

***BREAKING DIGITAL BARRIERS: THE ROLE OF FINANCIAL LITERACY IN
ACCELERATING INCLUSIVE FINANCING FOR SMEs***

**MENGHILANGKAN HAMBATAN DIGITAL: PERAN LITERASI KEUANGAN
DALAM MEMPERCEPAT PEMBIAYAAN INKLUSIF BAGI UKM**

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ABSTRACT

This study aims to analyze the influence of financial literacy on digital adoption by examining the mediating roles of perceived digital barriers and business characteristics in Small and Medium Enterprises (SMEs). Data were collected through a survey using structured questionnaires and analyzed using Structural Equation Modeling (SEM) with WarpPLS 8.0. The findings reveal that financial literacy has a positive and significant effect on perceived digital barriers, business characteristics, and digital adoption. Furthermore, perceived digital barriers and business characteristics significantly influence digital adoption. The R-square value of 0.672 indicates that financial literacy, perceived digital barriers, and business characteristics collectively explain 67.2% of the variance in digital adoption. These results highlight that financial literacy not only strengthens business management practices but also fosters critical awareness of technological barriers, thereby enabling SMEs to be better prepared to embrace digital adoption and access inclusive financial services.

Keywords: Financial Literacy; Perceived Digital Barriers; Business Characteristics; Digital Adoption; SMEs; Fintech; Financial Inclusion; Technology Acceptance.

ABSTRAK

Penelitian ini bertujuan untuk menganalisis pengaruh literasi keuangan terhadap adopsi digital dengan meneliti peran mediasi dari persepsi hambatan digital dan karakteristik usaha pada Usaha Kecil dan Menengah (UKM). Data dikumpulkan melalui survei menggunakan kuesioner terstruktur dan dianalisis menggunakan Model Persamaan Struktural (SEM) dengan WarpPLS 8.0. Temuan penelitian menunjukkan bahwa literasi keuangan memiliki pengaruh positif dan signifikan terhadap persepsi hambatan digital, karakteristik usaha, dan adopsi digital. Selain itu, hambatan digital yang dirasakan dan karakteristik usaha secara signifikan memengaruhi adopsi digital. Nilai R-kuadrat sebesar 0,672 menunjukkan bahwa literasi keuangan, hambatan digital yang dirasakan, dan karakteristik usaha secara kolektif menjelaskan 67,2% varians dalam adopsi digital. Hasil ini menyoroti bahwa literasi keuangan tidak hanya memperkuat praktik manajemen usaha, tetapi juga menumbuhkan kesadaran kritis terhadap hambatan teknologi, sehingga memungkinkan UMKM untuk lebih siap dalam mengadopsi teknologi digital dan mengakses layanan keuangan inklusif.

Kata kunci: Literasi Keuangan; Hambatan Digital yang Dirasakan; Karakteristik Bisnis; Adopsi Digital; UMKM; Fintech; Inklusi Keuangan; Penerimaan Teknologi.

INTRODUCTION

Digital transformation has emerged as an urgent imperative for Small and Medium Enterprises (SMEs) in Indonesia to sustain competitiveness in an increasingly digitalized global economy. Despite their economic significance, empirical studies indicate that Indonesian SMEs significantly lag behind larger corporations in digital technology adoption, creating a "digital divide" that threatens their long-term

viability (Affandi et al., 2024; Faiz et al., 2024). This gap is critical, as recent findings from Pontianak indicate that the ability of SMEs to adopt digital technology and apply entrepreneurial management principles contributes significantly to business success (Febrianawati, Puspitasari, & Hidayat, 2024).

A primary constraint identified in recent literature is the low level of digital financial literacy, which impedes

SMEs from accessing formal financial services and leveraging fintech solutions (Rohaeni et al., 2025). This issue is particularly acute in key economic regions such as West Java, Banten, and East Java, which serve as hubs for Indonesia's creative economy (Kasim, 2024). Furthermore, while the COVID-19 pandemic accelerated the general uptake of digital tools, it simultaneously exposed structural vulnerabilities and widened the gap between formal, digitally-ready SMEs and informal enterprises (Jaelani et al., 2023). Consequently, understanding the mechanisms that drive or inhibit fintech adoption has become a critical research priority.

Current academic discourse posits that financial literacy functions as a pivotal mediator in the relationship between technology adoption and business performance. For instance, a study of 150 SME owners in Banten Province demonstrated that digital financial literacy significantly enhances access to formal financial services, which subsequently strengthens financial performance (Rohaeni et al., 2025). Similarly, large-scale analysis involving 5,035 SMEs across Indonesia revealed a strong positive correlation between digital adoption and financial literacy, suggesting a reciprocal relationship where technology usage reinforces financial knowledge (Affandi et al., 2024). This aligns with Febrianawati et al. (2024), who found that digital literacy and entrepreneurial skills are key determinants of SME performance in the culinary sector.

Theoretical frameworks in this domain typically integrate the Technology-Organization-Environment (TOE) framework with the Technology Acceptance Model (TAM) and Diffusion of Innovation (DOI) theory (Mubeen et al., 2025). These studies

generally agree that technological factors (relative advantage), organizational factors (readiness), and environmental factors (competitive pressure) are key drivers of adoption (Faiz et al., 2024; Panjaitan et al., 2025).

However, despite the growing body of literature, significant research gaps remain. First, most existing studies employ cross-sectional designs that fail to capture the dynamic, cognitive processes explaining how financial literacy influences adoption decisions over time (Nagy et al., 2025). Second, prior research has predominantly focused on formal SMEs, leaving the digital adoption behaviors of informal enterprises which constitute a vast portion of the Indonesian economy underexplored (Rahayu et al., 2023). Third, while variables like financial inclusion and trust have been examined as mediators (Gosal & Nainggolan, 2023; Hilmawati & Kusumaningtyas, 2021), the moderating and mediating roles of perceived barriers and business characteristics within an integrated model remain insufficiently understood in the Indonesian context (Mutya & Ilankadhir, 2024). Finally, financial literacy is often operationalized as a unidimensional construct, whereas recent scholarship argues for a multidimensional approach encompassing knowledge, attitude, and behavior (Kusumawati et al., 2024).

Addressing these gaps, this study integrates the Resource-Based View (RBV) with the TOE framework to construct a comprehensive conceptual model. This model posits financial literacy as a strategic intangible resource that influences digital adoption not only directly but also indirectly through the formation of business characteristics and the cognitive processing of digital barriers. By validating these pathways, this research

contributes to the literature on financial inclusion (Ajide, 2020; Kurniasari et al., 2025) and provides actionable insights for policymakers aiming to accelerate digital transformation in emerging economies.

Theoretical Foundation: Integrating RBV and TOE

This study synthesizes the Resource-Based View (RBV) and the Technology-Organization-Environment (TOE) framework. RBV asserts that a firm's competitive advantage stems from internal resources that are valuable, rare, inimitable, and non-substitutable (Barney, 1991). In this context, financial literacy is conceptualized as a critical intangible resource that enhances managerial capabilities. This is supported by Febrianawati et al. (2024), who argue that digital and entrepreneurial literacy are strategic intangible resources that drive SME performance. Complementing this, the TOE framework explains how technological, organizational, and environmental contexts influence adoption decisions (Mubeen et al., 2025). The integration of these theories suggests that adoption is driven by the interplay between internal capacity (financial literacy) and the evaluation of external contexts (digital barriers).

Financial Literacy and Perceived Digital Barriers

Financial literacy extends beyond basic numeracy; it encompasses the ability to process economic information and make informed decisions regarding risk and capital management (Lusardi & Mitchell, 2014). Contrary to the assumption that knowledge reduces risk perception, this study argues that higher financial literacy increases critical awareness of digital risks (e.g., cybersecurity, hidden costs). Rohaeni et

al. (2025) suggest that literate individuals are more cognizant of potential pitfalls in fintech adoption. Thus, financial literacy is hypothesized to heighten the perception of digital barriers, transforming ignorance into calculated caution. H1: Financial literacy has a positive and significant effect on perceived digital barriers.

Financial Literacy and Business Characteristics

Financial literacy equips business owners with the skills to manage cash flow, maintain records, and plan for growth (Kusumawati et al., 2024). These competencies directly influence business characteristics, such as organizational formality and operational readiness. As noted by Faiz et al. (2024), organizational readiness is a key determinant of innovation. Moreover, entrepreneurial literacy, which includes financial management capability, has been shown to significantly impact SME performance (Febrianawati et al., 2024). Therefore, financial literacy is expected to shape more robust and adaptive business characteristics. H2: Financial literacy has a positive and significant effect on business characteristics.

Determinants of Digital Adoption

The ultimate decision to adopt digital technology depends on the alignment of resources and perceived benefits. Financial literacy facilitates the cost-benefit analysis required for adoption (Affandi et al., 2024). Furthermore, while barriers are typically seen as deterrents, recent studies in emerging economies suggest that identified barriers can drive proactive problem-solving and adoption, provided the perceived utility is high (Mutya & Ilankadhir, 2024; Rahayu et al., 2023). Similarly, favorable business

characteristics (e.g., adaptability, clear management structure) serve as necessary organizational antecedents for successful technology integration (Faiz et al., 2024; Nagy et al., 2025). Febrianawati et al. (2024) reinforce this by stating that digital literacy enables businesses to leverage technology and adopt innovative practices.

H3: Financial literacy has a positive and significant effect on digital adoption.

H4: Perceived digital barriers have a significant effect on digital adoption.

H5: Business characteristics have a positive and significant effect on digital adoption.

RESEARCH METHODS

This study utilizes a quantitative survey design to test the hypothesized causal relationships. The population comprises SME operators in Indonesia with a minimum of two years of operation. A purposive sampling technique was employed to select respondents who: (1) operate active enterprises with recorded financial transactions, and (2) currently use or have used digital platforms (e.g., e-wallets, POS systems, e-commerce). This method aligns with similar studies, such as Febrianawati et al. (2024), which used quantitative surveys to measure digital literacy's impact on SME performance.

Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) via WarpPLS 8.0 software. PLS-SEM was selected for its robustness in handling complex structural models and non-normal data distributions, which are common in social science research (Hair et al., 2021). The analysis proceeded in two stages: measurement model evaluation (validity and reliability) and structural model evaluation (path coefficients and R-square).

RESULTS AND DISCUSSIONS

Research Findings

Measurement Model Evaluation

The outer model evaluation confirmed that all indicators met the convergent validity criteria, with factor loadings exceeding 0.50 and significance levels at $p < 0.001$. Instrument reliability was established, as Composite Reliability (CR) and Cronbach's Alpha (CA) values for all variables Financial Literacy (CR = 0.903), Perceived Digital Barriers (CR = 0.919), Business Characteristics (CR = 0.915), and Digital Adoption (CR = 0.889) exceeded the recommended thresholds of 0.70 and 0.60, respectively (Hair et al., 2021).

Structural Model Evaluation

The structural model demonstrated substantial explanatory power. The model explained 72.5% of the variance in Perceived Digital Barriers ($R^2 = 0.725$), 82.2% in Business Characteristics ($R^2 = 0.822$), and 67.2% in Digital Adoption ($R^2 = 0.672$). Predictive relevance (Q^2) values were positive for all endogenous constructs, indicating the model's predictive validity. Goodness-of-fit indices (APC, ARS, AARS with $p < 0.001$; AVIF < 5) confirmed a robust model fit.

Hypothesis Testing

Tabel 1. Hypothesis Testing

	Path	Path Coefficient	p-value
H1	Financial Literacy → Perceived Digital Barriers	$\beta = 0.852$	$p < 0.001$
H2	Financial Literacy → Business Characteristics	$\beta = 0.257$	$p < 0.001$
H3	Financial Literacy → Digital Adoption	$\beta = 0.820$	$p < 0.001$
H4	Perceived Digital Barriers → Digital Adoption	$\beta = 0.327$	$p < 0.001$
H5	Business Characteristics → Digital Adoption	$\beta = 0.374$	$p < 0.001$

Sumber: Output Warppls, 2025

Discussion

The Cognitive Role of Financial Literacy

The finding that financial literacy serves as a primary driver of digital adoption ($\beta = 0.820$) aligns with Affandi et al. (2024), who observed that financial knowledge correlates strongly with technology uptake across Indonesian provinces. This confirms that financial literacy provides the necessary cognitive framework for SMEs to evaluate and accept fintech solutions (Mitta & Pamungkas, 2022). Furthermore, Febrianawati et al. (2024) similarly found that entrepreneurial literacy, which encompasses financial aspects, significantly influences SME performance and digital readiness.

Interestingly, financial literacy also strongly increases perceived digital barriers ($\beta = 0.852$). This supports the view of Rohaeni et al. (2025) and Naveed and Ali (2024), who argue that financial literacy enhances risk awareness. Rather than fostering naive optimism, financial literacy enables entrepreneurs to identify potential challenges (e.g., security risks, fees), leading to a more realistic and cautious assessment of the digital landscape. This phenomenon represents a paradox: heightened awareness of barriers does not deter adoption but instead fosters more strategic decision-making.

Paradox of Digital Barriers

Contrary to traditional Technology Acceptance Model (TAM) predictions where barriers inhibit adoption, this study found a positive relationship between perceived barriers and adoption ($\beta = 0.327$). This finding echoes Mutya and Ilankadhir (2024) and Rahayu et al. (2023), who found that awareness of obstacles (such as regulations or infrastructure gaps) can motivate proactive adaptation rather than avoidance in emerging economies.

SMEs that recognize these barriers are likely viewing them as operational challenges to be managed rather than insurmountable blockades, consistent with the resilience observed in Indonesian SMEs (Cahyadi et al., 2024).

This counterintuitive finding suggests that in the Indonesian SME context, perceived barriers trigger problem-solving behaviors and active information-seeking rather than avoidance. SME operators with financial literacy recognize that barriers exist but develop strategies to overcome them, viewing these obstacles as part of the digital transformation journey rather than reasons to abstain from adoption.

Organizational Readiness and Business Characteristics

The positive impact of business characteristics on adoption ($\beta = 0.374$) validates the TOE framework's organizational dimension (Faiz et al., 2024; Mubeen et al., 2025). Financial literacy contributes to this by professionalizing business operations ($\beta = 0.257$), such as improving record-keeping and financial planning (Kusumawati et al., 2024). This organizational maturity acts as a facilitator, making the integration of fintech solutions smoother and more sustainable (Nagy et al., 2025). This is consistent with Febrianawati et al. (2024), who emphasize that managerial capability is a strong predictor of SME success in the digital era.

The indirect pathway through business characteristics (Financial Literacy \rightarrow Business Characteristics \rightarrow Digital Adoption) accounts for a substantial portion of the total effect. This suggests that the development of robust organizational practices is a critical intermediate step in the digital transformation journey. SMEs that improve their internal management

systems enabled by higher financial literacy create the organizational infrastructure necessary for successful technology adoption.

Integrated Mechanisms of Digital Adoption

The research model reveals that financial literacy operates through multiple pathways to influence digital adoption:

1. Direct pathway: Financial literacy directly drives adoption decisions through improved cost-benefit analysis ($\beta = 0.820$).
2. Barrier-awareness pathway: Financial literacy increases barrier perception ($\beta = 0.852$), which paradoxically motivates more strategic adoption efforts ($\beta = 0.327$).
3. Organizational-readiness pathway: Financial literacy strengthens business characteristics ($\beta = 0.257$), which subsequently facilitates smoother technology integration ($\beta = 0.374$).

The cumulative effect of these three pathways creates a comprehensive driver of digital adoption among SMEs. This integrated framework addresses the complexity of SME decision-making and explains why financial literacy is such a critical factor in emerging economies, where structural barriers and organizational constraints are significant.

CONCLUSION AND SUGGESTION

Conclusion

This study provides empirical evidence that financial literacy is a foundational driver of digital adoption among Indonesian SMEs. The results demonstrate that financial literacy operates through multiple pathways: directly driving adoption, enhancing organizational readiness (business characteristics), and heightening critical

awareness of risks (perceived barriers). The model's high explanatory power (67.2%) suggests that accelerating digital transformation requires a holistic approach that combines technical skills with financial cognitive capabilities.

The counterintuitive finding that perceived barriers positively influence adoption represents a significant contribution to technology adoption literature in emerging economy contexts. This suggests that in developing countries with structural challenges, awareness of barriers does not impede adoption but instead leads to more deliberate and strategic implementation decisions.

Recommendations

For Policymakers:

Programs aiming to increase digital inclusion must integrate financial literacy education that specifically addresses digital risk management (Rohaeni et al., 2025; Jaelani et al., 2023). Rather than promoting adoption without addressing genuine concerns, policymakers should fund comprehensive financial literacy programs that transparently discuss both opportunities and challenges of fintech adoption. Additionally, government support for digital infrastructure should be complemented by targeted financial education initiatives.

For Fintech Providers:

User interfaces should be designed to lower perceived barriers through transparency and education, catering to users with varying levels of financial sophistication (Rizal et al., 2019). Fintech companies should invest in user education and support services that help SMEs understand risk management within digital financial ecosystems. Clear communication about security measures, fee structures, and

regulatory protections will help financially literate entrepreneurs make informed adoption decisions.

For SMEs:

Business owners should view financial literacy investment as a strategic necessity to navigate the complexities of the digital economy (Kusumawati et al., 2024). This includes not only basic financial management skills but also digital financial literacy. SMEs should prioritize organizational improvements in record-keeping and financial planning, which will strengthen their readiness to adopt and successfully implement digital technologies.

For Future Research:

Future studies should explore longitudinal effects of financial literacy on sustained adoption and business performance. Research examining the moderating roles of demographic factors (age, education), firm characteristics (size, sector), and contextual factors (geographic location, market competition) would provide deeper insights. Additionally, investigating the effectiveness of different financial literacy intervention programs would inform policy decisions.

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