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INNOVATION AND FINANCIAL RESILIENCE AS TWIN PILLARS OF MSME SUSTAINABILITY: RETHINKING THE ROLE OF DIGITAL TRANSFORMATION IN INDONESIA

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Abstract: This study examines the roles of innovation, digital transformation, and financial resilience in shaping the sustainability of Micro, Small, and Medium Enterprises (MSMEs) in Indonesia. It also investigates the mediating role of financial resilience in these relationships. Using a quantitative approach, data were collected from 352 MSME owners and managers in West Java through a structured questionnaire and analyzed using Structural Equation Modeling (SEM). The findings reveal that innovation has a positive and significant effect on both financial resilience and business sustainability. Financial resilience also significantly enhances business sustainability and partially mediates the relationship between innovation and sustainability. These results confirm the critical role of innovation as a strategic capability and highlight financial resilience as a key mechanism linking internal capabilities to long-term performance. In contrast, digital transformation does not show a significant effect on either financial resilience or business sustainability, nor does it exhibit a mediating effect. This unexpected finding suggests that digital transformation among MSMEs remains at a superficial adoption stage and has not yet translated into measurable performance outcomes. This study contributes to the literature by emphasizing the context-dependent nature of digital transformation and reinforcing the importance of innovation-driven capability building and financial strengthening as primary drivers of MSME sustainability in emerging economies.

Keywords: Innovation, Financial Resilience, MSME Sustainability.

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INTRODUCTION:

Micro, Small, and Medium Enterprises (MSMEs) are the backbone of the Indonesian economy. This sector contributes more than 60% to the national Gross Domestic Product (GDP) and employs over 97% of the workforce, making it a key pillar of the nation's economic structure. Globally, MSMEs account for around 90% of all existing businesses, absorb 60 to 70% of the workforce, and contribute around 50% to world GDP. However, despite their significant contributions, MSMEs face growing structural challenges, particularly in maintaining business sustainability amidst the dynamics of global competition and the accelerating transformation of the digital economy [1].

Digital transformation has brought significant changes to the MSME business landscape in Indonesia. The emergence of marketplaces like Shopee, Tokopedia, and Lazada has created new opportunities for MSMEs to market their products more efficiently. At the same time, the adoption of digital payment technologies like e-wallets and QRIS has simplified transactions while increasing business transparency and accountability. However, this enormous potential remains untapped. Research shows that only around 12% of MSMEs have successfully integrated digital technology into their operations, representing a significant gap that needs to be addressed [2], [3].

In this context, researchers have highlighted two key variables: innovation and digital transformation. Digital innovations, including e-commerce, digital payments, big data analytics, artificial intelligence, and cloud-based management systems, have been shown to significantly improve operational efficiency, expand market access, and boost MSMEs' adaptability. Meanwhile, digital transformation and entrepreneurship play a crucial role in enhancing MSME sustainability by helping them streamline operations, access new markets, and adapt to market changes [2], [4], [5]. However, the relationship between innovation, digital transformation, and business sustainability is not straightforward. There is a crucial but often overlooked mediating variable: financial resilience. Sustainable resilience strategies for MSMEs depend not only on financial capital but also on the ability to leverage digital technology to face the challenges of economic uncertainty. Digitalization plays a role in building business resilience while opening up opportunities for innovation [6], [7].

The research results show that financial technology and financial inclusion have a positive and significant impact on the financial performance of MSMEs, reflected in increased profitability, operational efficiency, business resilience, and long-term sustainability and competitiveness. This underscores the strategic role of financial resilience as a bridge connecting innovation capacity and digital adoption with long-term business sustainability [4], [8], [9], [10], [11]. The success of

MSME digital transformation depends not only on technology adoption but also on external support such as training, mentoring, and supportive government policies, as well as collaboration between the government, the private sector, and educational institutions to create a conducive ecosystem. Therefore, a comprehensive approach that considers the interrelationships between innovation, digital transformation, and financial resilience is becoming increasingly relevant for empirical study.

Based on the description above, this study aims to analyze the influence of innovation and digital transformation on the business sustainability of MSMEs in Indonesia, with financial resilience as a mediating variable. This research is expected to provide theoretical contributions and practical implications for MSMEs, policymakers, and financial institutions in designing more adaptive and sustainable business strategies.

LITERATURE REVIEW:

[12] suggest that innovation in MSMEs goes beyond developing new products; it encompasses innovation in processes, business models, marketing, and organizations. [13] further classified innovation dimensions in MSMEs into product/service, process, and business model innovation. They found that firm size and age moderate the effectiveness of each dimension on business performance. Younger and smaller MSMEs tend to benefit more from product innovation, while more mature MSMEs benefit more from process innovation. The influence of innovation on MSME business sustainability has been widely documented in the literature. [14] found that without adequate innovation capabilities, other organizational factors will be ineffective in driving sustainability. The impact of innovation on MSME performance explains that sustainability-oriented product and process innovation has a significant positive impact on business performance. In Indonesia, studies on innovation in the MSME context are strengthened by [4]. The link between innovation and sustainability is further strengthened by [15] who conducted an integrated bibliometric-systematic literature review of 754 peer-reviewed articles (1999-2024) in the Scopus database, indicating that innovation capabilities and entrepreneurial orientation are at the heart of the sustainability of MSME digital businesses.

Digital transformation (DT) is a process of fundamental change in how organizations create value by integrating digital technology into all aspects of business operations. [16] conducted a systematic review examining 15 years of DT-innovation research in MSMEs, shifting from individual technologies to the latest digital technologies. [17] emphasize the need for successful digital transformation for sustainable business performance. This SLR study reviewed 59

publications (2019-2023) and formulated critical steps that MSME owners/managers can take to initiate a sustainability-oriented digital transformation project. [1] focuses on an empirical study of 259 MSMEs in Andalusia, Spain, where digital transformation has been the focus of intensive research, which ultimately increases organizational adaptability and flexibility. [18] corroborate this by stating that digital technology helps MSMEs transform outdated business processes, develop adaptive capabilities, and generate MSME resilience.

Financial resilience in MSMEs refers to a company's ability to anticipate, absorb, respond to, and recover from financial stress and shocks while maintaining, or even increasing, its operational capacity. [19] define financial resilience as a strong financial foundation built through adaptive financial management strategies, including revenue diversification, prudent cash flow management, adequate access to financing, and high financial literacy. [20] proposed and validated a dynamic financial resilience measurement in Lithuanian MSMEs using a dynamic capabilities approach, providing an important conceptual contribution to the measurement of financial resilience.

The influence of innovation and digital transformation on the financial resilience of MSMEs has received significant empirical attention. [21] used data from 469 Indonesian MSMEs and an importance-performance mapping analysis (IPMA) to find that financial literacy increases loan availability and FinTech adoption, which in turn strengthens access to financing as a mediator between financial technology adoption and MSME business sustainability. The mediating variable of financial resilience in the path of innovation and digital transformation to business sustainability has received strong theoretical support from several studies. [22] found that one of the main mechanisms by which digital transformation increases innovation is by reducing financial constraints, which implicitly indicates the role of financial resilience as both an enabler and a mediator in the causal chain of digital transformation on performance. [9] confirmed that business resilience, including the financial resilience dimension, serves as a critical bridge between adaptation strategies (including the adoption of innovation and technology) and long-term business continuity. MSMEs with greater financial resilience can convert innovation and digital investments into sustainable competitive advantages. [23] found that financial literacy contributes to sustainable business performance through complex mediating mechanisms. These findings collectively support the position of financial resilience as a critical mediating variable.

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METHODOLOGY:

This study employs a quantitative research approach using Structural Equation Modeling (SEM) as the primary analytical method. This approach enables the systematic measurement and statistical testing of theoretical relationships among variables derived from the literature.

Research Design and Variables

The model consists of four main constructs: Innovation and Digital Transformation as exogenous variables, Business Sustainability as the endogenous variable, and Financial Resilience as a mediating (intervening) variable. In this context, Financial Resilience functions both as an outcome variable (affected by Innovation and Digital Transformation) and as a predictor of Business Sustainability, thereby clarifying its dual role within the structural model.

The operational definitions and measurement indicators for each construct are presented in Table 1.

Variable	Role	Definition	Indicators
Innovation (10 Indicators)	Exogenous	The process of creating, developing, and implementing new ideas in products, services, or MSME business processes.	Product Innovation : Unique and different elements from competitors, Collaboration with external partners, Competitive advantage, Adoption of the latest trends and developments, Process Innovation : New technology or innovative approaches, Operational efficiency, Market Innovation : Creative marketing strategies, Revolutionary delivery methods, Flexible pricing approach, Changes based on customer feedback
Digital Transformation (7 Indicators)	Exogenous	The integration of digital technology across all aspects of MSME business operations is fundamentally changing	Digital Marketing Adoption: Online marketing,e-commerce, Cloud Utilization: Business process connectivity,

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Variable	Role	Definition	Indicators
		how MSMEs deliver value to customers.	Business process effectiveness and efficiency, Database management, Business development. Digital Payment : Ease of customer transactions
Financial Resilience (10 Indicators)	Exogenous dan Endogenous	The ability of MSMEs to survive, adapt, and recover from financial shocks or economic pressures.	Cash Flow Management : Prepare a financial plan and budget, and prioritize primary needs. Financial reserves : Saving, Set aside a special fund for unexpected expenses. Debt Management : Think about risk before taking debt, Wise in taking debt, Financial literacy : Make a comparison between income and expenses, conduct expenditure evaluation with financial planning.
MSME Sustainability (12 Indicators)	Endogenous	The ability of MSMEs to maintain long-term business operations and growth across economic, social, and environmental dimensions.	Business sustainability: Reputation, ownership, Infrastructure, Resources, Integration Income stability: Profitability, Risk Sharing, Market Share, Employment retention : Service apability and Conflict Resolution, Environmental concern : Information systems and technology, Geographical Conditions, Top anagement Compatibility

Source: [4], [11], [14], [16], [18], [19], [22], [24], [25], [26].

Population, Sampling Technique, and Sample Size

The population of this study comprises all MSMEs operating in Indonesia. However, due to practical constraints and the need for contextual depth, this study focuses on MSMEs in West Java Province.

West Java is selected purposively (*purposive sampling*) based on several considerations. First, it is one of the provinces with the largest number of MSMEs in Indonesia, representing a significant proportion of the national MSME population. Second, West Java reflects diverse MSME characteristics in terms of sectoral distribution, scale, and level of digital adoption, making it a relevant proxy for the broader Indonesian MSME landscape. Third, the province has been a major target of government MSME development and digitalization programs, which aligns with the variables examined in this study. Therefore, while not claiming full national generalization, West Java provides a strong empirical context that reasonably represents typical MSME conditions in Indonesia.

The sampling technique used is purposive sampling, with the criteria that respondents are MSME owners or managers who are actively involved in business operations and decision-making processes.

Sample size determination follows the guidelines by [27], which recommend a minimum of 5–10 observations per indicator. Given that this study includes approximately 35 indicators, the minimum required sample size ranges from 175 to 350 respondents. Additionally, [28] suggests that a sample size greater than 200 is appropriate for multivariate analysis. Based on these considerations, a total of 352 valid responses were collected, satisfying the statistical requirements for SEM analysis.

Data Collection Procedure

Data were collected using a structured questionnaire distributed to MSME owners and managers in West Java. The questionnaire employed a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

The data collection process was conducted in two stages. First, the questionnaire was distributed through both online platforms (e.g., Google Forms) and offline approaches to ensure broader respondent coverage. Second, responses were screened to ensure completeness and consistency before being included in the analysis. Only fully completed questionnaires meeting the respondent criteria were processed further.

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Instrument Validity and Reliability (Pre-testing)

Before the main survey, a pilot study was conducted involving a small group of MSME respondents to evaluate the clarity, relevance, and reliability of the measurement items. Feedback from the pilot test was used to refine wording, eliminate ambiguous items, and improve the overall structure of the questionnaire.

Following data collection, construct validity and reliability were assessed using SEM procedures. Convergent validity was evaluated through factor loadings and Average Variance Extracted (AVE), while reliability was assessed using Cronbach's Alpha and Composite Reliability. Indicators with factor loadings below 0.70 were removed to ensure measurement accuracy, as presented in the results section.

RESULTS AND DISCUSSION:

The outer model is used to reveal the relationship between indicators and latent constructs. Evaluation is conducted by examining the factor loading values of each indicator. According to [27], an indicator is considered valid if it has a loading value > 0.70, while indicators with a loading value < 0.70 should be eliminated from the model because they cannot adequately represent the construct. The following are the results of the outer model, shown in Table 1:

Table 1. First step of outer model analysis

Items	Business Sustainability	Digital Transformation	Financial Resilience	Innovation	Conclusion
BS1	0.549				Invalid
BS10	0.707				Valid
BS11	0.664				Invalid
BS12	0.406				Invalid
BS2	0.737				Valid
BS3	0.708				Valid
BS4	0.595				Invalid
BS5	0.659				Invalid
BS6	0.712				Valid
BS7	0.648				Invalid
BS8	0.748				Valid
BS9	0.778				Valid
FR1			0.755		Valid
FR10			0.794		Valid
FR2			0.753		Valid

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FR3			0.736		Valid
FR4			0.697		Invalid
FR5			0.740		Valid
FR6			0.712		Valid
FR7			0.627		Invalid
FR8			0.667		Invalid
FR9			0.727		Valid
I1				0.767	Valid
I10				0.724	Valid
I2				0.815	Valid
I3				0.821	Valid
I4				0.759	Valid
I5				0.760	Valid
I6				0.793	Valid
I7				0.824	Valid
I8				0.653	Invalid
I9				0.788	Valid
TD1		0.878			Valid
TD2		0.889			Valid
TD3		0.899			Valid
TD4		0.892			Valid
TD5		0.841			Valid
TD6		0.892			Valid
TD7		0.850			Valid

Based on the data in Table 1, 10 factor loadings were < 0.70. Several indicators in the Business Sustainability construct did not meet the validity criteria. Indicators BS1 (0.549), BS11 (0.664), BS12 (0.406), BS4 (0.595), BS5 (0.659), and BS7 (0.648) were categorized as Invalid because they had loading values below 0.70. A similar situation occurred in the Financial Resilience construct, where FR4 (0.697), FR7 (0.627), and FR8 (0.667) were declared invalid. In the Innovation construct, indicator I8 (0.653) also did not meet the validity criteria. Indicators that failed validity tests were removed from the model because they could not adequately represent the construct. Furthermore, after elimination, the new Outer model can be seen in Table 2 below:

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Table 2. Second step of outer model analysis

Item	Business Sustainability	Digital Transformation	Financial Resilience	Innovation
BS10	0.745			
BS2	0.767			
BS3	0.697			
BS6	0.711			
BS8	0.790			
BS9	0.806			
FR1			0.788	
FR10			0.809	
FR2			0.781	
FR3			0.742	
FR5			0.740	
FR6			0.715	
FR9			0.734	
I1				0.771
I10				0.711
I2				0.833
I3				0.831
I4				0.777
I5				0.773
I6				0.798
I7				0.823
I9				0.786
TD1		0.879		
TD2		0.889		
TD3		0.899		
TD4		0.892		
TD5		0.842		
TD6		0.892		
TD7		0.849		

In Table 2, the indicators that were invalid in the initial stage have been eliminated. The results show significant improvements: The Business Sustainability construct now consists of only BS10, BS2, BS6, BS8, and BS9, all of which have loadings greater than 0.70. However, one invalid indicator, BS3, was still found. The Financial Resilience construct consists of FR1, FR10, FR2, FR3, FR5, FR6, and FR9, all valid. The Innovation construct consists of I1, I10, I2, I3, I4, I5, I6, I7, and I9, with loading values ranging from 0.711 to 0.833, all of which are valid. The Digital

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Transformation construct remained consistently valid with TD1–TD7. Based on the data in Table 2, even though the factor loading value < 0.70 has been eliminated, it turns out that one factor loading value < 0.70 was still found. Therefore, it was eliminated from the model because it was unable to represent the construct well. Furthermore, after elimination, the new Outer model can be seen in Table 3 below:

Table 3. Third step of outer model analysis

Item	Business Sustainability	Digital Transformation	Financial Resilience	Innovation
BS10	0.773			
BS2	0.766			
BS6	0.719			
BS8	0.804			
BS9	0.814			
FR1			0.787	
FR10			0.809	
FR2			0.780	
FR3			0.739	
FR5			0.743	
FR6			0.718	
FR9			0.733	
I1				0.772
I10				0.713
I2				0.832
I3				0.831
I4				0.775
I5				0.772
I6				0.798
I7				0.823
I9				0.787
TD1		0.879		
TD2		0.890		
TD3		0.899		
TD4		0.891		
TD5		0.843		
TD6		0.891		
TD7		0.848		

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In the final stage (Table 3), the remaining indicators were revalidated. The results showed consistency: All Business Sustainability indicators (BS10, BS2, BS6, BS8, BS9) had valid loadings of 0.719–0.814. The Financial Resilience indicators (FR1, FR10, FR2, FR3, FR5, FR6, FR9) were valid, with loadings ranging from 0.718 to 0.809. Innovation indicators (I1, I10, I2, I3, I4, I5, I6, I7, I9) were valid, with loadings ranging from 0.713 to 0.832. Digital Transformation indicators (TD1–TD7) remained valid, with loadings ranging from 0.848 to 0.899.

Based on Table 4, the construct reliability test indicates that all latent variables had Cronbach's Alpha values above 0.7 and Composite Reliability (rho_a and rho_c) values above 0.7. This result proves that the indicators in each construct are reliable. In addition, the Average Variance Extracted (AVE) for each construct was above 0.5, indicating that each variable has good convergent validity. Business Sustainability: Cronbach's Alpha = 0.834; AVE = 0.602, while Digital Transformation: Cronbach's Alpha = 0.950; AVE = 0.770. Next, Financial Resilience: Cronbach's Alpha = 0.877; AVE = 0.576. Then, Innovation: Cronbach's Alpha = 0.924; AVE = 0.624.

Table 4. Validity testing

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Business Sustainability	0.834	0.836	0.883	0.602
Digital Transformation	0.950	0.951	0.959	0.770
Financial Resilience	0.877	0.880	0.905	0.576
Innovation	0.924	0.927	0.937	0.624

Based on the data in Table 5 of Discriminant Validity, the cross-loadings indicate that each indicator's factor loading is higher on its respective construct than on other constructs. For example, indicators BS10–BS9 have the highest loading on Business Sustainability, indicators TD1–TD7 on Digital Transformation, indicators FR1–FR9 on Financial Resilience, and indicators I1–I10 on Innovation. This result proves that discriminant validity is met.

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Table 5. Discriminant validity

	Business Sustainability	Digital Transformation	Financial Resilience	Innovation
BS10	**0.773**	0.359	0.556	0.517
BS2	**0.766**	0.406	0.479	0.444
BS6	**0.719**	0.553	0.411	0.578
BS8	**0.804**	0.404	0.563	0.535
BS9	**0.814**	0.383	0.501	0.563
FR1	0.496	0.330	**0.787**	0.438
FR10	0.545	0.386	**0.809**	0.534
FR2	0.481	0.336	**0.780**	0.421
FR3	0.519	0.390	**0.739**	0.449
FR5	0.492	0.265	**0.743**	0.388
FR6	0.466	0.261	**0.718**	0.369
FR9	0.442	0.366	**0.733**	0.452
I1	0.559	0.551	0.509	**0.772**
I10	0.554	0.524	0.491	**0.713**
I2	0.562	0.651	0.482	**0.832**
I3	0.587	0.568	0.451	**0.831**
I4	0.454	0.582	0.377	**0.775**
I5	0.436	0.571	0.358	**0.772**
I6	0.577	0.485	0.484	**0.798**
I7	0.575	0.581	0.480	**0.823**
I9	0.498	0.574	0.434	**0.787**
TD1	0.494	**0.879**	0.411	0.662
TD2	0.480	**0.890**	0.402	0.670
TD3	0.484	**0.899**	0.399	0.652
TD4	0.463	**0.891**	0.390	0.570
TD5	0.506	**0.843**	0.401	0.710
TD6	0.476	**0.891**	0.357	0.576
TD7	0.417	**0.848**	0.351	0.526

Furthermore, the model testing results in Table 6 show that the SRMR value = 0.065 (<0.08), indicating a good model fit. Moreover, the NFI = 0.811 (>0.8) indicates a good level of model fit. The Chi-square value of 1,598.570 is acceptable given the large sample size.

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Table 6. Model fit test

	Saturated model	Estimated model
SRMR	0.065	0.065
d_ULS	1.736	1.736
d_G	0.720	0.720
Chi-square	1.598.570	1.598.570
NFI	0.811	0.811

The following is the final model of this research:

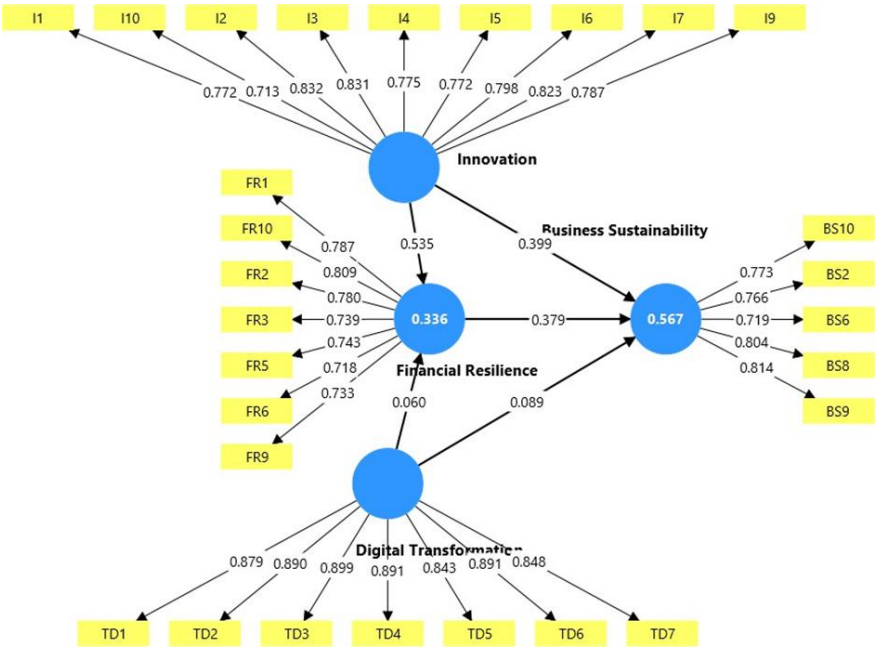

Figure 1. Research model

Source: Authors' Computation

The structural model estimation results in Table 8 show that innovation significantly influences financial resilience ($\beta = 0.535$; $p < 0.001$). It means that the higher the level of innovation undertaken by SMEs, the stronger their ability to face uncertainty and financial crises. Innovation drives cost efficiency, revenue diversification, and the creation of new products and services, which enhance competitiveness. This finding aligns with research by [29], which states that innovation is a key source of dynamic competitive advantage, enabling companies to survive in a rapidly changing business environment.

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Table 7. Path Coefficients Between The Variables (direct and indirect effects)

Relationship	β	M	STDE V	T- statistics	P- value	Decision
Direct Effect						
Innovation → Financial Resilience	0.535	0.537	0.058	9.211	0.000	**Supported**
Innovation → Business Sustainability	0.399	0.402	0.056	7.088	0.000	**Supported**
Digital Transformation → Financial Resilience	0.060	0.061	0.062	0.974	0.165	Not Supported
Digital Transformation → Business Sustainability	0.089	0.088	0.059	1.503	0.066	Not Supported
Financial resilience → Business Sustainability	0.379	0.379	0.045	8.500	0.000	**Supported**
Indirect Effect						
Innovation → Financial Resilience → Business Sustainability	0.203	0.204	0.032	6.344	0.000	Partial Mediation
Digital Transformation → Financial Resilience → Business Sustainability	0.023	0.023	0.024	0.958	0.169	No Mediation

Discussion

The structural model results provide important insights into the relationships between innovation, digital transformation, financial resilience, and MSME sustainability. Overall, the model demonstrates good explanatory power, with most hypothesized relationships supported except those related to digital transformation.

First, the findings confirm that Innovation has a positive and significant effect on Financial Resilience ($\beta = 0.535$; $p < 0.001$). This result reinforces the theoretical perspective that innovation serves as a dynamic capability that enables firms to adapt to uncertainty and enhance resilience. Innovation allows MSMEs to improve operational efficiency, diversify revenue streams, and develop competitive advantages, which ultimately strengthen their financial capacity to withstand external shocks. This finding is consistent with prior studies [4], [14], [29], which highlight innovation as a critical driver of firm performance and long-term sustainability. The result also supports the argument in the literature that innovation-oriented MSMEs are better positioned to transform internal capabilities into adaptive resilience.

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Second, Innovation is also found to significantly influence Business Sustainability ($\beta = 0.399$; $p < 0.001$). This finding confirms the central role of innovation in sustaining MSME growth and competitiveness. From a theoretical standpoint, this supports the resource-based view (RBV), where innovation is considered a strategic resource that creates sustainable competitive advantage. Empirically, this result aligns with previous studies [4], [15], which emphasize that innovation capability is at the core of MSME sustainability. The implication is that MSMEs that continuously innovate are more likely to survive and grow in highly competitive and dynamic markets.

Third, Financial Resilience significantly affects Business Sustainability ($\beta = 0.379$; $p < 0.001$), confirming its role as a key determinant of long-term business continuity. This finding strengthens the conceptualization of financial resilience as not merely an outcome variable but also a strategic capability that enables MSMEs to maintain stability and growth under uncertainty. This is consistent with prior research [9], [19], which positions financial resilience as a bridge between internal capabilities and sustainable performance. Theoretically, this result supports the dynamic capability perspective, where financial resilience enables firms to reconfigure resources and respond effectively to environmental changes.

Furthermore, the mediation analysis shows that Financial Resilience partially mediates the relationship between Innovation and Business Sustainability ($\beta = 0.203$; $p < 0.001$). This finding provides important theoretical insight by confirming that the effect of innovation on sustainability is not purely direct but also operates through the strengthening of financial capacity. This supports previous studies [9], [22], [23], which highlight the mediating role of financial mechanisms in translating innovation into sustainable outcomes. In this context, financial resilience acts as a transformation mechanism that converts innovation efforts into tangible sustainability performance.

In contrast, one of the most important and unexpected findings of this study is that Digital Transformation does not have a significant effect on Financial Resilience ($\beta = 0.060$; $p = 0.165$) nor on Business Sustainability ($\beta = 0.089$; $p = 0.066$). This result contradicts much of the existing literature [16], [17], [18], which generally finds a positive relationship between digital transformation and firm performance.

This inconsistency suggests several important theoretical and contextual implications. First, it indicates that digital transformation, in the context of MSMEs in Indonesia, may still be at a nascent or superficial adoption stage, where technology is used primarily for basic functions (e.g., marketing or transactions) rather than being fully integrated into core business processes. As a

result, its impact on financial performance and sustainability has not yet materialized.

Second, this finding implies that digital transformation alone is not a sufficient condition for improving MSME resilience and sustainability. In line with the dynamic capability theory, digital technologies need to be complemented by organizational capabilities such as innovation, managerial skills, and financial literacy to generate meaningful outcomes. Without these supporting capabilities, digital adoption may remain symbolic rather than transformative.

Third, the absence of a mediation effect of Financial Resilience in the digital transformation pathway ($\beta = 0.023$; $p = 0.169$) further reinforces the argument that digital transformation has not yet translated into improved financial capacity among MSMEs. This finding highlights a gap between technological adoption and financial outcomes, suggesting that the expected mechanism proposed in prior studies [22] does not fully operate in this empirical context.

From a practical perspective, these unexpected findings provide an important contribution by challenging the common assumption that digital transformation automatically leads to better performance. Instead, the results suggest that policymakers and practitioners should shift their focus from merely promoting digital adoption toward ensuring effective utilization and integration of digital technologies within MSME business models. This includes providing training, mentoring, and ecosystem support to enhance the absorptive capacity of MSMEs.

Overall, this study contributes to the literature by offering a more nuanced understanding of MSME sustainability. It confirms the dominant role of innovation and financial resilience while highlighting the conditional and context-dependent nature of digital transformation. The findings suggest that, in emerging economies such as Indonesia, innovation-driven capability building and financial strengthening remain the primary drivers of MSME sustainability, whereas digital transformation requires a more mature ecosystem to deliver its expected impact.

CONCLUSIONS

This study provides both theoretical and practical contributions to the understanding of MSME sustainability in emerging economies, particularly in the Indonesian context.

From a theoretical perspective, this study extends the literature on MSME sustainability by integrating the resource-based view (RBV) and dynamic capability theory into a single empirical model that simultaneously examines innovation, digital transformation, and financial resilience. The findings confirm that innovation functions as a core strategic capability that directly and indirectly (through financial resilience) enhances business sustainability. More importantly, this study contributes to the literature by clarifying the dual role of financial resilience as both an

outcome of strategic capabilities (innovation and digital transformation) and a driver of sustainability.

In addition, this study offers a novel contribution by demonstrating that digital transformation does not always produce significant performance outcomes in MSMEs, particularly in developing country contexts. This finding challenges the dominant assumption in prior literature that digital transformation universally improves firm performance, and instead suggests that its impact is conditional upon the maturity of adoption and supporting organizational capabilities. Thus, this study refines existing theoretical models by highlighting the context-dependent and capability-driven nature of digital transformation outcomes.

From a practical perspective, the findings provide several actionable implications. First, MSME owners should prioritize innovation capability development, particularly in product, process, and market innovation, as these have been empirically proven to strengthen both financial resilience and long-term sustainability. Second, improving financial resilience should become a strategic priority, which can be achieved through better cash flow management, financial planning, and strengthening financial literacy. Third, policymakers should shift their focus from merely promoting digital adoption toward ensuring effective utilization and integration of digital technologies, for example through targeted training programs, mentoring, and ecosystem support. Digital transformation policies should also be tailored to the actual readiness level of MSMEs to avoid superficial adoption that does not generate measurable impact.

Despite its contributions, this study has several limitations. First, the use of a cross-sectional design limits the ability to capture dynamic changes and causal relationships over time, particularly regarding the long-term impact of digital transformation. Second, the study focuses only on MSMEs in West Java Province, which, although representative in many aspects, may not fully capture regional variations across Indonesia. Third, the measurement of digital transformation is primarily based on adoption indicators, which may not fully reflect the depth of technological integration within business processes. These limitations suggest that the findings should be interpreted with caution, particularly in terms of generalization.

Based on these limitations, several directions for future research are proposed. First, future studies should employ longitudinal designs to better capture the evolving impact of digital transformation and innovation on MSME sustainability over time. Second, expanding the research scope to include multiple regions or cross-country comparisons would provide a more comprehensive understanding of contextual differences. Third, future research should

incorporate moderating variables such as digital capability, financial literacy, or organizational readiness to better explain the inconsistent effects of digital transformation. Fourth, qualitative or mixed-method approaches could be used to explore how MSMEs actually implement digital technologies and why such implementations may fail to produce expected outcomes.

In conclusion, this study highlights that MSME sustainability in Indonesia is primarily driven by innovation and financial resilience, while the impact of digital transformation remains conditional and context-dependent. Therefore, a more integrated approach that combines capability development, financial strengthening, and ecosystem readiness is essential to ensure sustainable MSME growth in the digital era.

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