# The Effect of Word – of – Mouth on the Adoption Behavior of Mobile Banking in Vietnam

Thuy Phan Chung[1(✉)] , Loan Nguyen Thi Ngoc[2] , Linh Nguyen Thi My[2] ,
and An Vu Xuan[1]

[1] School of Banking, College of Business, University of Economics Ho Chi Minh City, 59C
Nguyen Dinh Chieu, District 3, Ho Chi Minh City 700000, Vietnam
phanthuy@ueh.edu.vn

[2] Faculty of Banking and Finance, University of Finance – Marketing (UFM), 778 Nguyen
Kiem, Phu Nhuan District, Ho Chi Minh City 700000, Vietnam

Abstract. The effect of Word-of-Mouth on customer behavior has been studied in many countries. However, this effect hasn't been found, especially in the Vietnamese banking industry. This study, therefore, aims to examine whether Word-of-Mouth is the main driver of the adoption behavior of mobile banking in Vietnam. The study includes a data sample of 272 Vietnamese mobile banking customers, which was collected through a convenient sampling method. The data were then submitted to PLS-SEM for testing the research hypothesis and model. The results show that Word-of-Mouth is the main driving factor in explaining the adoption behavior of Vietnamese customers towards mobile banking. However, other factors, including Perceived Usefulness, Trust, and Social Influence, also significantly affect their Intention to use mobile banking. Surprisingly, Perceived Usefulness has the most substantial effect in our research model. The results highlight the importance of the related Word-of-Mouth marketing strategies in promoting mobile banking services.

Keywords: Word-of-Mouth · mobile banking · adoption behavior · Vietnam

1 Introduction

Mobile banking services have evolved into modern payment systems that meet people's financial needs in different aspects, including money transfers, bill payments, investment allocation, wealth management, and e-wallet integration. As technology advances, more innovative mobile banking services are expected. Until the COVID-19 pandemic, that is. Most e-banking services, especially mobile banking, could be fully promoted globally. For example, by the second quarter of 2021, 27% of the global population, or 2.1 billion people, will use mobile banking services (Statista Research Department, 2021). According to a McKinsey Global Payments report from 2021, the quality of mobile banking services in Asia and Africa has also doubled in the last three years. Mobile banking accounts for 99 percent of cashless transactions in China and 45 percent of global digital payments. Thailand has promoted mobile banking since 2017, but the COVID-19

pandemic increased this percentage by 30% by the end of the year. Therefore, banks worldwide play an essential role during the COVID-19 pandemic because of the rise in mobile banking.

Similar to other countries, the mobile banking service in Vietnam also made significant progress during COVID-19. According to Vietnam Digital (2021), mobile banking payments increased by 230% in 2020. The possible explanation is that 97% of Vietnamese people own smartphones, which is roughly the same as the percentage of Internet users. Vietnam has a high rate of smartphone use due to cheaper and easier access to the Internet and personal devices. During the COVID-19 pandemic, the law of social separation was enforced, forcing most people to work from home. So the demand for online payments and transactions overgrew, allowing mobile banking to emerge incredibly.

Although mobile banking has significantly grown in Vietnam, the network of mobile banking users in Vietnam is not vast, despite the fast-increasing number of Vietnamese who own mobile devices (Nguyen Tri Hieu, 2021). According to Digital's report in the first quarter of 2021, although 97% of smartphone users in Vietnam, only one-third use mobile banking services. Recent studies have found that Vietnamese customers are still afraid to use mobile banking because they believe this service remains risky, including information theft, personal information leakage, or online scams (i.e., Tam T. Le et al. (2020); Ha Nguyen Van et al. (2020)). Despite growing cashless payments, the proportion of cash payments has remained high and even increased (Thanh Nguyen, 2021). Although social distancing increased the number of people using mobile banking, the number of people willing to accept it increased only by 20% (Ha Linh, 2021). A recent report from VnEconomy (2021) shows that cash made up 11.05% of all payment methods in 2020 and 11.53% in April 2021. According to the World Bank 2020 statistics (cited in VA, 2020), only 4.9% of Vietnamese transactions are cashless, which is the lowest level in the region (i.e., Thai Lan (59.7%), Malaysia (89.7%), and China (26.1%)). This tendency seems terrible for Vietnamese commercial banks, who find it challenging to reach their customers and mainly increase the usage of their mobile banking apps.

Meanwhile, "Word-of-Mouth" marketing is the easiest way to grow mobile banking customers (Le Minh Chi and Le Tan Nghiem, 2018). According to Nielsen (2010), 92% of people worldwide prefer to make final decisions based on recommendations from friends and family over other marketing strategies. As a result, word-of-mouth marketing can explain why customers are more open to mobile banking. Word-of-mouth marketing influences most people's decisions (Allsop et al., 2007). For example, Word-of-Mouth marketing is supposed to increase return visitors in the tourism industry. A psychological distance from a location can improve the behavior of tourists who hear about it from others (Feng Xu et al., 2020). Furthermore, in the banking industry, word-of-mouth significantly impacts customer trust and willingness to use mobile payments (Tazizur Rahman et al., 2021). While word-of-mouth marketing isn't new, it hasn't been used very much in Vietnam yet.

This study, therefore, aims to test whether Word-of-Mouth affects consumers' adoption of mobile banking in relationship with other factors such as Perceived Usefulness, Trust, and Social Influence. The results show that word-of-mouth is the main driving factor in explaining the adoption behavior of Vietnamese financial customers towards mobile banking. While other factors, including perceived Usefulness, Trust, and Social

Influence, significantly affect customers' Intention to use mobile banking, Perceived Usefulness has the most substantial effect in the research model.

This paper is organized as follows: The next step is to review the literature and develop the research model and hypotheses. The study's methodology, findings, and implications are then described. The final section discusses the study's limitations and future research directions.

2   Literature Review

2.1   Mobile Banking

In the literature, there are different definitions of mobile banking across various studies, depending on the location of the study. In the USA, for example, mobile banking is an application that combines online banking services and enables clients to complete basic personal financial transactions via mobile devices (Statista Platform, 2021). However, it is considered a type of e-commerce that combines technology and mobile application services with banking activities in Asia, particularly China (Yang et al., 2012). In the Vietnamese financial Market, mobile banking is the system that allows consumers to carry out transactions without the need to visit a bank (Hoang Phuong Thao, 2015). In a broad sense, mobile banking can be thus considered a new way of distributing banking services to customers via a personal mobile device, usually a smartphone, with Internet access.

2.2   Mobile Payment

Payments made via mobile devices (or smartphones) are mobile payments, which allow customers to pay without using cash or bank/credit cards (Abhipsa Pal et al., 2021). E-wallets and mobile banking applications currently dominate mobile payments. Also, Mobile Payment has a contactless payment option via NFC (Near Field Communication). However, because NFC does not require authentication, it is not widely accepted. (Dutot, 2015). Previous research has shown that mobile banking differs from mobile payments. While Mobile Banking is a direct customer-bank relationship, Mobile Payment is a system of processes involving three parties: buyer, merchant, and bank (Waqas Ahmed et al., 2021).

2.3   Word of Mouth

Word-of-mouth is a marketing strategy that involves direct verbal communication between a receiver and communicator, with the receiver perceiving the sender's messages as non-commercial. Many businesses and practitioners think of word-of-mouth marketing as informal communication when using customers as spokespersons. Consumers trust word of mouth more than commercial advertising (Silverman, 2001). So, word of mouth has been utilized in the business for a long time, influencing people's decisions in many fields. For instance, Kardes and Kim (1991) show that word of mouth affects people's lives because people are more likely to trust recommendations from
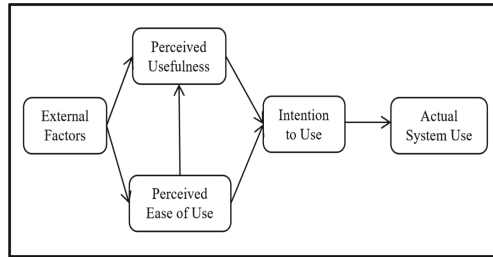
Fig. 1. Technology Acceptance Model (TAM) **Source:** David et al. (1986)

relatives, friends, or third parties than other ways. Also, Word of Mouth provides potential customers with first-hand accounts from friends, lowering the risk of purchasing a substandard product.

2.4   Technology Acceptance Model - TAM

TAM is the most widely used study framework to investigate the determinants of new computer technology adoption and utilization (Luarm and Lin, 2015). Davis et al. (1986) developed the TAM model using Fishbein and Ajzen's (1975) Theory of Reasoned Action (TRA). The fundamental determinants of user adoption in TAM are Perceived Usefulness and Ease of Use (Diagram 2.1). In their study, Davis et al. (1989) defined Perceived Usefulness as the degree to which using a particular system will improve the quality of their work, and "Perceived Ease of Use" is the degree to which a person believes using a specific approach will not take much effort. Venkatesh et al. (2002) measured "Perceived Usefulness" using performance growth, productivity growth, potency, overall functionality, time savings, and job achievement. These items are also used to measure the "Perceived Ease of Use" factor (Venkatesh et al., 2002).

As in previous research on customer behavior, several researchers have applied many statistical models to predict the adoption of mobile banking, internet banking, mobile money, and e-commerce (Kim et al., 2010; Schierz et al., 2010). Compared to other theories, including the theory of planned behavior (TPB), theory of innovation (TOI), and theory of reasoned action (TRA), TAM seems to be a better choice for explaining technology adoption (Yousafzai et al., 2010; Narteh et al., 2017) and mainly predicting online banking behavior (Mohammadi, 2015). However, recent research suggests that TAM still has some limitations. In particular, TAM has not considered socio-economic, demographic, or cultural variables (Bagozii, 2007; Biljon et al., 2007) in its model. Bagozzi (2007) also reports that the predictability power of TAM becomes more accurate when two factors, PE and PEOU, are included in the research model. The TAM model is thus expanded into different forms to fit different types of research contexts.
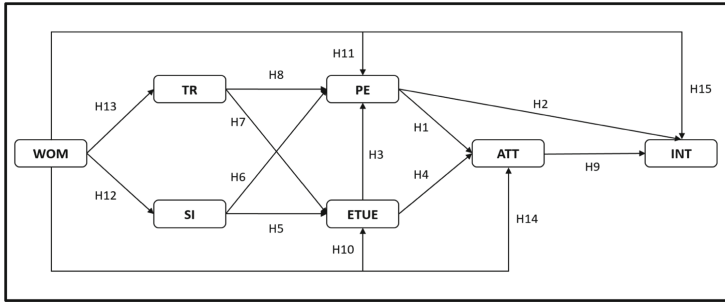
Fig. 2. The proposed research model
Note: PE = Perceived Usefulness; ETUE = Perceived Ease of Use; TR = Trust; ATT = Attitude; SI = Social Influence; WOM = Word of Mouth; INT = Intention to use Mobile Banking.

3 Research Model and Hypothesis

In this study, we employed the TAM model developed by Davis et al. (1986). To investigate the effect of Word of Mouth on the Intention to use Mobile Banking in Vietnam, we built our research model on four factors, including Perceived Usefulness, Perceived Ease of Use, Attitude, and Intention to use. Although Perceived Usefulness and Perceived Ease of Use are widely known as the main precursors of TAM, we included Attitude as another primary precursor in the research model. Furthermore, three more factors (such as Social Influence, Trust, and Word of Mouth) are also included for better predictability.

3.1 Perceived Usefulness (PE)

An individual's belief that using the provided technology system will help them achieve their goals more efficiently is "Perceived Usefulness." A person's expectation of "Perceived Usefulness" is a group's expectation of using new technology to increase productivity.

Many studies have investigated the role of Perceived Usefulness on mobile banking services (Carlos Flavian & Miguel Guinaliu, 2020; Richman et al., 2021; Hoang Ha, 2019). Moreover, Perceived Usefulness positively impacts customers' Intention to use mobile banking services (Mohammadi, 2015; Hoang Ha, 2020; Tareq Obaid and Ziad Aldammagh, 2021). Customers expect Mobile Banking to improve their work efficiency. Also, when customers benefit from using mobile banking, they will have a positive attitude towards the service and want to keep using it (Carlos Flavian & Miguel Guinalu, 2020). So we develop the following hypotheses:

- Hypothesis 1: Perceived Usefulness has a positive effect on Attitude.
- Hypothesis 2: Perceived Usefulness positively affects the Intention to use mobile banking services.

3.2 Perceived Ease of Use (ETUE)

Venkatesh et al. (2003) find that "Easy Expectation" shares many similarities with "Perceived Ease of Use" (TAM/TAM2) and "Ease of Use" (IDT/MPCU). "Ease expectation" refers to the degree to which customers expect the technology system to be simple. Also, following Carlos Flavian and Miguel Guinalu (2020), "Feeling the Ease of Use" is an individual's belief that using a technology system will not be too difficult. This study defines "Ease of Use" as the belief that using technology will be simple without too much effort.

In previous research, "Ease of Use" is an essential factor influencing most customers' decisions to use mobile banking. Tareq Obaid and Ziad Al Damage (2021), Dasgupta et al. (2011), and Vu Manh Cuong (2013) all came to the same conclusion. However, other research shows that "Ease of Use" does not significantly affect the customer's Intention to use the service. This study will address this issue to better develop mobile banking services in Vietnam.

Recent research suggests that Perceived Ease of Use positively affects efficiency expectations. Customers will perceive mobile banking applications as easy to use if they have a user-friendly interface. The more easily new technology is adopted, the more expected performance benefits. Thus, these hypotheses are constructed as follows:

- Hypothesis 3: Perceived Ease of Use positively affects Perceived Usefulness.
- Hypothesis 4: Perceived Ease of Use has a positive effect on Attitude.

3.3 Social Influence (SI)

Social influence is defined by Venkatesh et al. (2003) as the degree to which an individual's perception of being affected influences their acceptance of a new technological system by people they value. However, most studies, such as Hoang Ha (2019) or Richman Tumpal Micael Pakpahan and Nilo Legowo (2021), changed the original definition to fit their context and research problems. Social Influence refers to the level of an individual's perception of being affected by others in their decision to accept and use mobile banking. Recently, Carlos Flavian and Miguel Guinalu (2020) concluded that receiving a positive reference word leads to a positive attitude towards it. Thus, social and peer pressure positively impacts an individual's acceptance of a new technology system. To test the following hypothesis:

- Hypothesis 5: Social Influence positively affects Perceived Ease of Use.
- Hypothesis 6: Social Influence has a positive effect on Perceived Usefulness.

3.4   Trust (TR)

Zhou (2011) defines mobile banking as an environment of indirect branch-to-customer interaction. Thus, Trust is important in deciding to use a customer's service. They discovered that "Initial Belief" reflects an individual's willingness to take risks and meet needs without prior experience or reliable information. A customer's confidence that their financial transactions and personal data will be safe and secure is defined as "Trust" in this study.

Many previous studies found that Trust improves Perceived Usefulness and usability in e-commerce applications. By using Mobile Banking, customers' beliefs will increase their working efficiency and improve their lifestyles. So this study's hypothesis is:

- Hypothesis 7: Trust positively affects Perceived Ease of Use.
- Hypothesis 8: Trust has a positive impact on Perceived Usefulness.

3.5   Attitude (ATT)

Fishbein and Ajzen (1975) defined "Attitude" as a person's positive or negative feelings towards a particular behavior. However, Davis (1989) concluded that "Attitude" influences the Intention to use new technology. Luna et al. (2017) recently showed that behavior, cognitive, and affective factors contribute to one's "attitude." In their perspectives, "behavior" includes "purchase intent" and "referral intent" as well as "perception" and "affection" for a product or service. In this study, "Attitude" is defined as an individual's feelings towards using mobile banking services.

Similar to the study of Shaikh and Karjaluoto (2015), who found that Attitude positively affects the Intention to use mobile banking, we suggest that Attitude can predict Intention. Behavior comes later because Attitude exists in mind, and attitude degrees always come first. Finally, this study hypothesizes:

- Hypothesis 9: Attitude positively affects Intention to use mobile banking services.

3.6   Word of Mouth (WOM)

In this study, we define Word of Mouth as individuals verbally sharing positive information and experiences about mobile banking services. Previous literature shows that "word of mouth" has a more significant impact on consumer behavior than advertising or promotion because it can multiply. For example, Xia and Bechwati (2008) found that Word of Mouth is a powerful tool for free online marketing. So the study will develop these hypotheses:

- Hypothesis 10: Word of Mouth positively affects Perceived Ease of Use.
- Hypothesis 11: Word of Mouth positively affects Perceived Usefulness.
- Hypothesis 12: Word of Mouth positively affects Social Influence.
- Hypothesis 13: Word of Mouth positively affects Trust.
- Hypothesis 14: Word of Mouth positively affects Attitude.
- Hypothesis 15: Word of Mouth positively affects the Intention to use mobile banking services.

3.7 The Intention to use Mobile Banking (INT)

Davis et al. (1989) described "intention to use" as an individual's willingness to accept a new technological system, which is the most common and extensively used definition (Sara, 2007; Gang Liu et al., 2008). In this study, we refer to "the adoption/intention behavior towards mobile banking" as the individual's Intention and readiness to embrace the usage of mobile banking services in the future.

4 Research Methodology

4.1 Sample and Data Collection

The sample was drawn from the population of Vietnam that was currently using internet banking between September and November 2021. Due to limited resources, we used a non-probability sampling technique, primarily used in the literature (i.e., Farah et al., 2018). The survey response rates in HCMC and other provinces are nearly identical (59% vs. 41%).

   The total sample size used in the study was 272. Approximately 70% of respondents belonged to the age group of 18–30 years. 62.9% were university students, whereas only one-third were employees with either part-time or full-time jobs. More than half (55%) reported a monthly income of more than 5 million VND (equivalent to 250 USD). 35.3% were men, and 64.7% were women. Regarding mobile operating systems, they prefer iOS (60.9%) over Android (39%). Finally, 91.2% of the survey population have experience with mobile banking services (see Appendix 1).

4.2 Questionnaire Designs and Measures of Constructs

In this study, participants were asked to respond to a two-part questionnaire. In the first part, we asked participants about their personal information and experience with mobile banking. In the second part, we included 27 items measuring word-of-mouth and various factors affecting customers' Intention to use mobile banking apps. The scale items used in this study were adapted from previous studies, as presented in Table 1. All the responses were submitted on a 5-point Likert scale ranging from 1 to 5 (where 1 = strongly disagree, and 5 = strongly agree).

Table 1. Measures of constructs used in the study

Construct	Code	Item	Source
Perceived Usefulness (PE)	PE1	Mobile Banking would make my banking faster.	Hoang Phuong Thao (2015) Do Thi Ngoc Anh (2016) Daniel Mehrad and Shahriar Mohammadi (2016) Pham Thanh Hoa et al. (2020)
	PE2	Mobile banking would help do my banking.	Daniel Mehrad and Shahriar Mohammadi (2016) Le Minh Chi and Le Tan Nghiem (2018)
	PE3	I think that using mobile phone banking would improve how I do my banking.	Hoang Phuong Thao (2015) Do Thi Ngoc Anh (2016) Daniel Mehrad and Shahriar Mohammadi (2016) Seyed Javad Mousavian (2021)
	PE4	Mobile phone banking would make my banking easier.	Daniel Mehrad and Shahriar Mohammadi (2016)
Perceived Ease of Use (ETUE)	ETUE1	The interaction with mobile financial services is clear and understandable.	Hoang Phuong Thao (2015) Daniel Mehrad and Shahriar Mohammadi (2016) Le Minh Chi and Le Tan Nghiem (2018)
	ETUE2	Learning to use Mobile Banking would be easy.	Hoang Phuong Thao (2015) Daniel Mehrad and Shahriar Mohammadi (2016) Le Minh Chi and Le Tan Nghiem (2018) Seyed Javad Mousavian (2021)
	ETUE3	I find it easy to get mobile financial services to do what I want them to do.	Daniel Mehrad and Shahriar Mohammadi (2016)
	ETUE4	I think it would be simple for me to become skilled at using Mobile Banking.	
Social Influence (SI)	SI1	People who are important to me would recommend using mobile payment services.	Hoang Phuong Thao (2015) Do Thi Ngoc Anh (2016) Daniel Mehrad and Shahriar Mohammadi (2016) Le Minh Chi and Le Tan Nghiem (2018)

Table 1. (*continued*)

Construct	Code	Item	Source
	SI2	People who are important to me would find using mobile payment services beneficial.	Daniel Mehrad and Shahriar Mohammadi (2016)
	SI3	People who are important to me would find using mobile payment services a good idea.	Daniel Mehrad and Shahriar Mohammadi (2016)
	SI4	More people around me use Mobile Banking services.	Hoang Phuong Thao (2015) Daniel Mehrad and Shahriar Mohammadi (2016) Pham Thanh Hoa et al. (2020)
Trust (TR)	TR1	I think the Mobile Banking services are reliable.	Do Thi Ngoc Anh (2016) Le Minh Chi and Le Tan Nghiem (2018)
	TR2	Mobile Banking Services help customers.	Daniel Mehrad and Shahriar Mohammadi (2016)
	TR3	I think the banks are fulfilling their obligations, In the field of Mobile Banking.	
	TR4	I would trust my bank to offer secure Mobile Banking.	
Word of Mouth (WOM)	WOM1	I'll talk about the strengths of Mobile Banking with people I know.	Daniel Mehrad and Shahriar Mohammadi (2016) Phyo Min Tun (2020)
	WOM2	I'll talk about Mobile Banking to be quite positive.	
	WOM3	If you ask me about Mobile Banking, I will recommend it.	
Attitude (ATT)	ATT1	Using Mobile Banking services is compatible with my lifestyle.	Daniel Mehrad and Shahriar Mohammadi (2016) Seyed Javad Mousavian (2021)
	ATT2	Using Mobile Banking services is compatible with most banking activities.	Daniel Mehrad and Shahriar Mohammadi (2016)
	ATT3	Using mobile payment services is a wise idea.	
	ATT4	Using mobile payment services is beneficial.	
Intention to use Mobile Banking (INT)	INT1	I'm going to use Mobile Banking services.	Le Minh Chi and Le Tan Nghiem (2018) Phyo Min Tun (2020) Pham Thanh Hoa et al. (2020) Seyed Javad Mousavian (2021)

(*continued*)

Table 1. (*continued*)

Construct	Code	Item	Source
	INT2	I want to gain more information on Mobile Banking.	Pham Thanh Hoa et al. (2020)
	INT3	I'm going to make my payment through the Mobile Banking service.	Daniel Mehrad and Shahriar Mohammadi (2016)
	INT4	I want to manage my bank accounts using Mobile Banking.	

Table 2. Cronbach's alpha (CA), Composite reliabilities (CR), and Average Variance Extracted (AVE)

Variables	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
ATT	0.902	0.931	0.772
ETUE	0.857	0.903	0.699
INT	0.874	0.914	0.728
PE	0.882	0.919	0.739
SI	0.819	0.880	0.648
TR	0.827	0.885	0.659

5   Analysis and Results

The data analysis took place in different steps. First, we performed internal consistency and reliability. Moreover, we also evaluated convergent and discriminant validity in various forms using confirmatory factor analysis (CFA). Finally, SEM was used to assess the research hypotheses. The data was analyzed using SPSS and SmartPLS.

Table 2 shows that the internal consistency test results have Cronbach's Alpha values > 0.7, which can meet the standard criteria for further analysis. According to Fornell and Larcker (1981)'s study, Composite Reliability is a better measure of reliability uniformity than Cronbach's Alpha because it uses the standard loads of the observed variables. A CR of 0.7 or more is satisfactory (Henseler and Sarsedt, 2013). Table 2 shows that the scale's CR coefficients are all greater than 0.7, qualifying them for inclusion in the next step of factor analysis. All coefficients are also larger than 0.5 (Table 2), which confirms the discriminant validity of the scale. Furthermore, we observed that the standard requirements are met using the Fornell and Launcher criterion. Table 3 shows that the Heterotrait – Monotrait values are below 0.85, suggesting discriminant validity.

Table 3. Convergent validity using Fornell and Launcher criteria and the HTMT ratio

	Fornell and Launcher criteria						Heterotrait-Monotrait Ratio of Correlations					
	ATT	ETUE	INT	PE	SI	TR	ATT	ETUE	INT	PE	SI	TR
ATT												
ETUE	0.361						0.361					
INT	0.461	0.366					0.461	0.366				
PE	0.526	0.570	0.591				0.526	0.570	0.591			
SI	0.500	0.522	0.465	0.674			0.500	0.522	0.465	0.674		
TR	0.511	0.629	0.517	0.635	0.640		0.511	0.629	0.517	0.635	0.640	
WOM	0.484	0.480	0.473	0.423	0.460	0.546	0.484	0.480	0.473	0.423	0.460	0.546

Structural Equation Model (SEM)

The last analysis was to determine whether Word of Mouth drives Intention to use mobile banking in relationship with other factors such as Attitude, Social Influence, Trust, Perceived Usefulness, and Perceived Ease of Use. The SmartPLS 3.2.9 software's SEM linear structural model analysis method was used to validate the research model.

Hair et al. (2014) discovered that estimating the path coefficient depends on the regression results of each dependent and predictor variable. The zero path coefficients are guaranteed if multicollinearity among the independent variables. All hypothetical links are statistically significant and appear to be in the right direction. Table 4 shows that the VIF coefficients in this study are all less than 5. As a result, the model doesn't violate this phenomenon.

The goodness of fit indices in Table 5 indicates that the structural model fits the data quite well. Following Hair et al. (2014), R2 is classified as three groups with different structures of endogenous. In particular, 0.25 is considered weak, 0.5 for moderate, and 0.75 for high. Table 5 shows that most of the model's modified R2 values are at a reasonable level. The PE variable has the highest adjusted R2 (0.440), indicating that WOM explains 44% of the PE variable's variation. As a result, WOM can only explain 14.2% of the variation in SI. Furthermore, Q^2 is a model fit metric that complements corrected R^2 (Geisser, 1974; Stone, 1974). A Q^2 value greater than zero for an outcome endogenous latent variable indicates the path model's predictive relevance for that dependency concept (Chin, 2010). As shown in Table 5, Q^2 predictive relevance is more significant than 0, which shows that all dependent variables are predictive.

The effect coefficient f2 is also used for testing the impact of predictors in the model (Hair et al., 2013). Table 4 shows that most factors have a relative influence ranging from 0.038 to 0.146 and a strong influence ranging from 0.169 to 0.254. The remaining two factors have very weak effects on ATT (f2 = 0.001) and PE (f2 = 0.002).

Table 4. Standardized Path Coefficients

Hypothesis	Path	Path coefficient (β)	t–value	P–values (sig.)	VIF	f2	Result
H1	ATT → INT	0.149	2.246	0.025	0.147	0.024	Accepted
H2	ETUE → ATT	0.027	0.377	0.706	1.438	0.001	Not accepted
H3	ETUE → PE	0.197	3.700	0.000	1.515	0.047	Accepted
H4	PE → ATT	0.354	5.391	0.000	1.385	0.128	Accepted
H5	PE → INT	0.386	4.528	0.000	1.341	0.169	Accepted
H6	SI → ETUE	0.191	3.125	0.002	1.441	0.038	Accepted
H7	SI → PE	0.347	5.232	0.000	1.496	0.146	Accepted
H8	TR → ETUE	0.350	5.015	0.000	1.543	0.120	Accepted
H9	TR → PE	0.244	3.918	0.000	1.729	0.063	Accepted
H10	WOM → ATT	0.283	4.829	0.000	1.247	0.091	Accepted
H11	WOM → ETUE	0.174	3.269	0.001	1.300	0.035	Accepted
H12	WOM → INT	0.195	2.675	0.007	1.271	0.046	Accepted
H13	WOM → PE	0.041	0.611	0.541	1.346	0.002	Not accepted
H14	WOM → SI	0.381	4.767	0.000	1.000	0.170	Accepted
H15	WOM → TR	0.450	6.046	0.000	1.000	0.254	Accepted

Table 5. R-squared, adjusted R-squared coefficients, and Q-squared predictive relevance test

Indicators	R2	Adjusted R2	Q-2
ATT	0.295	0.286	0.219
ETUE	0.340	0.332	0.226
INT	0.343	0.335	0.237
PE	0.449	0.440	0.315
SI	0.145	0.142	0.077
TR	0.202	0.199	0.120

Further results of the structural model are provided in Table 4 and Fig. 2. The results show that the effect of TR (H9: β = 0.244, t = 3.918, p = 0.000) and Social Influence (H7: β = 0.347, t = 5.232, p = 0.000) on Perceived Usefulness to the adoption of mobile banking services were significant. Similarly, Trust (H8: β = 0.350, t = 5.015, p = 0.000) and Social Influence (H6: β = 0.191, t = 3.125, p = 0.002) also have significant effects on Perceived Ease of Use. Therefore, H6, H7, H8, and H9 were accepted. In addition,
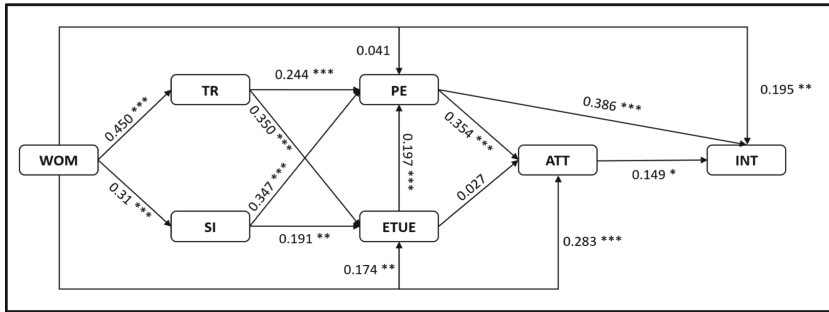
Fig. 3. Results of the research model
Note: PE = Perceived Usefulness; ETUE = Perceived Ease of Use; TR = Trust; ATT = Attitude; SI = Social Influence; WOM = Word of Mouth; INT = Intention to use Mobile Banking. *p < 0 .05; **p < 0.01; ***p < 0.001.

Perceived Usefulness shows its strong impact on users' Attitude (H4: β = 0.354, t = 5.391, p = 0.000). Hence, hypothesis H4 was accepted. Although Perceived Ease of Use had a substantial effect on Attitude (H3: β = 0.197, t = 3.700, p = 0.000), Perceived Ease of Use had no impact on the Attitude of Mobile Banking users in Vietnam (H2: β = 0.027, t = 0.377, p = 0.706). As a result, H3 was accepted, whereas H2 was not accepted. Furthermore, Attitude (H1: β = 0.149, t = 2.24, p = 0.025) and Perceived Usefulness (H5: β = 0.386, t = 4.528, p = 0.000) both impacted significantly on the Intention to use Mobile Banking. Therefore, hypotheses H1 and H5 were accepted.

For hypotheses related to the Word-of-mouth factor (WOM), the results show that Word of Mouth is found to significantly affect Attitude (β = 0.283 and p-value = 0.000 < 0.05), Perceived Ease of Use (β = 0.174 and p-value = 0.001 < 0.05), Intention to continue using Mobile Banking services (β = 0.195 and p-value = 0.007 < 0.05), Social Influence (β = 0.381 and p-value = 0.000 < 0.05) and the Trust of Mobile Banking users (β = 0.450 and p-value = 0.000 < 0.05). As a result, hypotheses H10, H11, H12, H14, and H15 were accepted. However, H13 was not accepted (β = 0.041 and p-value = 0.541), which shows that Word of Mouth seems not to affect the Perceived Usefulness of mobile banking services.

6 Discussion

From our findings, we conclude that all tested variables significantly impact whether or not people use mobile banking. Perceived Usefulness and Ease of Use strongly influence the Intention to use mobile banking, which is consistent with previous studies (i.e., Sudarsono, Nugrohowatt & Tumewang, 2020; Ayesha Akhter & Ahmed Al Asheq, 2020; Hoang Ha, 2019). Other factors such as Trust, Social Influence, and Attitude are also found to significantly impact the Intention to Use Mobile Banking (Hoang Phuong Thao, 2015; Tran Huu Ai and Cao Hung Tan, 2020). However, unlike most previous studies, this study investigates the influence of indirect variables on "Intention to Use" via the factor "Attitude." Thus, the analysis can yield valid results about consumer usage habits.
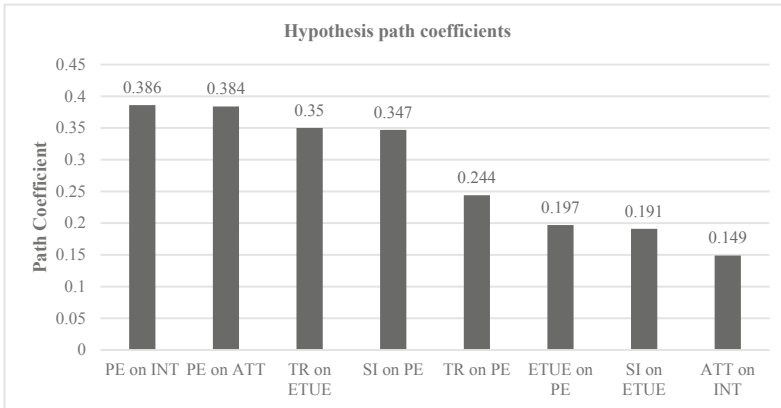
Fig. 4. The results on the impact level of the factors in the hypothesis

To better understand mobile banking behavior, we ranked the effect, from strong to weak, through the path coefficients (Fig. 4). The results show that Perceived Usefulness and Ease of Use affect consumers' acceptance of mobile banking services. Customers will be more likely to use mobile banking if they believe it will help them complete tasks efficiently and quickly. The trend of using mobile banking has increased since then. So commercial banks must improve their mobile banking services. Commercial banks can improve mobile banking services or design their applications with a friendly, clear, and understandable interface to make transactions easier for customers. Commercial banks can also diversify their products and services. This tendency will improve financial management and service usefulness for customers. Moreover, banks must enhance their staff's capabilities and allocate personnel to assist customers quickly.

Moreover, the effect of Trust and Social Influence differ across domains. While both directly affect Perceived Usefulness and Ease of Use, they affect Attitude and Intention to use mobile banking indirectly. The study suggests that externalities from people around them play a critical role in building Trust and helping customers realize the great benefits of mobile banking. While mobile banking usage in Vietnam has increased since the COVID-19 outbreak, the growth rate is low compared to other countries in the same region. Vietnamese people still use cash and are wary of new payment services like mobile banking (Nguyen Hong Sam, 2021); commercial banks should conduct and implement policies to authenticate user rights by fingerprint, face recognition, etc. SMS OTP, OTP with advanced 2FA security features.

Last but not least, the focus of the study is to investigate the impact of word of mouth on mobile banking in Vietnam. According to Fig. 5, the word-of-mouth factor has the most significant impact on the trust factor, which is also the study's most influential hypothesis. Thus, this study concluded that word of mouth significantly impacts people's Trust in mobile banking services. Word-of-mouth information is primarily from trusted relatives, friends, and third parties (Kardes & Kim, 1991). Thus, positive word of mouth increases a user's Trust in a specific product or service.
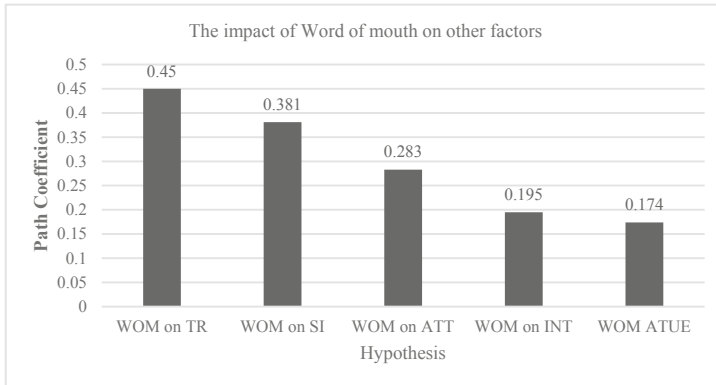
Fig. 5. The results of Word mouth impact on other factors.

The word-of-mouth factor also influences Social Influence ($\beta = 0.381$), User Attitude ($\beta = 0.283$), Intention to use ($\beta = 0.195$) and Perceived Ease of Use ($\beta = 0.149$). This study shows that educating customers about the benefits of mobile banking, trusting the system, understanding how easy it is to use, and hearing positive feedback increase their willingness to use it.

However, the study found that word of mouth has had little impact on perceived Usefulness in Vietnam. Because different emotions and experiences lead to different attitudes and information, When looking for more information about mobile banking, potential users will be overwhelmed by the amount of data available. It is an alarming signal that Vietnamese users can access much information but cannot filter out accurate and relevant information, which causes them to make regrettable choices later on.

Due to the abovementioned issue, commercial banks can promote mobile banking visibility and credit through professional press agencies to reach out to potential customers. Enabling a service to non-developing cities like Ho Chi Minh City or Hanoi is challenging without the help of communication professionals. Commercial banks should also have policies and solutions to eliminate unorthodox or false information to improve the trend of using mobile banking. To maximize the benefit of Word-of-Mouth marketing, banks should create forums for users to connect and share their feelings and experiences. Eventually, customers will indirectly help banks by being genuine ambassadors who use mobile banking.

7 Theoretical Contributions

Theoretically, this paper discussed the literature relating to communication in technology adoption by investigating the relationships between word of mouth and users' Intention to adopt mobile banking through perceived Usefulness, ease of use, and Attitude. However, Vietnam has conducted many studies on mobile banking. However, the impact of Word of Mouth on this service has received little research. Thus, the research will inform future research on how word of mouth influences customers' decisions to use mobile banking. With a result of $\beta = 0.405$, word of mouth significantly impacts mobile banking

customers' attitudes. In this way, the developed and verified model in this study can be used as a reference for future research on the impact of word-of-mouth on users' attitudes and Intentions to adopt mobile banking. According to the survey, users are more willing to use mobile banking if they hear about it from friends. Thus, this study is the first to investigate the impact of word-of-mouth marketing on mobile banking. The study's findings have significantly deepened and enhanced the existing literature by highlighting the importance of word-of-mouth marketing in mobile banking adoption in Vietnam.

8 Managerial Implications

As word-of-mouth marketing significantly impacts user adoption, Vietnamese mobile banking providers should use word-of-mouth marketing to increase mobile banking usage. For example, 92% of people worldwide prefer recommendations from friends and family over all other forms of advertising (Nielsen, 2010). John Berger (2018) discovered that banks that used word-of-mouth marketing had an 8% faster growth rate of customers adopting mobile banking than banks that did not. As a result, providers of mobile banking services, such as commercial banks, should create online forums where users can provide feedback. Providing more relevant information for those who have not used the service will help them make a more informed decision to adopt Mobile Banking. Moreover, improving service quality is not enough; commercial banks should also focus on marketing to enhance their brand image, which can help increase mobile banking.

9 Limitations and Recommendations for Future Studies

As with all research, this study has limitations. First, the study only investigated those who have used mobile banking services, not those who haven't at one point in time. Thus, a longitudinal model should be considered when examining customers' mobile banking adoption over time. Second, while the survey collected demographic data, the study did not analyze it thoroughly. Thus, future research should analyze demographic factors to provide more detailed and accurate results. Future research may compare gender, age, income, residence, and education differences in mobile banking. Except for Perceived Usefulness, the study found that word-of-mouth positively impacts perceived ease of use, Trust, Attitude, and Social Influence. Future research should include the characteristics of mobile banking when investigating the effect of word-of-mouth on mobile banking adoption. The model can consist onsumer behavior. For example, the government's social distancing policy has boosted digitalized e-commerce and online systems. Consumption habits will change after COVID-19, renderif relevant factors such as compatibility, safety, banking image, financial costs, etc. Finally, the study was conducted during the COVID-19 pandemic, which can bias Vietnamese cong the findings of this study obsolete. Thus, future research should focus on changes in the research context and the long-term effect of the word-of month on financial customers' Intentions to use mobile banking.

Appendix

Appendix 1: Descriptive Statistics of the Sample

Variable	Category	Frequency (N)	Percentage (%)
Gender	Male	96	35.3
	Female	176	64.7
Age	Under 18	8	2.9
	18 - 30	186	68.4
	31 - 40	33	12.1
	41 - 50	30	11.0
	Over 50	15	5.5
Employment	Part-time/full time	87	32.0
	Students	171	62.9
	Other	14	5.1
Income (VND)	Under 5 million	123	45.2
	5 - 10 million	46	1.9
	10 - 15 million	26	9.6
	15 - 20 million	12	4.4
	20 - 25 million	21	7.7
	Over 25 million	44	16.2
Education	Middle school	1	0.4
	High school	14	5.1
	College	8	2.9
	Bachelor	223	82.0
	Postgraduate	26	9.6
Habitation	Ho Chi Minh City	162	59.6
	Other provinces	110	40.4
Mobile operating system	Android	118	39.1
	iOS	14	60.9
Experience with mobile banking services	Used	248	91.2
	Have not used	24	8.8

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