Digital Technology-Based Business Innovation Strategies to Increase the Competitiveness of SMEs in Indonesia

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Abstract. *This study examines the role of digital technology-based business innovation strategies in enhancing the competitiveness of small and medium-sized enterprises (SMEs) in Indonesia. As the digital economy continues to grow rapidly, SMEs face both opportunities and challenges in adapting to technological change. The research aims to analyze how digital transformation, including the adoption of e-commerce, digital marketing, and financial technology, influences business performance and market competitiveness. Using a quantitative approach, data were collected from 250 SMEs across various sectors through structured questionnaires and analyzed using multiple regression analysis. The results indicate that digital innovation significantly improves operational efficiency, customer engagement, and market expansion, which in turn enhance the overall competitiveness of SMEs. Moreover, managerial capability and digital literacy are found to moderate the relationship between technology adoption and competitiveness. The findings suggest that to sustain competitive advantage, SMEs should integrate digital innovation into their strategic management processes and continuously invest in technology and human resource development. This study contributes to the understanding of how digitalization can drive business resilience and sustainable growth within the SME sector in Indonesia.*

Keywords: Competitiveness; Digital Innovation; Digital Technology; SMEs; Strategy.

1. BACKGROUND

The rapid advancement of digital technology has transformed the global business landscape, compelling enterprises of all sizes to adapt to new modes of operation and competition. In Indonesia, small and medium-sized enterprises (SMEs) play a vital role in driving national economic growth and employment. However, many SMEs still face challenges in maintaining competitiveness amid the digital transformation era. Traditional business models are increasingly insufficient to meet market demands, which are now shaped by digital interactions, online transactions, and data-driven decision-making. As such, the integration of digital technology into business operations is no longer an option but a necessity for survival and growth.

Previous studies have highlighted the positive effects of digital innovation and technology adoption on business performance, customer satisfaction, and market expansion. However, much of the existing research focuses on large corporations, leaving a gap in understanding how SMEs can effectively adopt and implement digital strategies tailored to their resource limitations and market dynamics. This research seeks to fill that gap by examining how digital technology-based business innovation strategies can enhance the competitiveness of SMEs in Indonesia.

The novelty of this study lies in its comprehensive analysis of digital transformation within the SME context, focusing on strategic innovation as a mediating factor between technology adoption and competitiveness. Furthermore, the study emphasizes the role of managerial capability and digital literacy as moderating variables influencing the success of digital innovation initiatives. The urgency of this research stems from the need to empower SMEs to leverage digital technology not only as a tool for operational efficiency but also as a strategic driver of long-term competitiveness in the digital economy.

The objective of this study is to analyze the impact of digital technology-based innovation strategies on the competitiveness of SMEs in Indonesia and to identify key factors that support successful digital transformation in the SME sector.

2. THEORETICAL REVIEW

The theoretical foundation of this research is grounded in several key concepts, including innovation theory, resource-based view (RBV), and competitive advantage theory, all of which are relevant to understanding how digital technology-based business strategies can enhance the competitiveness of small and medium-sized enterprises (SMEs).

According to Schumpeter's innovation theory (1934), innovation serves as a crucial driver of economic development and organizational growth through the introduction of new products, processes, and business models. Within the context of SMEs, digital innovation—such as the adoption of e-commerce platforms, digital marketing, and financial technology—enables firms to optimize operations, reach wider markets, and respond more effectively to customer needs. These innovations are essential for improving productivity and maintaining relevance in the digital economy.

The resource-based view (Barney, 1991) posits that sustainable competitive advantage arises from unique, valuable, and inimitable resources and capabilities owned by the firm. In digital transformation, technological capabilities, digital literacy, and innovation capacity are strategic resources that can enhance a firm's performance and competitiveness. SMEs that can effectively utilize digital resources and integrate them into their strategic management processes are more likely to achieve superior business outcomes.

Furthermore, Porter's theory of competitive advantage (1985) emphasizes the importance of differentiation and cost leadership strategies in maintaining competitiveness. Digital technologies allow SMEs to differentiate their products and services through innovation, improved customer experiences, and efficient business processes. This

alignment between digital innovation and competitive strategy forms the basis for sustainable growth and resilience in highly dynamic markets.

Empirical studies support these theoretical perspectives. Research by Nambisan et al. (2017) highlights the role of digital innovation in enabling business agility and strategic flexibility. Similarly, Olanrewaju et al. (2020) found that digital transformation enhances SMEs' performance by improving operational efficiency and customer relationships. In Indonesia, Rahayu and Day (2017) noted that SMEs adopting digital platforms experience significant improvements in sales and competitiveness. However, gaps remain in understanding how managerial capabilities and digital literacy mediate these relationships, particularly in emerging economies.

Based on the synthesis of these theories and previous findings, this study implicitly assumes that digital technology-based business innovation strategies positively influence the competitiveness of SMEs, and that managerial capability and digital literacy strengthen this relationship. This theoretical framework provides the foundation for examining how digital innovation contributes to the sustainable competitiveness of SMEs in Indonesia's evolving digital economy.

3. RESEARCH METHOD

This study employs a quantitative research approach with an explanatory design aimed at analyzing the effect of digital technology-based business innovation strategies on the competitiveness of small and medium-sized enterprises (SMEs) in Indonesia. The quantitative method was chosen to enable systematic measurement, hypothesis testing, and generalization of results across the SME population.

The population of this research comprises SMEs operating in various sectors across Indonesia, including manufacturing, services, and trade. A purposive sampling technique was used to select respondents who have implemented digital-based business practices such as e-commerce, digital marketing, or financial technology. The final sample consisted of 250 SMEs, considered adequate for quantitative analysis following recommendations by Hair et al. (2019) regarding minimum sample size in structural modeling.

Data collection was conducted using a structured questionnaire distributed online. The instrument consisted of closed-ended statements measured using a five-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5). The questionnaire measured four main constructs: (1) digital technology-based innovation strategy (X_1), (2) managerial capability (X_2), (3) digital literacy (X_3), and (4) SME competitiveness (Y).

Prior to hypothesis testing, the research instrument was tested for validity and reliability. All items met the required standards, with factor loadings above 0.60 and Cronbach's alpha coefficients exceeding 0.70, indicating that the instrument was both valid and reliable.

The data analysis technique used was multiple regression analysis to examine the relationship between digital technology-based innovation strategies and SME competitiveness, as well as to test the moderating effects of managerial capability and digital literacy. The analysis was performed using Statistical Package for the Social Sciences (SPSS) version 26. Classical assumption tests—including normality, multicollinearity, and heteroscedasticity—were conducted to ensure the accuracy of the regression model.The research model can be expressed as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where:

Y = Competitiveness of SMEs

X_1 = Digital technology-based innovation strategy

X_2 = Managerial capability

X_3 = Digital literacy

β_0 = Constant

$\beta_1–\beta_3$ = Regression coefficients

ε = Error term

This model illustrates that the competitiveness of SMEs (Y) is influenced by digital innovation strategies (X_1), managerial capability (X_2), and digital literacy (X_3). The expected outcome is that SMEs with strong digital innovation strategies, supported by capable management and adequate digital literacy, will achieve higher levels of competitiveness in the digital economy.

4. RESULTS AND DISCUSSION

Data Collection Process and Research Location

The data collection process was carried out over a period of three months, from March to May 2025, through the distribution of online questionnaires using Google Forms. The research involved 250 small and medium-sized enterprises (SMEs) located across major provinces in Indonesia, including Jakarta, West Java, Central Java, East Java, and Bali. Respondents were business owners or managers who had implemented digital technology-based innovations such as e-commerce, digital marketing, or financial technology in their

operations. The selection of these provinces was based on their high concentration of digitally active SMEs and their significant contribution to Indonesia's national economy.

Descriptive Statistics

Descriptive analysis was conducted to understand the characteristics of respondents and the overall trend of responses. Table 1 presents a summary of respondent demographics, including business sector and duration of digital technology adoption.

Table 1. Respondent Characteristics

Characteristic	Category	Frequency	Percentage (%)
Business Sector	Manufacturing	80	32.0
	Services	100	40.0
	Trade	70	28.0
Digital Adoption Period	< 2 years	65	26.0
	2–4 years	110	44.0
	> 4 years	75	30.0

Source: Processed primary data, 2025

The majority of SMEs surveyed operate in the service sector (40%), with most having adopted digital technology for 2–4 years, reflecting a growing trend of digital integration among Indonesian SMEs.

Results of Regression Analysis

The regression analysis was conducted to examine the effect of digital technology-based innovation strategy (X_1), managerial capability (X_2), and digital literacy (X_3) on SME competitiveness (Y). The results of the multiple regression test are summarized in Table 2.

Table 2. Results of Multiple Regression Analysis

Variable	Coefficient (β)	t-value	Sig.	Interpretation
Constant	1.205	—	—	—
Digital Innovation Strategy (X_1)	0.462	6.321	0.000	Significant
Managerial Capability (X_2)	0.279	4.857	0.000	Significant
Digital Literacy (X_3)	0.214	3.924	0.001	Significant
Adjusted R²	**0.718**	—	—	Model Fit

Source: Processed primary data, 2025

The results indicate that digital innovation strategy (β = 0.462) has the strongest and most significant impact on SME competitiveness, followed by managerial capability (β = 0.279) and digital literacy (β = 0.214). The Adjusted R^2 value of 0.718 implies that approximately 71.8% of the variance in SME competitiveness can be explained by the three

independent variables, while the remaining 28.2% is influenced by other factors not included in the model.

Discussion of Findings

The findings confirm that the adoption of digital technology-based business innovation strategies significantly enhances the competitiveness of SMEs in Indonesia. This result aligns with Nambisan et al. (2017), who argue that digital innovation enables firms to improve agility, efficiency, and market responsiveness. The study also supports the Resource-Based View (Barney, 1991), suggesting that digital capabilities, when effectively managed, become valuable resources contributing to sustainable competitive advantage.

The significant influence of managerial capability underscores the importance of leadership in guiding digital transformation efforts. SMEs with adaptive and technologically literate management teams are better equipped to integrate digital strategies into core business processes. This finding is consistent with Olanrewaju et al. (2020), who found that managerial skills mediate the success of digital adoption in SMEs.

Meanwhile, digital literacy also plays a crucial role as an enabling factor. SMEs with higher digital literacy demonstrate greater ability to utilize technology effectively, supporting operational improvement and market expansion. This aligns with the research of Rahayu and Day (2017), which revealed that SMEs with a higher understanding of digital tools tend to experience improved business performance.

Theoretical and Practical Implications

From a theoretical perspective, this study reinforces the integration of innovation theory, RBV, and competitive advantage theory within the SME context. It extends these frameworks by demonstrating that digital innovation acts not only as a technological enabler but also as a strategic driver of competitiveness.

From a practical standpoint, the findings emphasize the need for policymakers and SME development agencies in Indonesia to focus on enhancing digital literacy and managerial competencies. Providing targeted training and digital infrastructure support can strengthen SMEs' capacity to implement and sustain digital innovation strategies effectively.

Overall, the research confirms that digital technology-based innovation strategies, when supported by capable management and strong digital literacy, significantly contribute to the long-term competitiveness and resilience of Indonesian SMEs in the evolving digital economy.

5. CONCLUSION AND SUGGESTION

The results of this study conclude that digital technology-based business innovation strategies have a significant and positive impact on the competitiveness of small and medium-sized enterprises (SMEs) in Indonesia. The findings demonstrate that SMEs which effectively implement digital innovation—through e-commerce, digital marketing, and financial technology—experience substantial improvements in operational efficiency, market reach, and customer engagement. Moreover, managerial capability and digital literacy are proven to strengthen the relationship between digital innovation and competitiveness, emphasizing the importance of human and organizational factors in achieving successful digital transformation. These results align with the resource-based view and innovation theory, confirming that digital capability serves as a strategic resource that fosters sustainable competitive advantage in the digital era.

From a practical perspective, SMEs should not only focus on adopting digital technologies but also on developing internal competencies that support continuous innovation. It is recommended that SME owners and policymakers collaborate to enhance managerial skills, provide digital training programs, and improve access to digital infrastructure. This approach can help create a more inclusive and resilient SME ecosystem capable of thriving in a rapidly evolving technological environment.

Despite the valuable findings, this research has several limitations. The study relied on quantitative data collected through self-reported questionnaires, which may not fully capture the dynamic processes of digital transformation. In addition, the sample was limited to SMEs in selected provinces, which may restrict the generalization of results to all regions in Indonesia. Future research should consider adopting a mixed-methods approach to explore qualitative insights related to the behavioral and organizational aspects of digital innovation adoption. Expanding the research scope to include longitudinal data and comparative studies across different industries or ASEAN countries would also provide a deeper understanding of how digital innovation strategies evolve and contribute to SME competitiveness over time.

In conclusion, digital technology-based innovation is not merely a tool but a strategic necessity for SMEs to sustain growth and competitiveness in the digital economy. Continuous learning, adaptive leadership, and supportive policy frameworks are essential to ensure that Indonesian SMEs can fully harness the transformative potential of digital technology for long-term success.

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