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Research article

Continuance use of Quick Response Code Indonesian Standard: Acceptance, confirmation, and Task-Technology Fit

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Abstract
This study examines what drives continued use of Quick Response Code Indonesian Standard code payment standard. Using survey data from 571 users across several regions, it estimates a partial least squares structural equation model and assesses out-of-sample predictive ability. Task-Technology Fit emerges as the central factor, shaping perceived ease of use, perceived usefulness, confirmation, satisfaction, and continuance intention. Satisfaction and attitude also help explain continued use, whereas perceived ease of use and perceived usefulness show no direct effect. Overall, findings indicate that, among digitally mature users, sustained use depends more on functional fit with everyday transactions than on interface simplicity.

Keywords: quick response code payments; continuance intention; task–technology fit; technology acceptance; expectation confirmation.

Continuidad del uso de pagos con código de respuesta rápida en Indonesia: aceptación, confirmación y ajuste tarea-tecnología

Resumen
Este estudio examina los factores que explican la continuidad de uso del estándar nacional de pagos con código de respuesta rápida en Indonesia. Con datos de encuesta de 571 usuarios de distintas regiones, estima un modelo de ecuaciones estructurales por mínimos cuadrados parciales y evalúa su capacidad predictiva fuera de muestra. El ajuste tarea-tecnología emerge como el factor central del modelo, al influir en la facilidad de uso percibida, la utilidad percibida, la confirmación, la satisfacción y la intención de continuidad. Asimismo, la satisfacción y la actitud ayudan a explicar dicha continuidad, mientras que la facilidad y la utilidad percibidas no muestran un efecto directo. En conjunto, los hallazgos indican que, entre usuarios con mayor madurez digital, el uso sostenido depende más de la adecuación funcional a las transacciones cotidianas que de la simplicidad de la interfaz.

Palabras clave: pagos con código de respuesta rápida; intención de continuidad; ajuste tarea-tecnología; aceptación tecnológica; confirmación de expectativas.

Continuidade do uso de pagamentos por código de resposta rápida na Indonésia: aceitação, confirmação e ajuste tarefa-tecnologia

Resumo
Este estudo examina os fatores que explicam a continuidade do uso do padrão nacional de pagamentos por código de resposta rápida na Indonésia. Com dados de uma pesquisa realizada com 571 usuários de diferentes regiões, estima-se um modelo de equações estruturais por mínimos quadrados parciais e avalia-se sua capacidade preditiva fora da amostra. O ajuste tarefa-tecnologia emerge como o fator central do modelo, influenciando a facilidade de uso percebida, a utilidade percebida, a confirmação, a satisfação e a intenção de continuidade. Além disso, a satisfação e a atitude contribuem para explicar essa continuidade, enquanto a facilidade de uso percebida e a utilidade percebida não apresentam efeito direto. De modo geral, os resultados indicam que, entre usuários com maior maturidade digital, o uso contínuo depende mais da adequação funcional às transações cotidianas do que da simplicidade da interface.

Palavras-chave: pagamentos por código de resposta rápida; intenção de continuidade; ajuste tarefa-tecnologia; aceitação tecnológica; confirmação de expectativas.

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1. Introduction

Limited access to formal banking services has long constrained financial inclusion in many low-income countries (Song et al., 2025). However, in emerging economies such as Indonesia, mobile financial platforms are increasingly helping to reduce these barriers by expanding access to basic financial services (Elsaid Elmaasrawy et al., 2025). Recent evidence further suggests that digital financial inclusion is becoming more deeply embedded in Indonesia's broader development trajectory (Meniago, 2025).

Within this transformation, the Quick Response Code Indonesian Standard (QRIS) has become a central component of Indonesia's digital payment infrastructure. According to a projection issued by Bank Indonesia in 2019, QRIS was expected to reach more than 50 million users and record over 2.3 billion transactions by mid-2024 (Bank Indonesia, 2019). The expansion of smartphone use has further strengthened the conditions for wider adoption of mobile payment services in Indonesia (Statista, 2025). Yet rapid adoption does not necessarily translate into continued use. Unlike proprietary mobile payment applications, QRIS operates as a national interoperable payment standard that allows users and merchants to transact across different providers within a regulator-backed ecosystem (Bank Indonesia, 2019). This makes continuance toward QRIS analytically distinct from continuance toward a single branded payment app, because repeated use depends not only on interface perceptions but also on interoperability, ecosystem acceptance, and confidence in institutional governance (Bank Indonesia, 2019).

This distinction is important because the long-term value of a payment system depends not only on attracting first-time users, but also on remaining useful and relevant in routine transactions. In a government-backed payment ecosystem, continuance matters because sustained usage supports broader objectives related to payment efficiency, digital finance, and financial inclusion (Bank Indonesia, 2019). For this reason, understanding what drives continued use is important not only from a technological perspective, but also from a managerial and public policy perspective.

Although research on mobile payment behavior has grown considerably, most previous studies have focused on initial adoption. Much of this work has examined why people start using mobile payment services in the first place. Perceived usefulness and perceived ease of use, for example, are often treated as key predictors of acceptance (Chang et al., 2021). Trust has also been widely recognized as an important factor in encouraging adoption (Tounekti et al., 2022).

By contrast, post-adoption behavior has received less attention. This is especially true for continuance intention, which concerns whether users choose to keep using a payment system over time (Franque et al., 2021). This gap is important because the long-term success of a digital payment system depends not only on attracting new users, it also depends on whether they continue to use it in their daily lives (Pham Thi et al., 2024).

One reason this issue is still not fully understood is that earlier studies have often relied on separate theoretical perspectives. The Technology Acceptance Model (TAM) explains how beliefs such as usefulness and ease of use shape acceptance (Davis et al., 1989). The Expectation-Confirmation Model (ECM) focuses on post-use evaluation, especially confirmation and satisfaction (Bhattacherjee, 2001). Task-Technology Fit (TTF), in turn, explains whether a technology fits the tasks that users need to perform (Goodhue & Thompson, 1995).

Each of these perspectives offers valuable insight. However, when they are used separately, they may provide only a partial explanation of continuance behavior in digital payment settings (Mogaji & Nguyen, 2024). This limitation becomes more visible when payment systems are used across different merchant settings and in a wide range of routine transactions (Edu, 2024). It is also relevant in digital service environments where continued engagement is shaped by multiple, interrelated factors (Sharma et al., 2024). However, much of this literature has examined mobile payment in proprietary or platform-specific settings rather than in nationally standardized and regulator-backed payment ecosystems such as QRIS (Bank Indonesia, 2019). This distinction matters because continuance in an interoperable public payment infrastructure may be shaped not only by app-level beliefs, but also by broader ecosystem functionality and governance.

Despite the value of a more integrated perspective, empirical research that combines TAM, ECM, and TTF in a single framework remains limited, particularly in the context of large-scale, state-regulated digital payment platforms. Evidence on continuance intention toward Indonesia's government-backed national quick response code payment system is still scarce when these perspectives are brought together in a single explanatory model. Comparable evidence from other emerging economies also remains limited. As a result, an important gap persists in understanding how beliefs, confirmation, satisfaction, and task-technology alignment jointly shape continued use in a public digital payment ecosystem.

Against this background, this study explores how TAM, ECM, and TTF jointly explain users' continuance intention toward QRIS. To answer this question, it develops and tests an integrated framework using survey data from QRIS users across Indonesia. In doing so, the study aims to provide a fuller understanding of post-adoption behavior in a government-backed payment context. It also offers practical insights for policymakers and service providers working to strengthen the sustained use of quick response code payments and to support Indonesia's broader digital finance agenda (Bank Indonesia, 2019).

The remainder of this article is organized as follows. Section two reviews the relevant literature and develops the hypotheses; Section three describes the research

method, including data collection and analytical procedures; Section four presents the results. Section five discusses the findings in relation to prior studies and outlines their practical implications. Section six concludes the article by summarizing the main findings, outlining the limitations, and suggesting directions for future research.

2. Literature review

To explain continuance intention toward Quick Response Code Indonesian Standard, this study integrates Task-Technology Fit, the Technology Acceptance Model, and the Expectation-Confirmation Model. This integration is necessary because continuance behavior in digital payments is not driven by a single mechanism. Task-Technology Fit explains whether the system supports users' routine transaction requirements (Goodhue & Thompson, 1995). The Technology Acceptance Model explains how users evaluate the system through perceived ease of use and perceived usefulness (Davis, 1989). The Expectation-Confirmation Model explains how users reassess the system after actual use through confirmation and satisfaction (Bhattacherjee, 2001). These perspectives offer a more complete explanation of continuance intention by linking functional fit, cognitive evaluation, post-use validation, affective response, and behavioral intention within a single framework. The integrated model provides incremental explanatory power beyond any one model alone.

2.1 Task-Technology Fit and post-adoption continuance

Task-Technology Fit refers to the extent to which a technology supports the tasks users need to perform (Goodhue & Thompson, 1995). In digital payment settings, this fit matters when the system aligns with routine transaction requirements such as speed, convenience, reliability, and compatibility. When users perceive that a payment system supports these needs effectively, they are more likely to assess it positively in actual use (Rahi et al., 2021).

Prior research suggest that stronger task-technology alignment improves perceived ease of use because users encounter less friction when interacting with the system (Al Amin et al., 2022). A good fit can also strengthen perceived usefulness because the technology is seen as helping users to complete payment activities more effectively (Pham Thi et al., 2024). Evidence from cloud enterprise systems similarly shows that better Task-Technology Fit improves perceived usefulness and performance outcomes (Cheng, 2020).

Task-Technology Fit may also influence post-use evaluation. Ayyoub et al. (2023) found that a strong fit between task and technology reinforces confirmation of expectations after use. When the system fits users' needs well, it is also more likely to generate satisfaction (Cheng, 2020). The same alignment can support continued use because users tend to retain technologies that work well in activities they perform regularly (Ayyoub et al., 2023). Accordingly, the following hypotheses are proposed:

H1. When task-technology fit is stronger, users are more likely to perceive the technology as easy to use.

H2. A better task-technology fit enhances users' perception of the technology's usefulness.

H3. Stronger task-technology fit increases users' confirmation after using the technology.

H4. A strong task-technology fit leads to higher user satisfaction.

H5. Task-technology fit positively influences users' intention to continue using the technology.

2.2 Confirmation and post-use evaluation

The Expectation-Confirmation Model explains continuance as a post-adoption process in which users compare actual experience with prior expectations (Bhattacherjee, 2001). When actual experience confirms those expectations, users are more likely to develop favorable evaluations of the system after use. In internet banking, confirmation has been shown to strengthen perceived usefulness because users perceive that the system delivers what it promised in practice (Rahi et al., 2021). Similar evidence appears in fintech and mobile financial service settings (Savitha et al., 2022). More recent work also confirms this relationship in mobile payment environments (Al Amin et al., 2024).

Confirmation is also closely related to satisfaction. When users feel that a digital financial service performs as expected, they are more likely to report a positive overall experience (Nguyen & Dao, 2024). This relationship is consistent with the original logic of continuance research, which places confirmation and satisfaction at the center of post-adoption evaluation (Bhattacherjee, 2001).

Although the effect of confirmation on usefulness and satisfaction is well established, its relationship with perceived ease of use has received less attention in payment research. Even so, there are strong reasons to expect such a link. When actual experience matches prior expectations, a system is more likely to feel understandable, manageable, and easy to operate. Evidence from online learning environments suggests that confirmation can make digital systems feel easier to use in practice (Wandira et al., 2024). Comparable findings have also been reported in healthcare and service-platform contexts (Anil Kumar & Natarajan, 2020). These studies suggest that confirmation shapes not only what users think about a system, but also how effortless the system feels during actual use. Accordingly, the following hypotheses are proposed:

H6. Confirmation positively influences perceived ease of use.

H7. Confirmation positively influences perceived usefulness.

H8. Confirmation positively influences satisfaction.

2.3 Perceived ease of use, perceived usefulness, and continuance

Perceived ease of use refers to the extent to which a system feels easy and effortless to use. Perceived usefulness refers to the extent to which the system is seen as helping users perform their tasks better (Davis, 1989). Both constructs remain important in explaining continuance in digital payment services. Repeated use depends not only on having access to the technology but also on whether the technology feels manageable and useful in everyday transactions.

When users perceive a payment system as easy to use, they are more likely to feel comfortable using it again. This sense of ease can improve satisfaction because a system that requires less effort usually creates a smoother experience. Prior studies in mobile banking show that more intuitive applications tend to increase user satisfaction (Srivastava et al., 2024). Similar findings have also been reported in digital payment settings, where systems that are easier to use obtain more positive evaluations by users (Humbani & Wiese, 2019). Ease of use may also shape users' attitudes. People are generally more willing to embrace technologies that do not create unnecessary difficulty (Abdul-Halim et al., 2022). When a system feels simple and convenient, users are more likely to form a favorable view of it. Ease of use can also support continuance intention. Technologies that are easy to operate are more likely to become part of users' daily routines. As a result, users may be more willing to continue using them over time (Rahman et al., 2024). Accordingly, the following hypotheses are proposed:

H9. Perceived ease of use positively influences satisfaction.

H10. Perceived ease of use positively influences attitude.

H11. Perceived ease of use positively influences continuance intention.

Perceived usefulness also plays an important role in post-adoption behavior. Users are more likely to evaluate a system positively when it helps them complete transactions more efficiently. A system perceived as useful can create a better overall experience. It can also make users feel that the technology adds real value to their daily activities.

Previous studies support this view. Research on internet banking shows that perceived usefulness strengthens continued use (Rahi et al., 2021). Similar findings have been reported in mobile financial services and payment platforms, where usefulness helps sustain user engagement over time (Ma et al., 2023; Saima et al., 2024). When users feel that a technology is genuinely helpful, they are more likely to remain satisfied with it.

Perceived usefulness can also shape users' attitudes. Technologies that offer practical benefits are usually viewed more favorably (Patil et al., 2020). This pattern was also reported in research on financial technology continuance. In such settings, usefulness has been found to strengthen the intention to continue using a service (Al Amin et al., 2024). Users are also more likely to retain systems that simplify routine activities, such as bill payments and fund transfers (Inan et al., 2023). Accordingly, the following hypotheses are proposed:

H12. Perceived usefulness positively influences satisfaction.

H13. Perceived usefulness positively influences attitude.

H14. Perceived usefulness positively influences continuance intention.

2.4 Satisfaction, attitude, and continuance intention

Beyond cognitive evaluation, continuance is also influenced by affective responses that emerge through actual use. One of the most important responses is satisfaction. It reflects the extent to which users feel that their experience with a system has been positive and rewarding. In digital payment contexts, satisfied users are generally more willing to continue using the service over time (Khayer & Bao, 2019). A similar pattern has been found in internet banking, where continued use is closely related to how satisfied users feel with their experience (Rahi et al., 2021).

Satisfaction may also shape users' attitudes. When people repeatedly experience a system as effective, comfortable, and reliable, they are more likely to develop a favorable overall view of it. This is consistent with earlier research showing that positive usage experiences can strengthen users' attachment to digital services over time (Foroughi et al., 2019). In mobile payment settings, favorable prior experience has also been shown to support continued use, especially when the service fits smoothly into users' daily routines (Istijanto & Handoko, 2022). Related evidence further suggests that users are more likely to stay engaged with services that are easy to integrate into everyday life (Ha et al., 2024). These studies suggest that satisfaction plays an important role in post-adoption behavior. It helps explain how positive usage experiences translate into a more favorable attitude and a stronger intention to continue using the system. Accordingly, the following hypotheses are proposed:

H15. Satisfaction positively influences attitude.

H16. Satisfaction positively influences continuance intention.

H17. Attitude positively influences continuance intention.

The integration of these theoretical perspectives provides the foundation for the proposed research framework. Task-Technology Fit explains the alignment between technological capabilities and users' task requirements, the Technology Acceptance Model captures cognitive evaluations through perceived ease of use and perceived usefulness, and the Expectation-Confirmation Model describes post-adoption evaluations through confirmation and satisfaction. Together, these perspectives provide a comprehensive explanation of how functional, cognitive, and affective factors influence continuance intention toward the Quick Response Code Indonesian Standard, as presented in Figure 1.

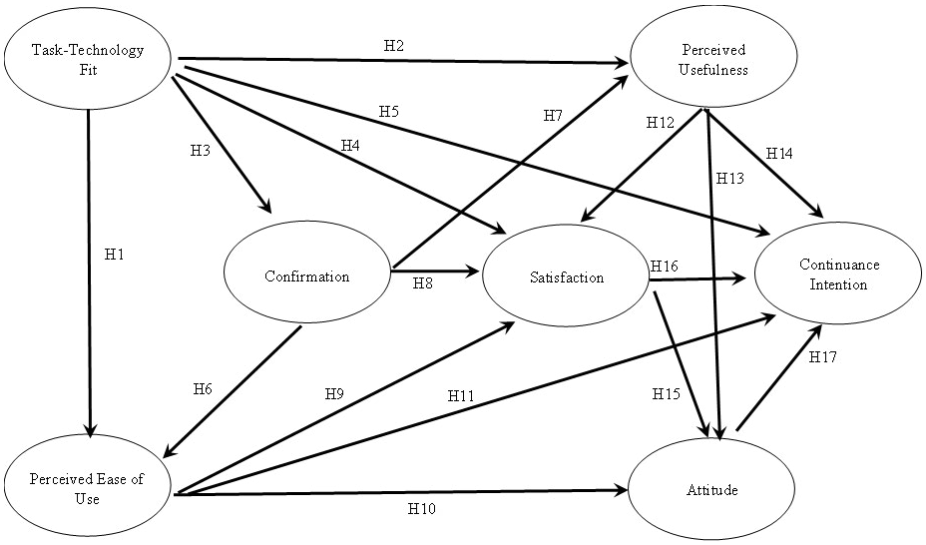

Figure 1. Integrated theoretical framework of continuance intention toward Quick Response Code Indonesian Standard.
Source: own elaboration.

3. Methodology

3.1 Sampling and data collection

This study used a non-probability convenience sampling approach because it allowed efficient access to active users of QRIS with relatively limited time and cost (Vehovar et al., 2016). As with other non-random strategies, this approach limits statistical generalizability (Martínez-Mesa et al., 2016). The questionnaire was administered online through Google Forms and distributed via region-based WhatsApp groups and geographically oriented social media communities, including hobby, professional, and university-related networks. To broaden regional coverage, distribution targeted respondents from Indonesia's six major geographic regions, thereby improving sample heterogeneity in a territorially diverse setting (Penn et al., 2023).

Eligible participants had to be at least 17 years old, reside in Indonesia, and have prior experience using quick response code payment services, in line with national ethical requirements for survey participation (Cahyaningsih et al., 2023). The Google Forms settings required respondents to complete all questions before submission and restricted the questionnaire to one submission per device, which helped prevent incomplete entries and reduce duplicate responses. As a result, all submitted questionnaires were usable, yielding 571 valid responses for analysis. Because the survey link circulated through open online channels, an exact response rate could not be calculated reliably.

Most items were adapted from established scales and translated into Indonesian using a cross-cultural adaptation approach. The wording was refined through comparative review to ensure semantic equivalence, preserve the original conceptual meaning, and improve contextual clarity within the Indonesian setting.

3.2 Common-method bias

Common-method bias was assessed using Kock's (2015) full-collinearity approach. The results of the full-collinearity VIF assessment are presented in Table 1. All VIF values were below the recommended threshold of 3.3 (ATT = 3.015, CIN = 2.186, CONF = 2.234, EOU = 2.088, PU = 1.806, SAT = 2.310, and TTF = 2.381), indicating that common-method bias was unlikely to pose a serious threat to the model (Kock, 2015).

Table 1. Common-method bias assessment using full collinearity VIF

	Common-method bias
Attitude	3.015
Continuance intention	2.186
Confirmation	2.234
Perceived ease of use	2.088
Perceived usefulness	1.806
Satisfaction	2.310
Task Technology Fit	2.381

Source: own elaboration.

3.3 Demographic profiles

A total of 571 participants were included in the study. The participant characteristics are summarized in Table 2. Of these, 55.69% were male and 44.31% were female, thus indicating a relatively balanced gender distribution. Generation Y represented the largest share of the sample (44.48%), followed by Generation Z (39.58%) and Generation X (15.94%). This distribution suggests that the sample was concentrated among users who are relatively familiar with digital technologies.

Participants were drawn from multiple regions in Indonesia. Java accounted for the highest portion (29.60%),

followed by Sumatra (18.04%) and Kalimantan (15.94%). Others came from Bali, Nusa Tenggara, Sulawesi, Maluku, and Papua. This range of locations adds valuable context to the perspectives gathered in the study.

Table 2. Participant profile

Category	Subcategory	Frequency	%
Gender	Male	318	55.69%
	Female	253	44.31%
	Total	**571**	**100%**
Generation	X	91	15.94%
	Y	254	44.48%
	Z	226	39.58%
	Total	**571**	**100%**
Region of residence	Bali and Nusa Tenggara	69	12.08%
	Java	169	29.60%
	Kalimantan	91	15.94%
	Maluku and Papua	62	10.86%
	Sulawesi	77	13.49%
	Sumatera	103	18.04%
	Total	**571**	**100%**

Source: own elaboration.

3.4 Instrument development and measurement

The measurement items were adapted from established scales in prior studies and refined to fit the context of QR Code payment services in Indonesia. The instrument measured seven constructs: continuance intention, attitude, satisfaction, perceived usefulness, confirmation, perceived ease of use, and task-technology fit. All items were assessed using a Likert-type scale. The complete measurement items and their corresponding sources are presented in Table 3.

4. Results

4.1 Measurement model evaluation

To evaluate the measurement model, PLS-SEM was applied using SmartPLS. As presented in Table 4, all constructs showed acceptable reliability; Cronbach's alpha and composite reliability values were consistently above 0.70. In addition, the model met the basic requirements for convergent validity (Hair et al., 2019). All AVE values were higher than 0.50, and each indicator's loading exceeded 0.70, following the criteria suggested by Anderson & Gerbing (1988). VIF scores were checked and all were below 5, thus indicating no serious multicollinearity issues (Kock, 2015). Based on these observations, the constructs can be considered valid and reliable, as recommended by Hair et al. (2019).

4.2 Discriminant validity evaluation

As an element of measurement model evaluation, discriminant validity was assessed by computing the Heterotrait-Monotrait (HTMT) ratios for all construct pairs, following Sarstedt et al. (2020). As presented in Table 5, all HTMT coefficients remained below 0.90, supporting the distinction among the constructs and providing evidence that they are empirically different from one another.

4.3 Structural model evaluation

4.3.1 Path coefficients, hypothesis testing, and confidence intervals

The structural model results indicate that 14 out of the 17 proposed hypotheses were supported. Task-Technology Fit emerged as the most influential predictor, showing significant positive effects on perceived ease of use, perceived usefulness, confirmation, satisfaction, and continuance intention. Confirmation also had significant positive effects on perceived ease of use, perceived usefulness, and satisfaction. In addition, satisfaction and attitude were both significant predictors of continuance intention.

Confidence intervals were consistent with these results. The path coefficients, hypothesis testing results, and confidence intervals are presented in Table 6. All inner-model VIF values were below the recommended threshold of 3.3 (ATT = 3.015, CIN = 2.186, CONF = 2.234, EOU = 2.088, PU = 1.806, SAT = 2.310, and TTF = 2.381), indicating that common-method bias was unlikely to pose a serious threat to the model (Kock, 2015).

4.3.2 Explanatory power and effect sizes

The R^2 and f^2 results presented in Table 7 indicate the model's explanatory power and the effect size of each structural relationship. The adjusted R^2 values indicate that the model has moderate to strong explanatory power. The highest explained variance is observed for continuance intention (0.681), followed by attitude (0.544), perceived ease of use (0.456), satisfaction (0.403), confirmation (0.380), and perceived usefulness (0.333). These results suggest that the model explains continuance intention particularly well.

The f^2 results show that the model is driven mainly by Task-Technology Fit and satisfaction. The former exerts a large effect on confirmation (0.615) and perceived ease of use (0.373), and a medium effect on perceived usefulness (0.193). Its effect on satisfaction (0.145) is close to the medium range, whereas its effect on continuance intention (0.053) is small. Satisfaction also shows large effects on attitude (0.350) and continuance intention (0.354). By contrast, the remaining relationships have only small effect sizes, indicating that their contributions are incremental rather than dominant. Overall, these findings reinforce the central role of Task-Technology Fit in shaping upstream evaluations and the importance of satisfaction in translating those evaluations into attitude and continuance intention.

Table 3. Research Instrument

Constructs	Items		Sources
Continuance intention	CIN1	I intend to continue using QR Code payment services rather than discontinue its use.	(Ha et al., 2024; Inan et al., 2023)
	CIN2	I prefer to continue relying on QR Code payment services rather than switching to alternative payment options like conventional methods.	
	CIN3	I will continuously use services offered by QR Code payment.	
	CIN4	I intend to keep making payments with QR Codes.	
	CIN5	I will advise others to try using QR Code payments.	
Attitude	ATT1	Using QR Code payment would be a wise idea.	(Ha et al., 2024)
	ATT2	Opting for QR Code payments seems like a wise decision.	
	ATT3	The concept of paying with QR Codes appeals to me.	
	ATT4	Utilizing QR Code payments would make for a positive experience.	
Satisfaction	SAT1	My overall experience with QR Code payment was highly satisfactory.	(Ha et al., 2024)
	SAT2	I felt very pleased with how QR Code payments worked for me.	
	SAT3	I was thoroughly satisfied with my experience using QR Code payments.	
Perceived usefulness	PU1	Using QR Code payment enhances the productivity of my financial transactions.	(Ha et al., 2024; Inan et al., 2023)
	PU2	Using QR Code payment plays a crucial role in supporting my financial activities.	
	PU3	Using QR Code payment allows me to complete my financial transactions more quickly.	
	PU4	I find QR Code payment useful for managing my financial activities.	
	PU5	Using QR Code payment improves the efficiency of my transactions.	
Confirmation	CONF1	The service level provided by QR Code payment was better than what I expected.	(Rahi et al., 2021)
	CONF2	My experience with using QR Code payments turned out to be better than I had anticipated.	
	CONF3	Using QR Code payment was more straightforward than I thought it would be.	
	CONF4	For the most part, using QR Code payment fulfilled what I was expecting.	
Perceived ease of use	EOU1	Learning to use this QR Code payment system is straightforward for me.	(Ha et al., 2024; Khayer & Bao, 2019)
	EOU2	I find it easy to complete what I need using this QR Code payment system.	
	EOU3	Using this QR Code payment system feels intuitive and easy to grasp.	
	EOU4	Interacting with QR Code payment is simple and not mentally taxing.	
	EOU5	I can easily use QR Code payment to accomplish what I want.	
Task Technology Fit	TTF1	Real-time QR Code payment services are highly suitable.	(Isaac et al., 2017; Rahi et al., 2021)
	TTF2	These QR Code payment services are very fitting.	
	TTF3	These services are suited for managing QR Code accounts.	
	TTF4	In general, QR Code payment services are sufficient.	
	TTF5	QR Code payment services align with job tasks and simplify transaction processes.	

Source: own elaboration.

Table 4. Construct reliability and convergent validity results

Items	Outer Loading	VIF	Cronbach's alpha	Composite reliability	AVE
CIN1	0.815	2.022			
CIN2	0.846	2.947			
CIN3	0.884	3.477	0.878	0.884	0.674
CIN4	0.838	2.183			
CIN5	0.713	1.633			
ATT1	0.894	3.190			
ATT2	0.861	2.716	0.904	0.907	0.776
ATT3	0.868	2.473			
ATT4	0.900	2.968			
SAT1	0.871	2.088			
SAT2	0.911	2.586	0.863	0.865	0.785
SAT3	0.876	2.150			
PU1	0.776	1.998			
PU2	0.852	2.802			
PU3	0.828	2.500	0.882	0.894	0.678
PU4	0.840	2.060			
PU5	0.819	1.983			
CONF1	0.859	2.069			
CONF2	0.842	1.983	0.844	0.856	0.681
CONF3	0.835	1.854			
CONF4	0.763	1.658			
EOU1	0.833	2.356			
EOU2	0.894	3.504			
EOU3	0.897	3.468	0.905	0.906	0.725
EOU4	0.849	2.430			
EOU5	0.781	1.762			
TTF1	0.808	2.175			
TTF2	0.813	2.192			
TTF3	0.766	1.788	0.862	0.862	0.644
TTF4	0.796	1.861			
TTF5	0.829	2.193			

Source: own elaboration.

Table 5. Heterotrait-Monotrait Ratios (HTMT)

	ATT	CIN	CONF	EOU	PU	SAT	TTF
ATT							
CIN	0.779						
CONF	0.813	0.601					
EOU	0.626	0.612	0.574				
PU	0.635	0.595	0.505	0.787			
SAT	0.736	0.871	0.577	0.506	0.511		
TTF	0.814	0.794	0.716	0.752	0.635	0.703	

Source: own elaboration.

Table 6. Path coefficients, hypothesis testing results, and confidence intervals

Hypothesis	Path	Original sample	P values	Decision	2.5%	97.5%
1	TTF -> EOU	0.571	0.000	Support	0.465	0.675
2	TTF -> PU	0.456	0.000	Support	0.353	0.560
3	TTF -> CONF	0.617	0.000	Support	0.563	0.668
4	TTF -> SAT	0.440	0.000	Support	0.323	0.555
5	TTF -> CIN	0.215	0.000	Support	0.100	0.326
6	CONF -> EOU	0.154	0.001	Support	0.060	0.248
7	CONF -> PU	0.173	0.000	Support	0.079	0.266
8	CONF -> SAT	0.177	0.000	Support	0.082	0.269
9	EOU -> SAT	-0.052	0.383	Not Support	-0.172	0.063
10	EOU -> ATT	0.201	0.000	Support	0.113	0.298
11	EOU -> CIN	0.055	0.292	Not Support	-0.045	0.165
12	PU -> SAT	0.164	0.000	Support	0.076	0.255
13	PU -> ATT	0.230	0.000	Support	0.135	0.319
14	PU -> CIN	0.070	0.109	Not Support	-0.016	0.156
15	SAT -> ATT	0.457	0.000	Support	0.369	0.539
16	SAT -> CIN	0.458	0.000	Support	0.362	0.546
17	ATT -> CIN	0.171	0.001	Support	0.076	0.279

Note: TTF = Task-Technology Fit; CONF = Confirmation; EOU = Perceived Ease of Use; PU = Perceived Usefulness; SAT = Satisfaction; ATT = Attitude; CIN = Continuance Intention.
Source: own elaboration.

Table 7. Explanatory power and effect sizes

	f^2						R^2
	ATT	CIN	CONF	EOU	PU	SAT	
ATT		0.035					0.544
CIN							0.681
CONF				0.027	0.028	0.032	0.380
EOU	0.043	0.004				0.002	0.456
PU	0.055	0.007				0.022	0.333
SAT	0.350	0.354					0.403
TTF		0.053	0.615	0.373	0.193	0.145	

Note: f^2 values of 0.02, 0.15, and 0.35 indicate small, medium, and large effect sizes, respectively. Adjusted R^2 values are reported only for endogenous constructs.
Source: own elaboration.

4.4 PLS-Predict

PLSpredict analysis was used to assess the model's predictive performance using external data (Shmueli et al., 2019). The results of the predictive relevance assessment are presented in Table 8. The positive Q^2predict values indicate that the model has predictive relevance. Furthermore, the PLS-SEM model generally showed similar or slightly better performance than the linear model (LM) across most items, as reflected by the RMSE comparison. However, the RMSE differences between the two models were minimal, suggesting that both approaches achieved comparable predictive accuracy in this context.

Table 8. Predictive relevance

Item	Q^2predict	PLS-SEM_RMSE	LM_RMSE
ATT1	0.366	0.540	0.533
ATT2	0.347	0.552	0.546
ATT3	0.389	0.507	0.499
ATT4	0.396	0.539	0.530
CIN1	0.286	0.661	0.662
CIN2	0.357	0.562	0.560
CIN3	0.390	0.537	0.535
CIN4	0.365	0.655	0.659
CIN5	0.208	0.747	0.752
CONF1	0.310	0.623	0.610
CONF2	0.259	0.653	0.651
CONF3	0.291	0.598	0.600
CONF4	0.154	0.801	0.797
EOU1	0.260	0.613	0.617
EOU2	0.307	0.562	0.567
EOU3	0.346	0.557	0.562
EOU4	0.339	0.554	0.558
EOU5	0.332	0.640	0.644
PU1	0.161	0.632	0.634
PU2	0.172	0.620	0.621
PU3	0.164	0.626	0.627
PU4	0.272	0.676	0.674
PU5	0.265	0.541	0.536
SAT1	0.281	0.653	0.658
SAT2	0.311	0.624	0.626
SAT3	0.267	0.659	0.662

Source: own elaboration.

As presented in Table 9, the CVPAT indicated that the PLS-SEM model had higher predictive accuracy than the individual average model. This was the case for all variables tested, with p-values below 0.05 (Sharma et al., 2024). In contrast, PLS-SEM did not show a meaningful improvement in predictive accuracy over the simple linear model (LM), because results were not statistically different ($p > 0.05$). This similarity in performance may reflect the predominantly linear nature of relationships among variables in data, thus allowing both models to capture observed patterns effectively.

Overall, the PLS-SEM model showed good predictive validity, as indicated by positive Q^2 predict values for all indicators. The PLSpredict analysis and the Cross-Validated Predictive Ability Test (CVPAT) confirmed that the model predicted outcomes better than the individual average benchmark. However, its predictive accuracy was very similar to that of a simple linear model. These results suggest that, in this setting, using a more complex model such as PLS-SEM did not provide substantial additional predictive value over a standard linear approach (Shmueli et al., 2019).

Table 9. CVPAT benchmark results for predictive accuracy

	PLS loss	IA loss	Average loss difference	p value	LM loss	Average loss difference	p value
ATT	0.286	0.457	-0.171	0.000	0.278	0.008	0.225
CIN	0.406	0.591	-0.186	0.000	0.407	-0.002	0.474
CONF	0.453	0.600	-0.147	0.000	0.448	0.006	0.343
EOU	0.344	0.503	-0.159	0.000	0.349	-0.005	0.052
PU	0.385	0.487	-0.102	0.000	0.384	0.001	0.875
SAT	0.416	0.583	-0.167	0.000	0.421	-0.005	0.129
Overall	0.380	0.534	-0.154	0.000	0.380	0.000	0.874

Source: own elaboration.

4.5 Importance–Performance Map Analysis (IPMA)

Table 10 summarizes the importance and performance scores of all constructs included in the IPMA. The IPMA results indicate that Task–Technology Fit (TTF) has the highest importance score (0.663) but only moderate performance (73.94). This combination suggests a substantial opportunity for improvement, as enhancing TTF could yield a strong positive effect on continuance intention. Satisfaction (SAT) follows closely with an importance score of 0.536 and similar performance (73.93), making it another key area for strategic focus (Ringle & Sarstedt, 2016).

In contrast, Perceived Usefulness (PU) shows moderate importance (0.198) but the highest performance (85.37) among all constructs. While less influential than TTF or SAT, PU's strong performance reflects that the system already delivers high perceived value. Attitude (ATT) and Confirmation (CONF) register lower importance (0.171 and 0.139, respectively) with performance levels of 76.09 and 70.13. Ease of Use (EOU) holds the lowest importance score (0.062) but still achieves high performance (80.26), indicating it is not a primary driver for continuance intention in this setting.

Improvements could make a big difference in TTF and SAT. At the same time, maintaining the current levels of PU, ATT, CONF, and EOU remains important for preserving the overall stability of the system.

Table 10. Importance-performance map analysis (IPMA) results

Construct	Importance (Total Effects)	Performance
ATT	0.171	76.09
CONF	0.139	70.13
EOU	0.062	80.26
PU	0.198	85.37
SAT	0.536	73.93
TTF	0.663	73.94

Source: own elaboration.

5. Discussion

The analysis confirms that Task–Technology Fit (TTF) shapes a broad spectrum of user perceptions, from ease of use and perceived usefulness to confidence, satisfaction, and continuance intention. System capabilities matter to the extent that they meet the operational demands for which they were developed. Comparable patterns have been noted in digital banking, where Rahi et al. (2021) observed that functions tailored to user requirements reduced cognitive effort and improved operational flow. Pham Thi et al. (2024) explain that intuitive alignment helps users learn faster. However, Türker et al. (2022) warn that the advantages of this fit might decrease when tasks change more quickly than the technology does.

The link between TTF and perceived usefulness supports the view of Pham Thi et al. (2024) that alignment enhances perceived value by improving task efficiency. Cheng (2020) adds that in complex systems such as cloud ERP, perceived usefulness is further reinforced by consistent output quality, suggesting that alignment must be accompanied by reliability. The effect of TTF on confidence reflects the results of Ayyoub et al. (2023), who contend that alignment diminishes operational uncertainty. Satisfaction follows the same logic, as shown by Cheng (2020), repeated success in performing tasks through a fitted system strengthens overall evaluations. Ayyoub et al. (2023) further show that users are less likely to switch platforms when their current one meets their operational needs.

The positive relationships from confirmation to ease of use, perceived usefulness, and satisfaction suggest that meeting initial expectations can reinforce favorable perceptions across multiple dimensions. This resonates with the expectation–confirmation framework, where fulfilment of anticipated benefits reduces uncertainty and strengthens evaluations. Cheng (2020) showed a similar effect in enterprise systems, noting that confirmation supports the adoption decision and makes future interactions easier. This pattern is reflected in the ease-of-use pathway observed here.

According to Cheng (2021), users perceive a system as more functional and relevant to their needs when outcomes align with their expectations. This finding is consistent with the observed effect of confirmation on perceived usefulness. Ayyoub et al. (2023) similarly suggest that satisfaction increases when expectations are met, generating positive emotions and long-term confidence. These results imply that managing expectations at the adoption stage is as critical as delivering high technical performance during usage.

Perceived ease of use contributed to positive attitudes but did not directly influence satisfaction or continuance intention. This divergence from earlier work reporting positive links among ease of use, satisfaction (Srivastava et al., 2024), and continuance intention (Yan et al., 2024)may be explained by user demographics. Generations Y and Z, who grew up with computers and smartphones, make up most of the responses. According to Legramante et al. (2023), segments with technology experience tend to take ease of use for granted and view it as less of a determining factor in satisfaction.

Intuitive contact leads to positive perceptions, which can promote continuous involvement (Rahman et al., 2024). This is consistent with the idea that ease of use influences attitudes. Nonetheless, its lack of influence on continuance intention aligns with Davis (1989) assertion that ease of use is more important for initial adoption than for sustained use. Once users achieve operational proficiency, their attention may shift toward functional value and performance reliability (Humbani & Wiese, 2019).

Perceived usefulness was associated with greater satisfaction and more positive attitudes but did not directly influence continuance intention. This pattern corresponds with the findings of Foroughi et al. (2019) regarding mobile banking, Khayer & Bao (2019) in relation to Alipay adoption, and Rahman et al. (2024) concerning mobile wallets, all of which associate usefulness with enhanced evaluations and sentiment. It also matches observations by (Rahi et al., 2021) and Franque et al. (2021), who found that users expressed higher satisfaction when services provided tangible benefits during the COVID-19 pandemic.

The lack of a direct effect on continuance intention is not unique to this study. Muñoz-Leiva et al. (2017) and Franque et al. (2021) found similar results, suggesting that the decision to continue is based more on expected future benefits than on past usefulness. (Savitha et al., 2022) suggest that perceived usefulness can affect retention only when users trust that it will remain relevant and beneficial. This shifts the focus from historical performance to forward-looking value propositions.

Satisfaction emerged as a key bridge between experience and future behavior, influencing attitudes and continuance intention. The strong connection to attitudes reflects the view of Rahman et al. (2024) that positive experiences shape favorable perceptions, which in turn support ongoing engagement. Ha et al. (2024) emphasize satisfaction as central to retention strategies, especially when service quality is consistently maintained.

The effect of satisfaction on continuance intention confirms its role as a stabilizing factor in technology use. Meeting or exceeding expectations makes users more likely to integrate the service into routine activities, making discontinuation less attractive. Attitude also directly predicted continuance intention, supporting the position of (Rahman et al., 2024) that positive sentiment translates into sustained usage. Positive attitudes and customer satisfaction are often more important for retention than small technical changes.

6. Conclusion

This study shows that Task-Technology Fit plays the most important role in shaping satisfaction, confirmation, and continuance intention in a nationwide, government-supported quick response code payment system. In other

words, continued use depends greatly on how well the system fits users' transaction needs. The study combines the Technology Acceptance Model, the Expectation-Confirmation Model, and Task-Technology Fit into one framework. It offers a broader explanation of post-adoption behavior than approaches that rely on only one model. Findings also suggest that continued use depends less on interface simplicity alone; it depends more on whether the system supports routine transactions effectively and provides a satisfying experience after use.

This study makes two main contributions. First, it extends continuance research by validating an integrated framework in a government-backed digital payment setting. Second, it shows that Task-Technology Fit and satisfaction are more important for continuance intention than perceived ease of use or perceived usefulness in this model. From a practical point of view, these findings suggest that service providers should pay closer attention to how well payment features match users' daily transaction routines. For institutions managing similar systems, results also highlight the importance of interoperability, service reliability, and institutional trust in sustaining user engagement.

At the same time, these findings should be interpreted with some caution. This study uses a cross-sectional design that limits causal interpretation. Likewise, data come from a single self-reported source, so response-related bias may still be present. In addition, the use of convenience sampling and open online distribution reduces statistical representativeness and limits generalizability. Although the model explains continuance intention quite well, omitted variables and endogeneity cannot be fully excluded. Future research could address these limitations by using longitudinal designs, more controlled sampling strategies, and comparative studies across different regulatory and service contexts.

Conflict of interest

The authors declare no conflict of interest

Statement on the Use of AI

The authors used generative artificial intelligence tools solely for language editing and stylistic refinement during the preparation of the manuscript. All AI-assisted revisions were carefully reviewed, verified, and approved by the authors. The authors retain full responsibility for the accuracy, originality, integrity, and validity of the manuscript.

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