

Digital Payment User Satisfaction: Evidence from Halal Micro, Small, and Medium Enterprises (MSMEs) in Medan City, Indonesia

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Abstract

The rapid adoption of digital payment systems among micro, small, and medium enterprises (MSMEs), especially in emerging markets like Indonesia, has transformed how businesses operate—particularly in the halal food and beverage sector. For halal-certified MSMEs in Medan City, embracing digital payments is not merely a matter of convenience but a strategic necessity to remain competitive. This study investigates how perceived value, perceived risk, and the quality of accounting information influence user satisfaction with digital payment systems among these enterprises. Using a quantitative approach, data were collected through surveys from halal-certified food and beverage MSMEs across 21 subdistricts in Medan, yielding 45 valid responses. The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS 4.0 to assess the proposed relationships. The results reveal that perceived value significantly and positively affects user satisfaction, while perceived risk has a significant negative impact. Moreover, the quality of accounting information also contributes positively to user satisfaction. These findings highlight the critical role of delivering high perceived value and accurate, reliable financial data, while addressing concerns related to risk, in fostering greater satisfaction with digital payments. As such, efforts to enhance the digital experience for halal MSMEs should prioritize value creation, information quality, and risk mitigation to ensure wider adoption and sustained use. This study provides practical implications for policymakers and digital service providers aiming to build more inclusive, user-focused digital financial ecosystems in Indonesia's halal MSME sector.

Keywords: Perceived Value, Perceived Risk, Accounting Information Quality (KIA), Digital Payment, User Satisfaction.

1. Introduction

The digital transformation era has ushered in substantial shifts across economic sectors, notably within the micro, small, and medium enterprise (MSME) landscape. Among the most impactful innovations propelling this transformation is the adoption of digital payment systems, which include mobile applications, digital wallets, and various electronic transaction platforms. These technologies offer numerous advantages, such as enhanced convenience, increased operational efficiency in terms of time and cost, and improved transactional security—factors that are particularly beneficial to MSME stakeholders.

Despite these benefits, user satisfaction remains a pivotal determinant in the successful adoption and sustained use of digital payment systems. Accordingly, identifying and understanding the underlying factors that influence user satisfaction is imperative to accelerating digital integration among MSMEs.

Empirical data underscore the growing relevance of digital payments within Indonesia. In 2023, the total value of digital banking transactions reached IDR 58,478.24 trillion, involving over 45 million users and 30 million merchants—many of whom operate within the MSME sector. However, the diffusion of this technology remains inconsistent, particularly in regions such as Medan City, a key economic center in North Sumatra. Here, MSMEs continue to encounter significant barriers in adopting digital payment systems, influenced by variables including perceived value, perceived risk, and the quality of accounting information.

From a theoretical standpoint, three critical constructs are frequently associated with user satisfaction in digital payment environments: perceived value, perceived risk, and the quality of accounting information. Perceived value refers to the net benefit users associate with digital payments in comparison to traditional transaction methods. Perceived risk captures concerns over potential financial loss, data breaches, or technical failures associated with digital platforms. Meanwhile, the quality of accounting information is vital in ensuring transparent and reliable decision-making processes for MSMEs, which often operate with constrained resources and limited financial literacy.

Grounded in the above context, this study seeks to empirically investigate the effects of perceived value, perceived risk, and accounting information quality (KIA) on user satisfaction with digital payment systems among halal food and beverage MSMEs in Medan City. Specifically, the research is guided by the following questions:

1. To what extent does perceived value influence user satisfaction with digital payment systems among MSME actors in Medan City?
2. How does perceived risk affect user satisfaction with digital payments among these enterprises?
3. What is the impact of accounting information quality (KIA) on user satisfaction with digital payment adoption in the MSME context?

2. Research Method

This study adopts a quantitative research design, relying on primary data collected through structured surveys. The target population comprises halal-certified micro, small, and medium enterprises (MSMEs) located in Medan City, Indonesia, that have integrated digital payment systems into their operations. The choice of Medan as the research site is justified by its high concentration of MSMEs utilizing digital payment technologies and the logistical accessibility it offers to the researcher. The data collection process was conducted from October 2024 until the study's completion.

The study population consists of all halal-certified MSMEs in Medan. However, the sample is limited to those enterprises that have adopted digital payment systems. Given the absence of precise data on the total number of such MSMEs, the study employs a non-probability sampling technique, specifically convenience sampling. This method involves selecting respondents based on their availability and accessibility, which is deemed appropriate under the circumstances of an unknown population size. The determination of the minimum required sample size is guided by the analytical technique employed—Partial Least Squares Structural Equation Modeling (PLS-SEM). PLS-SEM is known for its flexibility with small to medium sample sizes. In accordance with methodological standards, the minimum sample size in this study is set at 45 respondents, based on the maximum number of formative indicators included in the proposed research model. This study acknowledges the limitation of its relatively small sample size (45 respondents) obtained through convenience sampling, which may restrict the generalizability of findings. Future studies should adopt stratified or random sampling across regions to improve external validity.

Table 1: Presents the Operational Definitions of the Study Variables

Variables	Indicators	Measurement Scale	Source
Digital Payment User Satisfaction (Y)	<ul style="list-style-type: none"> Trust Satisfaction 	Likert 1-4	(Dhaigude et al., 2023)
Perceived Value (X1)	<ul style="list-style-type: none"> Perceived Fee Technicality Usefulness Enjoyment 	Likert 1-4	(H. W. Kim et al., 2007)
Perceived Risk (X2)	<ul style="list-style-type: none"> System Risk Financial Risk Loss Risk Overall Risk 	Likert 1-4	(D. J. Kim et al., 2008; Xie et al., 2021)
Accounting Information Quality (KIA) (X3)	<ul style="list-style-type: none"> Relevant Sufficient Accurate Timely information 	Likert 1-4	(Yuan et al., 2020)

The data in this study were analyzed using the Partial Least Squares Structural Equation Modeling (PLS-SEM) technique, implemented through SmartPLS 4.0 software. The analytical procedure was carried out in two primary stages: the evaluation of the measurement model (outer model) and the evaluation of the structural model (inner model).

In the first stage, the measurement model was assessed to determine the validity and reliability of the research constructs. This involved the application of reflective and formative measurement models, where the relationships between latent variables and their respective indicators were evaluated through indicator loadings and weight values. Only after confirming the validity and reliability of the constructs did the analysis proceed to the structural model, which was used to test the hypothesized relationships among variables.

The measurement model was designed to ensure that the observed indicators accurately and reliably represent the underlying constructs, thereby aligning with the Technology Acceptance Model (TAM) as the theoretical foundation. This study advances TAM by demonstrating how sectoral and cultural contexts (halal-certified MSMEs) shape adoption behavior. The results also align with Indonesia's national digital transformation policy, promoting inclusive MSME growth.

3. Results and Discussion

Descriptive statistical analysis was performed to summarize the demographic profile of the respondents based on gender, work experience, and organizational position within their respective MSMEs. The results indicate that 71% of respondents were female, while 29% were male, suggesting a higher adoption rate of digital payment systems among women. This trend may be attributed to their significant involvement in managing business operations and financial activities within MSMEs.

Regarding work experience, 47% of respondents had more than two years of professional experience, 31% had between one and two years, and 22% had less than one year. These findings imply that longer exposure to business operations may enhance familiarity with digital technologies, including digital payments.

With respect to organizational roles, most respondents (62%) identified as business owners, followed by cashiers (16%), employees (11%), store supervisors (2%), store managers (5%), and general managers (4%). The predominance of business owners among respondents indicates a high level of decision-making authority in the adoption and implementation of digital payment technologies within halal MSMEs.

Table 2: Loading Factor dan AVE

Variable	Indicator	Loading Factor	AVE	Validity
PV	PV1	0,721	0,667	Valid
	PV2	0,873		Valid
	PV3	0,847		Valid
	PV4	0,817		Valid
PR	PR1	0,870	0,752	Valid
	PR2	0,746		Valid

Variable	Indicator	Loading Factor	AVE	Validity
KIA	PR3	0,906	0,739	Valid
	PR4	0,935		Valid
	KIA1	0,797		Valid
	KIA2	0,868		Valid
	KIA3	0,894		Valid
KPDP	KIA4	0,877	0,828	Valid
	KPDP1	0,903		Valid
	KPDP2	0,917		Valid

The results of the construct validity analysis indicate that all variables included in the research model fulfill the criteria for convergent validity. This is demonstrated by the factor loading values of each indicator, all of which exceed the commonly accepted threshold of 0.70. Specifically, the indicators for the variable of perceived value show strong loading values of 0.721, 0.873, 0.847, and 0.817. Similarly, the indicators for perceived risk display loading values of 0.870, 0.746, 0.906, and 0.935. For the quality of accounting information, the loadings are 0.797, 0.868, 0.894, and 0.877, while the user satisfaction construct is represented by two indicators with high loading values of 0.903 and 0.917. These results affirm that each observed variable adequately reflects its respective latent construct.

In addition to factor loadings, the analysis also considers the Average Variance Extracted (AVE) as a measure of convergent validity. The AVE values for all constructs exceed the minimum recommended threshold of 0.50, suggesting that most of the variance in the indicators is explained by the latent variables. Specifically, the AVE for perceived value is 0.667, for perceived risk is 0.752, for the quality of accounting information is 0.739, and for user satisfaction is 0.828. These values further support the conclusion that the constructs are well-defined and that the measurement model is both valid and reliable.

Taken together, the high factor loadings and substantial AVE values confirm that the indicators used in this study are robust in capturing the theoretical dimensions they are intended to measure. Thus, the constructs within the research model can be considered valid representations of the underlying concepts, providing a sound foundation for further structural analysis.

Table 3: Fornell-Larcker Criterion

Indicators	X1	X2	X3	Y
Perceived Value	0,817			
Perceived Risk	0,134	0,867		
Accounting Information Quality	0,760	0,263	0,860	
Digital Payment User Satisfaction	0,606	-0,261	0,524	0,910

Based on the results presented in Table 3, the Fornell-Larcker criterion confirms that the discriminant validity of the constructs is adequately established. Specifically, the square root of the Average Variance Extracted (AVE) for each construct is greater than its correlations with any other construct in the model, thereby fulfilling the requirement that a construct should share more variance with its associated indicators than with other constructs.

Table 4: Cross Loading

Indicators	Latent Variables				Result
	X1 (PV)	X2 (PR)	X3 (KIA)	Y (KPDP)	
PV1	0,721	0,156	0,648	0,465	Valid
PV2	0,873	0,094	0,622	0,495	Valid
PV3	0,847	0,01	0,515	0,476	Valid
PV4	0,817	0,169	0,685	0,537	Valid
PR1	0,096	0,87	0,211	-0,219	Valid
PR2	0,277	0,746	0,38	0,019	Valid
PR3	0,184	0,906	0,346	-0,192	Valid
PR4	0,109	0,935	0,197	-0,266	Valid
KIA1	0,505	0,323	0,797	0,231	Valid
KIA2	0,549	0,374	0,868	0,33	Valid
KIA3	0,553	0,179	0,894	0,353	Valid
KIA4	0,827	0,148	0,877	0,651	Valid
KPDP1	0,548	-0,233	0,425	0,903	Valid
KPDP2	0,556	-0,241	0,524	0,917	Valid

As shown in Table 4, the cross-loading values meet the established criterion of > 0.70 . Given that the results of factor loadings, Average Variance Extracted (AVE), Fornell-Larcker criterion, and cross-loading all satisfy the required thresholds, it can be concluded that all latent variables in the model have successfully passed the validity test.

The inner model illustrates the structural relationships among the latent variables and serves as the basis for testing the proposed research hypotheses. Evaluation of the inner model is carried out by examining the coefficient of determination (R^2) for the endogenous constructs, along with the statistical significance of the structural path coefficients. The significance of these relationships is assessed through p-values, which are derived using the bootstrapping resampling procedure.

Table 5: Path Coefficient

	Original Sample (O)	Sample Mean (M)	Standar Deviasi (STDEV)	T Statistik (O/STDEV)	P-Values
PV → KPDP	0,431	0,439	0,162	2,652	0,004
PR → KPDP	-0,398	-0,369	0,203	1,962	0,025
KIA → KPDP	0,301	0,287	0,147	2,056	0,020

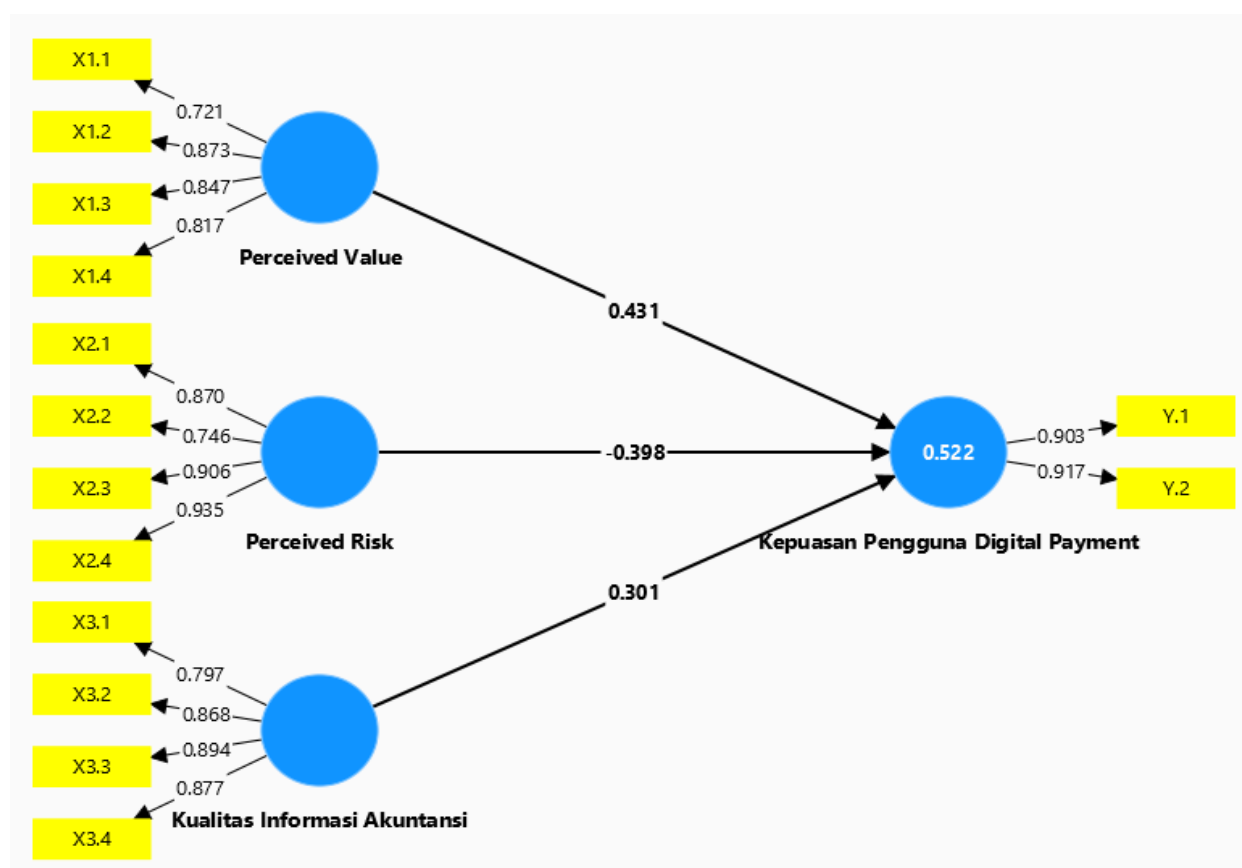


Fig. 1: The Inner Model

Figure 1 presents the inner structural model, showing a positive path from Perceived Value ($\beta = 0.431$, $p = 0.004$) and Accounting Information Quality ($\beta = 0.301$, $p = 0.020$) to User Satisfaction, and a negative path from Perceived Risk ($\beta = -0.398$, $p = 0.025$). These coefficients illustrate the strength and direction of each relationship.

Based on the results of the bootstrapping analysis presented in Table 5, the hypotheses formulated in this study—utilizing a sample of 45 respondents—can be empirically assessed. The direction and strength of the relationships between the latent variables are indicated by the path coefficients, which range from -1 to 1. A path coefficient within the range of 0 to 1 signifies a positive relationship, while a coefficient between 0 and -1 indicates a negative relationship. As shown in Table 6, the relationships between Perceived Value and Quality of Accounting Information with User Satisfaction in digital payment usage are positive, whereas the relationship between Perceived Risk and User Satisfaction is negative.

The hypotheses tested in this study are as follows:

- H1: Perceived value has a positive influence on user satisfaction with digital payments.
- H2: Perceived risk has a negative influence on user satisfaction with digital payments.
- H3: The quality of accounting information has a positive influence on user satisfaction with digital payments.

The findings of the hypothesis testing are summarized as follows:

The first hypothesis (H1) is supported by empirical evidence indicating that perceived value significantly and positively influences user satisfaction with digital payments. This relationship is statistically significant, as reflected by a p-value less than the standard threshold of 0.05 ($p = 0.000$). These results suggest that when users perceive digital payment systems as offering high utility—whether in terms of convenience, speed, or efficiency—their overall satisfaction increases. This finding aligns with previous studies, such as Yudhistira & Lestari (2024), who demonstrated that perceived value serves as a critical determinant of customer satisfaction in the context of digital services. Recent studies (e.g., Al-Harbi & Hassan, 2025; Chong et al., 2025; Farooq et al., 2025) further highlight the evolving role of perceived value, risk, and accounting information quality in shaping digital payment satisfaction in halal MSMEs.

The second hypothesis (H2) is also empirically validated, showing that perceived risk has a statistically significant negative effect on user satisfaction with digital payments ($p = 0.000$). This implies that when users perceive higher levels of financial, privacy, or operational risks associated with digital transactions, their satisfaction decreases. This finding is consistent with the work of Bahar et al. (2020), which highlighted the detrimental impact of perceived risk on digital service adoption and satisfaction. Specifically, financial risks (e.g., potential financial losses) and privacy risks (e.g., data breaches, misuse of personal information) appear most relevant in explaining the negative relationship between risk and satisfaction. Addressing these issues is crucial for user confidence.

The third hypothesis (H3) is confirmed by the data, demonstrating a significant and positive effect of the quality of accounting information on user satisfaction ($p = 0.000$). High-quality accounting information—characterized by accuracy, timeliness, relevance, and completeness—supports informed decision-making and fosters greater trust in digital payment systems. This result corroborates previous research, such as that by Agustina Rahayuningtyas (2022), which emphasized the role of information quality in enhancing user confidence and satisfaction in financial technologies.

In summary, the analysis underscores the pivotal roles of perceived value, perceived risk, and the quality of accounting information in determining user satisfaction with digital payment systems among micro, small, and medium-sized enterprises (MSMEs) in Medan. While perceived value and information quality exert a positive influence, perceived risk has a negative effect. These findings contribute to the growing body of literature on digital financial technologies and offer practical insights for policymakers and MSME stakeholders aiming to foster greater adoption and satisfaction with digital payment systems, particularly in emerging market contexts.

4. Conclusion

This study sought to investigate the effects of Perceived Value, Perceived Risk, and Quality of Accounting Information on User Satisfaction with digital payment systems among Halal Micro, Small, and Medium Enterprises (MSMEs) in Medan City. Employing the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach, the study yielded the following key findings:

First, Perceived Value was found to exert a positive and statistically significant influence on user satisfaction with digital payment systems. This indicates that the greater the perceived value—defined as users' assessment of the benefits obtained relative to the costs incurred—the higher the level of satisfaction reported. This result is consistent with previous research conducted by Yudhistira and Lestari (2024), as well as the seminal work of Zeithaml (1988), both of which identified perceived value as a critical determinant of customer satisfaction across diverse service contexts. Recent studies (e.g., Al-Harbi & Hassan, 2025; Chong et al., 2025; Farooq et al., 2025) further highlight the evolving role of perceived value, risk, and accounting information quality in shaping digital payment satisfaction in halal MSMEs.

Second, Perceived Risk demonstrated a negative and significant effect on user satisfaction. Elevated perceptions of risk—whether related to data security, privacy concerns, or system reliability—tend to diminish users' satisfaction with digital payment services. This finding aligns with the empirical evidence presented by Bahar et al. (2020) and Pavlou (2003), both of whom highlighted perceived risk as a fundamental barrier to the adoption and satisfaction of digital technologies.

Third, the Quality of Accounting Information was shown to have a positive and significant relationship with user satisfaction. Users who perceive accounting information as accurate, timely, relevant, and complete tend to report higher satisfaction levels with digital payment systems. These findings corroborate earlier studies by Rahayuningtyas (2022) and Chen et al. (2015), which underscore the importance of high-quality information in facilitating effective decision-making within digital financial infrastructures.

Considering these findings, the following recommendations are proposed for future research endeavors: Practical implications include enhancing encryption technologies, user education campaigns to reduce perceived risk, and policy support, such as subsidies for digital infrastructure, to strengthen halal MSMEs' adoption of digital payments.

1. Broadening the Research Context: As this study specifically targeted Halal MSMEs in Medan City, subsequent research should aim to investigate similar constructs in other types of MSMEs or in different geographical regions with varied levels of digital payment adoption. Expanding the contextual scope would enhance the generalizability and external validity of the model, as advocated by Hair et al. (2021).
2. Refining Sample Design and Methodological Approaches: Given the use of PLS-SEM in this study, future research should give careful attention to determining the appropriate sample size, considering the number of indicators and overall model complexity. Moreover, the incorporation of longitudinal research designs may offer valuable insights into how user perceptions evolve. As noted by Chin (2010), an adequate sample size is crucial for achieving reliable estimations of path coefficients within the PLS framework. This study acknowledges the limitation of its relatively small sample size (45 respondents) obtained through convenience sampling, which may restrict the generalizability of findings. Future studies should adopt stratified or random sampling across regions to improve external validity.
3. Introducing Additional Theoretical Constructs: To further enrich the explanatory power of the current model, future studies could incorporate additional mediating or moderating variables such as trust, technology readiness, or digital literacy. These constructs have been widely recognized in the literature—particularly in the Unified Theory of Acceptance and Use of Technology (UTAUT) model by Venkatesh et al. (2012)—as influential factors in the adoption and continued use of digital technologies. Such an extension would contribute to a more nuanced and comprehensive understanding of user behavior within digital payment ecosystems.

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