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Smart Village: Artificial Intelligence and Social Media for Sales Transformation

Sarjon Defit[1], Jhon Veri[1*], Tedy Wiraseptya[1], Siti Zaiton Mohd Hashim[2], Mohd Shahizan Othman[2], Mohd Murtadha Mohamad[2], Rohayanti Hassan[2], Apri Junaidi[2]

[1]Universitas Putra Indonesia YPTK, Padang, Indonesia
[2]University Teknologi Malaysia, Johor Bahru, Malaysia

*__Email__:jhon@upiyptk.ac.id

Abstract

This paper presents the Smart Village program, an international community engagement initiative conducted in Pasir Gudang, Johor Bahru, Malaysia, to improve digital marketing awareness and entrepreneurial innovation among local traders and micro-entrepreneurs. The program addressed the limited strategic use of digital platforms and Artificial Intelligence (AI) tools in small business marketing practices. Using a participatory training approach, 30 participants attended practical workshops on AI-assisted content creation, visual promotion using Photoroom, and audience engagement analysis through social media platforms. Quantitative evaluation results showed an improvement in participants' digital marketing competencies, with average scores increasing from 3.50 to 4.20 on a five-point Likert scale. In addition, five new TikTok business accounts were successfully developed with structured content strategies. The collaboration between Universitas Putra Indonesia YPTK, Universiti Teknologi Malaysia, and Majlis Bandaraya Pasir Gudang demonstrates a sustainable triple-helix partnership model that supports digital empowerment, knowledge sharing, and smart village development.

Keywords

Artificial Intelligence, Digital Marketing, Smart Village, Community Empowerment

Introduction

The emergence of digital technology in the 21st century has significantly transformed patterns of interaction, production, and socio-economic activities in society. In the digital era, this transformation is no longer limited to industrial or urban areas but has gradually expanded into rural communities, which have traditionally experienced limited access to information and technology. In this context, the concept of the Smart Village has emerged as a technological development approach aimed at empowering rural communities through digital technology, Artificial Intelligence (AI), and social collaboration (Cahya et al., 1957).

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This perspective emphasizes that AI and social media analytics can support inclusive digitalization by enabling rural micro-entrepreneurs to better understand market dynamics, automate promotional content, and improve sales strategies through data-driven decision-making. The Smart Village paradigm highlights that rural development is not solely dependent on physical infrastructure, but also on the ability of local communities to integrate technology into daily life, particularly in the creative economy and entrepreneurship sectors (Hikmah et al., 2024). Therefore, a smart village is not only characterized by internet accessibility, but also by the digital literacy of its community members and their ability to use technology to improve welfare, expand market access, and strengthen local identity in the digital environment (Putu et al., 2025).

In Southeast Asia, the Smart Village concept has become increasingly relevant due to the growing digital divide between urban and rural regions. Countries such as Malaysia, Indonesia, and Thailand have promoted the adoption of digital technology in rural areas to support sustainable development programs (Yusof et al., 2025),(Chueasawathi, 2025). However, the success of these initiatives depends not only on access to technology, but also on the capacity of individuals to learn, adopt, and utilize technology for economic and social empowerment (Judijanto et al., 2024), (Maulana et al., 2025).

Recent systematic reviews further describe the Smart Village framework as a multidimensional and dynamic model of rural development that integrates technological, economic, social, and environmental dimensions (Junaidi et al., 2025). These studies explain that smart villages function as ecosystems of digital innovation, governance, and community participation designed to improve quality of life while preserving cultural identity. In addition, the framework identifies key indicators related to ICT utilization, socio-economic inclusion, environmental sustainability, and financial resilience.

This gap highlighted the need for a more practical and strategic approach that not only introduced digital tools but also strengthened participants' understanding of how technology could be integrated into sustainable business models (Setiawan et al., 2025).To address these challenges, the Smart Village program adopted a participatory learning approach. Rather than relying solely on theoretical instruction, the program actively involved participants in content creation, AI tool utilization, and digital product analysis (Azies, 2024).

Overall, the program demonstrates that rural communities are capable of adopting digital technology when supported by appropriate training models, collaborative partnerships, and sustainable community engagement. The experience in Pasir Gudang illustrates how digital transformation initiatives can effectively empower grassroots communities through strong cooperation between academic institutions and local government. This study also contributes to the broader discussion on AI-driven business transformation by showing how artificial intelligence and social media analytics can help rural micro-entrepreneurs become active digital innovators rather than passive technology users.

Methodology

The methodology of the implementation of the Smart Village program that placed an emphasis on the use of AI and social media in transforming sales was constructed through the participatory approach that was aimed at community capacity building (Hikmah et al., 2024). This strategy allowed making the knowledge transfer process and digital training contextual and responsive to the socio-cultural dimensions of the business communities in the Pasir Gudang region, Johor Bahru, Malaysia. Furthermore, the approach placed special focus on the global cooperation of the institutions of higher learning in Indonesia and Malaysia, which made the program a prototype of community service as a cross-national initiative based on the mutual

knowledge sharing and co-learning., positioning the program as a model of cross-border community service grounded in mutual knowledge exchange and co-learning.

Research Design and Approach

This project utilized an applied and participatory research design which integrated educational aspects, practice activities, and outcome measures. The design was guided by the fact that the most effective way of influencing sustainable behavioral change as far as rural digital practices are concerned is when participants are taken through the learning process by doing, experimenting, and reflecting on what has been experienced (Noviaristanti et al., 2023).

The program started with a preliminary identification and evaluation period to find out the background understanding of the participants and their willingness to embrace digital marketing. Pre-program test was also done to gather measurable information on the digital competencies.

Knowledge transfer was the second phase that welcomed the participants to the basics of Smart Village development, the basics of digital marketing and how AI can be used to improve promotional strategies. This stage was done in form of interactive group discussions to achieve conceptual knowledge and peer education.

The third step, hands-on training, focused on applied learning by conducting intensive workshops on creating content using AI and organizing the use of social media platforms in the marketing campaigns. There was orientation of the participants to use the tools and theories presented in the previous sessions.

Lastly, the evaluation and reflection phase entailed post-program evaluation and group discussion. The output of the participants were also reviewed, feedback given and sustainability plans were developed so that the new skills learnt could be applied to the real business environment in the long term.

- **Location and Collaborative Partners**

The program was introduced in the Kompleks Pusat Bandar Raya, Pasir Gudang, Johor Bahru, Malaysia. The location was chosen as it has comparatively developed digital infrastructure, which, although present, was not, nevertheless, optimally used by local people to promote the economic growth (Sun et al., 2025), (Silva et al., 2025).

- **Participants and Characteristics**

The study involved 30 participants, mainly small business owners and traders in the Pasir Gudang region, who were selected using purposive sampling based on their active involvement in small-scale business activities and their use of digital communication platforms for business purposes. A participatory research design was chosen because it allowed direct engagement with participants in identifying challenges and developing practical digital marketing strategies collaboratively, which was considered more suitable than purely observational or survey-based approaches. Initial surveys showed that the majority of participants used social media platforms such as TikTok (63.3%), Instagram (66.7%), and WhatsApp (76.7%); however, they lacked well-planned strategies to utilize these applications effectively for business expansion.

In general, the respondents were very eager and willing to learn new digital tools and techniques. These findings supported the topicality, timeliness and community preparedness

of the training program.

- **Instruments and Analysis Techniques**

The effectiveness of the program was assessed using a mixed approach to the evalua tion. It was done using four complementary methods:

a. Pre and Post Program Survey: the survey aimed to evaluate the change of knowledge and skills among the participants. The survey involved the five- point Likert scale as the measure of digital marketing concepts knowledge, AI in promotional con-content developing, and social media strategy application.

b. Participatory Observation: to track the participation of the participants in terms of engagement, collaboration and creativity in the training exercises.

c. Content Analysis: to assess the digital promotional output of participants in terms of visual creativity, relevance of message, and possible reach to social media.

d. Reflection and Feedback: to elicit the perceptions, the challenges, and the in tentions of the participants on the implementation in the future.

- **Program Validity and Sustainability**

The validity of the programs was achieved by including the participation of aca demic experts and professional practitioners during every phase, use of measurable data and including the visual documentation process. The inter-university partnership between higher education institutions brought the methodological rigor, which is the synthesis of academic knowledge and practical community involvement.

- **Computational Evaluation Formula**

To quantify the improvement in participants digital literacy and business transfor mation, an AI-assisted evaluation model was applied. The improvement index (Δscore) was computed as follows:

$$\Delta Score = \frac{(Spost - Spre)}{(Spre)} X 100\%$$

Where ***Spre*** represents the average pre-training score, and ***Spost*** is the average post training score. Based on this formula, the participants digital literacy improvement was calculated as:

$$\Delta Score = \frac{(4{,}20 - 3{,}50)}{(3{,}50)} X 100\% = 20\%$$

This formula was embedded within an automated spreadsheet model that classified each particiapnt's transformation level (*basic, intermediate,advance*) using a simple rule-based algorithm:

```
Input: S_pre, S_post
Compute ΔScore = (S_post - S_pre)/S_pre × 100 If ΔScore < 10 →
Level = "Basic"
If 10 ≤ΔScore < 20 →Level = "Intermediate" If ΔScore ≥ 20 →
Level = "Advanced" Output: Level
```

This computational approach provides an objective measure to evaluate the impact of AI-based training and social media transformation within the Smart Village program. A calculated ΔScore of 20% indicates a substantial increase in digital literacy. A computational proxy for evaluating the outcomes of AI-based digital transformation, Leveraging Artificial Intelligence and Social Media for Digital Empowerment.

Result and Discussion

- **Program Effectiveness and Learning Outcomes**

The pre and post-training scores showed that the understanding of the concept of digital marketing and the practical application of AI as a supporting means of con ducting promotional activities were positively developed and measured after the train ing. This successful result confirms the validity and effectiveness of the program ma terial and methodological approach, which is the success of the participatory learning model in acquiring digital skills in a relatively short period.

The quantitative analysis revealed that the mean score of the participants rose by 20 percent before the training and after it, which was 3.50 to 4.20 respectively. Such a high profit indicates the power of the practical, hands-on approach taken in the workshops, where the participants participated in the process of developing AI-based digital content as opposed to passively receiving information.

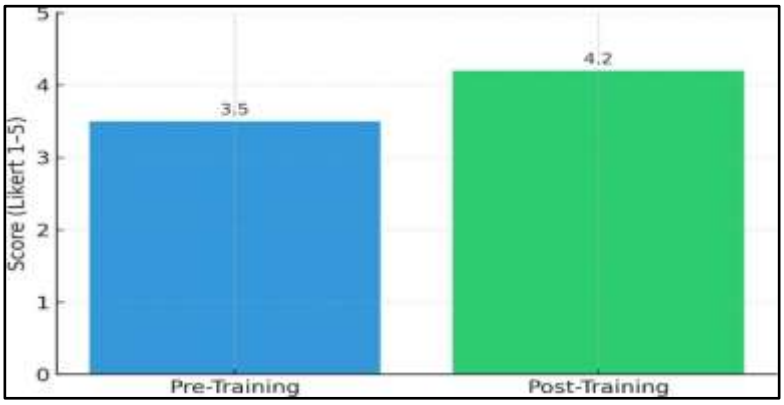

Figure.1 Comparison chart of pre- and post-training scores

The performance scores in the pre- and post-training were compared in Figure 1, which supports the existence of a steady upward trend in the participants. Post- training reflections also showed that the majority of the participants believed that the hands-on learning model was very effective, especially to assist them in comprehend- ing how to use AI tools like ChatGPT and Photoroom. As observed by many, the reality of examples based on what was familiar with their social media platforms helped them greatly in boosting their confidence and capability to come up with pro- motional work that was locally relevant. Together, these results support the point that practice-focused learning is an effective strategy in terms of promoting digital skills acquisition among small entrepreneurs.

Behavioral Transformation and Technology Adoption

Before the training, the majority of the participants depended on social media primarily to interact with other people and amuse themselves. Nonetheless, post-training tests revealed that there was a major behavioral change. Eighty-three percent of the respondents started promoting their product through their Tik Tok and Instagram ac counts in a strategic way. This change denotes the development of digital behaviour towards non-business users to proactive digital businesspeople who view social media as part of the business strategy.

Table.1 Participant Behavior Changes Before and After Training

Activity	Before Training	After Training	Change
Use of social media for Promotion	33%	83%	+50%
Creation of Visual Content with AI	10%	70%	+60%
Audience Engagement Analysis	7%	65%	+58%
Consistency in Content Upload schedule	13%	73%	+60%

The participants showed significant improvements in all the important behavioral indicators as shown in Table 1. Social media promotion of businesses was applied by half, and creating AI-based visual content was improved by 60. In the same way, the practice engagement analysis grew 7 to 65 percent, and regularity in posting digital content advanced by 60 percent.

The results of these provide an indication that the training was successful in pre- paring the participants with the technical and strategic skills that were needed to use the digital platforms in a more professional manner. The changes in behavior observed comply with the Technology Acceptance Model (TAM) that states technology adoption is determined by perceived usefulness and perceived ease of use by the users (Nofirda & Hastuti, 2025),(Olan et al., 2025). The enhanced skill and confidence of the participants in the application of AI tools suggest that in case communities are provided with systematic, contextual, and practice-driven instructions, they will be able to quickly gain access to new digital technologies and incorporate them into sustainable business practices.

Creativity and Innovation in Promotional Content

During the workshop periods, the participants were to create AI-based promotional messages in the form of showcasing their local products, such as traditional foods, as well as handmade craft and creative fashion products. The submissions were judged on three major criteria, namely, creativity, relevance of the promotional message, and possible virality on the social media channels.

According to the analysis provided by the implementation team, the success of participants in terms of creating content that is highly creative and makes effective use of visual design elements was approximately 70%.

Cross-Border Collaboration Analysis

Besides its local results, this project can be regarded as a concrete example of the global scholarly collaboration that successfully incorporates technological innovations, pedagogical planning and community-related interaction. The case of Universitas Putra Indonesia YPTK (UPI), Universiti Teknologi Malaysia (UTM), and Majlis Bandaraya Pasir Gudang (MBPG) is an example of how the Triple Helix Model can be synchronized with the involvement of institutions of higher learning, the state, and society as the co-creators of knowledge and

innovation.

Conclusion

The Smart Village initiative, which focused on the application of Artificial Intelligence (AI) and social media for sales transformation in Pasir Gudang, demonstrated that the integration of digital technologies into local business activities can significantly improve participants' competencies, business strategies, and digital confidence. Through a participatory and practice-oriented learning approach, the program successfully empowered local traders and micro-entrepreneurs to utilize AI tools and social media platforms for business promotion and market expansion.

The evaluation results showed a substantial improvement in participants' digital literacy and marketing competencies. The average understanding score increased from 3.50 before the training to 4.20 after the program, indicating more than a 20% improvement. Participants gained practical skills in creating AI-assisted promotional content, developing structured social media strategies, and managing digital engagement more professionally. These findings confirm the effectiveness of experiential and participatory training models in strengthening digital entrepreneurship skills within rural communities.

Beyond individual learning outcomes, the initiative also generated broader social and economic impacts. Five new TikTok business accounts were established and managed using consistent content strategies, while participants reported increased confidence in expanding their businesses through digital platforms. These outcomes suggest that the Smart Village framework can serve as a practical model for supporting sustainable and competitive local business ecosystems in the digital era.

This study contributes to the growing discussion on AI-driven community empowerment by demonstrating how participatory digital training can support rural economic transformation through accessible technology adoption. However, the findings are limited to a specific local context and relatively small participant group. Future research should involve larger and more diverse communities, incorporate long-term impact evaluation, and explore the integration of AI-based marketing strategies with e-commerce systems and national digital development policies to strengthen the scalability and sustainability of the Smart Village framework.

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References

Azies, H. Al. (2024). AI-Based Models for Identifying Underdeveloped Villages in Indonesia ' s Rural Development. 5(3), 192–202. https://doi.org/10.46456/jisdep.v5i3.611

Cahya, W., Angellia, F., Silvanie, A., & Kurniawan, A. (1957). AI Introduction Training For Umkm In Srengseng Sawah Village To Enhance Digital Marketing. 276–280. https://doi.org/https://ijcsnet.id/index.php/go/article/view/779/382

Chueasawathi, P. (2025). The Success of Agricultural Small and Medium-sized Enterprises (

SMEs) in the Digital Era : A Case Study of Northeastern Thailand. 5(5), 1167–1184. https://doi.org/https://so07.tci-thaijo.org/index.php/IJSASR/index

Hikmah, A. B., Alawiyah, T., Fatah, H., & Wibisono, T. (2024). Menuju smart village: sinergi e-commerce dan digital marketing untuk kesejahteraan masyarakat desa. Indonesian Community Service Journal of Computer Science, 1(2), 12–16. https://doi.org/https://jurnal.bsi.ac.id/index.php/indocoms/article/view/3430/1664

Judijanto, L., Liestyowati, L., Belani, S. W., Daud, A., & Syofya, H. (2024). Utilization of digital marketing for palm oil farmers and palm fruit craftsmen in Indonesia. Journal of Human and Education, 4(1), 33–40. https://doi.org/https://iposs.co.id/wp-content/uploads/2025/06/6.-2024-j-sawit-Utilization-Of-Digital-Marketing-For-Palm-Oil-Farmers-And-Palm-Fruit-Craftsmen-In-Indonesia.pdf

Junaidi, A., Othman, M. S. B., Mohd Hashim, S. Z., Mohamad, M. M., Kesa, D. D., & Nurfikri, A. (2025). Smart villages: a systematic review of trends, models, and metrics. Cogent Social Sciences, 11(1). https://doi.org/10.1080/23311886.2025.2492833

Maulana, M., Deliana, D., & Indah, T. (2025). Integrating Digital Marketing Communication and Community Participation for Sustainable Tourism Development : A Case Study of Sumberbulu Tourism Village , Indonesia. 13(1), 76–87. https://doi.org/10.12928/channel.v13i1.1061

Nofirda, F. A., & Hastuti, D. (2025). Examining The Impact of Artificial Intelligence (AI) – Assisted Social Media Marketing in Improving the Effectiveness of SMES Business Performance in Indonesia. 15(1). https://doi.org/10.37859/jae.v15i1.8856

Noviaristanti, S., Yunita, S. C., Puguh, S., & Triono, H. (2023). SOCIAL MEDIA USAGE IMPACTS ON SME ' S FIRM PERFORMANCE : EVIDENCE FROM WEST JAVA , INDONESIA. 9(2), 285–294. https://doi.org/https://www.semanticscholar.org/reader/139784ca9fddc94d492c6336f84b03d8e2b7f52d

Olan, F., Papadopoulos, T., Spanaki, K., & Jayawickrama, U. (2025). Social Entrepreneurial Marketing and Innovation in B2B Services : Building Resilience with Explainable Artificial Intelligence. Information Systems Frontiers, 28(1), 47–60. https://doi.org/10.1007/s10796-025-10583-5

Putu, N., Krismajayanti, A., Nurmalasari, M. R., Prawitasari, P. P., & Putu, I. A. (2025). Digital Transformation in Business Marketing of SMEs in Celuk Village , 294) Digital Transformation in Business Marketing of SMEs in Celuk Village , Gianyar , Bali. 293–299. https://doi.org/https://jurnal.stie.asia.ac.id/index.php/jpm/article/view/2301/755

Setiawan, S., Retnowati, M. S., Uluum, M. M., & Ghufron, L. (2025). Digital Marketing Assistance and Local Product Innovation : Development of the Village Micro Business Sector in Ponorogo. 3(1), 156–164. https://doi.org/https://jurnalpengabdianmasyarakatbangsa.com/index.php/jpmba/article/view/2168/1608

Silva, A., Almeida, I. D. De, Dionisio, A., Rabadão, C., & Capela, C. (2025). How digital technologies enhance competitiveness in manufacturing SMEs. https://doi.org/https://link.springer.com/article/10.1186/s13731-025-00576-8

Sun, B., Yu, J., Khattak, S. I., & Tariq, S. (2025). Digital Innovation , Business Models Transformations , and Agricultural SMEs : A PRISMA-Based Review of Challenges and Prospects. Di, 1–24. https://doi.org/https://www.mdpi.com/2079-8954/13/8/673

Yusof, M. S., Ali, M., Kamarudin, I., & Wahid, A. (2025). Transforming Agro-Food Smes In Malaysia Through Digital Innovation And Smart Technologies For Sustainable Competitiveness. 11(9), 530–543. https://doi.org/https://theaspd.com/index.php/ijes/article/view/1025/754