Macrothink Institute™

Business and Economic Research
ISSN 2162-4860
2025, Vol. 15, No. 1

Determinants Influencing the Intention to Use and Actual Use of Quick Response (QR) Payments in Sarawak

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Received: December 12, 2024 Accepted: January 13, 2025 Published: January 17, 2025

doi:10.5296/ber.v15i1.22461 URL: https://doi.org/10.5296/ber.v15i1.22461

Abstract

The rapid adoption of Quick Response (QR) payment systems has revolutionized financial transactions, offering a seamless, secure, and contactless alternative to traditional payment methods. This study investigates the determinants influencing the intention to use and actual use of QR payments in Sarawak, focusing on key factors such as perceived usefulness, perceived ease of use, and perceived security. Utilizing the Technology Acceptance Model (TAM) as the theoretical framework, data were collected through a survey of 396 respondents familiar with QR payment systems in Sarawak. Structural Equation Modeling (SEM) using AMOS software was employed to test hypotheses and validate the proposed model. Results reveal that perceived security has the most significant impact on behavioral intention, followed by perceived ease of use and perceived usefulness. Furthermore, behavioral intention strongly predicts actual QR payment usage. These findings provide critical insights for policymakers, service providers, and financial institutions in promoting QR payment adoption by addressing security concerns and enhancing user-friendly system designs. This study contributes to advancing Malaysia's digital transformation agenda and supports efforts to foster a cashless society. However, the regional focus on Sarawak presents limitations in generalizing the findings to other contexts, offering avenues for future research.

Keywords: QR payments, Perceived usefulness, Perceived ease of use, Behavioural intention, Perceived security

1. Introduction

Mobile payment systems have revolutionized financial transactions by enabling users to conduct payments via mobile devices, either with or without intermediaries (Ariffin et al., 2020). These systems encompass various mechanisms, including initiation, authorization, and payment completion processes (Hakim et al., 2023). Among the diverse mobile payment platforms, Quick Response (QR) codes have emerged as a popular and cost-effective solution, offering versatility and security for remote and in-person transactions (Tu et al., 2022). As two-dimensional barcodes, QR codes facilitate seamless payments, allowing consumers to scan or display codes for transactions, often linked to credit or debit cards (Silalahi et al., 2022). Widely adopted on platforms such as GrabPay, Touch 'n Go, and DuitNow QR in Malaysia (Rosli et al., 2020; Yan et al., 2021), QR codes also dominate international markets, including Alipay and WeChat Pay in China (Tu et al., 2022) OVO, ShopeePay, and GoPay in Indonesia (Ifada and Abidin, 2023) and Vnpay, Viettel and Zalo in Vietnam (Le, 2021).

The primary appeal of QR code payment systems lies in their convenience and user-friendly design, allowing cashless transactions, proximity to the point of sale (Ifada and Abidin, 2023), compatibility with mobile devices, enabling contactless, efficient, and secure transactions (Liébana-Cabanillas et al., 2020; Franque et al., 2021). Consequently, retailers also benefit from lower transaction costs and improved consumer insights, further encouraging using these systems (Nawang and Moess, 2023). This transformative impact is globally evident, with QR payments becoming integral to digital ecosystems, particularly in Malaysia, where usage increased from 25% in 2021 to 61% in 2022 (Siddharta, 2024). This surge reflects the growing reliance on digital payment solutions driven by e-commerce and government

initiatives (Statista, 2023).

In Malaysia, various types of QR payment systems have emerged, reflecting the growing trend towards cashless transactions. These systems leverage QR codes for secure and efficient payment processing, catering to consumer needs and preferences. Services like Touch 'n Go, GrabPay, and Boost allows users to scan QR codes for payments at merchants, facilitating quick transactions without needing cash or cards (Rosli et al., 2020). Similarly, financial institutions have provided platforms like DuitNow QR as a standardized payment method that facilitates seamless and streamlined transactions, such as fund transfers across banks and e-wallets (Suwartana, 2023).

Sarawak provides a unique case within Malaysia's digital payment landscape, marked by its government's active promotion of initiatives like S Pay Global, a fintech platform designed to foster a cashless society. Featuring interoperable QR codes and the "Cross Border QR" initiative, S Pay Global has recorded over RM4.2 billion in transactions and registered 770,000 users, showcasing the state's commitment to digital transformation (Zaidi et al., 2023). The COVID-19 pandemic further underscored the importance of contactless payment systems, reshaping consumer preferences and accelerating digital adoption. Global and local government efforts, such as Malaysia's e-Tunai Rakyat and e-Penjana initiatives, have significantly contributed to this trend, enhancing the accessibility of mobile payments (Ming and Jais, 2022; Suyunchaliyeva et al., 2021). Furthermore, the government has actively promoted digital transformation initiatives, including the MyDigital blueprint, to foster a robust digital economy (Siddharta, 2024).

However, despite these efforts and promising usage rates, the effective utilization of QR payment systems in Sarawak continues to face significant challenges. Bridging the gap between user intention and actual usage remains a critical issue, as systemic barriers such as security concerns persist as major impediments to broader acceptance of mobile payment technologies (Sehat et al., 2024). Moreover, factors such as user perceptions and the adequacy of technological frameworks significantly influence the performance of these systems in Sarawak (Tang et al., 2022). While government-led initiatives have laid the groundwork for digital transformation, the moderate level of e-wallet usage in the region highlights the need for further investigation into the factors that influence adoption and sustained usage behavior (Unting and Yap, 2022). Addressing these challenges is essential to maximizing the impact of Sarawak's digital payment initiatives and ensuring the long-term success of its cashless society agenda.

Therefore, this study examines the determinants influencing the users' behavioral intention to use and actual use of QR Payments in Sarawak. These findings will support Sarawak's ambition of achieving a cashless and inclusive digital economy, offering valuable insights for policymakers and stakeholders to overcome regional barriers. Addressing these systemic issues will enable Sarawak to advance its digital transformation goals, ensuring broader adoption and unlocking significant socio-economic benefits through mobile payment platforms.

2. Literature Review

2.1 Perceived Usefulness

The perceived usefulness of QR code payments is a critical factor influencing the intention to use QR payments in various contexts. As outlined in the Technology Acceptance Model (TAM) (Liébana-Cabanillas et al., 2020), perceived usefulness is defined as a central element that drives technology acceptance, making it a vital area of focus for stakeholders aiming to enhance the adoption of QR payment systems (Singh et al., 2020). Furthermore, perceived usefulness is strongly related to behavioral intention, as demonstrated in multiple studies (Franque et al., 2021). Key factors like ease of use and perceived usefulness play pivotal roles in shaping user satisfaction, which may drive positive recommendations for the technology (Hewawasam et al., 2023).

In addition to influencing behavioral intention, perceived usefulness is closely linked to actual system use (Pramana, 2021). Empirical evidence shows that when users perceive a payment system as beneficial, their engagement increases, further strengthening its role in promoting long-term adoption and consistent usage (Nurhapsari and Sholihah, 2022). This positive relationship underscores its importance during the initial stages of adoption and ensures continued usage over time (Pham et al., 2023). Users who find a system intuitive and straightforward are more likely to consider it valuable (Fitrian et al., 2024). This highlights the need for QR payment systems to prioritize user-friendly design, as simplicity in navigation enhances their perceived usefulness and, subsequently, their adoption rates (Rahimi et al., 2024). Thus, the following hypothesis is established:

H1: Perceived usefulness positively influences behavioural intention to use QR payment.

2.2 Perceived Ease of Use

Perceived ease of use refers to the mental effort required to adopt and effectively use new technology (Song et al., 2021) which emphasizes used-friendly designs and intuitive interfaces (Pricilla et al., 2020). Hewawasam et al.(2023) assert this as significant in facilitating cognitive efforts and contributing to positive user experiences, which is essential in forming user attitudes and fostering technology acceptance, particularly in digital payment systems. This is further supported by Wang et al.(2021), who claim that there is a strong relationship between perceived ease of use and customer satisfaction, showing that systems requiring minimal effort promote favorable perceptions and increase satisfaction with payment technologies.

Perceived ease of use focuses on the simplicity and intuitiveness of a system, enabling users to interact seamlessly with technology (Musyaffi et al., 2024). According to Venkatesh et al. (2003), foundational studies validate the relationship between PEOU and user attitudes. These findings align with broader technology acceptance frameworks, where ease of use is critical for building confidence and fostering adoption (Liébana-Cabanillas et al., 2020; Gano-an and Pan, 2024). Additionally, perceived ease of use indirectly influences behavioral intentions by enhancing perceived usefulness, as users can probably see value in a system they find easy to navigate (Yan et al., 2021). Thus, the following hypothesis is established:

H2: Perceived ease of use positively influences behavioural intention to use QR payment.

2.3 Perceived Security

Perceived security in electronic transactions reflects user confidence in the safety and reliability construct of payment systems (Hassan et al., 2020) which encompasses data protection, privacy, and fraud prevention concerns, all influencing consumer attitudes and behaviors (Nguyen, 2021). In QR code payment systems, security is essential in fostering trust, enhancing satisfaction, and encouraging adoption by mitigating the perceived risks associated with online transactions (Chang et al., 2021). Kristanty, (2024) claims that it may have a direct influence by reducing resistance to technology adoption and addressing fears of privacy breaches. These factors are often more influential than constructs, such as perceived ease of use or perceived usefulness in shaping user behavior that underpins the importance of security mechanisms in payment platforms (Zhong and Moon, 2022).

Furthermore, perceived security extends beyond safeguarding transactional data to encompass the overall quality of service in contactless payment systems (Bhosale et al., 2023), such as encryption protocols and fraud detection mechanisms, contribute to user satisfaction and loyalty, encouraging continued use and trust in the system (V.Geetha et al., 2023). For instance, secure systems foster a sense of safety and reliability in mobile payment adoption by alleviating concerns about unauthorized access or financial losses (Chang et al., 2021). Thus, the following hypothesis is established:

H3: Perceived security positively influences behavioural intention to use QR payment.

2.4 Behavioural Intention

Behavioral intention refers to an individual's conscious decision-making process, which determines their readiness to perform a specific action, such as adopting new technology (Davis, 1989). Behavioral intention is often utilized as a metric to assess the impact of attitudes on consumer behavior. Within the technology adoption framework, behavioral intention is a critical predictor of actual usage, influenced by factors including personal attitudes, social norms, and perceived advantages of the technology (Suo et al., 2022). Consequently, in the context of QR payment systems, these intentions are often a result of users' expectations regarding their performance and ease of use (Patianom et al., 2023).

Additionally, the influence of social networks and peer recommendations are particularly significant, where collective behaviors often drive individual adoption decisions (Michael et al., 2024). Users are more inclined to adopt QR payment systems when they perceive tangible benefits, such as improved transaction efficiency and enhanced traceability, which align with their operational or personal needs (Nguyen and Alang, 2024).

Empirical evidence demonstrates that stronger behavioral intentions toward QR payment systems are positively related to their integration into daily transactional practices (Sehat et al., 2024). Additionally, studies have shown that behavioral intention significantly influences the actual use of mobile wallets (Karim et al., 2020). Thus, the following hypothesis is established:

H4: Behavioral intention positively influences the actual use of QR payment.

2.5 Actual to Use

The actual use of QR payment systems is heavily influenced by user attitudes and behavioral patterns. Fadhil and Subriadi, (2023) claim that positive attitudes towards QR payments are closely associated with higher usage rates. This is because users who perceive the technology favorably are more likely to integrate it into their daily activities. Additionally, when users find QR payment systems reliable and easy to use, their comfort with the technology fosters regular engagement (Liébana-Cabanillas et al., 2020), demonstrating that habitual behavior plays a crucial role in solidifying the adoption of QR payments. Similarly, Michael et al. (2024) posit that it becomes a routine aspect of their financial interactions, reinforcing its use when users repeatedly engage with the technology.

Past research emphasizes the importance of familiarity and experience with similar technologies in sustaining long-term adoption using QR payment systems (Tu et al., 2022; Sehat et al., 2024). Maharjan et al. (2024) further suggest that increased exposure to and routine use of technological products has enhanced users' comfort levels and created a reinforcement cycle that encourages continued utilization.

The effectiveness of QR payments is particularly evident in sectors like retail, banking, and transportation, where they have revolutionized traditional processes (Pramana, 2021). In retail and banking, QR payments provide a necessary alternative to cash and card transactions, offering a safer and more efficient solution, especially during the COVID-19 pandemic when contactless methods were vital (Wang et al., 2021). Similarly, in transportation, QR codes have streamlined ticket purchasing through e-ticketing systems, enhancing user experiences while boosting sales (Kuncara et al., 2021). These examples illustrate the versatility and impact of QR payments in diverse contexts, underscoring their potential for broader integration.

2.6 Conceptual Model

Various theoretical models have been developed to predict user behaviour when adopting new technologies. The Technology Acceptance Model (TAM), developed by Davis (1989), is an influential framework derived from the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB) (Venkatesh and Davis, 2015). This model has proven highly valuable in predicting acceptance among potential users, providing insights into the factors influencing behavioral decisions regarding new technology adoption (Bosnjak et al., 2020; Liébana-Cabanillas et al., 2020). Essentially, TAM suggests that consumer behavior is related to the acceptance and use of technology, thus emphasizing two critical constructs: perceived usefulness (PU) and perceived ease of use (PEOU) (Davis, 1989).

Perceived usefulness refers to the degree to which a user believes a particular technology enhances task performance. For instance, in online shopping, perceived usefulness includes benefits like accessing valuable information, comparing offers, and enabling faster checkout processes (Alam et al., 2022). On the other hand, perceived ease of use describes the extent to which users believe that using a specific system requires minimal effort or is straightforward

and intuitive (Davis, 1989; Venkatesh et al., 2003). These constructs shape an individual's decision-making process regarding adopting and utilizing a new technological innovation. Furthermore, TAM has been extensively applied across various domains to understand consumer technology adoption. For example, TAM has been used to examine user behavior in mobile phones (Youn and Lee, 2019), mobile payments (Suo et al., 2021), and mobile ticketing (Gbongli, 2022). This application demonstrates the model's adaptability in exploring user behavior and acceptance in diverse technological contexts.

Despite its extensive applicability, one of TAM's most notable limitations lies in its failure to explicitly address the role of security. Given the critical importance of security in informational and financial transaction systems, overlooking this factor can result in an incomplete understanding of user behavior. Hence, the present research extends TAM by introducing perceived security as a new variable. This new variable seeks to account for users' concerns regarding the safety and integrity of technological systems, broadening the model's scope and enhancing its relevance in modern contexts. Thus, the conceptual model developed for this study is illustrated in Figure 1.

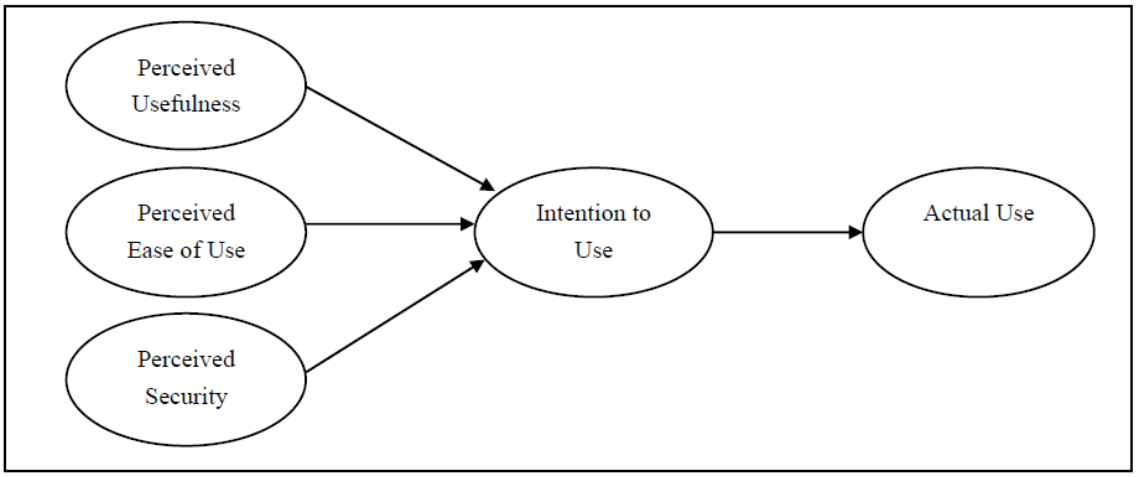

Figure 1. The conceptual model for this study

3. Methodology

This study aims to analyze the construct of users' intentions to use QR payments in Sarawak and their actual usage behaviors. The research methodology is designed to ensure comprehensive data collection, reliability, and validity for meaningful insights into these constructs. The study employs a quantitative research design, utilizing a survey-based approach to collect data from respondents. This design enables the systematic measurement of the variables and the exploration of relationships between users' intentions and actual behaviors in adopting QR payment systems. Purposive and convenience sampling methods were adopted to select respondents. This sampling method ensured that participants were relevant to the research context, focusing on individuals familiar with QR payment systems in Sarawak. Convenience sampling facilitated easy access to respondents by leveraging readily

available participants. A Google Form link was disseminated through social media platforms and instant messaging applications, enabling broad reach while maintaining cost efficiency. The inclusion criteria required respondents to have prior exposure to QR payment systems, ensuring the relevance and reliability of the collected data. Participants were assured of anonymity and confidentiality following ethical research practices. The survey instrument was adapted from validated scales in prior studies, ensuring the reliability and validity of the measurements. A 7-point Likert scale was employed to gauge the level of agreement or disagreement with the survey items, ranging from 1 ("Strongly Disagree") to 7 ("Strongly Agree").

3.1 Data Analysis

The data for this study were analyzed using two software tools: SPSS version 25.0 and AMOS version 24. SPSS was used for data entry, screening, and descriptive analysis. This process included identifying and handling missing or incomplete responses to ensure the dataset was accurate and complete. Descriptive analysis was then conducted to summarize the respondents' demographic information and provide an overview of the data, such as mean, standard deviation, and frequency distributions.

AMOS, a tool for Structural Equation Modeling (SEM), was used for advanced analysis and evaluation of the measurement model and hypotheses testing. Confirmatory Factor Analysis (CFA) was conducted to examine the relationships between survey items and their respective constructs to ensure the validity and reliability of the model. The analysis also included checking how well the model fit the data using standard fit indices. Finally, AMOS was also used to test the study's hypotheses through path analysis. This helped identify the strength and significance of relationships between users' intentions and actual behaviors in using QR payments in Sarawak.

4. Findings and Discussion

4.1 Confirmatory Factor Analysis (CFA)

The diagram in Figure 1 represents the Confirmatory Factor Analysis (CFA) conducted as part of the Structural Equation Modeling (SEM) process to evaluate the measurement model. The CFA is used to confirm the relationships between observed variables (indicators) and their corresponding latent constructs, namely perceived usefulness, perceived ease of use, perceived security, behavioural intention, and actual use. This analysis is essential for validating the constructs and ensuring that the measurement model fits the data appropriately.

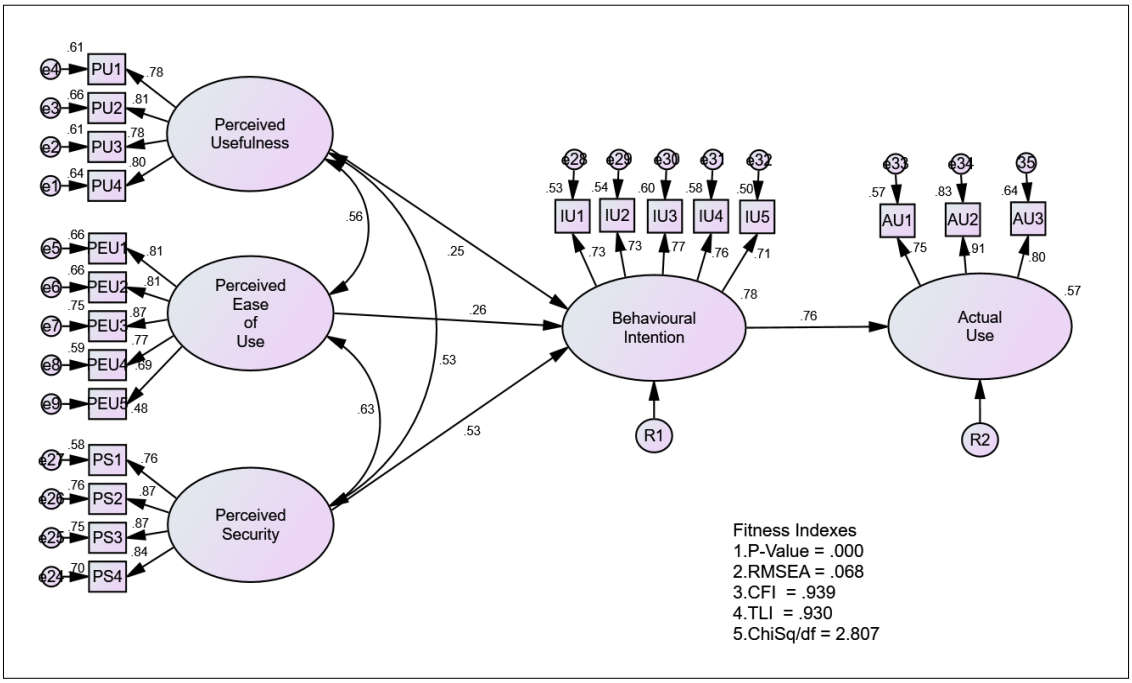

Figure 2: Standardized path coefficients between constructs in the structural model

The construct validity of the CFA model is supported by the fitness indices, which demonstrate that the model meets the criteria for absolute fit, incremental fit, and parsimonious fit. The Root Mean Square Error of Approximation (RMSEA), representing the absolute fit, is 0.068, which is below the acceptable threshold of 0.08, indicating a good fit between the model and the data. Incremental fit indices, including the Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI), have values of 0.939 and 0.930, respectively, both exceeding the minimum requirement of 0.90. These results indicate that the model performs well in explaining the relationships among the constructs. Additionally, the parsimonious fit, as reflected in the chi-square to degrees of freedom ratio (ChiSq/df) of 2.807, falls below the benchmark of 3.0, further confirming that the model achieves an adequate balance between complexity and explanatory power. Collectively, these indices confirm that the measurement model has strong construct validity and fits the data appropriately.

The CFA model also includes estimates of the relationships between the observed variables and their respective latent constructs. The factor loadings, which are all above 0.5, demonstrate that the observed variables are significant and reliable indicators of their corresponding constructs. For example, perceived usefulness is measured by four observed variables (PU1 to PU4), all of which exhibit strong factor loadings, confirming the unidimensionality and reliability of the construct. Similarly, perceived ease of use, perceived security, behavioural intention, and actual use are validated through their respective indicators, ensuring that the constructs are measured accurately and consistently.

The CFA results further demonstrate the explanatory power of the model through the R^2 values. For the behavioural intention QR payments, the R^2 value is 0.78, indicating that

perceived usefulness, perceived ease of use, and perceived security together explain 78% of the variance in users' behavioral intentions. Similarly, the R^2 value for actual use is 0.57, showing that 57% of the variance in actual usage behavior is explained by users' behavioural intention QR payments.

4.2 Hypothesis Testing

Table 1 presents the results of the hypothesis testing based on the regression path coefficients and their statistical significance. Hypotheses are deemed significant if the p-value is less than 0.05 (Awang, 2015; Awang et al., 2018). The findings in Table X indicate that all proposed hypotheses are supported, with p-values of 0.000 across all tested relationships, signifying a high level of statistical significance.

Table 1. The Regression Path Coefficient and its Significance

Relationship			**Estimate**	**S.E.**	**C.R.**	**P**	**Result**
Behavioural Intention	<---	Perceived Usefulness	0.212	.041	5.224	***	Significant
Behavioural Intention	<---	Perceived Ease of Use	0.213	.043	4.982	***	Significant
Behavioural Intention	<---	Perceived Security	0.420	.045	9.407	***	Significant
Actual Use	<---	Behavioural Intention	0.860	.074	11.687	***	Significant

The first hypothesis, which posits that perceived usefulness has a significant influence on behavioural intention QR payments, is supported with a path coefficient estimate of 0.212, a standard error (S.E.) of 0.041, and a critical ratio (C.R.) of 5.224. The significance level (p = 0.000) confirms the importance of perceived usefulness in shaping users' behavioral intentions. Similarly, the relationship between perceived ease of use and behavioural intention is also significant. The path coefficient for this relationship is 0.213, with an S.E. of 0.043 and a C.R. of 4.982. The p-value of 0.000 further demonstrates that perceived ease of use plays crucial role in influencing users' intention to adopt QR payment systems. In addition, perceived security emerges as the most influential predictor of behavioural intention, with a path coefficient of 0.420, an S.E. of 0.045, and a C.R. of 9.407. The p-value of 0.000 strongly supports the hypothesis that perceived security significantly impacts users' behavioural intention QR payments. This finding underscores the importance of security considerations in users' decision-making processes, as it contributes more substantially to behavioural intention than the other constructs. Finally, the analysis confirms that behavioural intention significantly affects the actual use of QR payments. The path coefficient for this relationship is 0.860, with an S.E. of 0.074 and a C.R. of 11.687. The p-value of 0.000 indicates that users' behavioral intentions are a strong and significant determinant of their actual usage behavior.

5. Conclusion

This study examines the determinants influencing the users' behavioral intention to use and actual use of QR payment in Sarawak, focusing on perceived usefulness, ease of use, security, behavioral intention, and actual usage. Findings indicate that perceived security significantly impacts behavioral intention, followed by ease of use and usefulness of QR payments. These

results highlight the importance of addressing security concerns while ensuring QR payment systems are user-friendly and practical.

From a practical perspective, this study provides valuable insights for stakeholders in the digital payment ecosystem, including policymakers, financial institutions, and service providers. Enhancing user perceptions of security, simplifying interfaces, and highlighting the practical benefits of QR payment systems can increase adoption rates in Sarawak. These findings support Malaysia's initiative to promote a cashless society through digital payments. The study also contributes to the theory by validating the Technology Acceptance Model (TAM) constructs and extending its application to QR payment systems in developing countries. Furthermore, it reinforces TAM's robustness by integrating security variables into the traditional framework.

One key limitation of this study is the influence of cultural differences. Studies focusing primarily on urban populations may overlook these nuances, limiting the findings' applicability to rural or culturally distinct groups (Ling et al., 2023). Social influence significantly shapes the intention to use QR payment, but its impact varies across cultures. Sarawak's rich cultural diversity, comprising multiple ethnic groups with distinct traditions and attitudes, affects the intention to use of QR payment. This heterogeneity may lead to varying acceptance levels, as individuals from different backgrounds exhibit contrasting behaviors toward technology use (Tang et al., 2022). In Sarawak, social influences such as peer pressure and societal norms drive the usage of e-wallets (Mohamed et al., 2023). However, studies in India suggest social influence has little effect on intention to use (Nandru et al., 2024). Similarly, research in Italy highlights that cultures with high uncertainty avoidance rely more on social influence, underscoring the role of cultural frameworks in moderating behavior (Migliore et al., 2022).

Perceptions of technology use also differ across cultural contexts. In Sarawak, trust in digital payment systems is crucial, especially in areas with low digital literacy and persistent scepticism about security measures (Nawang and Moess, 2023). Similar trends in Indonesia, where privacy and security concerns affected the use of QRIS, emphasize the need for strong security protocols (Fitrian et al., 2024). In contrast, countries with higher digital literacy, such as China, report greater trust and willingness to use digital payments (Wu and Liu, 2023). These comparisons illustrate the significance of addressing cultural barriers to increase the usage rates of QR payments.

Beyond cultural differences, several implementation challenges hinder the use of QR payment. Infrastructure limitations remain a significant barrier, particularly in Sarawak's rural areas, where internet connectivity is inconsistent (Ling et al., 2023). Similarly, infrastructural gaps in Indonesia and India also limit access to reliable digital payment systems (Djoyo et al., 2022). These issues stress the need to enhance infrastructure for seamless access and usage.

Security and privacy concerns further impact the intention to use in Sarawak and globally. Studies in Indonesia reveal vulnerabilities in QRIS systems deter users (Fitrian et al., 2024). Sarawak faces similar challenges due to low digital literacy and insufficient awareness of

security measures (Sehat et al., 2024). Promoting digital literacy through targeted programs and transparent security frameworks can address these concerns and foster the intention to use QR payment.

The usability and design of QR payment systems also influence the intention to use rates. In Sarawak, poorly designed systems that fail to meet expectations for ease of use and functionality reduce utilization (Unting et al., 2022). Comparatively, China's focus on user-centric designs and intuitive interfaces has driven higher intention to use (Wu and Liu, 2023). Adapting systems to local preferences while incorporating lessons from successful implementations can close usability gaps and improve satisfaction.

While these challenges are significant, they also offer opportunities for innovation. Addressing cultural differences through localized marketing strategies and adapting implementation frameworks can improve inclusivity and effectiveness. Future research should focus on enhancing digital literacy, strengthening security measures, and optimizing system design to better align with Sarawak's cultural and technological contexts. Comparing findings across regions can identify best practices and scalable strategies for sustainable the intention to use and actual use of QR payment.

Acknowledgement

We thank the i-CATS University College for supporting this study through the i-CATS Research and Innovation Grant Scheme (iRIGS).

Authors contributions

Kedani Ganie was responsible for literature design. Nurashikin Nazer Mohamed was responsible for data analysis. Nur Suriayanti Gadiman drafted the manuscript. Khairunnisa Ibrahim and Shazali Abu Mansor revised it. All authors were responsible for study design and contributed equally to the study.

Funding

The funding grant for this research was supported by i-CATS Research and Innovation Grant Scheme (iRIGS).

Competing interests

The authors declare that have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Macrothink Institute.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned; externally double-blind peer reviewed.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

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