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Understanding user Acceptance of Quick Response Code Indonesian Standard: Model TAM

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Abstract: The study explored the impact of QRIS on customer satisfaction and its contribution to Indonesia's digital transformation, economic efficiency, and financial inclusion, particularly in the context of mobile payment systems and their role in the country's economic recovery. The expansion of commerce in Indonesia necessitated a commensurate advancement in the growth rate of mobile cellular technology. Nowadays, most activities and transactions are conducted via mobile devices, including retail activities at marketplaces utilizing QRIS (Quick Response Code Indonesian Standard). This investigation's demographic focus is comprised of individuals who engage in transactions through QRIS and mobile technology. An objective sampling strategy was employed to disseminate questionnaires to 300 participants. This research framework incorporated the Technology Acceptance Model (TAM) alongside the commitment-trust paradigm within relational marketing. The Technology Acceptance Model (TAM) functioned as a tool to assess users' behavioral intentions, their acceptance, and the integration of new technologies by analyzing two core constructs—Perceived Ease of Use (PEOU) and Perceived Usefulness (PU). The correlation between all antecedents of the study and the dependent variables was statistically significant. Consumers' demands for cellular phone products must consider a range of individual tastes and preferences. The proposed model can enhance mobile user satisfaction when designing a product for the post-pandemic landscape. This implied that customer satisfaction with QRIS will likely escalate when PEOU, PU, and perceived trust are effectively managed. Consequently, the planned execution of PEOU, PU, and trust is expected to fulfill user expectations, resulting in a positive experience with mobile services.

Keywords: QRIS adoption, Technology Acceptance Model, user behavior analysis.

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A. INTRODUCTION

Mobile communication technology drives organizations to adopt innovations that enhance their offerings and services (Raza et al., 2019; Ström et al., 2014). Mobile Internet refers to wireless Internet access via portable devices (Usman et al., 2022). Mobile commerce encompasses a range of activities such as ticket purchasing, coupon utilization, mobile banking, and buying products and services through mobile devices (Hu et al., 2022; Lavuri, 2023). Nowadays, numerous businesses regard mobile technology as essential for attaining superior standards, resulting in heightened competition. As a result, the augmentation of customer satisfaction has become the primary aim for digital enterprises aspiring to improve their financial performance and establish a competitive edge.

Clarke (2001) articulates that mobile commerce constitutes the exchange of monetary value utilizing mobile networks. The proliferation of mobile marketplaces has facilitated the advent of online banking and the procurement of goods and services through portable devices. Mobile Payment Systems (MPS) empower consumers to execute transactions

directly on their devices, thereby diminishing dependence on cash (Mallat, 2007). A prevalent modality, QR code mobile payment, employs Near Field Communication (NFC) to enable transactions via QR codes, epitomizing the trend of smartphones evolving into digital wallets (de Luna et al., 2019; Liébana-Cabanillas et al., 2021; T.-T. T. Pham & Ho, 2015).

Indonesia, a developing nation, is in the early stages of adopting QR code mobile payments, a trend common in similar countries. Introducing QRIS (Quick Response Code Indonesian Standard) is crucial to Indonesia's digital transformation. By 1 November 2021, the number of merchants using QRIS surged to 12 million, up from 5.8 million in 2020. QRIS offers several benefits, including improved economic efficiency by streamlining payment and transaction processes (Indriasari & Jayadi, 2021). Furthermore, the Quick Response Code Indonesian Standard (QRIS) possesses the capacity to improve financial inclusion through the facilitation of access to digital payment mechanisms. As a result, QRIS has significantly contributed to accelerating the digital transformation of both the economic and financial sectors within the Indonesian context. An increased degree of endorsement and utilization by the general populace can hasten the process of national economic recovery. This research was also in line with Varnali and Toker's [12], which emphasizes that their research centers on consumer-oriented elements that influence the use of mobile marketing, such as emotions, trust, and user satisfaction. This research investigated how perceived usefulness (PU), perceived ease of use (PEOU), and perceived trust (PT) affect user satisfaction regarding QRIS access. The urgency of this research lies in the importance of understanding the adoption of QR code-based payment technology, particularly QRIS, in accelerating digital transformation and financial inclusion in developing countries such as Indonesia. This, in turn, can significantly strengthen national economic recovery.

B. LITERATURE REVIEW

1. Technology acceptance model (TAM)

Davis (Davis, 1989a) introduced the TAM to explain the factors influencing the adoption or rejection of new technologies, expanding on the Theory of Reasoned Action (TRA) by Fishbein (1975), which emphasized behavioral intention in predicting specific behaviors. TAM focuses on how PEOU and PU affect user intention (Venkatesh, 2000). Researchers have expanded TAM, noting that user perceptions can vary based on individual traits, organizational contexts, and technological advances (Szajna, 1996). However, TAM may need refinement to address adaptability and seamless integration (Wixom & Todd, 2005).

2. Perceived ease of use (PEOU)

PEOU is "the degree to which an individual believes that using a particular system requires minimal effort" (Davis, 1989b). PEOU has been widely used in research to predict electronic satisfaction (Usman et al., 2022). Before focusing on mobile devices, PEOU was also used to assess satisfaction with IT-based services and its impact on customer

contentment. If users find IT-driven self-service platforms more challenging to navigate, they will likely view these services less favorably. The PEOU is pivotal in gauging user acceptance of emerging technologies in IT dialogues. Du et al. (Du et al., 2012) highlighted that individual innovation propels PEOU for the revolutionary 4G technologies. PEOU and PU play essential roles in molding consumers' initial eagerness to embrace technology, with PU typically exerting a more substantial impact on consumer views regarding mobile commerce. This research defined PEOU as the user's comprehensive appraisal of the simplicity of executing mobile purchases. Studies consistently reveal PU as a more formidable predictor than PEOU (Shen, 2019). Additionally, users are more likely to adopt new technologies when they perceive them as easy to use, emphasizing the importance of PEOU.

3. Perceived usefulness (PU)

PU is the belief that a system will improve work efficiency (Davis, 1989b). PU and usability metrics have been used to predict user satisfaction in digital contexts (Yang et al., 2004). Mobile telecom companies are enhancing device usability and functionality to match technological advances. Consumers' willingness to accept ads on these platforms depends on the relevance of the information provided (Hu et al., 2022). The TAM suggests that attitudes toward use and perceived benefits influence intent. PU is crucial for evaluating user satisfaction with information systems (Hashim & Tan, 2018), and mobile device use is expected to boost positive intentions and customer loyalty. Studies show a strong link between PU, user satisfaction, and attitudes, impacting acceptance and satisfaction (Lopes et al., 2020; Tao Zhou, 2011).

4. Perceived trust (PT)

Perceived Trust in online shopping involves consumers' reliance on sellers and willingness to accept potential risks (Jarvenpaa, S.L., Tractinsky, N. and Vitale, 2000). PT is crucial in retail, influencing buyer-vendor dynamics through uncertainty, reliability, and risk (Yoon, 2009). For electronic retailers, building consumer trust is critical to improving financial performance. This study defined PT as consumers' evaluation of mobile service reliability (Raman, 2019). Unraveling the elements influencing customer trust poses a significant challenge for digital marketers. It considers the sparse investigation into PT within the TAM framework for online shopping. From the theoretical description above, we can postulate the following hypothesis: H1. PEOU has a positive and significant relationship with PU; H2. PEOU has a positive and significant relationship with satisfaction; H3. PU has a positive and significant relationship with trust; H4. PU has a positive and significant relationship with mobile user satisfaction; H5. Perceived trust rust has a positive and significant relationship with mobile user satisfaction.

C. RESEARCH METHODOLOGY

This research used quantitative research methods. The population is all mobile phone users who use QRIS as a transaction tool. The data collection process followed structured stages to ensure the quality of the information obtained. A rigorously designed sampling methodology was applied to disseminate questionnaires to individuals involved in the study. This research utilized a pretest and pilot study involving 25 questionnaires via Google Forms, resulting in a Cronbach's alpha coefficient of 0.60, indicating reliability (Nunnally, 1978). The research data was captured by three hundred questionnaires through digital platforms, thus requiring a carefully refined strategy for participant selection. The criteria for the sampling technique were that respondents must have a background in e-commerce and meet the age requirements to make informed purchasing choices. Three items, rooted in previous research, were utilized to measure PU, while another three items dedicated to evaluating PEOU were taken from previous scientific investigations.

Furthermore, the four constructs used to evaluate trust were modified from a separate scientific reference (Hair, J., Anderson, R., Tatham, R. and Black, 1998). A 5-point Likert scale was used to evaluate PU, PEOU, and trust level, where responses varied from "strongly disagree" (1) to "strongly agree" (5). Four constructs extracted from existing literature were used to measure satisfaction levels among mobile internet service users. A different 5-point scale was applied to measure overall satisfaction, ranging from "very dissatisfied" (1) to "very satisfied" (5). Structural equation modeling and confirmatory factor analysis (CFA) were used to investigate causal relationships and authenticate the measurement model. Figure 1 illustrates the conceptual framework.

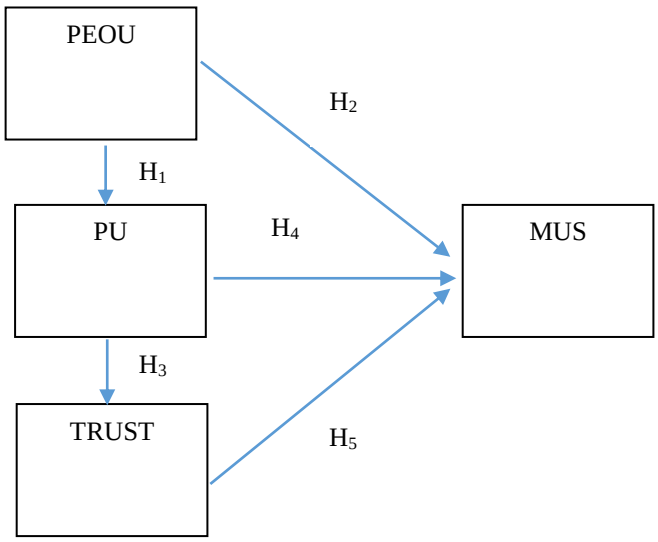

Figure 1. Conceptual framework

D. RESULTS AND DISCUSSION

1. Demographic

Three hundred questionnaires were disseminated, and 297 responses were retrieved and analyzed. Among the participants, 53 percent identified as female, while 47 percent identified as male. The demographic breakdown revealed that 61 percent were single, 39 percent were married, 26 percent were students, 74 percent were employed in the private sector, 19 percent were engaged in governmental roles, and 81 percent were categorized under other professional occupations.

2. Measurement model evaluation

The study analyzed the model in two phases: first, using Confirmatory Factor Analysis (CFA) to assess the relationships between measurements and their factors, and then evaluating the squared multiple correlations to check how well each indicator represented its construct. All squared multiple correlations exceeded 0.5, indicating strong reliability. Cronbach's alpha coefficients for PU, PEOU, perceived trust, and customer satisfaction were 0.789, 0.767, 0.832, and 0.859, respectively, all above the acceptable threshold of 0.700 (Nunnally and Bernstein, 1994). Convergent and discriminant validity were assessed using standardized factor loadings and average variance extracted (AVE) values ranging from 0.5400 to 0.6050. Model fit indices, which encompass the Comparative Fit Index (CFI), Goodness of Fit Index (GFI), and Tucker-Lewis Index (TLI), all surpassed the threshold of 0.900, thereby signifying an adequate model fit. The chi-square statistic amounted to 146.017 with a p-value of 0.0000; however, this metric was deemed less critical due to its sensitivity to sample size. The structural model elucidated that Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and trust exert substantial effects on customer satisfaction ($p < 0.001$). PEOU positively influenced both PU and satisfaction, corroborating hypotheses H1 and H2. Moreover, hypotheses H3, H4, and H5 received empirical support, affirming the existence of positive correlations among PU, Perceived Trust (PT), and satisfaction. Figure 2 shows a path diagram, which results from smart-PLS calculation.

Table 1. Standardized regression weight

Construct	Estimate	p-value
PU ← PEOU	0.6700	0.0000
PEOU ← PU	0.5000	0.0000
Trust ← PU	0.2990	0.0000
SAT← PU	0.3280	0.0000
SAT← PEOU	0.3290	0.0000

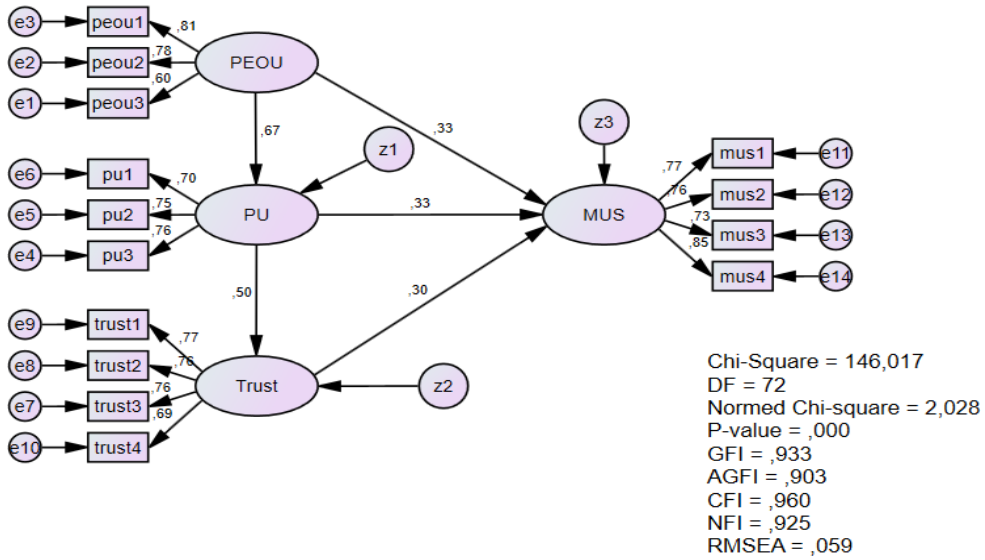

Figure 2. The Structural Model

This study meticulously examined five hypotheses to evaluate the effects of PU, PEOU, and PT on mobile satisfaction in the Indonesian context (Indriasari & Jayadi, 2021; López-Guzmán et al., 2019; Shen, 2019). The results provided empirical evidence that all hypothesized relationships demonstrated a positive and statistically significant impact. Augmenting PEOU, which entails the enhancement of mobile site accessibility, is imperative, as convenience constitutes a fundamental determinant of user satisfaction (Amin et al., 2014; Hashim & Tan, 2018; Raza et al., 2019). The study also identified PEOU as a significant predictor of PU. Addressing issues like screen comfort, storage, access speed, and response time as mobile device use increases is essential for improving QRIS usability. Secondly, the study highlighted a strong correlation between PU and user satisfaction with mobile telephony to push the usage of QRIS. PU is also a critical factor in establishing trustworthiness. As cellular technology advances, PU's role becomes increasingly crucial in strategic innovation planning. Users are generally satisfied with the QRIS access offered by many vendors. PU is a benchmark in mobile payments, commerce, data services, and e-CRM surveys (de Luna et al., 2019; Lavuri, 2023; Liébana-Cabanillas et al., 2021). The findings will encourage further research into mobile commerce applications across different organizational settings. Thirdly, Mobile commerce providers must demonstrate integrity and prioritize customer care, avoiding opportunistic practices to build trust. Trust is crucial for developing long-term relationships in digital payments and can predict customer satisfaction. It also helps identify target demographics and allocate marketing budgets effectively. Privacy concerns are significant in IT-enabled services, making trust even more critical to using QRIS in commercial transactions (Mallat et al., 2007; H. S. T. Pham & Khanh, 2021; Usman et al., 2022).

E. CONCLUSION

A substantial correlation between all research antecedents and dependent variables has been demonstrated. Various consumer preferences must be considered when addressing the requirements of consumers regarding cellular phone products. Applying the proposed framework in product design has the potential to significantly enhance consumer satisfaction in using QRIS within the commercial sector. Effectively managing perceived usefulness, perceived ease of use, and perceived trust will result in heightened customer satisfaction. Therefore, aligning user expectations through implementing PEOU, PU, and PT will culminate in users' overall satisfaction with their mobile service experience. For future research on QRIS adoption, expanding sample demographics by including respondents from diverse regions and backgrounds is recommended for a broader understanding across socioeconomic groups. Longitudinal studies could examine the long-term effects on customer satisfaction and financial inclusion. Investigating emerging technologies like AI and blockchain could address security and privacy concerns while exploring behavioral economics, which may help tailor QRIS to user preferences. Finally, focusing on small and medium enterprises (SMEs), especially in rural areas, could provide valuable insights for policymakers and developers.

REFERENCES

Amin, M., Rezaei, S., & Abolghasemi, M. (2014). User satisfaction with mobile websites: the impact of perceived usefulness (PU), perceived ease of use (PEOU) and trust. *Nankai Business Review International*, *5*(3), 258–274. https://doi.org/10.1108/NBRI-01-2014-0005

Clarke, I. (2001). Emerging value propositions for m-commerce. *Journal of Business Strategy*, *18*, 2.

Davis. (1989a). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, *13*(3), 319. https://doi.org/10.2307/249008

Davis, F. D. (1989b). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, *13*(3), 319–340.

de Luna, I. R., Liébana-Cabanillas, F., Sánchez-Fernández, J., & Muñoz-Leiva, F. (2019). Mobile payment is not all the same: The adoption of mobile payment systems depending on the technology applied. *Technological Forecasting and Social Change*, *146*, 931–944. https://doi.org/10.1016/j.techfore.2018.09.018

Du, H., Zhu, G., Zhao, L., & Lv, T. (2012). An empirical study of consumer adoption on 3G value-added services in China. *Nankai Business Review International*, *3*(3), 257–283. https://doi.org/10.1108/20408741211264576

Fishbein, M., Ajzen, I. (1975). *Belief, Attitude, And Behavior: An Introduction to Theory And Research.* Addison Wesley, Mass.

Hair, J., Anderson, R., Tatham, R. and Black, W. (1998). *Multivariate data analysis* (5th Editio). Prentice Hall.

Hashim, K. F., & Tan, F. B. (2018). Examining the determinant factors of perceived online community usefulness using the expectancy value model. *Journal of Systems and Information Technology*, *20*(2), 152–167. https://doi.org/10.1108/JSIT-11-2016-0068

Hu, X., Chen, Z., Davison, R. M., & Liu, Y. (2022). Charting consumers' continued social commerce intention. *Internet Research*, *32*(1), 120–149. https://doi.org/10.1108/INTR-

07-2020-0397

Indriasari, T. F., & Jayadi, R. (2021). An empirical study of mobile ticketing service adoption in rapid transit: Evidence from Jakarta. *Journal of Theoretical and Applied Information Technology*, *99*(8), 1740–1752.

Jarvenpaa, S.L., Tractinsky, N. and Vitale, M. (2000). Consumer Trust in an Internet Store. *Information Technology and Management*, *1*, 45–71. https://doi.org/http://dx.doi.org/10.1023/A:1019104520776

Lavuri, R. (2023). Intrinsic factors affecting online impulsive shopping during the COVID-19 in emerging markets. *International Journal of Emerging Markets*, *18*(4), 958–977. https://doi.org/10.1108/IJOEM-12-2020-1530

Liébana-Cabanillas, F., Molinillo, S., & Japutra, A. (2021). Exploring the Determinants of Intention to Use P2P Mobile Payment in Spain. *Information Systems Management*, *38*(2), 165–180. https://doi.org/10.1080/10580530.2020.1818897

Lopes, A. I., Dens, N., De Pelsmacker, P., & De Keyzer, F. (2020). Which cues influence the perceived usefulness and credibility of an online review? A conjoint analysis. *Online Information Review*, *45*(1), 1–20. https://doi.org/10.1108/OIR-09-2019-0287

López-Guzmán, T., Pérez Gálvez, J. C., Cordova Buiza, F., & Medina-Viruel, M. J. (2019). Emotional perception and historical heritage: a segmentation of foreign tourists who visit the city of Lima. *International Journal of Tourism Cities*, *5*(3), 451–464. https://doi.org/10.1108/IJTC-06-2018-0046

Mallat, N. (2007). Exploring consumer adoption of mobile payments – A qualitative study. *The Journal of Strategic Information Systems*, *16*(4), 413–432. https://doi.org/10.1016/j.jsis.2007.08.001

Mallat, N., Rossi, M., Tuunainen, V. K., & Öörni, A. (2007). An empirical investigation of mobile ticketing service adoption in public transportation. *Personal and Ubiquitous Computing*, *12*(1), 57–65. https://doi.org/10.1007/s00779-006-0126-z

Nunnally, J. C. (1978). *Psychometric theory*. McGraw-Hill.

Pham, H. S. T., & Khanh, C. N. T. (2021). Ecotourism intention: the roles of environmental concern, time perspective and destination image. *Tourism Review*, *76*(5), 1141–1153. https://doi.org/10.1108/TR-09-2019-0363

Pham, T.-T. T., & Ho, J. C. (2015). The effects of product-related, personal-related factors and attractiveness of alternatives on consumer adoption of NFC-based mobile payments. *Technology in Society*, *43*, 159–172. https://doi.org/10.1016/j.techsoc.2015.05.004

Raman, P. (2019). Understanding female consumers' intention to shop online. *Asia Pacific Journal of Marketing and Logistics*, *31*(4), 1138–1160. https://doi.org/10.1108/APJML-10-2018-0396

Raza, A., Koondhar, M. Y., Khan, M. S., Shaikh, H., & Shah, A. (2019). An integrated model for Acceptance of QR code Mobile Payment System in Pakistan. *2019 IEEE 6th International Conference on Engineering Technologies and Applied Sciences (ICETAS)*, 1–5. https://doi.org/10.1109/ICETAS48360.2019.9117543

Shen, A. (2019). Aging, PEOU, and adoption of communication technology. *Journal of Consumer Marketing*, *37*(2), 139–147. https://doi.org/10.1108/JCM-12-2018-2973

Ström, R., Vendel, M., & Bredican, J. (2014). Mobile marketing: A literature review on its value for consumers and retailers. *Journal of Retailing and Consumer Services*, *21*(6), 1001–1012. https://doi.org/10.1016/j.jretconser.2013.12.003

Szajna, B. (1996). Empirical evaluation of the revised technology acceptance model. *Manag. Sci.*, *42*(1), 85–92.

Tao Zhou. (2011). Understanding mobile Internet continuance usage from the perspectives of UTAUT and flow. *Information Development*, *27*(3), 207–218. https://doi.org/10.1177/0266666911414596

Usman, H., Projo, N. W. K., Chairy, C., & Haque, M. G. (2022). The exploration role of Sharia compliance in technology acceptance model for e-banking (case: Islamic bank in Indonesia). *Journal of Islamic Marketing*, *13*(5), 1089–1110. https://doi.org/10.1108/JIMA-08-2020-0230

Varnali, K., & Toker, A. (2010). Mobile marketing research: The-state-of-the-art. *International Journal of Information Management*, *30*(2), 144–151. https://doi.org/10.1016/j.ijinfomgt.2009.08.009

Venkatesh, V. (2000). Determinants of Perceived Ease of Use: Integrating Control, Intrinsic Motivation, and Emotion into the Technology Acceptance Model. *Information Systems Research*, *11*(4), 342–365. https://doi.org/10.1287/isre.11.4.342.11872

Wixom, B. H., & Todd, P. A. (2005). A Theoretical Integration of User Satisfaction and Technology Acceptance. *Information Systems Research*, *16*(1), 85–102. https://doi.org/10.1287/isre.1050.0042

Yang, Z., Jun, M., & Peterson, R. T. (2004). Measuring customer perceived online service quality. *International Journal of Operations & Production Management*, *24*(11), 1149–1174. https://doi.org/10.1108/01443570410563278

Yoon, C. (2009). The effects of national culture values on consumer acceptance of e-commerce: Online shoppers in China. *Information & Management*, *46*(5), 294–301. https://doi.org/10.1016/j.im.2009.06.001