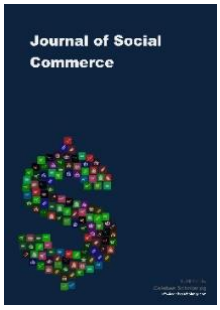

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TAM Model Analysis of QRIS Use Preferences with a Structural Equation Modelling Approach: An Empirical Study of GMIM Youth

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Article History

Keywords

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JEL Classification

G21, M31, D91, O33, Z13

Abstract

This study aims to analyze the influence of perceived usefulness (PU) and perceived ease of use (PEOU) on QRIS usage preferences among GMIM Youth using the Technology Acceptance Model (TAM) approach. The research method used is quantitative explanatory with primary data collection through questionnaires from 120 respondents selected by purposive sampling. Data were analyzed using Structural Equation Modeling (SEM) with SmartPLS 4.0 software. The results of the measurement model testing (outer model) showed that all indicators met the validity and reliability criteria. In the structural model testing (inner model), both hypotheses were proven significant: PEOU had a positive and significant effect on usage preferences (β = 0.483; p-value = 0.000), as did PU (β = 0.357; p-value = 0.000). The R^2 value of 0.602 indicates that the PU and PEOU variables are able to explain 60.2% of the variation in QRIS usage preferences. The conclusions of this study reinforce the TAM postulate that technology adoption, in this case QRIS, is largely determined by the perceived ease and usefulness of use. Consequently, service providers and relevant authorities are advised to continue improving the ease of use of the interface and promoting the benefits of QRIS, particularly within the context of religious communities.

Introduction

The development of financial technology (fintech) in Indonesia has experienced rapid growth in recent years. One notable innovation is the implementation of a QR code-based payment system through the Quick Response Code Indonesian Standard (QRIS). QRIS was launched by Bank Indonesia as an instrument to facilitate a faster, safer, and standardized payment system throughout Indonesia (Metri, 2024; Pratiwi, 2022; Prawitasari et al., 2024). With QRIS, people can conduct transactions simply by scanning a QR code through a digital payment application, without the need to carry cash (Permana et al., 2024; Rafferty & Fajar, 2022; Gunawan et al., 2023; Ramadhan & Afandi, 2025; Pratiwi, 2022).

In the context of digital payments, QRIS adoption among young people is crucial because the younger generation is considered the primary driver of financial technology adoption (Yasin et

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al., 2025; Andriyani et al., 2025; Leang et al., 2023; Mareta, 2023). Young people tend to be adaptive to new technology, but in reality, QRIS usage in religious communities such as the GMIM (Minahasa Evangelical Christian Church) Youth remains relatively low. This raises fundamental questions about the factors influencing young people's decisions to accept and use QRIS as a payment instrument (Lonardi & Legowo, 2021; Amri et al., 2025; Amini et al., 2024).

The Technology Acceptance Model (TAM), developed by Davis (1991), offers a conceptual framework that can explain technology acceptance among users. In this model, the two main factors that influence technology acceptance are perceived usefulness and perceived ease of use (Wilson et al., 2021; Kurniawan et al., 2022; Aburbeian et al., 2022; Tao et al., 2022; Natasia et al., 2022). Perceived usefulness refers to the extent to which users feel that using a technology will improve their performance, while perceived ease of use refers to the extent to which users feel that the technology is easy to use and understand. The conceptual approach used refers to TAM, which states that acceptance of a technology is strongly influenced by users' perceptions of its usefulness and ease of use. This model has proven relevant in various technology studies, including in the context of digital payment systems (Sholihah & Nurhapsari, 2023; Mediana et al., 2024). In the context of this research, the technology in question is QRIS (Quick Response Code Indonesian Standard), a QR code-based digital payment system initiated by Bank Indonesia to create a standardized, fast, and secure payment system in Indonesia.

Research on the adoption of financial technology, particularly QRIS, has grown rapidly in line with the digital transformation initiated by Bank Indonesia. Several previous studies have examined the factors influencing QRIS adoption using the Technology Acceptance Model (TAM) and other models such as the Unified Theory of Acceptance and Use of Technology (UTAUT), as well as general consumer behavior approaches (Handayani & Sudiana, 2015; Engko et al., 2023; Latifah, 2023). This socio-religious context was chosen because it is considered to have its own dynamics and values that can influence technology perception and adoption, a topic that has not been widely explored in previous studies. This research intentionally simplifies the model by focusing only on two core TAM variables (PU and PEOU) to produce a sharper and more focused analysis, without adding external variables such as trust or subjective norms, which are commonly found in modified TAM models.

Methods

This study uses a quantitative approach with explanatory research methods to explain the causal relationship between variables within the Technology Acceptance Model (TAM), specifically two key constructs: perceived usefulness and perceived ease of use, and QRIS usage preferences among GMIM youth. Referring to the TAM, the framework of this study is that the higher the youth's perception of the usefulness and ease of use of QRIS, the higher their tendency to choose QRIS for their daily transactions.

The data used are primary data collected through questionnaires distributed to GMIM youth. The questionnaire used a Likert scale of 1–5 (strongly disagree to strongly agree) to measure respondents' perceptions of the indicators in the PU, PEOU, and QRIS Usage Preference variables. The population in this study was GMIM youth who were active QRIS users or had used them. The sampling technique used purposive sampling with the following criteria; (1) Aged 17–30 years; (2) GMIM youth member; (3) Active or past QRIS user.

Some guidelines recommend a sample size, particularly when using the SEM-PLS analysis method, of at least 10 times the number of indicators (Hair et al., 2016). With a model relatively

concentrated on three independent variables and one dependent variable, 120 respondents are considered sufficient to produce stable estimates and valid hypothesis testing. Furthermore, researchers also have practical considerations regarding time efficiency, time constraints, costs, and available resources.

Research Variables and Operational Definitions

Perceived Usefulness (PU) is User perception that using QRIS can improve performance, productivity, efficiency, and transaction effectiveness. Perceived Ease of Use (PEOU) is User perception that QRIS is easy to understand and use. QRIS Usage Preference (PREF) is User tendency and consistency to choose and use QRIS in financial activities. Each variable is measured through 4 indicators which are arranged based on adaptations of the TAM instrument which has been tested for validity and reliability.

Data Analysis Techniques

The collected data will be analyzed using SmartPLS 4.0 software. The SEM-PLS approach was chosen because of its ability to handle smaller sample sizes, does not require strict data normality assumptions, and is suitable for predictive models. The analysis process will involve two main stages: (1) Measurement model analysis (Outer Model). This stage aims to assess the validity and reliability of latent constructs. Indicators to be evaluated include: (a) Convergent Validity: Measured through factor loading (values > 0.7 are recommended, or > 0.5 are acceptable), Average Variance Extracted (AVE) (values > 0.5), and Composite Reliability (CR) (values > 0.7); (b) Discriminant Validity: Measured by comparing the square root of AVE with correlations between constructs (Fornell-Larcker criteria) and through comparison of cross-loadings; (c) Internal Consistency Reliability: Measured through Cronbach's Alpha (values > 0.7); (2) Structural Model Evaluation (Inner Model): This stage aims to test the relationship between latent constructs (research hypotheses) and the predictive ability of the model. Indicators to be evaluated include; (a) Path Coefficients: Shows the strength and direction of the relationship between constructs; (b) p-value: Used to test the statistical significance of the relationship between constructs (generally, $p < 0.05$ indicates a significant relationship). This analysis will use the bootstrapping method to obtain p-values and t-statistics; (c) R-squared (R2) value: Measures the ability of independent variables to explain the variance of dependent variables (the predictive ability of the model).

Results and Discussion

Respondent Characteristics Profile

Based on the data processing results obtained through the questionnaire, it can be seen that the study respondents have diverse demographic characteristics, including age, gender, education level, and occupation. This overview is important to provide context for the research results, as respondents' backgrounds can influence their perspectives, experiences, and preferences regarding the topic being studied.

The age distribution of respondents shows that the majority are in the 26–30 age group, representing 53 people, or approximately 44% of the total respondents. The 21–25 age group ranks second with 36 people (30%), followed by the 17–20 age group with 31 people (26%). This finding indicates that participation is dominated by younger age groups who already have relative financial independence and experience with digital transactions. Based on gender, female respondents slightly outnumbered male respondents: 67 female respondents (56%), while 53 males (44%) participated. This composition indicates balanced involvement between both genders in QRIS use. The results of this study continue to represent the views of both

genders proportionally. The respondents' education levels varied considerably, but were dominated by bachelor's (S1) graduates (50 people) (42%) and high school/vocational high school (52 people) (43%). A small minority held master's (S2) degrees (10%) and diplomas (5%). This distribution indicates that the majority of respondents had secondary to higher educational backgrounds, which potentially impact their technological and financial literacy.

In terms of occupation, the majority of respondents worked in the private sector/honorary (41 people) (34.16%), and students (40 people) (33.33%). Others worked as civil servants (4.17%), state-owned enterprises (BUMN/D) (4.17%), self-employed (4.17%), and other categories (20%). The dominance of students and private sector employees is understandable, as these groups have high access to and involvement in digital technology, making them easier to reach in research. Furthermore, this variation illustrates that QRIS use has penetrated various occupational backgrounds.

The distribution of usage intensity shows that the majority of respondents use QRIS 3–5 times per week (66 people) (55%). The next group is users 1–2 times per week (42 people) (35%), while infrequent users (less than 4 times per month) are recorded at 12 people (10%). This data indicates a fairly high adoption rate among GMIM Youth. The most frequent type of transaction was food and beverages (51 people) (42.5%), followed by daily necessities (46 people) (38.33%), others (18 people) (15%), and donations to churches (5 people) (4.16%). These findings indicate that QRIS has become part of routine economic activities.

Table 1. Respondent Demographics

No	Characteristics	Category	Frequency (n)	Percentage (%)
1	Age	17–20 years	31	26
		21–25 years	36	30
		26–30 years	53	44
		Total	**120**	**100%**
2	Gender	Male	53	44
		Female	67	56
		Total	**120**	**100%**
3	last education	S3 Doctoral	0	0
		S2 Magister	12	10
		S1 Bachelor	50	42
		D1-D3 Diploma	6	5
		Senior High (SMA/SMK)	52	43
		Total	**120**	**100%**
4	Work	ASN	5	4.17
		BUMN/D	5	4.17
		Private / Honorary	41	34.16
		Self-employed	5	4.17
		Students	40	33.33
		Other	24	20
		Total	**120**	**100%**
5	Frequency of QRIS Use	3-5 times / week	66	55
		1-2 times / week	42	35
		Distance (<4 / month)	12	10
		Total	**120**	**100%**
6		Shopping for daily needs	46	38.33

Most Frequent Transaction Types	Food & Beverages	51	42.5
	Donation to the church	5	4.16
	Other	18	15
	Total	**120**	**100%**

Overall, the demographic profile of respondents in this study indicates that the majority are from the young, productive age group, with relatively high educational backgrounds, and a predominance of students. This situation implies that the research results are highly relevant in describing the views of the younger generation who are adaptive to technological developments and social change. The relatively balanced gender composition also strengthens the validity of the research results because they are not too biased toward one particular group. Meanwhile, the variety of occupations and education levels provides a more comprehensive picture of the population studied, so the research results are expected to represent a broader perspective.

Measurement Model Analysis

Table 2. Indicator Reliability

Variable	Indicator Code	*Outer Loading Value*	Condition	Information
PU Perceived Usefulness	PU1	0.765	> 0,7	Valid
	PU2	0.807	> 0,7	Valid
	PU3	0.838	> 0,7	Valid
	PU4	0.864	> 0,7	Valid
PEOU Perceived Ease Of Use	PEOU1	0.731	> 0,7	Valid
	PEOU2	0.866	> 0,7	Valid
	PEOU3	0.707	> 0,7	Valid
	PEOU4	0.868	> 0,7	Valid
PREF Usage Preferences	PREF1	0.816	> 0,7	Valid
	PREF2	0.837	> 0,7	Valid
	PREF3	0.799	> 0,7	Valid
	PREF4	0.842	> 0,7	Valid

Based on the test results, all indicators in the construct were declared valid because they had factor loading values greater than 0.7. The PU indicator had a value range between 0.765 and 0.864 with PU4 as the strongest indicator, while PEOU ranged from 0.707 to 0.868 with PEOU4 as the highest indicator and PEOU3 as the lowest, although still valid. In the PREF construct, the outer loading value ranged from 0.799 to 0.842 with PREF4 as the strongest indicator. These results indicate that all indicators are able to represent their respective constructs consistently and reliably in measuring the research model.

Table 3. Reliability and Validity

Construct (Variable)	Cronbach's Alpha (>0.7)	Composite Reliability (>0.7)	Average Variance Extracted (>0.5)	Information
Perceived Ease of Use (PEOU)	0.809	0.873	0.634	Valid and Consistent
QRIS Usage Preferences	0.842	0.894	0.678	Valid and Consistent
Perceived Usefulness (PU)	0.838	0.891	0.671	Valid and Consistent

Based on the results of the reliability and construct validity tests, it appears that all tested variables meet the established criteria. The Cronbach's Alpha value for each construct is above 0.7, indicating good internal consistency. Furthermore, the Composite Reliability (CR) value is also greater than 0.7, indicating that the research instrument can be considered reliable. The Average Variance Extracted (AVE) value for all constructs also exceeds the minimum limit of 0.5, indicating that the indicators in each variable are able to explain more than half of the construct's variance. Thus, the instrument used can be considered reliable and valid for measuring the variables in this study.

Table 4. Fornell-Lacker criterion

	PEOU Perceived Ease of Use	PREF Usage Preferences	PU Perceived Usefulness
PEOU Perceived Ease of Use	0.796		
PREF Usage Preferences	0.733	0.824	
PU Perceived Usefulness	0.701	0.695	0.819

Table 5. Heterotrait-Monotrait (HTMT) Ratio

	PEOU Perceived Ease of Use	PREF Usage Preferences	PU Perceived Usefulness
PEOU Perceived Ease of Use			
PREF Usage Preferences	0.866		
PU Perceived Usefulness	0.831	0.814	

The results of the discriminant validity analysis using the Fornell-Larcker Criterion and HTMT indicate that the model used has met the validity criteria. In the Fornell-Larcker Table, the AVE root value for each construct (PEOU = 0.796; PREF = 0.824; PU = 0.819) is greater than the correlation between variables, which indicates that each construct is able to explain its own variable more dominantly compared to other constructs. Meanwhile, in the HTMT test, all ratio values are below the threshold of 0.90 (PEOU–PREF = 0.866; PEOU–PU = 0.831; PREF–PU = 0.814), so it can be concluded that there are no discriminant validity problems. Thus, the variables Perceived Ease of Use, Preference for Use, and Perceived Usefulness are different empirical concepts and have adequate discriminant validity.

Structural Model Analysis

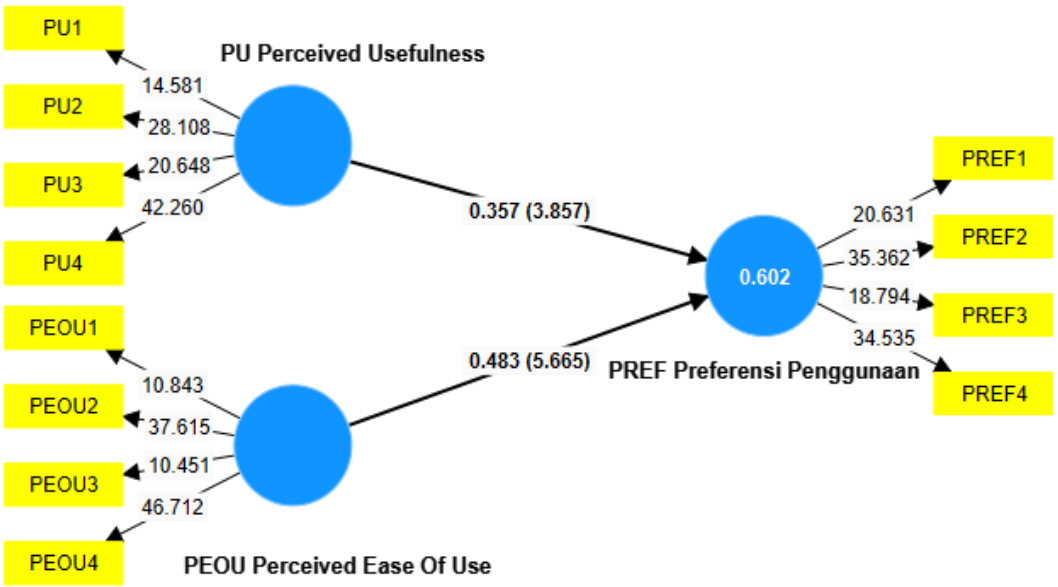

Figure 1. Path coefficient

Table 6. Hypothesis Test

Hypothesis	Relationship between constructs	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
H1	PEOU Perceived Ease of Use -> PREF Usage Preferences	0.483	0.489	0.085	5.665	0.000
H2	PU Perceived Usefulness -> PREF Usage Preferences	0.357	0.356	0.092	3.857	0.000

The results of data processing show that the two independent constructs, namely Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) contribute significantly to the dependent construct of Preference of Use (PREF). The influence of PEOU on PREF is reflected in the path coefficient of 0.483 with a t-statistic value of 5.665 and significance at the 0.000 level, so it can be concluded that ease of use is the main determinant in increasing user preference. Meanwhile, PU also shows a significant positive influence on PREF with a path coefficient of 0.357, a t-statistic value of 3.857, and a significance of 0.000, which confirms that the perceived benefits or utilities of a system have a real contribution in shaping usage preferences. It appears that the factors of ease of use (Perceived Ease of Use) and usefulness (Perceived Usefulness) both play an important role in shaping usage preferences. The findings indicate that when a system or application is perceived as easy to understand and operate, users will be more likely to choose and continue using it. Likewise, if the system provides tangible benefits and increases effectiveness or productivity, then usage preference will be strengthened. In other words, users consider not only how simple the system is to use, but also the extent to which it adds value to their activities. These two factors complement each other and significantly influence users' tendency to accept and adopt the offered system.

Thus, this finding aligns with the theoretical framework of the Technology Acceptance Model (TAM), which states that perceived ease of use and usefulness are key factors in the technology adoption process.

Table 7. Evaluation of the coefficient of determination

Variable	R Square	R Square Adjusted
PREF Usage Preferences	0.602	0.595

Based on the evaluation of the coefficient of determination in Table 8, the R-square value is 0.602 and the Adjusted R-square value is 0.595 for the Preference of Use (PREF) variable. This indicates that the independent variables in the study, namely Perceived Ease of Use (PEOU) and Perceived Usefulness (PU), are able to explain 60.2% of the variation in the dependent variable (Preference of Use), while the remaining 39.8% is influenced by other factors not included in the model.

The Adjusted R-square value, which is close to the R-square, indicates that the regression model used has a good level of fit and does not experience a significant decrease when accounting for the number of variables in the model. Thus, this research model can be considered sufficiently robust to explain the relationship between perceived ease of use, usefulness, and preference for using QRIS payment technology.

Perceived Ease and Utility in Shaping QRIS Usage Preferences

The empirical results of this study invite a reflective engagement with the Technology Acceptance Model as it continues to be applied to contemporary digital payment systems. The significant influence of perceived ease of use and perceived usefulness on QRIS usage preferences among GMIM youth suggests that the core cognitive evaluations proposed by Davis remain salient even as payment technologies become socially embedded and institutionally normalized. Rather than indicating theoretical stagnation, this persistence aligns with longitudinal evidence showing that perceived effort and perceived benefit retain explanatory relevance across technological generations when the object of adoption involves routine, low involvement transactions. Meta analytical work by King and He (2006) and later by Scherer et al. (2019) demonstrates that these two constructs consistently explain behavioral intention and preference across domains precisely because they map onto fundamental user cost benefit reasoning.

The stronger effect of perceived ease of use observed in this study resonates with a growing body of digital payment literature that positions usability as a primary trigger of preference rather than a secondary facilitator. Studies on mobile payment adoption in emerging economies have repeatedly shown that when systems are experienced as intuitive, users are more willing to integrate them into habitual transactions without conscious evaluation. Nirmawan & Astiwardhani (2021) found that perceived ease of use exerted a stronger influence than perceived usefulness in contexts where payment technologies were frequently used for small value transactions. Similar conclusions were drawn by Faraz & Anjum (2025), who argued that ease of use reduces psychological transaction costs, thereby increasing willingness to rely on digital payments in everyday settings. Within the QRIS context, Engko et al. (2023) reported that young users prioritize simplicity over feature richness, particularly when QR codes are used in informal commercial interactions.

In the present study, the dominance of perceived ease of use can be interpreted as reflecting the social nature of transactions among GMIM youth. Ease of use does not merely reduce individual effort but also minimizes disruption during shared activities. Chatterjee et al. (2023) emphasized that in socially visible technologies, effort expectancy becomes critical because difficulty is immediately observable and can generate social friction. This perspective helps explain why ease of use exerts a stronger influence than usefulness in this setting, where transactions often occur in collective environments rather than isolated consumer contexts.

Perceived usefulness, while secondary, remains a statistically and substantively important determinant of usage preference. Prior research on QRIS adoption among MSMEs and young consumers has consistently shown that users evaluate usefulness in terms of speed, flexibility, and compatibility with existing financial practices. Latifah (2023) demonstrated that QRIS adoption increases when users perceive tangible efficiency gains in daily transactions. Sholihah and Nurhapsari (2023) similarly found that perceived usefulness strengthens intention when users experience QRIS as reducing dependency on cash and simplifying transaction records. In the present study, usefulness appears to be anchored in pragmatic benefits rather than abstract productivity enhancement, aligning with Davis's original conceptualization of usefulness as performance improvement within the user's own frame of reference.

The relatively high explanatory power of the model reinforces arguments that core TAM constructs remain sufficient in contexts where trust and institutional legitimacy are already established. In contrast to studies that emphasize trust as a critical predictor in mobile payment adoption, such as Yang et al. (2023) and Rafdinal & Senalasari (2021), the findings here suggest that trust may operate as a background condition rather than an explicit determinant. Bank Indonesia's role in standardizing QRIS likely reduces uncertainty, allowing users to focus

on experiential attributes such as ease and utility. This interpretation is consistent with FakhrHosseini et al. (2024), who argued that in regulated technological environments, perceptual evaluations often overshadow trust considerations in explaining usage behavior.

The unexplained variance in usage preference should be interpreted cautiously. Information systems scholars have long noted that quantitative acceptance models capture dominant explanatory forces rather than the full range of social meaning associated with technology use (Wu, 2011; Mortenson & Vidgen, 2016; Ajibade, 2018; Nan, 2011). Bagozzi (2007) argued that while acceptance models explain variance effectively, they do not exhaust the interpretive dimensions through which users relate to technology. In religious youth communities, additional layers such as moral orientation, communal norms, and shared identity may shape how ease and usefulness are experienced, even if they do not emerge as independent predictors. Straub & Burton Jones (2007) similarly cautioned against overextending quantitative models to account for socially embedded interpretations that operate indirectly through perceptual constructs.

The demographic composition of respondents further contextualizes these findings. The dominance of young adults with moderate to high educational backgrounds mirrors adoption profiles reported in earlier fintech studies focusing on youth populations (Singla et al., 2025; Bermeo-Giraldo et al., 2023; Mahmud et al., 2022; Gati, 2023). Handayani & Sudiana (2015) found that younger users exhibit lower tolerance for complexity and higher sensitivity to interface clarity. More recent work by Scherer et al. (2019) confirms that digital natives evaluate technology less on novelty and more on how effortlessly it fits into existing routines. Within the GMIM youth context, this orientation appears to be amplified by the communal nature of many transactions, where individual difficulty can disrupt collective flow.

The findings suggest that QRIS usage preference among GMIM youth emerges from a quiet alignment between perceived simplicity, perceived benefit, and the rhythms of everyday communal life. The Technology Acceptance Model remains analytically effective here not because it is exhaustive, but because it captures how users pragmatically assess whether a system deserves a place in their routines. Adoption, in this sense, is less a deliberate decision than a gradual normalization shaped by repeated experiences of ease and utility.

Conclusion

This study shows that GMIM youth, particularly those in the younger productive age group with a relatively high level of digital literacy, have incorporated QRIS into their daily transaction activities, particularly for routine needs such as food, beverages, and daily shopping. The analysis confirms that Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) have a significant positive influence on QRIS usage preferences. Ease of use proved to be the primary determinant, followed by perceived usefulness. These two variables explained 60.2% of the variation in usage preferences, with the remainder influenced by factors outside the model. These findings support the Technology Acceptance Model (TAM) that technology acceptance is determined by perceived ease of use and usefulness. Focus on improving the ease of use of the QRIS application and expanding digital literacy campaigns that emphasize the benefits of QRIS, both for commercial transactions and donations. Conduct digital literacy education & Provide QRIS facilities in various aspects of church services to increase usage habits as a cash flow strategy Add external variables such as trust, attitude, and social influence, and conduct comparative studies in other religious communities to strengthen the generalizability of the TAM model.

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