exclusion criteria include: (i) articles that do not discuss sustainability; (ii) do not explicitly review AI; (iii) are not in the context of MSMEs; (iv) are not peer-reviewed scientific articles; and (v) are duplicate versions of other publications. A total of 25 articles were excluded based on these criteria, with five articles excluded for each reason.

The article selection process was carried out in stages according to the PRISMA flow. After the identification and screening stages, 188 articles were screened based on their titles and abstracts. Of these, 138 articles were deemed irrelevant. A total of 50 articles were then fully evaluated, and 9 articles were eliminated because they did not discuss the use of AI in the context of MSMEs. The final result left 41 articles that were included in the qualitative analysis. Data extracted from each article includes: author name, year of publication, country of origin, type of AI technology used (e.g. machine learning, chatbot, predictive analytics), SME sector studied, and its contribution to sustainability dimensions. The analysis was conducted using a thematic approach (thematic analysis) to identify key patterns and compile a classification of AI's contribution to MSME sustainability (Nowell, Norris, White, & Moules, 2017).

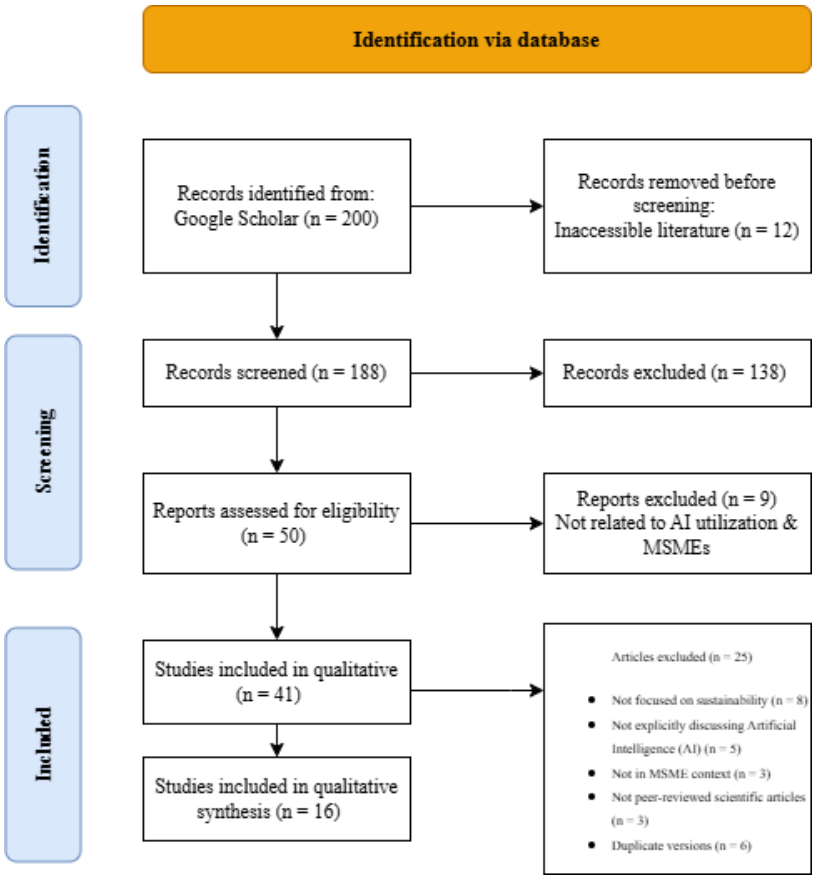

Figure.1. Flowchart of article selection process based on PRISMA protocol

The validity and reliability of the analysis were ensured through independent data extraction and coding by two researchers. Each article was coded based on the author, year, country, type of AI technology (e.g., machine learning, chatbot, predictive analytics), MSME sector, and sustainability dimensions discussed. Any differences in interpretation were resolved through discussion and consensus. Reference management was conducted using **Mendeley** to prevent data duplication and ensure citation accuracy. The exclusion process was documented systematically across five categories: not discussing sustainability, not focusing on AI, irrelevant to MSMEs, not peer-reviewed, and duplicate publications. A total of 25 articles were excluded. This approach ensured a systematic, transparent, and accurate literature analysis.

RESULTS AND DISCUSSION

Table 1: Research Findings

No	Research Focus / Findings	Author(s), Year
1.	The utilization of Artificial Intelligence (AI) to support the sustainability of Micro, Small, and Medium Enterprises (MSMEs)	(Sutisna and Hasim, 2025; Dwi Mardiatmi et al., 2025; Hadist et al., 2025; Hidayat et al., 2025; Irwan et al., 2025; Priyandaru et al., 2025)
2.	The types and forms of Artificial Intelligence (AI) applications most widely used by MSMEs	(Khoiril Mala et al., 2025) (Adi Wicaksono, 2024), Djaini et al. (2025) Gofur et al. (2025), Fajri (2024) , Halawa et al. (2025)
3.	Challenges and barriers to the implementation of Artificial Intelligence (AI) in MSME development	(Arsenio et al., 2024; Jun Prasetyo & Andrilla, 2025; Pratomo et al., 2025; Adi Perdana et al., 2024; Alvis Daniswara Ahmadin, 2025)
4.	Future directions and research opportunities for utilizing Artificial Intelligence (AI) to promote MSME sustainability	(Arsenio et al., 2024; Maulida et al., 2024; Gofur et al., 2025; Dwi Mardiatmi et al., 2025)

3.1. The Utilization of Artificial Intelligence (AI) to Support MSME Sustainability

The adoption of AI has transformed MSMEs from basic digitalization toward economic and social sustainability. Mardiatmi et al. (2025) highlight that AI-based marketing literacy is essential to help business owners adapt to changing consumer behavior and market trends. Similarly, Irwan et al. (2025) and Hadist et al. (2025) demonstrate that AI integration through digital catalogs and data management enhances promotion efficiency and expands local market reach. Priyandaru et al. (2025) emphasize that AI-driven market analysis supports data-based decision-making, while Hidayat et al. (2025) and Sutisna and Hasim (2025) show that chatbot utilization and AI-based digital marketing training improve branding, operational efficiency, and customer engagement.

3.2. Types of AI Applications in MSMEs

The reviewed studies reveal that AI adoption in MSMEs mainly focuses on digital marketing, customer service, operational efficiency, and fintech-based financing. Khoiril Mala et al. (2025) found that AI-driven branding enhances promotional content effectiveness, while Adi Wicaksono (2024) showed that omnichannel marketing using chatbots and recommendation systems improves cross-platform engagement. Djaini et al. (2025) emphasized ChatGPT's role in supporting innovation and responsive communication, and Gofur et al. (2025) noted its use in predictive analytics for improving production efficiency. In the financial sector, Fajri (2024) and Halawa et al. (2025) highlighted AI's role in credit scoring and cash management to expand MSME financial access. Overall, these applications form a connected digital value chain that strengthens MSME competitiveness and sustainability.

3.3. Challenges and Barriers to AI Implementation in MSMEs

The adoption of AI in MSMEs is constrained by technical, organizational, and environmental factors. According to Jun Prasetyo and Andrilla (2025), the main obstacles include limited infrastructure, leadership, and organizational readiness. Human resource capacity and digital literacy gaps also hinder effective AI use, as noted by Arsenio et al. (2024) and Pratomo et al. (2025). Furthermore, financial limitations, poor data quality, and privacy concerns make adoption difficult for micro and ultra-micro enterprises (Adi Perdana et al., 2024). The integration of AI with green marketing strategies adds further challenges due to high investment needs and lack of expertise (Alvis Daniswara Ahmadin, 2025). Strengthening digital literacy, financial support, and data governance frameworks is therefore crucial for sustainable AI adoption (Arsenio et al., 2024; Jun Prasetyo & Andrilla, 2025).

3.4. Future Research Directions on AI Utilization for MSME Sustainability

The SLR findings emphasize the need to develop contextual AI adoption models tailored to MSMEs, including adaptations of the TOE or TAM frameworks for micro and ultra-micro enterprises (Arsenio et al., 2024). Future

research should empirically test these models through longitudinal and intervention-based studies to measure AI's impact on the triple-bottom-line—economic, social, and environmental dimensions (Arsenio et al., 2024; Maulida et al., 2024). Additionally, the integration of AI in small-scale manufacturing presents research opportunities in resource efficiency and waste reduction (Gofur et al., 2025). From an implementation perspective, Mardiatmi et al. (2025) emphasize that future research should design sustainable literacy and training programs, evaluating community-based and multi-stakeholder collaborations to scale AI adoption for MSME sustainability.

CONCLUSION

This study systematically reviewed the utilization of Artificial Intelligence (AI) to promote the sustainability of Micro, Small, and Medium Enterprises (MSMEs). The findings reveal that AI plays a pivotal role in driving MSME transformation from simple digitalization toward economic, social, and environmental sustainability. The most common AI applications include digital marketing tools, chatbots, predictive analytics, and fintech-based credit scoring systems, all of which enhance efficiency, competitiveness, and market reach. However, the adoption of AI remains constrained by several challenges, such as limited digital literacy, financial and infrastructural barriers, and insufficient policy support. These issues highlight the need for comprehensive strategies involving digital capacity-building, financial incentives, and strong data governance frameworks to ensure inclusive and sustainable AI adoption. Future research should focus on developing contextual AI adoption models tailored to MSMEs, empirically testing their impact on triple-bottom-line outcomes, and exploring community-based training and cross-sector collaborations. Strengthening the synergy between technology, policy, and human resources is essential to unlock AI's full potential in advancing MSME sustainability.

REFERENCES

Arsenio, D., Abdurrahman, Y., Tania, A. L., Idaman, N., Ekonomi, F., Islam, B., & Korespondensi, E. P. (2024). *Peran Dan Praktik Artificial Intelligence Terhadap Umkm: Systematic Literature Review* (Vol. 6, Issue 2).

Digital, P. P., Berbasis, M., Untuk, A. I., Pemasaran, M., Produk, B., Umkm, P., Bandung, R. B., Teh, E., Sutisna, S., & As'ari, H. (2025). *Jurnal Pengabdian Dan Perubahan Sosial Volume. 2, Nomor. 1, Tahun 2025 E-Issn : 3048-135x; Dan P-Issn : 3062-6714; Hal*. 50–56. Https://Doi.Org/10.62951/Karya.V2i1.1132

Djaini, A., Permana, R. M., & Mahmudin, T. (2025). Analisis Strategi Adaptif Umkm Terhadap Integrasi Teknologi Chatgpt Sebagai Instrumen Peningkatan Daya Saing Berkelanjutan Dan Akselerasi Inovasi Bisnis Di Era Transformasi Digital. *Jurnal Minfo Polgan*, *14*(1), 1015–1024. Https://Doi.Org/10.33395/Jmp.V14i1.14959

Dwi Mardiatmi, B., Assumpta Wikantari, M., Gunaedi Argo, J., Tri Wahyono, B., Shinta Rachmawati, N., Delia Lestari, D., & Kunci, K. (2025). *Literasi Strategi Pemasaran Berbasis Ai (Artificial Intelligence) Bagi Umkm Mendukung Sustainable Development Goals (Sdgs)*. Http://Jiip.Stkipyapisdompu.Ac.Id

Ferdinan Suryadi, R. (2023). *Peran Umkm Dalam Mendorong Pertumbuhan Ekonomi Lokal: Studi Kasus Di Indonesia*. Central Publisher Journal Of Community Progress, 1(9), 1096–1102. Https://Doi.Org/10.60145/Jcp.V1i9.207

Hadist, N., Qoim, A., Muhammad, H., Kurniawan, M. R., Kinanti, K., Auliya, Y. A., & Jember, U. (2025). *Dedication: Jurnal Pengabdian Masyarakat Pemanfaatan Aplikasi Ai Dan Website E-Katalog Untuk Digitalisasi Umkm Desa "Paseban Kawis."* Https://Doi.Org/10.31537/Dedication.V9i2.2587

Hayati, N., Hadian, N., & Fanani, M. R. (2024). *Peningkatan Daya Saing Umkm Desa Bugangan Melalui Pemanfaatan Teknologi Ai Dalam Pemasaran Digital*. Abdiformatika: Jurnal Pengabdian Masyarakat Informatika, 4(2), 77–84. Https://Doi.Org/10.59395/Abdiformatika.V4i2.241

Hidayat, N., Hairul Rahman, Fausi Arifin, Hanifah Fauziyah, Syaiful Anshori, & Any Sani'atin. (2025). Digitalisasi Umkm Camilan Khas Madura: Pendampingan Pencatatan Keuangan Dengan Aplikasi Sepran Dan Optimalisasi Pemasaran Melalui Chatbot Ai. *Jurnal Pengabdian Masyarakat Dan Riset Pendidikan*, *4*(1), 6428–6434. Https://Doi.Org/10.31004/Jerkin.V4i1.2650

Irwan, A. G., Wahyuzi, Z., Dalimunthe, N. P., Martahayu, V., & Juliansyah, A. (2025). Pemanfaatan Teknologi Digital Dan Kecerdasan Buatan Dalam Menunjang Ekonomi Desa Melalui Umkm. *Jurnal Pengabdian Masyarakat Waradin*, *5*(3), 18–25. Https://Doi.Org/10.56910/Wrd.V5i3.655

Jun Prasetyo, R., & Andrilla, R. (2025). Balikpapan Micro, Small, And Medium Enterprises (Msmes) And Artificial Intelligence Adoption: Toe Framework. *Jurnal Geoekonomi*, *16*(1), 11–20. Https://Doi.Org/10.36277/Geoekonomi.V16i1.540

Khoiril Mala, I., Winarno, A., Abdul Fattah, F., Hidayat, R., Putri Ima Oktavia, A., Distina, C., Manajemen, D., & Ekonomi Dan Bisnis, F. (2025). *Pemanfaatan Teknologi Ai Untuk Meningkatkan Branding Digital Umkm Di Kabupaten Malang*.

Lathifah, D., Subhiyanto, S., Adityarini, E., & Mardiansah, M. A. (2024). *Analisis Implementasi Kecerdasan Buatan (Artificial Intelligence) Dalam Optimalisasi Proses Bisnis*. Jurnal Sistem Dan Teknologi (Sintek), 5(1), 90–99.

Pratomo, P. A., Jaya, T. S., & Irawan, I. (2025). Pemanfaatan Teknologi Kecerdasan Buatan Untuk Meningkatkan Daya Saing Umkm Di Era Ekonomi Digital. *Jurnal Masyarakat Madani Indonesia*, *4*(4), 970–979. Https://Doi.Org/10.59025/41hmym80

Priyandaru, H., Fauziah, S., Entas, S., & Puspasari, A. (2025). *Transformasi Digital Umkm Melalui Pelatihan Pemanfaatan Kecerdasan Buatan Untuk Pengelolaan Data Dan Analisis Pasar: Studi Kasus Desa Bojonggede*. *4*(3). Https://Jurnalilmiah.Id/Index.Php/Abdimas

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred Reporting Items For Systematic Reviews And Meta-Analyses: The Prisma Statement. Plos Medicine, 6(7), E1000097. Https://Doi.Org/10.1371/Journal.Pmed.1000097

Page, M. J., Mckenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... & Moher, D. (2021). The Prisma 2020 Statement: An Updated Guideline For Reporting Systematic Reviews. Bmj, 372, N71. Https://Doi.Org/10.1136/Bmj.N71

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic Analysis: Striving To Meet The Trustworthiness Criteria. International Journal Of Qualitative Methods, 16(1), 1–13. Https://Doi.Org/10.1177/1609406917733847