Analysis of the Use of Mobile Banking Using the Unified Theory of Acceptance and Use of Technology (UTAUT-2), Trust and Word-of-Mouth (WOM) for BNI Customers in Bandung

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Abstract. The current digital era 4.0 encourages various business sectors to carry out digital transformation, one of which is carried out by the banking sector, which has begun to utilize smartphone technology in conducting digital-based banking financial transactions using mobile banking applications. However, the use of mobile banking for PT Bank Negara Indonesia (BNI) customers is still relatively low. The share of mobile banking usage for BNI is only around 14%, in which 5,91% of the total users are located in Bandung representative, the capital city of West Java, making the city considered as the third lowest users out of 14 representatives in the country. This research aims to analyze the factors that influence the use of Mobile Banking BNI customers in the Bandung City area. The research model used in this study is UTAUT-2 which is extended by adding the Word-of-Mouth variable to mobile user customers. Furthermore, this study wants to explore to what extent the construction of PE, EE, SI, FC, HM, PV, Trust, and Word of Mouth (WOM) affects the Behavior Intention and Use Behavior of BNI Mobile Banking. This study uses a quantitative approach with purposive sampling using the slovin formula, with a total of 400 respondents joining the research. The data were analyzed using smartPLS with the Partial Least Square (PLS) and Structural Equation Modeling (SEM) technique. The results of the research show that PE has a positive effect on BI, EE has a positive effect on PE, PV has a positive effect on BI, Trust has a positive effect on PE, and BI from mobile banking. Furthermore, BI, FC, and WOM positively affect the UB of mobile banking. Meanwhile, from the results of hypothesis testing, SI has no significant effect on BI, EE has no significant effect on BI, and HM also has no significant effect on BI of mobile banking. The influence on Behavioral Intention is 56%, whereas the influence on Use Behavior is 70%. This research can be used as a reference for BNI to focus on developing mobile banking services as the primary approach for enhancing digital transformation. Further study on the use of mobile banking in the Bandung area can be conducted, and other regions can be included to allow for a comparison of each region.

Keywords: Digital transformation · Mobile banking · UTAUT-2 · Trust · WOM

1   Introduction

The COVID-19 pandemic, which has been ongoing for two years, has undoubtedly affected the process of accelerating more comprehensive digitalization of banking, starting from the system to banking operations, which have shifted digitally. Therefore, the public is encouraged to adapt to various digital financial services immediately. As a result of this case, BNI continues to work to make it easier for customers to switch to digital-based technology in mobile banking applications. According to the 2021 Bank Service Excellence Monitor (BSEM) survey conducted by Marketing Research Indonesia (MRI), BNI mobile banking was ranked the best mobile banking application in terms of the application's completeness of features [1].

The use of BNI mobile banking during this pandemic shows a significant increase until the first quarter of 2021. The number of users reached 8.56 million or grew 58.4% compared to the first quarter of 2020, which was 5.41 million customers. In terms of transaction value was recorded Rp. 138 trillion in March 2021, or a 33.2% growth compared to March 2020 of Rp. 103 trillion. The number of transactions in the first three months of 2021 was 95 million, an increase of 50.4% compared to the first quarter of 2020, which reached 63 million transactions [2]. The brand award institution, which annually conducts a survey related to the use of Mobile Banking in Indonesia in 2021; the results are as follows [3].

The survey conducted in the Top Brand Index (TBI) Phase 1 in the first semester of 2021 above shows that BNI's mobile banking is in the third position after BCA and Mandiri; this shows that the percentage of BNI mobile banking usage in Indonesia is still low at 14%, even though during this pandemic the use of mobile banking has increased. Figure 6 shows an increase in the number of mobile banking users and transactions for three periods (2018–2020), including the number of users increasing by 59.6%, growth in transaction value increasing by 47.6%, and transaction volume by 49.9%.

The researcher further interviewed several employees of the Bandung BNI College Branch Office, including Mr. I Putu Gede Restu as Branch Manager, Mrs. Linlin Nurlina Rahmah as Service Division Leader, and Mrs. Evy Wara Kusumawati as Head of Sub-Branch Office The data shows that there are still complaints from customers that are directly communicated by the employee at the frontline service unit when serving customers. The consumer complaints are about difficulties encountered when using mobile banking, such as technical issues with unsuccessful transfers or system malfunctions that prevent clients from transacting on mobile banking. Besides that, BNI employees may encounter these challenges when using mobile banking, and employees may experience as customers in general when they do. According to BNI's mobile banking usage data in the Bandung area (WBN), mobile banking usage is still low, at roughly 5.91%, with the Bandung area (WBN) ranking third lowest nationally in terms of mobile banking users.

2   Literature Review

This study adopted the research of [4], which examines the use of mobile banking on Jordanian Bank customers. The results of the previous hypothesis, combined with an indirect correlation to use behavior/adoption, contributed to a complicated theoretical

model that became the framework of this research. Research conducted by [4] using the UTAUT-2 model with the results of performance expectation, effort expectation, hedonic motivation, price value, and trust significantly and positively influencing behavior intention, which mediates positively on mobile banking adoption, in line with other studies [5], the relationship between the variables of performance expectation, effort expectation, hedonic motivation, facilitating conditions, price value and empirically proven to affect mobile banking behavior intention, meanwhile the relationship between use behavior/adoption variables or usage adoption is influenced by intention, behavior (behavior intention) and WOM. Therefore, the framework that will be carried out in this study is a development of previous research conducted previously by [4] and the expansion of the UTAUT-2 model, although based on the results of the UTAUT-2 literature review this model is the best model because it has the highest predictive power among the previous models, but a good model applied in a country may not necessarily be applicable. In other countries, due to different economic and social factors.

Mobile banking is defined as a type of banking transaction conducted via mobile devices such as cellular phones or smartphones, which are often included in mobile commerce [6]. Customers can use mobile banking to access bank accounts via mobile applications such as checking balances and other banking financial transactions [7]. Mobile banking was first implemented in the 2000s, when it was still in the form of text messages or SMS [8]. Mobile banking allows users to access information such as checking balances, viewing current account changes, and using the mobile cash feature to withdraw money from ATMs without using a debit card. In addition, customers are able to make financial transactions safely and in real time for bill payments and sending or receiving money transfers by utilizing the features available in mobile banking [9].

The Unified Theory of Acceptance and Use of Technology-2 (UTAUT-2) is a development of the UTAUT model, in which critical factors related to predicting individual behavioral intentions to use technology in an organizational context were filtered out. At the same time, UTAUT-2 studied acceptance and use of technology in a consumer context [10]. The earlier UTAUT-2 model, according to [11], was developed for technology acceptance at the employee or employee scope and is commonly transferred to the context of consumer acceptance and usage of technology.

3   Conceptual Model

Conceptual framework in the research using the UTAUT-2 model from [10] was modified in a previous study by [4] by adding the Trust variable, then in this study in addition to adopting the thought framework of [4] will also add a Word of Mouth (WOM) variable.

The framework used in this study is the extension of previous research by [4] and the expansion of the UTAUT-2 model. However, based on the UTAUT-2 literature results, this model is the best model because it has the highest predictive power of the previous models. However, due to differences in economic and social factors, a good model implemented in one country may not be applicable in another. As a result, the UTAUT-2 model from [10] was modified in a previous study by [4] by adding the Trust variable, and in this study, in addition to adopting the thought framework of [4], a Word of Mouth (WOM) variable will be added. Consider including the WOM variable, given that this
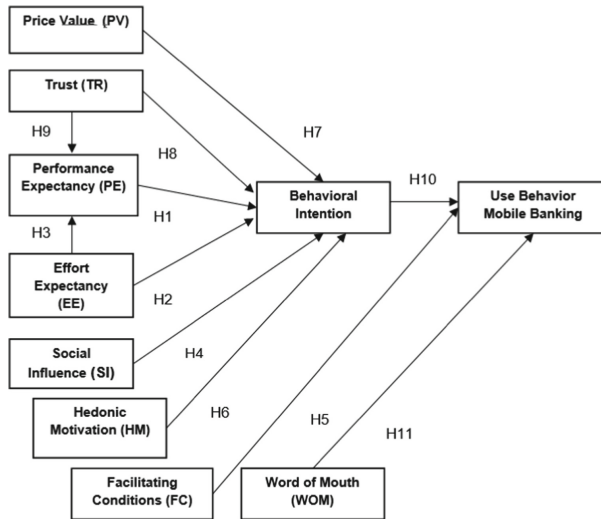
Fig. 1. Research Framework. Source: Modification of the model, [4, 5]

study is focused on consumers rather than organizations, as was the case with UTAUT. WOM is included in this research framework model because consumers are not expected to use mobile banking services unless they receive recommendations or testimonials from others in the context of mobile banking services. As a result, it is critical to include the WOM [5] (Fig. 1).

Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Condition, Hedonic Motivation, Price Value, Trust, and Word of Mouth are the eight independent factors in this study paradigm, whereas Behavioral Intention and Use Behavior are the two dependent variables. Customers' belief that adopting BNI's mobile banking services will increase their capacity to conduct real-time financial transactions will be measured using Performance Expectancy. The extent to which customers associate the ease of utilizing BNI's mobile banking services will be assessed by this Effort Expectancy. Customers' perceptions of how people in their social surroundings, both friends and family, affect their behavior toward using BNI's mobile banking services will be evaluated in this Social Influence. This Facilitating Condition will assess customers' belief that factors such as device availability, knowledge, instructions, and other people in their social groups are available to support the use of BNI mobile banking. This Hedonic Motivation will assess the pleasure and comfort derived from using BNI's mobile banking services. This Price Value represents the benefit perceived by the user in exchange for the financial costs associated with using BNI's mobile banking service. This trust will evaluate how customers lack confidence and trust in using BNI's mobile banking services to conduct banking transactions. This WOM will examine how much customers believe they receive word-of-mouth recommendations that influence their decision to use BNI mobile banking services.

4   Research Methods

The study utilizes a quantitative approach and a deductive method. Additionally, this study employs an explanatory which demonstrates the relationship between variables [8]. According to [12], a variable is a construct or trait that enables it to be investigated. According to [13], a variable is a quantifiable quality. [14] defines study variables as traits, properties, or values of persons, objects, or activities that have been subjected to various alterations by researchers in order to be investigated and conclusions are drawn. Variables have operational definitions, which enable the description or definition of a variable in operationalization through procedures for measuring the idea [15]. Additionally, this study will collect data directly from respondents using questionnaires, which will be processed as primary data. Along with primary data collection, questionnaires such as interviews and observations can be conducted [16]. In this study, variables are classified into three categories: independent variables (independent variables), dependent variables (dependent variables), and intervening variables (intervening variables) (interrupting variable).

This research employed non-probability sampling, a technique that does not ensure equal sampling opportunities for each element or member of the population. Purposive sampling will be used in this study [14]. Calculation of the sample from the entire population using the Slovin sampling technique, as follows.

$$n = N/N(d)^2 + 1 \tag{1}$$

$$n = 525.564/\left(\left(525.564(0,05)^{2)}\right) + 1\right)$$

$$\boldsymbol{n = 400}$$

Note:
n = number of samples
N = total population
d = 95% precision value or 0.05 significance.

The research applies two distinct types of data in the analysis: primary and secondary data. According to Silalahi [17], primary data is an unprocessed or raw material or data derived from the primary source. The authors obtained primary data by distributing questionnaires to BNI subscribers in the Bandung region, which served as a sample for the study. While [17] defines secondary data as information collected from a second available source or additional sources. For secondary data, the author obtained information about the company from the General Unit, and one of the Branch Heads in the BNI supervision company in the Bandung area. The data is related to the company's vision, mission, and internal data. Additionally, the author obtained additional information from books and research journals, both national and international journals, which were used to support and as literature in this research.

The researchers conducted a descriptive analysis in this study by distributing questionnaires to respondents who are BNI customers in the Bandung City region. The

researcher employs a multivariate technique since several variables are analyzed concurrently. In this study, the researcher employs SEM (Structural Equation Modeling) analysis, which is aided by using SmartPLS software. PLS-SEM was performed in two stages. The first phase is to evaluate the measurement model (outer model), then evaluate the structural model (inner model). The study evaluates the validity and reliability of the measurement model, whereas the structural model evaluates R2 and the importance of the path coefficient [15]. The outer model is a measuring model used to determine the model's validity and dependability. The algorithm iteration process resulted in the determination of the measurement model parameters (convergent validity, discriminant validity, composite reliability, and Cronbach's alpha), as well as the value of R2 as a parameter for the prediction model's accuracy [15]. The inner model is a structural model used to forecast the causal relationships between latent variables. Through the bootstrapping process, T-statistic test parameters were obtained to predict a causal relation [15].

5   Result and Discussions

The following are the results of the tests carried out in this study.

5.1   Outer Model Evaluation

The assessment model is used to determine the instrument's validity and reliability. The validity test was used to verify the research instrument's ability to accurately measure what should be assessed.

Validity analysis (Discriminant Validity, and Convergent Validity) and reliability analysis (Cronbach's Alpha, and Composite Reliability) are two things to assess at the analysis stage of the measurement model (outer model). The results of data processing utilizing the SmartPLS 3.3 application are shown Fig. 2, which can be used to illustrate the measurement model analysis (outer model).

5.2   Convergent Validity

According to the convergent validity test findings for 39 indicator items in Fig. 2, it can be concluded that all indicators are valid because their loading factor values exceed the minimum requirement, indicating that all indicators are valid and can proceed to the next stage of study.

5.3   Discriminant Validity

Based on the test results, it can be stated that all latent variables have good validity with an AVE value > 0.5 (Table 1).

Another strategy for determining discriminant validity is to examine each item's cross-loading value. The cross-loading value created by the 39 items examined indicates that each item's loading value on the construct is more than the cross-loading value (Table 2).
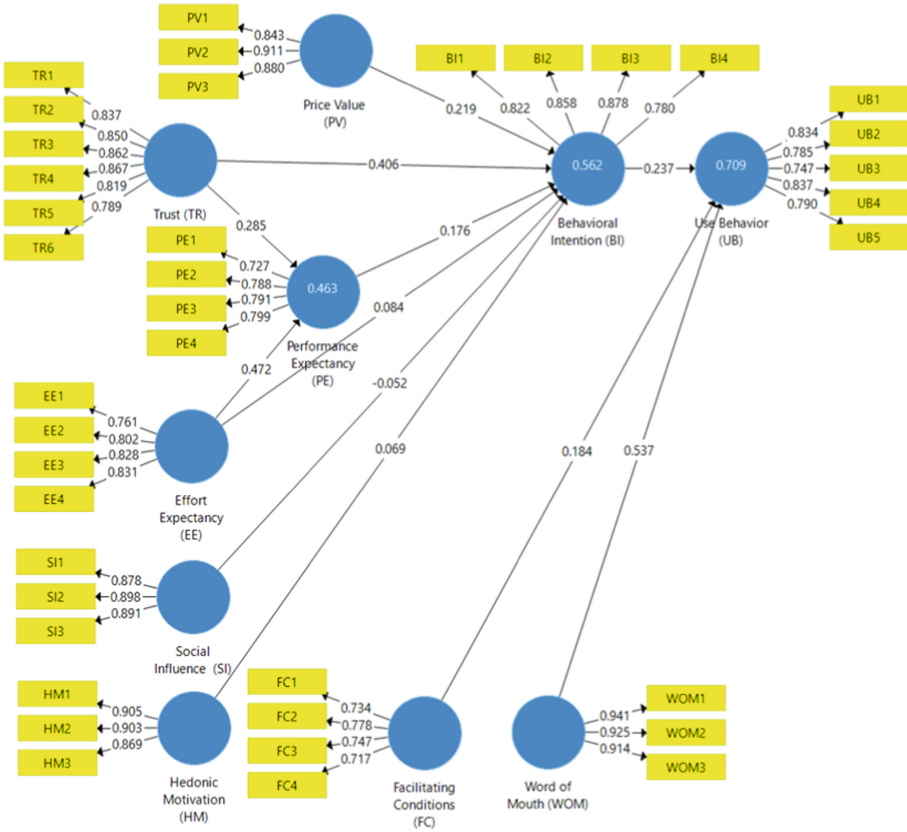
Fig. 2. SmartPLS Testing Research Model

5.4 Reliability Test

Based on the test results for 39 items, it can be concluded that all variables have a high degree of reliability, as evidenced by composite reliability values > 0.6 and Cronbach's alpha > 0.6 (Table 3).

5.5 Inner Model Evaluation

Inner model analysis is carried out to ensure that the structural model built is strong and accurate. Model evaluation is done through R-square test (R2).

Based on Table 4, the BI variable is influenced by PE, EE, SI, FC, HM, PV, Trust, and WOM by $R^2 = 0.562$ or 56.2%. Meanwhile, for UB variables influenced by BI of $R^2 = 0.709$ or 70.7%. To test the overall model quality, Goodness of Fit is used. The calculation results are as follows:

$$GoF = \sqrt{\overline{AVE} \times \overline{R^2}}$$

(2)

Table 1. Convergent Validity Test Results Average Variance Extracted (Ave)

Variable	Average Variance Extracted (AVE)	Decision
Performance Expectancy (PE)	0.847	Valid
Effort Expectancy (EE)	0.650	Valid
Social Influence (SI)	0.790	Valid
Facilitating Condition (FC)	0.554	Valid
Hedonic Motivation (HM)	0.797	Valid
Price Value (PV)	0.772	Valid
Trust (TR)	0.702	Valid
Word of Mouth (WOM)	0.859	Valid
Behavioral Intention (BI)	0.697	Valid
Use Behavior (UB)	0.639	Valid

Source: Processed Data, 2022

Table 2. Discriminant Validity Test Results

Variable	BI	EE	FC	HM	PE	PV	SI	TR	UB	WOM
Behavioral Intention (BI)	0.835									
Effort Expectancy (EE)	0.537	0.806								
Facilitating Conditions (FC)	0.557	0.562	0.744							
Hedonic Motivation (HM)	0.433	0.317	0.491	0.893						
Performance Expectancy (PE)	0.554	0.640	0.504	0.348	0.777					
Price Value (PV)	0.602	0.477	0.562	0.592	0.442	0.879				
Social Influence (SI)	0.452	0.497	0.604	0.438	0.507	0.555	0.889			
Trust (TR)	0.692	0.591	0.588	0.417	0.564	0.624	0.545	0.838		
Use Behavior (UB)	0.672	0.561	0.653	0.475	0.610	0.664	0.612	0.738	0.799	
Word of Mouth (WOM)	0.619	0.495	0.626	0.467	0.543	0.675	0.584	0.683	0.799	0927

Source: Processed Data, 2022

Table 3. Reliability Test Results

Variable	Cronbach's Alpha	rho A	Composite Reliability	Decision
Behavioral Intention (BI)	0.854	0.858	0.902	Reliable
Effort Expectancy (EE)	0.820	0.821	0.881	Reliable
Facilitating Conditions (FC)	0.733	0.736	0.832	Reliable
Hedonic Motivation (HM)	0.874	0.897	0.922	Reliable
Performance Expectancy (PE)	0.781	0.783	0.859	Reliable
Price Value (PV)	0.852	0.852	0.910	Reliable
Social Influence (SI)	0.867	0.868	0.919	Reliable
Trust (TR)	0.915	0.916	0.934	Reliable
Use Behavior (UB)	0.859	0.866	0.898	Reliable
Word of Mouth (WOM)	0.918	0.922	0.948	Reliable

Source: Processed Data, 2022

Table 4. Inner Model Test Results

Variable	R Square	R Square Adjusted
Behavioral Intention (BI)	0,562	0,555
Performance Expectancy (PE)	0,463	0,460
Use Behavior (UB)	0,709	0,707

Source: Processed Data, 2022

Based on this formula, the resulting GoF value is 0.638. The classification of GoF is 0.1 (GoF) small/low, 0.25 (GoF) moderate and 0.36 (GoF) large (Wetzels et al. [18]). Based on the R2, Q2, and GoF testing, it can be seen that the model formed is strong so that hypothesis testing can be carried out.

5.6   Hypothesis Testing

The output of hypothesis 1 shows that H1 is accepted that PE has a positive effect on BI from Mobile Banking BNI with a T statistic of 3.120, which is smaller than t table (1.65) and a P-Value of 0.001 < 0.05. The next test, namely hypothesis 2, shows that EE has no significant effect on BI at 1.231, which is smaller than t table (1.65) with P values 0.109 > 0.05, which means H1 is rejected. Hypothesis testing 3 shows that H1 is accepted, which states that EE has a positive effect on PE with a t-statistical value of 7.970, which is greater than t table (1.65) and P values of 0.000 < 0.05. Testing hypothesis 4 shows the results of H1 are rejected and that SI has no positive effect on BI with a t statistic value of 0.937, which is smaller than t table (1.65)

Table 5. Path Coefficients Hypothesis Test Results

Variable	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Performance Expectancy (PE) → Behavioral Intention (BI)	0.176	0.174	0.056	3.210	0.001
Effort Expectancy (EE) → Behavioral Intention (BI)	0.084	0.082	0.068	1.231	0.109
Effort Expectancy (EE) → Performance Expectancy (PE)	0.472	0.476	0.059	7.970	0.000
Social Influence (SI) → Behavioral Intention (BI)	−0.052	−0.046	0.055	0.937	0.175
Facilitating Conditions (FC) → Use Behavioral (UB)	0.184	0.187	0.044	4.194	0.000
Hedonic Motivation (HM) → Behavioral Intention (BI)	0.069	0.069	0.045	1.521	0.064
Price Value (PV) → Behavioral Intention (BI)	0.219	0.221	0.058	3.796	0.000
Trust (TR) → Behavioral Intention (BI)	0.406	0.404	0.063	6.473	0.000
Trust (TR) → Performance Expectancy (PE)	0.285	0.285	0.057	5.045	0.000
Behavioral Intention (BI) → Use Behavioral (UB)	0.237	0.232	0.055	4.280	0.000
Word of Mouth → Use Behavioral (UB)	0.537	0.540	0.054	9.856	0.000

Source: Processed Data, 2022

and P values 0.175 > 0.005. Next is hypothesis 5, where FC has a positive effect on BI, which results in a t statistic of 4.194 greater than t table (1.65) and P values of 0.000, meaning that H1 is accepted. Testing on hypothesis 6 states that HM has no significant effect on BI with a statistical t value of 1.521, which is smaller than t table (1.65) and a

P value of 0.064 which means that H1 is rejected. Hypothesis 7 is that PV has a positive effect on BI, which results in a t statistic of 3.796 greater than t table (1.65) and P values of 0.000, meaning H1 is accepted, Hypothesis 8, namely Trust, has a positive effect on BI which results in a t statistic of 6.473 greater than t table (1.65) and P values 0.000 means that H1 is accepted, then the 9 Trust hypothesis testing has a positive effect on PE which results in the t statistic being 5.045 greater than t table (1.65) and P values 0.000 meaning H1 is accepted. The next test is hypothesis 10, where H1 is accepted that BI has a positive effect on UB with a t-statistic value of 4.280, greater than t-table (1.65) and P values of 0.000 < 0.005. And lastly, Hypothesis 11 Word of Mouth (WOM) has a positive effect on PE, which results in a t statistic of 9.856 greater than t table (1.65) and P values of 0.000, meaning that H1 is accepted. Table 3 shows the results of the tests that have been carried out in this research using the SmartPLS software (Table 5).

6   Conclusion, Implication and Significance

Based on the findings from the research and SEM analysis conducted on the development of the UATAUT-2, Trust, and Word of Mouth models for the usage of BNI mobile banking for customers in Bandung area, numerous conclusions can be derived. The following are the findings that address the study's questions:

a. Performance Expectancy (PE) has a considerable and beneficial effect on consumers' behavioral intentions to utilize mobile banking services.
b. Effort Expectancy (EE) had no discernible effect on BNI customers' Behavior Intention (BI) to use mobile banking services.
c. Effort Expectancy (EE) has a considerable and beneficial effect on mobile banking's Performance Expectancy (PE).
d. Recognize that Social Influence (SI) has a negligible effect on BNI consumers' Behavior Intention (BI).
e. The Facilitating Condition (FC) has a considerable and beneficial effect on BNI customers' willingness to use mobile banking services.
f. Hedonic Motivation (HM) has no discernible effect on BNI's mobile banking service's Behavior Intention (BI).
g. Price Value (PV) has a considerable and beneficial effect on BNI customers' Behavior Intention (BI) to use mobile banking services.
h. Word of Mouth (WoM) has a considerable and favorable effect on BNI's mobile banking service's use behavior (UB).
i. TR has a considerable and beneficial effect on BNI consumers' Behavior Intention (BI) to embrace mobile banking services.
j. TR has a strong and beneficial effect on Performance Expectancy (PE) when it comes to using BNI mobile banking.
k. Mobile banking's Behavior Intention (BI) has a large and beneficial effect on the Use Behavior (UB) of BNI's mobile banking service.
l. The results of the hypothesis testing indicate that the UTAUT-2 factors (Performance Expectancy, Effort Expectancy, Facilitating Condition, and Price Value), Trust, and Word of Mouth all influence the behavior of BNI customers with Intervening Behavioral Intention when it comes to using mobile banking services.

m. The test results of the research framework model developed in this study clearly indicate that two variables, namely Social Influence and Hedonic Motivation, have little effect on the use of BNI mobile banking in the Bandung area.

This study offers a significant recommendation for increasing the level of adoption of mobile banking services based on the research framework's findings, which show the variables that influence BNI customers' adoption of mobile banking services, implying that in developing BNI mobile banking services, it is necessary to increase customer satisfaction so that they continue to use mobile. Furthermore, word of mouth (WOM) has a significant impact on increasing the adoption of BNI's mobile banking usage for BNI banking. As a result, BNI needs to accommodate aspirations and input from customers regarding testimonials of experiences using BNI's mobile banking for continuous improvement, so that the positive impact and benefits from the mobile banking services they receive can be recommended by other customers, while the shortcomings can be corrected immediately.

BNI can develop BNI mobile banking service applications by allowing easy user access via smartphones with various features that are simple to use, allowing new users to understand better how to use BNI mobile banking. Furthermore, to provide a sense of security and comfort for BNI's mobile banking services, customer trust in BNI's mobile banking services must be increased by anticipating the occurrence of technical problems in the application. As a result, by performing regular maintenance on BNI's mobile banking, the risk of transaction failure is reduced, increasing customer trust.

The price of BNI's mobile banking services is maintained by consistently providing the best service in the form of added value to mobile banking services so that it is more useful for customers, developing more innovative and attractive graphical displays on mobile banking applications, reviewing the completeness of features on services that suit customer needs, and carrying out financial transactions in real time.

Improve the facilitating condition factor for using BNI mobile banking by preparing resources and IT support to address technical problems in the field, resolve technical problems in BNI's mobile banking service rapidly, and increase BNI's responsive call center services.

Continuous improvement efforts should be made to increase the performance expectancy of BNI's mobile banking so that the benefits of BNI's mobile banking services can continue to be felt by customers to increase productivity both in conducting digital banking financial transactions.

This research is expected to provide information to BNI about the interests and behavior of mobile banking users, which can be used to make decisions in banking strategies, particularly to improve the quality of mobile banking services in the digital transformation era. In order to increase customer satisfaction and loyalty, we recommend that banking business players, particularly BNI, provide one-stop mobile banking services for customers while also paying attention to the security risks of mobile banking user data.

This research is not without flaws; it has limits. In light of these limitations, future researchers may wish to add relationships to independent variables such as Habit, Facilitating Condition, and Word of Mouth that affects Behavioural Intention, thereby

increasing the value of R Square (R2) on Behavioural Intention and adding experience moderating variables.

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