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The Influence of Security, Convenience, Usefulness, and Public Interest on The Use Of Digital Payment as A Means of Payment in Indonesia with Digital Literacy as A Moderating Variable

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Abstract

The development of information technology has driven the increased use of digital payment services in Indonesia. However, the level of digital payment usage is still influenced by various factors related to user perception and characteristics. This study aims to analyze the influence of security, usefulness, ease of use, and public interest on the use of digital payments, with digital literacy as a moderating variable. This research employs a quantitative approach using a survey method by distributing questionnaires to digital payment users in Indonesia. The data analysis technique used is Partial Least Squares-Structural Equation Modeling (PLS-SEM) with the assistance of the SmartPLS application. The research results indicate that security, usefulness, ease of use, public interest, and digital literacy have a positive and significant effect on the use of digital payments. The ease of use variable is the factor that has the greatest influence on the use of digital payments. Furthermore, the research results also show that digital literacy is able to moderate the influence of security and usefulness on the use of digital payments. However, digital literacy is not proven to moderate the influence of ease of use and public interest on the use of digital payments. The findings of this study indicate that the increased use of digital payments is not only influenced by user perceptions of the service's benefits, ease of use, and security, but also by the individual's ability to understand and utilize digital technology effectively. Therefore, digital payment service providers and the government need to improve service quality, system security, and digital literacy education programs to encourage wider adoption and use of digital payments in society.

Keywords: Digital Payment, Security, Ease of Use, Digital Literacy, PLS-SEM

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INTRODUCTION

The development of digital technology has brought massive changes to various sectors of human life, including the financial sector. Technology-based innovation, known as financial technology (fintech), has become the main driver in forming the modern digital economy ecosystem. In Indonesia, the development of fintech is prominently seen through the emergence of various digital payment systems such as GoPay, OVO, DANA, LinkAja, ShopeePay, and QRIS, which are now integral to community economic activities. Globally, digital payment systems continue to grow rapidly, accounting for over 70 percent of retail transactions in developed nations. In Indonesia, this transformation shows significant growth; based on Bank Indonesia (BI) data, electronic money transactions in the first semester of 2025 reached Rp 439.22 trillion, marking a 64.89% increase compared to the same period the previous year. This increase is driven by the widespread use of e-wallets, Quick Response Code Indonesian Standard (QRIS), mobile banking, and a national internet penetration rate that reached 79.5% in 2024. This transformation is inseparable from government and monetary authority strategic policies, such as the Blueprint Sistem Pembayaran Indonesia 2025 (BSPI 2025) and the Gerakan Nasional Non Tunai (GNNT), which successfully pushed the financial inclusion index to 75.02% and the financial literacy index to 65.43%.

However, behind this growth, there are challenges affecting comprehensive digital payment adoption. Some parts of society still show resistance to digital payment systems due to factors such as perceived security risks, application complexity, low understanding of economic benefits, fears of data leaks and digital fraud, as well as the deeply rooted cultural habit of physical cash transactions. These factors can be explained through the Technology Acceptance Model (TAM) introduced by Davis (1989), where the acceptance of a technology is influenced by perceived ease of use, perceived usefulness, and trust or security. Security acts as a primary pillar in financial systems; Park and Kim (2006) define it as the system's ability to guarantee data confidentiality, integrity, and authenticity, which directly impacts user trust. Meanwhile, perceived ease of use relates to the user's belief that utilizing the technology does not require heavy effort, and perceived usefulness measures the individual's belief that the technology improves transaction efficiency and effectiveness.

These perceptual factors collectively shape public interest or behavioral intention to use digital payment systems. As explained by Ajzen (1991) in the Theory of Planned Behavior, behavioral intention is a psychological tendency that acts as the primary predictor of actual behavior. Furthermore, the individual capacity to process these technological components relies heavily on digital literacy. Gilster (1997) and UNESCO (2018) define digital literacy as the competency to access, understand, evaluate, and utilize digital technology effectively, critically, and responsibly. In the context of digital

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payments, digital literacy functions as a moderating variable because individuals with high digital literacy are more capable of understanding security mechanisms, recognizing the provided benefits, and minimizing potential risks during transactions.

Several previous studies show diverse and inconsistent results regarding the factors influencing digital payment adoption in Indonesia. While some studies find that ease of use and convenience are primary motivators for e-wallet usage, others emphasize that security risks dominate user reluctance, or show that financial literacy has no significant effect on usage intention. Considering this research gap and the current phenomena, this study aims to empirically analyze the influence of security, perceived ease of use, perceived usefulness, and public interest on the use of digital payments as a means of payment in Indonesia, utilizing digital literacy as a moderating variable. This research holds strategic relevance to the Indonesia Digital Economy Roadmap 2030, aiming to provide academic contributions regarding financial technology adoption behaviors and practical input for regulators and service providers to strengthen a safe, efficient, and inclusive digital payment ecosystem.

METHOD

This research employed a quantitative approach with an explanatory design to test the causal relationships among the formulated variables. The analytical focus rests on determining how security, usefulness, ease of use, and public interest affect digital payment usage, while integrating digital literacy as a moderating construct.

The population encompassed Indonesian citizens who have engaged with digital payment services, including e-wallets, QRIS, and mobile banking. Due to the immeasurable exact number of users nationwide, a non-probability purposive sampling technique was applied. Respondent criteria specifically required individuals aged 20 to 40 years old, residing across both Western and Eastern regions of Indonesia, who had actively utilized digital payment platforms within at least the last six months. Following the analytical guidelines proposed by Hair et al. (2019), which suggest a minimum sample size of five to ten times the number of indicators, the target was set above the 180 minimum derived from the 36 research indicators. The actual data collection successfully gathered 219 eligible respondents.

Primary data acquisition was executed through online questionnaires distributed via Google Forms between May and June 2026. The instrument utilized a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), to quantify respondents' perceptions. Each of the six constructs—security, ease of use, usefulness, public interest, digital literacy, and digital payment usage—was operationalized using six specific reflective indicators. These primary metrics were supplemented by secondary data

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extracted from academic journals, Bank Indonesia reports, and Financial Services Authority (OJK) publications to strengthen the theoretical foundation.

Analytical procedures were conducted using Structural Equation Modeling-Partial Least Squares (SEM-PLS) via the SmartPLS 4.0 software. The analytical framework was divided into descriptive statistics and a two-stage PLS evaluation. The outer model assessment rigorously checked convergent validity, requiring a loading factor above 0.70 and an Average Variance Extracted (AVE) exceeding 0.50. Discriminant validity was confirmed through the Fornell-Larcker Criterion and the Heterotrait-Monotrait Ratio (HTMT). Construct reliability demanded both Cronbach's Alpha and Composite Reliability scores to surpass the 0.70 threshold.

Following the measurement validation, the inner model was evaluated using the coefficient of determination (R^2) and effect size (f^2) to determine the structural robustness and predictive relevance of the model. Finally, hypothesis testing, which included evaluating both direct relationships and the moderating role of digital literacy, was executed using the bootstrapping resampling method. Statistical significance was established at a 5% level, dictating that hypotheses were accepted if the T-Statistic exceeded 1.96 and the P-Value fell below 0.05.

RESULTS AND DISCUSSIONS

Respondent Characteristics

The data collection successfully gathered responses from 219 digital payment users across Indonesia. The demographic profile indicates that females slightly dominated the participation at 53.9%, while males accounted for 46.1%. The majority of respondents fell within the productive age group of 26–30 years (45.2%), resided in Western Indonesia (69.4%), and worked as private employees (46.6%). In terms of experience, a significant portion (47.9%) had been utilizing digital financial technologies for 3 to 6 years, with DANA emerging as the most frequently used application (43.4%), followed by GoPay (17.8%) and ShopeePay (16.4%).

Measurement Model Evaluation (Outer Model)

The measurement model was thoroughly evaluated to ensure the instrument's validity and reliability. Convergent validity was established, as all indicators exhibited outer loading values surpassing the 0.70 threshold. Discriminant validity was rigorously verified using Cross Loadings, the Fornell-Larcker Criterion, and the Heterotrait-Monotrait Ratio (HTMT), with all HTMT values remaining strictly below the 0.85 limit. Furthermore, the internal consistency of the constructs was confirmed, as both Cronbach's Alpha and Composite Reliability scores for all variables exceeded 0.70, while the Average Variance Extracted (AVE) stood above 0.50.

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Table 1. Construct Reliability and Validity

Variable	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	Average Variance Extracted (AVE)
Security	0.879	0.885	0.909	0.625
Perceived Ease of Use	0.942	0.946	0.955	0.780
Perceived Usefulness	0.895	0.896	0.920	0.658
Public Interest	0.914	0.933	0.933	0.699
Digital Literacy	0.938	0.951	0.950	0.762
Digital Payment Usage	0.915	0.917	0.934	0.704

Structural Model Evaluation (Inner Model) and Hypothesis Testing

The structural model evaluation revealed that the independent variables and the moderating interactions account for 55.2% of the variance in digital payment usage (R-Square = 0.552), categorizing the model's explanatory power as moderate. The effect size (f2) analysis highlighted that perceived ease of use provided the largest individual contribution to usage (0.092).

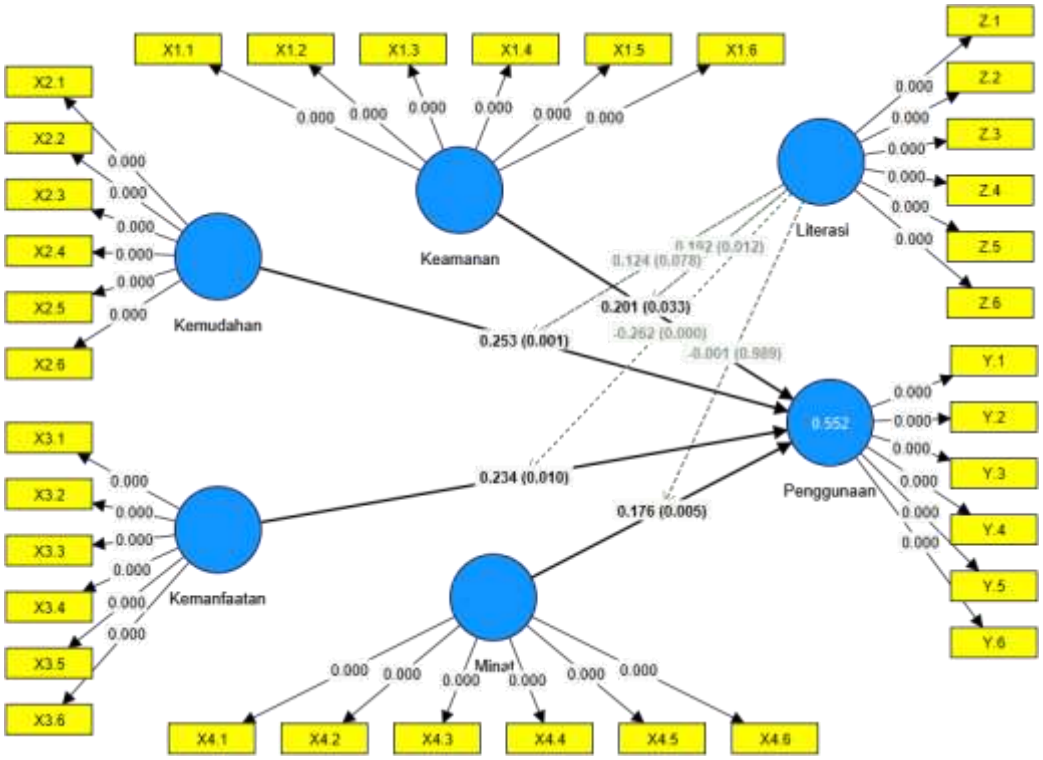


Figure 1. Inner Model Testing Results

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Hypothesis testing was executed using the bootstrapping resampling method with a 5% significance level. The results confirmed all five direct effect hypotheses and two out of four moderating hypotheses.

Table 2. Hypothesis Testing Results

Relationships	Original Sample (O)	T Statistics	P Values	Conclusion
Security -> Usage	0.201	2.133	0.033	Accepted
Perceived Ease of Use -> Usage	0.253	3.367	0.001	Accepted
Perceived Usefulness -> Usage	0.234	2.578	0.010	Accepted
Public Interest -> Usage	0.176	2.784	0.005	Accepted
Digital Literacy -> Usage	0.125	2.296	0.022	Accepted
Digital Literacy x Security -> Usage	0.192	2.524	0.012	Accepted
Digital Literacy x Perceived Ease of Use -> Usage	0.124	1.762	0.078	Rejected
Digital Literacy x Perceived Usefulness -> Usage	-0.262	3.517	0.000	Accepted
Digital Literacy x Public Interest -> Usage	-0.001	0.013	0.989	Rejected

DISCUSSION

The direct hypothesis tests substantiate the core principles of the Technology Acceptance Model (TAM). Perceived ease of use emerged as the most dominant determinant influencing digital payment adoption, indicating that straightforward interfaces, simple registration, and frictionless transactions are paramount for users. Perceived usefulness and public interest similarly possess significant positive impacts; the tangible efficiency of transactions and existing psychological willingness directly translate into sustained usage. Concurrently, security acts as a crucial foundation; users are significantly more inclined to adopt digital payments when they trust the system's capacity to shield their personal data and authenticate transactions securely. Digital

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literacy also plays a direct, positive role, empowering users with the confidence to navigate financial technologies effectively.

The moderating dynamics of digital literacy reveal complex behavioral patterns. Digital literacy functions as a positive moderator between security and usage. Highly literate users possess an acute awareness of cyber threats, meaning their adoption decisions rely heavily on the robustness of the platform's security protocols. In contrast, digital literacy negatively moderates the relationship between perceived usefulness and usage. For individuals with lower digital literacy, immediate transactional convenience is the primary adoption driver. However, as users become more digitally literate, their dependency on mere functional benefits decreases, as they begin to critically evaluate broader variables such as hidden costs and comprehensive risk management.

Finally, digital literacy does not significantly moderate the effects of either perceived ease of use or public interest. Modern payment applications are inherently designed for universal accessibility, ensuring that their ease of use is experienced uniformly regardless of a user's technical background. Likewise, an established behavioral interest drives usage independently of the user's digital competency.

CONCLUSION

The study concludes that security, perceived ease of use, perceived usefulness, public interest, and digital literacy significantly and positively influence the adoption and actual usage of digital payment systems in Indonesia. Among these factors, perceived ease of use stands out as the most critical determinant of usage, emphasizing that users place the highest priority on simple, intuitive, and frictionless transaction experiences. Security also functions as a vital prerequisite, as the level of trust in the system's ability to protect sensitive data and financial transactions is a decisive factor in user behavior. While digital literacy directly encourages usage by fostering user confidence, it also performs complex moderating roles, strengthening the impact of security while concurrently weakening the influence of perceived usefulness on usage.

Practically, these findings suggest that digital payment service providers must prioritize the ongoing optimization of user interfaces and robust security infrastructure to maintain and grow their user base. Since perceived ease of use is the most influential driver, any simplification of transaction procedures will likely lead to higher adoption rates. Simultaneously, policymakers and financial regulators are encouraged to intensify digital literacy programs, as improved user knowledge not only directly boosts usage but also creates a more informed user base that values security protocols appropriately. By addressing these key determinants and tailoring strategies to different levels of user proficiency, stakeholders can accelerate the transformation toward a more inclusive, secure, and efficient digital economic ecosystem in Indonesia.

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