Research Article

Explaining Post-Adoption Mobile Banking Usage in Indonesia Using an Integrated Technology Acceptance Model and IS Success Model: Evidence from PLS-SEM

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ABSTRACT

Mobile banking has become a primary channel for retail financial services in emerging economies; however, prior research has focused predominantly on initial adoption intention rather than post-adoption usage behavior. This study addresses that gap by integrating the Technology Acceptance Model and the DeLone and McLean IS Success Model to explain post-adoption mobile banking usage in Indonesia. A quantitative cross-sectional survey was conducted with 544 active users of mobile banking applications from four Indonesian state-owned banks, and the data were analyzed using PLS-SEM. The results indicate that perceived ease of use significantly enhances perceived usefulness ($\beta = 0.549$, $t = 14.213$, $p < 0.001$). In turn, perceived usefulness ($\beta = 0.192$, $p < 0.001$), system quality ($\beta = 0.247$, $p < 0.001$), information quality ($\beta = 0.225$, $p = 0.001$), and service quality ($\beta = 0.195$, $p < 0.001$) positively affect user satisfaction. User satisfaction, in turn, emerges as the strongest direct predictor of self-reported actual usage ($\beta = 0.523$, $t = 12.044$, $p < 0.001$). The model explains 30.2% of the variance in perceived usefulness, 51.2% of the variance in user satisfaction, and 27.3% of the variance in actual usage. These findings indicate that post-adoption mobile banking usage is shaped not only by cognitive acceptance beliefs but also by users' evaluations of system performance, information quality, and service support. This study contributes to post-adoption digital banking research by demonstrating that satisfaction is the central evaluative mechanism linking acceptance beliefs and service-quality perceptions to sustained behavioral usage.

KEYWORDS
digital innovation · financial inclusion · information systems success · innovation and infrastructure · reduced inequalities · user satisfaction · service quality

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1. INTRODUCTION

Mobile banking has emerged as one of the most important channels in digital financial services, enabling customers to conduct banking activities regardless of time and location and thereby transforming how financial services are accessed and delivered. Prior research has shown that mobile banking provides both banks and users with a flexible and increasingly indispensable service interface. More broadly, the digital financial services literature identifies perceived usefulness, perceived ease of use, security, and trust as among the most influential determinants of use [1]–[3]. In practice, mobile banking is no longer a peripheral service interface; rather, it has become a core transactional environment through which users check balances, transfer funds, pay bills, and manage everyday financial activities.

Despite its growing centrality, mobile banking differs qualitatively from many other digital services. Unlike low-risk applications, mobile banking mediates financial transactions that are monetary, time-sensitive, and trust-laden. System delays, failures, or ambiguities can generate not only inconvenience but also anxiety, uncertainty, and perceived financial risk. Earlier studies have therefore emphasized the importance of trust and confidence in shaping mobile banking use, particularly in contexts characterized by uncertainty and perceived risk [4], [5]. Continued engagement with mobile banking thus depends not only on users' initial acceptance of the technology but also on the application's ability to perform reliably, deliver accurate information, and provide adequate support over time. This post-adoption perspective is theoretically important because continued system use cannot be inferred directly from initial acceptance; users may discontinue a system even after having accepted it [6]–[8].

However, the extant mobile banking literature has focused more heavily on adoption and behavioral intention than on post-adoption behavior. Systematic reviews indicate that TAM, UTAUT, and related acceptance-based frameworks continue to dominate explanations of mobile banking adoption. In contrast, comparatively fewer studies examine actual use, continuance, or individual performance outcomes [9]–[12]. Although more recent studies have begun to address customer satisfaction, loyalty, and sustained usage, the field still requires stronger explanations of what keeps users engaged with mobile banking after adoption [13]–[15]. Taken together, this body of research suggests that although the literature has generated substantial insight into why users begin adopting mobile banking, it has been less successful in explaining why those who have already adopted the service continue to rely on it in their routine financial behavior.

This limitation is also reflected in the literature's theoretical fragmentation. On the one hand, technology acceptance studies emphasize cognitive beliefs such as perceived usefulness and perceived ease of use. Davis [16]

argues that these two beliefs are central to users' acceptance of information technology, and subsequent developments of TAM reaffirm that perceived ease of use is an important antecedent of perceived usefulness [17]. On the other hand, IS success research highlights system quality, information quality, service quality, use, and user satisfaction as core dimensions of information systems success [18]–[21]. In the context of mobile banking, both perspectives are clearly relevant: users must perceive the application as easy to use and useful, but they must also experience it as reliable, informative, secure, and well supported. Prior work on mobile banking service quality similarly shows that users evaluate not only application features but also responsiveness, credibility, access, communication, and other service dimensions [22]–[26]. Treating these two streams separately risks obscuring the ways in which acceptance beliefs and service evaluations jointly shape post-adoption behavior.

Recent evidence further underscores the need for such integration. A meta-analysis of 54 studies shows that mobile banking satisfaction is significantly associated with quality-related factors, technology acceptance factors, credibility factors, and behavioral outcomes such as actual use, continuance intention, and loyalty [27]. Similarly, a recent systematic review of 71 studies concludes that the mobile banking service-quality literature remains fragmented despite its clear relevance to customer-centered outcomes [28]. Moreover, Sharma and Sharma [29] show that satisfaction and intention to use are important antecedents of actual mobile banking usage, indicating that post-adoption outcomes should be traced beyond attitudes to realized behavior. Additional post-adoption research likewise suggests that perceived usefulness and satisfaction remain central after adoption, while continuance is strengthened when users experience the service as dependable and rewarding over time [30]–[32]. Collectively, these findings indicate that the next step in theory development is not merely to add isolated predictors, but to integrate acceptance-based and quality-based evaluations into a coherent post-adoption framework centered on satisfaction and actual usage.

Against this backdrop, the present study integrates the Technology Acceptance Model and the DeLone and McLean IS Success Model to explain actual mobile banking usage in the post-adoption stage. Specifically, the study proposes that perceived ease of use enhances perceived usefulness; perceived usefulness, system quality, information quality, and service quality shape user satisfaction; and user satisfaction subsequently drives actual usage. This model is theoretically appropriate because it recognizes that repeated use of mobile banking depends not only on perceived instrumental value but also on whether the service environment continues to perform in a dependable and confidence-building manner. This approach is consistent with TAM's cognitive logic, Bhattacherjee's post-adoption perspective, the DeLone and McLean IS success

framework, and empirical evidence linking satisfaction to actual usage in mobile banking [6], [16], [17], [33], [34].

This study makes three main contributions. First, it shifts the analytical focus from initial adoption to post-adoption behavior by treating actual usage, rather than mere intention, as the primary dependent variable. Second, it advances mobile banking theory by integrating two influential but often separately applied perspectives, TAM and the IS Success Model, into a unified explanatory framework. Third, it clarifies the mediating role of user satisfaction as the evaluative mechanism through which acceptance beliefs and service-quality perceptions are translated into repeated behavioral use. In doing so, the study responds to repeated calls in the literature for more integrated and post-adoption-oriented explanations of mobile banking behavior.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Post-Adoption Perspective and Theoretical

Mobile banking is not merely a digital interface for accessing information; it is a high-stakes service platform through which users conduct monetary, time-sensitive, and risk-laden transactions. As Baptista and Oliveira [2] explain, mobile banking enables customers to perform financial activities anytime and anywhere, but this convenience also heightens expectations regarding reliability, clarity, security, and responsiveness. In this context, post-adoption behavior cannot be reduced to initial acceptance alone. Rather, it should be understood as a cumulative evaluation of whether the application continues to deliver functional value and dependable service across repeated use. Bhattacherjee [6] explicitly distinguishes continuance from initial adoption by arguing that post-adoption judgments are grounded in actual usage experience rather than solely in pre-use expectations. Similarly, DeLone and McLean [33] emphasize that information systems success emerges from users' assessments of system quality, information quality, service quality, and satisfaction after interacting with the system.

Given these characteristics, mobile banking requires a theoretical lens that captures both users' technology-related beliefs and their service-related evaluations. The Technology Acceptance Model (TAM) is useful because, as Davis [35] argues, users form responses to technology primarily through perceived usefulness and perceived ease of use. However, TAM alone is insufficient to explain continued mobile banking use, because a banking application may be perceived as useful and easy to use while still failing to satisfy users if it is unstable, inaccurate, or poorly supported. The DeLone and McLean IS Success Model complements TAM by accounting for the quality of the system, its information outputs, and the service support surrounding it [33], [36]. More recent

evidence in mobile banking points in the same direction. Kumar et al. [27] synthesize studies linking satisfaction with actual use, continuance intention, and loyalty. At the same time, recent reviews likewise show that service quality in mobile banking remains central to both intended and actual behavioral outcomes [28], [37]–[39].

2.2. Technology Acceptance Model in Mobile Banking

According to Davis [16], perceived ease of use refers to the degree to which using a system is free of effort. In contrast, perceived usefulness refers to the degree to which using the system enhances task performance. In mobile banking, perceived ease of use is reflected in intuitive menus, clear transaction steps, understandable terminology, and smooth navigation across functions such as transfers, bill payments, and balance inquiries. By contrast, perceived usefulness is reflected in the extent to which the application enables users to complete banking activities more quickly, conveniently, and effectively. The continuing relevance of TAM has been reaffirmed by Venkatesh and Davis [17], who extended the model, and by subsequent studies [40]–[44], which further elaborated the determinants of usefulness and ease of use in technology contexts.

In post-adoption settings, TAM remains highly relevant because users continue to reassess whether the system saves time, reduces effort, and helps them achieve their goals. This logic is especially salient in mobile banking because users often transact on small screens, under time constraints, and in situations in which errors may have financial consequences. Davis [16] argues that when a system is easier to use, users can devote less attention to operating the technology and more attention to accomplishing their tasks; as a result, the technology appears more beneficial. Venkatesh and Davis [17] later reinforced this proposition by showing that perceived ease of use is an important antecedent of perceived usefulness. In mobile banking, therefore, interface simplicity should enhance users' perceptions that the application is genuinely useful for everyday financial management.

2.3. IS Success Model and Quality Dimensions in Mobile Banking

DeLone and McLean [33] propose that information systems success is shaped by three key quality dimensions: system quality, information quality, and service quality. In mobile banking, system quality refers to the technical performance of the application, including speed, accessibility, reliability, security, and availability. Information quality refers to whether balances, notifications, transaction records, and account information are accurate, timely, relevant, complete, and easy to understand. Service quality refers to the support users receive when problems arise, including responsiveness, competence, empathy, and effectiveness in complaint handling or problem resolution.

These dimensions are especially consequential in digital financial services because the consequences of poor quality are immediate and tangible. When a banking application is slow, unstable, or difficult to access, users may experience frustration and uncertainty precisely when they require speed and precision. When transaction information is unclear or outdated, users may hesitate to complete financial actions because they cannot be confident that the displayed information is trustworthy. Although mobile banking is largely self-service, service quality remains critical because users still depend on timely assistance during failed transfers, login restrictions, or security incidents. Prior studies show that system quality, information quality, and service quality positively affect user satisfaction in the mobile banking context [3], [22], [45]. At the same time, Sharma and Sharma [34] demonstrate that these quality dimensions play an important role in explaining both satisfaction and actual mobile banking usage. More recently, Palamidovska-Sterjadovska et al. [28] conclude that service quality in mobile banking is multifaceted and remains pivotal in shaping satisfaction, usage, and other customer-centered outcomes.

2.4. User Satisfaction and Actual Usage

User satisfaction is commonly understood as the user's overall evaluative judgment after interacting with a system and comparing its performance with prior expectations and needs. Bhattacherjee [6] places satisfaction at the center of post-adoption behavior by showing that continuance is driven not only by usefulness but also by users' cumulative satisfaction with prior usage experience. DeLone and McLean [33] likewise position satisfaction as a central outcome of system interaction and as an important driver of subsequent use-related outcomes. In mobile banking, satisfaction captures whether the application is perceived as beneficial, dependable, informative, and reassuring enough to become embedded in routine financial activity [46]–[49].

This study treats actual usage as a behavioral outcome rather than merely an intention. In other words, actual usage reflects how frequently and intensively customers rely on the application for real banking activities. This distinction is important because many users may intend to use mobile banking without necessarily incorporating it into their regular financial routines. Sharma and Sharma [34] explicitly examine actual mobile banking usage and show that satisfaction is one of its important antecedents. Kumar et al. [45], in their meta-analysis, also synthesize evidence linking satisfaction with actual use, continuance intention, and loyalty. Consistent with these arguments, satisfaction can be viewed as the immediate post-adoption mechanism through which beliefs about usefulness and perceptions of service quality are translated into sustained behavioral use.

2.5. Research Gap and Theoretical Contribution

Although the mobile banking literature is extensive, it remains theoretically fragmented. Many studies continue to focus on initial adoption intention rather than post-adoption behavior. In contrast, others examine only isolated drivers such as trust, service quality, or usefulness without integrating them into a coherent post-adoption framework. Kumar et al. [45] show that the satisfaction literature in mobile banking spans quality factors, technology acceptance factors, and multiple behavioral outcomes, indicating conceptual dispersion across studies. Likewise, Palamidovska-Sterjadovska et al. [28] note that the service quality literature in mobile banking remains fragmented despite its importance.

Accordingly, this study advances the mobile banking literature by integrating TAM and the IS Success Model within a post-adoption framework, thereby responding to the continued dominance of adoption- and intention-based explanations in prior research [9], [29], [50]–[52]. Building on Davis [16], the model explains how perceived ease of use enhances perceived usefulness, while drawing on DeLone and McLean [33] to show how system quality, information quality, and service quality shape users' evaluations beyond initial acceptance. This integration is particularly important in mobile banking, where continued use depends not only on whether the application is easy to use and useful, but also on whether it performs reliably, provides accurate information, and delivers dependable support during repeated interactions [34]. Consistent with post-adoption theory, user satisfaction is positioned as the key mechanism through which acceptance beliefs and service-performance perceptions are translated into sustained behavioral reliance on the application [6]. This argument is reinforced by recent evidence showing that mobile banking satisfaction is systematically associated with technology acceptance factors, quality dimensions, and downstream behavioral outcomes such as actual use and continuance [45]. At the same time, the service-quality literature remains conceptually fragmented [28]. Thus, the study contributes by clarifying how cognitive acceptance and service evaluation jointly shape actual usage, a behaviorally more robust outcome than intention alone in the mobile banking context.

2.6. Hypothesis Development

2.6.1. Perceived Ease of Use and Perceived Usefulness

Davis [16] argues that a system perceived as easier to use is more likely to be viewed as useful because users can devote less effort to operating the technology and more effort to achieving their intended goals. Venkatesh and Davis [17] later reaffirmed this logic by showing that perceived ease of use functions as an antecedent of perceived usefulness. In mobile banking, this relationship is especially important because customers commonly perform transactions quickly, through small-screen

interfaces, and in situations in which clarity and precision matter. When users can understand the layout, locate features easily, and complete transactions without confusion, they are more likely to believe that the application improves their effectiveness in managing daily financial tasks. Therefore, greater perceived ease of use should increase perceived usefulness.

H1: Perceived Ease of Use (PEOU) positively affects Perceived Usefulness (PU).

2.6.2. Perceived Usefulness and User Satisfaction

In post-adoption contexts, perceived usefulness refers not only to expected benefits before use, but also to whether the system continues to deliver meaningful value during repeated interactions. Bhattacherjee [6] shows that post-usage usefulness remains central to users' continuance evaluations, while Kumar et al. [27] and Baabdullah et al. [53] identify technology acceptance factors as important contributors to mobile banking satisfaction. In practical terms, when customers believe that a mobile banking application helps them save time, improves convenience, and enables them to manage financial activities more effectively, they are more likely to conclude that the application meets their needs. This positive performance evaluation should, in turn, enhance satisfaction.

H2: Perceived Usefulness (PU) positively affects User Satisfaction (SAT).

2.6.3. System Quality and User Satisfaction

According to DeLone and McLean [33], system quality reflects how well the technical characteristics of a system support user interaction and task completion. In mobile banking, strong system quality is reflected in fast response times, stable connectivity, secure access, and reliable transaction execution. Tam and Oliveira [3] empirically show that system quality positively affects user satisfaction in mobile banking, and Sharma and Sharma [34] further demonstrate that quality-related evaluations are critical for explaining actual usage. From a post-adoption perspective, Geebren and Jabbar [54] also identify system quality as an important antecedent of trust and satisfaction in mobile banking. Because banking transactions are sensitive and often urgent, users are unlikely to be satisfied with an application they perceive as unstable or risky. Therefore, higher perceived system quality should strengthen user satisfaction.

H3: System Quality (SQ) positively affects User Satisfaction (SAT).

2.6.4. Information Quality and User Satisfaction

DeLone and McLean [33] define information quality in terms of accuracy, timeliness, relevance, completeness, and clarity. In mobile banking, this dimension is particularly important because users depend on the application's information to verify balances, confirm transaction status, review account history, and make financial decisions. Tam and Oliveira [3] find that information quality positively contributes to satisfaction in mobile banking, suggesting that users respond favorably when the information they receive is dependable and easy to interpret. When information is ambiguous, incomplete, or outdated, users may feel uncertain and dissatisfied. Therefore, stronger information quality should improve user satisfaction.

H4: Information Quality (IQ) positively affects User Satisfaction (SAT).

2.6.5. Service Quality and User Satisfaction

Although mobile banking is designed as a self-service channel, service quality remains essential because users still require institutional support during service failures, access problems, or security concerns. DeLone and McLean [33] treat service quality as a core success dimension, and Pokhrel et al. [55] specifically show that mobile banking service quality affects continuance through satisfaction. In a more recent synthesis, Khan et al. [23] also conclude that service quality plays a pivotal role in shaping satisfaction and usage-related outcomes in mobile banking. When support is responsive, competent, and effective in resolving problems, users are more likely to feel reassured and to evaluate the application positively. Accordingly, higher service quality is expected to increase user satisfaction.

H5: Service Quality (SVQ) positively affects User Satisfaction (SAT).

2.6.6. User Satisfaction and Actual Usage

Bhattacherjee [56] argues that satisfaction is a central driver of post-adoption behavior because users who evaluate prior experience positively are more likely to continue engaging with the system. In mobile banking, satisfaction indicates that the application has consistently met users' transactional and informational needs. Sharma and Sharma [34] show that satisfaction is an important antecedent of actual mobile banking usage, while Kumar et al. [27] synthesize broader evidence linking satisfaction with actual use and other post-adoption outcomes. Therefore, when users are satisfied with the application, they should be more likely to incorporate it into routine banking behavior and to use it more frequently and intensively.

H6: User Satisfaction (SAT) positively affects Actual Usage (AU).

2.7. Integrated Research Model

Taken together, the proposed research model conceptualizes actual mobile banking usage as the outcome of a sequential post-adoption evaluation process

rather than as a mere continuation of initial acceptance. Drawing on TAM, the model assumes that perceived ease of use enhances perceived usefulness because users are more likely to recognize the instrumental value of a mobile banking application when it is easy to understand and operate [16], [17]. At the same time, consistent with the IS Success Model of DeLone and McLean [33], system quality, information quality, and service quality are treated as core service-performance dimensions that shape users' evaluations during repeated interactions with the application. In line with Bhattacherjee's [6] post-adoption perspective, these cognitive and quality-based evaluations are expected to converge in user satisfaction, which functions as the immediate mechanism through which users translate their cumulative experience into continued behavioral reliance on mobile banking. This structure is particularly appropriate because mobile banking usage is influenced not only by perceived utility, but also by the reliability and quality of the digital service environment [3], [27], [34], [57], [58].
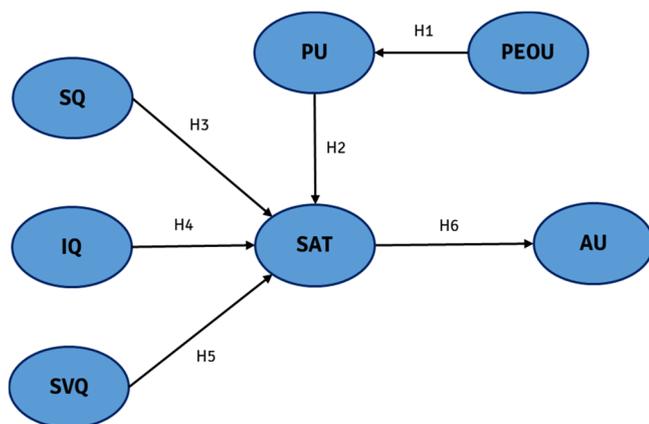
Figure 1. Proposed Post-Adoption Research Model

As illustrated in Figure 1, the model specifies six hypothesized relationships. H1 proposes that perceived ease of use (PEOU) positively influences perceived usefulness (PU), reflecting the TAM logic that ease of operation enhances users' recognition of functional benefits. H2 proposes that perceived usefulness positively affects user satisfaction (SAT), indicating that users are more satisfied when the application improves the efficiency and effectiveness of their financial activities. The model further proposes that system quality (SQ), information quality (IQ), and service quality (SVQ) positively influence user satisfaction through H3, H4, and H5, respectively, thereby capturing the role of technical reliability, informational accuracy, and support responsiveness in shaping post-adoption evaluations [33]. Finally, H6 posits that user satisfaction positively affects actual usage (AU), suggesting that satisfied users are more likely to integrate mobile banking into their routine financial behavior, consistent with post-adoption theory [6] and prior empirical evidence [45].

3. MATERIALS AND METHODS

3.1. Study Design

This study employed a quantitative, explanatory, cross-sectional survey design to test a post-adoption model integrating the Technology Acceptance Model (TAM) and the DeLone and McLean IS Success Model in the mobile banking context. A cross-sectional explanatory design is appropriate when the objective is to examine theoretically specified relationships among latent constructs based on users' direct experience with a focal information system [34], [56], [59]. The empirical setting was Indonesia, and the unit of analysis was individual users of mobile banking applications provided by Bank Mandiri, BRI, BNI, and BTN.

The study focused on post-adoption behavior rather than initial adoption. Accordingly, respondents were required to have prior experience using mobile banking so that their evaluations of usefulness, quality, satisfaction, and actual usage reflected cumulative use experience rather than pre-use expectations [6], [3], [34]. Because the proposed framework comprises multiple interrelated latent constructs and directional hypotheses, a survey-based design was considered appropriate for theory testing in a natural user setting [60], [61].

3.2. Population, Eligibility Criteria and Sampling

The target population consisted of active users of the HIMBARA mobile banking services in Indonesia. Nonprobability purposive sampling was employed because respondents were required to meet specific eligibility criteria relevant to the study objective: (1) owning an account at one of the four HIMBARA banks, (2) having actively used mobile banking for at least six months, and (3) being at least 18 years old. These criteria were applied to ensure that respondents could evaluate the focal constructs on the basis of actual service experience, which is essential in post-adoption research [34], [56]. Individuals who held bank accounts but did not actively use mobile banking were excluded from the study.

After data screening, 544 valid responses were retained for analysis. This sample size exceeds commonly recommended minimum requirements for PLS-SEM and provides adequate statistical power for models involving several constructs and structural paths [60]–[62]. Substantively, the final sample also offered sufficient demographic heterogeneity to capture variation in user evaluations across different segments of mobile banking users.

3.3. Instrument Development and Measurement

The questionnaire operationalized seven latent constructs: perceived ease of use (PEOU), perceived usefulness (PU), system quality (SQ), information quality (IQ), service quality (SVQ), user satisfaction (SAT), and actual usage (AU). The PEOU and PU measures were adapted from the Technology Acceptance Model

literature [16], [17]. The SQ, IQ, and SVQ measures were adapted from the DeLone and McLean IS Success Model and its applications in digital and mobile banking contexts [3], [33], [34]. The satisfaction and actual usage indicators were adapted from post-adoption and mobile banking studies that conceptualize satisfaction as a central evaluative mechanism and actual usage as a realized behavioral outcome rather than merely an intention [27], [34], [56].

Table 1.   Research Instruments

Construct	Items	Questioners
Actual Usage (AU)	AS1	On average, how often do you use/log in to the mobile banking app per week?
	AS2	Estimate your average number of mobile banking transactions per week (transfers, bill payments, balance checks).
	AS3	Approximately what percentage of your total banking transactions are done via mobile banking (vs. ATM, internet banking, teller)?
	AS4	How many days per week do you actively use the mobile banking app for any banking-related activity?
Information Quality (IQ)	IQ1	Information shown (balance/statement/transaction status) is accurate.
	IQ2	The app provides sufficient information for my needs.
	IQ3	Information in the app is up-to-date/real-time.
	IQ4	The information provided is useful and relevant to me.
	IQ5	Information is presented clearly and is easy to understand.
Perceived Ease of Use (PEOU)	PEOU1	The mobile banking app interface is clear and simple.
	PEOU2	The mobile banking app is easy to use (user-friendly).
	PEOU3	The app's screen layout/navigation is easy to understand.
Perceived Usefulness (PU)	PU1	Using the mobile banking app helps me complete banking transactions faster.
	PU2	The mobile banking app improves my effectiveness in banking activities (e.g., transfers/payments).
	PU3	The mobile banking app increases my productivity in managing daily financial transactions.
	PU4	Overall, this mobile banking app is useful to me.
System Quality (SQ)	SQ1	The mobile banking app is fast/responsive.
	SQ2	The mobile banking service is stable/available (rarely has errors or goes down).
	SQ3	The app makes it easy to access/search the information and features I need.
	SQ4	I feel the mobile banking app is secure from threats/hacking.
Service Quality (SVQ)	SVQ1	Support services (chat/call center/chatbot) respond quickly.
	SVQ2	Support services provide accurate answers/information.
	SVQ3	Support services resolve my issues when mobile banking problems occur.
	SVQ4	Support services are delivered as promised and on time.
User Satisfaction (SAT)	SAT1	I am satisfied because mobile banking meets my information-processing needs.
	SAT2	I am satisfied with the efficiency of mobile banking.
	SAT3	I am satisfied with the effectiveness of mobile banking.
	SAT4	Overall, I am satisfied with mobile banking.

All attitudinal indicators were measured using a five-point Likert scale ranging from (1 = strongly disagree) to (5 = strongly agree). Actual usage was measured using self-reported frequency and intensity indicators, including login frequency, transaction frequency, the proportion of banking activities conducted through mobile banking, and weekly active use. Before the main survey, the instrument was pretested with 30 respondents to assess wording clarity, item comprehension, and face validity. Minor editorial revisions were subsequently made before full deployment. Pilot testing is recommended to improve scale clarity and reduce avoidable measurement error before main data collection [60], [63], [64].

3.4. Data Collection Procedure

Data were collected between May and June 2024 using an online questionnaire administered through Google Forms. The survey link was distributed through social media groups, banking community networks, and direct outreach, thereby facilitating access to respondents from several major Indonesian cities. Before beginning the questionnaire, all respondents were presented with an informed consent statement explaining the purpose of the

study, the voluntary nature of participation, and the anonymity of responses. These procedural steps are important in survey-based behavioral research because they enhance transparency and help reduce evaluation apprehension and socially desirable responding [65]–[67].

After the survey period ended, the dataset was screened to remove incomplete responses and cases showing clear signs of inattentive responding, including uniform response patterns indicative of straight-lining. Data screening is an important quality-control procedure because unreliable or careless responses may bias parameter estimates and threaten the validity of structural model assessment [68].

3.5. Data Analysis

The data were analyzed using SmartPLS 4.0 following the recommended two-stage PLS-SEM procedure, in which the measurement model is evaluated before the structural model is tested [61], [62], [69]. PLS-SEM was considered appropriate because the study sought to predict key endogenous constructs, test a theory-informed model with multiple latent variables, and examine interrelationships among reflective constructs in an applied service context [62], [70].

In the measurement model stage, indicator reliability was assessed using outer loadings, whereas internal consistency reliability was evaluated using Cronbach's alpha and composite reliability. Convergent validity was examined using the average variance extracted (AVE), with values above conventional thresholds indicating adequate shared variance between a construct and its indicators [60], [71]. Discriminant validity was assessed using both the Fornell-Larcker criterion and the Heterotrait-Monotrait ratio (HTMT), as the combined use of these diagnostics is recommended to establish construct distinctiveness more rigorously [72].

In the structural model stage, collinearity diagnostics were examined before estimating the hypothesized paths. The structural model was then evaluated using path coefficients, coefficients of determination (R^2), effect sizes (F^2), and predictive relevance (Q^2). Statistical significance was assessed through bootstrapping with 5,000 resamples and a significance threshold of $p < 0.05$, consistent with current reporting recommendations for PLS-SEM studies [62], [70].

4. RESULTS

4.1. Respondent Profile

Table 2 presents the demographic characteristics of the 544 respondents included in this study. Profiling the respondents is important for establishing the contextual background of the sample and assessing its relevance to the study objectives. The analysis covers six key dimensions: gender, age, education, monthly income, frequency of use, and bank used, which together provide a concise overview of the respondents' demographic, socioeconomic, and behavioral characteristics.

As shown in Table 2, the sample was slightly female-dominated, with women accounting for 52.21% of respondents and men 47.79%. In terms of age, the largest group was 19–29 years (31.28%), followed by 50–59 years (27.27%), indicating that the sample was concentrated in both younger and older adult cohorts. Most respondents held a bachelor's degree (35.29%), followed by a master's degree (23.71%), suggesting a relatively well-educated sample. The most common monthly income category was Rp 1,500,000 – Rp 3,000,000 (31.62%), and the largest proportion of respondents reported using mobile banking daily (38.60%). With respect to bank affiliation, Bank Rakyat Indonesia (BRI) was the most frequently used bank (34.93%), followed by Bank Mandiri (27.57%) and Bank Negara Indonesia (BNI) (24.63%).

Table 2. Demographic Characteristics of the Respondent (n=544)

Variables	Category	Frequency	Percentage (%)
Gender	Male	260	47.79
	Female	284	52.21
Age	19–29 years	170	31.28
	30–39 years	83	15.32
	40–49 years	82	15.01
	50–59 years	148	27.27
	60–69 years	55	10.11
	70–79 years	5	0.86
	80–89 years	1	0.15
Education	High school	89	16.36
	Vocational	95	17.46
	Bachelor's	192	35.29
	Master's	129	23.71

Variables	Category		Frequency	Percentage (%)
	Doctorate		39	7.17
Income (Monthly)*	< Rp1,500,000		128	23.53
	Rp1,500,000 – Rp3,000,000		172	31.62
	Rp3,000,001 – Rp4,500,000		109	20.04
	Rp4,500,001 – Rp6,000,000		73	13.42
	> Rp6,000,000		62	11.4
Frequency of Use	Daily		210	38.6
	Several times a week		148	27.21
	Once a week		79	14.52
	Several times a month		67	12.32
	Rarely		40	7.35
Bank Used	Bank Mandiri		150	27.57
	Bank Rakyat Indonesia (BRI)		190	34.93
	Bank Negara Indonesia (BNI)		134	24.63
	Bank Tabungan Negara (BTN)		70	12.87

* $ 1.00 = Rp 16,500

Table 3. Reflective Measurement Model Assessment

Construct	Items	Factors Loading	CR	AVE	Cronbach's Alpha
Actual Usage	AS1	0.857	0.906	0.706	0.862
	AS2	0.851			
	AS3	0.823			
	AS4	0.823			
Information Quality	IQ1	0.843	0.934	0.739	0.912
	IQ2	0.856			
	IQ3	0.855			
	IQ4	0.877			
	IQ5	0.865			
Perceived Ease of Use	PEOU1	0.925	0.946	0.853	0.914
	PEOU2	0.933			
	PEOU3	0.912			
Perceived Usefulness	PU1	0.773	0.894	0.679	0.844
	PU2	0.862			
	PU3	0.860			
	PU4	0.799			
System Quality	SQ1	0.827	0.892	0.675	0.839
	SQ2	0.863			
	SQ3	0.847			
	SQ4	0.743			
Service Quality	SVQ1	0.872	0.937	0.787	0.838
	SVQ2	0.910			
	SVQ3	0.911			
	SVQ4	0.854			
User Satisfaction	SAT1	0.756	0.884	0.656	0.825
	SAT2	0.825			
	SAT3	0.834			
	SAT4	0.822			

4.2. Measurement Model Assessments

The reflective measurement model demonstrated satisfactory indicator reliability, internal consistency reliability, and convergent validity (Table 3). All outer loadings exceeded the recommended threshold of 0.70, ranging from 0.743 to 0.933. Cronbach's alpha values ranged from 0.825 to 0.914, composite reliability values ranged from 0.884 to 0.946, and average variance extracted (AVE) values ranged from 0.656 to 0.853. These results indicate that the indicators consistently represented their intended constructs and that each construct explained more than 50% of the variance in its respective measures.

4.3. Discriminant Validity

Discriminant validity was assessed to determine whether each latent construct was empirically distinct from the others. In PLS-SEM, discriminant validity can be evaluated using the Heterotrait-Monotrait ratio (HTMT), which compares the mean correlations across constructs with the mean correlations within the same construct. HTMT values below the recommended threshold indicate adequate construct distinctiveness [59], [73].

Table 4.   Discriminant Validity Based on HTMT Ratios

Variable	AU	IQ	PEOU	PU	SVQ	SQ	SAT
Actual Usage (AU)	1.000						
Information Quality (IQ)	0.544	1.000					
Perceived Ease of Use (PEOU)	0.542	0.658	1.000				
Perceived Usefulness (PU)	0.483	0.568	0.609	1.000			
Service Quality (SVQ)	0.516	0.647	0.604	0.444	1.000		
System Quality (SQ)	0.630	0.834	0.783	0.680	0.744	1.000	
User Satisfaction (SAT)	0.609	0.708	0.689	0.625	0.649	0.777	1.000

Table 5.   Structural Model Explanatory and Predictive Assessment

Endogenous construct	Coefficient of Determination (R²)	Predictive Relevance (Q²)
Actual Usage (AU)	0.273	0.962
Perceived Usefulness (PU)	0.302	
User Satisfaction (SAT)	0.512	

Table 6.   Path Coefficients and Hypothesis Testing Results

Hypothesis	Path	β	t-value	p-value	Decision
H1	PEU → PU	0.549	14.213	<0.001	Supported
H2	PU → US	0.192	4.552	<0.001	Supported
H3	SQ → US	0.247	4.041	<0.001	Supported
H4	IQ → US	0.225	3.340	0.001	Supported
H5	SVQ → US	0.195	4.131	<0.001	Supported
H6	US → AU	0.523	12.044	<0.001	Supported

4.4. Structural Model Assessment

The structural model was assessed using the coefficient of determination (R²) and predictive relevance (Q²). In PLS-SEM, R2 indicates the model's ability to explain the variance in endogenous constructs, whereas Q² assesses predictive relevance. A Q² value greater than zero indicates that the model has predictive relevance [62].

The results presented in Table 5 show that perceived usefulness had an R² value of 0.302, user satisfaction had an R² value of 0.512, and actual usage had an R² value of 0.273. These findings indicate that the model explained the greatest proportion of variance in user satisfaction, followed by perceived usefulness and actual usage. Overall, the model demonstrates adequate explanatory power for the endogenous constructs, particularly user satisfaction. The reported Q² value of 0.962 suggests very high predictive relevance. However, for greater transparency and precision, the specific endogenous construct to which this Q² value pertains should be explicitly identified in the final manuscript.

4.5. Hypothesis Testing

All six hypothesized relationships were statistically significant and supported (Table 6). The strongest path in the model was the effect of perceived ease of use on perceived usefulness (β = 0.549, t = 14.213, p < 0.001), indicating that interface simplicity and operational clarity strongly shape the perceived utility of mobile banking.

User satisfaction also had a substantial positive effect on actual usage ($\beta = 0.523$, t = 12.044, p < 0.001), confirming that favorable post-adoption evaluations translate into stronger behavioral reliance on the application. Among the antecedents of user satisfaction, system quality exhibited the largest direct effect ($\beta = 0.247$), followed by

information quality ($\beta = 0.225$), service quality ($\beta = 0.195$), and perceived usefulness ($\beta = 0.192$). This pattern suggests that, in post-adoption mobile banking, technical reliability and information performance are at least as important as instrumental usefulness in shaping user satisfaction.
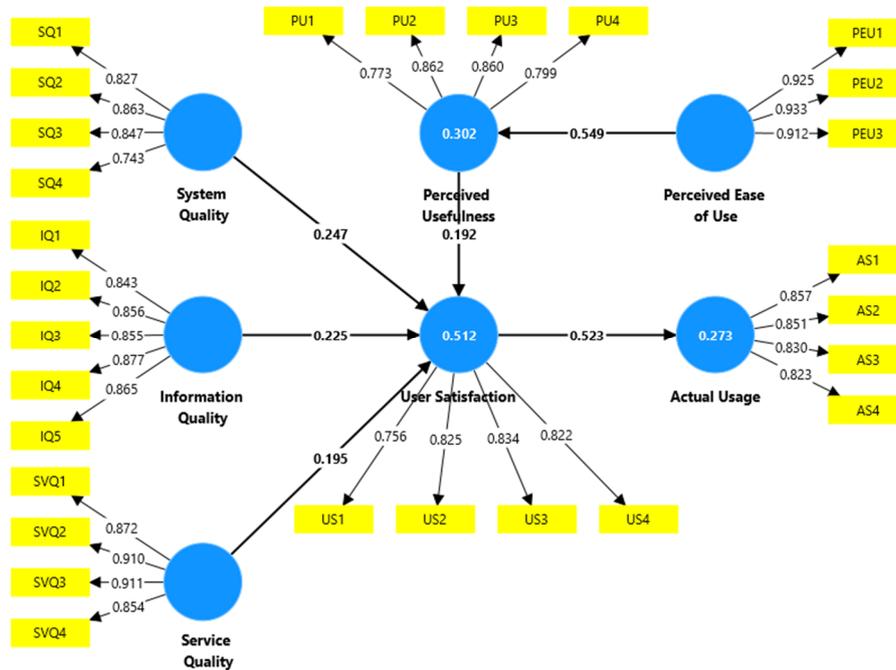
Figure 2. Estimated PLS-SEM Structural Model with Standardized Path Coefficients

Overall, the findings support the integrated post-adoption model. Perceived ease of use enhances perceived usefulness, perceived usefulness and service-performance dimensions improve satisfaction, and satisfaction subsequently drives actual mobile banking usage. Substantively, the model indicates that post-adoption behavior is shaped not only by perceived utility but also by the reliability, informational quality, and support quality of the digital banking environment.

5. DISCUSSION

This study demonstrates that actual mobile banking usage in the post-adoption stage is best explained by an integrated framework combining the Technology Acceptance Model (TAM) and the DeLone and McLean IS Success Model. All six hypothesized paths were significant, although their relative magnitudes are theoretically informative. Perceived ease of use exerted the strongest upstream effect on perceived usefulness ($\beta = 0.549$), whereas user satisfaction exerted the strongest downstream effect on actual usage ($\beta = 0.523$). Among the antecedents of satisfaction, system quality was the strongest predictor ($\beta = 0.247$), followed by information quality ($\beta = 0.225$), service quality ($\beta = 0.195$), and perceived usefulness ($\beta = 0.192$). In terms of explained variance, the model accounted for substantially more

variance in user satisfaction ($R^2 = 0.512$) than in perceived usefulness ($R^2 = 0.302$) or actual usage ($R^2 = 0.273$), indicating that the framework is particularly effective in explaining post-use evaluations, while offering moderate explanatory power for realized behavior.

This pattern is consistent with the growing body of scholarship arguing that mobile banking research must move beyond first-time adoption and intention-based models. Systematic and bibliometric reviews show that the literature has long been dominated by TAM-, UTAUT-, and intention-centered explanations, whereas post-adoption constructs such as satisfaction, continuance, trust reinforcement, and actual use remain comparatively underdeveloped conceptually [9], [11], [74]–[78]. More recent meta-analytic evidence further suggests that satisfaction in mobile banking is not merely an isolated affective outcome; rather, it is systematically associated with technology acceptance beliefs, quality factors, credibility-related variables, and behavioral outcomes such as actual use, continuance intention, and loyalty [45]. The present findings are therefore important because they position actual mobile banking usage within a cumulative post-adoption process rather than treating it as a simple continuation of initial acceptance.

The strong effect of perceived ease of use on perceived usefulness suggests that usability remains an important source of value recognition even after adoption. In mobile banking, ease of use reduces the cognitive and

procedural effort required to complete transactions, interpret menus, and recover from minor errors, thereby making the application appear more instrumental for everyday financial management. This interpretation is fully consistent with the core logic of TAM. Also, it aligns with more recent synthesis work showing that ease of use and usefulness continue to matter across digital financial services, even when adoption has become routine [1]. In other words, customers may have already adopted the application, but they continue to infer its usefulness from how frictionless the service feels during repeated interactions.

However, this result should not be overstated. The mobile banking literature suggests that ease of use is often necessary but not always decisive once deeper relational or post-adoption outcomes are considered. Arcand et al. [25], for example, found that design-related aspects were less central than security, privacy, and institutional practices in shaping customer relationships. Likewise, recent reviews indicate that trust, security, risk, reputation, and contextual facilitators often compete with or even outweigh pure usability in explaining sustained mobile banking behavior [1], [9], [11]. Cross-cultural and context-sensitive findings further suggest that ease of use may function more as an enabling baseline than as the ultimate determinant of durable attachment. The present result is therefore best interpreted as evidence that usability remains a gateway to perceived value, but not the only pathway to post-adoption reliance.

The positive effect of perceived usefulness on user satisfaction indicates that users continue to evaluate mobile banking in instrumental terms after the initial adoption stage. When the application helps customers save time, conduct transactions efficiently, and manage finances more effectively, satisfaction increases. This finding is consistent with post-adoption theory and with recent evidence showing that usefulness continues to shape customer evaluations even in mature digital service environments [27], [45]. It also resonates with continuance-oriented studies in adjacent financial technology contexts, where users tend to remain active when expected functional value is repeatedly confirmed over time [30].

At the same time, the present study shows that perceived usefulness is not the strongest driver of satisfaction. All three quality dimensions either matched or exceeded their effect, with system quality emerging as the most influential. This is theoretically important because it suggests a shift in emphasis from expected benefit to experienced performance. Once mobile banking becomes normalized, users may begin to take usefulness for granted and become more sensitive to whether the service is stable, informative, responsive, and trustworthy in practice. This interpretation is supported by recent reviews of service quality in mobile banking, which emphasize that customer-centered outcomes increasingly depend on the lived service experience rather

than on abstract perceptions of utility alone [28], [79], [80]. Accordingly, usefulness remains relevant, but post-adoption satisfaction appears to be shaped more strongly by quality in use than by usefulness in principle.

Among the quality dimensions, system quality had the strongest effect on satisfaction. This finding is theoretically plausible because banking is a high-stakes digital context in which speed, stability, accessibility, security, and transaction reliability are interpreted not merely as technical attributes but also as signals of institutional competence. When an application crashes, loads slowly, fails authentication, or interrupts transfers, users may not distinguish between a technical failure and a service failure. In this sense, system quality in mobile banking often functions simultaneously as an operational cue and a trust cue. This interpretation is consistent with empirical work showing that system quality is foundational to favorable performance and usage outcomes in mobile banking [3], [26], [53].

At the same time, evidence from the last decade suggests that the dominance of system quality is not universal. Sharma and Sharma [29] showed that trust, service quality, and information quality can be especially consequential for actual usage. Geebren and Jabbar [81] further argued that post-adoption satisfaction is difficult to understand without explicitly theorizing trust as a mechanism linking quality perceptions to evaluative outcomes. Recent trust-focused work also indicates that the effects of antecedents vary across gender, experience, and usage frequency, implying that what appears to be a strong system-quality effect in one context may partly reflect different trust-building processes in another [4], [54], [82]. The strong system-quality coefficient observed here should therefore not be treated as a universal law, but rather as context-specific evidence that Indonesian users may regard technical smoothness and transactional reliability as the most immediate indicators of service dependability.

Information quality also had a strong positive effect on satisfaction, which is unsurprising in a service context in which users rely on the application for balances, confirmations, transaction histories, alerts, and status messages. In mobile banking, accurate and comprehensible information reduces uncertainty and enables users to act with greater confidence. Prior empirical studies and review-based evidence consistently identify information quality as a central pillar of digital banking evaluations because even a highly usable interface becomes less meaningful when the information presented is delayed, incomplete, or ambiguous [3], [28], [34]. The present finding, therefore, reinforces the view that users do not merely interact with an application interface; they continuously evaluate the informational credibility of the bank through that interface.

Service quality was also significant, although it was the weakest of the three quality dimensions. This should not be interpreted as evidence of limited importance. A

more careful interpretation is that service quality in mobile banking is often episodic, becoming especially salient when users encounter disruptions, failed transactions, or the need for assistance. Recent work shows that service quality contributes to continuance through satisfaction [83], while service failures can materially undermine usage behavior by reducing satisfaction [84]. Moreover, the service-quality literature has become increasingly nuanced over the last decade. Jun and Palacios [22] and Arcand et al. [25] emphasized relational and experiential dimensions. In contrast, more recent review and text-mining studies show that users consistently raise concerns about customer care, complaint handling, recovery speed, and post-update support in app-store reviews [85]–[87]. The relatively smaller coefficient for service quality in the current model may therefore reflect not low substantive importance, but rather the fact that survey-based measures often capture only part of the broader service-recovery and relational experience documented in more recent research.

The strongest downstream relationship in the model was the effect of user satisfaction on actual usage. This is a central finding because it shows that post-adoption evaluation is not merely symbolic or attitudinal. Users who are satisfied are more likely to incorporate mobile banking into their routine financial activities. This result aligns with the strongest stream of recent post-adoption evidence in mobile banking, which consistently identifies satisfaction as a proximate driver of continuance, loyalty, and usage intensity [15], [81], [88]. It also accords with the broader logic of digital services: users continue to engage not simply because a system is available, but because repeated experience confirms that it is worth relying on.

Nevertheless, the moderate explanatory power for actual usage (R^2 = 0.273) is equally important because it suggests that satisfaction, although powerful, is not sufficient on its own. The mobile banking literature indicates that actual usage is shaped by a wider set of factors than satisfaction alone, including trust, perceived risk, habit, facilitating conditions, channel substitution, reputation, and contextual constraints [4], [47], [53]. Continuance studies likewise show that perceived value, communication quality, and experience-enhancing features can influence reuse decisions even when basic satisfaction is already present [89]. The modest R^2 should therefore not be interpreted solely as a limitation of the current model; it also reflects the inherently multidetermined nature of actual mobile banking behavior.

A first alternative explanation is that some of the observed effects of quality may partially proxy trust. Several post-adoption studies argue that system quality, information quality, and service quality enhance satisfaction because they reinforce trust, which in turn stabilizes continued use and positive service evaluation [81], [90]. A recent meta-analysis confirms that trust in mobile banking is deeply intertwined with quality factors, acceptance factors, risk factors, and behavioral outcomes, and that these associations vary across cultural settings [27]. Under this interpretation, the current model may slightly overattribute explanatory weight to quality constructs because trust was not explicitly specified as a mediator.

A second boundary condition is that factors outside the attitudinal and quality domain also shape the actual usage. Users may remain satisfied with mobile banking but still distribute transactions across other channels, such as internet banking, QR payment applications, ATMs, or branch services, depending on transaction type, urgency, regulation, accessibility, and digital literacy. Recent studies on actual use and accessibility show that customer behavior may be constrained by capability differences, vulnerability, and situational barriers even when digital services are positively evaluated [53], [91], [92]. A third boundary condition concerns heterogeneity in post-adoption pathways. Satisfaction does not lead to identical downstream outcomes for all users; technology readiness, experience level, age cohort, and cultural setting may moderate the relationship between satisfaction and loyalty or between satisfaction and usage [13], [48]. These considerations suggest that the current model captures a strong central pathway, but not the full complexity of mobile banking behavior.

6. IMPLICATION

The managerial implications of these findings are more specific than a generic recommendation to improve the application. First, banks should prioritize system robustness, authentication reliability, transaction stability, and recovery from post-update disruptions, because technical smoothness appears to be the most immediate basis of user satisfaction in this sample. Second, they should treat information quality as a strategic asset by ensuring that balances, notifications, transaction histories, and status messages are timely, accurate, and easy to interpret. Third, service quality should be strengthened, particularly in complaint management and failure recovery, because recent evidence from both survey-based and app-review research shows that users become highly sensitive to support failures when problems arise [83], [85], [87]. Finally, usability initiatives should be tied to meaningful task completion so that ease of use continues to reinforce usefulness rather than functioning merely as superficial interface simplicity.

More broadly, the findings indicate that post-adoption mobile banking usage is best understood as a cumulative process in which ease of use strengthens value recognition, experienced quality shapes satisfaction, and satisfaction drives behavioral reliance. At the same time, the broader literature makes clear that this pathway is embedded within a larger network of trust, risk, service

recovery, reputation, and contextual usage conditions. Future research should therefore extend the model by incorporating trust, habit, facilitating conditions, reputation, and service-recovery constructs. It should also consider multimethod designs that combine survey evidence with behavioral logs or app-review analytics. Such extensions would enable scholars to explain not only why users remain satisfied, but also why some become intensive mobile banking users. In contrast, others remain selective or intermittent users despite reporting positive evaluations.

7. CONCLUSION

This study examined actual mobile banking usage in the post-adoption stage by integrating the Technology Acceptance Model and the DeLone and McLean IS Success Model. The findings show that all hypothesized relationships are positive and significant. Perceived ease of use enhances perceived usefulness, while perceived usefulness, system quality, information quality, and service quality all contribute to user satisfaction. User satisfaction then emerges as the strongest predictor of actual usage. These results indicate that continued mobile banking usage is driven not only by users' cognitive evaluation of usefulness, but also by their overall experience of service performance, reliability, and information quality. Accordingly, this study extends the mobile banking literature by showing that actual usage is better understood through a post-adoption perspective that integrates technology acceptance and information systems success.

This study also offers important practical implications for banks and digital financial service providers. To strengthen post-adoption usage, providers should prioritize system reliability, transaction stability, security, information accuracy, and responsive customer support, as these factors are essential for building user satisfaction and encouraging actual use. Nevertheless, the study has several limitations, including its cross-sectional design, the use of self-reported measures of actual usage, and its focus on HIMBARA mobile banking users in Indonesia. Future research should therefore adopt longitudinal designs, incorporate objective usage data, and include additional post-adoption variables such as trust, habit, perceived risk, and service recovery to provide a more comprehensive explanation of sustained mobile banking behavior.

REFERENCES

[1] C. Neves, T. Oliveira, F. Santini, and L. Gutman, "Adoption and use of digital financial services: A meta analysis of barriers and facilitators," Int. J. Inf. Manag. Data Insights, vol. 3, no. 2, p. 100201, 2023, https://doi.org/10.1016/j.jjimei.2023.100201

[2] G. Baptista and T. Oliveira, "Understanding mobile banking: The unified theory of acceptance and use of technology combined with cultural moderators," Comput. Human Behav., vol. 50, pp. 418–430, 2015, https://doi.org/10.1016/j.chb.2015.04.024

[3] C. Tam and T. Oliveira, "Understanding the impact of m-banking on individual performance: DeLone & McLean and TTF perspective," Comput. Human Behav., vol. 61, pp. 233–244, 2016, https://doi.org/10.1016/j.chb.2016.03.016

[4] R. F. Malaquias and Y. Hwang, "An empirical study on trust in mobile banking: A developing country perspective," Comput. Human Behav., vol. 54, pp. 453–461, 2016, https://doi.org/10.1016/j.chb.2015.08.039

[5] Y. Kim, L. Wang, J. Noh, and T. Roh, "Exploring the role of innovation diffusion and trust transfer on technology acceptance: intention to use drone delivery service in China," Asian Bus. Manag., vol. 24, no. 3, pp. 357–384, 2025, https://doi.org/10.1057/s41291-025-00302-y

[6] A. Bhattacherjee, "Understanding information systems continuance: An expectation-confirmation model," MIS Q. Manag. Inf. Syst., vol. 25, no. 3, pp. 351–370, 2001, https://doi.org/10.2307/3250921

[7] M. K. Anam, A. Yunianta, H. J. Alyamani, Erlin, A. Zamsuri, and M. B. Firdaus, "Analysis and Identification of Non-Impact Factors in Smart City Readiness Using Technology Acceptance Analysis: a Case Study in Kampar District, Indonesia," J. Appl. Eng. Technol. Sci., vol. 5, no. 1, pp. 1–17, 2023, https://doi.org/10.37385/jaets.v5i1.2401

[8] Syaifullah, S. A. Ariffin, and N. M. Nordin, "Mobile Tourism Research and Practices: a Comprehensive Bibliometric Exploration and Future Study Direction," J. Appl. Eng. Technol. Sci., vol. 6, no. 1, pp. 21–47, 2024, https://doi.org/10.37385/jaets.v6i1.4970

[9]   N. Souiden, R. Ladhari, and W. Chaouali, "Mobile banking adoption: a systematic review," Int. J. Bank Mark., vol. 39, no. 2, pp. 214–241, 2021, https://doi.org/10.1108/IJBM-04-2020-0182

[10]   C. Tam and T. Oliveira, "Literature review of mobile banking and individual performance," Int. J. Bank Mark., vol. 35, no. 7, pp. 1042–1065, 2017, https://doi.org/10.1108/IJBM-09-2015-0143

[11]   M. Naeem, S. T. Jawaid, and S. Mustafa, "Evolution of modified TAM associated with e-banking services adoption: a systematic PRISMA review from 1975 to 2021," J. Model. Manag., vol. 18, no. 3, pp. 942–972, 2023, https://doi.org/10.1108/JM2-10-2021-0251

[12]   J. P. Shaji, K. S. Shyna, G. R. Maria, and S. Rohit, "Technology Adoption in Banking Sector: A Systematic Literature Review of TAM and UTAUT Models," Stud. Syst. Decis. Control, vol. 236, pp. 205–211, 2025, https://doi.org/10.1007/978-3-031-86712-5_17

[13]   H. Ho, S. M. Han, J. Cha, and L. Pham, "Mobile Banking Customer Satisfaction and Loyalty: The Roles of Technology Readiness," J. Risk Financ. Manag., vol. 18, no. 7, p. 403, 2025, https://doi.org/10.3390/jrfm18070403

[14]   M. Ghobakhloo and M. Fathi, "Modeling the success of application-based mobile banking," Economies, vol. 7, no. 4, p. 114, 2019, https://doi.org/10.3390/economies7040114

[15]   N. Bui, Z. Moore, H. Wimmer, and L. Pham, "Predicting Customer Loyalty in the Mobile Banking Setting: An Integrated Approach," Int. J. E-Services Mob. Appl., vol. 14, no. 1, pp. 1–22, 2022, https://doi.org/10.4018/IJESMA.296576

[16]   F. D. Davis, "Perceived usefulness, perceived ease of use, and user acceptance of information technology," MIS Q. Manag. Inf. Syst., vol. 13, no. 3, pp. 319–339, 1989, https://doi.org/10.2307/249008

[17]   V. Venkatesh and F. D. Davis, "Theoretical extension of the Technology Acceptance Model: Four longitudinal field studies," Manage. Sci., vol. 46, no. 2, pp. 186–204, 2000, https://doi.org/10.1287/mnsc.46.2.186.11926

[18]   W. H. DeLone and E. R. McLean, "Information Systems Success Measurement," Inf. Syst. Success Meas., vol. 2, no. 1, pp. 1–116, 2016, https://doi.org/10.1561/9781680831436

[19]   S. Petter, W. DeLone, and E. McLean, "Measuring information systems success: Models, dimensions, measures, and interrelationships," Eur. J. Inf. Syst., vol. 17, no. 3, pp. 236–263, 2008, https://doi.org/10.1057/ejis.2008.15

[20]   Y. S. Wang and Y. W. Liao, "Assessing eGovernment systems success: A validation of the DeLone and McLean model of information systems success," Gov. Inf. Q., vol. 25, no. 4, pp. 717–733, 2008, https://doi.org/10.1016/j.giq.2007.06.002

[21]   N. Gorla, T. M. Somers, and B. Wong, "Organizational impact of system quality, information quality, and service quality," J. Strateg. Inf. Syst., vol. 19, no. 3, pp. 207–228, 2010, https://doi.org/10.1016/j.jsis.2010.05.001

[22]   M. Jun and S. Palacios, "Examining the key dimensions of mobile banking service quality: an exploratory study," Int. J. Bank Mark., vol. 34, no. 3, pp. 307–326, 2016, https://doi.org/10.1108/IJBM-01-2015-0015

[23]   A. G. Khan, R. P. Lima, and M. S. Mahmud, "Understanding the Service Quality and Customer Satisfaction of Mobile Banking in Bangladesh: Using a Structural Equation Model," Glob. Bus. Rev., vol. 22, no. 1, pp. 85–100, 2021, https://doi.org/10.1177/0972150918795551

[24]   S. Kamboj, M. Sharma, and B. Sarmah, "Impact of mobile banking failure on bank customers' usage behaviour: the mediating role of user satisfaction," Int. J. Bank Mark., vol. 40, no. 1, pp. 128–153, 2022, https://doi.org/10.1108/IJBM-10-2020-0534

[25]   M. Arcand, S. PromTep, I. Brun, and L. Rajaobelina, "Mobile banking service quality and customer relationships," Int. J. Bank Mark., vol. 35, no. 7, pp. 1066–1087, 2017, https://doi.org/10.1108/IJBM-10-2015-0150

[26]   T. Orehovački, L. Blašković, and M. Kurevija, "Evaluating the Perceived Quality of Mobile Banking Applications in Croatia: An Empirical Study," Futur. Internet, vol. 15, no. 1, p. 8, 2023, https://doi.org/10.3390/fi15010008

[27]   P. Kumar, S. Chauhan, S. Kumar, and P. Gupta, "A meta-analysis of satisfaction in mobile banking: a contextual examination," Int. J. Bank Mark., vol. 42, no. 3, pp. 357–388, 2024, https://doi.org/10.1108/IJBM-04-2023-0236

[28]   N. Palamidovska-Sterjadovska et al., "Service quality in mobile banking," Int. J. Bank Mark., vol. 43, no. 6, pp. 1195–1230, 2025, https://doi.org/10.1108/IJBM-02-2024-0105

[29]   S. K. Sharma, "Integrating cognitive antecedents into TAM to explain mobile banking behavioral intention: A SEM-neural network modeling," Inf. Syst. Front., vol. 21, no. 4, pp. 815–827, 2019, https://doi.org/10.1007/s10796-017-9775-x

[30]   P. Raman and K. Aashish, "To continue or not to continue: a structural analysis of antecedents of mobile payment systems in India," Int. J. Bank Mark., vol. 39, no. 2, pp. 242–271, 2021, https://doi.org/10.1108/IJBM-04-2020-0167

[31]   X. Chen and S. Li, "Understanding continuance intention of mobile payment services: An empirical study," J. Comput. Inf. Syst., vol. 57, no. 4, pp. 287–298, 2017, https://doi.org/10.1080/08874417.2016.1180649

[32]   S. Yuan, L. Liu, B. Su, and H. Zhang, "Determining the antecedents of mobile payment loyalty: Cognitive and affective perspectives," Electron. Commer. Res. Appl., vol. 41, p. 100971, 2020, https://doi.org/10.1016/j.elerap.2020.100971

[33]   W. H. DeLone and E. R. McLean, "The DeLone and McLean model of information systems success: A ten-year update," J. Manag. Inf. Syst., vol. 19, no. 4, pp. 9–30, 2003, https://doi.org/10.1080/07421222.2003.11045748

[34]   S. K. Sharma and M. Sharma, "Examining the role of trust and quality dimensions in the actual usage of mobile banking services: An empirical investigation," Int. J. Inf. Manage., vol. 44, pp. 65–75, 2019, https://doi.org/10.1016/j.ijinfomgt.2018.09.013

[35]   F. D. Davis, R. P. Bagozzi, and P. R. Warshaw, "User Acceptance of Computer Technology: A Comparison of Two Theoretical Models," Manage. Sci., vol. 35, no. 8, pp. 982–1003, 1989.

[36]   A. Jeyaraj, "DeLone & McLean models of information system success: Critical meta-review and research

directions," Int. J. Inf. Manage., vol. 54, p. 102139, 2020, https://doi.org/10.1016/j.ijinfomgt.2020.102139

[37] Q. Zhou et al., "A study on factors affecting service quality and loyalty intention in mobile banking," J. Retail. Consum. Serv., vol. 60, p. 102424, 2021, https://doi.org/10.1016/j.jretconser.2020.102424

[38] J.-C. Gu, S.-C. Lee, and Y.-H. Suh, "Determinants of behavioral intention to mobile banking," Expert Syst. Appl., vol. 36, no. 9, pp. 11605–11616, 2009, https://doi.org/10.1016/j.eswa.2009.03.024

[39] M. T. Lu, G. H. Tzeng, H. Cheng, and C. C. Hsu, "Exploring mobile banking services for user behavior in intention adoption: using new hybrid MADM model," Serv. Bus., vol. 9, no. 3, pp. 541–565, 2015, https://doi.org/10.1007/s11628-014-0239-9

[40] V. Venkatesh and H. Bala, "Technology acceptance model 3 and a research agenda on interventions," Decis. Sci., vol. 39, no. 2, pp. 273–315, 2008, https://doi.org/10.1111/j.1540-5915.2008.00192.x

[41] L. M. Maruping, H. Bala, V. Venkatesh, and S. A. Brown, "Going beyond intention: Integrating behavioral expectation into the unified theory of acceptance and use of technology," J. Assoc. Inf. Sci. Technol., vol. 68, no. 3, pp. 623–637, 2017, https://doi.org/10.1002/asi.23699

[42] A. S. Al-Adwan, N. Li, A. Al-Adwan, G. A. Abbasi, N. A. Albelbisi, and A. Habibi, ""Extending the Technology Acceptance Model (TAM) to Predict University Students' Intentions to Use Metaverse-Based Learning Platforms"," Educ. Inf. Technol., vol. 28, no. 11, pp. 15381–15413, 2023, https://doi.org/10.1007/s10639-023-11816-3

[43] A. T. Lee, R. K. Ramasamy, and A. Subbarao, "Understanding Psychosocial Barriers to Healthcare Technology Adoption: A Review of TAM Technology Acceptance Model and Unified Theory of Acceptance and Use of Technology and UTAUT Frameworks," in Healthcare (Switzerland), 2025, vol. 13, no. 3, p. 250. https://doi.org/10.3390/healthcare13030250

[44] S. H. Alshammari and E. Babu, "The mediating role of satisfaction in the relationship between perceived usefulness, perceived ease of use and students' behavioural intention to use ChatGPT," Sci. Rep., vol. 15, no. 1, p. 7169, 2025, https://doi.org/10.1038/s41598-025-91634-4

[45] S. Kumar, S. Chawla, P. Kumar, and A. Arora, "An empirical investigation on mobile payments users' experience: insights using PLS-SEM approach," TQM J., pp. 1–26, 2025, https://doi.org/10.1108/TQM-01-2025-0044

[46] J. Schrank, "The impact of artificial intelligence on behavioral intentions to use mobile banking in the post-COVID-19 era," Front. Artif. Intell., vol. 8, p. 1649392, 2025, https://doi.org/10.3389/frai.2025.1649392

[47] Y. T. H. Nguyen, T. Tapanainen, and H. T. T. Nguyen, "Reputation and its consequences in Fintech services: the case of mobile banking," Int. J. Bank Mark., vol. 40, no. 7, pp. 1364–1397, 2022, https://doi.org/10.1108/IJBM-08-2021-0371

[48] C. H. Sampaio, W. J. Ladeira, and F. D. O. Santini, "Apps for mobile banking and customer satisfaction: a cross-cultural study," Int. J. Bank Mark., vol. 35, no. 7, pp. 1131–1151, 2017, https://doi.org/10.1108/IJBM-09-2015-0146

[49] T. Zhang, C. Lu, and M. Kizildag, "Banking 'on-the-go': examining consumers' adoption of mobile banking services," Int. J. Qual. Serv. Sci., vol. 10, no. 3, pp. 279–295, 2018. https://doi.org/10.1108/IJQSS-07-2017-0067

[50] A. A. Shaikh and H. Karjaluoto, "Mobile banking adoption: A literature review," Telemat. Informatics, vol. 32, no. 1, pp. 129–142, 2015, https://doi.org/10.1016/j.tele.2014.05.003

[51] D. Suhartanto, D. Dean, T. A. T. Ismail, and R. Sundari, "Mobile banking adoption in Islamic banks: Integrating TAM model and religiosity-intention model," J. Islam. Mark., vol. 11, no. 6, pp. 1405–1418, 2020, https://doi.org/10.1108/JIMA-05-2019-0096

[52] E. M. Abu-Taieh et al., "Continued Intention to Use of M-Banking in Jordan by Integrating UTAUT, TPB, TAM and Service Quality with ML," J. Open Innov. Technol. Mark. Complex., vol. 8, no. 3, p. 120, 2022, https://doi.org/10.3390/joitmc8030120

[53] A. M. Baabdullah, A. A. Alalwan, N. P. Rana, H. Kizgin, and P. Patil, "Consumer use of mobile banking (M-Banking) in Saudi Arabia: Towards an integrated model," Int. J. Inf. Manage., vol. 44, pp. 38–52, 2019, https://doi.org/10.1016/j.ijinfomgt.2018.09.002

[54] A. Geebren and A. Jabbar, "Antecedents of Trust in Mobile Banking: Do They Differ Across Gender, Customer Experience and Frequency of Use?," Inf. Syst. Manag., vol. 42, no. 4, pp. 598–621, 2025, https://doi.org/10.1080/10580530.2025.2506365

[55] L. Pokhrel, A. K C, and B. K. Shrestha, "Does mobile banking service quality matter? A two-staged structural equation modeling-artificial neural network approach," J. Mark. Anal., p. 1, 2024, https://doi.org/10.1057/s41270-024-00363-6

[56] A. Bhattacherjee, "Understanding information systems continuance," MIS Q., vol. 25, no. 3, pp. 351–370, 2001, https://doi.org/10.2307/3250921

[57] P. Pietrzak and M. Roman, "Examining the role of trust in the usage of mobile banking services: An empirical investigation from Poland," Trust Digit. Bus. Theory Pract., vol. 44, pp. 245–255, 2022, https://doi.org/10.4324/9781003266525-21

[58] N. Urbach and B. Müller, "The Updated DeLone and McLean Model of Information Systems Success," in Information Systems Theory: Explaining and Predicting Our Digital Society, Vol. 1, Springer, 2012, pp. 1–18. https://doi.org/10.1007/978-1-4419-6108-2_1

[59] J. F. Hair Jr., L. M. Matthews, R. L. Matthews, and M. Sarstedt, "PLS-SEM or CB-SEM: updated guidelines on which method to use," Int. J. Multivar. Data Anal., vol. 1, no. 2, p. 107, 2017, https://doi.org/10.1504/ijmda.2017.10008574

[60] J. F. Hair, B. J. Babin, R. E. Anderson, and W. C. Black, Multivariate Data Analysis. Belmont, CA: Cengage Learning, 2022.

[61] M. Sarstedt, C. M. Ringle, and J. F. Hair, Partial Least Squares Structural Equation Modeling. Asheboro, USA: Statistical Publishing Associates, 2021. https://doi.org/10.1007/978-3-319-57413-4_15

[62] J. F. Hair, G. T. M. Hult, C. M. Ringle, and M. Sarstedt, A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM), 3rd ed. Thousand Oaks, CA: SAGE Publications Inc., 2021.

[63] G. O. Boateng, T. B. Neilands, E. A. Frongillo, H. R. Melgar-Quiñonez, and S. L. Young, "Best Practices for Developing and Validating Scales for Health, Social, and Behavioral Research: A Primer," Front. Public Heal., vol. 6, p. 149, 2018, https://doi.org/10.3389/fpubh.2018.00149

[64] D. C. Miller and N. J. Salkind, Handbook of Research Design & Social Measurement. London, United Kingdom: SAGE Publications, 2002.

[65] P. M. Podsakoff, S. B. MacKenzie, J. Y. Lee, and N. P. Podsakoff, "Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies," J. Appl. Psychol., vol. 88, no. 5, pp. 879–903, 2003, https://doi.org/10.1037/0021-9010.88.5.879

[66] World Medical Association, "World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects," Jama, vol. 310, no. 20, pp. 2191–2194, 2013.

[67] P. M. Podsakoff, S. B. MacKenzie, and N. P. Podsakoff, "Sources of method bias in social science research and recommendations on how to control it," Annu. Rev. Psychol., vol. 63, no. 1, pp. 539–569, 2012, https://doi.org/10.1146/annurev-psych-120710-100452

[68] J. F. Hair, W. C. Black, B. J. Babin, R. E. Anderson, and R. L. Tatham, Multivariate Data Analysis, 8th ed. Edinburgh Gate, Harlow: Pearson Education Limited, 2019.

[69] C. M. Ringle, S. Wende, and J.-M. Becker, "SmartPLS 4," Bönningstedt: SmartPLS, 2024. https://www.smartpls.com

[70] J. F. Hair, J. J. Risher, M. Sarstedt, and C. M. Ringle, "When to use and how to report the results of PLS-SEM," Eur. Bus. Rev., vol. 31, no. 1, pp. 2–24, 2019, https://doi.org/10.1108/EBR-11-2018-0203

[71] C. Fornell and D. F. Larcker, "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," J. Mark. Res., vol. 18, no. 1, p. 39, 1981, https://doi.org/10.2307/3151312

[72] J. Henseler, C. M. Ringle, and M. Sarstedt, "A new criterion for assessing discriminant validity in variance-based structural equation modeling," J. Acad. Mark. Sci., vol. 43, no. 1, pp. 115–135, 2015, https://doi.org/10.1007/s11747-014-0403-8

[73] P. W. Fombelle et al., "Customer deviance: A framework, prevention strategies, and opportunities for future research," J. Bus. Res., vol. 116, pp. 387–400, 2020, https://doi.org/10.1016/j.jbusres.2019.09.012

[74] K. Kohli, B. Kumar, P. Kohli, and M. Kashyap, "Examining the factors affecting mobile banking adoption among users in the Himalayan region of Uttarakhand: an extension of the technology acceptance model through structural equation modelling," Int. J. Electron. Bank., vol. 4, no. 3, pp. 294–317, 2024, https://doi.org/10.1504/ijebank.2024.139221

[75] C. Tam and T. Oliveira, "Understanding mobile banking individual performance: The DeLone & McLean model and the moderating effects of individual culture," Internet Res., vol. 27, no. 3, pp. 538–562, 2017, https://doi.org/10.1108/IntR-05-2016-0117

[76] S. Syaifullah, S. A. Ariffin, and N. M. Nordin, "Acceptance of Culture Mobile Tourism Among Tourist: A Model Development Study," J. Appl. Eng. Technol. Sci., vol. 7, no. 1, pp. 356–375, 2025,

https://doi.org/10.37385/jaets.v7i1.7588

[77] S. N. Faizah, L. N. A. B. Dina, A. Kartiko, M. A. Ma'arif, and M. S. roni Hasan, "Student Acceptance Study of Phet Simulation With an Expanded Technology Acceptance Model Approach," J. Appl. Eng. Technol. Sci., vol. 5, no. 1, pp. 279–290, 2023, https://doi.org/10.37385/jaets.v5i1.3041

[78] A. A. Zulfahmi, R. Sadikin, and E. H. Hermaliani, "Hybrid Between Pieces Framework and Technology Acceptance Model (TAM) in Quality Testing of Mobile Application Office Automation System (Kemenkeu)," J. Appl. Eng. Technol. Sci., vol. 4, no. 1, pp. 286–306, 2022, https://doi.org/10.37385/jaets.v4i1.1087

[79] A. Shankar, B. Datta, and C. Jebarajakirthy, "Are the Generic Scales Enough to Measure Service Quality of Mobile Banking? A Comparative Analysis of Generic Service Quality Measurement Scales to Mobile Banking Context," Serv. Mark. Q., vol. 40, no. 3, pp. 224–244, 2019, https://doi.org/10.1080/15332969.2019.1630176

[80] R. B. Mostafa, "Mobile banking service quality: a new avenue for customer value co-creation," Int. J. Bank Mark., vol. 38, no. 5, pp. 1107–1132, 2020, https://doi.org/10.1108/IJBM-11-2019-0421

[81] A. Geebren, A. Jabbar, and M. Luo, "Examining the role of consumer satisfaction within mobile eco-systems: Evidence from mobile banking services," Comput. Human Behav., vol. 114, p. 106584, 2021, https://doi.org/10.1016/j.chb.2020.106584

[82] M. Che et al., "Investigating customers' continuous trust towards mobile banking apps," Humanit. Soc. Sci. Commun., vol. 10, no. 1, pp. 1–10, 2023, https://doi.org/10.1057/s41599-023-02483-3

[83] L. Pokhrel and A. K.C, "Mobile banking service quality and continuance intention: mediating role of satisfaction: a two-stage structural equation modeling-artificial neural network approach," Int. J. Bank Mark., vol. 42, no. 3, pp. 389–413, 2024, https://doi.org/10.1108/IJBM-11-2022-0512

[84] S. Kamboj, M. Matharu, W. M. Lim, F. Ali, and S. Kumar, "Consumer adoption of green hotels: understanding the role of value, innovation, and involvement," J. Hosp. Mark. Manag., vol. 31, no. 7, pp. 819–849, 2022, https://doi.org/10.1080/19368623.2022.2071370

[85] B. H. Leem and S. W. Eum, "Using text mining to measure mobile banking service quality," Ind. Manag. Data Syst., vol. 121, no. 5, pp. 993–1007, 2021, https://doi.org/10.1108/IMDS-09-2020-0545

[86] L. Çallı, "Exploring mobile banking adoption and service quality features through user-generated content: the application of a topic modeling approach to Google Play Store reviews," Int. J. Bank Mark., vol. 41, no. 2, pp. 428–454, 2023, https://doi.org/10.1108/IJBM-08-2022-0351

[87] A. Hussain, A. Hannan, and M. Shafiq, "Exploring mobile banking service quality dimensions in Pakistan: a text mining approach," Int. J. Bank Mark., vol. 41, no. 3, pp. 601–618, 2023, https://doi.org/10.1108/IJBM-08-2022-0379

[88] A. A. Pham and D. Bui, "Understanding mobile Banking Loyalty Among Vietnamese Gen Z and Millennials: The Impact of Service Quality and Relative Advantage," J. Glob. Inf. Technol. Manag., vol. 28, no. 4, pp. 322–339,

2025,
https://doi.org/10.1080/1097198X.2025.2568338

[89] A. Ciunova-Shuleska, N. Palamidovska-Sterjadovska, and J. Prodanova, "What drives m-banking clients to continue using m-banking services?," J. Bus. Res., vol. 139, pp. 731–739, 2022, https://doi.org/10.1016/j.jbusres.2021.10.024

[90] A. Geebren and A. Jabbar, "Factors that influence customer trust and satisfaction in mobile banking: A problematization approach," Int. J. E-bus. Res., vol. 17, no. 3, pp. 66–82, 2021,

https://doi.org/10.4018/IJEBR.2021070105

[91] J. R. Rodriguez-Barboza et al., "Posthumanist Technologies in Business: AI and Cloud Computing for Global Optimization and Ethical Challenges," Adv. Sustain. Sci. Eng. Technol., vol. 6, no. 4, 2024, https://doi.org/10.26877/asset.v6i4.1064

[92] N. A. Khumaira and M. T. Safirin, "Impact of Employee Placement, Motivation, and Career Development on Performance and Productivity at Bank XYZ Using PLS-SEM," Adv. Sustain. Sci. Eng. Technol., vol. 7, no. 1, 2025, https://doi.org/10.26877/asset.v7i1.662