

The Digital Transformation Process in Encouraging the Internationalization of MSMEs: The Role of Digital Literacy as a Key Supporter

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Abstract:

This study investigates the digital transformation process in encouraging the internationalization of micro, small, and medium enterprises (MSMEs), with a particular focus on the role of digital literacy as a key supporting factor. Employing a qualitative case study approach, the research was conducted in Jember, Indonesia, involving MSME actors across various sectors. Data were collected through in-depth interviews, observations, and documentation, and analyzed using an interactive model consisting of data condensation, data display, and conclusion verification. The findings reveal that digital transformation among MSMEs often begins with basic adoption of digital tools; however, its effectiveness in supporting internationalization is highly dependent on the level of digital literacy. MSMEs with higher digital literacy demonstrate more strategic use of digital platforms, enabling them to access broader markets, including international customers. Conversely, limited digital literacy results in suboptimal utilization of technology and restricts market expansion. This study contributes theoretically by integrating digital literacy into the digital transformation framework as a central enabler of MSME internationalization, particularly within the context of developing regions. Practically, the findings highlight the importance of capacity-building initiatives, suggesting that policymakers and stakeholders should prioritize digital literacy development alongside technological infrastructure. The study is limited by its qualitative design and localized scope; therefore, future research is recommended to employ broader and comparative approaches. Overall, this research underscores the critical role of digital literacy in maximizing the impact of digital transformation for sustainable MSME growth in the global economy.

Keywords: *digital transformation, digital literacy, MSMEs, internationalization, qualitative study, Jember.*

Abstrak:

Studi ini meneliti proses transformasi digital dalam mendorong internasionalisasi usaha mikro, kecil, dan menengah (UMKM), dengan fokus khusus pada peran literasi digital sebagai faktor pendukung utama. Dengan menggunakan pendekatan studi kasus kualitatif, penelitian ini dilakukan di Jember, Indonesia, melibatkan pelaku UMKM dari berbagai sektor. Data dikumpulkan melalui wawancara mendalam,

observasi, dan dokumentasi, dan dianalisis menggunakan model interaktif yang terdiri dari kondensasi data, tampilan data, dan verifikasi kesimpulan. Temuan menunjukkan bahwa transformasi digital di kalangan UMKM sering dimulai dengan adopsi dasar alat digital; namun, efektivitasnya dalam mendukung internasionalisasi sangat bergantung pada tingkat literasi digital. UMKM dengan literasi digital yang lebih tinggi menunjukkan penggunaan platform digital yang lebih strategis, memungkinkan mereka untuk mengakses pasar yang lebih luas, termasuk pelanggan internasional. Sebaliknya, literasi digital yang terbatas mengakibatkan pemanfaatan teknologi yang suboptimal dan membatasi ekspansi pasar. Studi ini memberikan kontribusi teoritis dengan mengintegrasikan literasi digital ke dalam kerangka transformasi digital sebagai penggerak utama internasionalisasi UMKM, khususnya dalam konteks wilayah berkembang. Secara praktis, temuan ini menyoroti pentingnya inisiatif peningkatan kapasitas, menunjukkan bahwa para pembuat kebijakan dan pemangku kepentingan harus memprioritaskan pengembangan literasi digital bersamaan dengan infrastruktur teknologi. Studi ini terbatas oleh desain kualitatif dan cakupan lokalnya; oleh karena itu, penelitian selanjutnya disarankan untuk menggunakan pendekatan yang lebih luas dan komparatif. Secara keseluruhan, penelitian ini menggarisbawahi peran penting literasi digital dalam memaksimalkan dampak transformasi digital untuk pertumbuhan UMKM yang berkelanjutan dalam ekonomi global.

Kata Kunci: *transformasi digital, literasi digital, UMKM, internasionalisasi, studi kualitatif, Jember.*

INTRODUCTION

The rapid advancement of digital technology has fundamentally reshaped global economic structures, particularly in how businesses expand beyond domestic markets (Abbas Khan, et al., 2024). Point: Digital transformation has become a crucial driver for the internationalization of micro, small, and medium enterprises (MSMEs) (Turner, 2024). Reason: It enables firms to access global markets, enhance operational efficiency, and improve competitiveness through digital platforms (Luo, & Zahra, 2023). Evidence: Reports from international development agencies indicate that MSMEs adopting digital tools are more likely to engage in cross-border trade compared to those relying on traditional methods (Massa, et al., 2023). Conclusion: Therefore, understanding the mechanisms that support digital transformation is essential for fostering MSME internationalization (Cha, et al., 2023). This research is important as it explores the role of digital literacy as a key enabler in this process, particularly within MSMEs in Jember, where digital adoption remains uneven despite growing global opportunities.

A general problem faced by MSMEs, especially in developing regions, is their limited ability to effectively adopt and utilize digital technologies for business expansion (Шлапак, et al., 2023). Many MSME actors struggle with inadequate digital skills, lack of access to training, and limited understanding of international market dynamics (Suprunenko, et al., 2024). This condition creates a significant barrier to entering global markets, even when digital platforms are readily available (Lawal, et al., 2025). Furthermore, the gap between technological advancement and human resource capability often results in underutilization of digital tools (Rachmad, 2025). As a consequence, MSMEs remain confined to local markets and miss opportunities for growth and competitiveness (Challoumis, 2024). This issue highlights the need to identify

key supporting factors, such as digital literacy, that can bridge this gap and empower MSMEs to participate more actively in the global economy (Mirzaye, & Mohiuddin, 2025).

Field observations in Jember reveal that while many MSMEs have begun adopting digital platforms such as social media and e-commerce, their usage is often limited to basic marketing functions. Most business owners lack the skills to leverage digital tools for strategic purposes, such as market analysis, customer relationship management, and international networking (Zeqiri, et al., 2025). Additionally, there is a tendency to rely on informal learning rather than structured digital training programs (Elias, et al., 2024). This results in inconsistent digital practices and limits the potential for scaling up operations to international markets (Alonge, et al., 2024). Moreover, infrastructure challenges and limited institutional support further hinder the digital transformation process (Uctu, et al., 2024). These phenomena indicate that digital adoption alone is insufficient without adequate digital literacy to maximize its benefits.

Previous studies have highlighted the importance of digital transformation in enhancing MSME performance and facilitating internationalization (Agbeyangi, et al., 2024). Research has shown that digital tools can reduce transaction costs, increase market reach, and improve innovation capacity (Sampson, & Annor, 2025). Additionally, digital literacy has been identified as a critical factor influencing the successful adoption of technology (Groenewald, et al., 2024). However, most existing studies tend to examine digital transformation and digital literacy separately, without fully exploring their interconnected roles in driving internationalization (Prokopenko, et al., 2024). Furthermore, many studies focus on large enterprises or developed countries, limiting their applicability to MSMEs in regions like Jember. This gap underscores the need for integrative research that examines how digital literacy specifically supports the digital transformation process in enabling MSMEs to access global markets.

The novelty of this study lies in its integrated approach, positioning digital literacy as a key supporting factor in the digital transformation process that drives MSME internationalization. Unlike previous research, this study emphasizes the interaction between technological adoption and human capability within a localized context (Magliocca, et al., 2025). By focusing on MSMEs in Jember, this research provides a more contextualized understanding of digital transformation challenges and opportunities in developing regions. Additionally, it offers a new perspective by highlighting digital literacy not merely as a complementary factor but as a strategic driver of internationalization (FakhrHosseini, et al., 2024). This state-of-the-art approach contributes to both theoretical development and practical solutions for enhancing MSME competitiveness in the global market.

Based on the above discussion, the research problem centers on how digital transformation influences the internationalization of MSMEs and the extent to which digital literacy supports this process. The main argument proposed is that digital transformation positively affects MSME

internationalization, and this relationship is strengthened by higher levels of digital literacy. In other words, digital literacy acts as a key enabler that enhances the effectiveness of digital transformation efforts. This study is expected to contribute theoretically by developing a more comprehensive model of MSME internationalization and practically by providing insights for policymakers and practitioners in designing targeted interventions to improve digital capabilities. Ultimately, this research aims to support the sustainable growth of MSMEs in Jember within the global digital economy.

RESEARCH METHOD

This study employs a qualitative approach using a case study design (Magliocca, et al., 2025). The qualitative method is chosen because the research aims to explore in depth the process of digital transformation and the role of digital literacy in encouraging MSME internationalization, which cannot be fully captured through numerical data alone (FakhrHosseini, et al., 2024). The case study design allows researchers to gain a comprehensive and contextualized understanding of real-life phenomena within specific settings (David, et al., 2023). This approach is particularly appropriate because MSMEs in Jember have unique characteristics influenced by local culture, resources, and technological readiness (Díaz-Arancibia, et al., 2024). By focusing on selected cases, the research can uncover patterns, challenges, and strategies used by MSMEs in adopting digital transformation. Therefore, this design provides rich, detailed insights that contribute to both theoretical development and practical implications.

The research is conducted in Jember Regency, East Java, Indonesia. This location is selected due to its growing number of MSMEs across various sectors, including agriculture, food processing, and creative industries (David, et al., 2023). Jember represents a developing region where digital transformation is emerging but not yet fully optimized. The area also has increasing access to digital infrastructure and government support programs aimed at MSME development. However, disparities in digital literacy levels among MSME actors still exist, making it a relevant setting for this study (Díaz-Arancibia, et al., 2024). Additionally, Jember's MSMEs have begun exploring broader markets, including potential international opportunities, but face challenges in scaling their operations. Therefore, Jember provides a suitable context to examine how digital literacy supports digital transformation in driving internationalization.

Data collection in this study is conducted using three primary techniques: in-depth interviews, observation, and documentation. In-depth interviews are carried out with MSME owners, managers, and relevant stakeholders to explore their experiences and perspectives on digital transformation and digital literacy. Observations are conducted to directly examine how digital tools are used in business operations, including marketing, communication, and transaction processes. Documentation involves collecting supporting data such as business reports, digital platform usage records, training materials, and government policy documents. These multiple data sources enable triangulation, enhancing

the richness and credibility of the findings. The combination of these techniques ensures a comprehensive understanding of the research phenomenon from different perspectives.

The data analysis process follows an interactive model consisting of data condensation, data display, and conclusion drawing/verification. Data condensation involves selecting, simplifying, and transforming raw data obtained from interviews, observations, and documentation into meaningful units (Schlunegger, et al., 2024). This includes coding and categorizing information based on relevant themes such as digital literacy, transformation processes, and internationalization strategies. Data display refers to organizing the condensed data into structured forms, such as matrices, charts, or narrative descriptions, to facilitate interpretation (Rosairo, 2023). Finally, conclusion drawing and verification involve interpreting the data to identify patterns, relationships, and insights while continuously validating findings through comparison with the data collected. This iterative process ensures that the analysis remains grounded in empirical evidence and produces valid conclusions.

Table 1. Techniques for Ensuring Data Validity

Validity Technique	Description
Source Triangulation	Comparing data from different informants (MSME owners, employees, experts)
Method Triangulation	Using interviews, observations, and documentation simultaneously
Member Checking	Confirming findings with respondents to ensure accuracy
Prolonged Engagement	Spending sufficient time in the field to gain deep understanding
Peer Debriefing	Discussing findings with colleagues or experts for objective evaluation

Source: Authors' own work

To ensure the credibility and trustworthiness of the data, this study applies several validation techniques. Source triangulation is used to compare information obtained from different respondents, ensuring consistency and reducing bias. Method triangulation strengthens findings by combining multiple data collection techniques (Miller, et al., 2023). Member checking is conducted by sharing preliminary findings with participants to verify accuracy. Prolonged engagement allows researchers to deeply understand the context and build trust with informants. Additionally, peer debriefing is used to obtain external perspectives and minimize subjectivity. These strategies collectively enhance the reliability and validity of the research findings.

FINDINGS AND DISCUSSION

Findings

The operational definition of the sub-theme “the role of digital literacy in supporting digital transformation for MSME internationalization” refers to the ability of MSME actors to understand, access, evaluate, and utilize digital

technologies strategically to expand their market reach beyond local boundaries. In the field, this concept is not limited to basic digital usage such as social media promotion, but extends to more advanced capabilities including digital marketing analytics, cross-border e-commerce utilization, customer engagement strategies, and digital financial transactions. Digital literacy in this context also includes adaptive learning behavior, where MSME actors continuously update their knowledge to respond to technological changes. Thus, digital literacy becomes a critical enabler that determines whether digital transformation efforts can effectively contribute to internationalization.

The first interview with an MSME owner revealed that digital tools initially were only used for simple promotion through social media platforms. The informant stated that *“we started by posting products online, but we did not understand how to reach international buyers or use analytics.”* This indicates that digital adoption was present but not yet optimized due to limited literacy. The researcher interprets this as a gap between access and capability, where technology is available but not fully utilized. It highlights that digital literacy is not merely about access but about strategic use. Without adequate understanding, digital transformation remains superficial and does not significantly contribute to market expansion.

A second informant, a younger MSME entrepreneur, provided a contrasting perspective by explaining that participation in digital training programs helped improve their ability to use e-commerce platforms and engage with international customers. The informant noted, *“after attending digital training, we learned how to use marketplaces, optimize keywords, and communicate with foreign buyers.”* This demonstrates that improved digital literacy directly enhances the effectiveness of digital transformation. The researcher interprets this as evidence that capacity-building initiatives play a crucial role in bridging the digital gap. It also suggests that digital literacy can accelerate MSME readiness for internationalization when supported by structured learning opportunities.

The process flow of this sub-theme begins with digital access, followed by digital literacy development, which then leads to effective digital transformation and ultimately supports internationalization. In this sequence, digital literacy acts as a mediating factor that determines whether digital tools can be used strategically. Without sufficient literacy, digital transformation efforts remain limited to basic functions. However, when literacy is enhanced, MSMEs can integrate digital tools into their business strategies, enabling them to reach broader markets. This flow highlights that digital literacy is not a secondary factor but a central driver in the transformation process.

Observational findings show that MSMEs with higher digital literacy levels tend to use multiple digital platforms simultaneously, including social media, e-commerce, and digital payment systems. These businesses also demonstrate more consistent branding, better customer interaction, and more structured online marketing strategies. In contrast, MSMEs with lower digital literacy rely on irregular posting and lack engagement with customers. The researcher interprets these observations as clear evidence that digital literacy

influences not only the adoption but also the quality and consistency of digital transformation practices. This reinforces the argument that digital literacy is essential for achieving meaningful business outcomes.

Restatement of the findings indicates that digital literacy significantly determines the success of digital transformation in supporting MSME internationalization. The data consistently show that MSMEs with higher digital literacy are more capable of leveraging technology to expand their market reach. The pattern emerging from the data suggests that digital literacy functions as a catalyst that transforms digital adoption into strategic business advantage. Without it, digital tools remain underutilized and fail to generate significant impact. Therefore, strengthening digital literacy is essential for maximizing the benefits of digital transformation among MSMEs.

Table 2. Ideal Influence of Digital Literacy in Supporting MSME Internationalization

Informant Position	Interview Excerpt	Indicator
MSME Owner	"We only used social media for posting products without understanding analytics"	Basic Digital Usage
Young Entrepreneur	"Training helped us use marketplaces and reach international buyers"	Advanced Digital Literacy
MSME Manager	"We started using digital payments and online customer service systems"	Digital Integration
Government Facilitator	"Many MSMEs need structured training to improve digital capabilities"	Capacity Building Support

Source: Authors' own work

The table illustrates varying levels of digital literacy among MSME actors and its influence on digital transformation outcomes. MSME owners with limited literacy tend to use digital tools only for basic purposes, resulting in minimal impact on business growth. In contrast, entrepreneurs who receive training demonstrate more advanced capabilities, enabling them to utilize digital platforms strategically. This highlights the importance of capacity-building initiatives in enhancing digital literacy. The presence of support from government facilitators further emphasizes the role of external interventions in improving MSME readiness for digital transformation.

Furthermore, the data reveal a clear pattern where higher levels of digital literacy are associated with more integrated and strategic use of digital technologies. MSMEs that develop digital skills progressively move from basic usage to full digital integration, including financial systems and customer engagement. This progression indicates that digital literacy is a dynamic capability that evolves over time. The pattern also suggests that sustained support and continuous learning are necessary to maintain competitiveness. Overall, the findings confirm that digital literacy plays a pivotal role in enabling MSMEs to successfully transform and expand into international markets.

Discussion

The findings of this study demonstrate that digital literacy plays a central role in enabling the digital transformation process of MSMEs and ultimately supports their internationalization. This result is consistent with existing literature that emphasizes digital literacy as a fundamental capability for technology adoption and effective utilization (Rachmad, 2025). Previous studies argue that MSMEs with higher levels of digital competence are more likely to engage in global markets due to their ability to leverage e-commerce platforms, digital marketing tools, and cross-border communication (McDermott, 2023). The present study confirms these arguments within the context of MSMEs in Jember, showing that digital literacy is not merely a supporting factor but a critical determinant of successful transformation. However, unlike some prior studies that treat digital literacy as a complementary variable, this research positions it as a key enabler that directly shapes the effectiveness of digital transformation efforts.

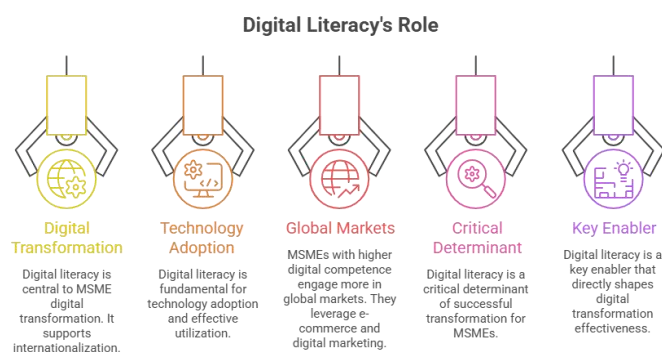


Figure 1 : Digital Literacy's Role

Source: Authors' own work

Furthermore, the study reveals that digital transformation among MSMEs often begins with basic digital adoption, such as social media usage, but does not automatically lead to internationalization (Massa, et al., 2023). This finding aligns with earlier research indicating that technology adoption alone is insufficient without the necessary skills to utilize it strategically. However, this study extends the literature by providing empirical evidence from field data that highlights the gap between access and capability. While previous studies have largely focused on infrastructure and technology availability, this research shows that the main challenge lies in the limited ability of MSME actors to optimize these tools. This suggests that the success of digital transformation depends not only on technological resources but also on human capital readiness, particularly digital literacy.

Another important finding is the role of training and capacity-building programs in enhancing digital literacy among MSME actors. This is consistent with prior research that highlights the importance of continuous learning and skill development in the digital economy. The study shows that MSMEs that participate in structured training programs demonstrate more advanced use of digital platforms, including international market engagement. However, this research adds a new dimension by illustrating how such training directly contributes to the internationalization process, rather than merely improving

operational efficiency. This distinction is important because it positions digital literacy development as a strategic investment rather than a technical necessity, thereby expanding the theoretical understanding of MSME development in the digital era.

Theoretically, this study contributes to the literature by integrating digital transformation and digital literacy into a unified framework that explains MSME internationalization. It challenges the traditional view that focuses primarily on technological adoption and instead emphasizes the interplay between technology and human capability. By doing so, the study provides a more comprehensive model that captures the complexity of digital transformation processes in developing regions. Practically, the findings suggest that policymakers and practitioners should prioritize digital literacy programs as part of MSME development strategies. Providing access to technology without adequate training may lead to suboptimal outcomes, whereas combining both elements can significantly enhance competitiveness and global market participation.

Overall, this study highlights that digital literacy functions as a catalyst that transforms digital tools into strategic assets for MSMEs. The findings suggest that without sufficient digital literacy, digital transformation remains superficial and fails to produce meaningful business outcomes. Conversely, when MSME actors possess strong digital capabilities, they are better equipped to navigate international markets and sustain growth. This has important implications for future research and practice, as it underscores the need for a more holistic approach to digital transformation that integrates both technological and human dimensions. Therefore, strengthening digital literacy should be considered a priority for achieving sustainable MSME internationalization in the evolving global economy.

CONCLUSION

This study explores the digital transformation process in encouraging the internationalization of MSMEs, with a particular emphasis on the role of digital literacy as a key supporting factor. The findings reveal that digital transformation alone is insufficient to drive internationalization unless it is supported by adequate digital literacy among MSME actors. Digital literacy enables business owners to strategically utilize digital technologies, moving beyond basic adoption toward more advanced applications such as digital marketing, e-commerce optimization, and cross-border customer engagement. Thus, digital literacy functions as a critical enabler that transforms technological access into tangible business outcomes, particularly in expanding market reach to the international level.

Theoretically, this study contributes to the existing body of knowledge by integrating digital transformation and digital literacy into a comprehensive framework within the context of MSMEs in a developing region. It extends prior research by positioning digital literacy not merely as a complementary variable but as a central mechanism that determines the effectiveness of digital transformation in achieving internationalization. This study also highlights the

importance of human capital readiness in the digital economy, offering a more nuanced understanding of how technological and behavioral factors interact in shaping MSME competitiveness.

From a practical perspective, the findings suggest that policymakers, practitioners, and development agencies should prioritize digital literacy enhancement as part of MSME empowerment programs. Efforts to expand digital infrastructure and access must be accompanied by structured training, mentoring, and continuous learning initiatives to ensure optimal utilization. Without such support, MSMEs risk remaining at a basic level of digital adoption, limiting their ability to compete globally. Therefore, integrated strategies that combine technology provision with capacity building are essential for fostering sustainable MSME growth and international expansion.

Despite its contributions, this study has several limitations. It focuses on a specific geographical area, which may limit the generalizability of the findings to other regions with different socio-economic contexts. Additionally, the qualitative case study approach, while rich in insight, may not capture broader statistical patterns. Future research is encouraged to adopt mixed-method or quantitative approaches, include comparative studies across regions, and explore additional variables such as institutional support, innovation capability, and digital ecosystem readiness. Overall, this study underscores the strategic importance of digital literacy in unlocking the full potential of digital transformation for MSME internationalization in the evolving global economy.

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