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Adoption of QRIS in MSME Marketing: The Influence of Digital Transformation, Financial Literacy, and Customer Trust on Marketing Performance

Mi'raj Akbar Pradianto¹, Endang Dwi Amperawati², Catur Sugiarto³, Rahmawati⁴, Francisca Sestri Goestjahjanti⁵

¹Sebelas Maret University, Central Java, Indonesia. miraj.akbar11@student.uns.ac.id

²Arlindo School of Management, Jakarta, Indonesia. endangdwi@gmail.com

³Sebelas Maret University, Central Java, Indonesia. caturugiarto@staff.uns.ac.id

⁴Sebelas Maret University, Central Java, Indonesia. rahmawati_fe@staff.uns.ac.id

⁵Insan Pembangunan University, Tangerang, Indonesia. sestri.rahardjo@gmail.com

Corresponding Author: miraj.akbar11@student.uns.ac.id¹

Abstract: This study aims to examine the role of Quick Response Code Indonesian Standard (QRIS) adoption as a mediating mechanism linking financial literacy, customer trust, and perceived ease of use to MSME digital transformation in ASEAN emerging economies. The study addresses a critical gap by positioning QRIS not merely as a transactional tool but as a strategic enabler of digital transformation and marketing performance. A cross-sectional survey was conducted involving 600 MSME owners across Indonesia, Malaysia, and Brunei Darussalam. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with bootstrapping procedures (5,000 resamples) to assess both direct and indirect effects. Measurement and structural models were evaluated using reliability, validity, and predictive relevance criteria. The findings provide actionable insights for policymakers and practitioners to enhance MSME digital transformation by strengthening financial literacy, building digital trust, and improving system usability. Financial literacy had the strongest direct effect on QRIS adoption ($\beta=0.360$, $p<0.001$), and QRIS adoption significantly explained 81.9% of the variance in MSME digital transformation ($R^2=0.819$). QRIS adoption can be leveraged as a scalable digital infrastructure to promote financial inclusion, customer engagement, and marketing performance in emerging markets. This study contributes to the Decision Sciences literature by integrating multiple theory into a unified framework and by conceptualizing QRIS adoption as a mediating decision mechanism. It provides novel cross-country empirical evidence on how digital payment systems drive MSME digital transformation in ASEAN contexts.

Keyword: MSMEs, Digital Transformation, Financial Literacy, Customer Trust, QRIS adoption

INTRODUCTION

The digital payment ecosystems in emerging economies have experienced notable growth through partnerships between fintech and traditional financial institutions (Behl et al., 2022; de Luna et al., 2019a; Yan et al., 2021). Key advancements in mobile and QR code payments have significantly transformed the digital financial landscape in Indonesia, Malaysia, and Brunei Darussalam. These countries are focusing on strengthening their digital economy to enhance financial inclusion and support micro, small, and medium-sized enterprises (MSMEs) (P. J. Morgan, 2022a; Yan et al., 2021). This digitalization effort aligns with a broader ICT-driven transformation designed to foster competitive growth and economic inclusivity. The introduction of the Quick Response Code Indonesian Standard (QRIS) by Bank Indonesia has simplified payments into a unified code, potentially reducing transaction complexities and expanding market access (Almunawar et al., 2023a; Hamzah Muchtar et al., 2024). Despite these advancements, adoption remains uneven, particularly among rural and traditional MSMEs, due to a digital divide linked to inconsistencies in technological readiness, financial literacy, and trust in digital systems. These challenges reflect broader issues seen in other domains of digital adoption, highlighting the need for a supportive entrepreneurial ecosystem to drive economic progress. The underutilization of QRIS among MSMEs, primarily as a transactional tool rather than a strategic marketing asset, demonstrates a gap in optimizing its benefits for customer acquisition and market expansion (Dwi Amperawati et al., 2024; Jenkins, Duer, and Connors 2021; Tarrant and Huerta 2015).

This study integrates the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) to analyze QRIS adoption behavior. TAM emphasizes perceived ease of use and usefulness as key factors for user acceptance, while UTAUT expands this by including performance expectancy, effort expectancy, social influence, and facilitating conditions. These constructs are crucial for micro, small, and medium enterprises (MSMEs), where QRIS adoption is shaped by trust, digital literacy, and usability (Azizah et al., 2024; Purnama et al., 2026). Additionally, the research employs a dynamic capabilities perspective, considering digital transformation as a strategic resource for companies to adapt their skills in varying contexts. This dual-framework approach enhances the understanding of QRIS adoption and its potential marketing benefits (Herdiyeni et al., 2025; Setiawan et al., 2025). Despite increasing QRIS research, studies remain scattered, focusing on consumer adoption, sustainability, and sector-specific contexts. Earlier investigations primarily addressed direct behavioral intentions or continued usage, neglecting QRIS adoption's mediating role between financial literacy, trust, and usability, and its implications for MSME digital transformation and marketing outcomes. As result, empirical insights linking QRIS adoption to organizational digitalization in MSMEs are limited.

Research indicates that consumer trust, perceived ease of use, and financial capability significantly influence MSMEs' willingness to adopt these technologies (Dwianto et al., 2025a). However, many enterprises in less urbanized or economically disadvantaged areas remain underserved in the digital realm, facing barriers like limited infrastructure and low awareness. This situation underscores the need for re-evaluation of adoption strategies and their implications for marketing performance and business development in the digital landscape. Overall, addressing these disparities is crucial for leveraging digital payment technologies to foster inclusive growth and enhance MSME competitiveness.

Digital Transformation 5.0 integrates AI, IoT, and automation into MSMEs to enhance agility, innovation, and competitiveness. It significantly boosts operational efficiency, customer engagement, and strategic decision-making (Muhammad et al., 2025; Setiawan et al., 2025). Furthermore, employing digital technologies allows firms to adapt resources to environmental changes, improving digital readiness and organizational agility (Helfat, 2011; Teece et al., 1997). While, MSME owners enhance their understanding and adoption of digital

financial technologies through financial literacy. However, user knowledge's impact is inconsistent with theories like TAM and UTAUT (F. D. Davis, 1989; Venkatesh et al., 2013), which link knowledge to perceived usefulness and adoption. Financially literate entrepreneurs effectively evaluate risks and returns of digital tools, improving adoption and business outcomes, thereby enhancing decision-making. Trust is essential for adopting digital technologies, especially in financial transactions where risk perception is higher. It reduces uncertainty, enhances confidence, and promotes the ongoing use of these technologies. For MSMEs, increased customer trust boosts digital platform adoption, improves engagement, and offers strategic advantages for scaling operations and integrating technology into business models (Klapper & Lusardi, 2020)

Interest in digital financial innovation is rising, yet there is insufficient empirical analysis of the relationship between QRIS adoption and marketing performance among cross-country MSMEs. Some studies have highlighted QRIS's potential to improve business performance, particularly in urban medium-sized firms (Affandi et al., 2024; Anas & Cahyawati, 2023; Musyaffi et al., 2024). However, other findings indicate that factors like low trust and digital illiteracy may hinder positive outcomes. Research has shown that digital tools lack strategic value without customer trust and usability, while others argue for the positive impact of digital payment solutions on engagement and brand image. There is a notable research gap concerning a comprehensive framework interlinking digital transformation, customer trust, financial literacy, QRIS adoption, and marketing performance (Almunawar et al., 2022; Dwianto et al., 2025b; Hamzah Muchtar et al., 2024). Additionally, existing research often overlooks QRIS as a strategic enabler, treating it as a transactional tool instead. This study aims to fill this gap by using a mediated-moderated model to explore QRIS's effects on the relationships among financial literacy, trust, digital transformation, and marketing performance (Brenes et al., 2019; Ferdous et al., 2024; Karim et al., 2022; Marshall et al., 2020). It contributes to payment literature by integrating three behavioral theories, comparing findings across three ASEAN countries, and expanding focus from payment functions to marketing performance enhancement.

Despite increasing interest in digital financial innovation, empirical research on QRIS adoption and its impact on marketing performance in cross-country MSMEs is limited. Studies indicate QRIS can enhance business performance, particularly in urban and medium-sized enterprises, yet findings on its effectiveness remain inconclusive due to factors like low trust and digital illiteracy. Research suggests that digital tools lack strategic value without customer trust and usability. Conversely, some studies highlight the positive role of digital payment solutions in customer engagement and brand image. A notable research gap remains, as no unified framework exists linking digital transformation, customer trust, financial literacy, QRIS adoption, and marketing performance. Furthermore, existing literature often treats QRIS merely as a transactional tool, neglecting its role as a strategic enabler. To address this, the current study uses a mediated-moderated model to explore QRIS's effects on the interplay between financial literacy, trust, digital transformation, and marketing performance, contributing to the payment literature by integrating behavioral theories and comparing three ASEAN countries.

METHOD

Research Design

A quantitative survey design was used in this research with the help of a structured questionnaire to generate perception and behavior data from a vast population (Bryant et al., 2023; Creswell, 2014). The employment of digital survey tools (i.e., Google Forms) facilitated wide geographic representation covering Indonesia, Malaysia and Brunei Darussalam, and was consistent with the research interest in digital transformation ((Hutchins

et al., 2023; Schmitt et al., 2023). All of the constructs were measured by validated items, selected from existing empirical studies to ensure reliability and construct validity (J. Hair & Alamer, 2022; Mudre, 2024; Roy, 2024). The theory base of this research embedded on three theory framework, namely Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), and Dynamic Capabilities Theory which collectively give a strong perception towards QRIS adoption and MSME digitalization (Dwianto et al., 2025b; Rachman et al., 2025). Tools like SmartPLS version (e.g., SmartPLS 4) are used to test the stratified random sampling to ensure representation, and standardized methods were used to make the study cross-culturally comparable. The use of multiple lens and the combined approach of different theories are argued to reinforce the internal validity and generate more comprehensive understanding of technology adoption behavior (Liébana-Cabanillas et al., 2015a; Silva et al., 2024).

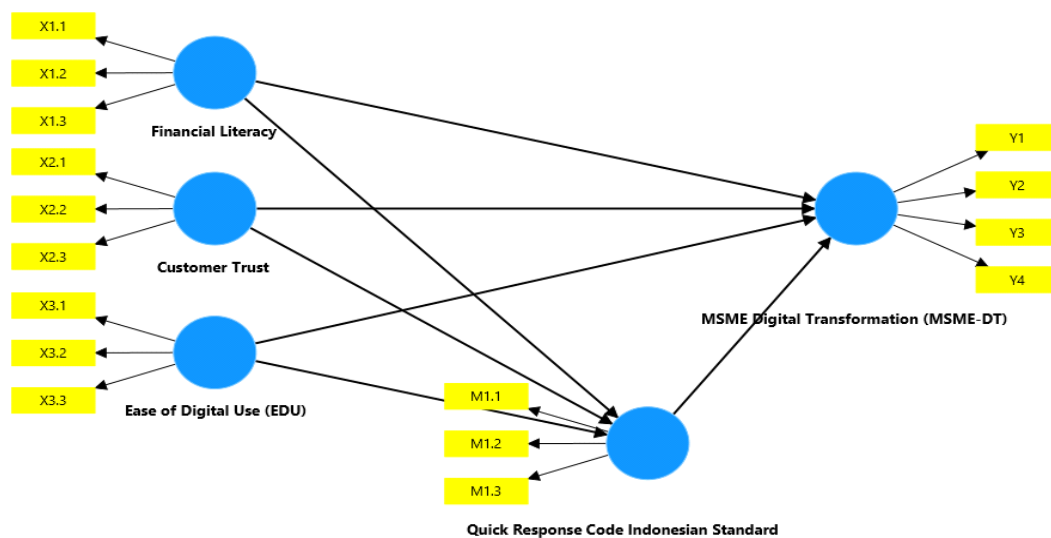


Figure 1. QRIS adoption development model (SmartPLS)

Data

This study uses cross-sectional survey data collected from micro, small, and medium-sized enterprises (MSMEs) in three ASEAN countries: Indonesia, Malaysia, and Brunei Darussalam. The data were collected between January and June 2025 using a structured questionnaire distributed electronically (e.g., via Google Forms). A total of 600 usable responses were subsequently collected, comprising 400 from MSMEs in Indonesia, 150 from MSMEs in Malaysia and 50 from MSMEs in Brunei Darussalam. MSME owners were used as the unit of analysis as they make decisions regarding the adoption of digital technologies such as QRIS.

As definitions of SMEs vary from one country to another, a harmonization approach was applied to ensure comparability. Three ASEAN Member States use different forms of SME classification: Indonesia uses a revenue-based classification; Malaysia uses a combination of revenue and workforce criteria; and Brunei Darussalam applies a hybrid classification system. This harmonization enables a cross-country analysis of SME digital transformation.

A two-stage proportional random sampling technique was used to collect the sample, ensuring representativeness of companies from each country, sector, and size. Stratification was conducted based on economic sectors (e.g., agriculture, manufacturing, services, ICT, and e-commerce), as well as company classification by size (micro, small, and medium), as these are the primary determinants of digital readiness (Radicic & Petković, 2023; Teece, 2018).

Table 1. Distribution of Samples

Country	Total MSMEs (est.)	Sample Size	Sectoral Stratification (%)	Size Stratification (%)
Indonesia	~64 million	400	Agriculture (15%), Retail (25%), Services (35%), E-commerce (15%), Others (10%)	Micro (60%), Small (30%), Medium (10%)
Malaysia	~1.2 million	150	Manufacturing (20%), Services (50%), E-commerce (20%), Others (10%)	Micro (50%), Small (40%), Medium (10%)
Brunei Darussalam	~6,000	50	Services (60%), Technology (30%), Others (10%)	Micro (40%), Small (50%), Medium (10%)

Note: The sample was proportionally distributed across countries, sectors, and firm sizes using stratified random sampling. MSME classifications were harmonized across countries for comparability.

Source: Processed research data (2024-2026)

Variable Data Instruments

Digitalization for MSMEs involves integrating digital tools for marketing, operations, and customer engagement, framed by the Technology Acceptance Model (TAM) and incorporating UTAUT and Dynamic Capability perspectives. Indicators of technological readiness are visible through digital process integration, online marketing, customer platforms, and QRIS usage (Hamzah Muchtar et al., 2024). Employing a 5-point Likert scale enhances validity by capturing detailed perceptions of these changes (Singh et al., 2024; Usman, Rianto, and Aujirapongpan 2025). The importance of digital infrastructure and behavioral orientation for post-pandemic transformation in Southeast Asia is also highlighted. Financial literacy significantly affects MSMEs' ability to utilize fintech tools like QRIS, influencing budgeting, digital planning, and risk awareness. Enhanced financial literacy leads to improved strategic decisions regarding ROI and partner selection, particularly in underdeveloped nations, where financial acumen mediates technology adoption and strengthens past digital adoption models against financial competence.

Trust is crucial for MSMEs adopting digital payments like QRIS, as it reflects customer confidence in the technology (Mayer et al. 1995). Trust cues in online selling environments enhance this perception, especially in low-response regions like Southeast Asia (Novak & Kovacikova, 2024; Arndt et al., 2022; Weygandt et al., 2019). Local technology trust differences show how customer trust influences digital literacy and adoption readiness. The ease of use of QRIS for MSMEs, informed by TAM and UTAUT models, hinges on factors such as straightforward adoption, minimal training, and low technical skill requirements. Many small businesses lack advanced computer systems, necessitating simple solutions. Usability is vital for adoption, according to research, highlighting the variability of technological readiness across ASEAN sectors, with some more equipped than others for technology integration.

The adoption of QRIS is explained by the operationalization of intention to behave and continued intention to use, which are the perceived usefulness, the system compatibility, and the customer pressure (Dwianto et al., 2025b; Jenkins et al., 2021). UTAUT behavioral intention and actual usage dimensions are included in the model (Venkatesh et al., 2003, 2008). The adoption of QRIS in Indonesia, Malaysia, and Brunei is triggered by policy, infrastructure, and digital culture (Qizam et al., 2025). A composite indicator allows us to further cross segment sectors and the economy and inform targeted analysis for inclusive fintech policy making (Sulistiyani, 2024; Trianto et al., 2023). MSME captures organization wide digitization, involved both operational tools e-commerce, cloud accounting, digital marketing, customer relationship technology and financial system technology such as QRIS (Nguyen, Nguyen, and

Nguyen 2024; Shumayleh, Othman, and Waseem 2024). It incorporates strategic components like leadership support and employee openness to change (Hussain et al., 2018).

Data Analysis

SmartPLS was utilized for Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze relationships between constructs, suitable for complex models with multiple latent variables (Chin, 1998; J. F. Hair et al., 2019, 2020, 2025). Given the ordinal data from a five-point Likert scale, directional scores were treated as approximately continuous to avoid information loss from categorization, a common practice in literature (J. F. Hair et al., 2020, 2025). PLS-SEM, a variance-based method, is robust to data distribution assumptions and tolerates non-normality (Hair et al., 2022; Henseler et al., 2009). Diagnostic checks, including Harman's single-factor test for common method variance and variance inflation factor (VIF) for multicollinearity, confirmed reliability, with no significant bias or collinearity detected (Podsakoff et al., 2003; J. F. Hair et al., 2025).

This study should be interpreted as descriptive and exploratory, based on cross-sectional survey data rather than time series data. Consequently, diagnostic procedures such as unit root tests (URT) and spurious regression tests are irrelevant in this context. Instead, standardized SEM-based diagnostic procedures were employed to evaluate the validity and robustness of the model (Sarstedt, Hair, et al., 2022). Overall, the analytical strategy adheres to recommended best practices within PLS-SEM and is consistent with recent work in the literature on digital transformation, as well as with research on technology adoption in emerging markets (J. F. Hair et al., 2025; Sarstedt, Radomir, et al., 2022).

RESULTS AND DISCUSSION

Table 2 provides a comprehensive overview of the perceptions of respondents towards the constructs examined in this study: Financial Literacy (FL), Customer Trust (CT), Ease of Digital Use (EDU), QRIS Adoption (QRIS-A), and MSME Digital Transformation (MSME-DT). All variables fall under the 'moderate' category, as the index values lie between 312.9 and 320.8. This implies that MSMEs demonstrate a fairly consistent level of engagement with digital transformation practices, although this level of engagement is not yet optimal or highly advanced. Financial literacy has the lowest index score (316.9), indicating that MSME actors have basic financial knowledge, but their digital utilization is limited to budgeting, investment planning, and risk assessment. Customer trust is also moderate at 312.9. This indicates that digital payment systems, especially QRIS, have become widely accepted, although users remain slightly cautious about security and reliability.

Conversely, Ease of Digital Utilization received the most favorable score (320.8), indicating that MSMEs generally consider QRIS and its supporting digital platforms to be user-friendly, despite some technical or usability issues that may still arise. QRIS adoption (319.2) indicates an intermediate stage between initial experimentation and consistent, ongoing use. In contrast, the MSME digital transformation index score is 317.8, suggesting that the integration of digital processes into business is ongoing but partial and evolving. These findings show that, although MSMEs recognize the strategic importance of digitalization, there are still significant gaps with regard to their financial capacity, trust levels, and technological absorption. Bridging these gaps is critical in accelerating the depth and impact of digitization across the MSME sector.

Table 2. Descriptive Statistics of the Main Variables

Variable	Indicators (n)	Min Score	Max Score	Mean Index	Std. Deviation	Category	Index Range
Financial Literacy (FL)	3.0000	301.2000	332.5000	316.9000	8.4200	Moderate	234–367
Customer Trust (CT)	3.0000	298.7000	328.4000	312.9000	7.9500	Moderate	234–367

Ease of Digital Use (EDU)	3.0000	305.6000	335.1000	320.8000	8.1100	Moderate	234–367
QRIS Adoption (QRIS-A)	3.0000	300.4000	334.2000	319.2000	8.2700	Moderate	234–367
MSME Digital Transformation (DT)	4.0000	302.1000	338.7000	317.8000	9.0300	Moderate	234–367

Note: All values are rounded to four decimal places in accordance with the journal's formatting requirements. The index values in this case are calculated from combined responses on a 5-point Likert scale, which are then interpreted according to their respective interval categories. Although Likert scale data is ordinal, it is treated as interval when aggregated in the composite index (J. F. Hair et al., 2020; Sarstedt, Radomir, et al., 2022), a practice applied in SEM-PLS.

Source: Processed research data (2024–2026).

The study evaluated convergent validity, discriminant validity, and reliability to assess the measurement model's adequacy. All structures exceeded recommended thresholds, affirming the reflective nature of indicators. Evaluation criteria confirmed valid constructs with high indicator loadings, exceeding 0.70. The constructs of Financial Literacy, Customer Trust, Ease of Digital Use, QRIS Adoption, and MSME Digital Transformation showed strong reliability, supporting the measurement model's effectiveness for structural model analysis.

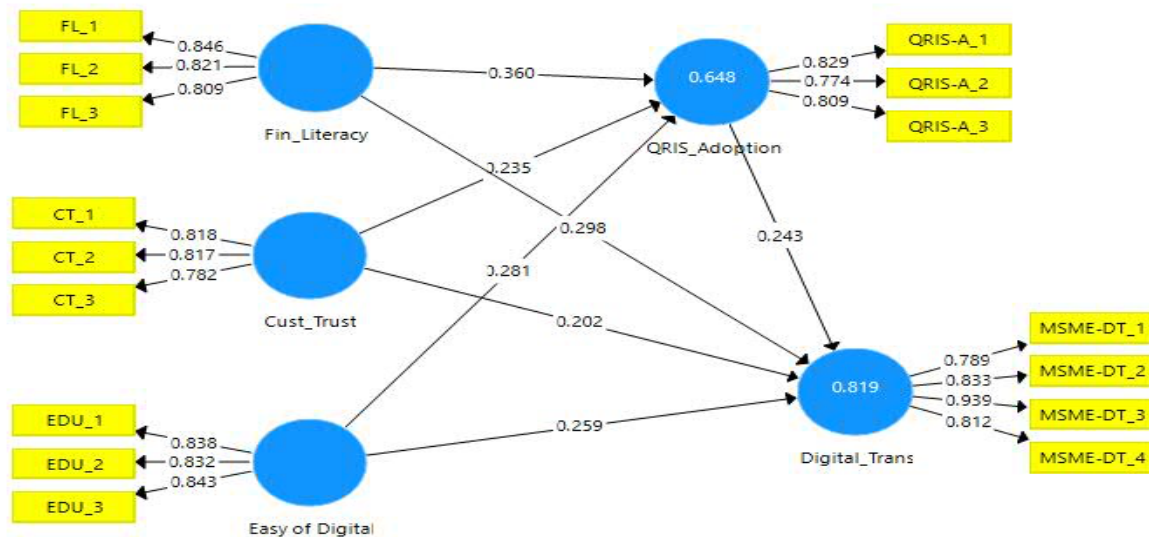


Figure 2. Measurement Model (Outer Model) Results

The study confirms the relevance of the Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), and Dynamic Capabilities Theory in understanding the adoption of QRIS by MSME owners. Both TAM and UTAUT illustrate that MSME owners are inclined to adopt QRIS if deemed useful and easy to use, alongside favorable conditions. Dynamic Capabilities Theory elucidates the adoption's capacity to induce organizational changes like digital integration. The digital transformation in MSMEs is complex and shaped by individual perceptions, institutional trust, and strategic capability development rather than being solely behavioral or structural. A key finding indicates that financial literacy significantly accelerates digital transformation, directly and indirectly through QRIS adoption. MSME owners with enhanced financial literacy are more adept at evaluating digital technologies and integrating them effectively. This corroborates previous research identifying financial literacy as crucial for digital readiness and participation in financial ecosystems, highlighting its role as both a strategic resource and personal competence, thereby reducing uncertainty and improving digital decision-making quality.

Table 3. Average Variance Extracted (AVE)

Construct	AVE
Customer Trust (CT)	0.6500
Digital Transformation (DT)	0.7140
Ease of Digital Use (EDU)	0.7020
Financial Literacy (FL)	0.6820
QRIS Adoption (QRIS-A)	0.6480

Customer trust is a key factor in digital transformation and QRIS adoption, vital for businesses to manage effectively. Trust significantly influences digital engagement, particularly in financial transactions, addressing concerns like risk, privacy, and reliability. According to TAM and UTAUT, trust diminishes uncertainty and boosts user confidence, promoting the adoption of digital systems (Hanoum et al., 2025; Krishnan et al., 2024). In the MSME context, trust facilitates QRIS acceptance and enhances customer loyalty in highly digitized environments (Peres et al., 2023). In Southeast Asia, digital trust varies based on employee competence and institutional maturity, highlighting that effective digital transformation requires a supportive service environment.

Table 4. Composite Reliability

Construct	Composite Reliability
Customer Trust	0.8480
Digital Transformation	0.9090
Ease of Digital Use	0.8760
Financial Literacy	0.8650
QRIS Adoption	0.8460

Note: CR = Composite Reliability. CR values > 0.7000 indicate good internal consistency reliability (Hair et al., 2022).

Source: Processed research data (2024–2026)

Table 5. Cronbach's Alpha

Construct	Cronbach's Alpha
Customer Trust	0.7300
Digital Transformation	0.8650
Ease of Digital Use	0.7870
Financial Literacy	0.7660
QRIS Adoption	0.7280

Note: Cronbach's alpha values > 0.7000 indicate acceptable internal consistency reliability (Hair et al., 2022).

Source: Processed research data (2024–2026)

As can be seen in Table 4, all constructs exceed the minimum threshold of 0.7000 for composite reliability. The results show that Digital Transformation obtained the highest reliability value (0.909). It was followed by Ease of Digital Use (0.8760). Next was Financial Literacy (0.8650). Then Customer Trust (0.8480). Finally, QRIS Adoption (0.8460). This shows strong internal consistency for all constructs, which is an important indicator of the reliability of the study's findings.

The same conclusion can be drawn from Cronbach's alpha, as shown in Table 5, which confirms that the measurement model is reliable. The values of all constructs with a score above 0.70 demonstrate that the Digital Transformation (0.865) has a higher value than the Ease of Digital Use (0.787), Financial Literacy (0.766), Customer Trust (0.730), and QRIS Adoption

(0.728). Further structural analysis can be conducted using these measures, which have been shown to be both valid and reliable.

Perceived ease of use significantly influences the adoption of QRIS and the digital transformation of MSMEs, aligning with the Technology Acceptance Model (TAM). For resource-limited MSMEs, usability is crucial for product adoption. QRIS simplifies payment processes, reducing barriers to usage and integration. As shows in Figure3. this finding supports research showing that ease of use is vital for adoption in low-tech environments lacking technical support. The impact of ease of use underscores that MSMEs' digital transformation relies on robust digital infrastructure and high-quality, user-friendly technology. This highlights the importance of developing digital ecosystems tailored to the operational needs of MSMEs, especially in emerging markets.

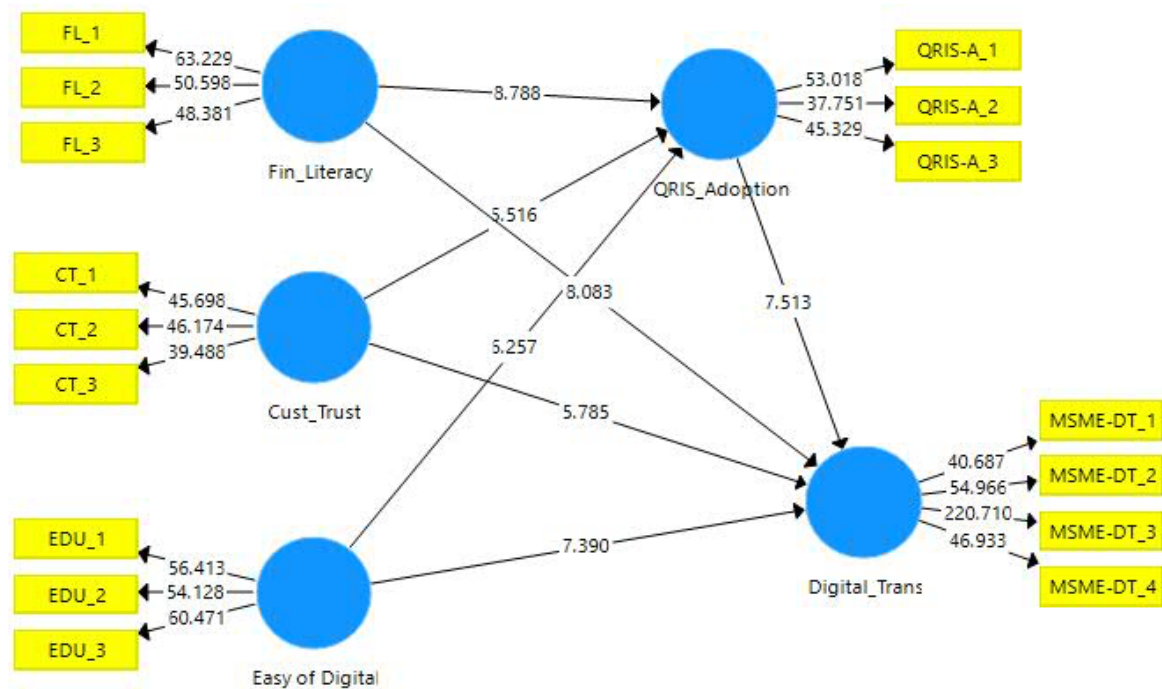


Figure 3. Structural Model (Inner Model) Results

The coefficient of determination (R^2) measures the amount of variance in endogenous constructs explained by their predictors. As can be seen from Table 10 above, the coefficient of determination for QRIS adoption is $R^2=0.6480$. This means that 64.8% of the variance in financial literacy, customer trust, and ease of digital use is explained by QRIS adoption. The remaining 35.2% is caused by factors excluded from our model. Conversely, MSME digital transformation has an R^2 value of 0.8190, meaning financial literacy, customer trust, ease of digital use, and QRIS adoption jointly explain 81.9000% of variances in MSME digital transformation. The remaining 18.1% is influenced by external variables. According to (J. F. Hair et al., 2025), an R^2 value above 0.75 is considered strong and one between 0.50 and 0.75 is moderate. Consequently, the results showed that the model has good explanatory power, particularly with regard to MSME digital transformation.

Endogenous Variable	R Square	R Square Adjusted
MSME Digital Transformation	0.8190	0.8180
QRIS Adoption	0.6480	0.6460

Source: Processed research data (2024–2026)

The study reveals that QR technology significantly influences the digital transformation of MSMEs, serving a broader purpose than merely functioning as a payment method. QRIS adoption potentially catalyzes a deeper digital integration across various business aspects, including customer interaction, transaction recording, operational efficiency, and access to organized financial systems. This aligns with previous research indicating that standardized payment systems enhance MSME efficiency and their participation in digital markets. By introducing MSMEs to digital systems and fostering transparency, QRIS facilitates broader digital transformation initiatives, establishing a foundation for adopting complementary technologies, especially pertinent in Indonesia and the ASEAN region, where policymakers leverage digital payment standardization for financial inclusion and modernization.

Moreover, the study confirms a mediating role for QRIS adoption, which constitutes a notable contribution. The mediation analysis indicates that while financial literacy, customer trust, and perceived ease of use do not directly impact MSME digital transformation, they influence it indirectly through QRIS adoption. This underscores QRIS as a medium that translates behavioral and organizational conditions into transformation outcomes, suggesting that digital transformation thrives when perceptions of capability, trust, and usability convert into actual behaviors. This perspective aligns with ongoing literature around QRIS and fintech, which posits that implementing digital payment solutions is a crucial initial step towards achieving digital readiness and subsequent business transformation.

From a strategic marketing angle, QRIS adoption should be viewed as integral to the customer-facing infrastructure of MSMEs. Implementing QRIS in an integrated manner enhances transaction convenience, builds customer trust, improves service responsiveness, and boosts brand perception in the digital realm. This research challenges earlier studies that categorized QR-based payment systems strictly as operational tools, emphasizing their role within the broader customer journey and suggesting that MSMEs leveraging QRIS can capture the advantages of digital engagement effectively. The findings suggest crucial policy implications for ASEAN governments and regulators. Supporting MSME digital transformation necessitates cohesive strategies across financial literacy enhancement, bolstering digital trust, and designing user-friendly platforms. Recommendations include advancing MSME financial capability through focused education, improving digital trust via payment safety standards, and ensuring that digital platforms like QRIS are accessible and user-friendly for smaller enterprises. Historical evidence supports that collaborative institutional strategies can accelerate technology adoption among MSMEs. Therefore, the policy challenge lies in ensuring that the drive for more adopters translates into meaningful transformative outcomes for all in emerging economies, balancing initiatives that foster adoption with those that guarantee impactful results.

CONCLUSION

The study empirically validates the adoption of QRIS as a strategic mechanism that links financial literacy, customer trust, and perceived ease of use to the digital transformation of MSMEs in ASEAN destinations in emerging economies. Based on a synthesis of TAM, UTAUT, and dynamic capabilities theory, the findings confirm that behavioral and strategic factors are significant predictors of digital transformation, both directly and indirectly via QRIS adoption. Financial literacy emerges as a key capability, enhancing MSMEs' ability to evaluate and leverage digital finance technologies, fostering customer trust, mitigating perceived risk, and cultivating confidence in digital systems. Perceived ease of use works in parallel to reduce adoption barriers and facilitate wider participation and engagement in digital platforms. Most critically, QRIS is validated not simply as a transactional capability but as a digital infrastructure that operationalizes foundational capabilities to deliver transformational outcomes for strategy and operational processes.

From both theoretical and practical perspectives, this study situates QRIS adoption as a mediating decision pathway that links firm-level QAC perceptions and digitization. Our findings suggest that policymakers and practitioners can accelerate inclusive MSME digitalization by prioritizing the development of financial capability, trust-building mechanisms, and user-friendly digital systems. However, the cross-sectional design and use of self-reported variables may limit causal inference and generalization and ability. Moving forward, studies should employ longitudinal designs and take into account objective performance measures and relevant contextual moderators, such as industry differences and regulatory environments. Overall, this study highlights that the sustainable digital transformation of MSMEs depends not only on the availability of technology but also on the integration of knowledge, trust, usability, and strategic adoption mechanisms within emerging digital ecosystems.

REFERENCE

- Affandi, Y., Ridhwan, M. M., Trinugroho, I., & Hermawan Adiwibowo, D. (2024). Digital adoption, business performance, and financial literacy in ultra-micro, micro, and small enterprises in Indonesia. *Research in International Business and Finance*, 70, 102376. <https://doi.org/https://doi.org/10.1016/j.ribaf.2024.102376>
- Almunawar, M. N., Islam, M. Z., & de Pablos, P. O. (2022). Digital Transformation Management. In *Digital Transformation Management*. <https://doi.org/10.4324/9781003224532>
- Almunawar, M. N., Ordóñez de Pablos, P., & Anshari, M. (2023). Digital Transformation for Business and Society. In *Digital Transformation for Business and Society*. <https://doi.org/10.4324/9781003441298>
- Anas, T., & Cahyawati, E. (2023). Strategic Investment Policies for Digital Transformation. *Journal of Southeast Asian Economies*, 40(1), 96–126.
- Arndt, A. D., Ford, J. B., Babin, B. J., & Luong, V. (2022). Collecting samples from online services: How to use screeners to improve data quality. *International Journal of Research in Marketing*, 39(1), 117–133. <https://doi.org/10.1016/j.ijresmar.2021.05.001>
- Azizah, S. N., Suradi, Koeswinarno, Fakhruddin, M., & Yuliani, I. (2024a). The Influence of Digital Transformation in Speeding Up the Empowerment of the Muslim Women's Economy to Improve the Performance of Micro, Small, and Medium Enterprises (MSMEs) in Ponorogo. In *Contributions to Management Science: Part F3298*. https://doi.org/10.1007/978-3-031-61778-2_5
- Azizah, S. N., Suradi, Koeswinarno, Fakhruddin, M., & Yuliani, I. (2024b). *The Influence of Digital Transformation in Speeding Up the Empowerment of the Muslim Women's Economy to Improve the Performance of Micro, Small, and Medium Enterprises (MSMEs) in Ponorogo BT - Strategic Islamic Business and Management: Solutions for Sust* (A. Rafiki, V. Ramadani, L.-P. Dana, & S. E. Hidayat, Eds.; pp. 71–107). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-61778-2_5
- Behl, A., Gaur, J., Pereira, V., Yadav, R., & Laker, B. (2022). Role of big data analytics capabilities to improve sustainable competitive advantage of MSME service firms during COVID-19 – A multi-theoretical approach. *Journal of Business Research*, 148, 378–389. <https://doi.org/https://doi.org/10.1016/j.jbusres.2022.05.009>
- Brenes, E. R., Ciravegna, L., & Pichardo, C. A. (2019). Managing institutional voids: A configurational approach to understanding high performance antecedents. *Journal of Business Research*, 105, 345–358. <https://doi.org/https://doi.org/10.1016/j.jbusres.2018.03.022>
- Bryant, D., Yazejian, N., Jang, W., Kuhn, L., Hirschstein, M., Soliday Hong, S. L., Stein, A., Bingham, G., Carpenter, K., Cobo-Lewis, A., Encinger, A., Fender, J., Green, S.,

- Greenfield, D., Jones Harden, B., Horm, D., Jackson, B., Jackson, T., Raikes, H., ... Wilcox, J. (2023). Retention and turnover of teaching staff in a high-quality early childhood network. *Early Childhood Research Quarterly*, 65, 159–169. <https://doi.org/https://doi.org/10.1016/j.ecresq.2023.06.002>
- Cahyasari, D., & Widyastuti, U. (2025). DIGITALIZATION OF MICRO-SIZED ENTERPRISES: DETERMINANTS OF QUICK RESPONSE CODE INDONESIAN STANDARD (QRIS), FINTECH USAGE BEHAVIOR, AND IMPLICATIONS FOR BUSINESS SUSTAINABILITY. *ABAC Journal*, 45(3), 114–137. <https://doi.org/10.59865/abacj.2025.18>
- Creswell, J. W. (2014). *Research design: qualitative, quantitative, and mixed-methods approaches, vol. 1 (1)*.
- Davis, F. D. (1989a). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly: Management Information Systems*, 13(3). <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. <https://doi.org/10.2307/249008>
- Davis, J. L., Prescott, W. H., Svarc, J. L., & Wendt, K. J. (1989). Assessment of global positioning system measurements for studies of crustal deformation. *Journal of Geophysical Research: Solid Earth*, 94(B10), 13635–13650. <https://doi.org/10.1029/JB094iB10p13635>
- 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>
- Dwi Amperawati, E., Hartoko, S., & Dwianto, A. (2024). Exploring the Landscape of Digital Entrepreneurship among Disabled People: A Bibliometric Analysis. *Qubahan Academic Journal*, 4(3), 469–484. <https://doi.org/10.48161/qaj.v4n3a918>
- Dwianto, A. (2025). Ethical Dynamics and Organizational Climate in Enhancing AI-based HRM Decision Making. *APPLIED ACCOUNTING - PRACTITIONER EJOURNAL*. <https://doi.org/https://dx.doi.org/10.2139/ssrn.5385682>
- Dwianto, A., Qurrota A'yun, A., & Sabila, I. (2025a). Mobile AI Applications to Support QRIS Literacy and Financial Growth of Traditional Market SMEs. *Journal Economic Business Innovation*, 2(1). <https://doi.org/10.69725/jebi.v2i1.234>
- Dwianto, A., Qurrota A'yun, A., & Sabila, I. (2025b). Mobile AI Applications to Support QRIS Literacy and Financial Growth of Traditional Market SMEs. *Journal Economic Business Innovation*, 2(1 SE-Articles), 77–96. <https://doi.org/10.69725/jebi.v2i1.234>
- Ferdous, A. S., Akareem, H. S., Viswanathan, M., Hollebeek, L. D., & Ringer, A. (2024). Boosting app-based mobile financial services engagement in B2B subsistence marketplaces: The roles of marketing strategy and app design. *Industrial Marketing Management*, 119, 147–161. <https://doi.org/10.1016/j.indmarman.2024.04.014>
- Hair, J., & Alamer, A. (2022). Partial Least Squares Structural Equation Modeling (PLS-SEM) in second language and education research: Guidelines using an applied example. *Research Methods in Applied Linguistics*, 1(3), 100027. <https://doi.org/10.1016/j.rmal.2022.100027>
- Hamzah Muchtar, E., Trianto, B., Maulana, I., Alim, M. N., Marasabessy, R. H., Hidayat, W., Junaedi, E., & Masrizal. (2024). Quick response code Indonesia standard (QRIS) E-payment adoption: customers perspective. *Cogent Business & Management*, 11(1), 2316044. <https://doi.org/10.1080/23311975.2024.2316044>

- Hartanto, J. D., Choirunisyah, Z., Santoso, T. W., & Limantara, N. (2025). Analyzing the Factors Influencing QRIS Adoption and Its Impact on Purchase Decision. *Proceedings - International Seminar on Intelligent Technology and Its Applications, ISITIA*, (2025). <https://doi.org/10.1109/ISITIA66279.2025.11137534>
- Helfat, C. E. (2011). Dynamic Capabilities and Strategic Management: Organizing for Innovation and Growth. By David J. Teece. *R&D Management*, 41(2). <https://doi.org/10.1111/j.1467-9310.2011.00638.x>
- Herdiyeni, Y., Juanda, B., Zhafira, N., Anggraeni, L., & Probokawuryan, M. (2025). Machine-Learning-Based Assessment and Prediction of Digital Transformation Performance for MSMEs in Indonesia. *International Journal of Information Technology and Decision Making*. <https://doi.org/10.1142/S0219622025500415>
- Hillary, H., Agatha, A., & Utama, I. D. (2024). Driving Digital Payment Adoption: Addressing Key Barriers for SMEs. *2024 9th International Conference on Informatics and Computing, ICIC 2024*. <https://doi.org/10.1109/ICIC64337.2024.10956355>
- Hussain, S. T., Lei, S., Akram, T., Haider, M. J., Hussain, S. H., & Ali, M. (2018). Kurt Lewin's change model: A critical review of the role of leadership and employee involvement in organizational change. *Journal of Innovation & Knowledge*, 3(3), 123–127. <https://doi.org/10.1016/j.jik.2016.07.002>
- Jenkins, J. M., Duer, J. K., & Connors, M. (2021). Who participates in quality rating and improvement systems? *Early Childhood Research Quarterly*, 54, 219–227. <https://doi.org/https://doi.org/10.1016/j.ecresq.2020.09.005>
- Kohli, A., Saini, M., Verma, C., & Kumar, V. (2025). Digital Transformation Framework for SMEs: Building Organizational Dynamic Capabilities. *Lecture Notes in Electrical Engineering*, 1421 LNEE. https://doi.org/10.1007/978-981-96-6034-6_31
- Koskelainen, T., Kalmi, P., Scornavacca, E., & Vartiainen, T. (2023). Financial literacy in the digital age—A research agenda. *Journal of Consumer Affairs*, 57(1), 507–528. <https://doi.org/https://doi.org/10.1111/joca.12510>
- Kumar, P., Chandra, A., Shivani, S., & Pillai, V. (2025). Evaluating the impact of digital and financial literacy on MSME performance. *Journal of the International Council for Small Business*, 6(2). <https://doi.org/10.1080/26437015.2024.2405548>
- Kuswoyo, D. A., Gunawan, I. P., & Cassandra, C. (2024). The Influence of QRIS Payment Method Usage and Effectiveness Level on Small and Medium Enterprise (SME). *ICECOS 2024 - 4th International Conference on Electrical Engineering and Computer Science, Proceeding*, 228–233. <https://doi.org/10.1109/ICECOS63900.2024.10791218>
- Marshall, Nancy L, Robeson, Wendy Wagner, & Roberts, Joanne. (2020). Integrating Intervention Approaches: Development and Initial Testing of an Early Childhood Education Intervention. *Journal of Applied Social Science*, 14(2), 178–194. <https://doi.org/10.1177/1936724420947011>
- Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995a). An Integrative Model Of Organizational Trust. *Academy of Management Review*, 20(3). <https://doi.org/10.5465/amr.1995.9508080335>
- Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995b). An Integrative Model of Organizational Trust. *The Academy of Management Review*, 20(3). <https://doi.org/10.2307/258792>
- Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995c). An Integrative Model Of Organizational Trust. *Academy of Management Review*, 20(3), 709–734. <https://doi.org/10.5465/amr.1995.9508080335>
- Mayer, R. C., Davis, J. H., & Schoorman, F. D. (2023). An Integrative Model of Organizational Trust. In *Organizational Trust*. <https://doi.org/10.1093/oso/9780199288496.003.0004>

- Muhammad, A. S., Adalier, A., & Adeshola, I. (2025). Digital transformation in youth owned MSMEs: A mixed method exploration on the impact of contemporary social commerce on sustainable performance. *Information Development*. <https://doi.org/10.1177/02666669251329908>
- Nguyen, N. G., Nguyen, N. K. D., & Nguyen, N. T. (2024). The Impact of Voluntary IFRS Application on Financial Reporting Quality: The Moderating Effect of State Ownership. *Global Business and Finance Review*, 29(11), 115–127. <https://doi.org/10.17549/gbfr.2024.29.11.115>
- Purnama, P. A., Iqbal Maulana, F., Prasetyo Adi, P. D., Hamim, M., Cahyana, V. A., & Lestari, D. (2026). *Perceived Value, Trust, and User Experience in Driving Digital Payment QRIS Adoption: Evidence from MSMEs in Malang*. <https://doi.org/10.1109/icimcis68501.2025.11327061>
- Putit, L., & Sahudin, Z. (2023). *Towards Adopting Innovative Quick Response (QR)-Enabled Contactless Transaction Payment: The Malaysian MSMEs' Entrepreneurial Perspective in COVID-19 Setting* BT - *Open Innovation in Small Business: Creating Values for Sustainability* (A. Rafiki, L.-P. Dana, & M. D. T. P. Nasution, Eds.; pp. 57–70). Springer Nature Singapore. https://doi.org/10.1007/978-981-99-5142-0_4
- Sarstedt, M., Hair, J. F., Pick, M., Liengaard, B. D., Radomir, L., & Ringle, C. M. (2022). Progress in partial least squares structural equation modeling use in marketing research in the last decade. *Psychology & Marketing*, 39(5), 1035–1064. <https://doi.org/https://doi.org/10.1002/mar.21640>
- Schmitt, S. A., Elicker, J. A., Purpura, D. J., Duncan, R. J., Schmerold, K. L., Budrevich, A., Bryant, L. M., & Finders, J. K. (2023). The effects of a high quality state-run preschool program as rated by a Quality Rating and Improvement System on children's school readiness. *Early Childhood Research Quarterly*, 62, 89–101. <https://doi.org/10.1016/j.ecresq.2022.07.013>
- Schweidel, D. A., Bart, Y., Inman, J. J., Stephen, A. T., Libai, B., Andrews, M., Rosario, A. B., Chae, I., Chen, Z., Kupor, D., Longoni, C., & Thomaz, F. (2022). How consumer digital signals are reshaping the customer journey. *Journal of the Academy of Marketing Science*, 50(6), 1257–1276. <https://doi.org/10.1007/s11747-022-00839-w>
- Setiawan, B., Pamungkas, B., Mekaniwati, A., & Kusuma, P. M. (2025). The strategic role of digital transformation, dynamic and agile capabilities for the performance of micro, small, and medium enterprises (MSMEs). *Bottom Line*, 38(2). <https://doi.org/10.1108/BL-08-2024-0120>
- Shumayleh, F., Othman, R., & Waseem, S. (2024). Patient Safety and Health Workforce Training: Identifying Curriculum Gaps and Development Needs. *Safety and Health for Medical Workers*, 1(3 SE-Articles), 111–126. <https://doi.org/10.69725/shmw.v1i3.152>
- Sulistiyani, L. (2024). Financial Accounting Training and Assistance for Activity Management Units of the Community Empowerment Trust Fund. *Community Service Research Innovation*, 1(1 SE-Articles), 10–15. <https://doi.org/10.5281/zenodo.11532382>
- Tarrant, K., & Huerta, L. A. (2015). Substantive or symbolic stars: Quality rating and improvement systems through a new institutional lens. *Early Childhood Research Quarterly*, 30, 327–338. <https://doi.org/https://doi.org/10.1016/j.ecresq.2014.04.002>
- Teece, D. J. (2018). Business models and dynamic capabilities. *Long Range Planning*, 51(1), 40–49. <https://doi.org/https://doi.org/10.1016/j.lrp.2017.06.007>
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7). [https://doi.org/10.1002/\(SICI\)1097-0266\(199708\)18:7<509::AID-SMJ882>3.0.CO;2-Z](https://doi.org/10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z)
- Trianto, B., Nik Azman, N. H., & Masrizal, M. (2023). E-payment adoption and utilization among micro-entrepreneurs: a comparative analysis between Indonesia and Malaysia.

- Journal of Science and Technology Policy Management*, ahead-of-p(ahead-of-print).
<https://doi.org/10.1108/JSTPM-12-2022-0207>
- Trianto, B., Nik Azman, N. H., & Masrizal, M. (2025). E-payment adoption and utilization among micro-entrepreneurs: a comparative analysis between Indonesia and Malaysia. *Journal of Science and Technology Policy Management*, 16(2).
<https://doi.org/10.1108/JSTPM-12-2022-0207>
- Venkatesh, V., Brown, S. A., & Bala, H. (2013). Bridging the qualitative-quantitative divide: Guidelines for conducting mixed methods research in information systems. *MIS Quarterly: Management Information Systems*, 37(1).
<https://doi.org/10.25300/MISQ/2013/37.1.02>
- Venkatesh, V., Brown, S. A., Maruping, L. M., & Bala, H. (2008). Predicting Different Conceptualizations of System Use: The Competing Roles of Behavioral Intention, Facilitating Conditions, and Behavioral Expectation. *MIS Quarterly*, 32(3), 483–502.
<https://doi.org/10.2307/25148853>
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27(3), 425–478.
<https://doi.org/10.2307/30036540>
- Weygandt, J. J., Kimmel, P. D., & Kieso, D. E. (2019). *Financial accounting*. John Wiley & Sons.
- Yan, L.-Y., Tan, G. W.-H., Loh, X.-M., Hew, J.-J., & Ooi, K.-B. (2021). QR code and mobile payment: The disruptive forces in retail. *Journal of Retailing and Consumer Services*, 58, 102300. <https://doi.org/https://doi.org/10.1016/j.jretconser.2020.102300>