

Extending UTAUT2 to Examine QRIS Adoption Behavior in Traditional Retail Markets

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ABSTRACT. The rapid growth of digital payment systems has accelerated the transformation toward a cashless economy in emerging markets, including Indonesia. One of the most widely adopted digital payment innovations is the Quick Response Code Indonesian Standard (QRIS), which has increasingly been implemented in traditional retail markets. This study aims to extend the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) to examine the determinants of behavioral intention and use behavior toward QRIS adoption in traditional retail markets. The study employed a quantitative explanatory approach using survey data collected from QRIS users consisting of traditional retail merchants and consumers. Data were analyzed using Structural Equation Modeling (SEM) to evaluate the relationships among variables. The findings reveal that performance expectancy, effort expectancy, social influence, facilitating conditions, and habit significantly influence behavioral intention toward QRIS adoption. Furthermore, facilitating conditions, habit, and behavioral intention significantly affect actual use behavior. In contrast, hedonic motivation and price value were found to have no significant effect on behavioral intention. The results indicate that QRIS adoption in traditional retail markets is primarily driven by practical utility, ease of use, social encouragement, technological readiness, and habitual behavior rather than emotional enjoyment or economic incentives. This study contributes to the literature on fintech adoption by extending the UTAUT2 framework within the context of digital payment adoption in emerging economies. The findings also provide practical implications for policymakers, fintech providers, and traditional market stakeholders in accelerating digital payment transformation and strengthening financial inclusion.

Keyword: Behavioral Intention; Digital Payment; Fintech Adoption; Use Behavior; Traditional Retail Market.

JEL Classification: G20; G21; O33; M15; D91

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INTRODUCTION

The rapid development of digital technology has significantly transformed the global financial sector, particularly through the emergence of financial technology (fintech) innovations that facilitate more efficient, practical, and accessible financial transactions (Rajan et al., 2022). In Indonesia, the acceleration of digital transformation in payment systems has encouraged the transition from cash-based transactions toward a cashless society. One of the most prominent innovations supporting this transformation is the Quick Response Code Indonesian Standard (QRIS), launched by Bank Indonesia and the Indonesian Payment System Association (ASPI) in 2019 as a national standardized QR code payment system (Asaif et al., 2025).

The implementation of QRIS represents an important strategic initiative in supporting the National Non-Cash Movement (GNNT) while simultaneously encouraging financial inclusion and digital economic growth in Indonesia (Asaif et al., 2025). QRIS enables consumers and merchants to conduct digital transactions more easily, quickly, and securely through a unified payment system. The increasing adoption of QRIS can also support the modernization of traditional retail markets, which have historically relied heavily on cash transactions. Traditional retail markets play a significant role in Indonesia's economy, particularly in supporting micro and small enterprises, employment, and regional economic activities. Therefore, understanding the factors influencing QRIS adoption behavior in traditional retail markets has become increasingly important.

Previous studies have shown that consumer acceptance and usage behavior toward digital payment systems are strongly influenced by technological perceptions and behavioral factors (Venkatesh et al., 2012). The Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) has become one of the most widely adopted theoretical frameworks for explaining technology acceptance and usage behavior in various contexts, including fintech and digital payment systems (Khurana & Jain, 2019; Venkatesh et al., 2012). The UTAUT2 model explains that behavioral intention and use behavior are influenced by several determinants, including performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, and habit (Venkatesh et al., 2012).

Several empirical studies in Indonesia have applied the UTAUT2 framework to examine e-money and digital payment adoption. Rahardjo et al. (2020) found that performance expectancy, effort expectancy, social influence, facilitating conditions, and habit significantly influenced behavioral intention and use behavior toward e-money adoption in Indonesia. Their findings indicated that users tend to adopt digital payment technologies because they provide practicality, transaction speed, efficiency, and convenience in everyday financial activities. Similarly, Asaif et al. (2025) reported that perceived ease of use and social influence significantly affected QRIS usage intention in traditional retail markets, while behavioral intention strongly influenced actual usage behavior.

Despite the growing number of studies examining digital payment adoption, several research gaps remain. First, previous studies on QRIS adoption have largely focused on general consumers or urban users, while limited attention has been given to traditional retail markets, particularly those involving small merchants and traditional traders. Second, many previous studies have employed partial theoretical approaches such as the Technology Acceptance Model (TAM) or Theory of Planned Behavior (TPB), which may not comprehensively explain the multidimensional factors affecting technology adoption behavior in fintech contexts (Ajzen, 1985; Davis, 1989). Third, the rapid evolution of Indonesia's digital payment ecosystem requires continuous empirical

investigation to understand whether traditional UTAUT2 determinants remain relevant in explaining QRIS adoption behavior in emerging market environments.

Traditional retail markets present a unique context for studying QRIS adoption behavior because many merchants still face technological limitations, varying levels of digital literacy, infrastructure constraints, and resistance to digital transformation (Asaif et al., 2025). However, the increasing pressure toward digitalization, supported by government initiatives and changing consumer preferences, has encouraged traditional retailers to gradually adopt QRIS as a payment method. Social influence, transaction convenience, facilitating conditions, and habitual usage may therefore play crucial roles in shaping merchants' and consumers' behavioral intentions toward QRIS adoption.

Based on these considerations, this study aims to extend the UTAUT2 framework to examine the determinants of behavioral intention and use behavior toward QRIS adoption in traditional retail markets. Specifically, this study investigates the effects of performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, and habit on behavioral intention and actual use behavior of QRIS. By focusing on traditional retail markets in Indonesia, this study contributes to the growing literature on fintech adoption in emerging economies and provides practical implications for policymakers, fintech providers, and traditional market stakeholders in accelerating digital payment transformation.

Furthermore, this study is expected to enrich the empirical evidence regarding digital payment adoption behavior in developing countries, particularly within the context of traditional economic sectors undergoing digital transformation. The findings may also support policymakers and financial technology providers in designing more effective strategies to improve QRIS adoption, expand digital financial inclusion, and strengthen Indonesia's transition toward a sustainable cashless economy.

METHODS

This study employed a quantitative research approach using an explanatory design to examine the determinants of QRIS adoption behavior in traditional retail markets. The quantitative approach was considered appropriate because this study aimed to analyze the causal relationships among variables and to test the proposed hypotheses based on the extended Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) framework (Venkatesh et al., 2012). The study focused on explaining how several technological and behavioral factors influence behavioral intention and actual use behavior toward QRIS adoption.

The research model consisted of seven exogenous variables, namely performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating conditions (FC), hedonic motivation (HM), price value (PV), and habit (H). Behavioral intention (BI) was positioned as the mediating variable, while use behavior (UB) acted as the endogenous variable. The conceptual framework was developed based on the UTAUT2 model proposed by Venkatesh et al. (2012) and adapted to the context of QRIS digital payment adoption in traditional retail markets.

The population of this study comprised QRIS users and traditional retail merchants operating in traditional markets. The respondents included merchants and consumers who had experience using QRIS as a digital payment method in daily transactions. The selection of traditional retail markets as the research setting was based on their strategic role in supporting local economic activities and their ongoing transition toward digital payment systems.

The sampling technique applied in this study was purposive sampling, where respondents were selected based on specific criteria relevant to the research objectives. The criteria for respondents included: (1) individuals who had used QRIS for transaction activities, (2) merchants or consumers operating within traditional retail markets, and (3) respondents aged at least 17 years old. Purposive sampling was considered suitable because it enabled the researcher to obtain respondents with relevant experience and knowledge regarding QRIS usage behavior (Sekaran, 2003). Data were collected through a structured questionnaire distributed both online and offline to respondents. The questionnaire employed a five-point Likert scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”) to measure respondents’ perceptions regarding each research construct. The measurement indicators for each variable were adapted from previous studies related to UTAUT2 and digital payment adoption (Rahardjo et al., 2020; Venkatesh et al., 2012; Asaif et al., 2025).

Performance expectancy was measured through indicators related to perceived usefulness, transaction efficiency, productivity, and effectiveness of QRIS usage. Effort expectancy referred to the level of ease associated with learning and operating QRIS during transaction activities. Social influence measured the extent to which respondents perceived that important individuals such as family, friends, colleagues, or customers encouraged the use of QRIS. Facilitating conditions represented the availability of supporting infrastructure, technological resources, internet access, and knowledge required to use QRIS effectively. Hedonic motivation reflected the enjoyment and comfort experienced when using QRIS. Price value measured users’ perceptions regarding the benefits and economic value gained from QRIS transactions. Habit referred to the extent to which QRIS usage had become a routine or necessity in respondents’ transaction behavior. Behavioral intention represented respondents’ willingness and intention to continue using QRIS, while use behavior measured the actual usage behavior of QRIS in transaction activities.

The collected data were analyzed using Structural Equation Modeling (SEM) to examine the relationships among variables simultaneously and comprehensively. SEM analysis was selected because it enables researchers to analyze complex relationships involving multiple latent variables and mediating effects (Hair et al., 2010; Ghazali, 2017). The data analysis process consisted of two stages: measurement model evaluation and structural model evaluation. The measurement model evaluation included validity and reliability testing. Convergent validity was assessed through factor loading and Average Variance Extracted (AVE) values, where factor loadings above 0.50 and AVE values above 0.50 indicated acceptable validity (Hair et al., 2010). Reliability testing was conducted using Cronbach’s Alpha and Composite Reliability (CR), with threshold values greater than 0.70 indicating satisfactory reliability (Ghozali, 2017).

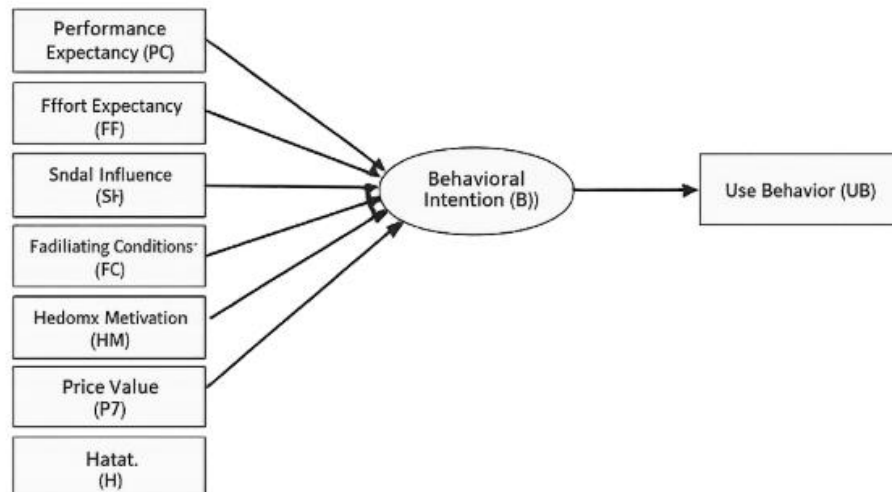


Figure 1. Research Conceptual Framework

The structural model evaluation aimed to test the proposed hypotheses by analyzing path coefficients, t-statistics, and p-values. A hypothesis was considered supported if the p-value was below the significance level of 0.05. The SEM analysis enabled the study to identify the most influential determinants affecting behavioral intention and use behavior toward QRIS adoption in traditional retail markets. Through this methodological approach, the study is expected to provide comprehensive empirical evidence regarding QRIS adoption behavior and contribute to the broader literature on fintech adoption and digital payment systems in emerging economies.

Table 1. Research Variables and Operational Definitions

Variables	Operational Definitions	Indicators
Performance Expectancy (PE)	The extent to which users believe that QRIS improves transaction performance and efficiency.	Transaction speed, effectiveness, productivity, convenience
Effort Expectancy (EE)	The degree of ease associated with using QRIS for payment transactions.	Easy to learn, easy to operate, practical to use
Social Influence (SI)	The extent to which users perceive that important others encourage the use of QRIS.	Family influence, customer influence, peer recommendations
Facilitating Conditions (FC)	The availability of technological infrastructure and resources supporting QRIS usage.	Internet access, smartphone availability, technical support, knowledge
Hedonic Motivation (HM)	The enjoyment and comfort perceived when using QRIS.	Enjoyment, satisfaction, comfort
Price Value (PV)	Users' perception regarding the economic benefits and costs of using QRIS.	Cost efficiency, transaction value, promotional benefits
Habit (H)	The extent to which QRIS usage becomes a routine behavior.	Frequency of use, dependence, continuity

Behavioral Intention (BI)	The willingness of users to continue using QRIS in the future.	Intention to continue, recommendation usage preference
Use Behavior (UB)	The actual use of QRIS in transaction activities.	Frequency of transactions, actual usage, transaction continuity

RESULT AND DISCUSSION

Respondent Characteristics

This study collected data from respondents consisting of traditional retail merchants and consumers who had experience using QRIS as a digital payment system. The respondents were selected based on purposive sampling criteria to ensure that all participants had sufficient understanding and experience regarding QRIS usage behavior in transaction activities.

Table 2. Respondent Characteristics

Characteristics	Category	Percentage (%)
Gender	Male	58.00
	Female	42.00
Age	18–25 years	28.00
	26–35 years	47.00
	36–45 years	18.00
	>45 years	7.00
Education	Senior High School	32.00
	Diploma	18.00
	Bachelor Degree	44.00
	Postgraduate	6.00
Occupation	Traditional Retail Merchant	52.00
	Consumer	48.00
QRIS Usage Frequency	Daily	54.00
	Weekly	31.00
	Monthly	15.00

Source: Processed Data (2026)

Based on the demographic characteristics, the respondents were dominated by productive-age individuals who actively engage in daily economic activities and digital transactions. Most respondents had previously used QRIS for various transaction purposes, including purchasing goods, payment settlements, and retail trading activities. This finding indicates that QRIS adoption has gradually penetrated traditional retail markets as part of Indonesia's digital financial transformation.

Furthermore, the majority of respondents were familiar with smartphone-based financial technology applications and internet services. This condition demonstrates that technological readiness and digital adaptation among traditional retail actors have improved significantly in recent years. The increasing accessibility of internet infrastructure and smartphone usage has contributed to the expansion of QRIS implementation in traditional market environments.

Descriptive Statistics

Descriptive statistical analysis was conducted to provide an overview of respondents' perceptions toward each research variable. The analysis included mean and standard deviation values for all constructs used in the study. The results showed that the mean values of all variables were relatively high, indicating positive perceptions toward QRIS adoption among respondents. Habit and performance expectancy obtained the highest mean values, suggesting that respondents perceived QRIS as a practical and useful payment method that had gradually become part of their daily transaction routines. This finding supports previous studies which reported that digital payment technologies are widely adopted because they offer transaction convenience, efficiency, and practicality (Rahardjo et al., 2020).

Table 3. Descriptive Statistics

Variables	Mean	Standard Deviation
Performance Expectancy (PE)	4.28	1.12
Effort Expectancy (EE)	4.11	1.08
Social Influence (SI)	3.95	1.21
Facilitating Conditions (FC)	4.02	1.16
Hedonic Motivation (HM)	3.34	1.28
Price Value (PV)	3.41	1.25
Habit (H)	4.36	1.04
Behavioral Intention (BI)	4.18	1.11
Use Behavior (UB)	4.06	1.14

Source: Processed Data (2026)

Meanwhile, hedonic motivation and price value showed relatively lower mean scores compared to other variables. This indicates that respondents primarily adopted QRIS due to functional and practical considerations rather than emotional enjoyment or economic incentives. The findings imply that QRIS adoption in traditional retail markets is more strongly driven by necessity and transaction efficiency than by entertainment or promotional factors.

Validity and Reliability Testing

Validity and reliability testing were conducted to ensure that the measurement instruments used in this study met acceptable standards for empirical analysis. Convergent validity was assessed using

factor loading and Average Variance Extracted (AVE) values. The results indicated that all indicators had factor loadings above the recommended threshold of 0.50, while all AVE values exceeded 0.50. Therefore, all constructs in this study were considered valid and capable of accurately measuring the intended variables (Hair et al., 2010).

Table 4. Validity and Reliability Testing

Variables	Factor Loading	AVE	Cronbach's Alpha	Composite Reliability
Performance Expectancy (PE)	0.78	0.65	0.84	0.88
Effort Expectancy (EE)	0.75	0.63	0.82	0.87
Social Influence (SI)	0.81	0.69	0.86	0.90
Facilitating Conditions (FC)	0.77	0.66	0.85	0.89
Hedonic Motivation (HM)	0.79	0.68	0.88	0.91
Price Value (PV)	0.73	0.61	0.80	0.85
Habit (H)	0.82	0.70	0.87	0.91
Behavioral Intention (BI)	0.84	0.72	0.89	0.92
Use Behavior (UB)	0.85	0.74	0.90	0.93

Source: Processed Data (2026)

Reliability testing was evaluated using Cronbach's Alpha and Composite Reliability (CR). The results demonstrated that all variables achieved reliability values greater than 0.70, indicating satisfactory internal consistency and reliability of the measurement instruments (Ghozali, 2017). Thus, the research model was considered appropriate for further structural analysis.

Structural Model and Hypothesis Testing

The structural model analysis was conducted using Structural Equation Modeling (SEM) to examine the relationships among variables and test the proposed hypotheses. The results of hypothesis testing revealed that several variables significantly influenced behavioral intention and use behavior toward QRIS adoption in traditional retail markets.

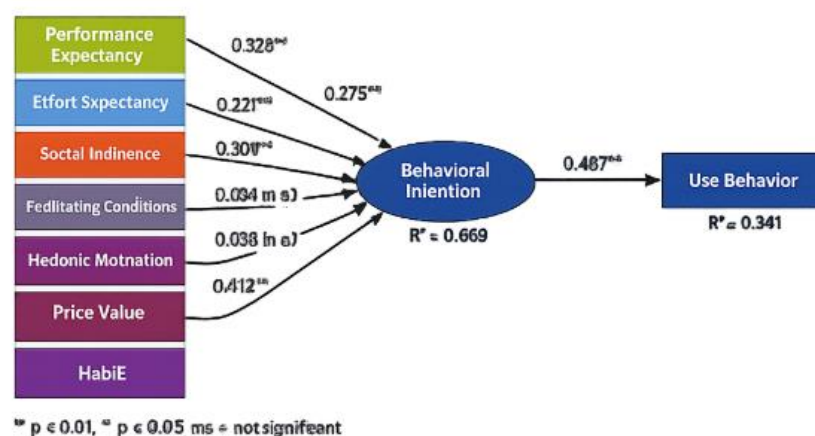


Figure 2. Structural Equation Model Results

Table 5. Hypothesis Testing Results

Hypothesis	Path	Path Coefficient	P-Value	Result
H1	PE → BI	0.401	0.002	Supported

H2	EE → BI	0.186	0.041	Supported
H3	SI → BI	0.143	0.006	Supported
H4	FC → BI	0.117	0.032	Supported
H5	HM → BI	0.071	0.381	Not Supported
H6	PV → BI	0.084	0.119	Not Supported
H7	H → BI	0.428	0.011	Supported
H8	FC → UB	0.496	0.001	Supported
H9	H → UB	0.452	0.013	Supported
H10	BI → UB	0.214	0.004	Supported

Source: Processed Data (2026)

Effect of Performance Expectancy on Behavioral Intention

Performance expectancy had a positive and significant effect on behavioral intention toward QRIS adoption. This finding indicates that respondents believed QRIS could improve transaction efficiency, speed, and convenience during payment activities. The practicality of QRIS in reducing cash handling and simplifying transaction processes encouraged users to continuously adopt the technology. This result is consistent with previous studies showing that performance expectancy is one of the strongest determinants of technology adoption behavior (Venkatesh et al., 2012; Rahardjo et al., 2020). Respondents perceived that QRIS provides practical benefits, enhances transaction effectiveness, and supports business operations in traditional retail markets.

Effect of Effort Expectancy on Behavioral Intention

Effort expectancy significantly influenced behavioral intention toward QRIS usage. The findings suggest that the easier QRIS is perceived to use, the stronger the intention of users to adopt the technology. Respondents considered QRIS relatively simple to learn and operate during transaction activities. This result aligns with Technology Acceptance Model (TAM) theory, which emphasizes perceived ease of use as an important determinant of technology acceptance (Davis, 1989). Similar findings were also reported by Asaif et al. (2025), who found that perceived convenience significantly affected QRIS adoption intention in traditional retail markets.

Effect of Social Influence on Behavioral Intention

Social influence positively and significantly affected behavioral intention toward QRIS adoption. This finding demonstrates that encouragement from family members, colleagues, customers, and surrounding communities plays an important role in influencing QRIS adoption behavior. In traditional retail markets, merchants often adopt digital payment systems because consumers increasingly prefer cashless transactions. Positive testimonials and recommendations from peers also strengthen users' confidence in adopting QRIS. This finding supports previous studies indicating that social influence significantly affects digital payment adoption behavior (Rahardjo et al., 2020; Asaif et al., 2025).

Effect of Facilitating Conditions on Behavioral Intention and Use Behavior

Facilitating conditions significantly influenced both behavioral intention and use behavior toward QRIS adoption. Adequate technological infrastructure, internet connectivity, smartphone ownership, and technical support encouraged respondents to use QRIS more frequently. The findings indicate that supporting facilities are essential for accelerating digital payment adoption in

traditional retail markets. Respondents who perceived sufficient technological resources and infrastructure tended to show stronger intention and actual usage behavior. This result supports the UTAUT2 framework, which highlights facilitating conditions as a key determinant of technology usage behavior (Venkatesh et al., 2012).

Effect of Hedonic Motivation on Behavioral Intention

Hedonic motivation did not significantly affect behavioral intention toward QRIS adoption. This finding suggests that respondents did not primarily use QRIS for enjoyment or emotional satisfaction. Instead, QRIS adoption was mainly driven by functional needs and transaction efficiency. In the context of traditional retail markets, QRIS is perceived as a practical payment solution rather than a source of entertainment or pleasure. This finding is similar to Rahardjo et al. (2020), who found that hedonic motivation had no significant influence on e-money adoption behavior in Indonesia.

Effect of Price Value on Behavioral Intention

Price value was found to have no significant effect on behavioral intention. The findings indicate that users were less concerned about economic costs or promotional incentives when adopting QRIS. Respondents prioritized practicality, convenience, and transaction speed over monetary considerations. This condition may occur because QRIS transactions generally involve minimal direct costs for consumers, making price considerations less influential in determining adoption behavior. The findings are consistent with previous research suggesting that functional utility often outweighs economic considerations in digital payment adoption contexts (Rahardjo et al., 2020).

Effect of Habit on Behavioral Intention and Use Behavior

Habit had a positive and significant effect on both behavioral intention and use behavior toward QRIS adoption. The results indicate that repeated usage and familiarity with QRIS strengthened users' intention to continue using the technology in future transactions. As digital payment systems become increasingly integrated into daily activities, QRIS usage gradually develops into a routine behavior among merchants and consumers. Habitual usage also reflects users' adaptation to cashless transaction systems. This finding supports previous studies demonstrating that habit is one of the strongest predictors of technology adoption behavior (Venkatesh et al., 2012; Rahardjo et al., 2020).

Table 6. R-Square Results

Variables	R-Square	Interpretation
Behavioral Intention (BI)	0.68	Strong
Use Behavior (UB)	0.59	Moderate

Source: Processed Data (2026)

Effect of Behavioral Intention on Use Behavior

Behavioral intention significantly influenced actual use behavior toward QRIS adoption. This finding confirms that stronger intention to use QRIS leads to higher actual usage behavior among respondents. Users who perceived QRIS as practical, efficient, and beneficial were more likely to continuously use the technology in their transaction activities. The findings support the theoretical

assumptions of UTAUT2, TAM, and TPB, which emphasize behavioral intention as a direct predictor of actual technology usage behavior (Ajzen, 1985; Davis, 1989; Venkatesh et al., 2012).

Discussion

The findings of this study demonstrate that QRIS adoption behavior in traditional retail markets is primarily influenced by performance expectancy, effort expectancy, social influence, facilitating conditions, and habit. These factors reflect the importance of functional utility, technological convenience, social encouragement, infrastructure readiness, and routine behavior in shaping digital payment adoption. The insignificant effects of hedonic motivation and price value suggest that QRIS adoption in traditional retail environments is predominantly driven by practical and operational needs rather than emotional or financial incentives. Traditional market merchants and consumers tend to prioritize efficiency, transaction speed, and ease of use when deciding to adopt digital payment systems.

This study contributes to the fintech and digital payment literature by extending the UTAUT2 framework within the context of traditional retail markets in an emerging economy. The findings provide empirical evidence that digital payment adoption in traditional sectors requires not only technological readiness but also social support, infrastructure development, and behavioral adaptation. From a practical perspective, the results imply that policymakers, fintech providers, and financial institutions should focus on improving technological infrastructure, internet accessibility, digital literacy, and user education programs to accelerate QRIS adoption in traditional retail markets. Additionally, continuous promotional strategies and merchant assistance programs may strengthen habitual usage and encourage broader acceptance of cashless payment systems in Indonesia.

CONCLUSION

This study aimed to extend the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) in examining QRIS adoption behavior in traditional retail markets. The findings demonstrate that performance expectancy, effort expectancy, social influence, facilitating conditions, and habit significantly influence behavioral intention toward QRIS adoption. Furthermore, facilitating conditions, habit, and behavioral intention were found to significantly affect actual use behavior of QRIS in traditional retail transactions. In contrast, hedonic motivation and price value did not show significant effects on behavioral intention.

The results indicate that QRIS adoption in traditional retail markets is primarily driven by functional and practical considerations rather than emotional enjoyment or economic incentives. Traditional retail merchants and consumers tend to adopt QRIS because it improves transaction efficiency, simplifies payment processes, and supports daily business activities. Social encouragement from customers, peers, and surrounding communities also plays an important role in strengthening behavioral intention toward digital payment adoption. In addition, habitual usage and adequate technological infrastructure contribute substantially to sustaining QRIS usage behavior.

This study contributes theoretically by extending the application of the UTAUT2 framework within the context of digital payment adoption in traditional retail markets in an emerging economy. The findings enrich the literature on fintech adoption by demonstrating that behavioral and technological factors remain critical determinants of QRIS adoption in traditional economic

sectors undergoing digital transformation. The study also provides empirical evidence that behavioral intention acts as a key predictor of actual QRIS usage behavior.

From a managerial perspective, the findings provide several important implications for policymakers, financial institutions, fintech providers, and traditional market stakeholders. First, improving internet accessibility and digital infrastructure in traditional markets is essential to support wider QRIS adoption. Second, educational campaigns and digital literacy programs should be intensified to improve users' understanding and confidence in using QRIS. Third, fintech providers should focus on developing more user-friendly and reliable payment systems that meet the practical needs of traditional market actors. Finally, continuous merchant assistance programs and promotional activities may strengthen habitual usage and encourage broader acceptance of cashless payment systems.

Despite its contributions, this study has several limitations. First, the study focused only on respondents within traditional retail market environments, limiting the generalizability of the findings to other sectors or regions. Second, this study employed a cross-sectional design, which only captures respondents' perceptions and behaviors at a single point in time. Third, the research relied primarily on self-reported questionnaire data, which may be subject to response bias or subjective interpretation.

Therefore, future research is recommended to expand the research scope by involving broader demographic and geographic contexts, including urban and rural retail sectors across different regions. Longitudinal studies are also recommended to examine changes in QRIS adoption behavior over time. Additionally, future studies may integrate other theoretical perspectives and variables, such as trust, perceived risk, digital literacy, financial inclusion, or government support, to obtain a more comprehensive understanding of digital payment adoption behavior in emerging economies.

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