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The Role Of Digital Payment Mediation In The Adoption Of Digital Technology To Improve The Performance Of MSMEs In Tuban Regency

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Abstract

Objective – This study aims to analyze the effect of technology adoption on the performance of Micro, Small, and Medium Enterprises (MSMEs) in Tuban Regency and to examine the role of digital payment as a mediating variable in this relationship. The adoption of digital technologies and payment systems is expected to improve transaction efficiency, accelerate cash flow, and enhance financial transparency, which may ultimately improve MSME performance. Design/Methodology/Approach – This study uses a quantitative research design with a survey approach involving MSME actors in Tuban Regency. Data were collected through questionnaires distributed to MSME owners and managers. The analysis was conducted using Partial Least Squares–Structural Equation Modeling (PLS-SEM) to test the direct and indirect relationships between technology adoption, digital payment usage, and MSME performance. Findings – The results show that technology adoption has a positive and significant effect on MSME performance. In addition, technology adoption significantly influences the use of digital payment systems. Digital payment also has a positive and significant effect on MSME performance and acts as a mediating variable that strengthens the relationship between technology adoption and MSME performance. Implications – The originality of this study lies in examining the mediating role of digital payment in the relationship between technology adoption and MSME performance within the context of local MSMEs in Tuban Regency. The findings provide theoretical contributions to digital technology adoption research and practical implications for policymakers and MSME stakeholders in encouraging digital transformation to improve competitiveness and sustainability in the digital economy.

Keywords: Digital Payment, MSME Performance, technology Adoption

INTRODUCTION

The rapid development of digital technology in recent years has significantly transformed the way businesses operate. Activities that were previously carried out manually are now increasingly shifting toward digital systems, ranging from marketing to payment processes. For Micro, Small, and Medium Enterprises (MSMEs), this shift is no longer merely a trend but a necessity to remain competitive in a rapidly changing market environment (Nambisan et al., 2017; Vial, 2019). In Indonesia, MSMEs play a crucial role in supporting economic growth and employment. However, not all MSMEs are able to adapt to technological developments optimally. Many business actors still face various challenges, including limited knowledge, readiness, and access to digital technology (Bharadwaj, 2000). This condition is also evident at the regional level, including in East Java Province, which has a large number of MSMEs contributing significantly to the regional economy (BPS Provinsi Jawa timur, 2024). Specifically, Tuban Regency has considerable MSME potential, yet the level of digital technology utilization remains relatively uneven. One form of technological advancement that has grown rapidly is the use of digital payment systems. Innovations such as QRIS, mobile banking, and electronic wallets enable faster, more efficient, and transparent transactions (Dahlberg et al., 2015; Liébana-Cabanillas et al., 2018). These systems also assist MSMEs in managing cash flow and improving financial records, making them an essential component of modern business operations.

MSME performance can be understood as the ability of a business to achieve its objectives, both financially and non-financially. According to (Jay Barney, 1991), organizational performance is influenced by how effectively internal resources are utilized. Furthermore,

(Kaplan & Norton, 2000) emphasize that performance can be evaluated from multiple perspectives, including financial outcomes, customer satisfaction, internal processes, and learning and growth. (Venkatraman, 1986) also distinguishes between financial and non-financial performance. In this context, the use of digital technology has been shown to enhance efficiency and productivity in MSMEs (Gabriella & Yuldinawati, 2025; Khin & Ho, 2019).

Technology adoption refers to the process by which individuals or organizations accept and utilize new technologies to improve their performance. (Rogers, 1995) explains that adoption is influenced by perceived benefits, compatibility, and ease of use. Similarly, the Technology Acceptance Model proposed by (Freed D. Davis, 1989) highlights perceived usefulness and perceived ease of use as key determinants of technology acceptance. Previous studies indicate that higher levels of technology adoption can improve MSME efficiency and performance (Ariyanti & Marianingsih, 2024a; Louis G. Tornatzky & Mitchell Fleischer, 1990; Najib & Fahma, 2020; Verhoef et al., 2021).

Digital payment, as part of financial technology, refers to electronic transaction systems that enable users to make cashless payments through digital platforms. According to (Bank Indoneisa, 2023), digital payment services include QRIS, mobile banking, and e-wallets such as GoPay, OVO, DANA, and ShopeePay. Compared to conventional payment methods, digital payments offer greater efficiency, speed, and security (Changsu Kim et al., 2009). Empirical studies also show that digital payments improve transparency, accelerate cash flow, and strengthen MSME competitiveness (Ariyanti & Marianingsih, 2024a; Humbani & Wiese, 2019; Najib & Fahma, 2020; Soto-Acosta, 2020). Recent studies specifically show that fintech and digital payment adoption significantly improve MSME financial performance, transaction efficiency, and financial inclusion, particularly in developing countries (Ariyanti & Marianingsih, 2024b). These findings indicate that digital payment systems play a crucial role in supporting business sustainability and access to financial services for small enterprises.

From a theoretical perspective, the Resource-Based View (RBV) provides a relevant framework to understand how technology contributes to business performance. (Jay Barney, 1991) argues that competitive advantage depends on a firm's ability to manage valuable, rare, inimitable, and non-substitutable resources. These resources may include both tangible and intangible assets, such as knowledge, innovation capability, and technological expertise (Grant, 1996; Wernerfelt, 1984). Recent studies highlight that digital financial technologies, including digital payment systems, can be considered strategic resources that enhance firm performance when effectively integrated into business operations (Go et al., 2025).

In the context of MSMEs, digital technology and digital payment systems can be viewed as strategic resources that create added value and competitive advantage. The ability to effectively utilize these technologies enhances operational efficiency, increases transparency, and builds customer trust (Arina et al., 2025; Ariyanti & Marianingsih, 2024a; Najib & Fahma, 2020). Moreover, digital payment systems can function as organizational capabilities that link technology adoption with improved business performance (Gabriella & Yuldinawati, 2025). Supporting this argument, recent empirical studies show that digital transformation and fintech adoption significantly improve business agility, innovation capability, and customer engagement in MSMEs (Ariyanti & Marianingsih, 2024).

Therefore, technology adoption and digital payment are closely interconnected in influencing MSME performance. However, studies examining the mediating role of digital payment in this relationship remain limited, particularly in local contexts such as Tuban Regency. This study aims to address this gap by analyzing how digital payment mediates the relationship between technology adoption and MSME performance, providing a more comprehensive understanding of digital transformation in MSMEs.

RESEARCH METHODS

Research Approach and Type

This study uses an explanatory quantitative approach with the aim of testing the causal relationship between the variables of technology adoption (X), digital payment (Z), and MSME performance (Y). This approach was chosen because it allows for empirical testing of causal relationships between variables through inferential statistical analysis, thereby providing an in-depth understanding of the strength and direction of the influence of technology adoption and digital payments on MSME performance. According to (Creswell, 2014). In addition, (Sugiyono, 2019) states that quantitative methods are appropriate for research aimed at testing hypotheses and analyzing the influence of independent variables on dependent variables,

Research Population and Sample

The population in this study is all Micro, Small, and Medium Enterprises (MSMEs) that are actively operating in Tuban Regency in 2025 and are registered with the Tuban Regency Cooperative, Industry, and Trade Office (Kementrian Koperasi dan UKM RI, 2025) Based on data from the East Java Provincial Statistics Agency in 2024, there were 13,491 MSMEs in Tuban Regency, covering various sectors such as trade, culinary, services, and creative industries. The diversity of business sectors makes the research population representative in reflecting the variation in technology adoption and digital payment implementation in Tuban Regency.

The sample was determined using probability sampling with the simple random sampling technique so that each member of the population had an equal chance of being selected as a respondent. This technique was chosen to minimize potential researcher bias and increase the external validity and generalization of the research results as recommended by (Sekaran & Bougie, 2016). The sample size was determined based on the guidelines of (Hair et al., 2019) for research using a Partial Least Squares (PLS)-based Structural Equation Modeling (SEM) approach, which is a minimum of five to ten times the number of variable indicators. With a total of twenty-five indicators, the minimum sample size required was one hundred and twenty-five respondents. However, to obtain more robust and reliable results, this study set the sample size at 150 MSME respondents in Tuban Regency. Respondents were selected randomly using a random number generator so that the distribution of respondents was spread proportionally across several major subdistricts, such as Tuban, Palang, Semanding, and Soko. Mathematical Equation of the Research Model. The model in this study explains the effect of digital financial literacy (X) on financial satisfaction (Y) both directly and indirectly through financial behavior (M) as a mediating variable. The relationship between variables can be expressed in the following mathematical equation:

$$Y = a + \beta 1X + \beta 2Z + e \quad \ldots\ldots\ldots (1)$$

$$Z = a + \beta 1X + e \quad \ldots\ldots\ldots (2)$$

Explanation:

Y = MSME performance β = Coefficient
X = Technology adoption a = Constant
Z = Digital payment e = Error

The mediating effect of digital payment is calculated using the indirect effect approach, which is the product of β1×β3. If the indirect effect is significant and the direct relationship β2 remains significant, then the mediation is partial; whereas if the direct relationship is not significant, then the mediation is full (Baron & Kenny, 1986). Data Analysis Techniques Data analysis was conducted in stages using SmartPLS version 4.0 software, in accordance with the Partial Least Squares–Structural Equation Modeling (PLS-SEM) approach. This technique was chosen because it is capable of analyzing models with complex latent variables, relatively small sample sizes, and does not require the assumption of multivariate normal distribution (Hair et al., 2019). The analysis stages included:

The Outer Model (Measurement Model) test was conducted to assess construct validity and reliability. Convergent validity was assessed based on a factor loading value ≥ 0.70 and an Average Variance Extracted (AVE) value ≥ 0.50. Discriminant validity testing uses the Fornell–Larcker criteria and a Heterotrait–Monotrait Ratio (HTMT) value < 0.90. Meanwhile, construct reliability is measured using Composite Reliability (CR) and Cronbach's Alpha, both of which must have a value ≥ 0.70. Furthermore, the Inner Model (Structural Model) test was conducted to examine the relationship between latent variables based on the path coefficient (β) and t-statistic values through the bootstrapping method with 5,000 subsamples. The Coefficient of Determination (R^2) value was used to assess the model's ability to explain the variation in the dependent variable, while Effect Size (f^2) and Predictive Relevance (Q^2) were analyzed to measure the strength and predictive relevance of the model. Hypothesis and mediation tests were conducted with the stipulation that the hypothesis was accepted if the p-value was < 0.05. The mediation effect was tested using the Bootstrapping Indirect Effect approach in accordance with the recommendations of (Preacher & Hayes, 2008).

The final stage involved evaluating the model fit using the Standardized Root Mean Square Residual (SRMR), with a value of < 0.08 indicating a feasible model. Path analysis was performed using the SmartPLS application because the Partial Least Squares Structural Equation Modeling (PLS-SEM) method was considered more appropriate for studies with a relatively small sample size. This approach does not require the assumption of normal data distribution and is capable of providing accurate estimates of the relationship between variables even with a limited sample size.

RESULTS AND DISCUSSION

The research data used was obtained from 164 MSME respondents in Tuban, East Java, who were willing to fill out the questionnaire. The characteristics of the respondents can be seen in Table

Table 1. Respondent characteristics

		n= 164	
		Frequency	Percentage
Position in Business	Manager	20	12.2%
	Owner	40	24.4%
	Staff	104	63.4%
Gender	Man	91	55.5%
	Women	73	44.5%
Age	< 20 Years	53	32.3%
	30-40 Years	81	49.3%
	>40 Years	30	18.2%
Length of Business	<1 Year	24	14.6%
	1-3 Years	66	40.2%
	3-5 Years	48	29.3%
	>5 Years	26	15.9%
Business Sector	Trading	44	26.5%
	Culinary	50	30.5%
	Service	37	22.6%
	Creative Industry	33	20.1%
Business Scale	Micro	82	50%
	Small	44	26.8%
	Intermediate	38	23.2%

Frequency Use of Digital Payment	Never	0	0%
	Sometimes	29	17.7%
	Often	58	35.4%
	Every Transaction	77	47%
Types of Digital Payment Applications You Use in Business Transactions	Gopay	56	34.1%
	OVO	38	23.2%
	ShopeePay	87	53%
	Bank Mobile App (BCA Mobile, BRImo , Livin , etc.)	71	43.3%

Source: Author's compilation

Based on Table 1, it can be concluded that the research subjects were predominantly business staff (63.4%) with a slightly higher proportion of men (55.5%) than women (44.5%). The majority of respondents were in the 30–40 age group (49.3%), followed by those under 20 years of age (32.3%), indicating that most of the business owners in this study were of productive age. In terms of business characteristics, most respondents have been operating their businesses for 1–3 years (40.2%) and are predominantly micro-scale (50%), with the most common business sectors being culinary (30.5%) and trade (26.5%). The pattern of digital payment usage shows a very high adoption rate, as evidenced by the fact that none of the respondents had never used digital payments and the majority of respondents used them for every transaction (47%) and frequently (35.4%). The most widely used applications are ShopeePay (53%), followed by mobile banking (43.3%) and GoPay (34.1%), indicating that digital payment integration has become an important part of the operational activities of the respondents' MSMEs.

Table 2. Outer Model Test

Construct	Item	Loading	*a*	CR	AVE
Technology Adoption	Digital technology provides benefit real for improvement profit business I .	0.867	0.905	0.929	0.725
	The technology that I use in accordance with needs and characteristics business I .	0.861			
	technology that I use easy understood and operated .	0.838			
	I have chance For try technology new before truly use it in business .	0.807			
	Result of implementation easy digital technology observed and measured in business I .	0.882			
Digital Payment	System digital payments that I use easy used in every transactions .	0.874	0.873	0.913	0.724
	I believe that system secure digital payments For used .	0.836			
	Use digital payments help I speed up the transaction process with customer .	0.853			
	I feel satisfied with experience use system digital payments .	0.851			

MSME Performance	Income or profit business I increase after utilise digital technology .	0.831	0.866	0.909	0.713
	Satisfaction level or loyalty customer I increase after apply digital system .	0.842			
	Operational processes business become more efficient or organized after use digital technology .	0.853			
	I become more innovative or easy adapt to change technology in operate business .	0.851			

Source: Author's compilation

Based on Table 2, the Outer Model test results show that all indicators have met the convergent validity criteria, as indicated by factor loadings above 0.70 on all items. The Average Variance Extracted (AVE) values for the variables of Technology Adoption (0.725), Digital Payment (0.724), and MSME Performance (0.713) are also greater than 0.50, thus declared valid. In addition, the research instrument proved to be reliable, with Cronbach's Alpha (0.866–0.905) and Composite Reliability (0.909–0.929) values all above 0.70. Thus, all indicators in this study are suitable for further analysis. Inner Model Test The inner model test was conducted to assess the relationship between latent constructs and the model's ability to explain endogenous variables. The structural model evaluation included testing the coefficient of determination (R^2), predictive relevance (Q^2), effect size (f^2), and path coefficients using the bootstrapping method to determine the significance of the relationship between variables. All analyses were performed using SmartPLS 3.0 software.

Coefficient of Determination (R^2)

The coefficient of determination (R^2) describes the ability of independent variables to explain the variation that occurs in the dependent variable. In general, the interpretation of the R^2 value is divided into three levels, namely 0.75, which indicates a strong category, 0.50, which is a moderate category, and 0.25, which is a weak category.

Table 3. R^2 Square

	R Squre	R Squre Adjusted
Digital Payment	0.619	0.615
MSME Performance	0.569	0.567

Source: Author's compilation

The analysis results show that the Digital Payment variable has an R^2 value of 0.619 and an Adjusted R^2 of 0.615. This means that 61.9% of the variation in Digital Payment can be explained by the independent variables in the research model. Based on the interpretation classification, this value is in the moderate to strong category, so it can be concluded that the model has a fairly good explanatory power for the Digital Payment variable.

Meanwhile, the MSME Performance variable obtained an R^2 value of 0.569 and an Adjusted R^2 of 0.567. This means that 56.9% of the variation in MSME Performance can be explained by the exogenous variables in the model. This value is in the moderate category, which indicates that the model has adequate explanatory power in explaining the variation in MSME Performance. Predictive Relevance (Q^2) is a measure used to assess the model's ability to predict the value of endogenous variables. If the Q^2 value is greater than 0, the model is said to have predictive relevance. In general, the interpretation of the Q^2 value is divided into three levels, namely 0.02 indicates low predictive ability, 0.15 is in the moderate category, and 0.35 is in the high category.

Table 4. Q^2 Square

	Q^2
Digital Payment	0.426
MSME Performance	0.403

Source: Author's compilation

Based on the Q^2 test results, all endogenous constructs showed values above zero, which means that the model has adequate predictive power. The Q^2 value for the Digital Payment variable was 0.426 and for MSME Performance was 0.403. Both values are in the high category, so it can be concluded that this research model has a strong level of predictive accuracy for the endogenous variables analyzed. **Effect size (F^2)** is a measure used to assess how significant the role of each exogenous variable is in influencing endogenous variables in a structural model. The interpretation of the F^2 value is divided into three levels, namely 0.02 is categorized as a small effect, 0.15 as a moderate effect, and 0.35 as a large effect.

Table 5. F^2 Square

	Technology Adoption	Digital Payment	Kinerja UMKM
Technology Adoption		0.196	1.323
Digital Payment			
MSME Performance		0.204	

Source: Author's compilation

The effect size (F^2) test results show that the effect of Technology Adoption on MSME Performance is 1.323, which is classified as large and is the most dominant effect in the model. The effect of Technology Adoption on Digital Payment is 0.196 and the effect of MSME Performance on Digital Payment is 0.204, both of which are in the moderate category. This shows that the largest contribution comes from Technology Adoption on MSME Performance, while the other relationships have a significant effect.

Hypothesis Testing (Path Coefficient)

Table 5. Path coefficient

Relationship Between Variables	Original Sample (O)	T Statistic	P Values	Description
Technology Adoption -> MSME Performance	0.416	5.213	0.000	Significant
Technology Adoption -> Digital Payment	0.755	15.812	0.000	Significant
Digital Payment -> MSME Performance	0.424	5.538	0.000	Significant
Technology Adoption -> Digital Payment -> MSME Performance	0.320	4.843	0.000	Mediating

Source: Author's compilation

According to (Hair et al., 2019), a hypothesis is accepted if the p-value is less than 0.05 and the t-statistic is greater than 1.96. Based on the results of hypothesis testing in Table 4, several findings were obtained.

1. The Influence of Technology Adoption on MSME Performance (H1)

Technology adoption has a positive and significant effect on MSME performance with a path coefficient of 0.416, a t-statistic of 5.213, and a p-value of 0.000 (<0.05). This indicates that the higher the level of technology utilization by MSME actors, the better the business performance achieved. The use of digital technology helps MSMEs improve operational efficiency, expand market reach, and manage business activities more effectively. These findings are consistent with (Najib & Fahma, 2020), who state that the adoption of digital technology can

increase productivity and market access for MSMEs. Similarly, (Ariyanti & Marianingsih, 2024a) found that digital-based technology improves operational efficiency and financial performance of small businesses. From the Resource-Based View perspective, digital technology can be considered a strategic resource that creates competitive advantages when utilized effectively (Jay Barney, 1991).

2. The Influence of Technology Adoption on Digital Payment (H2)

Technology adoption also has a positive and significant effect on the use of digital payment systems, with a path coefficient of 0.755, a t-statistic of 15.812, and a p-value of 0.000 (<0.05). This result indicates that MSME actors who are more capable of adopting technology tend to utilize digital payment services in their business operations. The use of digital payment systems such as QRIS, mobile banking, and e-wallets offers convenience, transparency, and faster transactions, which encourage MSMEs to integrate these technologies into their business activities. This finding supports (Ariyanti & Marianingsih, 2024a; Najib & Fahma, 2020), who explain that the level of technology acceptance among MSME actors plays an important role in encouraging the use of fintech services. In line with Diffusion of Innovations theory, the decision to adopt a technology is influenced by perceived benefits, ease of use, and compatibility with user needs (Rogers, 1995).

3. The Influence of Digital Payment on MSME Performance (H3)

Digital payments have a positive and significant effect on MSME performance, with a path coefficient of 0.424, a t-statistic of 5.538, and a p-value of 0.000 (<0.05). This indicates that the use of digital payment systems can improve transaction efficiency, accelerate cash flow, and enhance customer satisfaction, which ultimately contributes to improved business performance. These findings are consistent with (Arina et al., 2025), who state that digital payment implementation strengthens the competitive advantage of MSMEs through improved efficiency and transaction convenience. Likewise, (Gabriella & Yuldinawati, 2025) found that digital payment systems can increase sales volume and overall business performance. From the Resource-Based View perspective, the ability of MSMEs to utilize digital payment technology can be considered an organizational capability that improves operational effectiveness and creates added value for businesses (Jay Barney, 1991).

4. The Mediating Role of Brand Trust in the Relationship between E-WoM and Repurchase Intention (H4)

The mediation analysis shows that digital payments act as a mediating variable in the relationship between technology adoption and MSME performance. The indirect effect of technology adoption on MSME performance through digital payments is significant ($\beta = 0.320$; $t = 4.843$; $p = 0.000$), indicating that the influence of technology adoption on business performance occurs both directly and indirectly through the use of digital payment systems. These findings support (Ariyanti & Marianingsih, 2024a), who show that digital payments bridge the relationship between technology implementation and MSME financial performance. Similarly (Arina et al., 2025) demonstrate that digital payment systems strengthen the impact of technological innovation on business competitiveness. Within the Resource-Based View framework, digital payments can therefore be understood as an organizational capability that transforms technological resources into competitive advantages through improved transaction efficiency, faster cash flow, and increased consumer trust.

CONCLUSION

This study concludes that the adoption of digital payment technology plays a significant role in improving the performance of Micro, Small, and Medium Enterprises (MSMEs) in Tuban

Regency. The implementation of digital payment systems contributes to more efficient transaction processes, faster cash flow management, improved financial recording, and broader market access, which collectively strengthen the competitiveness of MSMEs in the digital economic environment. These findings support the research objective that technological adoption, particularly through digital payment platforms such as QRIS and e-wallets, can positively influence business performance and encourage the digital transformation of small enterprises.

However, this research still has several limitations. The study is geographically limited to MSMEs located in Tuban Regency, which may restrict the generalization of the findings to MSMEs in other regions. In addition, the number of MSME actors who have adopted digital payment technology is relatively limited, and the study mainly focuses on digital payment as the primary indicator of technological adoption. Other relevant factors, such as digital literacy, technological readiness, infrastructure availability, and institutional support, were not examined in greater depth within this research.

Considering these limitations, future research is recommended to expand the geographical scope of the study, involve a larger and more diverse sample of MSMEs, and incorporate additional variables related to digital transformation, such as digital capability, financial literacy, and technological readiness. Such improvements would provide a more comprehensive understanding of the factors influencing MSME performance in the digital era. From a policy perspective, local governments and relevant stakeholders should strengthen digital literacy programs, improve technological infrastructure, and intensify outreach and assistance related to digital payment systems for MSME actors. These policy efforts are expected to accelerate digital transformation among MSMEs, enhance financial inclusion, and ultimately contribute to sustainable regional economic growth.

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