



Beyond Utility: Habitual Dynamics in Mobile Payment Continuance Post-Pandemic – An Extension of Technology Continuance Theory

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Abstract

Background: The rapid adoption of digital payment services in Indonesia surged during the COVID-19 pandemic, reaching 96% population penetration by 2024. However, a critical research gap exists: most studies focus on initial adoption, leaving post-pandemic continuance behavior—particularly the role of habit—underexamined. This study addresses this gap by investigating post-adoption mobile payment continuance through the Technology Continuance Theory (TCT), extended with habit as a moderating variable.

Objective: The objective of this study is to explore the factors influencing users' continuance intention to use digital payment services in Indonesia after the COVID-19 pandemic. It aims to incorporate habit as a moderating variable within the TCT framework.

Methods: Data were collected from 264 urban respondents who have consistently used digital payment services since the pandemic. A partial least squares structural equation modeling (PLS-SEM) approach was employed to analyze the data and test the proposed model.

Results: The study found that user attitude, satisfaction, and perceived ease of use significantly influence continuance intention. Additionally, confirmation of usage experience positively impacts satisfaction and perceived usefulness. Interestingly, perceived usefulness does not directly influence continuance intention. The study revealed that habit plays a dual role: it strengthens the relationship between perceived usefulness and continuance intention while weakening the influence of satisfaction.

Conclusion: The findings suggest that habit significantly affects post-adoption behavior, shifting the decision-making process from deliberate to automatic. Practical implications for fintech providers include fostering habit formation through personalization and satisfaction monitoring. This study extends TCT by integrating habit as a crucial moderating factor in continuance intention.

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INTRODUCTION

The rapid development of financial technology has transformed payment methods worldwide, including in Indonesia. Mobile payments, which include digital wallets such as GoPay, OVO, DANA, ShopeePay, LinkAja, and mobile banking services, are increasingly accepted as faster and more efficient payment alternatives to traditional methods (Lin et al., 2020; Mouakket, 2020).

Ease of use significantly increases user satisfaction with these services, mainly due to intuitive and responsive applications (Rahardja et al., 2023). To accelerate the adoption of digital payments, the Government of Indonesia, through Bank Indonesia, has integrated various digital payment methods into a universal QR code system called QRIS, simplifying transactions and increasing user convenience (Nida & Alfirdaus, 2024; Nugrahini & Alfian, 2021). In addition, these systems often offer promotional incentives such as discounts and loyalty programs Liébana (2020) and feature real-time expense tracking that supports financial management (Rahardja et al., 2023).

Mobile payment adoption was driven primarily by the COVID-19 pandemic Sreelakshmi (2024), which compelled users to adopt this method to minimize the risk of virus transmission. Following the pandemic, mobile payments have continued to trend upward. According to the most recent data from Visa in 2024, cash usage declined to 64% by 2023, while mobile payment usage reached 92% (Saputra, 2024). According to data extrapolated from the Indonesia Fintech Trends 2024 survey, this trend was expected to reach as high as 96% by the end of 2024 (Reynaldy, 2024). Repeated use has established new habits (Istijanto & Handoko, 2022). The sustainability of this trend implies that users are likely to continue utilizing technology-based services (Tanjung et al., 2023). Usability is another crucial factor affecting users' attitudes toward mobile payments, particularly in situations where features, functionality, and practical benefits are emphasized (Prompunthum & Chirapanda, 2024).

Despite the extensive literature on mobile payment adoption, a critical research gap persists: most existing studies focus on the initial adoption stage and the factors that drive it rather than explaining why users maintain or discontinue usage after adoption. In Indonesia specifically, while mobile payment penetration has reached 96% of the population Reynaldy (2024) and digital wallet usage increased by 92% in 2023 alone Saputra (2024), the sustained post-pandemic continuation of these behaviors remains underexamined. Although many studies on mobile payments—especially in Indonesia—have been conducted, most focus on identifying factors influencing initial adoption rather than post-adoption continuance. This gap is particularly important because the post-pandemic context represents a critical inflection point: users who adopted mobile payments out of necessity during COVID-19 must now consciously choose to continue using them, making the psychological and habitual mechanisms of continuance fundamentally different from the drivers of initial adoption.

TCT has been applied across diverse technology contexts, including internet banking Rahi (2020); Rahi (2021) chatbot services Nguyen (2021), mobile learning Wang (2021), and e-wallets (Tanjung et al., 2023). However, these studies share a critical limitation: they predominantly examine TCT constructs—confirmation, perceived usefulness, satisfaction, and attitude—as direct determinants of continuance intention without accounting for the role of behavioral habit as a boundary condition that fundamentally alters these relationships. This study addresses this limitation by extending TCT with habit as a moderating variable, thereby providing a more nuanced explanation of post-adoption behavior that prior TCT applications have not fully captured.

In addition, the variable of habit as a moderator within the TCT framework has rarely been studied; however, it can strengthen understanding of how habits affect the sustainability of technology use. Several previous studies have examined the continued use of mobile payments during the COVID-19 pandemic (Daragmeh et al., 2021; Liu et al., 2022). However, since the end of the pandemic, relatively few studies have specifically discussed the continued use of mobile payments in the post-pandemic period. Previous studies used samples consisting of mobile payment users during the pandemic with usage frequencies ranging from 6 to 10 times per month Daragmeh (2021) and mobile payment users during the COVID-19 pandemic Liu (2020), whereas this study focuses on users who began using mobile payments during COVID-19 and have continued using them to the present day.

This research examines the sustainability of mobile payment usage after the pandemic through the lens of Technology Continuance Theory (TCT) by incorporating habit variables. In particular, this study aims to examine the significance of habit in influencing mobile payment continuance, given that contactless payments initially emerged as an emergency necessity during

the onset of COVID-19. The findings of this study are expected to complement previous research, support future studies, and enhance knowledge generation in both academic and practical contexts. Although several studies have previously been conducted, particularly regarding mobile payment adoption, very few studies have analyzed post-pandemic continuance behavior, especially in developing countries such as Indonesia.

Furthermore, the moderating influence of habit within the TCT framework remains understudied, particularly in post-pandemic environments. This study therefore makes a unique contribution by analyzing how habit affects the relationship between continuance intention, perceived usefulness, and satisfaction, thereby offering a more comprehensive understanding of the sustainability of technology use in post-crisis environments.

Literature Review

Technology Continuance Theory (TCT)

TCT was first presented by Liao (2009) as a synthesis of three models: the *Technology Acceptance Model* (TAM) Davis (1986), the *Cognitive Model* (COG) Oliver (1980), and the *Expectation-Confirmation Model* (ECM) (Bhattacharjee, 2001). According to TAM, user acceptance is mainly determined by perceived usefulness and perceived ease of use of technology (Davis, 1986). By contrast, ECM prioritizes user satisfaction in determining their continuance intention toward technology use (Bhattacharjee, 2001). In addition to satisfaction, COG asserts that continuance behavioral intention is contingent upon users' attitudes toward technology (Oliver, 1980).

With the integration of these three core elements, TCT has proven to be an instrumental framework for understanding sustained technology use. At its core, TCT reflects the continuity between attitude and satisfaction within a single model, indicating a valid foundation for analyzing continuance intentions (Aprilia & Amalia, 2023). Liao (2009) argue that TCT can be contextualized to domain-sensitive factors across different areas of study. Rahi (2020) emphasize that the length of time a good or service is used ultimately predicts its success rather than initial user acceptance.

TCT comprises the core constructs derived from prior models: confirmation (CON), perceived usefulness (PU), perceived ease of use (PEU), satisfaction (SAT), attitude toward usage (ATT), and continuance intention (CI). The TCT framework provides a more comprehensive basis for understanding the long-term continuance of technology usage among consumers (Jain et al., 2022).

Continuance Intention (CI)

Continuance intention refers to an individual's intention to continue using an already adopted system (Yan et al., 2021). As explained by Ha (2024), customers who are satisfied with a service tend to view it positively and use the service regularly. Thus, when the level of satisfaction is sufficiently high, the perceived benefits gained from using the service strengthen users' intentions to continue using the product or service. Therefore, in the context of this study, continuance intention is defined as an individual's willingness to use mobile payments on a day-to-day basis.

Attitude (ATT)

According to Davis (1989), attitude refers to how a person expresses positive or negative feelings about a behavior. Attitude is one of the key elements of TAM Aprilia (2023); thus, it greatly influences the acceptance of new technologies. According to many post-adoption theories of technology use, attitude is considered a crucial determinant of behavioral intentions (Ahn, 2022). Abdul-Halim (2022) demonstrated that consumers' attitudes and mindsets toward technology influence their technology usage behavior.

Research indicates that consumer attitude can predict continuance intention (Foroughi et al., 2024). Aprilia (2023) found that users who maintain a positive perception of a service, such as mobile payments, are more likely to continue using it. Wijaya (2024) stated that attitude positively affects continuance intention in the use of QRIS. This finding is consistent with earlier

studies on the use of mobile wallets Daragmeh (2021), mobile payments Raman (2021), and mobile banking (Rahi et al., 2020).

H1: Attitude will positively affect continuance intention.

Satisfaction (SAT)

Satisfaction refers to the perceived gap between pre-use expectations and actual performance outcomes (Oliver, 1980). When the performance or outcomes of an information system fail to meet expectations, individuals do not feel satisfied (Foroughi et al., 2024). Satisfaction predicts post-adoption behavior in the ECM model (Bhattacharjee, 2001). Satisfaction emerges when users evaluate the extent to which actual performance meets their pre-adoption expectations, triggering an emotional response that influences future behavioral intentions (Babin & Griffin, 1998; Bagozzi, 1991). Therefore, user satisfaction with mobile payments depends on whether the actual performance of mobile payments fulfills user expectations (Aprilia & Amalia, 2023).

Users with high levels of satisfaction are more likely not only to remain engaged with the service but also to continue using it, particularly when system performance meets their expectations (Sae-tae & Wang, 2024). Users who derive satisfaction from a system are more likely to continue using it (Ashfaq et al., 2020; Nurdin, 2023). This finding is consistent with previous studies showing that continuance intention depends on satisfaction (Hepola et al., 2020; Yang, 2021). Vahdat (2020) argued that emphasizing satisfaction is one of the simplest ways to develop a positive attitude toward a brand. Rahi (2020) indicated that satisfaction affects Pakistani internet banking customers' attitudes and continuance intentions. This is in line with the findings of Wijaya (2024), which show a positive relationship between attitude and satisfaction. This relationship has also been supported by previous studies (Daragmeh et al., 2021; Raman & Aashish, 2021).

H2: Satisfaction will positively affect continuance intention.

H3: Satisfaction will positively affect attitude.

Perceived Usefulness (PU)

Perceived usefulness refers to users' evaluations of the extent to which an information system can assist them in effectively performing their activities (Davis, 1989). This perspective concerns the degree to which technology helps improve the speed and efficiency of routine daily tasks (Bolodeoku et al., 2022). Talwar (2020) argued that PU positively influences satisfaction and continuance usage following the initial adoption decision. This construct has been confirmed to significantly influence continuance intention Rahi (2021), in line with other studies and reviews based on the applied model. Understandably, users may abandon an information system if they do not perceive benefits from its use (Carissa et al., 2023). This phenomenon has also been identified in studies of mobile wallets Sasongko (2022) and mobile banking (Nguyen et al., 2021).

Additionally, PU influences users' attitudes toward technology. Alhassan (2020) claimed that perceived usefulness is a significant factor affecting users' attitudes toward technology, while customers' attitudes toward a product or service are influenced by their perceptions of its utility (Aprilia & Amalia, 2023). Therefore, users are more likely to develop favorable attitudes toward technologies they perceive as useful (Laksamana et al., 2023). Similar conclusions were drawn by Abdul-Halim (2022), whose findings also support this relationship. Additionally, studies by Sasongko (2022) and Nguyen (2021) demonstrated a positive relationship between perceived usefulness and satisfaction. This finding is consistent with research on mobile payments by Sreelakshmi (2020), which found a positive correlation between PU and satisfaction.

H4: Perceived usefulness will positively affect continuance intention.

H5: Perceived usefulness will positively affect attitude.

H6: Perceived usefulness will positively affect satisfaction.

Perceived Ease of Use (PEU)

Perceived ease of use refers to the degree to which technology is perceived as easy to use; simpler systems are generally perceived as more user-friendly (Hervas & Medina, 2023; Mois &

Beer, 2020). Within TAM and UTAUT, which form the foundation of TCT, users are more likely to accept technologies they perceive as easy to use; therefore, PEU is one of the main elements influencing technology adoption and continuance (Davis, 1989). In addition, according to TCT, PEU also plays a role as part of post-adoption expectations, meaning that after adopting the technology, users continue to evaluate its ease of long-term use (Ha et al., 2024). In other words, PEU helps users understand and adapt to modern technologies, thereby increasing the likelihood of continued usage (Abdul-Halim et al., 2022).

Difficulty in using a system may reduce service adoption Alqudah (2023), whereas an easy-to-use system increases the intention to use technologies such as mobile payments. Ease of navigation also increases positive user attitudes Xu (2022) and significantly influences perceived usefulness, which in turn drives acceptance and usage intentions (Darmansyah et al., 2021; To & Trinh, 2021).

H7: Perceived ease of use will positively affect attitude.

H8: Perceived ease of use will positively affect perceived usefulness.

Confirmation (CON)

According to Bhattacharjee (2001), confirmation refers to the congruence between initial expectations and the actual benefits obtained from using a system. Confirmation is a key factor in determining satisfaction with technology (Alshammari & Alkhabra, 2025). When users' expectations regarding the use of technology are fulfilled and validated, they become more satisfied (Alshammari & Alshammari, 2024). On the other hand, dissatisfaction may arise if actual outcomes fall short of initial expectations (Nguyen et al., 2022). When users' initial expectations are confirmed, user satisfaction increases (Foroughi et al., 2023). Previous studies by Wijaya (2024) indicated that perceived usefulness and satisfaction are influenced by confirmation. This finding is consistent with studies demonstrating that confirmation in system use influences perceived usefulness (Carissa et al., 2023; Ayyoub et al., 2023).

H9: Confirmation will positively affect satisfaction.

H10: Confirmation will positively affect perceived usefulness.

Habit (HAB)

Habit refers to the tendency to perform behaviors automatically due to prior learning and repeated behavior (Bölen, 2020; Soormo et al., 2024). Habit is also an important factor influencing the continued use of technology (Chávez Herting et al., 2023). Typically, individuals repeatedly perform familiar behaviors automatically without consciously reflecting on them (Wang & Lin, 2021). Habits reflect behaviors that are stable and repeatedly enacted (Wu et al., 2022). Based on research conducted by Wang (2021), the effect of perceived usefulness on continuance intention is stronger among users with weaker habits.

Users with weaker habits pay greater attention to the benefits of an application, whereas the effect of perceived usefulness on continuance intention becomes weaker among users with stronger habits because they are already accustomed to using the application or system. Wang (2021) also found that the effect of satisfaction on continuance intention is stronger among users with stronger habits because these users place greater emphasis on their satisfaction once they become accustomed to using the application or system. This finding is supported by studies conducted by Lin (2017) on mobile platforms and Wu (2022) on health applications.

This study assumes that habit moderates the relationships between perceived usefulness, satisfaction, and continuance intention in the use of mobile payments after the pandemic. This assumption is supported by the findings of Qi (2023) and Khayer (2023), which show that users who are satisfied and perceive benefits from an application tend to develop automatic usage habits, which in turn may lead to strong loyalty even when alternative options are available. However, in specific contexts, habits may also weaken the influence of cognitive evaluation because the stronger the habit, the lower the tendency for users to consciously evaluate the benefits or satisfaction associated with mobile payment use. Thus, habit is positioned as a moderator with a contextual and dynamic influence on the relationships among variables in this model.

H11a: Habit moderates the effect of perceived usefulness on continuance intention.

H11b: Habit moderates the effect of satisfaction on continuance intention.

METHOD

The constructs in this study were measured using validated items from previous literature. Four items measuring perceived usefulness were derived from (Laksamana et al. 2023). Four items measuring perceived ease of use and satisfaction were derived from (Foroughi et al., 2024; Ha et al., 2024). Four items measuring confirmation were adapted from (Al Amin et al., 2024; Foroughi et al., 2024). Four items from Wu (2022) were used to measure habit, while four items measuring attitude were adapted from (Abdul-Halim et al., 2022; Laksamana et al. 2023). Lastly, four items from Foroughi (2024) and Laksamana (2023) were used to measure continuance intention.

Based on the recommended minimum sample-to-variable ratio of 20:1 Memon (2020), this study involved a total of 264 respondents who completed a questionnaire distributed through an online platform as part of the study's quantitative methodology. The respondents were individuals who began using mobile payment services during the COVID-19 pandemic and continued using them afterward. To maximize the use of available resources, this study employed purposive sampling, a qualitative sampling technique that intentionally selects individuals or groups with expertise or specific experience relevant to the area under study (Mohd Radzi et al., 2025).

The survey was distributed across major cities in Indonesia—Jakarta, Bogor, Depok, Tangerang, and Bekasi (JABODETABEK)—using purposive sampling. This sampling strategy was selected because the research required respondents with specific characteristics: (1) consistent mobile payment users since the pandemic period; (2) urban residents with reliable access to digital infrastructure; and (3) individuals with sufficient experience to evaluate both the utility and habitual dimensions of mobile payment use. JABODETABEK was chosen as the primary sampling frame because it represents the highest concentration of mobile payment penetration and digital economic activity in Indonesia, ensuring that respondents possess the contextual experience necessary to provide valid and informed responses regarding post-pandemic continuance behavior (Tikno et al., 2024). These inclusion criteria align with the purpose of purposive sampling, which is to select information-rich cases that are most relevant to the research questions.

Data analysis was conducted using the SEM-PLS (Structural Equation Modeling–Partial Least Squares) method. SEM-PLS is well suited for analyzing complex models and examining relationships among latent constructs Hair (2022), making it appropriate for this study. It also effectively supports exploratory models aimed at explaining relationships among variables (Manishimwe et al., 2025). The SEM-PLS analysis was conducted using SmartPLS 4 software.

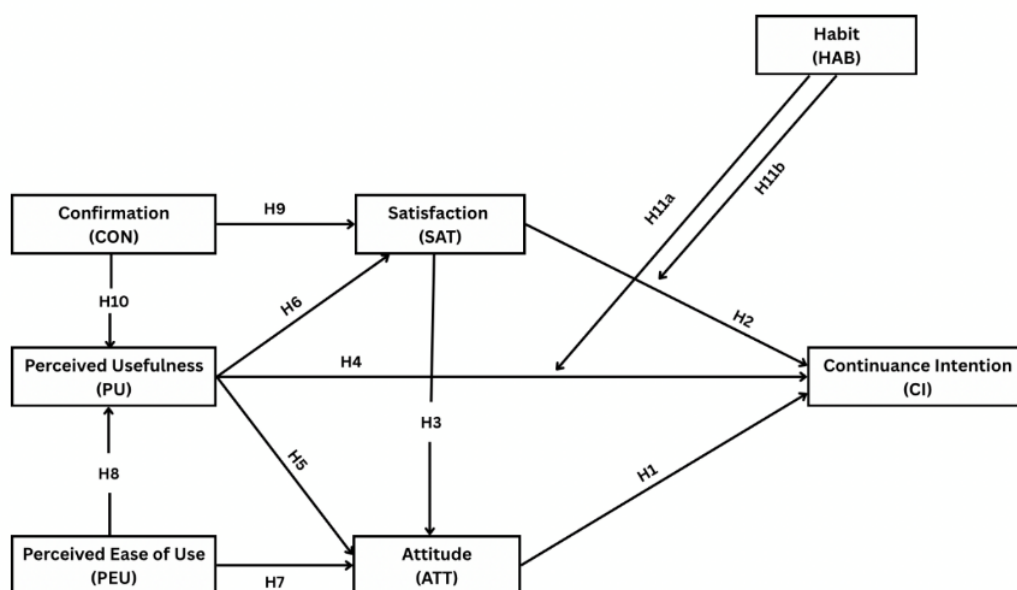


Figure 1. Framework Research

RESULTS AND DISCUSSION

Results

Data Analysis and Results

Table 1. Demographic profiles of samples (N= 264)

Demographic Profile	Frequency	Percentage (%)
Gender		
Male	100	37.88
Female	164	62.12
Age		
<18	1	0.38
18 - 25	139	52.65
26 - 35	42	15.91
36 - 45	34	12.88
46 - 55	40	15.15
>55	8	3.03
Level of education		
High school and below	81	30.68
Diploma	24	9.09
Undergraduate	147	55.68
Postgraduate and above	12	4.55
Mobile payment usage in the past month		
More than 10 times	162	61.36
6 - 10 times	49	18.56
1 - 5 times	53	20.08
Mobile payment mostly use		
Gopay	183	69.32
Ovo	112	42.42
DANA	77	29.17
Shopeepay	146	55.3
Link Aja	14	5.3
Mobile Banking	236	89.39
Purpose of use		

Demographic Profile	Frequency	Percentage (%)
Online shopping	237	89.77%
Transportation	186	70.45%
FnB	222	84.09%
Pay bills	161	60.98%
Entertainment	134	50.76%

A total of 264 respondents participated in the study, the majority of whom were female (N = 164; 62.12%) and between the ages of 18 and 25 years (52.65%). With 55.68% holding a college degree, most respondents were considered educated users. Regarding frequency of use, 61.36% reported using mobile payment services more than ten times in the previous month. The most frequently used platform (89.39%) was mobile banking, followed by GoPay (69.32%) and ShopeePay (55.30%). The majority of respondents used mobile payments for online shopping (89.77%), followed by food and beverage (F&B) purchases at 84.09%. On average, respondents reported using two to three different mobile payment systems, implying a varied and adaptable adoption pattern. These findings indicate strong participation and widespread multi-platform usage among Indonesian digital payment consumers.

Measurement Model Analysis

Table 2. Results of the measurement model

Construct	Item	Mean	SD	Factor Loading	Cronbach's Alpha	CR	AVE
ATT	ATT 1	0.853	0.018	0.853	0.788	0.876	0.703
	ATT 3	0.862	0.021	0.863			
	ATT 4	0.796	0.030	0.797			
CI	CI 1	0.901	0.015	0.902	0.824	0.896	0.744
	CI 2	0.926	0.011	0.926			
	CI 4	0.750	0.030	0.750			
CON	CON 1	0.827	0.030	0.828	0.866	0.908	0.712
	CON 2	0.839	0.032	0.841			
	CON 3	0.850	0.021	0.848			
	CON 4	0.859	0.017	0.858			
HAB	HAB 1	0.902	0.020	0.902	0.904	0.940	0.840
	HAB 3	0.920	0.013	0.920			
	HAB 4	0.926	0.011	0.927			
PEU	PEU 1	0.845	0.022	0.911	0.858	0.914	0.780
	PEU 2	0.890	0.018	0.846			
	PEU 4	0.911	0.013	0.891			
PU	PU 1	0.916	0.013	0.916	0.894	0.934	0.826
	PU 2	0.919	0.014	0.919			
	PU 3	0.891	0.015	0.891			
SAT	SAT 1	0.822	0.045	0.821	0.895	0.927	0.762
	SAT 2	0.898	0.013	0.897			
	SAT 3	0.890	0.015	0.890			
	SAT 4	0.881	0.017	0.881			

Note: Standard Deviation (SD), Composite Reliability (CR), Average Variance Extracted (AVE)

The validity and reliability of the constructs used in this study were assessed to examine the measurement model. The factor loadings, Cronbach's alpha, and composite reliability values all exceeded the recommended minimum threshold of 0.7. Furthermore, the average variance extracted (AVE) value for each construct surpassed the minimum threshold of 0.5 (J. F. Hair et al., 2019). The findings of this study generally indicate that the instruments employed satisfy the validity and reliability standards required for further investigation.

Table 3. Result of Discriminant Validity – Heterotrait-monotrait ratio (HTMT)

	ATT	CI	CON	HAB	PEU	PU	SAT
ATT							
CI	0.812						
CON	0.705	0.621					
HAB	0.786	0.862	0.636				
PEU	0.882	0.781	0.692	0.822			
PU	0.881	0.739	0.616	0.796	0.876		
SAT	0.847	0.736	0.797	0.734	0.863	0.774	

With the highest value of 0.882 between ATT and PEU, all HTMT values between constructs fall below the threshold of 0.90. Based on Hair (2019), this suggests that each construct demonstrates good discriminant validity.

Structural Model Analysis

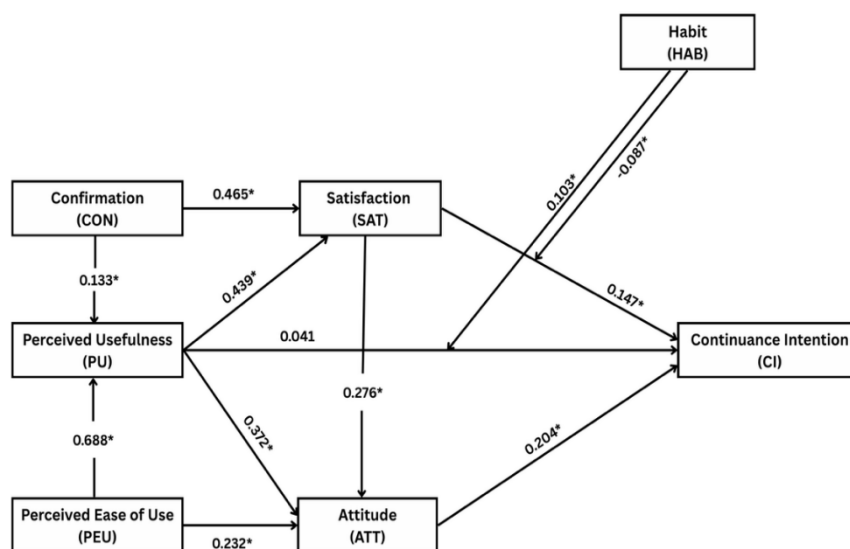


Figure 2. Path Coefficients

Note: * indicates statistically significant path coefficients (p < 0.05), based on bootstrapping results.

The R-squared (R²) value in Figure 2 indicates the degree of variation in each endogenous construct explained by the exogenous constructs in the model. The higher the R² value, the greater the structural model’s predictive ability. Hair (2019) classify R² values of 0.75, 0.50, and 0.25 as substantial, moderate, and weak, respectively. The model results show R² values of Satisfaction = 0.632, Perceived Usefulness = 0.601, Attitude = 0.641, and Continuance Intention = 0.616. These results indicate that the model demonstrates moderately strong to substantial predictive power, particularly in explaining continuance intention.

Table 4. Hypothesis testing

Hypothesis	Relationship	Path Coefficient	T Statistics	P Value	Decision
H1	ATT -> CI	0.204	2.911	0.002	Supported
H2	SAT -> CI	0.147	2.129	0.017	Supported
H3	SAT -> ATT	0.276	3.689	0.000	Supported
H4	PU -> CI	0.041	0.573	0.283	Not Supported
H5	PU -> ATT	0.372	5.386	0.000	Supported
H6	PU -> SAT	0.439	8.880	0.000	Supported
H7	PEU -> ATT	0.232	3.278	0.001	Supported
H8	PEU -> PU	0.688	13.488	0.000	Supported

H9	CON -> SAT	0.465	10.575	0.000	Supported
H10	CON -> PU	0.133	2.778	0.003	Supported
H11a	HAB x PU -> CI	0.103	2.370	0.009	Supported
H11b	HAB x SAT -> CI	-0.087	1.823	0.034	Supported

The bootstrapping technique was frequently employed in hypothesis testing to estimate standard errors in PLS-SEM analysis (Méndez-Suárez, 2021). Based on the criteria of T-statistics > 1.96 and p-values < 0.05, these hypotheses were considered “supported” (J. F. Hair et al., 2019). The results confirmed twelve hypotheses, while one hypothesis was not supported.

ATT significantly and positively influenced CI (H1), with a path coefficient of 0.204 (T = 2.911, p = 0.002). H2 was also supported, as satisfaction (SAT) had a significant positive effect on CI (path coefficient = 0.147, T = 2.129, p = 0.017). H3 was likewise supported, with satisfaction found to have a positive effect on attitude (ATT) (path coefficient = 0.276, T = 3.689, p = 0.000), indicating its role in shaping user attitudes.

On the other hand, the hypothesis that perceived usefulness (PU) affects CI was not supported (H4: path coefficient = 0.041, T = 0.573, p = 0.283). However, H5 and H6 were supported, as PU was a significant predictor of ATT (path coefficient = 0.372, T = 5.386, p = 0.000) and SAT (path coefficient = 0.439, T = 8.880, p = 0.000). H7 and H8 were tested to demonstrate that ATT (path coefficient = 0.232, T = 3.278, p = 0.001) and PU (path coefficient = 0.688, T = 13.488, p = 0.000) significantly increased with PEU.

Confirmation (CON) significantly increased satisfaction (H9: path coefficient = 0.465, T = 10.575, p = 0.000) and PU (H10: path coefficient = 0.133, T = 2.778, p = 0.003), thereby supporting H9 and H10 as well [89]. Regarding the moderation hypotheses, H11a was supported, showing that habit strengthened the relationship between PU and CI (path coefficient = 0.103, T = 2.370, p = 0.009). However, H11b was not supported (path coefficient = -0.087, T = 1.823, p = 0.034), suggesting that the effect of satisfaction on continuance intention becomes less relevant as habitual behavior increases.

Discussion

This research develops the Technology Continuance Theory (TCT) with habit as a moderating variable to provide important insights into post-adoption mobile payment behavior in Indonesia's post-pandemic context. The findings both support and challenge key premises of the TCT model. Consistent with TCT, attitude, satisfaction, confirmation, and perceived ease of use all significantly predicted continuance intention directly or through mediated pathways, affirming the model's core structure. However, this study challenges the TCT assumption that perceived usefulness directly determines continuance intention: the non-significant direct path from PU to CI (H4 not supported) suggests that, in habituated post-pandemic usage contexts, usefulness no longer drives the decision to continue independently; instead, it operates indirectly through attitude and satisfaction. This finding signals a maturation of mobile payment adoption in Indonesia, where utilitarian calculation has given way to affective and automatized behavioral patterns, a transition that the standard TCT model was not originally designed to capture.

The larger effect of attitude in predicting continuance intention also suggests that sustained use relies on emotional and psychological comfort between consumers and mobile payment systems. When users perceive their use of mobile payments as confident and optimistic, they are more likely to continue using them. This is in line with Foroughi (2023) who identified attitude as a primary factor affecting consumers' intention to continue using technology, as also supported by Azhar et al. This highlights the importance of fostering user trust and creating positive impressions when technology adoption is driven by peer influence and social reinforcement.

Additionally, satisfaction confirms Nurdin (2023), who found that consumers continue using services when their expectations are fulfilled or exceeded, thereby contributing significantly to continuance usage. These findings also indicate that application dependability, transaction speed, and service quality across digital platforms are important retention factors in the Indonesian context. The dominance of mobile banking (89.39%) and GoPay (69.36%) among

respondents indicates that users are more satisfied with these two platforms than with others. Satisfied consumers can become informal ambassadors, incorporating mobile payments into the fabric of everyday life.

This finding contradicts the common assumption in the Technology Continuance Theory (TCT) framework that perceived usefulness directly determines continuance intention. However, it is consistent with accumulating evidence from post-adoption and habit-formation studies. Qi (2023) found that when traditional payment habits successfully transition into mobile payment habits, utility-based evaluations diminish as direct drivers of continued use. Similarly, Raman (2021) reported non-significant PU→CI paths in mature mobile payment markets, attributing the finding to the automatization of usage routines. In the Indonesian post-pandemic context, where mobile payment adoption has moved beyond early-majority diffusion to mainstream habitual use, the direct effect of perceived usefulness on continuance intention may be largely absorbed by habit strength, rendering deliberate utility assessments less consequential in continuation decisions.

Service usability, which is generally perceived as natural and expected, is no longer a factor that significantly predicts continuance intention toward mobile digital services. This finding is consistent with previous research Franque (2021), which showed that PU has little effect on CI. In this study, 61.36% of participants used mobile payments more than 10 times per month, reinforcing this interpretation through descriptive statistics. This indicates that even if users perceive the service as effective and helpful, emotional satisfaction contributes more strongly to continued usage decisions than logical evaluations of utility.

However, perceived usefulness still has a substantial impact on attitude and satisfaction. Because mobile payments are convenient, fast, and secure for common transactions, they have become increasingly popular in Indonesia. The growth of technological infrastructure and broader acceptance of digital technology contribute to users' positive perceptions of these services as rational and reliable payment methods. This finding agrees with Abdul-Halim (2022), who highlighted that satisfying mobile payment users becomes easier when the payment method is perceived as user-friendly and efficient. Furthermore, consumers are more likely to develop favorable attitudes toward using the service when they believe that mobile payment systems are practical and beneficial.

Perceived ease of use had a significant influence on attitudes toward mobile payments and on perceived usefulness. This finding corroborates the fundamental assumptions of the Technology Acceptance Model (TAM) and Technology Continuance Theory (TCT): when technology is easier to use, users develop more positive attitudes and perceive it as more valuable. Given differences in digital literacy levels across the population, this finding is especially relevant in the Indonesian context. Intuitive applications with minimal learning curves enable users from different demographic groups to adopt mobile payment systems without significant barriers. In addition, the integration of mobile payments into daily activities such as online shopping, transportation, and bill payments demonstrates that convenience is an important pillar in creating positive user experiences. Users are more likely to remain loyal to a service when they feel comfortable using it without difficulty. Previous research Xu (2022) supports this assertion by showing that perceived ease of use influences perceived usefulness and user attitudes toward e-learning, e-banking, and e-health systems. When technology is easy to operate, users tend to feel more comfortable with it and are more likely to prefer using it.

Confirmation is another important construct shaping perceived usefulness and satisfaction. This finding supports Expectation-Confirmation Theory Bhattacharjee (2001), which suggests that alignment between users' initial expectations and their actual service experience is critical for continuance behavior. In Indonesia, where consumers often use at least three digital payment systems, loyalty depends heavily on service reliability and consistency. When user expectations are consistently fulfilled over time—for example, through fast transactions, seamless QRIS integration, or cashback promotions—the perceived value of the service is reinforced, generating emotional fulfillment that encourages continued use. Confirmation positively affects both satisfaction and perceived usefulness (Carissa et al., 2023). When the expected benefits of technology are realized or exceeded, users experience greater satisfaction and perceive the

technology more positively.

The key contribution of this study is the analytical role of habit as a moderating variable within the TCT framework. The findings show that habit strengthens the influence of perceived usefulness on continuance intention (H11a), consistent with Lin (2017), who demonstrated that high-habit users in mobile platform contexts are more responsive to utility signals because they have already internalized the value of routine use. In addition, Chávez (2023) similarly confirmed that habit acts as an amplifier for performance-based evaluations in technology continuance contexts, suggesting that this moderation pattern generalizes beyond mobile payments to other forms of habitual technology use.

Conversely, the moderating effect of habit on the satisfaction–continuance intention relationship was negative (H11b supported with a negative coefficient). This finding challenges conventional assumptions regarding habit’s role: rather than uniformly amplifying the effect of satisfaction on continuance, high levels of habit reduce the sensitivity of continuance intention to satisfaction levels. This suggests that habituated users continue using mobile payments regardless of their current satisfaction evaluations; their behavior has become automatized to the point that it no longer requires affective justification. This finding extends the TCT framework by revealing that habit operates as a double-edged mechanism: it strengthens the utility-to-continuance pathway while simultaneously decoupling continuance from the satisfaction evaluation process. This has important theoretical implications for post-pandemic studies: as pandemic-era mobile payment adoption solidifies into habit, the traditional satisfaction–continuance relationship central to TCT may progressively weaken, requiring researchers to incorporate habit as a moderator in future longitudinal models of post-adoption behavior.

Managerial and Theoretical Implications

Managerial Implications

This analysis offers insights into the mobile payment industry that challenge several conventional assumptions. The finding that perceived usefulness does not directly influence continuance intention suggests a shift in user behavior, in which habitual use and emotional comfort take precedence over rational assessments of benefits. Therefore, mobile payment companies should focus on building emotionally driven relationships with users by personalizing financial summaries, implementing strategic in-app notifications, and celebrating user milestones. These approaches can strengthen emotional engagement, foster a sense of connection and support, and encourage users to remain engaged beyond purely cognitive evaluations of whether the application functions effectively.

Moreover, the moderating role of habit presents both opportunities and risks. Although habits encourage regular use, they can also reduce consumers’ sensitivity to declining satisfaction and gradually weaken engagement over time. Managers should proactively monitor indicators of dissatisfaction among loyal users through tools such as sentiment analysis and behavioral trend alerts, allowing corrective action before disengagement occurs. Payment systems should also be designed to integrate seamlessly into routine activities such as retail purchases, food delivery, and transportation transactions so that they become embedded in users’ daily payment habits. In addition, companies can create effective habit loops by associating rewards with repeated interactions across various usage contexts, without relying solely on deliberate intention. Finally, users who continue to perceive clear value through meaningful performance feedback—such as time or money saved through platform usage—are more likely to remain satisfied and trust the service. These strategies encourage managers to move beyond purely data-driven approaches to user engagement and instead focus on reinforcing routines, implementing human-centered interventions, and cultivating emotional connections that support habitual usage behavior.

Theoretical Implications

This research contributes significantly to the theoretical understanding of post-adoption technology behavior, particularly in the context of mobile payments. By incorporating habit as a moderating variable within the TCT framework, this study extends the theory beyond its traditional focus on perceived usefulness, confirmation, and satisfaction Bhattacharjee (2001);

Liao (2009), resulting in a more behaviorally grounded model. Empirical evidence indicates that habitual use promotes automatic rather than consciously evaluated utility assessments in shaping continuance intention (Nguyen et al., 2022; Wang & Lin, 2021). This result directly challenges one of the fundamental assumptions of TCT: that perceived usefulness exerts a significant direct effect on continuance intention. Accordingly, these findings emphasize the importance of incorporating habitual and behavioral dimensions into future models of digital engagement and technology continuance.

This study also highlights the importance of contextualizing behavioral theory within emerging markets. Compared with previous research conducted primarily in developed countries or during the peak of the pandemic Daragmeh (2021) and Liu (2020), this study focuses on post-pandemic mobile payment usage in Indonesia, where fintech development and user behavior are rapidly evolving. Extending TCT into this temporal and contextual setting enhances the theory's generalizability Qi (2023) and contributes to ongoing efforts to localize global theoretical models. By integrating habitual behavioral mechanisms with socio-technical contexts, this study moves beyond the traditional cognitive perspective commonly emphasized in technology continuance theory.

CONCLUSION

This study examined post-pandemic mobile payment continuance in Indonesia (N = 264) by extending the Technology Continuance Theory (TCT) with habit as a moderating variable. The results confirm that attitude ($\beta = 0.204$), satisfaction ($\beta = 0.356$), and perceived ease of use significantly drive continuance intention, while perceived usefulness operates indirectly through attitude and satisfaction rather than directly influencing continuance intention. Critically, habit strengthens the perceived usefulness–continuance intention pathway (H11a supported) but weakens the satisfaction–continuance intention relationship (H11b supported, negative), revealing that habituated users maintain usage regardless of ongoing satisfaction evaluations. These findings challenge the standard TCT assumption that usefulness is a primary direct driver of continuance in post-adoption contexts.

The primary theoretical contribution of this study is the empirical demonstration that habit fundamentally reconfigures TCT's predictive pathways in post-pandemic, high-penetration mobile payment contexts, shifting decision-making from deliberate utility assessment to automated behavioral execution. For practitioners, these findings imply that mobile payment providers in Indonesia should focus on deepening habitual engagement through seamless, low-friction design rather than repeatedly promoting feature usefulness. Future research should replicate this model using longitudinal designs to capture the temporal evolution of habit strength, expand sampling beyond Jabodetabek to include non-urban populations, and test the moderating role of habit in other fintech contexts, such as buy-now-pay-later services and digital investment platforms.

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AUTHOR CONTRIBUTION STATEMENT

Indra Fata Raharja contributed to conceptualization, methodology, formal analysis, and manuscript drafting. Charissa Nurkhayla Sutanto contributed to data curation, investigation, and visualization. Sarah Qonitah contributed to literature review, validation, and editing. Willy Gunadi supervised the research process, provided critical revisions, and approved the final manuscript.

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