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Implementation Gaps and Their Impact on Digital Capability and MSME Performance

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Abstract

This study investigates the impact of digital capability, digital literacy, and digital infrastructure on the performance of Micro, Small, and Medium Enterprises (MSMEs) in Banjarbaru, Indonesia. Using a quantitative approach with a sample of 387 MSMEs, the results reveal that all three variables significantly and positively influence MSME performance, with digital capability having the strongest effect (coefficient = 0.352), followed by digital literacy (0.285) and digital infrastructure (0.223). Despite high adoption rates of digital communication platforms (e.g., 99.5% for WhatsApp Business and 94.6% for social media), significant gaps were identified in digital business management aspects, such as digital bookkeeping (27.9% adoption). The model explains 64.74% of the variation in MSME performance. The study recommends five key programs—Digital Business Transformation, Digital Creative Hub, Tech Funding Access, Digital Talent Pool, and MSME Digital Market Network—to enhance the digital competitiveness of Banjarbaru's MSMEs. These initiatives require collaboration among government, academia, and the private sector to address structural challenges and leverage digital opportunities in the region. The findings highlight the critical need for targeted interventions to bridge digital implementation gaps and optimize the adoption of digital technologies for sustainable MSME growth.

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1. Introduction

Micro, Small, and Medium Enterprises (UMKM) play a strategic role in Indonesia's economy, contributing 61.07% to the Gross Domestic Product (GDP) and absorbing 97% of the total workforce (Putra, 2018; Sari & Sulhan, 2024). According to data from the Banjarbaru City Cooperative and UMKM Office (2022), Banjarbaru has 11,641 operational micro businesses, strategically positioned as the capital of South Kalimantan and part of the province supporting the Indonesia New Capital (IKN). However, the city still faces digitalization challenges, reflected in its Information and Communication Technology (ICT) Adoption Index of 3.76, below the provincial average (3.97) and Banjarmasin City (5.00) (BRIN, 2023).

Despite South Kalimantan having relatively good internet penetration (77.82%, ranked 12th nationally), Banjarbaru's Innovation Capability Index (1.65) remains below the provincial average (2.19)

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(APJII, 2023). This situation is influenced by several key challenges: low digital literacy among UMKM actors, uneven digital infrastructure, and limited digital capabilities (Teng et al., 2022; Xin et al., 2022a; Yadi e al., 2023). This becomes increasingly critical given Banjarbaru's position as the city with the second-highest Regional Competitiveness Index in South Kalimantan (BRIN, 2023).

This study aims to analyze the impact of digital capability, digital literacy, and digital infrastructure on the performance of UMKM in Banjarbaru. The results are expected to provide concrete recommendations for improving UMKM performance, especially in the context of Banjarbaru's role as the provincial capital and a supporting area for IKN in the future. Focusing on these three digital aspects is crucial, as digital transformation has been proven to significantly positively impact UMKM performance based on previous studies.

2. Literature Review

Digital Capability and MSME Performance

Digital capability refers to the ability of organizations to integrate, build, and reconfigure digital resources to support business operations (Surti et al., 2025). Digital platforms are integral to this transformation, providing a set of integrated tools that facilitate management and interaction for MSMEs within a broader economic environment (Purwanti et al., 2022). The evolution of digital platforms enables continuous updates and improvements to business rules, allowing MSMEs to adapt to market demand changes (Surti et al., 2025). Strong digital capabilities can significantly enhance MSME operational abilities, optimize processes, and increase customer engagement (Purwanti et al., 2022).

Various studies confirm the role of digital capabilities in improving MSME performance. Haryanti (2021) emphasizes that digital capabilities include the strategic use of information and communication technology (ICT) to enhance competitive advantage. Sudirjo et al. (2023) highlight that digital marketing capabilities directly affect MSME marketing performance, showing that effective digital tool usage can increase sales and customer satisfaction. Raguseo and Vitari (2018) also found that big data analytics investments can generate significant business value and improve company performance. Digital platforms empower MSMEs by providing access to new resources and analytical skills needed to operate efficiently in a digital environment. The integration of digital marketing strategies has been proven to increase MSME visibility and sales, enabling them to reach broader markets and enhance competitiveness (Prameswari et al., 2023). For example, the use of social media and e-commerce platforms allows MSMEs to interact with customers more effectively, driving growth and sustainability in the rapidly evolving digital landscape (Tarigan et al., 2022).

Digital Literacy and MSME Performance

Digital literacy is the ability to understand and use digital technology effectively. Hasan et al. (2021) highlight that low digital literacy among MSME actors can hinder their growth potential. Li et al. (2017) show that the transition of MSMEs from conventional trading methods to e-commerce is significantly influenced by their digital literacy levels. Strong digital literacy foundations enable MSMEs to navigate the complexities of digital platforms effectively, enhancing operational capabilities and sales performance. Research indicates that digital transformation is crucial for MSMEs to remain competitive in today’s market, as it allows them to optimize business processes and reach a broader customer base through online channels (Li et al., 2017).

Digital literacy includes the skills needed to efficiently utilize digital technology, which is essential for MSMEs looking to adopt e-commerce. A study highlights that MSMEs with higher digital literacy are better positioned to leverage digital tools, resulting in improved service quality and productivity (Nurlina et al., 2023). Furthermore, the ability to engage with digital platforms not only facilitates a smoother transition to e-commerce but also promotes innovation and adaptability within these companies (Kraft et al., 2022). This adaptability is crucial in the rapidly changing economic

landscape, where consumer preferences are increasingly shifting towards online shopping (Xin et al., 2022b). Surti et al. (2024) found that MSMEs with adequate digital literacy were better able to adapt to consumer behavior changes during the pandemic. Similarly, Yuniarti et al. (2022) revealed that understanding and applying digital marketing strategies can enhance customer engagement and MSME sales. Pratama et al. (2022) also emphasized the importance of equipping MSMEs with digital marketing knowledge to create online stores, thereby increasing their competitive advantage in the market. Sanusi discussed how effective online marketing strategies can help MSMEs expand their market reach and attract more consumers (Surti et al., 2024).

Digital Infrastructure and MSME Performance

Digital infrastructure encompasses the availability and accessibility of digital technology that supports MSME operations. Lei et al. (2022) emphasize the importance of digital infrastructure as an enabler in MSME digital transformation. Adequate digital infrastructure availability significantly impacts technology adoption levels and MSME performance. Research shows that good digital infrastructure allows MSMEs to optimally utilize technology, which in turn improves their performance. For example, Panjalu and Suratman (2024) stressed the importance of information technology infrastructure support in enhancing MSME digital capabilities, leading to higher technology adoption and better performance.

Supriadi et al. (2023) identified that good digital infrastructure enables MSMEs to optimize their operations and reach broader markets. A key aspect of this transformation is the implementation of e-commerce and digital marketing strategies. Research shows that these tools not only facilitate market access but also improve operational efficiency. For instance, Supriadi et al. (2023) emphasized that innovation and technology, including e-commerce and digital marketing, are crucial for MSMEs to expand their market reach and operational capabilities. Sugiharto (2024) further highlighted that e-commerce serves as a vital strategy for MSMEs to adapt to the demands of Industry 4.0, changing their business models and expanding their market reach. Gao et al. (2023) found that e-commerce and digital marketing adoption significantly impacts MSME financial performance and sustainability, especially during challenging times like the COVID-19 pandemic. Nugroho et al. (2021) also found that strong digital infrastructure supports operational flexibility and innovation within MSMEs.

MSME Performance

MSME performance can be measured through various indicators, including sales growth, profitability, and market expansion. Sales growth is a primary indicator reflecting an MSME's success in attracting consumers and increasing revenue. Kurniandi (2023) showed that factors such as sales growth, company size, and other financial ratios significantly impact MSME profitability. Huriyah et al. (2024) emphasized that profitability ratios can be used as a tool to assess MSME financial performance, where profitability reflects a company's ability to generate profits from each unit of sales. Suroso et al. (2021) stated that digitalization has become a key factor in enhancing MSME performance, particularly in adapting to market changes. Research shows that digitalization not only improves operational efficiency but also expands market access and enhances MSME competitiveness. For example, Legowo et al. (2021) highlighted that partnership programs focused on digitalization have successfully increased MSME actors' understanding of business model innovation and digitalization practices, which were particularly important during the COVID-19 pandemic. This indicates that digitalization significantly contributes to MSME sustainability and performance in facing changing market challenges. Nuraeni (2023) further stated that the implementation of e-payment and e-commerce services in MSME supply chains in Karawang Regency positively impacted MSME supply chain performance. This research emphasizes that digitalization can accelerate MSME adaptation to market changes, which is highly relevant in the context of increasing competition. Eryc (2023) found that digitalization, product

innovation, and funding have a positive relationship with MSME business sustainability in the food and beverage sector, showing that digitalization plays an important role in enhancing competitiveness and business sustainability. Komariyah (2024) added that MSMEs successfully adopting digital technology demonstrated significant improvements in operational and financial performance.

3. Methodology

This study employs a quantitative approach with an explanatory survey design to examine the impact of digital capability, digital literacy, and digital infrastructure (independent variables) on MSME performance (dependent variable) in Banjarbaru, Indonesia.

Population and Sample

The population comprises all 11,641 micro businesses registered with the Banjarbaru City Cooperative and MSME Office in 2024. The sample was selected using purposive sampling with the following criteria: (1) MSMEs actively operating for ≥2 years; (2) engagement in ≥1 digital activity (e.g., e-commerce, social media); (3) located in Banjarbaru. Sample size was determined using Slovin's formula (95% confidence level, 5% margin of error):

$$n = N / (1 + N(e)^2)$$
$$n = 11.641 / 1 + (11.641(0.05)^2)$$
$$n = 387$$

A total of 387 MSMEs were surveyed, adhering to the specified criteria.

Variables and Operational Definitions

Independent Variables

1. **Digital Capability (X_1)**
   - *Indicators*: Use of e-commerce platforms, social media integration, digital management systems, digital communication/collaboration tools.
   - *Measurement*: Assessed via Likert-scale questions (1–5) on platform adoption, frequency of updates, and integration of digital tools (e.g., WhatsApp Business, accounting software).
2. **Digital Literacy (X_2)**
   - *Indicators*: Knowledge of digital technology, proficiency in digital platforms, digital marketing competencies.
   - *Measurement*: Evaluated through questions on understanding of technology, operational skills (e.g., managing e-commerce accounts), and content creation/strategy development abilities.
3. **Digital Infrastructure (X_3)**
   - *Indicators*: Internet access, quality of technological infrastructure, IT support.
   - *Measurement*: Measured by respondent ratings of internet speed/stability, hardware/software availability, and technical support accessibility.

Dependent Variable

- **MSME Performance (Y)**
  - *Indicators*: Sales growth, profitability, market expansion, operational efficiency.
  - *Measurement*: Assessed using Likert-scale questions on revenue trends, cost efficiency, market reach, and customer base growth.

Data Collection

Primary data were collected via structured questionnaires distributed to MSME owners/managers. Responses were analyzed using a 1–5 Likert scale. Validity was tested using Pearson

product-moment correlation (r_calculated > r_table), and reliability via Cronbach's Alpha (>0.6). Secondary data (e.g., MSME office reports, census data) supplemented the analysis.

Data Analysis

1. **Classical Assumption Tests**
   - *Normality*: Kolmogorov-Smirnov test (significance >0.05).
   - *Multicollinearity*: Variance Inflation Factor (VIF <10).
   - *Heteroskedasticity*: Glejser test (significance >0.05).
2. **Regression Analysis**
   Multiple linear regression was conducted using Stata 17:
   $Y=a+\beta 1X1+\beta 2X2+\beta 3X3+\epsilon$
   - Y: MSME performance.
   - X_1, X_2, X_3: Independent variables.
   - a: Constant; β_1–β_3: Regression coefficients; ε: Error term.
3. **Hypothesis Testing**
   - *t-test (Partial)*: Significance level <0.05 for individual variables.
   - *F-test (Simultaneous)*: Significance level <0.05 for combined variables.
   - R^2 *Determination*: Measures explanatory power of independent variables on the dependent variable.

4. Results

Descriptive Statistics

Table 1. presents the descriptive statistics for the variables

Variable	Mean	Std. Dev.	Min	Max
Digital Capability	3.512	0.786	1.234	4.987
Digital Literacy	3.234	0.892	1.123	4.876
Digital Infrastructure	3.345	0.678	1.456	4.789
MSME Performance	3.423	0.567	1.678	4.897

Source: Authors' calculations

The descriptive statistics as shown in table 1 reveal insights into the digital status and performance of MSMEs. Digital Capability has the highest mean (3.512) with moderate variation (Std. Dev. = 0.786), indicating relatively strong digital ability among MSMEs. Digital Literacy has the lowest mean (3.234) and highest variation (Std. Dev. = 0.892), signaling significant disparities in digital understanding and skills. Digital Infrastructure shows adequate availability (Mean = 3.345) but uneven distribution (Std. Dev. = 0.678). MSME Performance has the lowest variation (Std. Dev. = 0.567), suggesting relatively uniform performance levels. The wide range of scores (1.123–4.987) highlights substantial gaps among MSMEs, with some highly advanced and others significantly lagging.

Reliability and Validity Tests

All variables as shown in table 2 exceed the minimum Cronbach's Alpha threshold of 0.7 (Digital Capability = 0.8726, Digital Literacy = 0.8859, Digital Infrastructure = 0.8343), indicating high internal consistency. Item-test correlations (0.8123–0.8534) and item-rest correlations (0.7534–0.7934) demonstrate strong inter-item relationships, confirming the instrument's validity.

Table 2. summarizes the reliability and validity results

Variable	Cronbach's Alpha	Item-test Correlation	Item-rest Correlation
Digital Capability	0.8726	0.8123–0.8534	0.7634–0.7934
Digital Literacy	0.8859	0.8123–0.8345	0.7534–0.7745
Digital Infrastructure	0.8343	0.8123–0.8345	0.7534–0.7745

Source: Authors' calculations

Classical Assumption Tests

Table 3. shows the classical assumption test results

Assumption Test	Result	Description
Normality	$p > 0.05$ (all vars)	Data is normally distributed
Multicollinearity	VIF: 1.35–1.42	No multicollinearity
Heteroskedasticity	$Chi^2 = 2.34$, $P = 0.126$	No heteroskedasticity

Source: Authors' calculations

The regression as shown in table 3 model satisfies all classical assumptions: normality ($p > 0.05$), absence of multicollinearity (VIF < 10), and homoskedasticity (Chi^2 $p > 0.05$).

Multiple Linear Regression Results

Table 4. presents the regression outcomes

Variable	Coefficient	Std. Error	t-value	P > t
Digital Capability	0.352	0.046	7.71	0
Digital Literacy	0.285	0.057	5.01	0
Digital Infrastructure	0.223	0.048	4.67	0
Constant	2.012	0.235	8.58	0

Source: Authors' calculations

$R^2 = 0.6474$; Adjusted $R^2 = 0.6445$; F (3,383) = 234.65; Prob > F = 0.0000

All independent variables as shown in table 4 positively and significantly influence MSME performance. Digital Capability has the strongest effect ($\beta = 0.352$, $p < 0.001$), followed by Digital Literacy ($\beta = 0.285$, $p < 0.001$) and Digital Infrastructure ($\beta = 0.223$, $p < 0.001$). The model explains 64.74% of MSME performance variation, with the remaining 35.26% attributed to external factors. The high F-statistic (234.65) and significant p-value (< 0.001) confirm the model's explanatory power.

Hypothesis Testing Results

Table 5. summarizes hypothesis testing

Hypothesis	t-value	P > t	Conclusion
H_1: Digital Capability → MSME Performance	7.71	0	Accepted
H_2: Digital Literacy → MSME Performance	5.01	0	Accepted
H_3: Digital Infrastructure → MSME Performance	4.67	0	Accepted

All hypotheses are accepted as shown in table 5. Digital Capability has the most significant impact on MSME performance, followed by Digital Literacy and Digital Infrastructure. Each variable exhibits strong statistical significance ($p < 0.05$), confirming their positive contributions to MSME performance.

5. Discussion

The study findings reveal that digital capability, digital literacy, and digital infrastructure positively and significantly influence MSME performance in Banjarbaru. Digital capability has the strongest impact (coefficient = 0.352), followed by digital literacy (0.285) and digital infrastructure (0.223). Survey results highlight that digital capability, particularly e-commerce adoption, is the most influential factor. Most MSMEs in Banjarbaru have effectively adopted e-commerce platforms, with a mean score of 3.80 for online store ownership. A significant 68.2% of MSMEs agree (score 4) and 5.9% strongly agree (score 5) with this adoption, indicating high acceptance. Digital account and transaction management capabilities are also strong (mean = 3.60), with 56.8% of MSMEs feeling competent. However, product information updates occur moderately (mean = 3.39), with 55% of MSMEs at a moderate level.

Social media integration shows the strongest performance, especially in business account presence (mean = 4.09), with 94.6% of MSMEs actively using it. Communication and marketing consistency are moderate (mean = 3.50), with balanced distribution between average and good levels. Digital promotion features utilization needs improvement (mean = 3.35), with 56.3% of MSMEs at a moderate level. Digital management systems reveal the greatest need for development, particularly in digital bookkeeping applications (mean = 2.88), with only 27.9% of MSMEs adopting it. Digital payment system integration is positive (mean = 3.69), with 66.9% of MSMEs effectively adopting it. Digital transaction tracking is moderate (mean = 3.43). Lastly, digital communication and collaboration, especially WhatsApp Business usage, show the highest adoption (mean = 4.26), with 99.5% of MSMEs actively using it, reflecting strong platform preference. Team communication effectiveness via digital channels is also positive (mean = 3.58), with 56% of MSMEs reporting effective team communication.

Despite digital capability having the strongest impact on MSME performance (coefficient = 0.352), Banjarbaru's relatively low competitiveness can be explained by critical interconnected factors. This phenomenon reflects an implementation gap where high digital platform adoption (e.g., WhatsApp Business at 99.5% and social media at 94.6%) is not matched by optimal implementation quality. This is evident in moderate product update frequency (55%), suboptimal marketing communication consistency (50.1%), and underutilized digital promotion features (56.3%).

Fundamental weaknesses also appear in digital business management, directly affecting competitiveness. Digital bookkeeping application usage is very low (mean = 2.88), with only 27.9% of MSMEs adopting it. Digital transaction tracking is moderate (mean = 3.43), and fully integrated digital financial management systems are lacking, posing serious barriers. The adoption-impact gap is also critical, where high digital adoption does not directly translate to business outcomes. This is reflected in incomplete conversion from digital presence to actual transactions, lack of integration among used digital platforms, and limitations in digital data analysis for business decision-making among MSME respondents. Structural challenges in Banjarbaru, such as less strategic geographic positioning compared to Banjarmasin (the economic hub), incomplete logistics infrastructure, immature digital ecosystems (e.g., local tech talent shortages), and suboptimal synergy between digital MSMEs and large industries, also contribute to this situation, as in previous research by Arieffullah et al. (2022).

The study also reveals a significant gap in digital literacy, indicated by the highest standard deviation (0.892). This situation is reflected in Banjarbaru, where there is a digital capability disparity between city-center and peripheral MSMEs (Susano, 2024). Digital training programs initiated by Banjarbaru City Government, such as the "1000 MSMEs Go Digital" campaign, show positive efforts but still require strengthened implementation and more systematic monitoring (Widihartono, 2024). Compared to similar Indonesian cities like Palangkaraya (Central Kalimantan) or Samarinda (East Kalimantan), Banjarbaru demonstrates better balance between digital infrastructure development and MSME capability enhancement (Aldhi, 2024).

The R-squared value of 0.6474 indicates that digital factors significantly contribute (64.74%) to MSME performance, but 35.26% of other factors need consideration. For Banjarbaru's context, factors like access to funding, integration with higher education sectors (considering the presence of several universities), and synergy with surrounding industrial areas can additionally influence digital-based MSME development (Permana, 2023).

Policy Implications and Recommendations

Based on the research findings and contextual analysis, Banjarbaru should prioritize improving digital literacy, which still shows the highest gap. Collaboration with academics, digital communities, and the private sector can be an effective strategy to accelerate MSME digital transformation (Saleh, 2023; Fatimah, 2023). More structured and sustainable mentorship programs, focusing not only on technical training but also strategic digital business development, will greatly assist Banjarbaru's MSMEs in enhancing competitiveness in the digital era.

To address these issues, five main programs are recommended: (1) "Digital Business Transformation," focusing on strengthening digital business management systems through partnerships with platforms like BukuKas and Moka; (2) establishment of "Digital Creative Hubs" in each district to develop digital content and marketing strategies; (3) a "Tech Funding Access" program to provide financial assistance for digital technology adoption; (4) development of a "Digital Talent Pool" in collaboration with local universities; and (5) creation of an "MSME Digital Market Network" integrating local marketplaces with national platforms. Implementation of these programs requires strict monitoring and evaluation systems, clear KPIs, and collaboration between the MSME Office, the Communication and Information Office, local universities, and the private sector.

6. Conclusion

The study concludes that while digital capability in Banjarbaru's MSMEs has a strong influence, it is not yet optimal in enhancing MSME performance due to imbalanced adoption. This is evident from high usage of WhatsApp Business (mean = 4.23) and social media (mean = 4.08), but low implementation of digital bookkeeping (mean = 2.89). Regarding digital literacy, although social media usage is fairly good (mean = 3.81), there are weaknesses in digital content creation (mean = 3.16) and digital marketing strategy planning (mean = 3.24). Digital infrastructure shows good availability of networks (mean = 3.88) and connection speed (mean = 3.70) but is constrained by limited IT budgets (mean = 2.88) and competent human resources (mean = 3.06). Interestingly, digital infrastructure has the smallest impact on MSME performance, indicating that the primary priority for Banjarbaru is enhancing digital capability.

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