SEMARAK ILMU PUBLISHING

Journal of Advanced Research in Applied Sciences and Engineering Technology

Journal homepage:
https://semarakilmu.com.my/journals/index.php/applied_sciences_eng_tech/index
ISSN: 2462-1943

Factors Influencing Mobile Banking Usage Among Malaysians During Covid-19 Period

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ARTICLE INFO

Article history:
Received 12 June 2024
Received in revised form 7 October 2024
Accepted 16 October 2024
Available online 10 December 2024

Keywords:
COVID-19; mobile banking; ordered probit model

ABSTRACT

The COVID-19 pandemic has indeed brought about significant changes in various aspects of human life, including daily activities, the global economy, and the financial sector. Restrictive measures aimed at controlling the spread of the virus have prompted greater reliance on digital solutions, including mobile banking, due to limited physical access to traditional banking services. For this reason, this study aims to investigate the factors that influence individual attitudes towards the use of mobile banking during this period. Therefore, this study uses a survey method through a developed questionnaire to collect responses. The questionnaire comprises several sections on the socio-demographic profile and the Likert-scale questions on the interest factors. A total of 274 respondents is successfully obtained through the online medium. The findings suggest that the Perception of Ease of Use (PEOU) and Enjoyment (PE) have a significant positive effect on attitude. In contrast, the Perception of Usefulness (PU) and Perceived Credibility (PC) are then discovered to have no significant impact on attitude toward the use of mobile banking. In summary, this study contributes valuable insights into the factors influencing individual attitudes toward mobile banking at a time when digital financial solutions are becoming increasingly relevant due to the pandemic. The findings underscore the importance of user experience and security considerations in shaping consumer attitudes and, subsequently, the use of mobile banking services.

1. Introduction

Mobile banking is one of the advances in the banking system that are being upgraded with the rapid growth of the technology industry. The definition of mobile banking itself refers to a channel whereby the customer interacts with the bank via mobile phones or a personal digital assistant [1]. The ever-expanding technological advances have greatly affected the financial system, forcing banks to provide exceptional offerings over time. Mobile banking refers to the use of any device to perform anything related to financial transactions, such as self-account transfers, bill payments, and prepaid services, to name a few, which can be achieved at the consumer's fingertips. In this system, financial

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https://doi.org/10.37934/araset.53.2.215224

institutions and banks use Short Message Service (SMS) and mobile banking applications to send out alerts about potential fraud or maintenance updates.

Most banks in Malaysia have improved their electronic banking systems by introducing mobile banking [2]. Despite efforts to develop a better and easier mobile banking system, most customers are unaware of this system. According to recent statistics reported by the Central Bank of Malaysia, the number of mobile banking subscribers for July 2020 rose to 33.6 million compared to 30.8 million in January 2020, which can be concluded to be a 9% increase [3]. The expansion of electronic communication has significant implications for conducting banking activities as the banking industry becomes more competitive [4]. People now rely on technology to propel economic systems forward and improve their quality of life [5]. In addition, individual internet usage in Malaysia increased to 96.8% in 2020, up from 89.6% in 2010. Meanwhile, the percentage of mobile phone users increased to 98.7% in 2021, up from 98.2% in 2020 [6]. Thus, mobile banking will become an essential service for the bank with the dramatic increase in mobile phone usage among Malaysians.

COVID-19, known as Coronavirus Disease 2019, is a novel pneumonia disease that originated in Wuhan, China, and was confirmed by the World Health Organisation (WHO) on January 12, 2020, before becoming a nationwide epidemic. As the epidemic spread, the Malaysian government implemented a Movement Control Order (MCO) to break the chain and used the hashtag #stayathome. During the period when the MCO is in effect, everyone is required to stay at home and do everything from home, including banking. Therefore, the COVID-19 pandemic has increased the demand for mobile banking services for financial transactions [4,7,8]. This service can be valuable to customers by saving them time, providing real-time information, and giving them greater control over their own accounts.

Several factors influence the use of mobile banking during COVID-19. There are:

i. Perceived Ease of Use (PEOU)
ii. Perception of Usefulness (PU)
iii. Perceived Enjoyment (PE)
iv. Perceived Credibility (PC)

PEOU can be described as a person who believes that using a particular system would be free of effort [8]. However, the study by Ali and Arshad [9] believed that the more beneficial the technology could be, the more it will increase the adoption and usage of mobile banking. Purwanto and Mutahar [10] found that consumers need technologies that are easy to use, can make their activities simple, and require little effort, as everyone is busy nowadays. The young generation of Malaysians love to have mobile banking as their platform to do transactions because they consider it the easiest and fastest way to complete their needs without allocating much time [11]. Moreover, everyone is staying at home, and they are not allowed to have the time to go to banks to do the transaction.

According to a study by Rehman and Shaikh [8], PU is the degree to which an individual believes using a particular system will enhance their job performance. In general, they depend on the benefits of its technologies, which are more beneficial and suitable for their daily lives. A study by Naeem and Ozuem [7] highlighted that encouraging the continued use of mobile banking plays a significant role in gaining customer trust. They acknowledged the ability of banks to provide mobile banking applications that will reduce their problems with banks with high security. Another study by Huterska *et al.,* [12] suggested that perceived usability, channel choice, and perceived value were the three main determinants of mobile banking usage. Normalini and Ramayah [13] stated in their study that non-users of mobile banking move their status to that of users of mobile banking because of the usefulness and facilitating conditions of the mobile banking application. Meanwhile, PE is then

defined as the performance of activities without clear reinforcement other than the act of doing the activity. The use of mobile banking systems with PE has been discovered to be positively related. According to Sulaiman and Jauhari [2], PE is significantly associated with mobile banking behavioural intention and is a crucial determinant for female mobile banking users compared to male mobile banking users. Since mobile banking was introduced as a new banking tool, security and privacy concerns have become critical to understanding the adoption of mobile banking. At the same time, PC comprises security and privacy, which have been identified in some previous studies [14], and it affects the behavioural intentions of users who use internet-based trading systems.

Furthermore, there are limited previous studies that focus on the attitudes towards the use of mobile banking among Malaysians during the COVID-19 period. For this reason, this study aims to analyse factors that influence the usage of mobile banking during the COVID-19 pandemic, examine the relationship between all independent variables (PEOU, PU, PE, and PC), and study how mobile banking applications are helpful to Malaysians during the COVID-19 period.

2. Data and Methodology

This section comprises three parts: the framework of the study, data collection, and methodology to be used in this study.

2.1 The Framework of the Study

The research framework in Figure 1 is designed to examine the effect of attitudes such as PEOU, PU, PE, and PC on the use of mobile banking during the epidemic in Malaysia. According to the theory of the Technology Acceptance Model (TAM) [15,16], which represents the determination of customers towards mobile banking, the PEOU and PU were proposed in the model as the determinants of the customer's attitude towards mobile banking. Meanwhile, PE and PC are supporting variables potentially impacting mobile banking during the COVID-19 pandemic. Furthermore, some demographic variables, such as education level and monthly income, are control variables that might influence consumer attitudes toward the use of mobile banking during the pandemic.

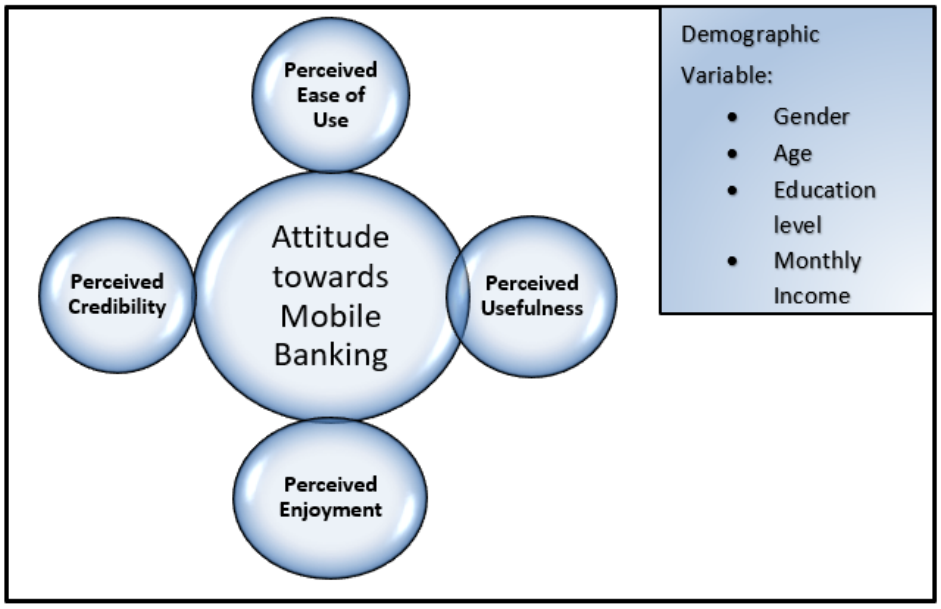

Fig. 1. Research framework

2.2 Data Collection

This study employs a survey method to collect the data of targeted respondents. A questionnaire for this survey was developed based on previous studies [8,12] and distributed using a Google link form through Facebook, Twitter, Instagram, WhatsApp, and Telegram. The sampling technique is nonprobability sampling. As a result, about 274 respondents from various demographic backgrounds were collected successfully.

The questionnaire is divided into six sections. Basically, Section 1 comprises questions on the socio-demographic profile of the respondents, such as age, gender, marital status, race, education level, monthly income, and knowledge of mobile banking. Meanwhile, Section 2 highlights the questions related to the use of mobile banking during the COVID-19 pandemic. Section 3 includes questions about PEOU, PU, and internet facilities. Questions in Sections 2 to 5 are on a five-level Likert scale ranging from 1 to 5. Note that the Likert scale used ranges from 1 (strongly disagree) to 5 (strongly agree).

2.3 Methodology

There are several procedures employed to achieve the objectives of the study. Amongst them are:

2.3.1 Initial process of data analysis

The reliability of the questionnaire was assessed through a pilot test of 35 respondents. The measure of reliability was analysed using Cronbach's alpha. The Cronbach's alpha value must be at least 0.7 for each question in order to be used to proceed with the real data collection [17]. The question that did not reach the 0.7 value of Cronbach's alpha is removed from the survey, and the remaining questions are retained for the study. The next process is data collection. Once the number of target respondents is achieved, the category of respondents is tabulated in the frequency table to see the characteristics of the collected sample. Some initial diagnostics are performed prior to proceeding with the model. The processes are computing the mean and standard deviations for each question, performing the multicollinearity test among the independent variables, and performing correlation analysis before we proceed to the model.

2.3.2 The ordered probit model

The ordered probit model is regarded as the best model to evaluate the survey data due to the use of ordered data, which is Likert-scale items in the dependent variable, y^* (Attitude towards the use of mobile banking) [18]. The model is expressed as the following equation, Eq. (1).

$$y^* = \beta x + \varepsilon \tag{1}$$

where

x : vector of independent variables (perceived ease of use, perceived usefulness, perceived enjoyment, and perceived credibility)

β : vector of parameters to be estimated, and

ε : unobserved error term

The relationship between the latent $y^*$and the observed y can be illustrated as follows

$$y = z \text{ if } \mu_{z-1} \leq y^* \leq \mu_z = z \text{ with } z = 1, 2, 3, 4, 5 \quad (2)$$

where the μ_z is assumed to be a function of cut-off points or threshold parameters, which are estimated along with the regression coefficients such that

$$y = \begin{cases} 1 \rightarrow strongly\ disagree & if\ \mu_0 = -\infty \leq y^* < \mu_1 \\ 2 \rightarrow disagree & if\ \mu_1 \leq y^* < \mu_2 \\ 3 \rightarrow neutral & if\ \mu_2 \leq y^* < \mu_3 \\ 4 \rightarrow agree & if\ \mu_3 \leq y^* < \mu_4 \\ 5 \rightarrow strongly\ agree & if\ \mu_4 \leq y^* < \mu_5 \end{cases} \quad (3)$$

The model of Eq. (1) can be estimated using the Maximum Likelihood Estimator (MLE), while the fit of the model is assessed through Nagelkeke's R-square score. The model is good enough if the result of is greater than 0.5 and the score should be within 1. The software used in this study are SPSS and R programming.

3. Results

3.1 Result of the Initial Process

3.1.1 The reliability result

The reliability results for 35 respondents revealed a satisfactory value, with all questions providing Cronbach's alpha values of more than 0.94. It can be concluded that the questions in the questionnaire are reliable and can be used for the next process.

3.1.2 Socio-demographic profile

A total of 273 respondents were successfully collected, and the information of the respondents is tabulated in Table 1. According to the result indicated in Table 1, females constitute the majority of respondents (71.5%) compared to males. Following that, most respondents are Malays with 97.8%; others are Chinese and Indian with 1.5% and 0.7%, respectively. Furthermore, the majority of respondents were below 22 years old (32.8%), followed by those above 47 years old (21.5%), and the rest were between (10–7%). In terms of marital status, most of the respondents were single (55.7%), while the rest were married (43.2%) and divorced (1.1%). In addition, those with bachelor's degrees made up the highest percentage, with 67.3% compared to other categories. Most respondents are in the category of monthly income below RM2,500, with 52.0%. Lastly, about 98% of respondents have used mobile banking during the COVID-19 period.

Table 1
Socio-demographic profile of collected respondents

Profile	Category	Frequency	Percentage (%)
Gender	Male	78	28.5
	Female	96	71.5
Race	Malay	268	97.8
	Chinese	4	1.5
	Indian	2	0.7
Age	Below 22 years old	90	32.8
	23-28 years old	54	19.7
	29-34 years old	25	9.1
	35-40 years old	20	7.3
	41-46 years old	26	9.5
	Above 47 years old	59	21.5
Marital status	Single	152	55.7
	Married	118	43.2
	Divorce	3	1.1
Education level	SPM and below	24	8.8
	Diploma	35	12.9
	Bachelor's Degree	183	67.3
	Master / PhD	30	11
Monthly salary	Below RM 2500	142	52
	RM 2500 - 4449	45	16.5
	RM 4500 - 9999	56	20.5
	Above RM10000	30	11
Have you used mobile banking during COVID-19 pandemic	Yes	267	97.8
	No	6	2.2

3.1.3 Descriptive statistics result

Descriptive statistics are analysed on all variables, which are attitudes towards the use of mobile banking among Malaysians during the COVID-19 period, PEOU, PU, PE, and PC. Table 2 displays the mean and standard deviation for each variable in this study. These measurements will expose closely how responses adhere to central tendencies [19].

For attitude towards the use of mobile banking among Malaysians during the COVID-19 period, the values indicate that most respondents are inclined to believe that mobile banking is the best application to use. Moreover, during the COVID-19 pandemic, mobile banking applications were frequently used for banking matters. They intend to further the use of mobile banking as the COVID-19 period is recovering daily, although not all respondents trust mobile banking applications for a few reasons. As for Perceived Ease of Use (PEOU), most respondents agree that mobile banking would save them time, be easy to use during the COVID-19 pandemic, and be flexible to interact with.

For Perceived Usefulness (PU) variable, most respondents strongly agree that the use of mobile banking is useful, that mobile banking is relevant at any place as it can prevent infection between customers, and that mobile banking will help them manage banking tasks better during the COVID-19 pandemic. In terms of Perceived Enjoyment (PE) variable, most respondents agreed they love using mobile banking applications as they are very convenient and compatible with life during the COVID-19 pandemic. The use of mobile banking during the COVID-19 pandemic is exciting and wise. Lastly, for Perceived Credibility (PC), respondents strongly agree that the mobile banking environment is safe since there will be no bacterial infection between customers. This indicates that most respondents can continue tracking their transactions using the mobile banking application.

Table 2
Descriptive statistic result of items in questionnaire

	Variable	Mean	Standard Deviation
Attitude towards the use of mobile banking among Malaysians during the COVID-19 period (ATT)			
1	During the COVID-19 pandemic, using mobile banking is a good idea	4.8540	0.4022
2	I often used mobile banking applications during the COVID-19 pandemic for banking matters such as money transfers, checking balances, and so on	4.8504	0.4054
3	I fully trust online mobile banking services during the COVID-19 pandemic rather than visit banking agencies	4.3394	0.8062
4	I intend to continue using mobile banking rather than discontinue its use after the pandemic of COVID-19 ends	4.7044	0.5711
Perceived Ease of Use (PEOU)			
1	I find mobile banking easy to use during pandemic of COVID-19	4.7628	0.4672
2	I believe that I am skilful at using mobile banking as I am used to handling matters using it even before the pandemic	4.5474	0.6682
3	I find mobile banking services flexible to interact with	4.6058	0.6155
4	I believe using mobile banking during the pandemic of COVID-19 would save me time	4.7847	0.4583
Perceived Usefulness (PU)			
1	During the COVID-19 pandemic, I found that using mobile banking for my banking services increased my productivity	4.3796	0.8087
2	Mobile banking is applicable at any place, especially during the COVID-19 pandemic, to avoid infection among customers	4.7044	0.5582
3	I think that using mobile banking services will enhance my effectiveness in conducting my banking tasks during the pandemic of COVID-19	4.6387	0.5968
4	In general, I would find mobile banking useful	4.7883	0.4677
Perceived Enjoyment (PE)			
1	I love using mobile banking to do any banking activities as it is very convenient and compatible with my life during the pandemic of COVID-19	4.6314	0.5734
2	Mobile banking is enjoyable as the performance of them is superb as people staying at home during the pandemic of COVID-19	4.5255	0.6182
3	I enjoy using mobile banking during the pandemic of COVID-19 as it is user-friendly	4.5438	0.6230
4	Overall, using mobile banking during the pandemic of COVID-19 is exciting and wise for me	4.5949	0.5992
Perceived Credibility (PC)			
1	I believe my information is being kept confidential when using mobile banking during pandemic of COVID-19	4.0073	0.8298
2	During COVID-19, I can keep tracking my transactions using an online banking application because it is very secure	4.3577	0.7185
3	I believe my privacy would not be divulged when using online banking during pandemic of COVID-19	3.9891	0.8997
4	When using mobile banking during the pandemic of COVID-19, I believe the banking environment is safe as there will be no bacterial infection among customers	4.5146	0.6912

3.2 The Ordered Probit Model result

The result of the ordered probit model is summarised in Table 3. The coefficients for the independent variables are all insignificant due to their relationship to the use of mobile banking among Malaysians during COVID-19. The marginal effects, however, are significant, revealing that the respondents agree that PEOU, PU, and PE may have a positive impact on mobile banking transactions during COVID-19 while not on PC. A study by Amin *et al.,* [20] discovered that PEOU has a positive relationship with the intention to use mobile banking in Malaysia. This result aligns with the study of Luarn and Lin [21], who also discovered a positive effect between PEOU and the intention to use mobile banking. Another study by Huterska *et al*., [12] revealed that perceived usability, channel choice, and perceived value were the three main determinants of mobile banking usage. The

probability of strongly agreeing increased by 12.07% for PEOU, indicating that respondents strongly agree that this type of intention attracts people to use mobile banking during COVID-19. The same goes for PU and PE attitudes, except for PC, which gives contradictory responses. Thus, it is proven that they are crucial determinants of attitudes towards the use of mobile banking among Malaysians during COVID-19.

Table 3
The ordered probit results of collected respondents

Variable	Coefficient	Marginal Effects				
		P(Y=1|X)	P(Y=2|X)	P(Y=3|X)	P(Y=4|X)	P(Y=5|X)
Perceived Ease of Use (PEOU)	0.9578 (0.0010) [0.2772]	N/A		-0.0219* (0.0280) [0.0100]	-0.0987* (0.0010) [0.0293]	0.1207* (0.0000) [0.0342]
Perceived Usefulness (PU)	0.3586 (0.1600) [0.2552]			0.0067* (-0.1406) [0.0800]	-0.0370* 0.1540 [0.0259]	0.0452* 0.1540 [0.0317]
Perceived Enjoyment (PE)	0.6139 (0.0330) [0.2881]			-0.1406* (0.0800) [0.0080]	-0.0633* (0.0410) [0.0310]	0.0773* (0.0360) [0.0368]
Perceived Credibility (PC)	-0.0083 (0.9650) [0.1907]			0.0019* (0.9650) [0.0044]	0.0086* (0.9650) [0.0197]	-0.0010* (0.9650) [0.0240]
Log Likelihood	-80.568476					
R^2	0.4214					

Note: * shows that the coefficient is statistically significant at a 5% significant level
The values given in brackets are the p-value, and in square brackets are the standard error of the coefficients.
'1' represents strongly disagree, '2' represents disagree, '3' represents neutral, '4' represents agree, and '5' represents strongly agree.

4. Conclusions and Recommendations

This study aims to investigate the effects of attitudes towards the use of mobile banking, which are PEOU, PU, PE, and PC, among Malaysians during the COVID-19 period. The result revealed that the level of user awareness of mobile banking is high at 97.8%. In contrast, the rest of the Malaysians are familiar with mobile banking applications, and the rest did not use mobile banking during COVID-19.

According to the information in the socio-demographic profile, 32.8% are the young generation and have a high educational background, of which 67.3% have a bachelor's degree. Depending on the results of this test, 52% have a monthly income ranging from RM2,449 and below. Finally, this study discovered that mobile banking services are already being accepted by Malaysians, as the older generation, ranging from 47 years old and above, is also getting used to mobile banking applications. This is due to the desire to learn new things, particularly technology-related, while adapting to the new norm during COVID-19. They are aware of this service, and with sufficient information and trust, they feel safe using it for their financial transactions. In summary, mobile banking applications have been demonstrated to be beneficial in helping people protect their lives and conveniently execute transactions without the need to physically visit banks [22].

As a recommendation, banks must provide adequate information to mobile banking users to increase their trust in mobile banking. They can be provided with a user manual with information about mobile banking. Furthermore, they should offer special advice or assistance to bank customers regarding the use of mobile banking. Additionally, ensure that security devices in the mobile banking

system are correct, functional, and enforced. A larger sample size is recommended for further research to adequately examine the overall phenomenon of attitudes towards the use of mobile banking among Malaysians during the COVID-19 period, as it can provide more reliable outcomes. Additionally, there are many other factors that can be studied to determine which factor has the most significant impact on the attitude towards the use of mobile banking.

Acknowledgement
This research was not funded by any grant.

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