The Eastasouth Management and Business
Vol. 4, No. 02, January 2026, pp. 580 – 591
ISSN: 2985-7120, DOI: 10.58812/esmb.v4i02

Evaluating Technology Acceptance and Service Quality: An Integrated TAM – TPB Approach In Digital Aplication Adoption

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Article Info

Article history:

Received Nov, 2025
Revised Jan, 2026
Accepted Jan, 2026

Keywords:

Digital payment adoption;
Service Quality;
Technology Acceptance Model;
Theory of Planned Behavior;
University Students

ABSTRACT

The rapid expansion of digital payment applications has transformed financial transactions, particularly among university students who are highly engaged in digital ecosystems. Understanding the factors that drive adoption and shape perceptions of service quality is essential for both theory and practice. This study aimed to evaluate the adoption of digital payment applications by integrating the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB) to explain their combined effects on perceived service quality. A quantitative research design was applied using a cross-sectional survey distributed to 250 students in East Java who had experience using digital payment applications. The instrument employed a structured questionnaire measured on a five-point Likert scale, and data were analyzed using multiple regression techniques. The results revealed that perceived usefulness and attitude were the strongest predictors of perceived service quality, while perceived ease of use, subjective norms, and perceived behavioral control also contributed significantly, albeit with weaker effects. The integrated TAM–TPB model explained 57% of the variance in service quality, demonstrating a stronger explanatory power than either model alone. These findings suggest that both functional and psychosocial factors are critical in evaluating digital payment services. The study contributes theoretically by extending adoption models to the domain of service quality and provides practical insights for developers and policymakers to improve digital financial services for students.

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1. INTRODUCTION

The rapid advancement of digital technology has reshaped social behavior, particularly in how individuals engage with financial transactions. Digital payment applications have become an integral part of students' daily lives, offering efficiency, convenience, and a cashless lifestyle. This phenomenon is not only significant in transforming consumption patterns but also in influencing the quality of services delivered by application providers. University students, as digital natives, are among the most active adopters of such applications, and their evaluations of usability, perceived usefulness, and service quality are critical for sustaining digital ecosystems. Recent studies highlight that the growing reliance on mobile payment

platforms reflects broader socio-economic shifts, including increased trust in digital ecosystems and reduced reliance on traditional cash transactions [1], [2], [3]. Consequently, understanding what drives adoption among students is crucial for developing digital services that meet both functional and experiential expectations [4].

Previous research has extensively applied the Technology Acceptance Model (TAM) and Theory of Planned Behavior (TPB) to investigate technology adoption across different contexts. For instance, Saeidi et al. demonstrated that perceived usefulness and perceived ease of use strongly shape behavioral intentions in digital transportation systems, while Yildirim and Ayar confirmed the robustness of integrating TAM and TPB in predicting mobile banking adoption [5]. However, most of these studies tend to stop at measuring intention to use, without linking adoption constructs to service quality as an outcome. Emerging evidence from FinTech and mobile wallet contexts suggests that service quality should not be treated as separate from technology acceptance but rather as a crucial extension of the adoption process [6]. This gap underscores the need for more research on how TAM and TPB constructs affect perceived service quality, particularly in academic settings.

Based on this gap, the current study seeks to address several research questions: To what extent do students' perceptions of perceived usefulness and perceived ease of use affect the quality of digital application services? How do attitudes, subjective norms, and perceived behavioral control shape students' evaluation of service quality? Can the integration of TAM and TPB provide a more comprehensive understanding of the adoption of digital payment applications in the student context? These questions aim to move beyond adoption intention and focus on perceived service quality as a direct outcome. Prior works suggest that perceived usefulness and attitude are likely to be the most significant predictors, while ease of use, subjective norms, and perceived behavioral control maintain important but secondary roles [7]. Thus, this research builds on recent international findings while tailoring the inquiry to the student population of East Java.

This research argues that the integration of TAM and TPB offers a more holistic theoretical framework for explaining technology adoption and its implications for service quality. Combining functional and psychosocial perspectives captures both the rational and social-psychological drivers of adoption. Theoretical contributions extend prior work by linking adoption constructs directly to perceived service quality rather than merely to behavioral intention. Practical contributions lie in guiding providers of digital applications toward strategies that enhance usefulness-driven features, foster positive attitudes, and leverage peer influence in academic communities. The study thereby aims to fill an important gap in both literature and practice by situating digital payment adoption within a framework that integrates TAM, TPB, and service quality dimensions [8].

Research Problem Formulation:

1. What is the effect of perceived usefulness and perceived ease of use on the quality of digital application services?
2. How do attitudes, subjective norms, and perceived behavioral control affect the quality of digital application services?
3. To what extent does the integration of TAM and TPB provide a comprehensive understanding of digital application adoption among students?

2. LITERATURE REVIEW

2.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was first developed by Davis (1989) to explain the factors that affect user acceptance of a technological system. This model emphasizes two main constructs, namely *Perceived Usefulness (PU)* and *Perceived Ease of Use (PEOU).* PU is defined as the extent to which a person believes that the use of a particular technology will improve their performance, while PEOU refers to the level of ease of use of that technology. These two constructs are considered to be the main determinants in shaping

attitudes towards the use of technology, which ultimately influences the intentions and actual behavior of users.

Various cutting-edge studies support the relevance of TAM in the context of digital technology adoption. For example, research by Alalwan et al. shows that PU and PEOU have a significant effect on the intention to use mobile banking applications among the younger generation [1]. Another study by Choudrie et al. found that the PU factor is more dominant than PEOU in explaining the adoption of e-government services in developing countries [2]. These results confirm the importance of ensuring the real benefits of digital applications to be accepted by users, especially students who are highly critical of the utility of applications.

Nonetheless, some studies also show variations in findings. For example, research by Shareef et al. found that although PU is significant, PEOU often does not have a direct effect, but rather only indirectly through user attitudes. This provides the basis that further research needs to examine the relationship between TAM variables in different contexts, including digital payment applications among college students. Thus, TAM remains an important cornerstone in assessing the acceptance of technology, but it needs to be combined with other models to gain a more comprehensive understanding.

2.2 Theory of Planned Behavior (TPB)

Convey concisely and clearly the literature review in your article (10 pt) The Theory of Planned Behavior (TPB) was developed by Ajzen (1991) as a development of the Theory of Reasoned Action (TRA). TPB adds one important construct, namely *Perceived Behavioral Control (PBC),* which complements the previous two constructs, *Attitude toward Behavior (ATT)* and *Subjective Norms (SN).* ATT refers to an individual's attitude towards a behavior, SN reflects perceived social pressure from those around him, whereas PBC describes an individual's perception of the ability to perform certain behaviors. These three constructs together form behavioral intentions that can then influence actual actions.

In the context of digital applications, TPB has been widely used to explain users' intentions in adopting technology services. Research by Rahman et al. shows that ATT and SN have a significant effect on the adoption of e-wallet services in Malaysia [9]. On the other hand, a study by Al-Qaysi et al. found that PBC has a stronger influence than ATT in explaining the adoption behavior of online learning applications [10]. These differences in results indicate that social factors and control perceptions play a dynamic role, depending on the technological context and user characteristics.

The recent literature also emphasizes that the integration of TPB with TAM can provide a richer understanding. For example, research by Dwivedi et al. confirmed that the combination of the two models was able to explain more variants of technology use intentions than each model separately [11]. Therefore, testing TPB in the adoption of student digital payment applications is an important step, considering that students tend to be influenced by the social norms of their peers and their ability to manage technology.

2.3 Integration of TAM and TPB

The integration of TAM and TPB has become a popular approach in modern technology adoption research. TAM focuses on the aspects of utility and convenience, while TPB adds dimensions of attitudes, social norms, and behavioral control. This combination is considered to be able to explain the technology adoption process more comprehensively. According to Venkatesh et al., the integration of TAM and TPB can improve the predictive ability of adoption behavior by up to 60% compared to using only one of the models [12].

Empirical studies support this claim. Saeidi et al. examined the use of digital transportation and found that PU, ATT, and PBC had a significant effect on use intention, while PEOU only had an indirect effect [5]. Another study by Yildirim & Ayar shows that the integration of TAM and TPB is highly effective in explaining the acceptance of mobile banking, with PU and SN as the dominant factors [13]. In the education sector, Al-Hadid et al. proved that the integration of the two models can better explain students' intentions in using online learning platforms [5].

The research gap arises because most studies focus on behavioral intention, while other aspects such as service quality have not been well researched. In fact, service quality is an important outcome that represents the real user experience. By linking the TAM–TPB variable with service quality, this study makes a new contribution to the literature, as well as relevant to the practical needs in improving the satisfaction of digital application users

2.4 Service Quality

Service quality is an important concept in assessing user satisfaction and successful technology implementation. According to Parasuraman, service quality can be measured through five main dimensions: tangibles, reliability, responsiveness, assurance, and empathy. In the digital context, service quality also includes aspects of speed, transaction security, ease of application navigation, and overall user experience.

Recent literature shows a close link between service quality and technology acceptance. Research by Alalwan shows that the quality of mobile banking services is greatly influenced by the perception of usability and ease of application [1]. Similarly, research by Laksamana & Wong found that the quality of digital payment services is influenced by users' subjective attitudes and norms. An international study by Tran et al. in Vietnam confirms that service quality is an important indicator that determines the sustainability of digital payment application adoption [3].

For students, the quality of digital payment services is very important because they need fast, easy, and secure services to support their daily activities. Their satisfaction level depends not only on the functionality of the app, but also on a consistent and reliable service experience. Therefore, examining how TAM and TPB variables affect service quality will provide a more comprehensive understanding as well as practical implications for application providers

2.5 Literature Synthesis and Research Gaps

From the literature review, it is clear that TAM and TPB are the two dominant theoretical frameworks in explaining technology adoption. Various studies have proven the important role of variables such as PU, PEOU, ATT, SN, and PBC in shaping usage intentions. However, most previous research has focused more on actual intentions or behaviors, not many have linked it to service quality as an outcome that reflects user satisfaction.

This research is here to fill this gap by integrating TAM and TPB to assess their influence on the quality of digital payment application services among students. By focusing on a group of students who are active users of technology, this study has the potential to make a new contribution to the technology adoption literature while offering practical implications for digital service providers in improving the quality of their services.

The existing literature suggests that the integration of TAM and TPB is a valid approach to explain technology adoption, but it is still rarely associated with quality of service as an outcome. Therefore, this research will make a theoretical contribution by expanding the scope of the model to the domain of service quality, as well as making a practical contribution in increasing the

adoption and user satisfaction of digital payment applications.

3. METHODS

This study employed a quantitative explanatory research design to examine the adoption of digital payment applications among university students in East Java. The research focused on evaluating how constructs from the Technology Acceptance Model (TAM) namely perceived usefulness (PU) and perceived ease of use (PEOU) and constructs from the Theory of Planned Behavior (TPB) attitude toward behavior (ATT), subjective norms (SN), and perceived behavioral control (PBC) influence perceived service quality. A cross-sectional survey was considered appropriate for capturing the perceptions of students at a specific point in time, allowing the relationships between variables to be statistically tested. The quantitative design also ensured objectivity and generalizability, making the findings relevant for both theoretical contributions and practical implications in the field of digital financial technology adoption.

The population of this study consisted of undergraduate students across several universities in East Java who actively use digital payment applications in their daily activities. Students were chosen as the unit of analysis because they represent digital natives who are highly exposed to financial technology services and exhibit diverse adoption behaviors. The sampling technique used was purposive sampling, with criteria requiring respondents to be active students and have at least three months of experience using digital payment applications such as GoPay, OVO, DANA, or ShopeePay. Based on the population size and to ensure sufficient statistical power, 250 valid responses were collected. This sample size met the requirements for multiple regression analysis, as suggested by Hair et al., ensuring that the statistical tests could be conducted reliably.

Data collection was carried out through an online questionnaire distributed via email and social media platforms, making it possible to reach a wide range of students across East Java. The questionnaire was developed using established measurement items from previous studies and adapted to fit the context of digital payment adoption. Each construct was measured using multiple indicators assessed on a five-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5). The survey instrument underwent a pilot test involving 30 students to ensure clarity, reliability, and validity of the items. Minor revisions were made based on feedback before the questionnaire was fully distributed. Ethical considerations, including informed consent and confidentiality of respondents, were strictly observed during the data collection process.

The analysis procedures included several steps to ensure data accuracy and reliability. First, preliminary analysis involved screening the data to check for missing values and outliers. Second, the reliability of constructs was assessed using Cronbach's alpha, while construct validity was evaluated through factor analysis. Third, descriptive statistics were applied to present the demographic profile of respondents and their general usage patterns of digital payment applications. Finally, multiple regression analysis was employed to test the hypothesized relationships between TAM and TPB constructs and service quality. This analytical method was chosen because it allows for identifying the strength and significance of the influence of independent variables on the dependent variable, consistent with studies in similar contexts [5].

In addition to regression, supplementary analyses were performed to enhance interpretation. Correlation analysis was used to explore relationships among constructs, while multicollinearity tests ensured no redundancy among predictors. All analyses were conducted using SPSS version 26, with a significance level set at $p < 0.05$. The systematic combination of TAM and TPB within this framework provided a comprehensive lens to evaluate both individual perceptions and social influences on the adoption of digital payment applications. By linking these adoption factors with perceived service quality, the study

offers an enriched perspective beyond intention to use, which has dominated prior literature. The methodological rigor ensures that the results can be generalized to similar populations and contribute both to theoretical discourse and practical strategies for improving digital financial services in higher education contexts

4. RESULTS AND DISCUSSION

The results of the first regression analysis tested the effect of *perceived usefulness* (PU) and *perceived ease of use* (PEOU) on the quality of digital payment application services. Table 1 shows that the value of the PU regression coefficient is 0.462 ($p < 0.001$), while the PEOU is only 0.178 ($p = 0.042$). The model's R^2 value reached 0.38, which means that PU and PEOU together were able to explain the 38% variation in the quality of service perceived by students. The restatement of this data is that students consider the usability of the application (PU) to be more important than ease of use (PEOU) in shaping the perception of service quality. Thus, although the application is easy to use, what is more decisive is the extent to which it provides real benefits in supporting students' daily transaction activities

The data pattern in Table 1 shows that the PU variable is more dominant than PEOU in explaining the quality of digital application services. These findings are consistent with Alalwan et al.'s research on mobile banking, which shows that perceived benefits are more decisive than technical convenience [1]. Choudrie et al. also found something similar in the context of e-government [2]. The results of this study confirm that students in East Java value the reliability, speed, and features of the application that help their activities, rather than just ease of navigation. Thus, digital payment services are considered high-quality when they really improve transaction efficiency, such as college payments, online shopping, or daily expenses. In conclusion, the quality of digital payment services is more closely related to perceived functionality than just operational convenience.

Table 1. The Influence of PU and PEOU on Service Quality

Variable	Coefficient	Sig.
PU	0.462	0.000
PEOU	0.178	0.042
$R^2 = 0.38$	$F = 24.91$	$P < 0.0001$

Source: Processed primary data (2025)

Analytically, the pattern of dominance of PU over PEOU can be interpreted through the behavior of students as digital natives. They are used to various applications so that the convenience aspect is relatively not the main obstacle. Instead, they are more selective about the real benefits offered. Evidence from Tran et al. in Vietnam Tran et al., and Yildirim & Ayar in mobile banking corroborates this argument, where PEOU tends to have indirect effects [3], [13]. This means that students assess applications that provide additional functions, such as transaction security and ease of integration with other services, to be of higher quality. Thus, PEOU is only a hygiene factor, while PU is a motivating factor in determining service quality. In conclusion, these results confirm the first hypothesis that PU has a significant effect on service quality, while the influence of PEOU is weaker.

The next analysis tested the influence of *attitude (ATT), subjective norms (SN),* and *perceived behavioral control (PBC)* on the quality of digital application services. Table 2 shows that ATT has a coefficient of 0.395 ($p < 0.001$), SN of 0.251 ($p = 0.013$), and PBC of 0.219 ($p = 0.022$). The R^2 value for this model is 0.42, indicating that all three TPB variables are able to explain 42% of the variation in service quality. The restatement of this data is that student attitudes (ATT) are the strongest predictors, while social norms and control perceptions also make important contributions. In other words, students who have a positive attitude towards digital

applications tend to rate services as more quality, supported by peer influence and perceptions of their ability to use it.

Table 2. The Influence of ATT, SN, and PBC on Service Quality

Variable	Coefficient	Sig.
ATT	0.395	0.000
SN	0.251	0.013
PBC	0.219	0.022
$R^2 = 0.42$	F = 27.34	P < 0.001

Source: Processed primary data (2025)

The results in Table 2 show a pattern that ATT is the most dominant variable in influencing the quality of digital application services. These findings are consistent with Rahman et al.'s study on e-wallets in Malaysia, which emphasizes the importance of positive user attitudes [9]. Social norms (SN) also play a role, as evidenced by research by Dwivedi et al. which confirms that peer influence strengthens the acceptance of technology [11]. PBC has a moderate contribution, as found by Al-Qaysi et al. in the context of online learning [10]. This means that students with a positive attitude towards digital applications and receive social support are more likely to consider quality services, although the personal control factor is still relevant. In conclusion, attitude factors and social norms have a significant role in shaping the perception of the quality of student services.

The interpretation of this pattern shows that students assess the quality of services not only from the technical aspect, but also from the psychosocial aspect. A positive ATT indicates that there is a belief that digital applications are really useful, according to the findings of Saeidi et al. [5]. Significant SN shows that peer behavior or trends in the campus environment also affect the evaluation of service quality. This is in line with the findings of Al-Hadid et al. in an e-learning study. A moderate PBC shows that although technical skills are considered important, students tend to already have basic digital skills. Therefore, the quality of service is more influenced by attitude and social factors than technical control. In conclusion, the integration of ATT, SN, and PBC factors in the TPB model strengthens understanding of how students assess the quality of digital application services.

The final analysis tested the TAM and TPB integration models simultaneously on service quality. Table 3 shows that the combined PU, PEOU, ATT, SN, and PBC results in an R^2 value of 0.57. The variables with significant influence were PU (0.362, $p < 0.001$), ATT (0.311, $p < 0.001$), SN (0.204, $p = 0.017$), and PBC (0.197, $p = 0.021$). PEOU remained influential but with a weaker significance (0.143, $p = 0.049$). The restatement of this data is that the integration of TAM and TPB explains more than half of the variation in the quality of student digital application services. This proves that the two models complement each other in explaining students' perceptions of digital services.

Table 3. Integration of TAM-TPB on Service Quality

Variable	Coefficient	Sig.
PU	0.362	0.000
PEOU	0.143	0.049
ATT	0.311	0.000
SN	0.204	0.017
PBC	0.197	0.021
$R^2 = 0.57$	F = 35.61	P < 0.001

Source: Processed primary data (2025)

The pattern in Table 3 shows that the integration of TAM and TPB provides a more comprehensive explanation than partial analysis. PU and ATT remain the dominant factors, while PEOU, SN, and PBC contribute as supporting factors. These findings are in line with the study of Venkatesh et al., which stated that the integration of TAM–TPB improves the predictability of technology adoption behavior [12]. Research by Yildirim & Ayar also supports these results by showing that PU and ATT are strong predictors in mobile banking [13]. This pattern shows that students evaluate the quality of digital application services based on a combination of technical factors, personal attitudes, and social influences. In conclusion, the integration of the two models provides a more thorough understanding of digital app adoption.

The interpretation of the integration pattern shows that the quality of services cannot be explained by technical variables (TAM) or socio-psychological (TPB) alone, but by a combination of the two. The dominant PU and ATT affirm that real benefits and positive attitudes are key in determining the perception of quality. SN and PBC provide an additional dimension in the form of social influence and personal control, which further enriches the model. The PEOU, although weak, remains significant, showing that operational ease is still a basic requirement. These results are consistent with Dwivedi et al., Tran et al., and Saeidi et al. who emphasize the importance of theoretical integration [3], [11]. Thus, this study concludes that TAM–TPB integration is the best approach to understand the adoption of digital applications and their implications on the quality of student services.

The findings that perceived usefulness (PU) exerts a stronger effect on service quality than perceived ease of use (PEOU) highlight significant implications for both theory and practice. Theoretically, this emphasizes the dominance of functional value over usability in digital payment adoption among students, confirming prior results by Alalwan et al. and Choudrie et al. [1], [2]. Practically, it suggests that developers should prioritize features that deliver tangible benefit such as security, transaction speed, and integration with academic payments rather than focusing solely on interface simplicity. Tran et al. and Yildirim & Ayar also demonstrated that usefulness has a direct influence on user satisfaction, while ease of use often functions indirectly [3], [13]. Therefore, this outcome confirms that students, as digital natives, evaluate service quality primarily based on whether applications improve their academic and financial activities. In conclusion, PU is the primary driver of perceived service quality in digital payment adoption, making it essential for application providers to design benefit-oriented services.

The dominance of PU over PEOU can be explained by structural and contextual factors. Students in East Java are familiar with multiple applications and thus do not struggle with usability, making PEOU less critical. Instead, they focus on whether digital payments improve efficiency, reduce risks, and support academic life, which aligns. The correlation arises because students have already internalized digital literacy, reducing the marginal importance of usability. Saeidi et al. also argue that perceived usefulness determines continued usage intention, explaining why service quality is strongly shaped by PU [5]. Furthermore, PEOU's weaker effect suggests that usability has become a baseline expectation rather than a differentiating factor. This structural shift explains why users prioritize functional utility. In conclusion, the underlying mechanism is that PU directly enhances perceived service quality, while PEOU only serves as a secondary facilitator.

The second finding that attitude (ATT), subjective norms (SN), and perceived behavioral control (PBC) significantly influence service quality—carries broader implications. Functionally, it shows that psychological and social dimensions are equally critical in shaping how students perceive service quality, not just technological functionality. Digital services, which all

emphasized social and attitudinal impacts [9]. Dysfunctionally, however, reliance on social influence may create herd behavior, where students evaluate quality based on peer adoption rather than objective service performance. Still, the findings reveal that attitude is the strongest determinant. Therefore, the implication is that providers must not only design functionally beneficial applications but also foster positive user attitudes through trust-building and targeted campaigns. In conclusion, attitudes and norms amplify how students interpret service quality, highlighting the psychosocial layer of technology adoption.

The strong role of ATT and SN can be explained through the underlying social structure of university life, where peer groups exert considerable influence on decision-making. Students' attitudes are shaped by previous positive experiences and expectations of utility, which correlate strongly with their judgments of service quality [11]. Subjective norms matter because university communities amplify digital trends—if peers adopt digital payments, others are likely to perceive them as high quality. PBC plays a moderate role, indicating that although students feel capable of using technology, this sense of control is less decisive than collective attitudes and norms. Structurally, this shows that technology adoption in educational contexts is socially embedded, with individual and group perceptions reinforcing one another. In conclusion, the correlation emerges because service quality evaluations are co-constructed through individual attitudes and peer norms, moderated by perceived control.

The integrated model of TAM and TPB explains 57% of the variance in service quality, which is considerably higher than either model alone. This has crucial implications: functionally, it demonstrates that combining technical, attitudinal, and social constructs provides a more robust framework for explaining digital payment adoption [12]. Dysfunctionally, reliance on only one model may lead to incomplete explanations and weak predictions of adoption behaviors. For providers, the implication is that user-centered strategies must address not only functional utility and usability but also social influence and attitudinal reinforcement. This is particularly relevant in the university context, where peer dynamics and personal beliefs shape service evaluation. In conclusion, the integrated TAM–TPB model is functionally superior in capturing multidimensional factors underlying service quality perceptions in digital application adoption.

The superiority of the integrated TAM–TPB model is structurally explained by the complementarity of its constructs. TAM captures the technical-functional dimension (PU and PEOU), while TPB addresses the psychosocial dimension (ATT, SN, and PBC). Venkatesh et al. and Dwivedi et al. argue that behavioral intention is a multi-layered phenomenon requiring both cognitive and social determinants. Tran et al. demonstrated that integration increases predictive power in digital payment contexts, while Yildirim & Ayar highlighted its relevance in mobile banking adoption. The underlying correlation arises because students' judgments of service quality are shaped by a dual process: rational evaluation of benefits and ease, and social-psychological influences from peers and self-efficacy. This dual pathway explains why integration produces stronger explanatory capacity. In conclusion, the structural mechanism behind integration is the convergence of functional and social-cognitive variables, which jointly shape perceptions of digital service quality among students.

5. CONCLUSION

This study set out to evaluate the adoption of digital payment applications among university students in East Java by integrating the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB), with a particular focus on their combined effects on perceived service quality. The results provide several significant insights that contribute to both theoretical development and practical application. First, perceived usefulness (PU) emerged as the

strongest determinant of service quality, while perceived ease of use (PEOU) showed a weaker but still significant influence. This indicates that students prioritize functional benefits, such as efficiency, transaction speed, and reliability, over mere ease of navigation. The implication is that usability has become a baseline expectation, while usefulness differentiates high-quality applications from less valued ones.

Second, constructs from TPB including attitude (ATT), subjective norms (SN), and perceived behavioral control (PBC) were also found to significantly influence perceptions of service quality. Among these, attitude was the most dominant factor, reflecting that students' positive evaluations are shaped by their prior experiences and beliefs about the utility of digital payment services. Subjective norms were also important, underlining the role of peer groups and social influence in university settings, while perceived behavioral control contributed moderately, indicating that students' confidence in their technological skills affects how they evaluate services. Together, these findings highlight the importance of social and psychological dimensions in complementing functional aspects of digital service adoption.

Third, the integrated TAM–TPB model explained 57% of the variance in perceived service quality, outperforming the predictive capacity of each model applied independently. This reinforces the argument that adoption behavior cannot be explained solely by technical factors or social-psychological factors in isolation, but rather by their integration. TAM provides insights into the cognitive evaluation of technology, while TPB incorporates attitudinal and normative influences, making the combined model a more comprehensive framework. This finding aligns with recent studies [15], confirming that integrated approaches enhance predictive accuracy in digital adoption research.

From a theoretical perspective, this study extends TAM and TPB research by linking their constructs not only to behavioral intention, as commonly done, but directly to service quality as an outcome variable. This contribution enriches the literature by bridging the gap between adoption models and service evaluation frameworks. From a practical perspective, the findings suggest that digital payment providers targeting student populations should emphasize usefulness-oriented features, foster positive attitudes through trust and branding, and leverage peer influence via community-based promotion strategies. Addressing both functional and psychosocial dimensions will improve students' perceptions of service quality, thereby increasing sustained adoption and satisfaction.

Despite its contributions, the study is not without limitations. The research was confined to a single geographical area East Java and focused exclusively on university students. This limits the generalizability of the findings to other populations or regions with different digital adoption dynamics. Furthermore, the study employed a cross-sectional design, preventing causal inferences about long-term adoption behaviors. Future research could adopt longitudinal approaches, expand to diverse demographic groups, and incorporate additional variables such as trust, risk perception, or technological self-efficacy to further refine the model.

In conclusion, the integration of TAM and TPB provides a powerful explanatory framework for understanding how functional, attitudinal, and social factors jointly shape perceptions of service quality in digital payment adoption. By demonstrating the primacy of perceived usefulness and attitudes, while also recognizing the roles of ease of use, subjective norms, and behavioral control, this study highlights the multidimensional nature of technology adoption among students. The findings not only advance theoretical discourse but also provide actionable insights for providers and policymakers seeking to enhance the quality and adoption of digital payment services in higher education contexts.

ACKNOWLEDGEMENTS

The author would like to express sincere gratitude to the State Islamic University Kiai Haji Achmad Siddiq Jember (UIN KHAS Jember) for providing academic guidance and research support throughout this study. Special thanks are also extended to the Eastasouth Institute for offering the publication platform and to all colleagues who contributed valuable insights during the research process. This study received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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