Social Science Asia, Volume 8 Number 2, 2022, p: 22-44

FACTORS INFLUENCING MOBILE PAYMENT ADOPTION BY SILVER GENERATION IN THAILAND AND SWEDEN

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Abstract

This paper aims to examine the factors that influence the willingness to adopt mobile payments and the behavior intention to adopt among Thailand and Sweden's older adults. The developed Unified Theory of Acceptance and Use of Technology model was adopted as a conceptual framework and a measurement for this study. The five factors include performance expectancy, effort expectancy, social influence, facilitating conditions, and perceived risk are the independent variables plus the behavior intention to adopt mobile payments as a dependent variable. A quantitative analysis approach has been chosen to obtain data that can be statistically analyzed and compared. A total of 303 of the target respondents in Thailand and Sweden were collected through self-administered questionnaire surveys and analyzed with ADANCO with the partial least square method. The empirical results revealed a significant relationship between most factors with effort expectancy as the only insignificant determinant. For instance, the findings show that social influence has a substantial positive impact on the Thais and a significant impact on Sweden's willingness to adopt mobile payments. Further, perceived risk was found to negatively impact the adoption of mobile payment services in both countries. Still, the fear of losing money was significantly less in Sweden than in Thailand.

Keywords: Mobile Payments, Cashless Society, Technology Adoption, UTAUT Model, Silver Generation, Older adults, Perceived Risk

Introduction

Background and Significance of Research

In the past decades, the rapid advancement of information technologies and innovation has generated a massive transformation in the mobile industry. Mobile phones have been remarkably enhanced. In fact, the worldwide growth of electronic commerce is increasingly driven by mobile shopping (Ertz et al., 2021). The phone is not just a communication device, but it can be used by individuals in various contexts of people's everyday lives, for example, for online shopping, payment services, navigation, etc. On the provider side, countless mobile services and applications have been developed and launched in order to support the business sector and accommodate customers (Song et al., 2014). Recent research

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Received: 17/12/2021; Revised: 5/01/2021; Accepted: 10/02/2022

predicts that the number of smartphone users in Thailand will continue to increase to 87%, which is approximately 60 million by 2026. In Sweden, the number is already over 84% (Statista Research Department, 2021).

Thereby, the technology improvement significantly reshaped business practices in the financial sector. The latest innovation is mobile payment, Tee and Ong (2016) studied that electronic payments potentially improved productivity and increased economic consumption in 56 countries worldwide. The adoption improves transparency and reduces cash-related fraud, the foundation of development and economic growth. Moreover, apart from the fact that the prosperity of mobile payments can initiate benefits for the users and the enterprise that invests in the development, it will also enhance the overall standard of financial services, which leads to a greater cost efficiency (Phonthanukitithaworn et al., 2016). The service was described as an instrument for purchasing goods, services and paying bills by utilizing wireless and other forms of networking technologies (Dahlberg et al., 2015). In particular, mobile payments are crucial for m-commerce platforms (e.g., virtual marketplaces and online stores). Therefore, individuals' willingness to adopt mobile payment via their smartphones is a key to expansion and business success. Since cash cannot fulfill the role, the platform is highly dependent on mobile payment services as every transaction requires an online payment channel (Yang et al., 2015).

Along with innovation and the growth of technology is the aging population. As a result of urbanization, advances in healthcare technology, shrinking family sizes, the average age of the population in many countries is rising. For example, according to Thailand Investment Review (TIR) (2019), Thailand will enter a super-aged society by 2030, with 30% of the population being 60 or older. In Sweden, over 25% of the population is 60 or older already. Thus, this burgeoning senior population lives longer and consumes more, opening plenty of new business opportunities in various sectors. However, according to various studies, the primary consumers of mobile technology like smartphones, laptops, and mobile networks are young-middle-aged people, leaving senior citizens behind (Nikou, 2015). Since the silver generation is becoming a larger percentage of the population and business sectors would profit if they become active users of technology, concerns about the environment, preferences, and other information about this group are crucial. Therefore, this study has chosen to specify Silver generation as 55+ in Thailand and 60+ for Sweden in order to make a fair comparison. The rationale for this is that according to (Worldometer, 2021) the life expectancy for Thailand is 77.74 and 83.33 in Sweden. Further, the retirement age in Thailand is 60 and 65 in Sweden.

Furthermore, in order to make a fair comparison in salaries, the studies have kept the Baht and SEK ranges, respectively. The rationale for this is that: on December 14, 2021, 1 SEK = 3.50 Baht. When comparing the average salaries in the capitals of respective countries on (Livingcost.org, 2021) shows that the salaries in Sweden are 4.5 times higher which then gives a relatively fair comparison.

Research Questions

What factors influence mobile payment adoption by Silver Age groups in Thailand and Sweden?

Objectives of Research

The purpose of this study can be separated into three aspects:

1) To analyze positive and negative factors that influence older adults' acceptance of mobile payment services;

2) To examine the impact of perceived risk towards the adoption of mobile payments and the likelihood to increase the usage of such;

3) To provide a further suggestion for the mobile industry to increase acceptance and usage.

Scope of Study

This study will focus on the key determinants that affect the intention to adopt mobile payment in the silver generation in Thailand and Sweden based on the UTAUT model. As this exploratory study requires an opinion and experience from the recently active users, web-based surveys (Survey Monkey and Sunset Survey) were employed to collect data from 300 respondents in Thailand and 206 in Sweden who is aged above 55 and 60, respectively, and all owners of a smartphone and have experience with mobile payment applications that are available in the respective countries.

Research Limitations

Since the study's focus is limited to Thailand and Sweden's urban areas, the findings do not adequately represent the silver age groups' feedback throughout the respective countries. Furthermore, all of the respondents own a smartphone or other equivalent device, and the majority are familiar with and have experience using mobile payments, so the results will only reflect the perspective of non-users to a limited extent.

Benefits of Research

This study will contribute to other literature on mobile payment adoption by the silver age group in Thailand and Sweden for the theoretical implications. Furthermore, this study will also provide a further understanding of factors that drive mobile technology adoption among older adults.

In terms of the practical implications, the result of this research will provide the driving factors of the silver generation. By understanding the factors that influence the older customer's intention to adopt mobile payments, mobile services practitioners can use the information to improve the services to meet specific customers' needs and preferences.

Literature Review

This chapter contains literature reviews derived from relevant journals and articles from other researchers and theoretical models, frameworks, and hypotheses. In order to understand the existing knowledge and contributions concerning the adoption of mobile payment studies in the target group.

Background of Mobile Payment Services in Thailand

Mobile payment is an alternate payment method to regular payments such as cash, checks, or bank cards. A consumer uses a smartphone or other connected device to pay for products and services online via applications such as Prompt Pay, Swish, AirPay, Samsung Pay, Apple Pay, and PayPal. As smartphones are becoming an increasingly common and necessary part of Thais' everyday lives, the purchasing level of online shopping has risen. A Board of Trade, BOT, survey discovered that 80 percent of Thai respondents use mobile payment to buy online products and merchandise at least once a month. This implies that the awareness of mobile payment among Thai citizens has increased. According to Chucherd et al., (2018), Thailand's E-payment-to-GDP ratio increased by 2 percent in the past five years while cash-to-GDP remains the same, which indicates that Thailand is now in the primary stage of transformation to a cashless society. In addition, Figure 1 shows the amount of Thai mobile transactions used annually from 2010 to 2019. It can be interpreted that the value of mobile payment transactions is increasing exponentially throughout the period and will continue to rise in the near future (Bank of Thailand [BOT], 2019).

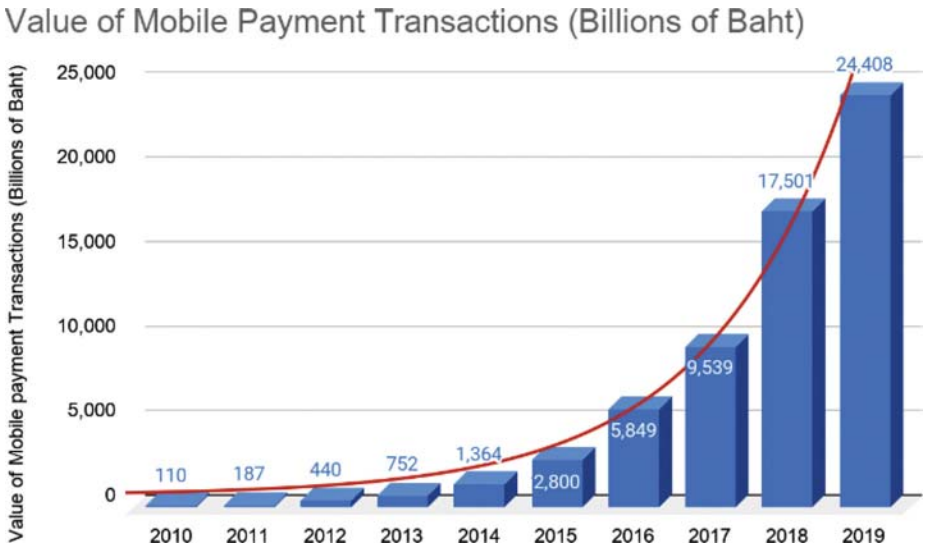

Figure 1 Value of Mobile Payments in Thailand (2010-2019)
Source: Bank of Thailand (BOT)

Silver Age group

This study has chosen to define the Silver Age Group as people that are now at the age of 55 years or older in Thailand and main focus on 60 or older in Sweden, with 20-30% of the population having middle to high income or wealthier retirement age. It means they have high purchasing power and are less conservative with their money (Benjawan, 2020). This group of the aging population tends to live longer, consume more, and demand more products, leading to the upsurge of the silver economy market. Moreover, generating a wide range of business opportunities in various sectors (TIR, 2019).

Unified Theory of Acceptance and Use of Technology

The Unified Theory of Acceptance and Use of Technology model is an extended version of all the eight Technology Acceptance competing models which consist of the Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM), the Motivational Model (MM), the Theory of Planned Behavior (TPB), a model combining the Technology Acceptance Model and the Theory of Planned Behavior (C-TAM-TPB), the model of PC utilization, the Innovation Diffusion Theory (IDT), and the Social Cognitive Theory (SCT) (Ahmad, 2014). The UTAUT model was introduced and developed by Venkatesh et al. (2003), with the purpose of extensively investigating, predicting, and explaining an individual's intentions or behavior prior to accepting and using information technology (Hsu, 2012). The model has four key elements (i.e., performance expectancy, effort expectancy, social influence, and facilitating conditions) that influence behavioral intention to use a particular technology (Venkatesh et al., 2012).

Moreover, previous research has found that risk plays a significant role in a user's willingness to adopt and participate in an online financial activity due to high uncertainty and unknown risks that are involved in online transactions (Luo et al., 2010). Uncertain risks lead to a declining trust level. Hence, lack of trust has been evaluated as an obstacle for individuals to consider using mobile payment (Duane et al., 2014). Furthermore, Gupta et al., (2019) stated that mobile payment includes confidential financial details and as a consequence security issues may become an obstacle to adopting technology. Accordingly, Perceived Risk has been included in the research model in order to examine the target group's behavior towards adopting mobile payment services.

A. Performance Expectancy

Performance Expectancy (PE) refers to the degree to which an individual believes that technology will benefit them when performing certain tasks and enhance their overall performance (Venkatesh et al., 2012). In the context of this study, mobile payments provide a convenient approach for financial transactions. In addition, individuals can access mobile payment services via the ubiquitous usage of mobile phones (Slade et al., 2015). Hence, more economic benefits, higher levels of convenience, and satisfaction are likely to be important drivers of adoption.

H1: Performance Expectancy has a positive effect on the intention to adopt mobile payment services.

B. Effort Expectancy

Effort Expectancy (EE) is the degree of ease associated with consumers' use of technology (Venkatesh et al., 2012). Therefore, it is expected that the easier mobile payment systems are to use, the higher the users' behavioral adoption would be (Al-Saedi et al., 2020). However, given the character of the mobile payment systems, they require a certain degree of skills and knowledge. Therefore, the user's willingness to adopt such technology could be mostly influenced by effort expectancy (Alalwan et al., 2017). Besides, numerous studies have shown effort expectancy to be one of the most important factors affecting M-payment adoption (Al-Saedi et al., 2020).

H2: Effort Expectancy has a positive effect on the intention to adopt mobile payment services.

C. Social Influence

Social Influence (SI) is the extent to which an individual's technology usage on a particular technology is influenced by significant others' opinions (e.g., family, social influencers, friends, and colleagues) (Venkatesh et al., 2012). Research study shows that social groups are likely to form a common base for interactions in order to exchange service experiences within the same group of users (Dawi et al., 2013). In other words, members of a particular social community are likely to exchange shared service experiences and that information paired with the encouragement of surrounding people would raise potential customers' awareness and the intention to adopt technology (Dawi, 2019).

H3: Social Influence has a positive effect on the intention to adopt mobile payment services.

D. Facilitating Conditions

Facilitating Conditions (FC) refers to individuals' recognition of the resources and support available in order to perform a certain task (Venkatesh et al., 2012). As mentioned earlier, mobile payments require a set of skills and knowledge; apart from that, they also require a supported device and assistance. Thus, the behavior intention to adopt mobile payment would increase if the users believe Mobile payment services are compatible with other technology they already use, and if they have access to a certain level of support and resources (Oliveira, 2016).

H4: Facilitating Conditions has a positive effect on the intention to adopt m-payment services.

E. Perceived Risk

In the technology adoption process, perceived risk was usually represented as a detractor factor (Slade et al., 2015). Moreover, the term perceived risk consists of five factors which are performance risk, security/privacy risk, time risk, social risk, and financial risk as defined by Lee and Chung (2009). According to past studies, the perception of risk is regarded as a crucial factor that hinders M-payment adoption (Al-Saedi et al., 2020).

According to Kabir (2013):

- Performance risk refers to losses caused by bugs or failures of mobile payment servers.
- Security risk is defined as a potential loss resulting from fraud or a hacker violating a mobile banking user's security.

- Social risk refers to the possibility that using mobile banking would be frowned upon by one's peers, relatives, or coworkers.
- Financial risk is defined as the potential for financial loss due to transaction errors or bank account misuse.
- Time risk refers to a loss of time and any inconvenience incurred due to payment delays or navigational difficulties.

Therefore,

H5: Perceived Risk has a negative effect on the intention to adopt mobile payment services.

Conceptual Framework and Variables

The conceptual model is proposed to explore the factors that influence the adoption of mobile payment services by silver age groups in Thailand and Sweden. The four variables are shown on the left side (Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions and Perceived Risk) are categorized as ***independent variables*** and the ***dependent variables*** is the Intention to adopt mobile payment services. While Age, Gender, Marital status, Education, and Income were held as ***control variables.***

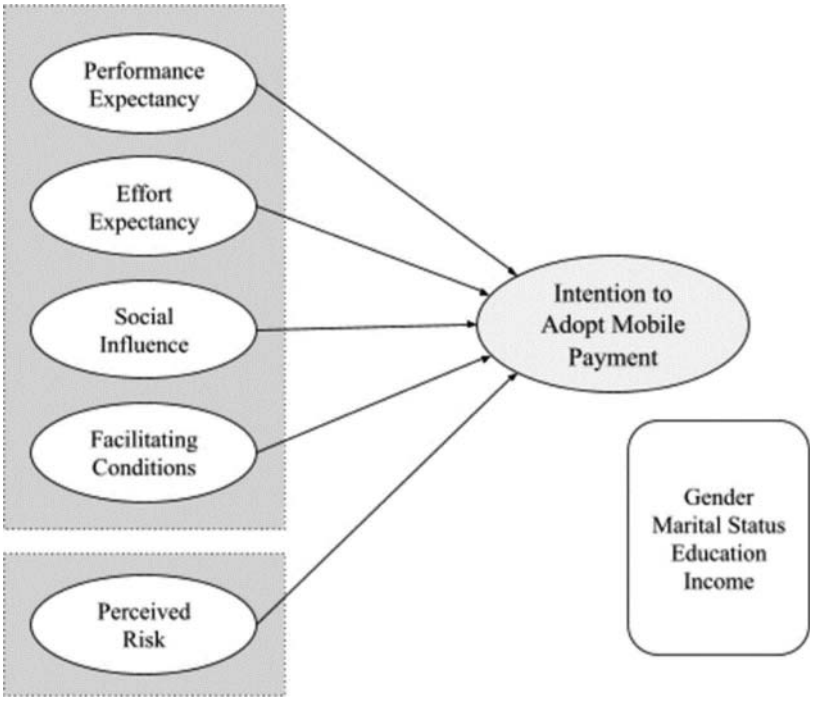

Figure 2 Conceptual Framework

Research Methodology

The research design and method used to study and evaluate the conceptual model of this study is described. Sampling design (sample population and sampling methods), measurement structures, data collection, and data analysis methods used in this study will all be discussed in this chapter.

Research Design

The aim of this research is to look into the relationship between behavioral intention to adopt mobile payments and the factors that influence consumer to use. As a result, a quantitative analysis approach was chosen to obtain data that can be statistically analyzed and compared. The surveys were distributed to the target respondents in Thailand and Sweden via

online channels such as Messaging Apps (e.g., Whatsapp, Line, and Messenger), Linkedin, and Facebook pages. Hence, the relationship between the dependent and independent variables was investigated using questionnaires in this study.

The conceptual model from Lee et al. (2019). was adopted and modified for this study. The independent variables consist of performance expectancy, effort expectancy, social influence, facilitating conditions, and perceived risks, while behavior intention to adopt mobile payments is the only dependent variable. The collected data were processed in ADANCO 2.2.1 using Partial Least Square Structural Equation (PLS-SEM) technique after collection and 'cleaning' using Excel.

Sampling Design

The target population for this study is for both genders in Thailand and Sweden aged 55 years and above and 60 and above in Sweden. The sample will include both people who actually use mobile payments or have knowledge about the systems that are available in the respective countries.

Measurement Constructs

A five-point Likert-type scale was used to enhance response rate and quality while decreasing respondents' frustration levels (Bertram, 2007). Furthermore, as the scale provides respondents with the option of remaining neutral, it can affect the score resulting from the neutral. Hence, it is crucial to phrase a midway correctly. For example, a neutral degree of opinion is represented as Neutral, or Neither Agree nor Disagree (Chyung et al., 2017). However, according to the previous literature in this field of study, a 5-point Likert scale was widely accepted. As the questionnaire items were adapted from previous studies and literature, the existing scales will be implemented in this study. The item's measurement scales were separated into five choices: 1 – Strongly disagree, 2 – Disagree, 3 – Neither agree nor disagree, 4 – Agree, 5 – Strongly agree. All of the questionnaire items that were chosen were written in a closed-ended format. Since English is the primary language of this study, the questionnaires were translated the from English Language version to Thai and Swedish respectively to get answers from the target respondents. Then, the surveys were retranslated into English for further discussion and data analysis.

Data Collection

A. Questionnaire Design

The questionnaires are categorized into three sections which are demographic information, factors influencing the adoption of mobile paym,ents and the behavior intention to adopt. The first section includes the demographic profile to gather the respondents' personal background, such as age, gender, income, education level, etc., to ensure that we collect the correct group of samples. Next, the determinants section can be divided into five parts: performance expectancy section, effort expectancy section, social influence section, facilitating conditions section, and perceived risk section, all of which were adopted and modified from previous literature. The information gathered will be used to reflect the relationship and significance of each variable on the behavior intention. In addition, the 5-point Likert scale was used to answer the questions. Lastly, the behavior intention part measures the likeliness of particular respondents to adopt mobile payment.

B. Data Collection Result

The questionnaires were launched and distributed for approximately one month during March 2020 in Thailand and during September and October 2021 in Sweden. The total number of respondents in Thailand was 356; however, only 303 of them passed the data screening, leaving 53 respondents to be eliminated. In Sweden, there were 206. This sample size exceeds Green's method minimum subject criterion and falls within the acceptable range of 300 to 350 subjects for Thailand and falls slightly short for Sweden.

Table 1 Questionnaire Design

Construct	Items	Reference
PE	• I find mobile payment useful in my daily life. • Using mobile payment help me accomplish my tasks more quickly. • Using mobile payment increases my productivity. • I can save time when I use mobile payment rather than normal payment process.	Venkatesh et al. (2003)
EE	• I find Mobile payments easy to use. • Learning how to use Mobile payments was easy for me. • It does not take long for me to learn to use Mobile payments. • It is easy for me to become skillful at using mobile payments.	Venkatesh et al. (2003)
SI	• You would use the Mobile payment service if someone in the family uses it or recommends it. • You would use the Mobile payment service if your friends/colleagues use it or recommend it. • Most people around me are using mobile payments. • You are interested or decided to use the Mobile payment service after observing the usage of others.	Venkatesh et al. (2003)
FC	• I have the resources necessary to use Mobile payments. • I have the knowledge necessary to use Mobile payments. • Mobile payments are compatible with other technologies that I use e.g., Facebook, WhatsApp. • I can get help from others when I have difficulties using Mobile payments.	Boontarig et al. (2012)
PR	• User payment information on Mobile payment system can be disclosed. • Entering misinformation or paying by mistake may lead to extra loss or missing amount of money. • Some transaction gets cancelled because of disturbance in network and result in loss of time. • The Internet is not safe for financial transactions. • Problems with servers will affect mobile banking experience.	Sobti (2019)
BI	• Mobile Payment service can replace your normal way of spending. • You are willing to train yourself to always be up to date when using Mobile Payment services. • You will use Mobile payments more frequently in the future.	Venkatesh et al. (2003); Davis et al. (1989)

Data Analysis

In order to exclude outlier data, the screening section was run via an Excel program. Following that, the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach was chosen to evaluate the research hypotheses, and ADANCO 2.0 was used to examine the correlation, consistency, and reliability of this study.

According to Chin (1998), The assessment of the measurement model and the structural model are the two measures that must be taken to evaluate the reliability and validity of each construct. The first step in evaluating a reflective measurement model is to look at the indicator loadings. Convergent validity (factor loadings) indicates whether or not objects on a scale are theoretically related. A minimum threshold for loadings is 0.7 to assure that the model is reliable (Hair et al., 2019). Following that, Composite Reliability can be used to examine internal consistency. According to Joreskog's (1971), the value of the construct that is considered as satisfactory to good should be between 0.7 to 0.9 with an exception of 0.6 for exploratory studies. In the third step, the Cronbach Alpha is used to determine the convergent validity of each construct calculation. According to Hair et al. (2019), the acceptable minimum value is similar to Composite Reliability, which is 0.7 and higher. Furthermore, the Average Variance Extracted (AVE) must be evaluated to verify convergent

validity. A value of 0.50 or higher indicates that the construct explains at least 50 percent of the variance among each construct (Hair et al., 2019). Lastly, Fornell, and Larcker's (1981) method is used to determine discriminant validity: if AVE is greater than all model constructs' shared variance or squared correlations, the model is discriminant valid. However, researchers would then evaluate the structural model if the measurement models followed all the minimum requirements (Hair et al., 2017a).

Collinearity must be tested before evaluating the structural model to ensure that it does not distort the regression results. The VIF values greater than 5 indicate that the predictor constructs are likely to be collinear. Thus, the VIF values should ideally be about 3 and below (Hair et al., 2017a). For the structural model, the R^2 is a measure of the model's explanatory power since it calculates the variance that is described in each of the endogenous constructs (Shmueli & Koppius, 2011). According to Hair et al. (2019), If R^2 is greater than 0.75, 0.50, or 0.25, it is considered strong, moderate, and weak, respectively. Moreover, bootstrapping was used to generate standard errors and t-statistics (Chin, 1998).

Findings and Results

Descriptive Statistics

This section demonstrates the summary of the respondents' demographic information obtained from the questionnaires for both Thailand and Sweden. Discussion of respondents' age, gender, and the reason for mobile payment usage is presented separately.

A. Age

The pie charts below (Figure 3) show the age of all respondents in Thailand and Sweden. The majority of participants in Thailand are between the ages of 55 and 60, accounting for 56.3 percent of the total. In contrast, in Sweden, participants are over the age of 70, with 59.40 percent of the total. Furthermore, respondents aged 66 to 70 and 55 to 66 made up the smallest segments of the Thai and Swedish survey groups, respectively.

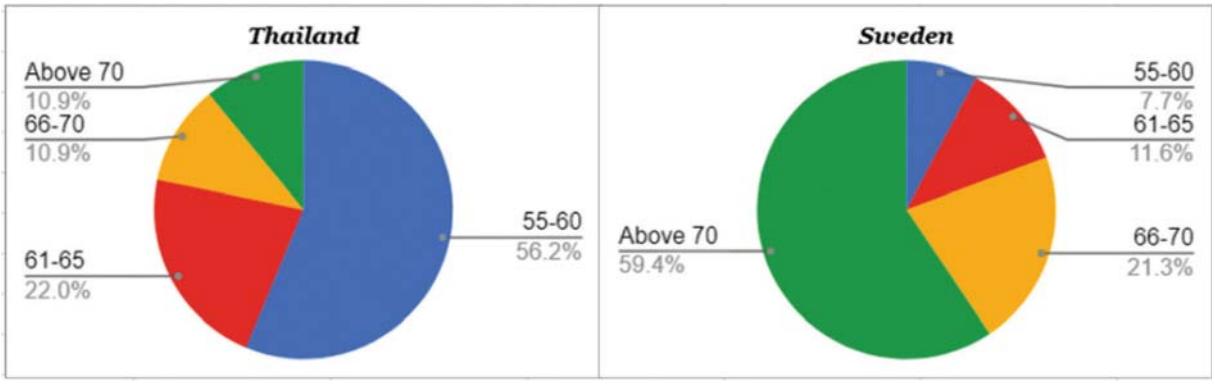

Figure 3 Age Profile

B. Gender

The gender profile findings are depicted in figure 4 and a brief description. According to the findings, one major difference between the Thai and Swedish surveys is that females were accounted for around 64 percent of all respondents in the Thai survey, whereas females were accounted for only approximately 34 percent of all respondents in the Swedish survey.

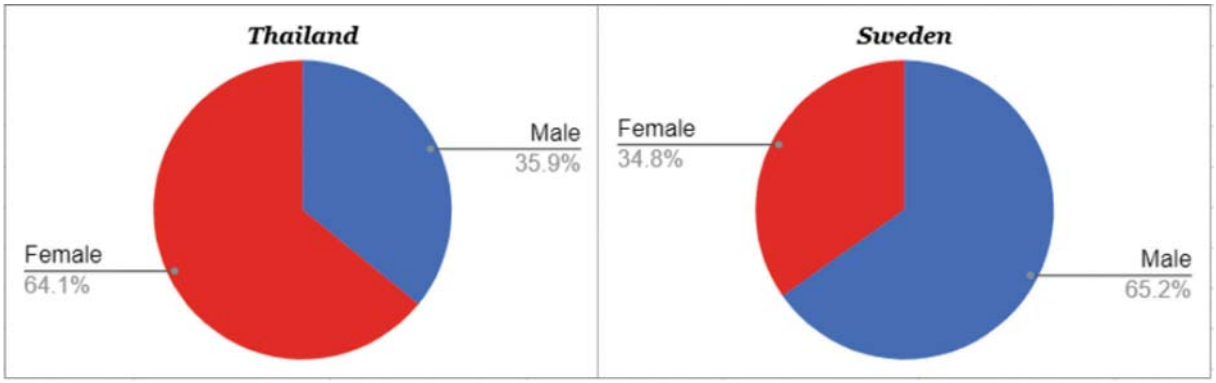

Figure 4 Gender Profile

C. Reasons for Adopting Mobile Payment

According to table 1, the main reason for adopting or being interested in mobile payment services in both countries is convenience (79.93 and 77.88 percent). Fast-functioning mobile payment systems are followed by 73.68 percent and 61.06 percent, respectively. However, the third reason for Thai respondents' adoption of mobile payment is that mobile payment can access online shopping platforms is 47.37 percent. In contrast, the third reason for Swedish respondents is that mobile payments allow for contactless transactions (45.67 percent). These are the top three reasons given by respondents who currently use the services and those who have only heard of it and never experienced it.

Table 2 Reason Behind The Interest In Mobile Payment

Reasons	Thailand	Sweden
Mobile payments are convenient	79.93%	77.88%
Mobile payments are fast and using it can help to save time	73.68%	61.06%
Mobile payments allow you to purchase products or services online e.g., Lazada, Shopee etc.	47.37%	37.50%
Mobile Payments makes Contactless Transactions possible	44.08%	45.67%
Mobile Payments helps you to manage your budget/money	26.32%	3.37%
Mobile payments are more secure	25.99%	5.77%
Others	2.63%	5.29%

Source: Author's Calculation

Summary of Demographic Information

Table 2 summarizes the key demographic profiles of the participants in Thailand and Sweden, including gender, age, marital status, family members, monthly income, and level of education.

Table 3 Descriptive Analysis of Demographic Profile

Variable	Thailand		Sweden	
	Description	**Percentage**	**Description**	**Percentage**
Gender	Male	35.64%	Male	65.22%
	Female	64.36%	Female	34.78%
Age	55-60 years old	56.25%	55-60 years old	7.73%
	60-65 years old	22.04%	60-65 years old	11.59%
	66-70 years old	10.86%	66-70 years old	21.26%
	Above 70 years old	10.86%	Above 70 years old	59.42%
Status	Single	27.39%	Single	4.81%
	Married	65.02%	Married	79.81%
	Divorced	3.29%	Divorced	8.17%
	Widowed	4.28%	Widowed	6.73%
Family members	2 people	14.35%	2 people	94.23%
	3 people	22.37%	3 people	3.37%
	4 people	29.61%	4 people	1.44%
	5 people	17.43%	5 people	0.48%
	More than 5 people	15.79%	More than 5 people	0.00%
Monthly Income	Less than 15,000 baht	7.57%	Less than 15,000 kr	10.10%
	15,000-30,000 baht	13.82%	15,000-30,000 kr	39.90%
	30,001-45,000 baht	17.43%	30,001-45,000 kr	26.44%
	45,001-60,000 baht	18.09%	45,001-60,000 kr	14.42%
	More Than 60,000 baht	43.09%	More Than 60,000 kr	7.69%
Education level	Lower than High school	3.95%	Lower than High school	2.90%
	Highschool Graduate	7.24%	Highschool Graduate	17.39%
	Diploma	7.57%	Diploma	20.29%
	Bachelor's Degree	50.33%	Bachelor's Degree	18.84%
	Master's Degree	28.62%	Master's Degree	27.54%
	Doctor's Degree	2.30%	Doctor's Degree	13.04%

Source: Author's Calculation

Thailand

Measurement Model Assessment

This research studies the constructs of Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC), and Perceived Risk (PR). These determinants were measured to examine each construct's reliability and validity. In this section of the study, the results of the reliability and validity of the measurement instrument are tested and modified as shown in the tables below.

Examining the indicator loadings is the first step in evaluating a reflective measurement model, as the loadings show the reliability of all indicators. A criterion for a reliable factor loading is 0.7 or higher, as it demonstrates that the construct reflects more than half of the variance in the indicator (Hair et al., 2019). According to the required minimum, a total of 4 initial indicators valued below 0.7, hence, Social Influence (SI3), Facilitating Conditions (FC4) and Perceived Risk (PR4-5) were eliminated. The rest of the items loaded on their constructs are over 0.7, indicating convergent validity in this case.

Secondly, the Composite Reliability (Joreskog's rho) is used to indicate internal consistency. The higher the value, the more consistent the items are, and all of the items in this study range between 0.849 and 0.946. Regarding the rule of thumb, items valued between 0.7 to 0.9 are considered satisfactory to good. Furthermore, Cronbach Alpha has a similar threshold: each construct value should be greater than 0.7 with the exception of

0.6 for exploratory research in order to be considered reliable (Hair et al., 2009). In this study, Cronbach's alpha requirements were met by all constructs.

The next measurement is the Average Variance Extracted (AVE) which must be evaluated in order to validate convergent validity. According to Chin (1998), a satisfactory minimum for the construct is 0.5 and above. AVE in this study ranged from 0.6532 to 0.8154 indicates that the variance in its items is explained by the construct.

Finally, the Fornell-Larcker criterion must be evaluated to determine whether the measurement model is discriminant valid or not. All model constructs' shared variances should not be greater than their AVEs (Fornell &Larcker, 1981). As shown in table 4, all constructs passed the requirement, and that discriminant validity is present.

Table 4 The Measurement Model (n = 303)

Construct	Items	Loadings	Composite Reliability	Cronbach's alpha (α)	AVE
Behavior Intention	BI1	0.864	0.919	0.8682	0.7918
	BI2	0.912			
	BI3	0.893			
Performance Expectancy	PE1	0.852	0.939	0.9133	0.7939
	PE2	0.908			
	PE3	0.911			
	PE4	0.892			
Effort Expectancy	EE1	0.879	0.946	0.9245	0.8154
	EE2	0.921			
	EE3	0.920			
	EE4	0.891			
Social Influence	SI1	0.899	0.879	0.7920	0.7089
	SI2	0.891			
	SI4	0.724			
Facilitating Conditions	FC1	0.731	0.849	0.7315	0.6532
	FC2	0.876			
	FC3	0.810			
Perceived Risk	PR2	0.909	0.856	0.6708	0.7482
	PR3	0.818			

Table 5 Fornell-Larcker Criterion

Construct	PE	EE	SI	FC	PR	BI
PE	**0.7939**					
EE	0.5145	**0.8154**				
SI	0.3816	0.2369	**0.7089**			
FC	0.4589	0.5282	0.2814	**0.6532**		
PR	0.0569	0.0951	0.021	0.1161	**0.7482**	
BI	0.5384	0.3618	0.3526	0.4513	0.1314	**0.7918**

Source: Squared correlations; AVE in the diagonal

Structural Model Assessment

Through the analysis of variances, the structural model calculates the r-squared value and the path coefficients to show the relationship between each construct. For statistical significance estimation, bootstrapping is employed to derive t and p statistics.

The VIF value of this research ranges between 1.2749 and 3.8094, indicating that there are no multicollinearity issues. The value of R^2 reflects a model's explanatory power; if the value of R^2 is greater than 0.25, 0.50, or 0.75, the model is considered weak, moderate, or high explanatory power, respectively. The R^2 and the adjusted R^2 of this structural model are 0.635 and 0.628, respectively, which can interpret that the behavior intention construct can be explained by 63.5 percent by the structural model.

Figure 5 illustrates the path coefficient, which shows a negative relationship between Effort Expectancy (EE) and Perceived Risk (PR), and a positive relationship between Performance Expectancy (PE), Social Influence (SI), and Facilitating Conditions (FC). According to the hypotheses, Effort Expectancy is the only factor that did not come out as predicted. Furthermore, the coefficient value demonstrates how influential a particular factor is on the Behavior Intention (BI). Hence, Performance Expectancy (PE) has the strongest effects on the behavior intention to adopt mobile payment at 0.436 and Effort Expectancy as the weakest factor at -0.028.

However, the four constructs (PE, SI, FC, and PR) are significant after assessing t-value and p-value at 95 percent confidence interval; Effort Expectancy (EE) is considered insignificant. As a result, it can be inferred that only four constructs supported the model.

Table 6 Summary of Structural Model Results

Hypothesis	Path	Coefficient	t-value	p-value (2-sided)	Results
H1	PE -> BI	0.4358	6.7616	0.0000	Supported
H2	EE -> BI	-0.0277	-0.5516	0.5813	Not Supported
H3	SI -> BI	0.1854	3.9984	0.0001	Supported
H4	FC -> BI	0.2450	4.2253	0.0000	Supported
H5	PR -> BI	-0.1568	-3.4183	0.0007	Supported

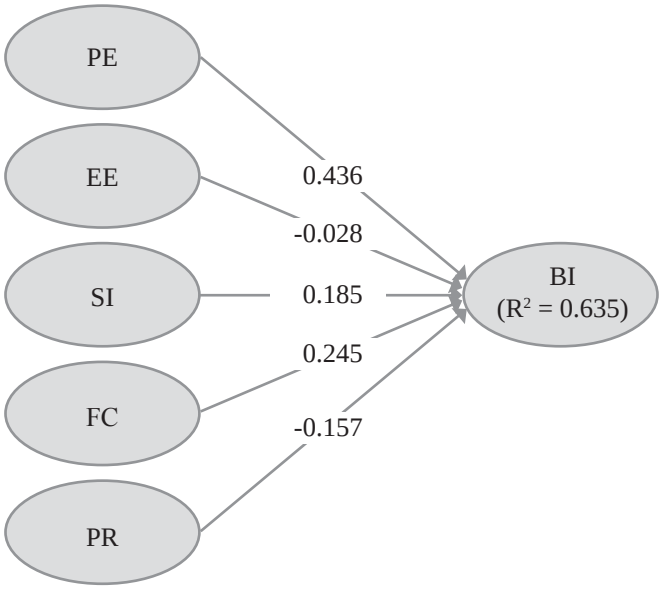

Figure 5 Structural Model and Hypothesis Result

Sweden

Measurement Model Assessment

Prior to assessing composite reliability, Cronbach's alpha, and AVE, the factor loadings of items were evaluated to guarantee indicator applicability, construct quality, and internal consistency. The criteria for a reliable factor loading are approximately 0.6 or higher; hence four indicators were eliminated. As a result, the final model only includes 2 indications for social Influence (SI1-SI2), and 3 indicators for perceived risk (PR1, PR3, and PR5).

A. Problem identification and Solution

According to Hair et al. (2009), Cronbach's Alpha Coefficient is used to measure the reliability and internal consistency. A higher alpha level may indicate that the items in that construct are highly correlated. The value must be greater than 0.7 to be considered reliable, 0.6 for exploratory research to be considered acceptable, and 0.5 to have poor internal consistency. In addition, according to Tavakol and Dennick (2011), a low alpha value could be caused by a limited number of questions, insufficient item inter-relatedness, or heterogeneous constructs.

As shown in Table 7, in two tiers, four constructs passed Cronbach's alpha requirements. For the exploratory study, one construct (FC) passed at the 0.6 criteria, while the other three constructs (i.e., PE, EE, and SI) passed at the 0.7 thresholds, with values ranging from 0.8032 to 0.9057. Perceived Risk, on the other hand, is equal to 0.5011, which meets the criteria but is deemed to have poor internal consistency. As a matter of fact, a low alpha value may indicate that the PR assumptions were not met. Consequently, the Perceived Risk (PR) construct was removed from the study to ensure the research's overall consistency and reliability.

Table 7 The Measurement Model

Construct	Items	Loadings	Composite Reliability	Cronbach's alpha (α)	AVE
Behavior Intention	BI1	0.7641	0.885	0.8032	0.7199
	BI2	0.8633			
	BI3	0.9114			
Performance Expectancy	PE1	0.8042	0.915	0.8760	0.7296
	PE2	0.8714			
	PE3	0.8793			
	PE4	0.8597			
Effort Expectancy	EE1	0.7677	0.935	0.9057	0.7831
	EE2	0.9356			
	EE3	0.9408			
	EE4	0.8847			
Social Influence	SI1	0.9515	0.953	0.9011	0.9099
	SI2	0.9563			
Facilitating Conditions	FC1	0.6417	0.798	0.6693	0.4978
	FC2	0.7008			
	FC3	0.7332			
	FC4	0.7421			
Perceived Risk	PR1	0.8403	0.720	0.5011	0.4693
	PR3	0.5706			
	PR5	0.6133			

B. Results

After eliminating PR, this research consists of 4 constructs: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC). Each construct's reliability and validity are assessed in this section to determine its eligibility for usage in this study.

As mentioned in the previous section, the Cronbach Alpha Coefficient criteria is 0.6 and higher, so all of the four constructs meet the criteria (0.67 to 0.91), indicating that internal consistency is present. The same criteria apply to Joreskog's rho, which is used to evaluate composite reliability. Joreskog's rho has a satisfactory range of 0.70 to 0.90, with a 0.60 minimum exception for exploratory research. As shown in Table 8, all constructs satisfy the criteria, ranging from 0.798 to 0.953. As a result, all items are regarded as reliable.

Furthermore, in order to evaluate the convergent validity, the Average Variance Extracted (AVE) was examined. Satisfactory range for AVE should be approximately 0.5 and above. The AVE in this study ranged from 0.5 to 0.9, implying the convergent validity is valid. Lastly, Fornell-Larcker it is a measurement of discriminant validity. To be considered discriminant valid, the shared variances must be below the average variance extracted. According to Table 9, all the factors have met the requirement which refers to the discriminant validity of this research.

Table 8 The Measurement Model

Construct	Items	Loadings	Composite Reliability	Cronbach's alpha (α)	AVE
Behavior Intention	BI1	0.7696	0.885	0.8032	0.7201
	BI2	0.8591			
	BI3	0.9110			
Performance Expectancy	PE1	0.8041	0.915	0.8760	0.7296
	PE2	0.8713			
	PE3	0.8792			
	PE4	0.8599			
Effort Expectancy	EE1	0.7676	0.935	0.9057	0.7831
	EE2	0.9356			
	EE3	0.9408			
	EE4	0.8847			
Social Influence	SI1	0.9515	0.953	0.9011	0.9099
	SI2	0.9564			
Facilitating Conditions	FC1	0.6415	0.798	0.6693	0.4977
	FC2	0.7000			
	FC3	0.7331			
	FC4	0.7428			

Table 9 Fornell-Larcker Criterion

Construct	PE	EE	SI	FC	BI
PE	**0.7296**				
EE	0.2676	**0.7831**			
SI	0.2213	0.1710	**0.9099**		
FC	0.3291	0.3789	0.2437	**0.4977**	
BI	0.2300	0.1654	0.3317	0.3412	**0.7201**

Source: Squared correlations; AVE in the diagonal

Structural Model Assessment

Prior to evaluating the structural model, the VIF value of the study must be examined. The Variance Inflation Factors (VIF) should be less than 3 according to the criteria to ensure that the model is usable and does not endure from collinearity issues. As an outcome, the VIF ranged from 1.23 to 2.90 in this study. Consequently, the collinearity problem is not present in this study. Furthermore, it can be confirmed that the interpretation of the results of this structural model will be unbiased.

As shown in Figure 6, the R^2 obtained in this study is 0.459, indicating that the structural model can explain 45.90 percent of the behavior intention. Moreover, the path coefficient in Table 10 shows the positive relationship between PE, SI, and FC and a negative relationship between EE. The coefficient value indicates how influential a specific factor is on Behavior Intention (BI). As a result, the most influential construct is SI, with a value of 0.3529, followed by FC, with a value of 0.3517, and PE and EE, with values of 0.1215 and -0.018, respectively. However, after assessing the t-value and p-value at a 95 percent confidence interval, only PE, SI, and FC are considered significant, while EE is considered insignificant. Hence, H1, H3, and H4 are supported by the model.

Table 10 Summary of Structural Model Results

Hypothesis	Path	Coefficient	t-value	p-value (2-sided)	Results
H1	PE -> BI	0.1215	2.2060	0.0276	Supported
H2	EE -> BI	-0.0187	-0.2373	0.8125	Not Supported
H3	SI -> BI	0.3529	4.8493	0.0000	Supported
H4	FC -> BI	0.3517	4.2882	0.0000	Supported

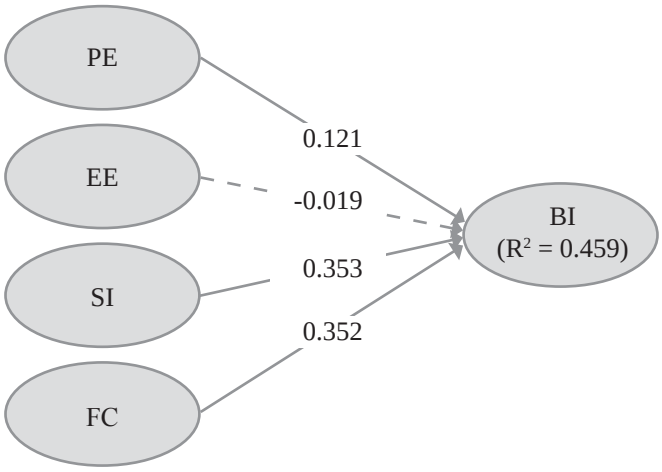

Figure 6 Structural Model and Hypothesis Result

Discussion and Conclusion

This section includes a thorough discussion of the results of this study and findings from other studies, including the conclusion, theoretical and managerial implications, and recommendations for future research.

An experimental model was used to examine the relationship and effects of the performance expectancy, effort expectancy, social influence, facilitating conditions, and perceived risk on the behavior intention to adopt mobile payments by silver generation in Thailand and Sweden. The necessary data output and interpretations from the measurement model and structural model were generated by the PLS-SEM method. As a result, the model was supported by four out of five hypotheses: performance expectancy, social influence, facilitating conditions, and perceived risk.

The findings show a strong significant positive relationship between H1 performance expectancy (0.436) and behavior intention to use mobile payment in Thailand. As supported in previous studies (Chou et al., 2018; Sair & Danish, 2018; Lee et al., 2019). Which implies that in terms of effectiveness, performance expectancy was regarded as the foremost predictor variable to the behavioral intention to use mobile payment systems. Moreover, this would be clarified by the fact that the more efficient mobile payment systems are, the higher the behavioral intention to use them (Al-Saedi et al., 2020). Similarly, when compared to Thailand, H1 for Sweden has a positive relationship but with a moderate effect (0.1215). The lower coefficient can be since Sweden is a developed country that has transitioned to a cashless society faster than Thailand, which is still developing. In contrast to Sweden, where the silver generation has become accustomed to the cashless society as a normal part of their lives, Thailand is still in the early stage of development, with technologies such as mobile payment still being considered novel in the everyday life of the Thais silver generation. Nevertheless, payment banks' utility and value-added advantages should be emphasized by service providers. As a result, consumers' attention may be captured, reinforcing the acceptance of Mobile payments.

Social influence, according to the findings, H3 has a substantial positive impact (0.185) on Thais' behavioral intention to use Mobile payment systems, whereas it has a significant impact (0.3529) on Swedish behavior intention. This could be because the silver generation in Thailand is more conservative than the one in Sweden. According to Jinbo et al.,jores Asian elders avoid using technology because they are afraid of making mistakes and are concerned about their social responsibility, which may prevent them from adopting online technology.

Moreover, previous studies confirm that consumers place emphasis on their family and peers' recommendations and perspectives when it comes to developing confidence in mobile payment services and, as a result, forming their intentions to use them (Yang et al., 2012; Kim et al., 2010; Slade et al., 2016). This indicated that promoting the service functionality and convenience through a social or community network would be a good marketing strategy.

Similarly, the results pointed out that H4 facilitating condition has a significant positive impact on the behavioral intention to adopt mobile payment services in both countries. The FC coefficient value for Thailand is 0.2450, whereas it is 0.3517 in Sweden, indicating that individuals' recognition of the resources and support available to perform a specific task is an important factor influencing mobile payment adoption. Moreover, the findings of this study's FC are consistent with those of previous studies that looked at the effect of FC on actual mobile payment use (Alalwan et al., 2017; Zhou et al., 2010). Moreover, consumers who have easier access to smartphones and other technologies embrace mobile payments more quickly than those who do not (Joshua & Koshy, 2011).

Only H5 Perceived risk was found to have a negative impact on the adoption of mobile payment services, as also shown in past studies (Hongxia et al., 2011; Madan & Yadav, 2016; Slade et al., 2015). According to Phonthanukitithaworn (2016), PR, it can be argued that it can reduce people's intentions to use mobile payment services, especially among those who are unfamiliar with them. Assuming that users are likely to have preconceived notions about the threats associated with digital payment systems, providers of these services will benefit from explicitly articulating their ability to secure sensitive data during the transaction phase. Consumers' perceptions of privacy threats can be reduced by introducing reliable, safe technology and policy efforts to protect personal information, resulting in more efficient and consistent use of mobile payment systems. In addition, the perceived risk was not included in the Sweden's analysis, which may be due to the fact that people in Sweden are more concerned about their personal integrity than the possibility of losing money when using mobile payment systems, as Sweden has higher consumer protection and more effective law enforcement relating to online activity compared to Thailand.

However, H2 effort expectancy has an insignificant effect on the behavior intention to use mobile payment in both Thailand and Sweden, which means that the variable does not support the model. The finding contradicts the hypothesis and some previous research (Im et al., 2011; Chong, 2013; Alalwan et al., 2017), where the higher the effort expectancy, the higher the positive behavior intention. Thus, the insignificant value can be demonstrated that today's mobile technology is designed to be convenient, easy to use, and as simple as it could be. So, the perception of the effort required to complete tasks using such systems no longer represents a variable (Morosan & DeFranco, 2016; Oliveira et al., 2016).

Theoretical Implications

The research contributed to the awareness of mobile payment adoption and other literatures. Firstly, the UTAUT model with PE, EE, SI, FC was successfully expanded by including PR in the analysis to provide more specific data for future studies on mobile payment adoption by Thai senior citizens. Furthermore, this study found that Thailand had 63.46 percent of the R2 value, while Sweden had 45.90 percent of the R2 value, which indicated the independent antecedents of this study could explain Thais and Swedish' silver generation behavioral intention. Secondly, since most research will concentrate on mobile health applications for elders, this study expanded on aspects of technology adoption in the elderly by using a set of requirements. Finally, the model and its constructs can be generalized or extended to various economic fields to compare and furnish the results.

Managerial Implications

Practically, the study's findings are meaningful to the mobile industry. As in-depth information and understanding about the needs of specific groups of customers could help the mobile service providers develop their services and attract more potential consumers. First, based on the numerical result, performance expectancy is the most significant determinant of behavior intention to adopt. Adding services to the mobile payment app, such as direct bill payment, unique goods and services, or a collaboration between mobile payment providers and merchants to offer a range of services tailored to the elderly will enable them to use it more often.

Facilitating conditions played a significant role in influencing the adoption. Mobile payment providers should ensure the app's stability and provide facilitating functions for customers, such as support tools, 24/7 call centers, and clear explanations and tutorials throughout the app. These functions would help older consumers develop their skills and continue to use the service.

Next, the impact of social influence on adoption intention, adoption of mobile payment services can serve as means to strengthen individuals' social links and social status, particularly among potential users. As a member in the same social group, in this case elderly, interested in the same topics and shared experiences. Promoting mobile payment services via a social or group network may be a good strategy for service providers.

Another important issue that service providers emphasized, particularly among elderly users, are risk avoidance and risk mitigation. This study proved that when providing mobile payment services to older consumers, service providers should maintain a secure system to build trust and, at the same time, make sure it's simple to use.

Limitations and Suggestions for Future Research

Despite the fact that the paper thoroughly and successfully examined the effect of UTAUT factors and perceived risk on the acceptance of mobile payment in the silver generation, it did not focus on certain disparities. For example, the majority of respondents in this survey are already using mobile payment services, with only a small part never using these services. Since the questionnaires were launched through online channels, only those with sufficient devices and internet access were able to fill in the questionnaires. As a result, the survey will be biased because the silver generation includes elderly people who can use technology and those who cannot. Furthermore, because of the Covid-19 situation and the limited amount of data collection period, the research would be more efficient with a larger number of respondents varieties and specifications, such as an equal amount of each age range, specific income level, and so on. Following the completion of this research, it is clear that there are opportunities to further enhance this area of study in Thailand, Sweden, and other countries. To begin with, the findings and analytical data can be compared to other research papers in order to highlight the similarities or differences between various groups or sectors. Moreover, the conceptual framework developed in this study can be applied to other fields of technology services for any population group. Finally, by including more variables in the conceptual model, such as perceived confidence, perceived cost, etc., researchers could dispute future findings and obtain more accurate results in this study's context.

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