

Dari Nilai Yang Dipersepsikan Menuju Penggunaan Aktual: Pemodelan Adopsi Mobile Banking Pada Bank Pembangunan Daerah

From Perceived Value To Actual Use: Modeling Mobile Banking Adoption In A Regional Development Bank

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Abstract

The rapid expansion of mobile banking services has encouraged regional development banks to enhance digital adoption among their customers. However, actual system use remains a critical challenge despite increasing availability of mobile banking applications. This study aims to examine the relationships between Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) on actual system use, with Behavioral Intention (BI) serving as a mediating variable. A quantitative approach was employed using survey data collected from customers of a regional development bank who actively use mobile banking services. The data were analyzed using Partial Least Squares–Structural Equation Modeling (PLS-SEM) to assess both the measurement and structural models. The results indicate that Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) have positive and significant effects on Behavioral Intention (BI). Furthermore, Behavioral Intention (BI) demonstrates a significant positive effect on actual system use and acts as a key mediating variable in translating user perceptions into real usage behavior. Among the examined relationships, Behavioral Intention (BI) shows the strongest influence on actual system use, highlighting its critical role in mobile banking adoption. These findings contribute to the technology acceptance literature by confirming the applicability of the Technology Acceptance Model in the context of regional development banks. Practically, the study suggests that bank management should prioritize improving functional benefits and ease of interaction to strengthen customer intention and encourage sustained mobile banking usage.

Keywords: Mobile Banking; Technology Acceptance Model; Perceived Usefulness (PU); Perceived Ease of Use (PEOU); Behavioral Intention (BI); Actual System Use; Regional Development Bank

Abstrak

Pesatnya perkembangan layanan mobile banking mendorong bank pembangunan daerah untuk meningkatkan adopsi digital di kalangan nasabahnya. Namun, penggunaan sistem secara aktual masih menjadi tantangan utama meskipun ketersediaan aplikasi mobile banking terus meningkat. Penelitian ini bertujuan menguji hubungan antara Perceived Usefulness (PU) dan Perceived Ease of Use (PEOU) terhadap penggunaan sistem aktual, dengan Behavioral Intention (BI) sebagai variabel mediasi. Penelitian ini menggunakan pendekatan kuantitatif dengan data survei yang dikumpulkan dari nasabah bank pembangunan daerah yang aktif menggunakan layanan mobile banking. Data dianalisis menggunakan Partial Least Squares–Structural Equation Modeling (PLS-SEM) untuk menilai model pengukuran dan model struktural. Hasil penelitian menunjukkan bahwa PU dan PEOU berpengaruh positif dan signifikan terhadap BI. Selanjutnya, BI menunjukkan pengaruh positif signifikan terhadap penggunaan sistem aktual dan berperan sebagai variabel mediasi utama dalam menerjemahkan persepsi pengguna menjadi perilaku penggunaan nyata. Di antara hubungan yang diuji, BI menunjukkan pengaruh terkuat terhadap penggunaan sistem aktual, menegaskan peran pentingnya dalam adopsi mobile banking. Temuan ini berkontribusi pada literatur penerimaan teknologi dengan mengonfirmasi penerapan Technology Acceptance Model pada konteks bank pembangunan daerah. Secara praktis, penelitian ini menyarankan agar manajemen bank memprioritaskan peningkatan manfaat fungsional dan kemudahan interaksi guna memperkuat intensi nasabah dan mendorong penggunaan mobile banking yang berkelanjutan.

Kata Kunci: Mobile Banking; Technology Acceptance Model; Perceived Usefulness (PU); Perceived Ease of Use (PEOU); Behavioral Intention (BI)

1. Pendahuluan

The rapid growth of mobile banking services has transformed the delivery of financial services, enabling customers to conduct transactions conveniently through smartphones, irrespective of location and time. Mobile banking adoption has become a strategic focus for banks globally, as it promises improved service efficiency, customer satisfaction, and competitive advantage in the digital era. However, the gap between Behavioral Intention (BI) and actual system use remains a challenge for financial institutions, particularly in emerging economies where customer behavior and technological readiness vary widely.

The Technology Acceptance Model (TAM) is one of the most widely used theoretical frameworks to explain technology adoption, proposing that Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) directly influence users' Behavioral Intention (BI), which in turn affects their actual use behavior. This framework has been applied in numerous mobile banking studies, demonstrating that user perceptions play a fundamental role in shaping adoption outcomes. Prior research shows that PU and PEOU significantly affect users' intention to adopt mobile banking services in various contexts (Prastiawan et al., 2021).

Several recent studies reinforce these relationships. For instance, empirical evidence from extended TAM research indicates that both Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) significantly influence users' mobile banking intention (Widiar et al., 2023). Moreover, broader adoption research highlights that Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) remain central determinants in users' decision-making processes for mobile financial services (Addula et al., 2025).

Despite this well-established understanding of intention formation, there is a need for deeper insights into the Behavioral Intention (BI) → actual system use pathway, especially in the context of mobile banking platforms provided by regional development banks. A few studies have begun examining how Behavioral Intention (BI) translates into actual usage behavior, showing that the strength of this relationship can vary according to contextual and demographic factors (Kumar et al., 2023).

In the context of regional banks in emerging economies, customers' perceptions and technology acceptance mechanisms may differ from global or national banking contexts, suggesting a need to test the applicability of TAM constructs in such settings. Therefore, this study aims to model mobile banking adoption by investigating the effects of Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) on actual system use via Behavioral Intention (BI), employing Partial Least Squares–Structural Equation Modeling (PLS-SEM) as the analytical approach. This research contributes to the literature by focusing on the full mechanism from perceptions to actual use behavior in a specific banking environment and provides actionable insights for improving mobile banking adoption strategies in regional development banks.

2. Metode

2.1. Research Design and Approach

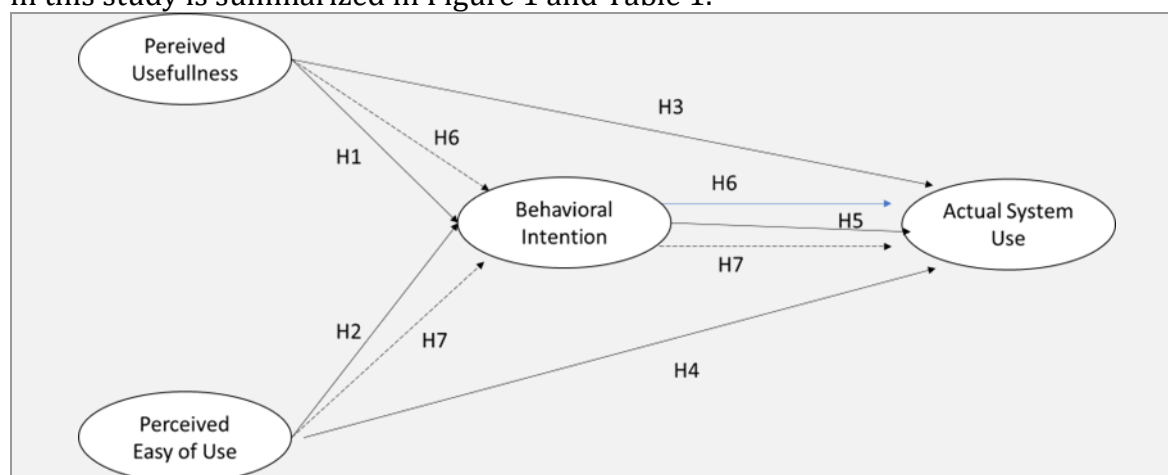
This study employs a quantitative explanatory research design to investigate factors influencing mobile banking adoption in a regional development bank. The research framework is grounded in the Technology Acceptance Model (TAM), which explains how users' cognitive perceptions influence their intention and actual usage

of information systems. TAM emphasizes Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) as the primary antecedents of Behavioral Intention (BI), which subsequently determines Actual System Use (ASU).

Recent mobile banking studies continue to validate TAM as a robust theoretical model for explaining users' adoption behavior, particularly in digital financial services (Kumar & Gupta, 2022; Alalwan et al., 2022). Moreover, the inclusion of Behavioral Intention (BI) as a mediating variable enables a deeper understanding of how user perceptions are translated into actual usage behavior, which has been increasingly emphasized in recent empirical research (Shaikh et al., 2023).

2.2. Research Hypotheses

Based on the Technology Acceptance Model (TAM) and prior empirical findings in mobile banking adoption research, this study proposes a set of hypotheses to examine the relationships among Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Behavioral Intention (BI), and Actual System Use (ASU). The proposed hypotheses are designed to capture both the direct effects of user perceptions on intention and usage behavior, as well as the indirect effects through Behavioral Intention (BI) as a mediating variable. The complete set of research hypotheses tested in this study is summarized in Figure 1 and Table 1.



Gambar 1. Skema Hipotesis Penelitian.

Tabel 1. Hipotesis Penelitian.

Hipotesis	Hubungan	Deskripsi
H1	PU – BI	Perceived Usefulness (PU) has a positive effect on Behavioral Intention (BI) to use mobile banking
H2	PEOU – BI	Perceived Ease of Use (PEOU) has a positive effect on Behavioral Intention (BI) to use mobile banking
H3	PU – ASU	Perceived Usefulness (PU) has a positive effect on Actual System Use (ASU) of mobile banking
H4	PEOU – ASU	Perceived Ease of Use (PEOU) has a positive effect on Actual System Use (ASU) of mobile banking

Hipotesis	Hubungan	Deskripsi
H5	BI – ASU	Behavioral Intention (BI) has a positive effect on Actual System Use (ASU) of mobile banking
H6	PU – BI – ASU	Behavioral Intention (BI) mediates the relationship between Perceived Usefulness (PU) and Actual System Use (ASU)
H7	PEOU – BI – ASU	Behavioral Intention (BI) mediates the relationship between Perceived Ease of Use (PEOU) and Actual System Use (ASU)

2.3. Population and Sampling Technique

The population of this study consists of 46,778 customers registered at the main branch of a regional development bank who have access to mobile banking services. Due to the need to ensure that respondents had prior experience with mobile banking, this study adopted a purposive sampling technique, which is appropriate when samples are selected based on specific characteristics relevant to the research objectives (Etikan et al., 2016).

The minimum sample size was determined using the Slovin formula, which is commonly applied when the population size is known and researchers aim to obtain a representative sample with limited resources (Tejada & Punzalan, 2012). Based on the calculation, a total of 100 respondents were selected for analysis. This sample size is also considered adequate for Partial Least Squares–Structural Equation Modeling (PLS-SEM), which performs well with relatively small sample sizes and complex models (Hair et al., 2021).

2.4. Measurement of Variables

The measurement instrument consisted of four latent constructs: Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Behavioral Intention (BI), and Actual System Use (ASU). Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) were each measured using six items, Behavioral Intention (BI) was measured using three items, and Actual System Use (ASU) was measured using four items. All measurement items were adapted from prior technology acceptance studies and contextualized for mobile banking services in a regional development bank. A complete list of measurement items is provided in Appendix A.

2.5. Data Collection and Measurement Instrument

Primary data were collected through a structured questionnaire distributed to selected respondents. The measurement items were adapted from validated instruments used in recent mobile banking and technology acceptance studies to ensure content validity (Kumar & Gupta, 2022; Oliveira et al., 2021). All indicators were measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), which is widely employed in behavioral and information systems research (Hair et al., 2021).

The constructs measured in this study include Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Behavioral Intention (BI), and Actual System Use (ASU).

These constructs have been extensively applied and empirically validated in recent mobile banking adoption research (Alalwan et al., 2022; Shaikh et al., 2023).

2.6. Data Analysis Method

Data analysis was conducted using Partial Least Squares–Structural Equation Modeling (PLS-SEM) with the assistance of SmartPLS software. PLS-SEM is particularly suitable for predictive research and theory testing involving mediating variables, especially when data normality assumptions cannot be guaranteed (Hair et al., 2021).

The analysis followed a two-stage procedure: (1) evaluation of the measurement model, including internal consistency reliability, convergent validity, and discriminant validity; and (2) evaluation of the structural model, including hypothesis testing and mediation analysis. PLS-SEM has been widely used in recent mobile banking studies due to its flexibility and robustness in analyzing complex behavioral models (Alalwan et al., 2022).

2.7. Ethical Considerations

Participation in this study was voluntary, and respondents were informed about the purpose of the research prior to data collection. All responses were treated confidentially and anonymously. No personal identifying information was collected, and the study adhered to standard ethical principles for social science research.

3. Hasil Dan Pembahasan

3.1. Respondent Profile

A total of 100 respondents participated in this study, all of whom were active users of mobile banking services at the main branch of a regional development bank. The demographic characteristics of respondents, including gender, age group, and duration of mobile banking usage, are summarized in Table 2. Overall, the respondents were dominated by users in the productive age group and those with sufficient experience using mobile banking services, indicating that the sample was appropriate for evaluating Actual System Use (ASU) behavior.

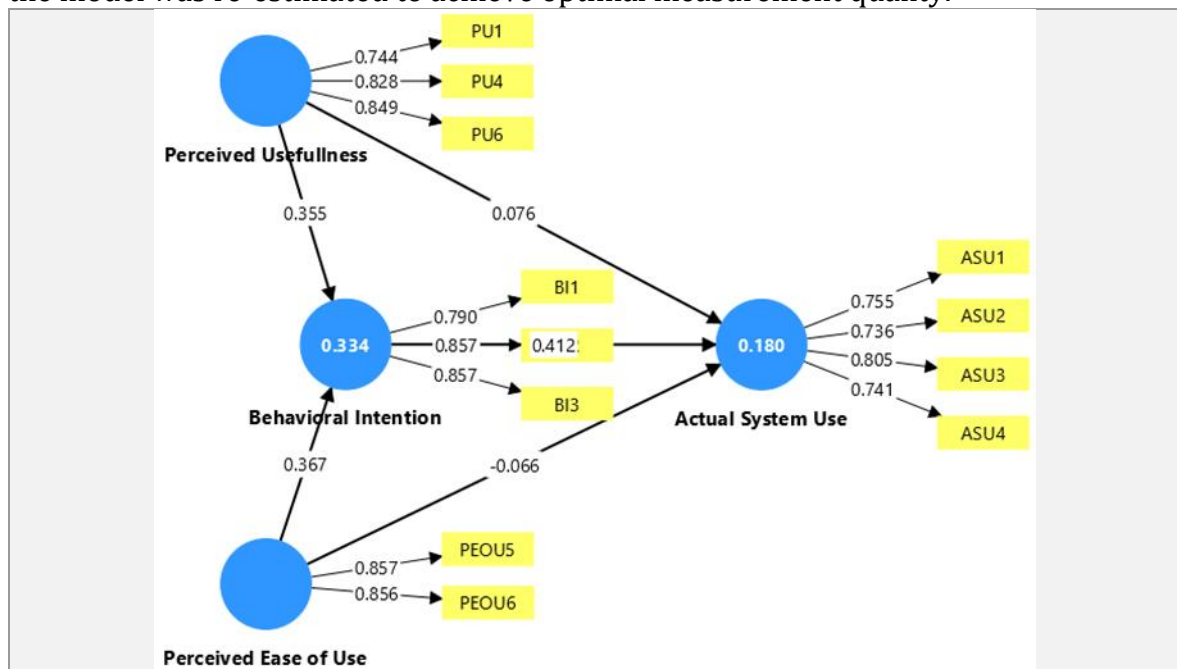
Tabel 2. Profil Responden.

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	58	58
	Female	42	42
Age	18 – 39 years	65	65
	40 – 59 years	28	28
	> 60 years	7	7
Duration of use	3 – 12 months	45	45
	> 12 months	55	55

3.2. Measurement Model Evaluation

The measurement model was evaluated to assess convergent validity, discriminant validity, and construct reliability. As presented in Table 3, all retained indicators exhibited outer loading values above the recommended threshold of 0.70,

indicating that each indicator adequately represented its corresponding construct. Indicators that did not meet this criterion in the initial estimation were removed, and the model was re-estimated to achieve optimal measurement quality.



Gambar 2. Hasil Model Pengukuran.

Tabel 3. Evaluasi Model Pengukuran.

Construct	Item	Outer Loading	AVE	CR
PU	PU1	0.744	0.653	0.849
	PU4	0.828		
	PU6	0.849		
PEOU	PEOU5	0.857	0.733	0.846
	PEOU6	0.856		
BI	BI1	0.790	0.698	0.874
	BI2	0.857		
	BI3	0.857		
ASU	ASU1	0.755	0.577	0.845
	ASU2	0.736		
	ASU3	0.805		
	ASU4	0.741		

Convergent validity was further confirmed through Average Variance Extracted (AVE) values. As shown in Table 3, all constructs achieved AVE values greater than 0.50, ranging from 0.577 to 0.733, demonstrating that the constructs explained more than half of the variance of their indicators. In addition, Composite Reliability (CR)

values for all constructs exceeded 0.70, indicating satisfactory internal consistency reliability.

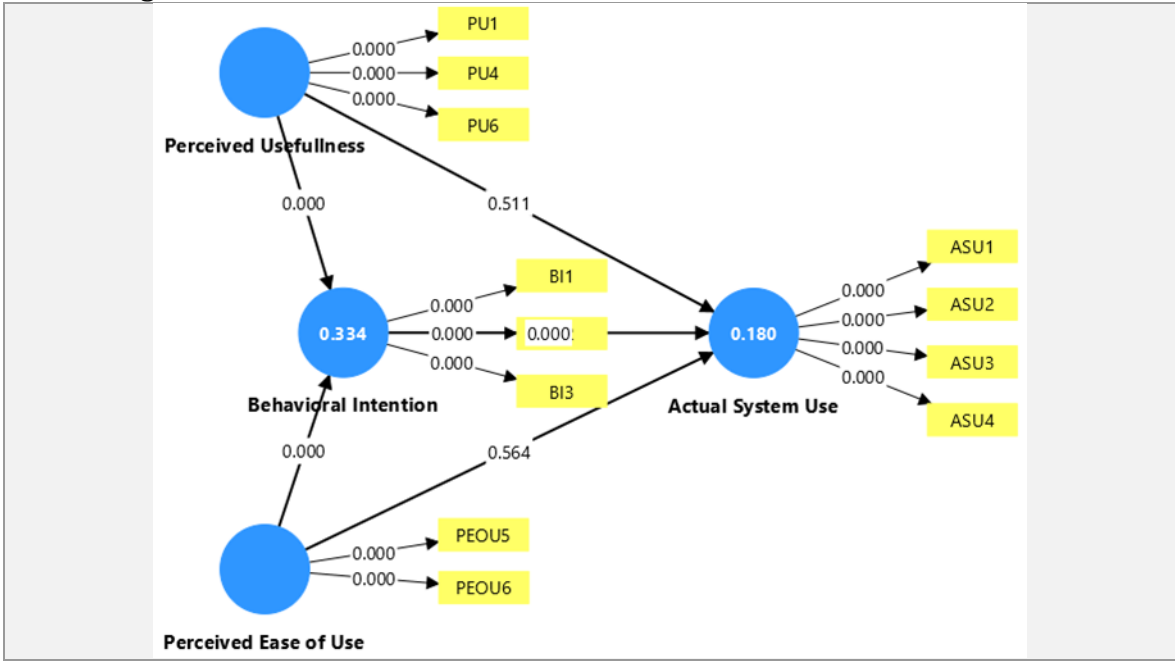
Tabel 4. Validitas Diskriminan (Kriteria Fornell–Larcker).

Construct	ASU	BI	PEOU	PU
ASU	0.760			
BI	0.416	0.835		
PEOU	0.148	0.467	0.856	
PU	0.246	0.459	0.282	0.808

Discriminant validity was assessed using the Fornell–Larcker criterion, as reported in Table 4. The square roots of AVE (diagonal values) for each construct were higher than the inter-construct correlations, confirming that all latent variables were empirically distinct. These results indicate that the measurement model met all recommended validity and reliability criteria.

3.3. Structural Model Evaluation

The structural model was evaluated by examining the coefficient of determination (R^2), path coefficients, and effect sizes. The R^2 value for Behavioral Intention (BI) was 0.334, indicating that Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) jointly explained a moderate proportion of variance in Behavioral Intention (BI). Meanwhile, the R^2 value for Actual System Use (ASU) was 0.180, suggesting that the proposed model explained a modest proportion of variance in actual usage behavior.



Gambar 3. Hasil Model Struktural.

Tabel 5. Hasil Model Struktural dan Uji Hipotesis.

Hipotesis	Path	β	T-Value / P-Value	Decision
H1	PU – BI	0.355	4.407 / 0.000	Supported
H2	PEOU – BI	0.367	5.427 / 0.000	Supported
H3	PU – ASU	0.076	0.658 / 0.511	Not Supported
H4	PEOU – ASU	-0.066	0.577 / 0.564	Not Supported
H5	BI – ASU	0.412	4.292 / 0.000	Supported

Hypothesis testing was conducted using a bootstrapping procedure. The results of the structural model analysis are summarized in Table 5. Perceived Usefulness (PU) demonstrated a positive and significant effect on Behavioral Intention (BI) ($\beta = 0.355$, P-Value < 0.001), as did Perceived Ease of Use (PEOU) ($\beta = 0.367$, P-Value < 0.001). Behavioral Intention (BI) also showed a positive and significant effect on Actual System Use (ASU) ($\beta = 0.349$, $p < 0.001$).

In contrast, the direct effects of Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) on Actual System Use (ASU) were not statistically significant. These findings indicate that user perceptions do not directly drive actual usage behavior but instead exert their influence primarily through Behavioral Intention (BI).

3.4. Mediation Analysis

To further examine the role of Behavioral Intention (BI) as an intervening variable, mediation analysis was performed. The results of the indirect effect testing are presented in Table 6. The indirect effect of Perceived Usefulness (PU) on Actual System Use (ASU) through Behavioral Intention (BI) was positive and statistically significant ($\beta = 0.146$, P-Value = 0.001). Similarly, Perceived Ease of Use (PEOU) exerted a significant indirect effect on Actual System Use (ASU) via Behavioral Intention (BI) ($\beta = 0.151$, P-Value = 0.002).

Tabel 6. Hasil Analisis Mediasi.

Hipotesis	Path	β	T-Value / P-Value	Mediation
H6	PU – BI – ASU	0.146	3.086 / 0.001	Partial Mediation
H7	PEOU – BI – ASU	0.151	3.336 / 0.002	Partial Mediation

The significance of both indirect effects, combined with the non-significant direct effects of Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) on Actual System Use (ASU), confirms that Behavioral Intention (BI) plays a critical mediating role in the proposed model. These results highlight Behavioral Intention (BI) as the key mechanism through which user perceptions are translated into actual mobile banking usage.

3.5. Pembahasan

This study aimed to model mobile banking adoption in a regional development bank by examining the roles of Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Behavioral Intention (BI), and Actual System Use (ASU). The findings provide several important insights into how user perceptions are translated into real usage behavior, particularly through the mediating role of Behavioral Intention (BI).

First, the results demonstrate that Perceived Usefulness (PU) has a positive and significant effect on Behavioral Intention (BI). This finding indicates that customers are more inclined to intend to use mobile banking when they perceive the application as beneficial for improving the effectiveness and efficiency of their banking activities. This result is consistent with recent empirical studies that emphasize Perceived Usefulness (PU) as a primary determinant of intention in mobile banking contexts (Kumar & Gupta, 2022; Oliveira et al., 2021). In the context of a regional development bank, this suggests that functional value such as transaction speed, reliability, and usefulness remains a critical driver of customer intention.

Second, Perceived Ease of Use (PEOU) is found to have a positive and significant effect on Behavioral Intention (BI), confirming that simplicity and ease of interaction play a crucial role in shaping customers' willingness to use mobile banking services. This finding aligns with recent studies showing that systems perceived as easy to learn and operate are more likely to be accepted by users, particularly in emerging economy contexts where digital literacy levels may vary (Alalwan et al., 2022; Tran & Nguyen, 2024). The result implies that reducing complexity in user interface design and transaction processes can significantly strengthen customers' intention to use mobile banking.

Interestingly, the findings reveal that Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) do not have significant direct effects on Actual System Use (ASU). This result suggests that positive perceptions alone are insufficient to directly drive actual usage behavior. Similar findings have been reported in recent mobile banking research, which highlights that favorable perceptions must first be internalized as intention before being translated into consistent usage behavior (Shaikh et al., 2023). In this regard, Actual System Use (ASU) appears to be a more complex behavioral outcome that requires a strong motivational component rather than mere cognitive evaluation.

Consistent with the Technology Acceptance Model, Behavioral Intention (BI) is shown to have a positive and significant effect on Actual System Use (ASU), confirming its pivotal role as the most immediate predictor of real usage behavior. This result reinforces prior evidence that intention serves as the key mechanism through which perceptions influence actual technology use (Alalwan et al., 2022; Shaikh et al., 2023). For regional development banks, this implies that efforts to increase mobile banking usage should prioritize strategies that strengthen customers' intention, such as trust-building initiatives, user engagement programs, and continuous service improvement.

More importantly, the mediation analysis confirms that Behavioral Intention (BI) significantly mediates the relationships between Perceived Usefulness (PU) and Actual System Use (ASU), as well as between Perceived Ease of Use (PEOU) and Actual System Use (ASU). The presence of significant indirect effects combined with non-significant direct effects indicates that Behavioral Intention (BI) functions as a full mediating mechanism in this model. This finding extends recent TAM-based studies by empirically demonstrating that the influence of user perceptions on actual usage

behavior operates primarily through intention rather than direct pathways (Tran & Nguyen, 2024).

Overall, these findings contribute to the mobile banking and technology acceptance literature by reaffirming the relevance of TAM in the context of regional development banks while emphasizing the central role of Behavioral Intention (BI) as a bridging construct between perception and behavior. From a practical perspective, the results suggest that improving Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) alone is not sufficient to increase actual mobile banking usage unless these improvements are accompanied by strategies that actively foster customers' intention to use the system.

4. Simpulan

This study examined mobile banking adoption in a regional development bank by applying the Technology Acceptance Model and incorporating Behavioral Intention (BI) as a mediating variable between user perceptions and Actual System Use (ASU). Using PLS-SEM analysis, the study provides empirical evidence on how Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) influence customers' intention and subsequent usage behavior.

The findings confirm that Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) significantly affect Behavioral Intention (BI) to use mobile banking. In contrast, neither Perceived Usefulness (PU) nor Perceived Ease of Use (PEOU) exerts a direct influence on Actual System Use (ASU). Instead, Behavioral Intention (BI) emerges as the most influential determinant of actual usage behavior. The mediation analysis further demonstrates that Behavioral Intention (BI) plays a critical mediating role, indicating that user perceptions affect Actual System Use (ASU) primarily through intention rather than through direct pathways.

From a theoretical perspective, this study reinforces the applicability of the Technology Acceptance Model in the context of regional development banks and extends prior research by highlighting the central role of Behavioral Intention (BI) as a bridging mechanism between cognitive perceptions and actual usage behavior. The results provide additional empirical support for intention-driven models of technology use in mobile banking environments, particularly within emerging economy settings.

From a practical standpoint, the findings suggest that bank management should not only focus on improving the functional benefits and ease of use of mobile banking applications but also actively promote strategies that strengthen customers' intention to use the system. Such strategies may include enhancing user engagement, building customer trust, and providing continuous support and communication to encourage sustained usage.

Despite its contributions, this study has several limitations. The analysis was based on data collected from a single regional development bank, which may limit the generalizability of the findings. In addition, Actual System Use (ASU) was measured using self-reported data, which may be subject to response bias. Future research is encouraged to incorporate objective usage data, examine additional explanatory variables, and extend the analysis to multiple banking institutions to provide a more comprehensive understanding of mobile banking adoption behavior.

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