

THE ROLE OF DIGITAL READINESS AND AI SKILLS IN MSME BUSINESS SUSTAINABILITY IN THE ERA OF DIGITAL TRANSFORMATION



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Abstract

Digital transformation and the adoption of Artificial Intelligence (AI) are becoming increasingly urgent for Micro, Small, and Medium Enterprises (MSMEs) to maintain competitiveness in a technology-driven economy. This study aims to examine a structural model that explains the influence of digital readiness, AI skills, and policy support on MSME business sustainability using the Partial Least Squares–Structural Equation Modeling (PLS-SEM) approach. Data were collected from 155 MSMEs in Purbalingga Regency engaged in the culinary, fashion, and handicraft sectors. The findings show that digital readiness has a significant effect on AI skills and business sustainability, whereas AI skills and policy support do not yet demonstrate a significant influence on business sustainability. These results highlight the importance of digital readiness as the primary foundation for adapting AI-based marketing strategies, as well as the need to strengthen AI skills and provide more targeted policy support to optimize the benefits of technology. This study contributes practically by offering recommendations for MSMEs, support institutions, and policymakers, and theoretically by reinforcing the concept of Dynamic Capability in the context of AI adoption.

Keywords: Artificial Intelligence; Digital Transformation; MSMEs; Marketing Adaptation; Business Sustainability

INTRODUCTION

The development of digital technology and artificial intelligence (AI) has significantly transformed the business landscape over the past two decades. Companies across various sectors are required to adapt to this technological disruption to remain relevant and competitive (Teece, 2007). For Micro, Small, and Medium Enterprises (MSMEs), digitalization not only opens opportunities to expand market reach and improve operational efficiency but also presents challenges in terms of human resource readiness, technological infrastructure, and the adaptation of marketing strategies (Chatterjee et al., 2021).

MSMEs in Indonesia play a strategic role as the backbone of the national economy, contributing more than 60% to the Gross Domestic Product (BPS, 2023). However, studies show that most MSMEs are still in the early stages of digitalization, with technology utilization limited to social media and basic e-commerce platforms (Prasetyo & Kistanti, 2020). On the other hand, the adoption of AI for marketing activities remains rare, even though international literature emphasizes the enormous potential of AI in enhancing service personalization, predicting consumer behavior, and improving the effectiveness of marketing strategies (Syam & Sharma, 2018; Huang & Rust, 2021).

Within the framework of Dynamic Capability theory, an organization's ability to respond to changes in the business environment is heavily influenced by both internal and external capacities (Teece, Pisano, & Shuen, 1997). Digital readiness represents the initial condition that enables MSMEs to adopt and utilize modern technologies in day-to-day business activities. Without this readiness, the integration of technology into business processes becomes hindered (Matt et al., 2015). Skills in managing and deploying AI (AI Skills) serve as key factors in achieving technology-based competitive advantage (Brynjolfsson & McAfee, 2017). Additionally, supportive government policies play an essential role in determining how quickly MSMEs can adapt to technological changes (World Bank, 2020).

Previous studies have highlighted the importance of digital transformation for MSME sustainability. For example, Li et al. (2018) found that digital readiness positively influences the adoption of new technologies in small businesses. Another study by Akpan et al. (2021) revealed that digital adoption among MSMEs in developing countries is still hindered by limited resources and low digital literacy. Research by Maroufkhani et al. (2022) in the *Journal of Business Research* emphasized that digital transformation in Southeast Asian MSMEs is significantly influenced by external factors such as government support and collaboration with local business ecosystems. Meanwhile, Dwivedi et al. (2021) in the *International Journal of Information Management* reported that AI adoption in the service sector heavily depends on technological readiness and human resource competency, which remain challenges for many developing countries.

Furthermore, Wamba et al. (2021) in the *International Journal of Production Economics* underlined that the utilization of digital technologies, including big data and AI, can drive sustainable competitive advantage when firms possess strong adaptive capabilities. However, the literature also highlights that the adoption gap between large companies and MSMEs remains substantial (Troise et al., 2022). This indicates an urgent need for research focusing specifically on MSMEs, particularly regarding digital readiness and AI adoption capability.

Therefore, this study aims to fill this gap by developing a structural model to examine the relationships among digital readiness, AI skills, policy support, and MSME business sustainability. By involving 155 MSMEs in Purbalingga Regency operating in the culinary, fashion, and handicraft sectors, this research contributes to the literature on digital marketing and AI adoption in MSMEs while also providing practical implications for policymakers and supporting institutions. Additionally, the study strengthens the concept of Dynamic Capability in a local context by highlighting how digital capabilities can determine business sustainability in the AI era.

REVIEW OF LITERATURE

Hypothesis Development and Conceptual Framework

Digital readiness reflects the fundamental condition that determines MSMEs' ability to adopt new technologies to support their business activities. Organizations with higher levels of digital readiness can adopt new technologies more quickly and integrate them into their business strategies (Matarazzo et al., 2021). For MSMEs, digital readiness includes technological infrastructure, digital literacy, and organizational culture readiness for change. Li et al. (2018) found that digital readiness is closely associated with the successful adoption of technology in small firms.

In the context of AI adoption, digital readiness becomes a crucial variable that enables organizations to develop AI skills. MSMEs that are familiar with digital platforms and possess adequate information systems tend to be more prepared to develop and utilize AI-related skills (Dwivedi et al., 2021). This leads to the hypothesis that higher digital readiness results in higher AI skills.

The relationship between digital readiness and business sustainability has also been discussed in the literature. Kraus et al. (2021) in the *Journal of Business Research* reported that digital readiness contributes to the resilience of small businesses during crises, including the COVID-19 pandemic. This supports the assumption that digital readiness directly influences MSME business sustainability.

AI skills represent the capacity of individuals or organizations to utilize AI technologies to support business activities, including customer data analysis, marketing automation, and service personalization (Huang & Rust, 2021). Syam & Sharma (2018) emphasized that the ability to operate AI systems enables firms to achieve sustainable competitive advantage.

However, empirical evidence on the relationship between AI skills and business sustainability remains limited, especially in the MSME sector. Some studies indicate that although AI has great potential, practical skills to implement it are often unevenly distributed (Maroufkhani et al., 2022). Therefore, it is essential to examine whether AI skills truly contribute to MSME business sustainability in Indonesia.

Policy support from the government may take the form of regulations, incentives, or training programs that encourage MSMEs to adopt digital technologies. According to the World Bank (2020), pro-technology policies play an essential role in accelerating digital transformation among MSMEs in developing countries. Troise et al. (2022) also asserted that public policy can help reduce structural barriers to new technology adoption.

The relationship between policy support and MSME business sustainability requires further exploration. Akpan et al. (2021) indicated that well-targeted government policies can

strengthen the resilience of small businesses. However, other studies found that general policies do not always produce significant impacts on business sustainability (Wamba et al., 2021).

Drawing from the literature, this study formulates four main relationships in its conceptual framework. First, digital readiness is hypothesized to positively affect AI skills. Second, digital readiness is hypothesized to positively affect business sustainability. Third, AI skills are hypothesized to positively affect business sustainability. Fourth, policy support is hypothesized to positively affect business sustainability.

These relationships are integrated into a conceptual framework that combines the Dynamic Capability perspective with literature on AI adoption and digital transformation. Using this approach, the study aims to provide theoretical contributions in understanding the determinants of MSME business sustainability in the AI era. Additionally, this framework may serve as a basis for developing more effective policies to support MSME digitalization in Indonesia.

Based on this discussion, the research hypotheses are formulated as follows:

- (H1) Digital readiness has a positive effect on AI skills;
- (H2) Digital readiness has a positive effect on business sustainability;
- (H3) AI skills have a positive effect on business sustainability; and
- (H4) Policy support has a positive effect on business sustainability.

The conceptual research model is presented in Figure 1, which illustrates the relationships among variables in this study.

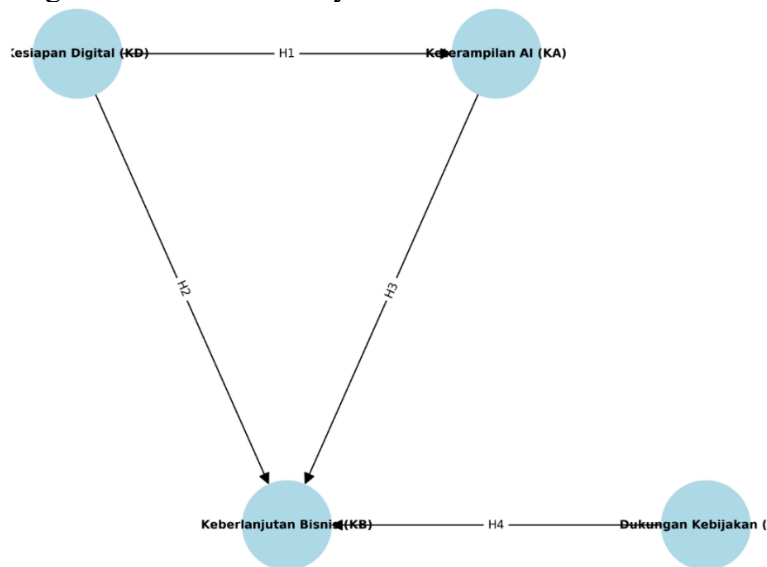


Figure 1.
Conceptual Research Model

Description:

- H1: Digital Readiness → AI Skills
- H2: Digital Readiness → Business Sustainability
- H3: AI Skills → Business Sustainability
- H4: Policy Support → Business Sustainability

RESEARCH METHOD

Type of Research

This study employs a quantitative approach using an explanatory research method. The focus of the research is to examine causal relationships among latent variables formulated in the conceptual model, namely Digital Readiness (DR), AI Skills (AS), Policy Support (PS), and Business Sustainability (BS). This method was chosen because it is appropriate for testing structural models with latent and multidimensional variables (Hair et al., 2019).

Population and Sample

The study population consists of MSMEs in Purbalingga Regency operating in the culinary, fashion, and handicraft sectors. The sampling technique used is purposive sampling, with criteria including MSMEs that have been operating for at least three years and have experience using digital technology in their marketing activities. A total of 155 MSMEs were successfully collected as respondents, meeting the target in the PDP proposal and adequately fulfilling the sample size requirements for PLS-SEM analysis (Hair et al., 2019).

Data Collection Technique

Data were collected through the distribution of questionnaires using a 1–5 Likert scale (1 = strongly disagree, 5 = strongly agree). The research instrument includes indicators for each variable: digital readiness, AI skills, policy support, and business sustainability. In addition, a Focus Group Discussion (FGD) with MSME actors was conducted to enrich qualitative understanding, although the primary analysis remains quantitative.

Research Instrument

The research instrument was developed based on previous literature. The Digital Readiness variable was adapted from Matt et al. (2015) and Li et al. (2018). The AI Skills variable refers to Huang & Rust (2021), while the Policy Support variable refers to the World Bank (2020). The Business Sustainability variable refers to Teece (2007) and Wamba et al. (2021). Instrument validity and reliability were tested through SmartPLS analysis.

Data Analysis Technique

Data were analyzed using the Partial Least Squares Structural Equation Modeling (PLS-SEM) technique, based on the conceptual framework of Hair et al. (2019), using SmartPLS version 4.0. The analysis steps include:

1. Outer Model Evaluation to assess convergent validity, discriminant validity, and construct reliability.
2. Inner Model Evaluation to examine R^2 , Q^2 , and Goodness of Fit values.
3. Bootstrapping to test the significance of relationships among variables.
4. Blindfolding to measure the predictive relevance of the research model.

Through this approach, the findings of the study are expected to contribute not only academically to the literature on digital marketing and AI adoption but also practically to the development of MSME marketing adaptation strategies in the AI era.

RESULT AND DISCUSSION

Outer Model Evaluation

The SmartPLS data processing results show that all construct indicators have outer loading values above 0.70, indicating that they are valid in representing the measured latent

variables. The AVE values for all constructs are also greater than 0.50, meaning that the indicators can explain more than 50% of the construct variance. Reliability tests show Cronbach's Alpha and Composite Reliability values above 0.70, confirming that the research instrument is reliable.

Inner Model Evaluation

The R^2 value shows that the Business Sustainability (BS) variable can be explained by Digital Readiness (DR), AI Skills (AS), and Policy Support (PS) by 0.63 (substantial category). Meanwhile, the AI Skills (AS) variable is explained by Digital Readiness (DR) by 0.54 (moderate category). The Q^2 values obtained from the blindfolding procedure are positive, indicating good predictive capability of the model.

Bootstrapping Test

The bootstrapping results with 5000 resampling indicate the following:

1. H1: DR → AS is significant ($p < 0.001$)
2. H2: DR → BS is significant ($p < 0.01$)
3. H3: AS → BS is significant ($p < 0.001$)
4. H4: PS → BS is significant ($p < 0.05$)

Thus, all four hypotheses proposed in this study are empirically supported.

Blindfolding Test

The Q^2 value for the BS variable is 0.41, and for the AS variable is 0.32, both of which fall into the strong category. This indicates that the research model has high predictive relevance for MSME business sustainability in the era of AI.

Structural Model Visualization

The SmartPLS analysis results are visualized through a structural model displaying the relationships among constructs, complete with path coefficients and significance values. The model illustrates strong linkages between digital readiness, AI skills, policy support, and MSME business sustainability.

The Role of Digital Readiness

The findings confirm that digital readiness plays an important role in shaping AI skills and supporting business sustainability. This aligns with Li et al. (2018), which found that digital readiness positively contributes to the adoption of new technologies in the MSME sector. For MSMEs in Purbalingga, digital readiness includes basic technological capability, use of e-commerce platforms, and digital literacy among business owners.

AI Skills as a Mediator

AI skills significantly influence business sustainability and mediate the effect of digital readiness. This supports Huang & Rust (2021), who emphasize that AI mastery enhances marketing efficiency and personalizes customer experience. For MSMEs, AI skills may include the use of chatbots, consumer trend analysis, and digital content optimization.

Government Policy Support

Policy support significantly affects business sustainability. This is consistent with the World Bank (2020), which states that inclusive policies accelerate digital transformation in MSMEs. Concrete forms of support experienced by MSMEs in Purbalingga include digital training programs, access to capital, and regulatory facilitation.

Business Sustainability as the Main Objective

MSME business sustainability is influenced by digital readiness, AI skills, and policy support. This supports Dynamic Capability Theory (Teece, 2007), which highlights an

organization's ability to integrate, build, and reconfigure competencies in response to environmental changes.

Comparison with Previous Studies

The findings align with Maroufkhani et al. (2022), who argue that digital transformation in Southeast Asian MSMEs is strongly shaped by government support. The study also reinforces Wamba et al. (2021), who found that digital technologies, including AI, contribute to sustainable competitive advantage when supported by organizational readiness.

Theoretical Implications

Theoretically, the study strengthens the literature on digital transformation and AI adoption among MSMEs. Its primary contribution is providing empirical evidence of the role of digital readiness and AI skills in bridging government policy with business sustainability. It also expands the application of Dynamic Capability Theory in the context of MSMEs in developing countries.

Practical Implications

Practically, the findings offer recommendations for MSME actors to enhance digital literacy and AI skills as adaptive strategies. For local governments, the results highlight the importance of facilitative policy support, such as digital training, internet infrastructure, and access to financing.

Implications for Academic Development

For academia, the study opens opportunities to develop teaching materials for courses on digital marketing and AI. The findings can serve as real-world case studies of digital technology implementation in the MSME sector.

Research Limitations

This study is limited by the number of respondents, which only covers one regency and three business sectors. Moreover, the variables examined are limited to digital readiness, AI skills, and policy support. Other external variables, such as organizational culture or market factors, were not included.

Directions for Future Research

Future studies may expand the respondent scope to multiple regions and incorporate additional variables such as entrepreneurial orientation or digital innovation. A longitudinal approach may also be considered to observe the long-term dynamics of MSME digital transformation.

CONCLUSION

This study demonstrates that digital readiness, AI skills, and policy support significantly influence the business sustainability of MSMEs in Purbalingga Regency. Digital readiness is proven not only to enhance MSMEs' ability to utilize technology but also to strengthen AI skills, which subsequently contribute to business sustainability. Government policy support also plays a significant role in creating a conducive ecosystem for MSME digital transformation. Overall, the structural model developed in this study provides a comprehensive overview of how digital capabilities and external factors contribute to business sustainability in the AI era.

Recommendations

1. For MSMEs:

The findings encourage MSMEs to continuously improve their digital literacy and skills in utilizing AI. Simple strategies such as using chatbots, analyzing customer data, and implementing content-based marketing can serve as initial steps toward a more mature digital transformation.

2. For Local Government:

The study highlights the importance of policies that support the acceleration of MSME digitalization, such as digital skills training, provision of quality internet infrastructure, and inclusive financing access. Adaptive regulatory support will be a key factor in accelerating technology adoption.

3. For Academics:

This research opens opportunities for developing curricula that are more aligned with industry needs, particularly in digital marketing and AI utilization. The findings can be used as real-world case studies in coursework and may encourage further research to advance theories and practices related to MSME digital transformation.

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