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Digital Transformation and Innovation Capabilities in MSME Growth: The Mediating Role of MSME Empowerment

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Abstract: Digital transformation and innovation capabilities are increasingly important for the growth of micro, small, and medium-sized enterprises (MSMEs). However, adopting digital technologies and developing innovations do not necessarily strengthen business capacity in a direct or uniform manner. This study examines the relationships of digital transformation and innovation capabilities with MSME growth, considering MSME empowerment as a mediating variable. Its contribution lies in examining these two business capabilities within an integrated framework that distinguishes direct relationships from indirect relationships through empowerment. A quantitative survey was conducted with 150 MSME owners or managers operating in Jakarta, Indonesia. Data were collected using a five-point Likert-scale questionnaire and analyzed using SPSS and Hayes' PROCESS Macro Model 4, with 5,000 bootstrap resamples. The results indicate that digital transformation and innovation capabilities are negatively associated with MSME empowerment, with coefficients of −0.137 and −0.168, respectively. MSME empowerment is positively associated with MSME growth (b = 0.287). The direct relationships of digital transformation and innovation capabilities with MSME growth are also positive, with coefficients of 0.893 and 0.966, respectively. The indirect effects through empowerment are negative for both relationships. This pattern suggests that the indirect pathways operate in a direction opposite to the direct pathways. The findings highlight the importance of aligning digital adoption and innovation initiatives with managerial capacity-building and structured business support.

Keywords: *Digital Transformation, Innovation Capabilities, MSME Empowerment, MSME Growth*

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INTRODUCTION

Micro, small, and medium-sized enterprises (MSMEs) play an important role in economic activity (Rosyidiana & Narsa, 2024), employment creation, and the expansion of public participation in productive activities (Wahyudi et al., 2024). Nevertheless, a large number of operating MSMEs does not necessarily mean that all businesses have the same capacity to develop (Salsabillah et al., 2023). Differences in access to capital, managerial skills, technology, marketing networks, and market information may affect an enterprise's ability to retain customers and expand its business. In an increasingly competitive economic environment, the challenge for MSMEs concerns not only business survival but also their ability to convert limited resources into sustainable economic value.

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Changes in the business environment have become more evident with the development of electronic commerce and the broader use of digital technologies. Statistics Indonesia (BPS, 2025), through its E-Commerce Statistics 2024 publication, presents information on business profiles, worker characteristics, business activities, and the value of electronic-commerce transactions during 2024. The publication provides an empirical basis for understanding the development of electronic commerce in Indonesia and the characteristics of businesses participating in these activities.

These developments create opportunities for MSMEs to reach consumers beyond conventional market boundaries, improve customer communication, and develop new sales channels (Carvalho et al., 2021). However, the availability of technology and digital commerce platforms does not automatically guarantee higher sales or MSME growth (Alfie et al., 2024).

This issue becomes particularly important when digital transformation is understood not merely as the use of devices or applications but as a change in how a business operates. MSME owners may use social media for promotion, online marketplaces for sales, and digital payment systems to facilitate transactions. Nevertheless, the benefits may remain limited when technology adoption is not accompanied by the ability to manage customer information, evaluate marketing outcomes, maintain product quality, and adjust strategies to changing demand. Price competition, promotional expenses, distribution costs, and changes in consumer preferences may also influence whether digital activities translate into tangible MSME growth (Kofman, 2006). Therefore, the relevant question is not simply whether MSMEs use digital technology, but how digital transformation relates to business capacity and the expansion of business scale.

This perspective suggests that digital transformation should be understood as a process shaped by internal business capabilities rather than as a uniform change that produces the same outcomes for all MSMEs (Hanelt et al., 2021).

A related issue concerns innovation capabilities. Digital technology provides information and interaction opportunities that businesses can use to identify consumer needs, monitor market developments, and improve their offerings. However, this information becomes strategically valuable only when business owners can translate it into product development, process improvement, service innovation, or adjustments to marketing models. Hassan et al. (2024), in a study of 1,100 small and medium-sized enterprises in Germany published in Small Business Economics, found that the purposeful integration of digital technologies into business processes was associated with firms' innovation activities (Hassan et al., 2024). Their study also highlighted the importance of human-resource quality and research activities in using technology to develop new products. Although the geographical context and business characteristics differ from those of Indonesian MSMEs, the findings provide a basis for considering innovation capabilities when examining the benefits of digitalization.

The relationship between digital capabilities and business outcomes has also been investigated in Indonesia. Prakasa and Jumani (2024) examined 330 small businesses in East Java to investigate the relationships among digital capabilities, digital business transformation, and business performance. Their findings indicated significant relationships among these variables and identified a mediating role for digital business transformation in the relationships examined (Prakasa & Jumani, 2024).

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This research supports the argument that the benefits of technology may depend on business transformation processes rather than on the ownership or use of technology alone. However, business performance and MSME growth are not identical concepts. Performance may encompass financial outcomes, flexibility, quality, and efficiency, whereas MSME growth emphasizes changes in business scale, such as increases in turnover, customer numbers, sales volume, or market reach over a specified period. This distinction matters because greater efficiency does not necessarily lead to higher sales, and an increase in transactions does not always result in higher profits if operating costs rise more rapidly. A study that specifically treats MSME growth as the dependent variable can therefore provide a more focused understanding of the economic outcomes sought by MSMEs.

From a theoretical perspective, the Resource-Based View (RBV) explains that valuable and difficult-to-imitate resources and capabilities can provide a basis for sustained competitive advantage (J. Barney, 1991). Dynamic capabilities theory emphasizes an organization's ability to identify opportunities, seize them, and reconfigure resources as the business environment changes (Teece, 2007, 2018). Both perspectives are relevant to explaining why digital transformation and innovation capabilities may support MSME development. Technology provides means of accessing information and improving processes, while innovation capabilities help business owners convert opportunities into changes that respond to market needs.

Within this framework, MSME empowerment is positioned as a potential mechanism connecting digital transformation and innovation capabilities with MSME growth. Empowerment is not understood solely as assistance provided by external parties. It also refers to strengthening business owners' capacity to manage resources, make decisions, develop managerial skills, and use market opportunities more independently. If digital transformation improves access to information and innovation capabilities strengthen problem-solving, these factors may contribute to empowerment. Stronger capabilities may, in turn, help business owners convert opportunities into business expansion. Nevertheless, these relationships require empirical testing because capital constraints, digital competence, and organizational capacity may affect the outcomes achieved.

Previous research provides an opportunity to extend the discussion by examining digital transformation, innovation capabilities, MSME empowerment, and MSME growth within a single analytical framework. Research on digital technology adoption in Indonesia has examined factors associated with technology use. Other studies have investigated relationships among digital capabilities, digital business transformation, and small-business performance, while studies of digitalization and innovation have highlighted the importance of internal capabilities in generating new developments (Sipayung, 2025). However, these findings do not by themselves establish whether MSME empowerment mediates the relationships of digital transformation and innovation capabilities with MSME growth, particularly when both independent variables are examined within the same analytical framework and research context (Setyawan et al., 2025).

The research gap has three dimensions. First, a contextual gap arises because findings from small businesses in East Java and SMEs in Germany need to be examined in the context of the MSMEs targeted in this study. Second, a conceptual gap concerns the need to distinguish MSME empowerment from technology use, innovation capabilities,

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and MSME growth so that the relationships among the constructs can be interpreted appropriately. Third, an empirical gap concerns the need to test the direct and indirect relationships of both independent variables with MSME growth through MSME empowerment in a consistent model. These gaps motivate the present study; they do not imply that similar relationships have never been investigated.

The study's intended contribution is to examine an integrated framework in which digital transformation and innovation capabilities are associated with MSME growth, with MSME empowerment specified as a potential mediating mechanism. The study seeks to clarify the role of empowerment in the direct and indirect pathways while distinguishing MSME growth from the broader concept of business performance (Nur et al., 2025).

Accordingly, this study aims to examine the relationships of digital transformation and innovation capabilities with MSME empowerment, the relationship between empowerment and MSME growth, and the direct relationships of digital transformation and innovation capabilities with MSME growth. It also tests whether MSME empowerment mediates the relationships of digital transformation and innovation capabilities with MSME growth. The findings are expected to contribute empirical evidence to business and economic research and inform empowerment programs that integrate technology adoption, innovation development, and stronger managerial capacity.

RESEARCH METHODS

Research Type

This study used a quantitative survey design to examine the relationships among digital transformation, innovation capabilities, MSME empowerment, and MSME growth. The quantitative approach was selected because the study evaluates relationships among variables using numerical responses and statistical procedures.

The research design is cross-sectional if the data were collected once during a specified period. The model positions digital transformation and innovation capabilities as independent variables, MSME empowerment as a mediator, and MSME growth as the dependent variable. The mediation analysis examines whether empowerment statistically accounts for part or all of the relationship between each independent variable and MSME growth (Hayes, 2022).

This framework is related to prior research investigating digital capabilities, business transformation, innovation, and small-business outcomes. For example, Prakasa and Jumani (2024) examined the mediating role of digital business transformation in the relationship between digital capabilities and the performance of small businesses in Indonesia (Prakasa & Jumani, 2024).

Population and Sample/Informants

The target population comprised MSME owners or managers operating in Jakarta, Indonesia. Jakarta was selected as the research setting because of its dynamic business environment and the role of MSMEs in supporting local economic activities. The sample comprised 150 MSME respondents. The unit of analysis was the owner or manager providing information about digital technology use, innovation capabilities, business empowerment, and business development.

Purposive sampling was used. The inclusion criteria were that respondents (a) owned or managed an MSME and participated in business decision-making; (b) operated

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a business in Jakarta; (c) used digital technology in marketing, transactions, customer communication, or business operations; and (d) were willing to complete the questionnaire.

Instrumentation or Tools

This study employed a quantitative research approach using a structured questionnaire consisting of 47 measurement items distributed across four research variables: digital transformation (X1), with 12 items; innovation capabilities (X2), with 12 items; MSME empowerment (M), with 11 items; and MSME growth (Y), with 12 items. All items were measured using a Likert scale to capture respondents' perceptions of the respective research constructs.

Before the main data collection and hypothesis testing, validity and reliability tests were conducted on a preliminary sample of 30 respondents using the Statistical Package for the Social Sciences (SPSS). These tests were performed to assess the validity and internal consistency of the questionnaire items. Following the instrument evaluation, data from the 150 MSME respondents were analyzed using SPSS with Andrew F. Hayes' PROCESS macro, Model 4, to examine the direct relationships among the research variables and the mediating role of MSME empowerment.

In addition to primary data collected through the questionnaire, a literature review was conducted of relevant empirical studies, scholarly books, and theoretical references on MSMEs, digital transformation, innovation capabilities, empowerment, and MSME growth. These sources were used to establish the theoretical foundation, develop the research framework, formulate the hypotheses, and support the interpretation of the empirical findings.

Data Collection Procedures

The study used primary data collected through a structured questionnaire. The questionnaire measured four constructs: digital transformation, innovation capabilities, MSME empowerment, and MSME growth.

Each statement was measured on a five-point Likert scale: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, and 5 = strongly agree. Higher scores indicated stronger agreement with the statements. The responses were checked for completeness, coding consistency, and suitability for the intended analysis.

The data-collection process involved developing questionnaire items based on the conceptual definitions and indicators of each variable, assessing item readability and relevance, collecting responses, checking the completed questionnaires, and coding the data before statistical analysis.

Data Analysis

The research model includes two independent variables, one mediating variable, and one dependent variable. Digital transformation (X1) and innovation capabilities (X2) are examined in relation to MSME empowerment (M) and MSME growth (Y). MSME empowerment is specified as a potential mechanism through which each independent variable is indirectly associated with MSME growth.

Direct and indirect effects were tested using SPSS with Hayes' PROCESS Macro Model 4. The analysis used 5,000 bootstrap resamples and a 95% confidence level. Direct effects were evaluated using regression coefficients, standard errors, t-statistics, p-values, and confidence intervals. Indirect effects were evaluated using bootstrap confidence

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intervals. An indirect effect is generally considered statistically distinguishable from zero when its bootstrap confidence interval does not include zero.

RESULTS AND DISCUSSION

Descriptive Statistics

Descriptive statistics were used to summarize the distribution of the scores for digital transformation, innovation capabilities, MSME empowerment, and MSME growth. The statistics include the number of observations, minimum and maximum values, means, and standard deviations.

Table 1. Descriptive Statistics

Statistic	Digital transformation	Innovation capabilities	MSME empowerment	MSME growth
N	150	150	150	150
Minimum	13	14	35	17
Maximum	60	60	53	60
Mean	47.75	47.01	42.51	47.92
Standard deviation	11.504	11.392	4.910	10.927

All four variables had 150 valid observations. Digital transformation had a mean of 47.75, with scores ranging from 13 to 60 and a standard deviation of 11.504. Innovation capabilities had a mean of 47.01, a minimum of 14, a maximum of 60, and a standard deviation of 11.392. These values indicate variation in respondents' scores on both constructs.

MSME empowerment had a mean of 42.51, with scores ranging from 35 to 53 and a standard deviation of 4.910. Its standard deviation was lower than those of the other variables, indicating that its observed scores were more concentrated around the mean. MSME growth had a mean of 47.92, a minimum of 17, a maximum of 60, and a standard deviation of 10.927. These descriptive statistics summarize the distribution of the scores; they do not establish the direction or strength of relationships among the variables.

Validity and Reliability Results

Table 2. Summary of Item-Validity Results (Pilot Sample, n = 30)

Variable	Item range	Pearson correlation range	r-table	Significance	Decision
Digital transformation (X1)	X1.1–X1.12	0.800–0.920	0.361	< 0.05	All items valid
Innovation capabilities (X2)	X2.1–X2.12	0.796–0.942	0.361	< 0.05	All items valid
MSME empowerment (M)	M1–M11	0.383–0.693	0.361	< 0.05	All items valid
MSME growth (Y)	Y1–Y12	0.408–0.957	0.361	< 0.05	All items valid

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Table 3. Reliability Results (Pilot Sample, n = 30)

Variable	Number of items	Cronbach's alpha	Criterion	Evaluation
Digital transformation (X1)	12	0.969	> 0.600	High; possible item redundancy
Innovation capabilities (X2)	12	0.974	> 0.600	High; possible item redundancy
MSME empowerment (M)	11	0.757	> 0.600	Acceptable reliability
MSME growth (Y)	12	0.973	> 0.600	High; possible item redundancy

Digital transformation, innovation capabilities, and MSME growth have alpha values above 0.95, while MSME empowerment has an alpha value of 0.757. All values exceed the criterion of 0.60 and the 0.70 threshold commonly applied. However, alpha values above 0.90 for these three constructs may indicate redundant items rather than higher reliability. These coefficients were obtained from the pilot sample of 30 respondents.

Direct Effects and Hypothesis Testing

Table 4. Regression Results for Direct Effects

Path	Relationship	b	SE	t	p	95% LLCI	95% ULCI
H1	Digital transformation → MSME empowerment	−0.137	0.033	−4.125	< 0.001	−0.203	−0.071
H2	Innovation capabilities → MSME empowerment	−0.168	0.033	−5.152	< 0.001	−0.233	−0.104
H3	MSME empowerment → MSME growth	0.287	0.082	3.513	0.001	0.126	0.449
H4	Digital transformation → MSME growth	0.893	0.035	25.559	< 0.001	0.824	0.962
H5	Innovation capabilities → MSME growth	0.966	0.029	33.875	< 0.001	0.910	1.022

Digital Transformation and MSME Empowerment

The regression coefficient for digital transformation in relation to MSME empowerment is negative and statistically significant (b = −0.137, SE = 0.033, t = −4.125, p < 0.001; 95% CI [−0.203, −0.071]). The confidence interval lies entirely below zero, supporting the conclusion that the estimated relationship is negative in the model.

This result differs from the expectation that digital transformation necessarily strengthens empowerment. One possible explanation is that adopting digital tools may create initial demands for financial resources, training, workflow adjustments, and managerial attention. These demands may temporarily constrain other business-development activities, especially where digital skills and organizational resources are limited. The Resource-Based View and dynamic capabilities perspective suggest that technology creates value through the resources and processes used to integrate it into business activities (J. B. Barney & Hesterly, 2021; Teece, 2007). However, the present

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cross-sectional results do not directly measure transitional shocks or learning curves. These explanations should therefore be treated as possible interpretations rather than established mechanisms**.**

Innovation Capabilities and MSME Empowerment

Innovation capabilities also show a negative and statistically significant relationship with MSME empowerment in the model (b = −0.168, SE = 0.033, t = −5.152, p < 0.001; 95% CI [−0.233, −0.104]). The estimated direction is negative, and the confidence interval does not include zero.

One possible interpretation is that innovation activities may require additional time, funding, and organizational effort. When business owners pursue product or process changes without sufficient managerial resources, these activities may compete with routine management and capacity-building activities. Organizational ambidexterity research discusses the challenges organizations face when balancing exploration and exploitation (Raisch & Birkinshaw, 2008). Nevertheless, the present study did not directly measure resource-allocation conflicts or innovation costs. Such explanations should be tested in future research rather than treated as demonstrated causes.

The result also indicates that the direction of the estimated relationship must be distinguished from the statistical significance of the coefficient. If H2 predicted a positive relationship, the negative coefficient does not support that directional hypothesis, even though the relationship is statistically significant.

MSME Empowerment and MSME Growth

MSME empowerment has a positive and statistically significant relationship with MSME growth in the model (b = 0.287, SE = 0.082, t = 3.513, p = 0.001; 95% CI [0.126, 0.449]). The positive coefficient indicates that higher empowerment scores are associated with higher MSME growth scores, conditional on the model specification.

This finding is consistent with the view that managerial capacity, decision-making autonomy, access to opportunities, and the ability to organize business resources may support business development. Empowered business owners may be better positioned to manage finances, respond to customer needs, and make operational decisions. Tambunan (2019) discusses the constraints faced by Indonesian MSMEs and the relevance of policy and institutional support (Tambunan, 2019). However, the specific mechanisms linking empowerment to growth were not separately tested in the model. The results therefore support an association rather than proving that a particular empowerment intervention caused growth.

Digital Transformation and MSME Growth

Digital transformation has a positive and statistically significant direct relationship with MSME growth in the model (b = 0.893, SE = 0.035, t = 25.559, p < 0.001; 95% CI [0.824, 0.962]). The positive estimate is consistent with the possibility that digital tools help businesses reach customers, facilitate transactions, and develop additional sales channels.

Digital marketing, online marketplaces, and digital payment systems may help MSMEs communicate with customers and reduce some transaction barriers. Prior research has discussed digital transformation as a multidisciplinary business process rather than a simple technology-adoption decision (Hassan et al., 2024; Verhoef et al., 2021). Research on the digitalization of SMEs has also examined differences in the extent and patterns of technology adoption (Brodny, 2022).

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The coefficient should not, however, be interpreted as proof that a particular digital tool produces a specific increase in revenue or profit. The study uses questionnaire-based scores, and the model's scale and specification must be considered when interpreting the magnitude of the estimate. Because the design is cross-sectional, the results establish an estimated association rather than a definitive causal effect.

Innovation Capabilities and MSME Growth

Innovation capabilities show a positive and statistically significant direct relationship with MSME growth ($b = 0.966$, $SE = 0.029$, $t = 33.875$, $p < 0.001$; 95% CI [0.910, 1.022]). The result suggests that higher scores on innovation capabilities are associated with higher growth scores in the model.

Innovation may support MSME growth through product differentiation, service improvements, process changes, and adaptation to customer preferences. Schumpeter (1934) emphasized the role of innovation in economic development, while research on SMEs has examined the relationship between innovation capabilities and business performance (Maldonado-Guzmán et al., 2018; Saunila, 2019). These perspectives provide a theoretical basis for the positive relationship found here.

Nevertheless, the numerical size of the coefficient should be interpreted cautiously. A coefficient close to or above one may reflect the measurement scales and model specification and does not, by itself, establish that innovation is the strongest determinant of growth. Comparing the relative importance of digital transformation and innovation capabilities requires consistent model estimation and, where appropriate, standardized coefficients or formal tests of differences.

Mediation Analysis

In mediation analysis, an indirect effect is statistically distinguishable from zero when its bootstrap confidence interval does not contain zero. The direction of the indirect effect must also be considered when interpreting the mediation pattern (Hayes, 2022; Preacher & Hayes, 2008).

Table 5. Indirect Effects Through MSME Empowerment

Path	Indirect relationship	Indirect effect	BootSE	BootLLCI	BootULCI
H6	Digital transformation → MSME empowerment → MSME growth	−0.039	0.013	−0.068	−0.018
H7	Innovation capabilities → MSME empowerment → MSME growth	−0.082	0.020	−0.127	−0.046

The Mediating Role of MSME Empowerment in the Digital Transformation–Growth Relationship

The indirect effect of digital transformation on MSME growth through empowerment is −0.039, with a bootstrap standard error of 0.013 and a 95% confidence interval from −0.068 to −0.018. Because the interval does not include zero, the indirect effect is statistically distinguishable from zero.

The indirect effect is negative, whereas the direct effect of digital transformation on growth is positive. If both estimates are derived from the same correctly specified mediation model, this pattern is consistent with an indirect pathway that operates in the

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opposite direction to the direct pathway. It is more precise to describe this as an inconsistent or competitive mediation pattern than to report only that empowerment mediates the relationship.

A possible explanation is that the benefits associated with digital adoption may coexist with short-term demands for training, adjustment, and resource allocation. These demands may constrain the empowerment pathway even while digital transformation remains positively associated with growth through other routes. However, the study does not directly test this explanation. It should therefore be presented as a possible interpretation that requires additional evidence.

The Mediating Role of MSME Empowerment in the Innovation Capabilities–Growth Relationship

The indirect effect of innovation capabilities on MSME growth through empowerment is −0.082, with a bootstrap standard error of 0.020. The 95% bootstrap confidence interval ranges from −0.127 to −0.046. Because the interval excludes zero, the indirect effect is statistically distinguishable from zero.

As with the digital-transformation pathway, the indirect effect is negative while the direct relationship between innovation capabilities and growth is positive. This pattern suggests that the pathway through empowerment operates in a direction opposite to the direct pathway. It does not mean that empowerment has no relevance; rather, the estimated relationship differs across the direct and indirect routes.

Innovation initiatives can require investment, experimentation, and organizational attention. When these demands are not matched by adequate managerial support, they may complicate the process through which innovation capabilities relate to empowerment. The current data do not directly establish that innovation costs or additional workloads caused the negative indirect effect. Further research using more detailed measures of resource constraints, managerial capability, and the timing of innovation activities would be needed to evaluate this explanation.

The results show positive direct relationships of digital transformation and innovation capabilities with MSME growth. At the same time, both variables have negative relationships with MSME empowerment, and the indirect effects through empowerment are negative. These findings suggest that the relationships among digital capabilities, innovation, empowerment, and growth may not follow a uniformly positive pathway.

The positive direct relationships are broadly consistent with the Resource-Based View, which emphasizes the strategic value of business resources and capabilities (J. Barney, 1991), and with research on digital transformation and innovation capabilities (Hassan et al., 2024; Saunila, 2019). Digital tools may expand customer access and facilitate transactions, while innovation capabilities may help businesses adapt products, processes, and services to market needs (Verhoef et al., 2021).

The negative indirect effects require a more cautious interpretation. They indicate that the pathway through empowerment differs in direction from the direct relationships estimated in the model. This finding should not be presented as proof that empowerment programs are harmful or that digital transformation necessarily reduces empowerment. It may reflect resource constraints, the way constructs were measured, characteristics of the sample, or the model specification. These possibilities need to be evaluated using the questionnaire, diagnostic results, and original statistical output.

As a suggestion that goes beyond the data tested here, digital adoption and innovation programs could be accompanied by appropriate managerial support. MSMEs

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may benefit from practical training, financial planning, customer-data management, and support in evaluating the costs and benefits of new technology. Support programs should also consider the capacity of each business to implement change rather than assuming that technology adoption alone will produce the same results for every enterprise.

Several limitations must be considered. First, a cross-sectional design limits the ability to establish temporal order or long-term causal relationships. Second, self-reported questionnaire data may be affected by response and common-method biases. Third, the sample is limited to MSMEs operating in Jakarta, which may restrict the generalizability of the findings to areas with different infrastructure, markets, and business conditions. Fourth, the study used purposive sampling and did not include control variables, which limits representativeness and the control of confounding. Fifth, MSME growth was measured through respondents' perceptions rather than objective indicators such as turnover or sales.

Future research could use longitudinal data to examine how digital transformation and innovation capabilities relate to growth over time. Studies could also investigate digital financial literacy, managerial capacity, access to finance, market turbulence, and external business support as potential moderators or additional explanatory variables. Mixed-methods research combining surveys with interviews may help explain how MSME owners experience the costs, learning demands, and benefits of digitalization and innovation.

CONCLUSION AND RECOMMENDATIONS

This study examined the relationships of digital transformation and innovation capabilities with MSME growth, with MSME empowerment specified as a mediating variable. Digital transformation and innovation capabilities had positive and statistically significant direct relationships with MSME growth. MSME empowerment was also positively associated with growth. In contrast, digital transformation and innovation capabilities had negative relationships with empowerment, and the indirect effects through empowerment were negative. All seven paths (H1–H7) were statistically significant. H3, H4, and H5 had positive coefficients, whereas H1, H2, H6, and H7 had negative coefficients.

This pattern indicates that the direct and indirect pathways may operate in opposite directions. The results should therefore be interpreted as evidence of a potentially inconsistent mediation pattern rather than as proof that all pathways are positive.

The study contributes to the discussion of MSME development by considering digital transformation, innovation capabilities, empowerment, and growth within one analytical framework. Its practical implication is that technology adoption and innovation initiatives should be accompanied by managerial capacity-building and business support tailored to the resources and readiness of MSMEs. Such support may help business owners evaluate new opportunities and manage the organizational demands associated with business change.

The findings are subject to limitations arising from the cross-sectional design, reliance on self-reported data, purposive sampling, perception-based measurement of growth, and geographic focus on Jakarta. Future research should use longitudinal designs, broaden the geographical coverage, and examine the role of managerial capability, digital financial literacy, resource constraints, and external support in the relationships among digitalization, innovation, empowerment, and MSME growth.

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