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Digital Transformation and MSME Competitiveness: Examining the Mediating Effect of Innovation Management (A PLS-SEM Study in Indonesian MSMEs)

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Abstract

Digital transformation has become a strategic necessity for Micro, Small, and Medium Enterprises (MSMEs), particularly in emerging economies where firms face resource and managerial limitations. This study examines the influence of Information Technology Capability, Innovation Orientation, and Managerial Capability on MSME competitiveness, with Innovation Management as a mediating variable. Using a quantitative approach, data were collected from 400 MSME owners and managers in the Pasar Lama area of Tangerang City and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings indicate that organizational capabilities significantly influence both Innovation Management and MSME competitiveness. Innovation Management was found to be the strongest predictor of competitiveness and played a significant mediating role in the relationship between organizational capabilities and competitiveness. These results suggest that sustainable competitiveness in MSMEs depends not only on digital technology adoption but also on the ability to effectively manage innovation processes. This study contributes to the understanding of how innovation management strengthens MSME competitiveness during digital transformation in emerging economy contexts.

Keywords

MSME Competitiveness; Innovation Management; Digital Transformation; Organizational Capabilities; Digital Capability; Mediation Model; PLS-SEM

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1. INTRODUCTION

Digital transformation has become a strategic necessity for Micro, Small, and Medium Enterprises (MSMEs), particularly in emerging economies where MSMEs contribute significantly to employment generation, economic resilience, and regional development. In Indonesia, MSMEs account for more than 99% of business entities and play a substantial role in national economic growth, making their competitiveness an important strategic issue. However, despite the rapid expansion of digital technologies, many MSMEs continue to experience difficulties in transforming digital adoption into sustainable competitive advantage.

Recent studies indicate that digital transformation alone is insufficient to improve competitiveness unless firms possess adequate organizational and managerial capabilities to integrate digital technologies into business processes and strategic decision-making activities (Gautam et al., 2025; Valdez-Juárez et al., 2024; Van Hoang et al., 2025). MSMEs frequently face limitations related to resources, managerial expertise, and innovation systems, which reduce the effectiveness of digital transformation initiatives. Consequently, the central challenge of digital transformation lies not only in technology adoption but also in the firm's ability to systematically manage innovation processes that convert organizational capabilities into competitive outcomes.

From a theoretical perspective, this study is grounded in the Resource-Based View (RBV) and Dynamic Capabilities (DC) perspectives. RBV explains that firms achieve competitive advantage through valuable, rare, inimitable, and non-substitutable resources, whereas DC emphasizes the firm's ability to integrate, reconfigure, and transform those resources in response to environmental change. In this study, RBV provides the foundation for understanding organizational capabilities as strategic resources, while DC explains how these capabilities are mobilized through adaptive and innovation-oriented processes. Accordingly, innovation management is positioned as a dynamic organizational mechanism that transforms internal capabilities into sustainable MSME competitiveness (Alrub & Sánchez-Cañizares, 2025; Saputra et al., 2024; Valdez-Juárez & Castillo-Vergara, 2021)

The conceptual logic of this study can therefore be summarized as follows: organizational capabilities (RBV) → dynamic capability processes (DC) → innovation management → MSME competitiveness. This integration provides a clearer explanation of how MSMEs generate strategic value during digital transformation.

Previous studies on MSME competitiveness generally focus on three major perspectives. First, capability-based studies emphasize the importance of information technology capability and managerial capability in improving organizational adaptability and business performance (Al Dhaheri et al., 2024; Heubeck, 2023; Tahat, 2021). Second, innovation-oriented studies highlight the role of innovation practices in strengthening competitiveness and strategic positioning (AlTaweel & Al-Hawary, 2021; de Andrés-Sánchez et al., 2022). Third, digital transformation studies argue that technological adoption contributes to competitiveness when supported by organizational readiness and managerial effectiveness (Gautam et al., 2025; Valdez-Juárez et al., 2024).

Although these studies generally agree that organizational capabilities are important for competitiveness, their findings remain inconsistent regarding the mechanism through which competitiveness is achieved. Some studies report direct effects of organizational capabilities on competitiveness, whereas others identify indirect relationships mediated by innovation-related variables (AlTaweel & Al-Hawary, 2021; de Andrés-Sánchez et al., 2022; Nuryakin & Qamari, 2026).

Furthermore, most prior studies conceptualize innovation as an organizational outcome rather than as a structured managerial process. This inconsistency indicates that the process through which organizational capabilities are transformed into sustainable competitiveness remains insufficiently explained, particularly in the context of MSMEs undergoing digital transformation in emerging economies.

This study argues that innovation management differs conceptually from innovation itself. Innovation reflects organizational output, whereas innovation management represents the structured managerial process used to organize, coordinate, and implement innovation activities. Consequently, the absence of effective innovation management may explain why digital transformation does not always generate sustainable competitiveness among MSMEs. In this context, technology adoption alone is insufficient unless firms possess the managerial capability to systematically manage innovation processes.

Accordingly, this study addresses the research gap by examining innovation management as a process-based mediating construct linking information technology capability, innovation orientation, managerial capability, and MSME competitiveness within the context of digital transformation. This issue is particularly relevant in highly competitive urban MSME clusters, where increased digital adoption has not consistently resulted in long-term competitive advantage due to limitations in organizational capabilities and innovation management practices.

This study aims to analyze the effects of information technology capability, innovation orientation, and managerial capability on MSME competitiveness, as well as to examine the mediating role of innovation management in these relationships. Specifically, this study investigates how organizational capabilities influence innovation management, how innovation management affects MSME competitiveness, and whether innovation management functions as a mediating mechanism linking organizational capabilities and competitiveness. The conceptual framework illustrating the relationships among variables is presented in Figure 1.

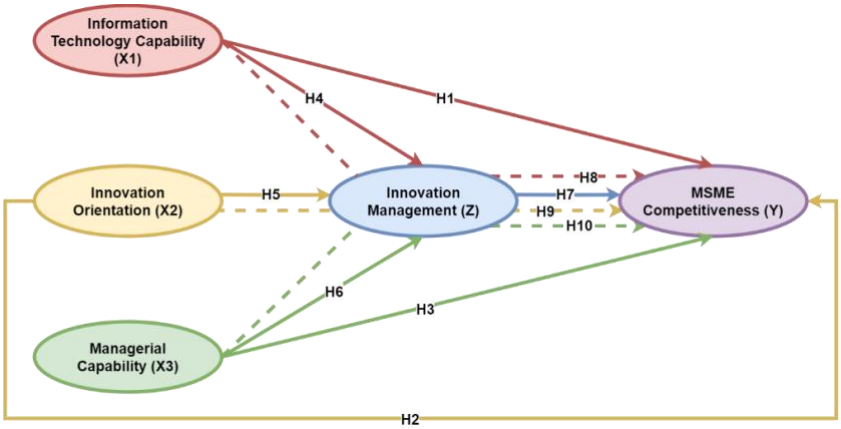

Figure 1. Conceptual Framework

H1: Information Technology Capability (X1) has a positive effect on MSME Competitiveness (Y).
H2: Innovation Orientation (X2) has a positive effect on MSME Competitiveness (Y).
H3: Managerial Capability (X3) has a positive effect on MSME Competitiveness (Y).
H4: Information Technology Capability (X1) has a positive effect on Innovation Management (Z).
H5: Innovation Orientation (X2) has a positive effect on Innovation Management (Z).
H6: Managerial Capability (X3) has a positive effect on Innovation Management (Z).
H7: Innovation Management (Z) has a positive effect on MSME Competitiveness (Y).
H8: Innovation Management (Z) mediates the effect of Information Technology Capability (X1) on MSME Competitiveness (Y).
H9: Innovation Management (Z) mediates the effect of Innovation Orientation (X2) on MSME Competitiveness (Y).
H10: Innovation Management (Z) mediates the effect of Managerial Capability (X3) on MSME Competitiveness (Y).

This study offers both theoretical and practical contributions. **Theoretically, it extends the integration of RBV and DC perspectives by proposing a process-based mediation model in which innovation management functions as the central mechanism transforming organizational capabilities into competitiveness. Practically, the study provides insights for policymakers and MSME practitioners regarding the importance of systematically managing innovation rather than relying solely on digital technology adoption.** The novelty of this study lies in positioning innovation management as a dynamic managerial process that mediates the relationship between organizational capabilities and MSME competitiveness during digital transformation.

2. METHODS

This study employs a confirmatory quantitative approach aimed at examining the causal relationships among variables within a structural model developed based on the synthesis of Resource-Based View and Dynamic Capabilities theories. This approach is chosen because it is capable of producing objective and measurable findings, as well as enabling empirical hypothesis testing regarding the influence of organizational capabilities on MSME competitiveness through the mechanism of innovation management.

The research design used in this study is a causal design employing Partial Least Squares Structural Equation Modeling (PLS-SEM). The research model consists of three exogenous variables, namely information technology capability (X1), innovation orientation (X2), and managerial capability (X3), one mediating variable, innovation management (Z), and one endogenous variable, MSME competitiveness (Y). PLS-SEM was selected because the study is prediction-oriented, focuses on mediation analysis, and

involves relatively complex relationships among latent constructs with reflective indicators. In addition, PLS-SEM is considered more appropriate than covariance-based SEM (CB-SEM) because it accommodates non-normal data distributions and heterogeneous respondent characteristics more effectively while emphasizing prediction and exploratory model development rather than theory confirmation.

The population in this study consists of MSMEs located in the Pasar Lama area of Tangerang City. A purposive sampling technique was employed to select MSME owners or managers who are actively involved in decision-making, utilize information technology in business operations, and engage in innovation activities. This approach ensured that respondents possessed relevant experience related to digital transformation and innovation practices. The study targeted 400 respondents to enhance statistical power and improve the robustness of the PLS-SEM analysis. The sample size also exceeds the minimum recommendation for PLS-SEM, thereby strengthening the reliability of the empirical findings. However, since purposive sampling is a non-probability sampling technique, the findings may have limited generalizability beyond MSMEs with similar characteristics and digital transformation experiences.

The research instrument used is a structured questionnaire with a five-point Likert scale, designed to measure information technology capability, innovation orientation, managerial capability, innovation management, and MSME competitiveness. The measurement items were adapted from previously validated studies and adjusted to the MSME context to ensure construct relevance and contextual suitability. The instrument has undergone expert judgment validation to ensure clarity, relevance, and alignment of the indicators with the research constructs. Prior to the main survey, a pilot test involving a limited number of MSME respondents was conducted to evaluate item clarity, wording consistency, and preliminary reliability of the measurement scales.

Each construct and measurement indicator was adapted from previously validated scales in prior studies, as summarized in Table 1.

Table 1. Operationalization of Variables

Variables	Indicators	References
Information Technology Capability (X1)	1. Availability of IT infrastructure (devices/applications/internet) for business operations. 2. Ability to use digital systems/applications for sales, marketing, and customer service. 3. Ability to manage business data (records, transactions, customers) digitally. 4. Integration of IT into business processes (inventory, payments, ordering, basic accounting).	(Gautam et al., 2025; Jie et al., 2025; Lu & Shaharudin, 2024; Merín-Rodrigáñez et al., 2024; Saputra et al., 2024; Sarfo et al., 2025; Valdez-Juárez & Castillo-Vergara, 2021; Van Hoang et al., 2025)

Variables	Indicators	References
	5. Security and reliability of IT usage (backup, access, data control) in the business.	
Innovation Orientation (X2)	1. MSMEs' commitment to continuously seek new ideas (products/services/processes). 2. Willingness to try new approaches despite risks (innovative risk-taking). 3. Speed in responding to market/customer trends through updates. 4. Openness to customer/partner feedback for improvement. 5. Internal support (time/cost) for experimentation and development.	(AlTaweel & Al-Hawary, 2021; Gani et al., 2025; Held et al., 2025; Heubeck, 2023; Lu & Shaharudin, 2024; Valdez-Juárez et al., 2024)
Managerial Capability (X3)	1. Ability to formulate business goals and plans (planning). 2. Ability to organize resources (human resources, materials, time, capital) efficiently. 3. Ability to make data-driven decisions (sales/cost/demand data). 4. Ability to build networks/partnerships (suppliers, communities, digital platforms). 5. Leadership and control capability (performance monitoring, evaluation, improvement).	(AlTaweel & Al-Hawary, 2021; Appiah & Essuman, 2024; Heubeck, 2023; Kahveci, 2025; Makhloufi et al., 2021; Saputra et al., 2024; Sarfo et al., 2025)
Innovation Management (Z)	1. Innovation planning: the existence of clear innovation targets/agenda (product, process, marketing). 2. Idea management: mechanisms for collecting, selecting, and prioritizing ideas. 3. Innovation implementation: ability to transform ideas into actual changes (testing–launching). 4. Evaluation & learning: measurement of innovation outcomes and continuous improvement. 5. Allocation of innovation resources: determination of budget/time/human resources for innovation.	(AlTaweel & Al-Hawary, 2021; de Andrés-Sánchez et al., 2022; Held et al., 2025; Merín-Rodrigáñez et al., 2024; Sarfo et al., 2025; Valdez-Juárez & Castillo-Vergara, 2021)
MSME Competitiveness (Y)	1. Differentiation: uniqueness of products/services compared to competitors in the market. 2. Quality & value: customer perception of quality and value for money. 3. Market responsiveness: speed in fulfilling demand/handling complaints and adapting to trends. 4. Market performance: growth in customers/sales/repeat purchases relative to competitors.	(Heubeck, 2023; Lu & Shaharudin, 2024; Makhloufi et al., 2021; Saputra et al., 2024; Valdez-Juárez & Castillo-Vergara, 2021; Van Hoang et al., 2025)

Variables	Indicators	References
	5. Sustainability of advantage: ability to maintain business position in competition.	

Data analysis in this study was conducted using the PLS-SEM approach, which includes evaluation of the measurement model (outer model) and the structural model (inner model). The outer model assessment involved convergent validity, discriminant validity, and construct reliability using Composite Reliability and Cronbach's Alpha. Discriminant validity was additionally assessed using the Heterotrait–Monotrait Ratio (HTMT), with values below 0.90 indicating adequate discriminant validity among constructs.

The inner model assessment evaluated the relationships among variables through the coefficient of determination (R^2), predictive relevance (Q^2), and direct and indirect effects, including the mediating role of innovation management. In addition, effect size (f^2) was assessed to determine the substantive impact of exogenous constructs on endogenous variables, while model fit was evaluated using the Standardized Root Mean Square Residual (SRMR) criterion.

The analysis was performed using SmartPLS software with a bootstrapping procedure of 5,000 resamples to assess the significance of path coefficients and mediating effects. Hypothesis significance was determined based on t-statistics and p-values with a significance threshold of 0.05. Accordingly, the analytical procedure was expected to provide comprehensive empirical evidence regarding the structural relationships and mediating mechanisms influencing MSME competitiveness.

3. FINDINGS AND DISCUSSION

This study employs a confirmatory quantitative approach based on Resource-Based View (RBV) and Dynamic Capabilities (DC) to analyze the influence of organizational capabilities, including information technology capability, innovation orientation, and managerial capability, on MSME competitiveness through the mediating role of innovation management in the context of digital transformation. Empirical testing was conducted using the PLS-SEM method to identify both direct and indirect relationships among variables.

The study involved 400 MSME owners and managers in the Pasar Lama area of Tangerang City selected through purposive sampling based on predefined criteria, namely involvement in business decision-making, utilization of digital technology, and participation in innovation activities. After data screening and validation, 400 valid responses out of the initial 420 questionnaires were retained for analysis to ensure data consistency and quality.

Table 2. Respondent Profile

Characteristics	Dominant Category	Percentage
Education Level	Bachelor's Degree	55%
Age	25-35 years	45%
Position	Business Owners	70%
Business Sector	Culinary	45%
Business Duration	1-3 years	30%
Number of Employees	1-5 employees	60%
Technology Adoption	Basic-Intermediate	82.5%
Monthly Revenue	IDR 10-50 million	45%

The respondent profile indicates that the majority of MSMEs are relatively young, technology-adaptive, and operated directly by business owners. This condition reflects a dynamic MSME environment with substantial potential to strengthen competitiveness through organizational capability development and structured innovation management practices.

3.1. Finding

Outer Model Evaluation

Table 3. Outer Loading

Indicator	Outer Loading
X1.1	0.851
X1.2	0.884
X1.3	0.875
X1.4	0.840
X1.5	0.868
X2.1	0.872
X2.2	0.885
X2.3	0.861
X2.4	0.879
X2.5	0.868
X3.1	0.864
X3.2	0.878
X3.3	0.871
X3.4	0.853
X3.5	0.869
Z.1	0.868
Z.2	0.881
Z.3	0.857
Z.4	0.873
Z.5	0.865
Y.1	0.859
Y.2	0.874
Y.3	0.852
Y.4	0.868
Y.5	0.861

Notes: X1: Information Technology Capability; X2: Innovation Orientation; X3: Managerial Capability; Y: MSME Competitiveness; Z: Innovation Management.

Table 3 shows that all indicators have outer loading values above 0.70, ranging from 0.840 to 0.885. These results confirm that all indicators adequately represent their respective latent constructs and satisfy the convergent validity requirement in PLS-SEM analysis. Therefore, all indicators were retained for further structural model evaluation.

Reliability and Convergent Validity

Table 4. Average Variance Extracted (AVE)

Variables	Cronbach's Alpha	Composite Reliability	AVE
Information Technology Capability (X1)	0.892	0.921	0.732
Innovation Orientation (X2)	0.908	0.933	0.748
Managerial Capability (X3)	0.901	0.927	0.741
Innovation Management (Z)	0.910	0.934	0.756
MSME Competitiveness (Y)	0.904	0.929	0.749

Based on Table 4, all constructs demonstrate strong reliability and validity. Cronbach's Alpha values range from 0.892 to 0.910, while Composite Reliability values range from 0.921 to 0.934, exceeding the recommended threshold of 0.70. In addition, all AVE values range from 0.732 to 0.756, which are above the minimum criterion of 0.50. These findings indicate that the measurement model possesses strong internal consistency and satisfactory convergent validity.

Discriminant Validity

Table 5. Discriminant Validity: Fornell–Larcker Criterion

Variable	X1	X2	X3	Z	Y
Information Technology Capability (X1)	0.856				
Innovation Orientation (X2)	0.682	0.865			
Managerial Capability (X3)	0.671	0.701	0.861		
Innovation Management (Z)	0.694	0.736	0.722	0.869	
MSME Competitiveness (Y)	0.659	0.688	0.676	0.741	0.865

Table 5 presents the Fornell–Larcker Criterion results. The square root of AVE for each construct is greater than its correlations with other constructs, indicating adequate discriminant validity. To strengthen the robustness of discriminant validity assessment, the HTMT (Heterotrait-Monotrait Ratio) test was also conducted in Table 6 and all HTMT values were below the recommended threshold of 0.90, confirming that each construct is empirically distinct from the others.

Table 6. Heterotrait–Monotrait Ratio (HTMT)

Variable	X1	X2	X3	Z	Y
Information Technology Capability (X1)					
Innovation Orientation (X2)	0.781				
Managerial Capability (X3)	0.769	0.803			
Innovation Management (Z)	0.801	0.842	0.826		
MSME Competitiveness (Y)	0.756	0.792	0.781	0.851	

Table 7. Effect Size (f^2)

Variable	Y	Z
Information Technology Capability (X1)	0.173	0.214
Innovation Orientation (X2)	0.196	0.267
Managerial Capability (X3)	0.181	0.238
Innovation Management (Z)	0.392	
MSME Competitiveness (Y)		

Notes: f^2 values of 0.02, 0.15, and 0.35 indicate small, medium, and large effect sizes, respectively.

Table 7 indicates that all exogenous variables exert meaningful effects on endogenous constructs. Innovation Management (Z) demonstrates the strongest effect on MSME Competitiveness (Y) with a large effect size ($f^2 = 0.392$), indicating that innovation management is the most substantial predictor of MSME competitiveness within the proposed structural model.

Table 8. Predictive Relevance (Q^2)

Variable	SSO	SSE	Q^2 (1-SSE/SSO)
Information Technology Capability (X1)	1200.000	1200.000	
Innovation Orientation (X2)	1200.000	1200.000	
Managerial Capability (X3)	1200.000	1200.000	
Innovation Management (Z)	1200.000	668.895	0.512
MSME Competitiveness (Y)	1200.000	586.809	0.548

Notes: Q^2 values greater than 0 indicate predictive relevance of the structural model.

Based on Table 8, all endogenous constructs show Q^2 values above zero, indicating that the model possesses satisfactory predictive relevance. The Q^2 values for Innovation Management (Z) and MSME Competitiveness (Y) suggest that the structural model has strong predictive capability in explaining endogenous latent constructs.

Table 9. Model Fit

	Saturated Model	Estimated Model
SRMR	0.083	0.083
d_ULS	1.357	1.357
d_G	0.514	0.514
Chi-Square	547.232	547.232
NFI	0.846	0.846

Table 9 shows that the SRMR value for both the saturated and estimated models is 0.083, indicating an acceptable model fit as the value is close to the recommended threshold of 0.08. In addition, the NFI

value of 0.846 suggests that the structural model demonstrates an adequate level of fit for PLS-SEM analysis and is therefore suitable for hypothesis testing.

Structural Model Evaluation

Table 10. R Square test results

Variable	R Square (R^2)	Criteria
Innovation Management (Z)	0.712	Strong
MSME Competitiveness (Y)	0.738	Strong

Table 10 shows that Innovation Management (Z) has an R^2 value of 0.712, while MSME Competitiveness (Y) has an R^2 value of 0.738. These values indicate substantial explanatory power, suggesting that the structural model explains 71.2% of the variance in Innovation Management and 73.8% of the variance in MSME Competitiveness. Compared with previous MSME studies, these R^2 values indicate relatively strong predictive capability, demonstrating that organizational capabilities and innovation management jointly provide a comprehensive explanation of competitiveness in the digital transformation context.

Hypotesis Testing

Table 11. Path Coefficient

Variable	Original Sample (O)	T Statistics (|O/STDEV|)	p-value	Decision
X1 → Y	0.214	3.182	0.001	Accepted
X2 → Y	0.198	2.964	0.003	Accepted
X3 → Y	0.176	2.587	0.010	Accepted
X1 → Z	0.241	3.754	0.000	Accepted
X2 → Z	0.318	4.986	0.000	Accepted
X3 → Z	0.287	4.421	0.000	Accepted
Z → Y	0.356	5.734	0.000	Accepted
X1 → Z → Y	0.086	2.941	0.003	Accepted
X2 → Z → Y	0.113	3.527	0.000	Accepted
X3 → Z → Y	0.102	3.214	0.001	Accepted

Notes: X1: Information Technology Capability; X2: Innovation Orientation; X3: Managerial Capability; Y: MSME Competitiveness; Z: Innovation Management.

Based on Table 11, all hypotheses (H1–H10) are accepted because the T-statistics exceed 1.96 and the p-values are below 0.05. Information Technology Capability ($\beta = 0.214$), Innovation Orientation ($\beta = 0.198$), and Managerial Capability ($\beta = 0.176$) positively and significantly affect MSME Competitiveness. In addition, Information Technology Capability ($\beta = 0.241$), Innovation Orientation ($\beta = 0.318$), and Managerial Capability ($\beta = 0.287$) significantly influence Innovation Management. Among these predictors, Innovation Orientation demonstrates the strongest effect on Innovation Management,

indicating that organizational commitment to innovation plays a central role in strengthening innovation processes.

Innovation Management also has a positive and significant effect on MSME Competitiveness (β = 0.356), indicating that it is the strongest predictor in the structural model. Furthermore, Innovation Management significantly mediates the relationships between Information Technology Capability and MSME Competitiveness (β = 0.086), Innovation Orientation and MSME Competitiveness (β = 0.113), and Managerial Capability and MSME Competitiveness (β = 0.102). These findings demonstrate that organizational capabilities contribute to competitiveness not only directly but also indirectly through effective innovation management processes.

3.2. Discussion

Information Technology Capability has a positive effect on MSME Competitiveness

Based on the findings of this study, Information Technology Capability (X1) has a positive and significant effect on MSME Competitiveness (Y), in line with the Resource-Based View (RBV), which emphasizes the importance of strategic resource ownership in achieving sustainable competitive advantage. In the MSME context, the use of digital technologies such as online marketing systems, data management, and business process integration can improve operational efficiency and expand market reach. This finding is supported by previous studies indicating that data analytics-based digital capabilities enhance decision-making quality and competitive advantage (Lee et al., 2020), digital transformation significantly impacts organizational performance and innovation (Valdez-Juárez & Castillo-Vergara, 2021), and IT capability serves as a key enabler of agility and competitiveness (Makhloufi et al., 2021). These findings suggest that MSMEs with higher levels of digital maturity are more capable of adapting to market changes, responding to customer needs, and sustaining competitiveness in increasingly dynamic business environments. Therefore, IT capability should not be viewed merely as a technological asset, but as a strategic capability that supports long-term organizational transformation. These findings further indicate that the strategic value of IT capability becomes more significant in highly dynamic and uncertain business environments where MSMEs are required to respond rapidly to market and technological changes. Thus, hypothesis H1 is accepted.

Innovation Orientation has a positive effect on MSME Competitiveness

The results show that Innovation Orientation (X2) has a positive and significant effect on MSME Competitiveness (Y), consistent with the Dynamic Capabilities perspective, which highlights the importance of an organization's ability to respond to change through innovation. In practice, innovation orientation is reflected in risk-taking, idea exploration, and adaptability to market dynamics. This

finding is supported by studies showing that innovation orientation improves business performance through adaptive capability and product development, drives competitive advantage through responsiveness to market changes (Makhloufi et al., 2021), and directly enhances competitiveness through innovative strategies (Valdez-Juárez & Castillo-Vergara, 2021). The findings further indicate that innovation orientation becomes more effective when MSMEs operate in highly competitive and rapidly changing markets, where responsiveness and experimentation are critical for maintaining relevance and differentiation. This implies that contextual factors such as environmental uncertainty and market turbulence may strengthen the strategic value of innovation orientation. However, the findings also suggest that innovation orientation alone may not automatically generate sustainable competitiveness unless it is supported by systematic innovation implementation and managerial coordination.

Managerial Capability has a positive effect on MSME Competitiveness

Managerial Capability (X3) is found to have a positive and significant effect on MSME Competitiveness (Y), aligning with the RBV perspective that emphasizes internal capabilities such as strategic planning, decision-making, and resource management. In MSMEs, strong managerial capability enables businesses to optimize operations and effectively respond to market changes. This finding is supported by research indicating that managerial capability enhances competitive advantage through effective resource management (AlTaweel & Al-Hawary, 2021), strengthens business strategy and performance, and improves competitiveness through operational efficiency and adaptability (Valdez-Juárez & Castillo-Vergara, 2021). Beyond operational functions, managerial capability also reflects managerial cognition and leadership capacity in recognizing opportunities, managing uncertainty, and coordinating organizational resources during digital transformation processes. Consequently, MSME competitiveness is influenced not only by resource availability but also by the quality of managerial decision-making and strategic leadership. This finding highlights that managerial capability becomes increasingly important in MSMEs facing rapid digital transformation, where strategic flexibility and adaptive leadership are essential for sustaining competitiveness.

Information Technology Capability has a positive effect on Innovation Management

The study finds that Information Technology Capability (X1) positively and significantly affects Innovation Management (Z), consistent with the Dynamic Capabilities perspective, which emphasizes the role of technology in enabling sensing, seizing, and transforming processes. In MSMEs, IT capability serves as a foundation for planning, implementing, and evaluating innovation. This finding is supported by studies showing that IT-based analytics improve decision-making and innovation (Lee et

al., 2020), digital capability enhances innovation through knowledge and technology integration (Vu & Asongu, 2020), and IT accelerates innovation processes and improves implementation quality (Papagiannidis et al., 2020). This finding indicates that digital technology facilitates not only operational activities but also organizational learning and knowledge integration, which are essential components of systematic innovation management. Therefore, digital capability should be understood not merely as operational support, but as an enabling mechanism that strengthens structured innovation processes within MSMEs.

Innovation Orientation has a positive effect on Innovation Management

Innovation Orientation (X2) has a positive and significant effect on Innovation Management (Z), consistent with the Dynamic Capabilities perspective emphasizing commitment to new ideas, risk-taking, and responsiveness to change. In MSMEs, innovation orientation enables structured idea management and continuous innovation implementation. This finding is supported by studies indicating that innovation orientation strengthens innovation culture and processes, enhances innovation performance through adaptive strategies (Valdez-Juárez & Castillo-Vergara, 2021), and directly affects innovation management effectiveness (Vu & Asongu, 2020). The findings imply that innovation orientation encourages MSMEs to institutionalize innovation activities into structured managerial processes rather than relying solely on spontaneous or informal innovation practices. This result also suggests that MSMEs with stronger innovation orientation are more capable of embedding innovation into organizational routines and long-term strategic processes.

Managerial Capability has a positive effect on Innovation Management

Managerial Capability (X3) is shown to have a positive and significant effect on Innovation Management (Z), aligning with the Dynamic Capabilities perspective, which highlights the importance of managerial skills in managing innovation processes effectively. In MSMEs, managerial capability supports planning, resource allocation, and control of innovation activities. This finding is supported by studies showing that managerial capability enhances innovation capacity through efficient resource management (AlTaweel & Al-Hawary, 2021), strengthens strategic integration and decision-making, and improves innovation implementation success (Vu & Asongu, 2020). This result highlights that managerial capability plays a critical role in coordinating innovation activities, aligning organizational goals, and ensuring that innovation initiatives are implemented consistently and strategically. Accordingly, managerial capability functions not only as an administrative competence but also as a strategic coordination mechanism supporting sustainable innovation management.

Innovation Management has a positive effect on MSME Competitiveness

Innovation Management (Z) has a positive and significant effect on MSME Competitiveness (Y), consistent with the Dynamic Capabilities perspective, which emphasizes innovation as a key driver of sustainable competitive advantage. In MSMEs, effective innovation management enables value creation through product, process, and strategic improvements. This finding is supported by studies indicating that innovation enhances competitive advantage through performance and product differentiation, improves competitiveness through environmental adaptation (Valdez-Juárez & Castillo-Vergara, 2021), and creates strategic value in competitive markets (Vu & Asongu, 2020). More importantly, this study positions Innovation Management as a dynamic managerial process that systematically transforms organizational capabilities into competitive outcomes. This finding extends the RBV and Dynamic Capabilities perspectives by emphasizing that sustainable competitiveness depends not only on possessing strategic resources but also on the firm's ability to organize, coordinate, and continuously renew innovation processes. Therefore, Innovation Management represents the central theoretical contribution and novelty of this study. These findings also explain why some prior studies reported inconsistent direct relationships between organizational capabilities and competitiveness, as competitiveness may depend on how effectively innovation processes are managed and institutionalized within MSMEs.

Innovation Management as a Mediating Mechanism

The mediation analysis demonstrates that Innovation Management significantly mediates the effects of Information Technology Capability, Innovation Orientation, and Managerial Capability on MSME Competitiveness. These findings indicate that organizational capabilities alone are insufficient to generate sustainable competitive advantage unless they are translated into structured innovation processes. In this context, Innovation Management functions as the critical mechanism that connects organizational resources and capabilities with strategic competitive outcomes.

Information Technology Capability (X1) is found to have a positive and significant effect on MSME Competitiveness (Y) through Innovation Management (Z), indicating that IT contributes indirectly via enhanced innovation capability. This aligns with the Dynamic Capabilities perspective, where IT acts as an innovation enabler. This finding is supported by studies showing that digital capability improves performance through innovation (Lee et al., 2020), digital transformation strengthens competitive advantage via innovation (Vu & Asongu, 2020), and IT enhances competitiveness through innovation as a mediator (Valdez-Juárez & Castillo-Vergara, 2021).

Innovation Orientation (X2) has a positive and significant effect on MSME Competitiveness (Y) through Innovation Management (Z), indicating both direct and indirect effects via innovation

processes. This is consistent with the Dynamic Capabilities perspective, where innovation orientation triggers effective innovation capability. This finding is supported by studies showing that innovation orientation improves performance through innovation, strengthens competitive advantage via innovation strategies (Valdez-Juárez & Castillo-Vergara, 2021), and affects competitiveness through innovation mediation (Vu & Asongu, 2020).

Managerial Capability (X3) has a positive and significant effect on MSME Competitiveness (Y) through Innovation Management (Z), indicating that managerial skills influence competitiveness both directly and indirectly via innovation management. This aligns with the Dynamic Capabilities perspective emphasizing resource coordination in driving innovation. This finding is supported by studies showing that managerial capability improves performance through innovation (AlTaweel & Al-Hawary, 2021), strengthens competitive advantage via innovation strategies, and influences competitiveness through structured innovation mediation (Vu & Asongu, 2020).

Collectively, the mediation findings can be synthesized into a single conceptual explanation: organizational capabilities function as strategic resources, while Innovation Management acts as the dynamic managerial process that transforms these resources into sustainable competitive outcomes. In this framework, Information Technology Capability, Innovation Orientation, and Managerial Capability provide the organizational foundation, whereas Innovation Management operationalizes these capabilities through systematic planning, coordination, implementation, and continuous improvement of innovation activities.

This study therefore proposes a process-based mediation framework in which Innovation Management becomes the central mechanism linking organizational capabilities and MSME competitiveness during digital transformation. Collectively, these findings reinforce the argument that MSME competitiveness in the digital transformation era is shaped not only by organizational capabilities themselves but also by the firm's ability to manage innovation systematically and continuously.

Theoretical Implications

This study contributes theoretically by extending the integration of the Resource-Based View (RBV) and Dynamic Capabilities perspectives through a process-based mediation framework. Unlike prior studies that predominantly position innovation as an organizational outcome, this study conceptualizes Innovation Management as a dynamic managerial process that systematically converts organizational capabilities into competitive advantage.

The findings further suggest that sustainable MSME competitiveness is shaped not only by the possession of strategic resources, but also by the organizational ability to continuously organize,

coordinate, and renew innovation processes in response to environmental change. This study therefore strengthens the argument that Innovation Management represents the missing explanatory mechanism connecting organizational capabilities and competitiveness within the digital transformation context.

4. CONCLUSION

This study examined the effects of Information Technology Capability, Innovation Orientation, and Managerial Capability on MSME competitiveness, as well as the mediating role of Innovation Management in these relationships. The findings demonstrate that MSME competitiveness is influenced not only by organizational capabilities, but also by the firm's ability to transform these capabilities into structured and continuous innovation processes. Among all variables examined, Innovation Management emerged as the strongest predictor of MSME competitiveness, highlighting its strategic role in converting organizational resources into sustainable competitive outcomes.

From a theoretical perspective, this study extends the integration of the Resource-Based View (RBV) and Dynamic Capabilities perspectives by emphasizing that sustainable competitive advantage is both resource-dependent and process-dependent. The primary theoretical contribution of this study lies in proposing a process-based mediation framework in which Innovation Management functions as the central dynamic mechanism linking organizational capabilities and MSME competitiveness during digital transformation. Unlike prior studies that primarily position innovation as an outcome, this study conceptualizes Innovation Management as an active managerial process involving innovation planning, implementation, evaluation, and continuous improvement.

From a practical perspective, the findings suggest that MSMEs should move beyond a narrow focus on technology adoption and strengthen systematic innovation management practices. MSME owners and managers are encouraged to integrate digital capability development with structured innovation planning, continuous evaluation, employee involvement, and strategic resource allocation to enhance long-term competitiveness. In addition, policymakers should support MSMEs not only through digitalization programs, but also through managerial training, innovation facilitation, and capability development initiatives that strengthen sustainable innovation processes.

Despite its contributions, this study has several limitations that provide opportunities for future research. First, the study is limited to a specific geographical and sectoral context, which may reduce the generalizability of the findings. Future studies could extend the research model to different regions or conduct cross-country comparisons. Second, additional variables such as digital literacy, market turbulence, entrepreneurial orientation, or organizational learning could be incorporated to enrich the explanatory power of the model. Third, future research is encouraged to adopt longitudinal or mixed-method approaches to better capture the dynamic evolution of organizational capabilities and

innovation processes over time.

In conclusion, this study confirms that sustainable MSME competitiveness is achieved not merely through digital transformation or organizational capabilities alone, but through the firm's ability to systematically manage innovation as an ongoing strategic process.

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