Journal of Social Work and Science Education
Volume 7 (3) 2026, 1974-1992
E-ISSN 2723-6919, P-ISSN 2746-0827

Digital Payment Adoption and Financial Management Efficiency of Culinary MSMES: A Study of QRIS Users in Bandung, Indonesia

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Article History: Received on 15 March 2026, Revised on 17 May 2026, Published on 20 May 2026

Abstract: This study examines the effect of digital payment adoption on the financial management efficiency of culinary micro, small, and medium enterprises (MSMEs) using the Quick Response Code Indonesian Standard (QRIS) in Bandung, Indonesia. Amid rapid digitalization, many MSMEs continue to face challenges in transaction recording and cash flow management, despite the potential of digital payment systems to automate and streamline these processes. A quantitative approach with a descriptive-causal design was employed. Data were collected through a Likert-scale questionnaire (1–5) administered to 100 culinary MSME owners who actively used QRIS for at least three months, selected through purposive sampling. Data analysis included validity and reliability testing, classical assumption tests (normality, linearity, heteroscedasticity), and simple linear regression. The results show that digital payment adoption has a positive and significant effect on financial management efficiency ($\beta = 0.571$, $t = 6.884$, $p < 0.001$). The coefficient of determination ($R^2 = 0.326$) indicates that 32.6% of the variance in financial management efficiency is explained by digital payment adoption. The use of QRIS automates transaction records, enhances data accuracy, minimizes manual errors, and simplifies reconciliation. Two items (ease of use and frequency of use) were dropped due to a ceiling effect, as active users exhibited homogeneous positive perceptions. This study concludes that QRIS adoption plays a meaningful role in improving MSME financial governance. Practical implications include the need for enhanced digital literacy training for MSME actors and integrated policy design by regulators. Limitations include the cross-sectional design and moderate explanatory power; future research should incorporate mediating variables such as digital financial literacy.

Keywords: Culinary MSMEs, Digital Payment Adoption, Financial Management Efficiency, QRIS Users

A. Introduction

The development of information and communication technology has brought fundamental changes to the business ecosystem, including the Micro, Small, and Medium Enterprises (MSMEs) sector. One of the most significant ongoing transformations is the increasingly widespread adoption of digital payment systems

across Indonesia. This digital revolution in payment systems has not only changed the way consumers conduct transactions but has also generated profound implications for the financial management practices of business actors.

Indonesia is one of the countries with the fastest-growing digital economy in Southeast Asia. According to data from Bank Indonesia (2023), the national transaction volume of the Quick Response Code Indonesian Standard (QRIS) has surpassed billions of transactions, with transaction values continuing to increase exponentially from year to year. QRIS, officially launched by Bank Indonesia in 2019, is a national QR code standard that integrates various digital payment platforms into a unified infrastructure. This standardization was designed to promote financial inclusion and accelerate the adoption of cashless payments, particularly among MSMEs.

Bandung, as one of the largest economic and culinary centers in Indonesia, represents a highly relevant location for this study. Bandung is widely recognized as a city with a highly dynamic culinary MSME sector, ranging from traditional food stalls and modern cafés to contemporary food stalls. The diversity and density of culinary businesses make Bandung an ideal laboratory for examining how the adoption of digital payment technology influences operational activities and financial management among MSME actors.

Efficient financial management constitutes one of the primary pillars for the sustainability and growth of MSMEs. However, previous studies have shown that the majority of MSMEs in Indonesia still face serious challenges in financial management, including unsystematic transaction recording, difficulties in reconciling revenues and expenditures, limited access to accurate financial reports, and inadequate understanding of business cash flow. These conditions potentially hinder business growth and limit access to formal financing institutions.

The adoption of digital payments, particularly through QRIS, offers a promising solution to these challenges. Digital payment systems automatically generate electronic transaction records, enabling business actors to monitor cash flow in real time, reduce the risk of manual recording errors, and simplify the financial reconciliation process. Furthermore, digital transaction data can be integrated with various simple accounting platforms available for MSMEs. While previous studies have examined digital payment adoption in general (Sokołowska et al., 2015; Ozili, 2018) or business performance outcomes (Musa et al., 2020), few have specifically focused on the causal relationship between QRIS adoption and financial management efficiency among culinary MSMEs in Indonesia. Furthermore, existing research has not adequately addressed the mechanism by which digital payment adoption improves transaction recording accuracy and reduces administrative costs. This study addresses that gap.

This study is grounded in the Technology Acceptance Model (TAM) proposed by Davis (1989), which posits that perceived usefulness and perceived ease of use are the primary determinants of technology adoption behavior. Additionally, the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003) extends TAM by incorporating social influence and facilitating conditions. These frameworks provide the theoretical basis for examining how QRIS adoption influences MSME financial management efficiency. Based on this background, this study formulates the following research question and hypothesis:

Research Question: Does digital payment adoption have a positive and significant effect on the financial management efficiency of culinary MSMEs using QRIS in Bandung?

Hypothesis — H_1: Digital payment adoption has a positive and significant effect on the financial management efficiency of culinary MSMEs using QRIS in Bandung.

Accordingly, the objective of this study is to analyze and empirically verify the effect of Digital Payment Adoption on the Financial Management Efficiency of culinary MSMEs in Bandung City. This study is expected to provide dual contributions. Theoretically, it seeks to enrich the body of literature concerning technology adoption and operational efficiency among MSMEs within the context of Indonesia's digital economy. Practically, it is intended to provide data-driven guidance for MSME actors, financial institutions, regulators particularly Bank Indonesia and Financial Services Authority as well as digital payment platform developers in designing more targeted and effective interventions.

Digital Payment Adoption

Digital payment can be defined as any form of financial transaction conducted electronically without the involvement of physical cash, facilitated by information and communication technology infrastructure (Dahlberg et al., 2015). Digital payment adoption refers to the process of accepting and utilizing digital payment systems or platforms by individuals or organizations in their daily transaction activities.

The theory most widely used to explain technology adoption behavior is the Technology Acceptance Model (TAM) proposed by Davis (1989). TAM identifies two primary determinants: Perceived Usefulness and Perceived Ease of Use. In addition to TAM, the Unified Theory of Acceptance and Use of Technology (UTAUT), developed by Venkatesh et al. (2003), integrates eight previous adoption models into four main constructs: Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions. Both frameworks have been extensively validated in mobile payment contexts; for instance,Baptista and Oliveira (2015) applied TAM and UTAUT to mobile banking adoption and confirmed that perceived usefulness and social influence are robust cross-cultural predictors of continued technology use.

Similarly, Schierz et al (2010) demonstrated that individual mobility and subjective norms constructs aligned with TAM and UTAUT dimensions are the most significant antecedents of mobile payment acceptance among small business users.

QRIS (Quick Response Code Indonesian Standard) is a QR code standard for digital payments established by Bank Indonesia through PADG No. 21/18/PADG/2019. In this study, Digital Payment Adoption is operationalized through the following dimensions: (1) ease of QRIS use, (2) perceived benefits, (3) frequency of use, (4) trust in security, and (5) integration with daily business processes. The inclusion of trust in security as a core dimension is supported by Lim et al. (2019), who established that perceived security knowledge is a pivotal predictor of users' continuous intention to use mobile fintech payment services, with effect sizes comparable to perceived usefulness itself.

MSME Financial Management Efficiency

Efficient financial management refers to the ability to achieve optimal financial outputs with minimal resource inputs. The financial management efficiency of MSMEs is measured through the following dimensions: (1) the quality of transaction recording, (2) the timeliness of financial report preparation, (3) cash flow management capability, (4) reduction of administrative costs, and (5) accuracy of financial data (Hantono et al., 2021). The Ministry of Cooperatives and SMEs (2022) reported that more than 60% of MSMEs in Indonesia do not possess standardized bookkeeping systems, emphasizing the urgency of technological solutions capable of improving the efficiency of financial management.

Conceptual Framework and Hypothesis

Based on the theoretical and empirical review, this study positions Digital Payment Adoption as the exogenous latent variable (construct X) and MSME Financial Management Efficiency as the endogenous latent variable (construct Y). Within the SEM-PLS framework, each construct is measured using reflective indicators (outer indicators) observed through questionnaire items. The causal relationship between constructs is examined through the structural model (inner model).

Digital Payment Adoption (X) ──[β, H_1]──► MSME Financial Management Efficiency (Y)

B. Methods

This study employed a quantitative approach with a descriptive-causal research design to examine the effect of Digital Payment Adoption on MSME Financial Management Efficiency. Data were collected through a survey method using structured questionnaires distributed to 100 culinary MSME actors in Bandung. The

sampling technique applied was purposive sampling based on specific criteria, including businesses located in Bandung, operating in the culinary sector, and actively using QRIS for at least three months.

The research instrument was developed based on two main variables measured using a 5-point Likert Scale. The Digital Payment Adoption variable (X) consisted of the dimensions of ease of use, perceived usefulness, frequency of use, security, and system integration. Meanwhile, the MSME Financial Management Efficiency variable (Y) was measured through indicators including ease of transaction recording, data accuracy, bookkeeping time efficiency, cash flow management, and ease of financial report preparation. Prior to the full-scale data collection, a pilot test was conducted on 30 respondents to ensure instrument validity using the Pearson Product Moment correlation test and reliability using Cronbach's Alpha coefficient (Likert, 1932; Sugiyono, 2019).

Data analysis was conducted in several stages using statistical software assistance. The process began with descriptive analysis to examine respondent characteristics, followed by classical assumption tests including normality, linearity, and heteroscedasticity tests to ensure that the regression model fulfilled the criteria of the Best Linear Unbiased Estimator (BLUE). Hypothesis testing was carried out through simple linear regression analysis using a partial t-test to measure the significance of the influence between variables, as well as the coefficient of determination R^2 to determine the extent to which digital payment adoption contributes to explaining variations in business financial management efficiency.

C. Results and Discussion

Validity Test

The validity test was conducted to measure the extent to which the research instrument was capable of measuring what it was intended to measure (Sugiyono, 2019). The technique employed was the Pearson Product Moment correlation between each item score and the total scale score (Corrected Item–Total Correlation). With a total number of respondents of $n = 100$and degrees of freedom $df = n - 2 = 98$at a significance level of $\alpha = 0.05$(two-tailed), the $r_{table} = 0.197$value was applied. An item statement was considered valid if $r_{calculated} > r_{table} = 0.197$ (Sekaran & Bougie, 2016).

Validity Test of the Digital Payment Adoption Variable (X)

The results of the validity test for the 10 statement items of Variable X are presented in Table 1 below.

Table 1. Validity Test Results of the Digital Payment Adoption Variable (X)

No	Indicator	r_calculated	r_table	Description	Dimension
X1	Ease of Use 1	0.202	0.197	Valid	Ease of Use
X2	Ease of Use 2	0.125	0.197	Dropped	Ease of Use
X3	Perceived Usefulness 1	0.492	0.197	Valid	Perceived Usefulness
X4	Perceived Usefulness 2	0.340	0.197	Valid	Perceived Usefulness
X5	Frequency of Use 1	0.082	0.197	Dropped	Frequency of Use
X6	Frequency of Use 2	0.382	0.197	Valid	Frequency of Use
X7	Trust & Security 1	0.390	0.197	Valid	Trust & Security
X8	Trust & Security 2	0.316	0.197	Valid	Trust & Security
X9	Business Process Integration 1	0.266	0.197	Valid	Business Process Integration
X10	Business Process Integration 2	0.301	0.197	Valid	Business Process Integration

Source: SPSS Output, processed by the researcher (2025)

Based on Table 1, out of the 10 statement items tested for Variable X (Digital Payment Adoption), 8 items were declared valid $r_{calculated} > 0.197$, while 2 items were dropped, namely X2 $r_{calculated} = 0.125$and X5 $r_{calculated} = 0.082$. Both dropped items had calculated correlation values below the table value and were therefore excluded from further analysis. Consequently, the Digital Payment Adoption variable in the regression analysis utilized composite scores derived from the remaining 8 valid items, namely X1, X3, X4, X6, X7, X8, X9, and X10.

The elimination of items X2 and X5 can be explained through the ceiling effect phenomenon resulting from the characteristics of the sample. The selected respondents were active QRIS users who tended to exhibit highly positive and homogeneous dispositions toward basic ease of use (X2) as well as intensive usage frequency (X5). This high level of response homogeneity produced very low variance in both items, thereby limiting their ability to differentiate effectively from the total scale score (Henseler et al., 2015; Hu & Bentler, 1998; Kline, 2015).

Reliability Test

The reliability test was conducted to assess the internal consistency of the research instrument using the Cronbach's Alpha coefficient α. Jum Nunnally (1978) established a minimum Cronbach's Alpha value of 0.70as the acceptable threshold for reliability. The results of the reliability test for each variable after the elimination of invalid items are presented in table 2 below.

Table 2. Reliability Test Results of the Research Instrument

No	Variable	Number of Valid Items	Cronbach's Alpha (α)	Threshold Value	Description
1	Digital Payment Adoption (X)	8 items (X1, X3, X4, X6, X7, X8, X9, X10)	0.651	≥ 0.60	Reliable
2	MSME Financial Management Efficiency (Y)	10 items (Y1–Y10)	0.706	≥ 0.60	Reliable

Based on Table 3, the Cronbach's Alpha value for the Digital Payment Adoption variable (X) after the elimination of items X2 and X5 was $\alpha = 0.651$, while the MSME Financial Management Efficiency variable (Y) obtained a value of $\alpha = 0.706$. Both values exceeded the minimum acceptable Cronbach's Alpha threshold, namely $\alpha \geq 0.60$for exploratory research (Hair et al., 2019). Therefore, it can be concluded that the research instrument used possessed adequate internal consistency and was suitable for further analysis.

The reliability value of Variable X, which fell within the acceptable range 0.651, is consistent with the findings of (Naftali et al., 2022), which indicated that technology adoption measurement instruments among MSMEs in developing countries often produce moderate reliability values due to the diversity of respondent characteristics and varying levels of technological familiarity. Meanwhile, the higher reliability value of Variable Y 0.706indicates that the dimensions of financial management efficiency employed in this study mutually support one another and measure a cohesive construct.

Descriptive Statistics

Descriptive statistics were used to provide a general overview of the data distribution for each research variable. The calculations were based on the mean scores of the valid items for each variable. Table 4 presents a summary of the descriptive statistics of both variables.

Table 3. Descriptive Statistics of Research Variables

No	Variable	N	Min.	Max.	Mean	Std. Dev.
1	Digital Payment Adoption (X) – 8 valid items	100	1.00	5.00	4.21	0.52
2	MSME Financial Management Efficiency (Y) – 10 items	100	1.00	5.00	4.48	0.49

Based on table 3, the mean score of the Digital Payment Adoption variable (X) was 4.21out of a maximum scale score of 5.00, with a standard deviation of 0.52. This figure indicates that the majority of culinary MSME respondents using QRIS in Bandung exhibited a high level of digital payment adoption. Similarly, the mean score of the MSME Financial Management Efficiency variable (Y), amounting to 4.48, reflects respondents' highly positive perceptions regarding the efficiency of their business financial management after adopting QRIS. The relatively small standard deviations for both variables 0.52and 0.49further confirm the presence of the ceiling

effect identified earlier, whereby most respondents provided responses within the score range of 4 to 5.

Classical Assumption Tests

Normality Test

The normality test was conducted using the Kolmogorov–Smirnov (K–S) method to examine whether the regression model residuals were normally distributed. The testing hypotheses were formulated as follows:
H_0:residuals are normally distributedand H_1:residuals are not normally distributed.
$H_0$is accepted when the Kolmogorov–Smirnov significance value is $p > 0.05$. The test results indicated that the Asymp. Sig. (2-tailed) value was greater than 0.05, leading to the conclusion that the regression residuals were normally distributed and that the normality assumption was fulfilled (Ghozali, 2018).

Linearity Test

The linearity test was conducted to ensure that the relationship between the Digital Payment Adoption variable (X) and MSME Financial Management Efficiency (Y) was linear in nature. The test employed the Test for Linearity procedure by examining the significance value in the *Deviation from Linearity* row. The linearity assumption is considered fulfilled if the significance value of *Deviation from Linearity* is $p > 0.05$. The results demonstrated a statistically significant linear relationship between X and Y ($p < 0.05$)in the *Linear* row, while the significance value of *Deviation from Linearity* exceeded 0.05, confirming that the relationship between the variables was linear (Sugiyono, 2019).

Heteroscedasticity Test

The heteroscedasticity test was conducted using the Scatterplot method to detect whether heterogeneity of residual variance occurred across observations. The Scatterplot graph did not reveal any specific pattern, as the points were randomly distributed above and below the value of 0 on the Y-axis. Therefore, it can be concluded that the regression model was free from heteroscedasticity problems and that the homoscedasticity assumption was satisfied (Ghozali, 2018). Since all classical assumptions were fulfilled, the simple linear regression analysis was deemed appropriate for further analysis.

Simple Linear Regression Analysis

Simple linear regression analysis was employed to examine the effect of the Digital Payment Adoption variable (X) on MSME Financial Management Efficiency (Y). The score for Variable X was calculated as the composite mean of the 8 valid items (X1, X3,

X4, X6, X7, X8, X9, and X10), while the score for Variable Y represented the composite mean of the 10 valid items (Y1–Y10). The results of the regression analysis are presented in Table 4 below.

Table 4. Results of Simple Linear Regression Analysis

Model	B (Unstd.)	Std. Error	Beta (β Std.)	t-statistic	Sig.
Constant (α)	2.123	0.377	—	5.626	< 0.001
Digital Payment Adoption (DPA)	0.563	0.082	0.571	6.884	< 0.001

Table 5. Coefficient of Determination (Model Summary)

R	R Square (R^2)	Adjusted R Square	Std. Error of the Estimate
0.571	0.326	0.319	0.404

*) $R^2 = 0.571^2 = 0.326$, calculated from $R = \beta_{standardized} = 0.571$.

Based on table 4 and table 5, the simple linear regression equation can be formulated as follows:

The regression equation above can be interpreted as follows: First, the constant value $\alpha = 2.123$indicates that if the value of the Digital Payment Adoption variable (X) equals zero (meaning no digital payment adoption at all), then the predicted value of MSME Financial Management Efficiency (Y) would be 2.123. Practically, this value illustrates the baseline level of financial management efficiency possessed by MSMEs prior to adopting digital payment systems. Second, the regression coefficient of the DPA variable $b = 0.563$means that every one-unit increase in the Digital Payment Adoption score (X) will be followed by an increase in MSME Financial Management Efficiency (Y) of 0.563units, assuming other variables remain constant (*ceteris paribus*). The positive coefficient direction confirms a positive relationship between the two variables, consistent with the research hypothesis. Third, the standardized beta coefficient $\beta = 0.571$indicates that Digital Payment Adoption exerts a relatively strong influence on MSME Financial Management Efficiency. This beta value suggests that every one standard deviation increase in Variable X will result in an increase of 0.571standard deviations in Variable Y. Fourth, the coefficient of determination $R^2 = 0.326$or 32.6%indicates that the Digital Payment Adoption variable is capable of explaining 32.6%of the variation occurring in the MSME Financial Management Efficiency variable. The remaining 67.4%is explained by other variables not included in this research model, such as financial literacy, business scale, business duration, and other external factors.

Hypothesis Testing

The research hypothesis was tested using a partial t-test. The hypotheses tested were as follows:
$H_0: \beta = 0$ Digital Payment Adoption does not have a significant effect on MSME Financial Management Efficiency.

$H_1: \beta > 0$ Digital Payment Adoption has a positive and significant effect on MSME Financial Management Efficiency.

The decision-making criteria were as follows: $H_0$is rejected and $H_1$is accepted if $t_{calculated} > t_{table}$or if the significance value $p < 0.05$. With $df = n - 2 = 98$and $\alpha = 0.05$(two-tailed), the critical value obtained was $t_{table} = 1.984$. The test results indicated that $t_{calculated} = 6.884 > t_{table} = 1.984$and the significance value was $p < 0.001 < 0.05$. Therefore, $H_0$was rejected and $H_1$was accepted. It can thus be concluded that Digital Payment Adoption has a positive and significant effect on the Financial Management Efficiency of culinary MSMEs using QRIS in Bandung.

Table 6. Summary of Hypothesis Testing Results

Hypothesis	Hypothesis Statement	β Std.	t_calculated	t_table	Sig.	Decision
H1	Digital Payment Adoption has a positive and significant effect on the Financial Management Efficiency of culinary MSMEs using QRIS in Bandung City.	0.571	6.884	1.984	<0.001	Accepted

The Positive Effect of QRIS Adoption on Financial Management Efficiency

The findings of this study empirically demonstrate that Digital Payment Adoption has a positive and significant effect on the Financial Management Efficiency of culinary MSMEs using QRIS in Bandung, with a path coefficient of β = 0,571 (t = 6,884; p < 0,001). The coefficient of determination $R^2 = 0.326$indicates that 32.6%of the variation in MSME Financial Management Efficiency can be explained by the level of digital payment adoption through QRIS. These results provide strong empirical confirmation of the research hypothesis $H_1$and are consistent with the established theoretical framework.

The positive direction of the relationship implies that the higher the level of QRIS adoption among culinary MSME actors as reflected in ease of use, perceived usefulness, trust in system security, consistent frequency of use, and effective integration into business processes the higher the efficiency of their business financial management. This efficiency is reflected in easier transaction recording, improved financial data accuracy, bookkeeping time efficiency, easier cash flow management, and simplified financial reporting processes. This pattern echoes the post-adoption behaviour framework articulated by Zhou (2011), who argued that once users transition from initial acceptance to habitual use, the primary driver of continued engagement shifts from ease of use to perceived value and system integration precisely the dimensions that exhibit the strongest loadings in the present study. Furthermore, Schierz et al. (2010); Fornell & Larcker (1981) found that individual mobility and compatibility with existing business practices are critical determinants of mobile payment acceptance, which is consistent with the strong loading of the QRIS integration dimension (X4) in our instrument.

This finding (β = 0.571, p < 0.001) is consistent with Agustina and Pertiwi (2021), who reported a similar effect size (β ≈ 0.55) in their Indonesian MSME study (Chin, 1998). However, the present study's coefficient is slightly higher, possibly due to the specific focus on culinary MSMEs in Bandung, which have higher digital payment penetration than other sectors. The convergence of these results across different samples and regions strengthens the generalizability of the finding that QRIS adoption meaningfully improves financial management efficiency among MSMEs.

Theoretical Contributions to TAM and UTAUT

The findings of this study reinforce the relevance of the Technology Acceptance Model (TAM) developed by Davis (1989) within the context of digital payment adoption among MSMEs. TAM postulates that user acceptance of technology is determined by two primary constructs: Perceived Usefulness and Perceived Ease of Use. In this study, indicator X3 (Perceived Usefulness 1) demonstrated the highest Corrected Item–Total Correlation value within Variable X ($r = 0.492$), confirming that perceived usefulness represents the strongest dimension driving QRIS adoption and subsequently contributing to financial management efficiency. The high loading of perceived usefulness (r = 0.492) supports Davis's (1989) original proposition that perceived usefulness is a stronger predictor of adoption than ease of use, particularly for active users who have passed the initial learning stage a finding corroborated by Baptista and Oliveira (2015) in their mobile banking study across multiple cultural contexts.

Furthermore, these findings are consistent with the extension of TAM proposed by Venkatesh et al. (2003) through the Unified Theory of Acceptance and Use of Technology (UTAUT), which introduced the dimensions of Social Influence and Facilitating Conditions as determinants of adoption behavior. In the context of QRIS, the policy of Bank Indonesia requiring QR code standardization (Facilitating Conditions), as well as the widespread QRIS user community in Bandung (Social Influence), also played important roles in encouraging high levels of adoption among the respondents in this study. These findings resonate with Schierz et al. (2010), who found that subjective norms the social expectation to use mobile payment systems constitute the strongest driver of adoption among small business operators, reinforcing the UTAUT's Social Influence construct within the QRIS-MSME context.

Mechanism of Influence: From Adoption to Efficiency

The influence of Digital Payment Adoption on MSME Financial Management Efficiency can be explained through several primary mechanisms. First, the QRIS system automatically generates an electronic transaction record (digital trail) whenever a transaction occurs. This directly addresses one of the fundamental problems faced by MSMEs, namely unsystematic transaction recording (Ministry of Cooperatives and SMEs, 2022). With transaction histories digitally stored, MSME

actors are able to compile daily sales recapitulations without relying on manual recording systems that are prone to errors. Hantono et al. (2021) specifically identified automated digital recordkeeping as the primary channel through which digital payment adoption translates into improved financial management efficiency in Indonesian MSMEs, which is precisely the mechanism evidenced by the high item loadings on Y1 (transaction recording ease) and Y3 (financial data accuracy) in this study.

Second, the elimination of cash transactions through QRIS inherently reduces the risk of calculation errors (*human error*) commonly associated with cash-based transactions. The security architecture of QRIS including encryption and centralized settlement further reduces reconciliation discrepancies; Lim et al., (2019) empirically showed that users who perceive mobile payment systems as secure are significantly more likely to use them consistently for business transactions, which in turn generates the high-quality transaction records that underpin financial management efficiency. This finding is also consistent with the study by Tomiwa Sunday Ozili (2018), which demonstrated that digital finance adoption significantly enhances the transparency and accuracy of MSME financial transactions. Third, transaction data stored within the QRIS platform can be utilized as the basis for preparing simple financial reports, thereby accelerating and simplifying bookkeeping processes that have traditionally posed challenges for MSME actors (Agustina & Pertiwi, 2021).

Item Y5 (Bookkeeping Time Efficiency 1), which exhibited the highest Corrected Item–Total Correlation value within Variable Y ($r = 0.579$), provides strong evidence that time-saving in bookkeeping constitutes the most tangible benefit perceived by MSME actors from QRIS adoption. This finding is relevant to the argument proposed by Musa et al. (2020), which states that administrative burden reduction represents one of the greatest added values of digital payment systems for MSMEs in developing countries.Zhou (2011) further contextualizes this by demonstrating that in the post-adoption phase, users' continued engagement with mobile services is primarily sustained by the utilitarian value they derive in this study's context, the concrete time savings and reduction in manual bookkeeping effort that QRIS delivers to culinary MSME operators.

The Ceiling Effect and Its Implications

The elimination of items X2 and X5 due to the ceiling effect is methodologically important. It suggests that among active QRIS users, basic ease of use and frequency of use no longer differentiate respondents all active users have, by definition, surpassed these initial adoption thresholds. This finding aligns with the staged adoption model articulated by Zhou (2011), who demonstrated that in the post-adoption phase, constructs such as ease of use become saturated among experienced users and lose their predictive power relative to perceived value and system integration. Similarly, Baptista and Oliveira (2015) noted that TAM's ease-of-use

construct exhibits diminishing variance among experienced mobile banking users, a pattern that maps directly onto the ceiling effect observed here. The discriminant validity loss once the sample is restricted to experienced users is also well-documented in measurement methodology literature (Kline, 2015; Streiner et al., 2015). Future research should include non-users or new users to capture the full range of adoption stages. A comparative design would allow examination of whether ease of use and frequency of use remain salient predictors in the early adoption phase, while perceived usefulness and system integration dominate for established users consistent with the trajectory observed by Schierz et al. (2010) across different user segments in mobile payment contexts.

The 32.6% Explained Variance: What Remains?

While $R^2 = 0.326$ is substantial by (Cohen, 1988) standards where $R^2 \geq 0.26$ is considered large in the social sciences the remaining 67.4% of unexplained variance points to a set of theoretically important omitted variables. These include digital financial literacy (Lusardi & Mitchell, 2014), which governs the capacity to translate QRIS transaction data into actionable financial decisions; business scale and age, which shape the complexity and formalization of financial management practices; accounting software integration (e.g., BukuKas, BukuWarung), which mediates the conversion of digital payment records into structured financial reports; and owner education level, which may moderate the degree to which QRIS capabilities are exploited. Future research incorporating these variables in a multi-predictor or mediated regression framework would substantially improve the explanatory power of the model and yield richer practical guidance for MSME support programs.

Comparison with Previous Studies

The findings of this study are consistent with several previous studies conducted in similar contexts. Agustina and Pertiwi (2021), in their study on MSMEs in Indonesia, found a positive and significant relationship between digital payment adoption and financial management efficiency, with a coefficient of determination $R^2 = 0.318$, which is very close to the value obtained in the present study $R^2 = 0.326$. This similarity indicates that the proportion of financial efficiency variation explained by digital payment adoption is relatively consistent across different regions in Indonesia. Rahayu and Sari (2022), in their research on MSMEs in West Java, identified a significant positive correlation between the intensity of digital payment usage and the accuracy of business financial data, which is consistent with the findings related to dimensions Y3 and Y4 (Financial Data Accuracy) in this study. Meanwhile, Tomiwa Sunday Ozili (2018), in a global literature review, emphasized that digital finance adoption contributes to increased financial transparency and reduced transaction costs, which collectively promote the financial management efficiency of micro and small business actors.

On the other hand, this study also enriches the literature by providing empirical evidence within the context of QRIS, which is a digital payment standard unique to Indonesia. Bank Indonesia (2023) reported that QRIS adoption among MSMEs continues to grow rapidly, and this study confirms that such increased adoption generates tangible impacts on financial management efficiency, rather than merely facilitating transaction convenience.

Interpretation of the Coefficient of Determination ($\boldsymbol{R^2 = 32.6\%}$)

The coefficient of determination $R^2 = 0.326$indicates that Digital Payment Adoption explains 32.6%of the variation in MSME Financial Management Efficiency, while the remaining 67.4%is explained by other variables outside the research model. This result should not be viewed as a limitation of the study, but rather as valuable information that opens opportunities for further research. Several factors potentially explaining the remaining variation include:

1. Financial literacy among MSME actors, which plays an important role in the ability to interpret and optimally utilize digital transaction data (Lusardi & Mitchell, 2014);
2. Business scale and business age, where larger and more established MSMEs tend to possess more structured financial management systems;
3. The use of supporting accounting applications (such as BukuKas, BukuWarung, or Accurate) that can interact with QRIS transaction data; and
4. Overall digital ecosystem support, including internet connectivity and the availability of supporting devices.

Research Implications

Theoretical Implications

This study reinforces the relevance of the Technology Acceptance Model (TAM) proposed by Fred Davis (1989) and the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh et al. (2003) within the context of digital payment adoption among MSMEs in Indonesia. The robust regression framework applied here combining classical assumption testing with simple linear regression follows the guidelines articulated by Gefen et al. (2000) for establishing valid predictive relationships between technology acceptance variables and behavioral outcomes in information systems research. Furthermore, this study extends the scope of technology adoption research by explicitly linking the adoption variable (digital payment adoption) with business operational outcomes (financial management efficiency), rather than focusing solely on usage intention or user satisfaction.

Practical Implications for MSME Actors

These findings provide strong empirical justification for culinary MSME actors to continuously increase the intensity of QRIS adoption in their business operations. Specifically, MSME actors are encouraged to maximize the utilization of transaction history and sales reporting features available in QRIS applications as substitutes for manual bookkeeping systems, as well as to integrate QRIS transaction data with simple financial recording applications currently available.

Implications for Regulators and Policymakers

Bank Indonesia and the Ministry of Cooperatives and SMEs may utilize these findings as a foundation for designing more integrated digital financial literacy training programs for MSME actors, considering that increased QRIS adoption has been empirically proven to directly improve business financial management efficiency.

Implications for Platform Developers

QRIS service providers and digital financial application developers are encouraged to develop features that facilitate the export and analysis of QRIS transaction data in user-friendly formats in order to maximize the benefits of QRIS adoption for MSME financial management efficiency.

Research Limitations

This study has several limitations that should be acknowledged openly. First, the cross-sectional design captures only a snapshot in time; as a result, causality between QRIS adoption and financial management efficiency cannot be firmly established. Longitudinal or quasi-experimental designs would be needed to verify directionality. Second, the coefficient of determination $R^2 = 32.6\%$Second, the purposive sampling strategy targeting only active QRIS users limits generalizability to non-users and businesses in the early adoption stage. The marginal reliability of Variable X ($\alpha = 0.651$) also reflects the ceiling effect and signals the need for instrument refinement, particularly in developing items that better discriminate among experienced users. Third, the single-city context (Bandung) constrains the external validity of the findings. Bandung is characterized by relatively high digital payment penetration and an active culinary MSME ecosystem, and results may not be representative of regions with lower digital infrastructure. Replication studies across different Indonesian provinces are recommended to enhance generalizability.

D. Conclusions

Based on the research findings, it can be concluded that digital payment adoption has a positive and significant effect on the financial management efficiency of culinary

MSMEs using QRIS in Bandung, Indonesia. The key finding reveals that digital payment adoption demonstrates a substantial effect ($\beta = 0.571$, $t = 6.884$, $p < 0.001$), explaining 32.6% of the variance in financial management efficiency. The primary mechanisms through which this effect operates include automated transaction recording, reduction of manual calculation errors, simplified reconciliation processes, and meaningful time efficiency in bookkeeping all of which constitute tangible improvements in daily financial governance for MSME operators. From a theoretical standpoint, this study makes two contributions: first, it extends the Technology Acceptance Model (TAM) by empirically linking technology adoption constructs directly to operational business outcomes rather than limiting the dependent variable to usage intention or user satisfaction; second, it provides empirical support for the UTAUT's facilitating conditions construct within the Indonesian QRIS context, demonstrating that QR code standardization functions as a concrete institutional facilitating condition that accelerates adoption. The practical implication of this study is directed at three distinct audiences. For MSME actors, the findings recommend maximizing the use of QRIS transaction history and sales reporting features as structured substitutes for manual bookkeeping, and integrating QRIS data with accessible financial recording applications such as BukuKas or BukuWarung. For Bank Indonesia and policymakers, this study provides empirical justification for designing integrated digital financial literacy training programs that equip MSME owners with capacity to interpret and leverage digital transaction data for financial planning, tax compliance, and access to formal credit facilities. For QRIS platform developers, the findings suggest building features that enable seamless export and analysis of transaction data in formats compatible with widely used accounting tools, and embedding basic financial summary dashboards within the merchant interface. Future research should incorporate mediating variables such as digital financial literacy and accounting software integration to account for the remaining 67.4% of unexplained variance. Longitudinal designs would enable stronger causal claims by tracking how financial efficiency evolves alongside increasing QRIS adoption intensity over time. Comparative studies contrasting active QRIS users with non-users would restore variance in ease-of-use and frequency-of-use constructs suppressed by the ceiling effect. Finally, replication across cities with varying levels of digital infrastructure such as Surabaya, Medan, and Makassar would substantially strengthen external validity and policy generalizability.

E. Acknowledgement

We acknowledge all lecturers and friends from Universitas Pendidikan Indonesia who helped us in this project.

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