ANALYZING THE ADOPTION OF MOBILE BANKING SERVICE IN VIETNAM: EXTENDING UTAUT2 WITH FEAR OF COVID-19

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Abstract: In Vietnam, the acceptance rate of mobile banking is still at a low level despite the efforts from banks and the government. Therefore, it is important to look at the elements influencing Vietnamese customers' adoption of mobile banking. Moreover, non-cash payment actions are more prevalent in an epidemic scenario. A straightforward explanation is that most people fear the illness and look for ways to avoid social interaction. In this study, the unified theory of acceptance and use of technology model (UTAUT2) is extended by considering perceived fear of the COVID-19 pandemic. According to the findings, trust, performance expectancy, social influence, and fear of the pandemic significantly affect behavioral intention to adopt mobile banking services of Vietnamese people. Furthermore, the behavioral intention, followed by the perceived fear of the COVID-19, considerably and favorably influence the usage behavior toward mobile banking.

Introduction

Under competitive pressure and a worldwide wave of banking digitization, banks are forced to innovate and digitize their operations to catch up with the digital banking trend in the new context. The technological

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breakthrough in mobile information technology and telecommunications provides solutions that enable banks to serve customers efficiently. A customer can use a mobile phone with a banking app installed to carry out many transactions, such as account management, service payments, and money transfers. Every bank is in the race to continuously devote financial and technical resources to integrate mobile banking channels into logistical systems (Lin, 2013).

In Vietnam, commercial banks are racing to apply digital technology to products and services to speed up payment, enhance security, and increase customer satisfaction. Many Vietnamese commercial banks continuously innovate mobile banking to provide the best experience for customers by integrating many utilities into one application that is easy to install on any smartphone. Despite efforts to promote cashless payments from the government and banks in recent years, the proportion of non-cash payments over the total value of transactions is still low. As stated by the Vietnamese Central Institute for Economic Management, in 2019, cash payments accounted for approximately 88% of the total means of payment. Paying cash is a long-standing habit for the Vietnamese, and most do not want to change it.

However, the outbreak of the COVID-19 pandemic changes the situation. The Ministry of Industry and Trade reports that more than half of Vietnamese citizens have participated in online shopping, and the e-commerce market has grown by 18%, accounting for $11.8 billion in 2020. According to experts in banking technology, 2020 is considered the year of digital transformation for banks with substantial investments in technology. The banks offer competitive and innovative products and services that aim to satisfy customers. Non-cash payment has demonstrated its advantages in safety because it limits contact and cash use, contributing to the prevention of the virus. By the end of 2020, according to the Vietnam National Payment Joint Stock Company, the number of payments via mobile phones accounted for more than 918.8 million transactions with a value of nearly 9.6 million billion VND, increasing by 123.9% in quantity and 125.4% in value in comparison to the last year. The current trend of a strong shift from cash to non-cash payment activities requires the banking industry to hasten its digital transformation and offer many new services to create competitive advantages.

The unified theory of acceptance and use of technology (UTAUT) provided by Venkatesh et al. (2003) is popular in information systems and technology studies. However, these models are only suggested regarding organizational context. The differences between customers and organizations lead to concerns in a customer-focused context about the

applicability of mobile banking. Then, it is crucial to select a theoretical framework for investigating factors shaping an individual's intentions and behavior towards technology. Venkatesh et al. (2012) introduce the extended unified theory of acceptance and use of technology (UTAUT2) to elucidate technology adoption from an individual aspect. Four critical factors from the UTAUT, including effort expectancy, facilitating conditions, performance expectancy, and social influence.

According to previous studies, trust has been confirmed to be a crucial factor that determines the intention to accept a new technology (Hanafizadeh et al., 2014). Hence, in this study, the UTAUT2 is expanded by including the trust factor in the conceptual model. Besides, in the epidemic context, non-cash payment activities occur more widely. A simple explanation is that most people panic about the disease and try to find approaches that limit social contact. Thus, feeling fear is a new factor affecting technology acceptance intention that needs to be tested.

1. Theoretical framework

Trust is an individual's sense of safety, confidence, and readiness that a service or a product will consistently meet his expectations (Kim et al., 2011). Studies such as Hanafizadeh et al. (2014), Alalwan et al. (2018) prove that trust is a principal cause of customer perception and intention to conduct non-cash payments through mobile phones. Building personal trust is integral as it reduces consumer fear and uncertainty, thereby reducing decision delay and promoting adoption intention (Koksal, 2016; Luo et al., 2010). Zhou (2011) also confirms that trust is crucial to customers' intentions towards mobile banking. Following these arguments, the first hypothesis is:

H1. Customers' trust positively impacts their intention to engage in mobile banking services.

Individuals use a particular technology with an air of performance expectation when they hope that technology will motivate them to get performance improvement in their jobs (Venkatesh, 2003). Mobile banking has been one of the most convenient channels that enable customers to log on to a service at anytime from anywhere, as long as they can surf the internet (Riquelme & Rios, 2010; Gu et al., 2009). If customers recognize that mobile banking makes their lives and work more advantageous, they will try it.

H2. Customers' performance expectancy positively impacts their intention to engage in mobile banking services.

Effort expectancy is described as the simplicity of being familiar with the new technology (Venkatesh, 2003). Effort expectancy reflects a consumer's perception of the simplicity of registering a mobile banking account and employing it for making payments or receiving money. When users realize that new technology requires little effort, they are willing to install and use it. Because a certain level of knowledge and skills is required to become acquainted with mobile banking, effort expectancy is thought to be influential in shaping the intention to accept a new tool (Ali et al., 2016).

H3. Customers' effort expectancy positively impacts their intention to engage in mobile banking services.

Social influence is about how social interactions with friends, seniors, and family influence a customer's intention to adopt a mobile banking channel (Venkatesh, 2003). People tend to interact with others for suggestions and advice to reduce uncertainty and anxiety when facing new situations. Then, social influence is one of vital determinants of customers' decisions to use or not use online banking (Martins et al., 2014; Zhou et al., 2010). Thus, it is hypothesized that:

H4. Social influence positively impacts customers' intention to engage in mobile banking services.

Customers could cognitively compare the benefits gained from using a new system with the fees (Venkatesh et al., 2012). Customers will forgo the new tools if they realize that the monetary cost to be paid is greater than the sum of the potential rewards. Consistent with this assumption, budgetary constraints strongly determine the customers' predisposition to use mobile banking. Yang (2009) argues that lower fees for financial transactions through banking applications directly and positively affect mobile banking adoption. Consequently, users would accept the service more if the benefit derived from mobile banking services outweighs the costs.

H5. Price value positively impacts customers' intentions to engage in mobile banking services.

Hedonic motivation indicates the happiness and satisfaction of using a system or technology (Brown & Venkatesh, 2005). Ali et al. (2016) investigate and confirm that hedonic motivation plays a part in Jordanian clients' choice to adopt telebanking. According to Arcand et al (2017), enjoyment is the main reason people use mobile devices. Because mobile banking services are performed via mobile phones, emotional motivation should be considered.

H6. Customers' hedonic motivation positively impacts their intention to engage in mobile banking services.

Facilitating conditions refer to how consumers perceive the resources' accessibility and availability to support the use of new technologies

(Venkatesh et al., 2003). According to Nisha et al. (2019), mobile apps that are adaptive and useful can improve users' tendency to utilize them. Users need to equip themselves with basic knowledge and skills for using mobile devices, sending, and receiving messages (Kiconco et al., 2019). Users won't use mobile banking if they find it difficult to learn about these manipulations.

H7. Facilitating conditions will positively impact customers' usage behaviors.

Many previous studies have confirmed the decisive role of behavioral intention in increasing the probability that a customer uses and adopts new systems. Behavioral intention is a crucial predictor of actual mHealth app usage in Bangladesh (Alam et al., 2020). Besides, the results of Madan and Yadav (2018) indicate that behavioral intentions are a strong determinant of the adoption of mobile shopping. Hence, it can be hypothesized that:

H8. The behavioral intention will positively influence customers' usage behaviors.

During the COVID-19 outbreak, people were afraid to make contact with patients infected with the coronavirus (Ahorsu et al., 2020). People tend to reduce face-to-face conversation and change their payment behavior as they speculate about the link between handling physical money and virus infections (Wisniewski et al., 2021). Consequently, the COVID-19 pandemic brought a rise in the prevalence of digital payments. This study investigates the relationship between the use of mobile banking technology and the extrinsic factor of fear by incorporating the fear factor into the UTAUT2 model. Hence, the final hypothesis is as follows:

H9. Perceived fear will positively influence customers' usage behavior.
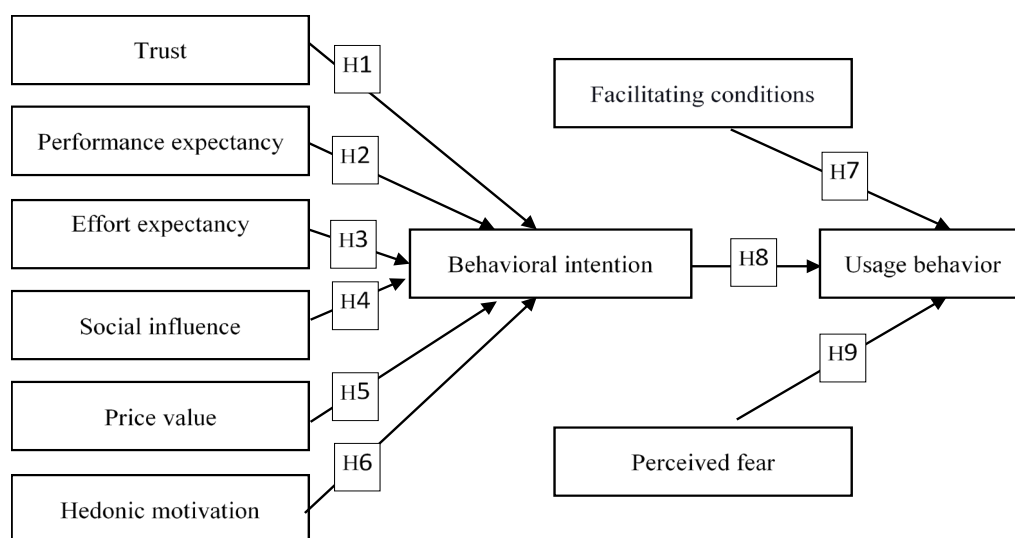
Source: Authors' own work.

Figure 1. The proposed conceptual model

2. Data and methodology

Initially, we conducted a pilot test with 100 mobile banking service users to ensure that no significant challenges with respect to wording, clarity, and relevance exist in the questionnaire. After some slight changes, the questionnaire is evaluated as being simple enough to comprehend.

Next, questionnaires were issued to 500 mobile banking users from Ho Chi Minh City via convenience sampling. We obtained 440 observations, and 60 questionnaires were excluded due to non-fulfillment. For multiple regression and analysis of covariance, a sample size ranging from 200 to 500 is enough to derive reliable results (Israel, 1992). The study by Venkatesh et al. (2012) is cited as the source of the seven factors including facilitating conditions, effort expectancy, hedonic motivation, price value, performance expectancy, social influence, and behavioral intentions. Trust in mobile banking is obtained through the study of Gefen et al. (2003), and perceived fear is referenced in Al-Maroof et al. (2020). The Likert-type scale has a range of 1 to 5, with 1 denoting strong disagreement and 5 denoting strong agreement. The study's proposed hypotheses are tested using maximum likelihood estimation via AMOS software.

3. Empirical results and discussion

3.1. Empirical results

The demographic information of respondents can be seen in Table 1. 37.0 percent of the participants are male, while 63.0 percent are female. More than 48 percent are between 25 and 35 years old, which makes up the largest group. In contrast, the smallest percentage, 7.0 percent, is greater than 35 years old.

Table 1.
The participants' characteristics

		Frequency	Percentage
Gender	Male	163	37.0%
	Female	277	63.0%
Age group	18 – 25 years	122	27.7%
	25 – 35 years	273	62.0%
	35 older	40	9.10%
	Missing	5	1.10%
Total		440	100%

Source: Authors' own calculations.

Table 2 shows the items' description and reliability analysis on 10 latent variables. Cronbach's alpha values are in the interval (0.79, 0.94), which exceeds the threshold point of 0.70. The scores of composite reliabilities are between 0.85 and 0.95, which are greater than the recommended value. Thus, the internal consistency and convergent validity of the interest factors are guaranteed. Besides, the discriminant validity is supported because the square roots of the average variance extracted are greater than the inter-construct correlations.

Table 2.
Variables' description, Cronbach alpha, and composite reliability

Variables and items	Cronbach's alpha	Composite reliability
Trust (TR) Mobile banking (MB) is, in my opinion, completely secure. The MB app that I am currently using is trustworthy. The security of MB apps is beyond question. I am confident that MB is legitimate.	0.94	0.94
Performance Expectancy (PE) MB is very useful in everyday life. MB gives me chances to acquire crucial stuff. Using MB helps get tasks done faster. Using MB has increased my performance. MB helps conduct financial transactions quickly and efficiently.	0.84	0.87
Effort Expectancy (EE) It is simple to figure out how to use the MB app. MB apps are understandable. It is no hardship to use the MB app. I am skilled at using the MB app.	0.85	0.90
Social influence (SI) Important people in my life urge me to use MB. People influencing my attitude urge me to use MB. Significant others encourage me to adopt MB. My acquaintances utilize MB.	0.93	0.93
Prive Value (PV) MB is available at an affordable price. MB helps me reduce costs. MB helps me save time.	0.90	0.92
Hedonic Motivation (HM) It is fun to use MB. It is enjoyable to use MB. It is a fantastic experience to use MB.	0.79	0.85

Behavioral Intention (BI) I will keep using MB next time. I will incorporate MB into my daily routine. MB transactions will become more popular in the future.	0.93	0.95
Facilitating Conditions (FC) I am equipped with the skills necessary to use MB. The MB app is compatible with the phone I am using. When I experience issues with MB, I can find assistance from acquaintances.	0.88	0.87
Perceived Fear (PF) Using MB reduces the fear of coronavirus infection caused by cash transactions. Using MB allows me to break free from social isolation. MB keeps my financial transactions uninterrupted during the pandemic.	0.81	0.88
Use Behavior (US) I frequently use MB to make financial transactions. MB is the most effective way to conduct banking transactions in pandemics. I am willing to update new features of the MB app.	0.91	0.94

Source: Authors' own calculations.

The fit indices values obtained from the structural model include CMIN/df (2.949), CFI (0.910), TLI (0.900), GFI (0.795), and RMSEA (0.067). The model satisfies conditions in fitting to the data because these indices are greater than recommended values. The intention to adopt mobile banking service is significantly predicted by trust (= 0.54, $p < 0.01$), performance expectancy (= 0.33, $p < 0.01$), and social influences (= 0.09, $p < 0.1$). Hypotheses H1, H2, and H4 are supported. Effort expectancy (= 0.09, $p > 0.1$) and hedonistic motivation (= -0.04, $p > 0.1$) have no significant effect upon the intention to adopt mobile banking channels by Vietnamese customers; therefore, H3 and H5 are not supported. Regarding H7, H8, and H9, mobile banking usage is explained by behavioral intention (= 0.59, $p < 0.01$), perceived fear (= 0.30, $p < 0.01$), and facilitating conditions (= 0.16, $p < 0.05$). The coefficients of determination in direct measures are as follows: 71.9% for behavior of using mobile banking; 67.3% for intention to use.

Table 3.
Hypothesis testing results

Hypothesis	Coefficients	Standardized Coefficients	S.E.	C.R.	Result
BI ← TR (H1)	0.54	0.47	0.08	7.06***	Supported
BI ← PE (H2)	0.33	0.24	0.12	2.84***	Supported
BI ← EE (H3)	0.09	0.05	0.17	0.53	Not supported
BI ← SI (H4)	0.09	0.09	0.06	1.69*	Supported
BI ← PV (H5)	0.13	0.11	0.08	1.65	Not supported
BI ← HM(H6)	-0.04	-0.03	0.06	-0.67	Not supported
US ← FC (H7)	0.16	0.12	0.07	2.30**	Supported
US ← BI (H8)	0.60	0.59	0.05	11.82***	Supported
US ← PF (H9)	0.30	0.26	0.07	4.61***	Supported

Sources: Authors' own research. *, **, *** stand for significance at 10%, 5%, and 1% levels.

3.2. Discussion

The studies have captured the most critical aspects relating to mobile banking adoption in Vietnam. The author extends the model UTUAT2 by adding trust and perceived fear in an epidemic context.

The results show that users' intention to use banking services via the internet and mobile technology is most strongly influenced by trust. This finding ties in with previous studies about mobile credit card readers in Malaysia (Ooi & Tan, 2016), or m-banking in Ghana (Kwateng et al., 2019). It is necessary for banks to focus on facilitating and accelerating service usage by cooperating with third-party security certificates to ensure the security of their non-cash payment systems. Also, banks should periodically analyze technical procedures to protect data transmission and user information.

Performance expectancy impacts perceived usefulness positively and significantly. Theoretically, many previous studies have reported the significant dependency of behavioral intention on the performance expectations of customers (Martins et al., 2014; Yu, 2012). Obviously, if users discover that mobile banking brings faster transactions and higher productivity, they are more likely to learn more about it. Furthermore, the findings also indicate that consumers' intentions to accept mobile banking are predicted by social influence. This conclusion is reported in some mobile studies, such as mobile tourism shopping in Malaysia (Hew et al., 2018) and mobile payment service in the U.S. (Park et al., 2019). This finding suggests that ideas from friends, peers, and colleagues are a dominant factor that

entices new customers into mobile banking. Banks should offer incentives to current customers if they share their mobile banking experience with undecided customers or take advantage of social networks to acquire new customers. The experimental results do not support the linkage between effort expectation and behavioral intention. Also, the study does not find a significant effect of hedonic motivation on behavioral intention. The participants in this study probably do not care much about the pleasure yielded from mobile banking services. The considerable influence of facilitating conditions demonstrates that respondents are interested in the necessary facilities and resources to use mobile banking effectively. Thus, bank managers should offer a user-friendly interface and technical support for the mobile banking app. Information such as how to use the banking app should be illustrated clearly on their website. Users' behavioral intentions predict their use behavior. This result is in line with Mutlu and Der (2017), Kwateng et al. (2019). If somebody intends to use mobile banking, he/she will eventually decide to adopt it.

Recent studies have focused on how the coronavirus pandemic impacts the adoption of modern technology, especially as it relates to finance. According to the model, perceived fear of COVID-19 has a significant impact on Vietnamese adoption of mobile banking. People believe that mobile banking is a successful mechanism to reduce the spread of the coronavirus, so they are inclined to switch from cash payments to non-cash payments. Thus, investigating the pandemic's effect on financial transactions both offline and online during this period is necessary. This study fills the gap and contributes a new perspective about the relationship between fear of disease infection and the adoption of new technology.

Conclusion

The study represents a significant contribution to existing literature about technology adoption with respect to the banking channel in Vietnam. This study also contributes to confirming the suitability of the conceptual model based on the theory for the context of Vietnamese customers. Furthermore, this is an early study to expand the UTAUT2 by looking at new technologies during a pandemic. The results reinforce the critical role of trust, expected performance, behavioral intentions, facilitation, and social influence. Therefore, banks should focus on these factors, especially trust, when motivating customers to use mobile banking. This study also

contributes to providing evidence of the fear of COVID-19 infection on intentions and behaviors towards a new technology.

The study is now making a substantial contribution to the knowledge regarding the channels of online financial transactions and the adoption of technology in the Vietnamese context. UTAUT2 has been selected as an excellent theoretical foundation for the conceptual model since it is specifically conceptualized to explain technology adoption from the customer's perspective (Venkatesh et al., 2012). Thus, by examining mobile banking in a new setting (the banking industry in a developing country) and in the context of the effect of the COVID-19 epidemic with its long-lasting repercussions, this study is one of the studies intended to broaden the applicability of UTAUT2.

Even though this study is a worthy endeavor for adopting of mobile banking channels, it is restricted by several limitations. First, the convenience sampling method is carried out to collect data, which often derives biased estimates. Besides, the respondents are banking customers only in Ho Chi Minh City, which could reduce the generalizability of results across other cities. The results of the current study are also based on cross-sectional data, which raises concerns about their long-term relevance because customer prejudices, beliefs, and perceptions regarding such technologies are more likely to alter over time.

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