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Factors Influencing QRIS-Based Digital Wallet Use Among Generation X in Indonesia: A Literature-Based Model Development

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ABSTRACT

This study aims to identify the key factors influencing the adoption of QRIS-based digital payment systems among Generation X in Indonesia. While younger generations such as Millennials and Gen Z have rapidly embraced QRIS due to high digital literacy and lifestyle compatibility, Generation X continues to exhibit lower adoption rates. Employing a Systematic Literature Review (SLR) approach based on Kitchenham's (2015) protocol, this research synthesizes findings from 16 Scopus-indexed articles published between 2020 and 2025. The conceptual model developed highlights five primary determinants: performance expectancy, effort expectancy, social influence, facilitating conditions, and perceived security, with trust serving as a mediating variable. These constructs were framed within a modified Unified Theory of Acceptance and Use of Technology (UTAUT) model tailored to the behavioral and psychological characteristics of Generation X. The results emphasize the critical role of trust, usability, and infrastructural support in shaping QRIS adoption behavior among older users.

Keywords: QRIS adoption; Generation X; UTAUT; systematic literature review; Indonesia.

INTRODUCTION

The Quick Response Code Indonesian Standard (QRIS) is a national standard issued by Bank Indonesia in 2019 to unify various QR payment codes from all payment service providers. QRIS simplifies cashless transactions by allowing users to scan a single QR code—interoperable across digital wallets and banking applications—then enter or confirm the payment amount before authenticating with a PIN or biometric verification. Technically, QRIS supports two interface schemes: Merchant Presented Mode (MPM), where the merchant displays the QR code and the customer scans it, and Customer Presented Mode (CPM), where the customer displays a code that the merchant scans. This integrated approach has proven to enhance transaction speed, security, and financial inclusion across Indonesia.

Indonesia's population is highly diverse, with more than half under the age of 40. Recent studies indicate that millennials and Generation Z are the dominant users of QRIS, driven by high smartphone and e-wallet penetration rates, lifestyle patterns that demand speed and convenience, and social norms shaped by peer groups and educational environments. A quantitative study involving 505 respondents from Eastern Indonesia confirmed that attitudes, subjective norms, and perceived behavioral control significantly influence millennials'

intention to use QRIS. Another recent study conducted in Semarang found that lifestyle fit and ease of use, reinforced by financial literacy, positively influence Generation Z's intention to adopt QRIS for everyday payments.

In contrast, Generation X—born approximately between 1965 and 1980—exhibits significantly slower adoption rates. The global fintech literature reveals that while ease of use and perceived usefulness remain important among older users, they are often counterbalanced by concerns over perceived risks, lack of trust, and physical-psychological factors such as deteriorating vision or interface discomfort. A critical review also emphasized the persistent digital divide based on age, particularly regarding the adoption of cashless payment innovations, and recommended targeted research focusing on middle-aged to older populations in developing countries. Although several studies have examined QRIS adoption among younger users—such as a two-stage PLS-SEM analysis on the general Indonesian population—similar investigations focusing on Generation X remain limited and largely conceptual in nature.

Addressing this research gap, the present study aims to conduct a systematic literature review of existing research on QRIS and mobile payment adoption among older age groups, and subsequently develop a conceptual model identifying the key determinants of QRIS usage within Indonesia's Generation X demographic.

In line with this objective, the research question proposed is "What are the factors that influence the intention and decision of Generation X in Indonesia to adopt QRIS-based digital payment methods?" The findings of this study are expected not only to enrich the literature on digital payment adoption among older and middle-aged adults, but also to provide practical insights for regulators and service providers in designing age-inclusive financial strategies that support broader digital payment adoption.

LITERATURE REVIEW

Quick Response Code Indonesian Standard (QRIS)

QRIS was introduced in 2019 as a joint initiative between Bank Indonesia (BI) and the Indonesian Payment System Association (ASPI) to unify various siloed QR code systems previously used across digital wallets, mobile banking, and electronic money cards. The standard establishes two interface schemes—Merchant-Presented Mode (MPM) and Customer-Presented Mode (CPM)—along with data structure specifications, encryption mechanisms, transaction limits, and a maximum merchant discount rate of 0.7%, all intended to ensure interoperability among payment service providers. Consequently, a single QRIS code can be scanned by any application, eliminating the need for multiple QR stickers at payment points and streamlining the digital checkout process for both consumers and merchants.

Several studies have identified tangible economic and social benefits resulting from this integration. The benefits are increased income and operational efficiency for MSMEs due to automated reconciliation and digital transaction records, enhanced financial literacy and inclusion, and an expanded regional tax base through transaction transparency. For example, an experimental study involving 75 business owners in Jayapura confirm the positive impact of QRIS on the financial performance of small enterprises.

However, challenges in implementation remain, particularly among older age groups and in non-urban areas. A qualitative analysis published in EkBis: Jurnal Ekonomi dan Bisnis highlighted several barriers, including digital literacy gaps, uneven internet infrastructure, limited collaboration between industry and government, and concerns over cybersecurity and fraud. The study recommended enhancing educational campaigns and offering fiscal incentives to merchants to achieve more equitable QRIS penetration. Similar insights were reinforced

in a 2019–2025 public policy review, which emphasized the need for regulatory harmonization across regions and ongoing training for field implementers.

Generation X and Digital Payment Adoption

Generation X is commonly defined as individuals born between 1965 and 1980. Unlike digital natives (Generations Y and Z), Gen X are considered digital immigrants, having first encountered the internet and smartphones in adulthood. Core characteristics of this cohort include a high degree of independence, skepticism toward authority, a preference for direct communication, and a risk-averse attitude shaped by economic downturns in the 1980s.

Research on mobile payment adoption confirms that these characteristics influence fintech engagement. A comparative study on NFC payments published in Electronic Commerce Research found that perceived ease of use, subjective norms, and financial risk were primary drivers of mobile payment adoption among Gen X, whereas lifestyle compatibility was more dominant for Gen Z. A post-pandemic quantitative study involving 363 Gen X respondents in Java expanded on these findings, revealing that transaction security and perceived health benefits (e.g., reduced physical contact) significantly influenced attitudes and intentions to use e-wallets. Similar conclusions were drawn from a cross-generational study employing the TAM-DIT framework in Nusa Tenggara, which confirmed that ease of use and perceived usefulness were positive determinants of e-wallet adoption across all age groups, with the strongest effect observed among Gen X users.

From a practical standpoint, these findings suggest that Generation X values utility-driven digital payment technologies that are easy to use without steep learning curves, and that offer robust financial and data security. They are also more responsive to social support mechanisms—such as recommendations from colleagues—and to institutional assurances, such as those from central banks, rather than gamified incentives commonly targeted at Gen Z. Therefore, incorporating variables such as perceived usefulness, effort expectancy, security risk, and subjective norms into the QRIS adoption model for Generation X is essential to ensure that the conceptual framework accurately reflects their user profile and decision-making behavior.

MATERIALS & METHODS

This study adopts a Systematic Literature Review (SLR) approach, based on the guidelines proposed by Kitchenham (2015), which emphasize conducting phases in review protocol. The phases consist of search strategy, inclusion and exclusion criteria, and study selection procedure. The breakdown of papers in the database search are detailed in Table 1.

1. Search Strategy. The keyword “QRIS” was applied to the title, abstract, and keywords fields within the Scopus database. The search was limited to publications from 2020 to 2025, to align with the post-launch period of QRIS (introduced in 2019).
2. Inclusion Criteria. The criteria for inclusion were: (i) articles written in English; (ii) studies focusing specifically on QRIS payment (excluding general digital wallets or cross-border QR payment systems); and (iii) publications indexed in Scopus. Exclusion Criteria. Excluded from the review were: non-empirical articles, conference papers without peer review, and studies discussing QR codes outside the context of payment systems in Indonesia.
3. Study Selection Procedure. Search results were exported to Zotero for reference management. The first author conducted an initial screening based on the title, abstract, and keywords, followed by an independent screening by the second author. Any discrepancies between the two reviewers were

resolved through discussion to reach consensus.

Table 1. Paper Breakdown of Primary Search

Selection Stage	n
Search on Database	157
Evaluating (Inclusion and Exclusion Criteria)	100
Reviewing Title, Abstract, Keyword	60
Reviewing Full-Text	16

RESULT

Based on the systematic literature review conducted in accordance with the protocol proposed by Kitchenham (2015), a conceptual model was developed, as illustrated in Figure 1 based on 16 articles. This model identifies five key factors that consistently emerged across the selected literature concerning QRIS usage, particularly among Generation X users. These factors include performance expectancy, effort expectancy, social influence, facilitating conditions, and perceived security. These five factors do not directly influence the intention to use QRIS; rather, their effect is mediated by the variable of trust. This finding reflects the adoption behavior commonly observed among Generation X, who tend to require a higher level of confidence in a system before making the decision to adopt it.

The model is constructed based on the Unified Theory of Acceptance and Use of Technology (UTAUT), which has been modified and adapted to align with the specific characteristics of Generation X users.

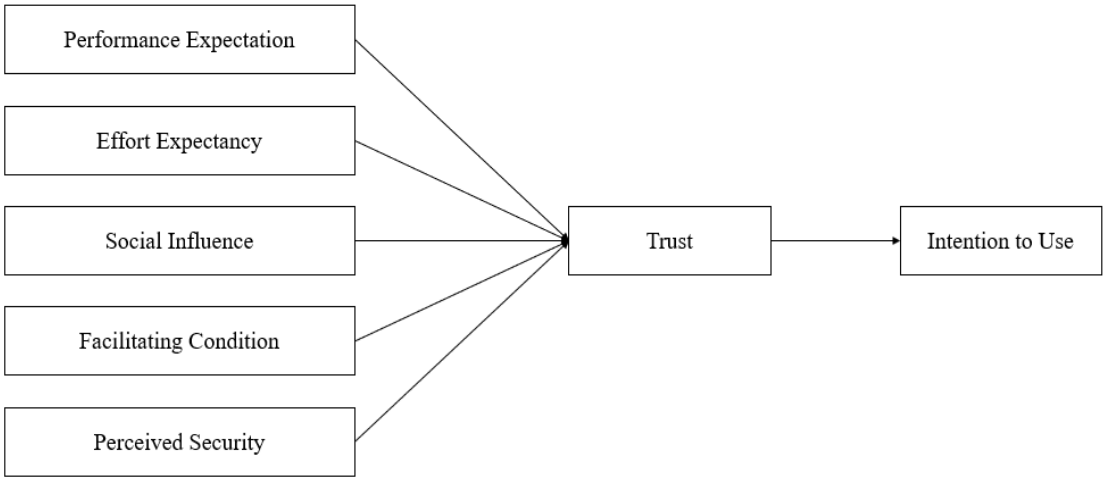

Figure 1. Conceptual Framework

DISCUSSION

This section discusses the findings of the study by integrating them with existing literature on technology adoption, particularly within the framework of the Unified Theory of Acceptance and Use of Technology (UTAUT). Each construct identified in the conceptual model—performance expectancy, effort expectancy, social influence, facilitating conditions, perceived security, and trust—is examined in relation to prior empirical evidence to highlight its relevance in influencing the adoption of QRIS among Generation X users. By situating the results within established theoretical perspectives and comparing them with findings from previous studies, this discussion provides a deeper understanding of the key determinants that shape behavioral intention in adopting digital payment systems in this demographic segment.

1. UTAUT

The Unified Theory of Acceptance and Use of Technology (UTAUT) has been extensively validated due to its integration of core constructs from eight established technology acceptance models. Its robustness has been empirically supported across diverse geographical contexts—including the Americas, Europe, Asia, and Africa—and across a wide range of technological applications, thereby strengthening its predictive power in explaining user behavior. In addition, Abushanab and Pearson (2007) demonstrated that UTAUT exhibits strong model fit within the domain of internet banking, making it a reliable analytical framework for investigating technology adoption.

2. Performance Expectation

Performance expectancy refers to the extent to which users believe that employing a particular technology will enhance their task performance. This construct highlights the perceived utility of technological innovations in improving user efficiency and outcomes. In the context of electronic payment systems, a higher perception of usefulness is often associated with an increased likelihood of adoption. Empirical evidence has consistently indicated a positive association between performance expectancy and users' behavioral intention to adopt digital platforms. Supporting this, Farzin et al. (2021) found that performance expectancy significantly influenced consumers' intention to adopt mobile banking services in Iran. Similarly, Rahim et al. (2023) reported that performance expectancy was a key determinant in the adoption of Islamic financial technology among millennial users in Malaysia, as measured through the UTAUT2 framework.

3. Effort Expectancy

Effort expectancy refers to the perceived ease of use associated with a particular technology or system. In the context of electronic payment platforms such as QRIS, it reflects users' assessment of how simple and convenient the service is to register for, navigate, and operate. If a system is perceived as user-friendly, individuals are more likely to engage with it, particularly when cognitive or occupational demands are high. As noted by Wu et al., maintaining the sustainability of electronic payment systems becomes increasingly difficult when usability barriers exist. Furthermore, effort expectancy captures the degree of effort a user anticipates needing to exert while interacting with a technology; the lower the perceived effort, the greater the likelihood of adoption. Users generally prefer systems that require minimal effort, which facilitates smoother transitions to new technological platforms.

4. Social Influence

Social influence (SI) within the UTAUT framework refers to the perceived social pressure an individual feels from significant referents—such as family, friends, or coworkers—to engage with a particular technology. Conceptually grounded in subjective norms and social image, SI captures the tendency of individuals to align their behavior with expectations endorsed by their social network. In the context of QRIS, social influence represents users' perceptions that those important to them expect them to maintain and actively use a QRIS account, and it reflects their motivation to comply with those expectations. Evidence indicates that consumers at the base of the economic pyramid, in particular, seek guidance from peers and social contacts to mitigate uncertainty when adopting new mobile payment solutions, which further magnifies the role of SI in QRIS adoption decisions.

5. Facilitating Condition

Facilitating conditions, as defined within the UTAUT framework, refer to an individual's perception of the availability of organizational, technical, and infrastructural resources that support the use of a particular system. This construct encompasses access to tools, knowledge, skills, and external assistance that enable users to effectively engage with the technology. From a consumer perspective, facilitating conditions represent the perceived ease of

access to the necessary support systems and resources required to perform the desired behavior. Chemingui and Ben Lallouna (2013) emphasized that users are less likely to adopt mobile banking services in the absence of sufficient facilitating conditions—such as financial capability, digital literacy, and reliable mobile internet access—which serve as foundational enablers of technology adoption.

6. Perceived Security

Perceived security is defined as an individual's belief regarding the safety and protection of digital transactions, particularly in relation to data integrity, financial information, activity records, and personal privacy. In the context of QRIS adoption, perceived security plays a critical role for both consumers and merchants, as it influences their confidence in using a relatively new technological system. The assurance that sensitive information is securely managed is often a prerequisite for the acceptance and continued use of digital payment platforms, highlighting the importance of trust in securing user adoption.

7. Trust

Trust is conceptualized as the degree to which an individual believes that a given technology is reliable and capable of supporting secure and effective transaction activities. Within the context of digital payment systems, such as QRIS, trust must be established not only among consumers but also among merchants, as it serves as a foundational element in fostering confidence in the system. Prior research has demonstrated that trust exerts a significant influence on users' behavioral intentions to adopt and continue using digital transaction platforms.

CONCLUSION

This study aimed to explore the factors influencing the adoption of QRIS-based digital payment systems among Generation X in Indonesia through a systematic literature review (SLR) guided by Kitchenham's (2015) protocol. The findings resulted in a conceptual model highlighting five key determinants—performance expectancy, effort expectancy, social influence, facilitating conditions, and perceived security—which influence behavioral intention to use QRIS, with trust acting as a critical mediating variable.

The study affirms that while QRIS adoption has grown rapidly among younger generations, Generation X remains relatively hesitant due to concerns over usability, perceived risk, and technological unfamiliarity. The inclusion of trust as a mediating factor reflects the unique adoption behavior of this demographic, which places a high emphasis on system reliability and institutional credibility before embracing new financial technologies.

The proposed model, adapted from the UTAUT framework, contributes to the growing literature on digital payment adoption by offering insights tailored to middle-aged users in developing countries. Practically, the results provide valuable input for policymakers and financial service providers to design age-inclusive digital financial strategies, particularly in improving education, usability, infrastructure, and trust-building initiatives for Generation X users.

Future research is encouraged to empirically validate the conceptual model proposed in this study using quantitative methods, such as Structural Equation Modeling (SEM), across different regional and socioeconomic contexts in Indonesia.

Declaration by Authors

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