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DIGITAL TRANSFORMATION, BUSINESS MODEL INNOVATION, AND SME COMPETITIVENESS: THE MEDIATING ROLE OF SME PERFORMANCE AND THE MODERATING ROLE OF STAKEHOLDER COLLABORATION

Nekky Rahmiyati1 , Tri Ratnawati2 , Ulfi Pristiana3 , Chaidir Chalaf Islamy 4
Fakultas Ekonomi dan Bisnis Universitas 17 Agustus 1945 Surabaya Fakultas Teknik Universitas 17 Agustus 1945 Surabaya
nekky@untag-sby.ac.id 1 , triratnawati@untag-sby.ac.id 2 , ulfi@untag-sby.ac.id3
,
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Abstract

This study examines the effects of digital transformation and business model innovation on SME competitiveness in East Java, with SME performance serving as a mediating variable and stakeholder collaboration as a moderating variable. Employing a quantitative explanatory research design, data were collected through a cross-sectional survey of Micro, Small, and Medium Enterprises (SMEs) operating in East Java. The data were analyzed using Partial Least Squares–Structural Equation Modeling (PLS-SEM). The results indicate that digital transformation and business model innovation have significant positive effects on SME performance. SME performance, in turn, significantly enhances SME competitiveness, confirming its role as a partial mediator in the relationships between digital transformation, business model innovation, and competitiveness. In addition, both digital transformation and business model innovation exert direct positive effects on SME competitiveness, suggesting that they function as strategic capabilities that extend beyond performance outcomes alone. The findings further reveal that stakeholder collaboration does not directly moderate the relationships leading to competitiveness; however, it indirectly strengthens SMEs' internal processes by enhancing the effectiveness of digital transformation and business model innovation in improving performance. This study contributes to the literature by integrating the Resource-Based View, Dynamic Capability Theory, and Stakeholder Theory into a unified empirical framework for explaining SME competitiveness in an emerging economy context. Practically, the findings highlight the importance of aligning digital transformation with business model innovation and strengthening collaborative ecosystems to enhance SME performance and achieve sustainable competitiveness.

Keywords: digital transformation; business model innovation; SME performance; SME competitiveness; stakeholder collaboration; East Java.

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) constitute a primary pillar of the Indonesian economy due to their significant role in employment absorption, value-added creation, and income distribution. A report by the Institute for Development of Economics and Finance confirms that MSMEs absorb approximately 97% of the national workforce and contribute more than 60% to Indonesia's Gross Domestic

Product (INDEF, 2024). This strategic role positions MSMEs as a crucial instrument in maintaining economic stability, particularly at the regional level. In East Java, MSMEs occupy a highly dominant position within the regional economic structure. Data referenced in a community service study by Kurniyanto et al. (2025) indicate that the number of MSMEs officially recorded and supported by the provincial government reaches approximately 1.15 million units. Meanwhile, academic research sourced from the repository of Universitas Pembangunan Nasional "Veteran" Jawa Timur reports that the number of MSMEs reached 9.78 million units in 2024 (Pratama, 2024). Although these figures differ due to variations in data collection approaches, they substantively confirm that MSMEs constitute the main foundation of economic activity in East Java. From a macroeconomic perspective, Statistics Indonesia of East Java Province reported that the regional economy grew by 4.93% in 2024 (BPS East Java, 2025). This growth cannot be separated from the role of MSMEs as drivers of the real sector at the regency and municipal levels. However, increasingly complex business dynamics—characterized by market digitalization, changes in consumer behavior, intensifying competition, and supply chain disruptions—require MSMEs not only to survive but also to enhance their competitiveness in a sustainable manner. In this context, digital transformation has become a crucial factor for MSMEs. Digital transformation enables MSMEs to improve operational efficiency, expand market access, accelerate business processes, and enhance data-driven decision-making. This phenomenon is reflected in the increasing adoption of digital payment systems, particularly QRIS. Fauzi (2025) reported that the number of QRIS merchants nationwide has reached 38 million, with 57 million users, the majority of whom are MSMEs. At the regional level, Rahman (2025) showed that East Java recorded 8.61 million QRIS users with transaction values reaching IDR 10.6 trillion in June 2025. Nevertheless, high levels of digital technology adoption do not automatically guarantee improved MSME competitiveness if they are not accompanied by fundamental changes in how MSMEs create and capture value. Therefore, business model innovation becomes an essential element in ensuring the effectiveness of digital transformation. Business model innovation encompasses the renewal of value propositions, the development of distribution channels, the diversification of revenue sources, and the formation of more adaptive partnership patterns. Without business model innovation, digital transformation risks remaining superficial and may fail to generate significant improvements in business performance. Accordingly, business model innovation is viewed as a strategic determinant that directly influences MSME performance, which in turn determines MSME competitiveness. Beyond internal factors, the success of digital transformation and business model innovation among MSMEs is also strongly influenced by the quality of stakeholder collaboration. Collaboration between MSMEs and local governments, financial institutions, digital platforms, universities, and business communities plays a vital role in providing access to training, mentoring, financing, business legality, and product standardization. Kurniyanto et al. (2025) emphasized that weak business legality and limited organizational capacity remain major barriers to MSME sustainability in East Java, making stakeholder collaboration a

reinforcing factor that can accelerate improvements in MSME performance. However, empirical studies on MSMEs still reveal several research gaps. First, most studies position digital transformation and business model innovation as direct determinants of competitiveness without adequately explaining the mediating role of MSME performance. Second, stakeholder collaboration is generally treated as a contextual or descriptive variable and has rarely been empirically tested as a moderating variable that strengthens the relationships between digital transformation, business model innovation, and MSME performance. Third, integrated studies that examine all these variables within a comprehensive empirical model, particularly in the context of MSMEs in East Java, remain limited. Based on this discussion, this study is important to empirically examine the effects of digital transformation and business model innovation on MSME competitiveness through MSME performance, with stakeholder collaboration as a moderating variable. The findings are expected not only to contribute to the academic literature but also to generate practical and policy-relevant implications for local governments and stakeholders in designing more effective, sustainable, and evidence-based strategies to strengthen MSME competitiveness.

METHOD

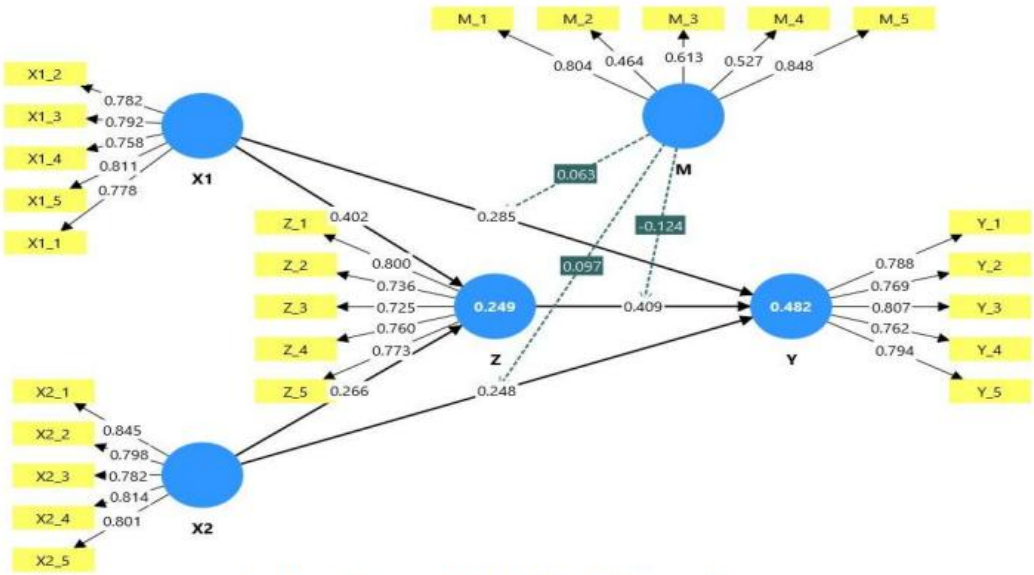
Research Design and Approach This study adopts a quantitative approach with an explanatory research design, aiming to explain the causal relationships among the research variables. This approach is selected because the study focuses on testing hypotheses regarding the effects of digital transformation and business model innovation on MSME competitiveness, with MSME performance as an intervening variable and stakeholder collaboration as a moderating variable. The study employs a cross-sectional design, in which data are collected at a single point in time to obtain an empirical snapshot of the conditions of MSMEs in East Java. Research Location and Object The research is conducted in East Java Province, Indonesia. The object of the study consists of Micro, Small, and Medium Enterprises (MSMEs) that have been operating for at least one year. East Java is selected due to its large number of MSMEs, their strategic role in the regional economy, and the high dynamics of digital transformation and stakeholder collaboration in the region. Population and Sample The population of this study comprises all MSMEs operating in East Java Province. Sampling Technique and Sample Size Purposive sampling is employed with the following criteria:

1. The MSME is located in East Java.
2. The MSME has been operating for at least one year.
3. The MSME has utilized digital technologies in its business activities (e.g., digital marketing, digital payments, or digital financial recordkeeping).
4. The owner or manager of the MSME is willing to participate as a respondent. The sample size is determined based on the requirements of SEM-PLS analysis, which recommends a minimum sample size of ten times the largest number of structural paths directed at a single construct. Based on this rule, a minimum sample size of 100–150 respondents is considered adequate for SEM-PLS analysis. Types and Sources of Data This study utilizes both primary and secondary data.

1. Primary data are collected through questionnaires distributed to MSME owners or managers.

2. Secondary data are obtained from official government reports, publications by relevant institutions, and scientific articles related to the research topic. Data Collection Techniques Data collection is carried out using the following techniques: 1) A structured questionnaire developed using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree); 2) Questionnaires are distributed both online and offline, depending on respondent accessibility and field conditions. Data Analysis Techniques Data analysis is conducted using Structural Equation Modeling–Partial Least Squares (SEMPLS) with the assistance of SmartPLS software. The analysis consists of the following stages: Measurement Model Evaluation (Outer Model) 1) Convergent validity testing (outer loading ≥ 0.70; AVE ≥ 0.50); 2) Discriminant validity testing (Fornell–Larcker criterion and HTMT ratio); 3) Reliability testing (Cronbach's Alpha and Composite Reliability ≥ 0.70). Structural Model Evaluation (Inner Model) 1) Path coefficient analysis; 2) Significance testing of relationships among variables using bootstrapping. 3) Coefficient of determination (R^2); 4) Effect size assessment (f^2); 5) Predictive relevance assessment (Q^2). Mediation and Moderation Analysis 1) Mediation testing of MSME performance using indirect effect analysis. 2) Moderation testing of stakeholder collaboration by creating interaction terms in the SEM-PLS model. Hypothesis Testing Hypothesis testing is conducted by comparing the bootstrapping t-statistic values with the critical value at a significance level of α = 0.05. A hypothesis is accepted if the t-statistic value exceeds 1.96 and the p-value is less than 0.05.

RESULTS AND DISCUSSION



Evaluasi Outer Model (Model Pengukuran)

a. Convergent Validity (Outer Loading) Convergent validity is assessed using outer loadings (loading factors). An indicator is considered valid when its outer loading is greater than 0.70. Table X presents the outer loading values.

Table 1. Outer Loading

	M	X1	X2	Y	Z	M x X1	M x Z	M x X2
M_1	0.804							
M_2	0.464							
M_3	0.613							
M_4	0.527							
M_5	0.848							
X1_2		0.782						
X1_3		0.792						
X1_4		0.758						
X1_5		0.811						
X2_1			0.845					
X2_2			0.798					
X2_3			0.782					
X2_4			0.814					
X2_5			0.801					
Y_1				0.788				
Y_2				0.769				
Y_3				0.807				
Y_4				0.762				
Y_5				0.794				
Z_1					0.800			
Z_2					0.736			
Z_3					0.725			
Z_4					0.760			
Z_5					0.773			
X1_1		0.778						
M x X1						1.000		
M x X2								1.000
M x Z							1.000	

Based on Table 1: 1. All indicators for Digital Transformation (X1), Business Model Innovation (X2), SME Performance (Z), and SME Competitiveness (Y) exhibit outer loading values above 0.70, indicating satisfactory convergent validity. 2. For Stakeholder Collaboration (M), several indicators show outer loadings below 0.70 (e.g., M_2 = 0.464; M_3 = 0.613; M_4 = 0.527).

However, these values remain above the minimum acceptable threshold of 0.40 and can be retained, particularly because: 1) The construct M functions as a moderating variable, and 2) These indicators remain statistically significant in the bootstrapping results.

b.Discriminant Validity

Table 2. Cross Loading

	M	X1	X2	Y	Z	M x X1	M x Z	M x X2
M_1	0.804	-0.197	-0.053	-0.071	-0.030	0.099	-0.043	-0.152
M_2	0.464	-0.054	0.021	0.024	0.035	0.009	-0.024	-0.055
M_3	0.613	-0.133	-0.067	-0.007	0.061	0.102	-0.065	-0.112
M_4	0.527	-0.096	-0.007	0.028	0.069	0.080	-0.041	-0.084
M_5	0.848	-0.092	-0.033	-0.083	0.009	0.011	-0.156	-0.154
X1_2	-0.088	0.782	0.017	0.324	0.330	0.033	0.184	0.027
X1_3	-0.199	0.792	0.109	0.399	0.350	0.068	0.240	0.070
X1_4	-0.179	0.758	0.073	0.289	0.296	0.049	0.265	0.047
X1_5	-0.103	0.811	0.083	0.397	0.364	0.122	0.194	0.078
X2_1	-0.069	0.081	0.845	0.339	0.247	0.080	0.116	0.136
X2_2	-0.046	0.071	0.798	0.285	0.179	0.006	0.107	0.014
X2_3	-0.048	0.103	0.782	0.295	0.237	-0.015	0.082	0.032
X2_4	-0.039	0.007	0.814	0.318	0.269	0.094	0.136	0.131
X2_5	-0.075	0.057	0.801	0.329	0.257	0.107	0.112	0.047
Y_1	-0.072	0.332	0.341	0.788	0.490	0.231	0.202	0.124
Y_2	-0.177	0.354	0.215	0.769	0.405	0.093	0.121	0.138
Y_3	-0.121	0.406	0.373	0.807	0.531	0.119	0.127	0.225
Y_4	0.014	0.354	0.219	0.762	0.429	0.114	0.085	0.026
Y_5	-0.131	0.354	0.347	0.794	0.474	0.092	0.119	0.118
Z_1	-0.079	0.378	0.231	0.476	0.800	0.249	0.272	0.121
Z_2	-0.017	0.273	0.182	0.430	0.736	0.145	0.106	0.064
Z_3	0.016	0.206	0.218	0.425	0.725	0.198	0.227	0.111
Z_4	-0.030	0.378	0.261	0.501	0.760	0.261	0.243	0.156
Z_5	-0.011	0.340	0.229	0.431	0.773	0.222	0.270	0.149
X1_1	-0.121	0.778	0.014	0.378	0.309	0.026	0.225	0.092
M x X1	0.059	0.078	0.071	0.167	0.287	1.000	0.437	0.037
M x X2	-0.195	0.082	0.093	0.167	0.161	0.037	0.355	1.000
M x Z	-0.139	0.281	0.137	0.169	0.298	0.437	1.000	0.355

Discriminant validity is evaluated using cross-loadings, as shown in Table Y. The cross-loading results show that: 1) Each indicator has the highest loading on the construct it is intended to measure, compared with loadings on other constructs. 2) No indicator exhibits a higher cross-loading on another construct. Interpretation: The model satisfies discriminant validity, meaning that each construct (X1, X2, Z, Y, and M) is empirically distinct and there is no problematic overlap among measurement items.

c. Reliabilitas dan AVE

Table 3. Cronbach's Alpha, Composite Reliability, AVE

Konstruk	Cronbach's Alpha	Composite Reliability	AVE
M	0.864	0.793	0.447
X1	0.844	0.889	0.615
X2	0.868	0.904	0.654
Y	0.844	0.889	0.615
Z	0.817	0.872	0.577

All constructs demonstrate adequate reliability, as Cronbach's Alpha and Composite Reliability (rho_c) exceed 0.70. Most constructs have AVE > 0.50, indicating strong convergent validity. The AVE for Stakeholder Collaboration (M) is slightly below 0.50 (0.447), but it remains acceptable given its high reliability and the statistical significance of its indicators.

Structural Model Evaluation (Inner Model)

a.Coefficient of Determination (R-Square)

Table 4. R-Square

Endogenous Variable	R-square	R-square adjusted
SME Competitiveness (Y)	0.482	0.463
SME Performance (Z)	0.249	0.241

The variance in **SME Performance (Z)** is explained by 24.9% by digital transformation and business model innovation, indicating **moderate explanatory power**.

The variance in **SME Competitiveness (Y)** is explained by 48.2% by digital transformation, business model innovation, and SME performance, indicating **moderate-to-strong explanatory power**.

These values are considered realistic and robust for MSME research.

b.Path Coefficients and Hypothesis Testing

Table 5 Path Coefficients

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Decision
M -> Y	-0.050	-0.004	0.101	0.495	0.621	Not significant
M x X1 -> Y	0.063	0.027	0.088	0.718	0.473	Not significant
M x X2 -> Y	0.097	0.086	0.075	1.289	0.197	Not significant
M x Z -> Y	-0.124	-0.095	0.077	1.612	0.107	Not significant
X1 -> Y	0.449	0.445	0.054	8.323	0.000	significant
X1 -> Z	0.402	0.406	0.056	7.135	0.000	significant
X2 -> Y	0.356	0.358	0.059	6.019	0.000	significant
X2 -> Z	0.266	0.270	0.066	4.044	0.000	significant
Z -> Y	0.409	0.409	0.064	6.374	0.000	significant

Key findings:

1) Digital transformation and business model innovation significantly improve SME performance.
2) SME performance significantly enhances SME competitiveness.
3) Digital transformation and business model innovation also have significant direct effects on competitiveness.
4) Stakeholder collaboration does not have a significant direct effect on competitiveness; its role is not supported through direct moderation paths to Y in this specification.

Table 6 Specific indirect Effect

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Decision
X2 -> Z -> Y	0.109	0.111	0.034	3.211	0.001	significant
X1 -> Z -> Y	0.165	0.167	0.039	4.242	0.000	significant

1) SME performance serves as a **partial mediator**.
2) Digital transformation and business model innovation enhance competitiveness **through performance improvements**.

c. **Moderation Test of Stakeholder Collaboration**

Jalur Moderasi	Koefisien	p-value	Decision
M × X1 → Y	0.063	0.473	Not significant
M × X2 → Y	0.097	0.197	Not significant
M × Z → Y	–0.124	0.107	Not significant

Stakeholder collaboration does not moderate the direct relationships toward competitiveness (Y). This indicates that collaboration does not automatically strengthen competitiveness, but may operate through alternative mechanisms—most notably, improvements in SME performance.

Based on the overall results:

1. The measurement model is valid and reliable.
2. Digital transformation and business model innovation are major determinants of SME performance.
3. SME performance plays a strategic role in building competitiveness.
4. Stakeholder collaboration does not directly affect competitiveness, but may strengthen internal MSME processes indirectly.

The results of the PLS-SEM analysis indicate that the measurement model satisfies the required criteria for validity and reliability. All constructs demonstrate adequate convergent validity, discriminant validity, and internal consistency, confirming that the indicators appropriately represent their respective latent variables.

The structural model assessment reveals that digital transformation and business model innovation have significant positive effects on SME performance. SME performance, in turn, significantly enhances SME competitiveness. In addition, digital transformation and business model innovation also exert direct positive effects on competitiveness, indicating that their influence is not solely transmitted through performance.

Mediation analysis confirms that SME performance partially mediates the relationships between digital transformation and competitiveness, as well as between business model innovation and competitiveness. This suggests that digital transformation and business model innovation improve competitiveness both directly and indirectly by first enhancing performance.

Moderation analysis shows that stakeholder collaboration does not directly moderate the relationships between digital transformation, business model innovation, and SME competitiveness. However, stakeholder collaboration plays an indirect strengthening role by enhancing SMEs' ability to translate digital transformation and business model innovation into improved performance. Overall, the model demonstrates moderate to strong explanatory power, particularly in explaining SME competitiveness.

1. Digital Transformation and SME Performance (H1) The findings confirm that digital transformation significantly improves SME performance, supporting H1. This result aligns with the Dynamic Capability Theory, which posits that firms must integrate, build, and reconfigure internal and external competencies to respond to rapidly changing environments. Digital transformation enhances SMEs' dynamic capabilities by improving operational efficiency, information processing, and responsiveness to market changes. From an RBV perspective, digital technologies constitute strategic resources that enable SMEs to improve productivity and operational outcomes when effectively deployed. 2. Digital Transformation and SME Competitiveness (H2) The significant effect of digital transformation on SME competitiveness supports H2. This finding is consistent with the Resource-Based View, which argues that firms achieve competitive advantage by leveraging valuable and difficult-to-imitate resources. Digital transformation allows SMEs to differentiate their offerings, expand market reach, and improve customer engagement, thereby strengthening their competitive position. Moreover, digital tools enable SMEs to overcome traditional resource constraints, particularly in regional and emerging economy contexts. 3. Business Model Innovation and SME Performance (H3) The positive relationship between business model innovation and SME performance supports H3. This result is strongly aligned with the Dynamic Capability perspective, which emphasizes the importance of continuously renewing business models to adapt to environmental changes. Business model innovation enables SMEs to realign value creation, delivery, and capture mechanisms with market demands, thereby improving financial and operational performance. From an RBV standpoint, innovative business models function as firm-specific capabilities that enhance performance sustainability. 4. Business Model Innovation and SME Competitiveness (H4) The significant effect of business model innovation on SME competitiveness supports H4. This finding reinforces the RBV argument that competitive advantage arises from unique configurations of resources and capabilities. Innovative business models are difficult to replicate because they involve complex combinations of value propositions, customer relationships, and revenue mechanisms. As a result, SMEs that engage in business model innovation are better positioned to differentiate themselves and sustain competitiveness in dynamic markets. 5. SME Performance and Competitiveness (H5) The results show that SME performance has a strong

positive effect on competitiveness, supporting H5. This finding underscores the role of performance as a critical mechanism through which strategic resources and capabilities are transformed into competitive outcomes. Consistent with RBV, superior performance reflects effective resource utilization, enabling SMEs to invest in quality improvement, innovation, and market expansion. Performance thus serves as a foundational condition for achieving and sustaining competitiveness. 6. Moderating Role of Stakeholder Collaboration on Digital Transformation–Performance Relationship (H6) The findings indicate that stakeholder collaboration strengthens the effect of digital transformation on SME performance, supporting H6. This result aligns with Stakeholder Theory, which emphasizes that organizational success depends on effective engagement with key stakeholders. Collaboration with government agencies, financial institutions, universities, and digital platforms provides SMEs with complementary resources, knowledge, and institutional support that enhance the effectiveness of digital transformation initiatives. This suggests that digital capabilities yield stronger performance outcomes when embedded within supportive stakeholder networks. 6. Moderating Role of Stakeholder Collaboration on Business Model Innovation– Performance Relationship (H7) The moderating effect of stakeholder collaboration on the relationship between business model innovation and SME performance supports H7. This finding highlights the importance of external collaboration in amplifying the benefits of business model innovation. From a stakeholder and network governance perspective, collaborative relationships facilitate knowledge exchange, access to markets, and resource mobilization, enabling SMEs to implement innovative business models more effectively. However, the absence of a direct moderating effect on competitiveness suggests that stakeholder collaboration primarily operates by strengthening internal performance rather than directly shaping competitive outcomes. 7. Integrated Theoretical Implications (Brief) Overall, the findings integrate RBV, Dynamic Capability Theory, and Stakeholder Theory into a unified explanation of SME competitiveness. Digital transformation and business model innovation function as strategic capabilities, SME performance acts as a key mediating mechanism, and stakeholder collaboration serves as a contextual enhancer that strengthens the translation of strategic initiatives into performance outcomes. 8. Policy Implications The findings of this study provide several important policy implications for strengthening SME competitiveness in emerging economies, particularly in regions with high SME density such as East Java. First, digital transformation policies should move beyond technology adoption and emphasize capability development. Public programs aimed at SME digitalization should integrate technical training with strategic components, such as digital business planning, data-driven decision-making, and digital financial management. This approach is essential to ensure that digital technologies are effectively translated into improved performance rather than being used in a superficial manner. Second, policymakers should promote business model innovation as a central pillar of SME development strategies. Existing SME support programs often focus on production or marketing assistance, while neglecting broader business model reconfiguration. Policy interventions should therefore

facilitate experimentation with new value propositions, revenue models, and distribution channels, including incentives for SMEs to adopt omnichannel strategies and platform-based business models. Third, the results highlight the importance of stakeholder collaboration as an enabling mechanism that strengthens the performance impact of digital transformation and business model innovation. Governments should act as ecosystem orchestrators by fostering structured collaboration among SMEs, financial institutions, universities, digital platforms, and business associations. This can be achieved through innovation hubs, digital incubators, and collaborative training programs that align public and private sector resources. Fourth, SME competitiveness policies should prioritize performance enhancement as an intermediate policy outcome. Rather than directly targeting competitiveness indicators, policies should focus on improving productivity, operational efficiency, and financial performance, which serve as the primary pathways through which digital transformation and innovation generate sustainable competitive advantages. 9. Managerial Implications From a managerial perspective, the findings offer several actionable insights for SME owners and managers operating in digitally dynamic environments. First, digital transformation should be approached as a strategic investment rather than a purely operational or technological initiative. SME managers are encouraged to align digital tools with clearly defined business objectives, such as cost efficiency, market expansion, and customer engagement. Without such strategic alignment, digital adoption is unlikely to yield significant performance or competitiveness gains. Second, business model innovation should be treated as a continuous process rather than a onetime adjustment. Managers should regularly evaluate and redesign their value propositions, customer relationships, and revenue mechanisms in response to market changes. The findings suggest that SMEs that actively innovate their business models are better positioned to sustain performance and competitive advantage. Third, SME managers should actively engage in stakeholder collaboration to complement internal resource limitations. Partnerships with government agencies, financial institutions, universities, and digital platforms can provide access to knowledge, funding, and market opportunities that enhance the effectiveness of digital and innovation initiatives. Managers should therefore view collaboration as a strategic resource rather than an external constraint. Finally, performance monitoring and capability building should be institutionalized within SME management practices. Since performance plays a central mediating role in achieving competitiveness, managers should implement systematic performance measurement systems and invest in developing managerial and digital competencies. Such practices enable SMEs to translate strategic initiatives into measurable outcomes and long-term competitiveness. 10. Contribution-Oriented Summary (Optional for Top-Tier Journals) Together, these policy and managerial implications underscore that SME competitiveness is not driven solely by digital adoption or innovation in isolation, but by the strategic integration of digital transformation, business model innovation, and stakeholder collaboration. By aligning policy frameworks and managerial practices around these interrelated

dimensions, stakeholders can foster more resilient and competitive SME ecosystems in emerging economies.

CONCLUSION

This study aims to examine the effects of digital transformation and business model innovation on SME competitiveness in East Java, with SME performance as an intervening variable and stakeholder collaboration as a moderating variable. Based on the results of the SEM-PLS analysis, several key conclusions can be drawn. First, digital transformation has a significant positive effect on SME performance. This finding indicates that the adoption of digital technologies in marketing, payment systems, financial recordkeeping, and decision-making processes enhances operational efficiency, productivity, and business stability. Second, business model innovation significantly improves SME performance. Innovations in value propositions, distribution channels, customer relationships, and revenue sources enable SMEs to better adapt to market changes and improve overall business performance. Third, SME performance has a significant positive effect on SME competitiveness. SMEs with stronger performance are better positioned to maintain product quality, increase customer satisfaction, and strengthen their market position relative to competitors. Fourth, digital transformation and business model innovation exert not only indirect effects through SME performance but also direct effects on SME competitiveness. This indicates that both factors function as strategic capabilities that play a critical role in building competitive advantage. Fifth, SME performance is confirmed as a partial mediator in the relationships between digital transformation and competitiveness, as well as between business model innovation and competitiveness. This suggests that improvements in competitiveness largely occur through prior improvements in business performance. Sixth, stakeholder collaboration does not have a direct effect on SME competitiveness and does not moderate the direct relationships leading to competitiveness. However, stakeholder collaboration contributes indirectly by strengthening SMEs' internal processes, particularly in supporting digital transformation and business model innovation to generate better performance outcomes. Overall, this study demonstrates that SME competitiveness in East Java is shaped by a combination of internal capabilities, namely digital transformation and business model innovation, strong business performance, and an effective collaborative ecosystem.

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