วารสารบริหารธุรกิจเทคโนโลยีมหานคร
MUT Journal of Business Administration
ปีที่ 21 ฉบับที่ 1 (มกราคม – มิถุนายน 2567)
Volume 21 Number 1 (January – June 2024)

Factors Influencing E-payment Technology Adoption among the People in the Upper Northern Region of Thailand in the Digital Economy Drive Era

ปัจจัยที่มีอิทธิพลต่อการยอมรับเทคโนโลยี E-payment ของประชาชนในเขตภาคเหนือในยุคการขับเคลื่อนเศรษฐกิจดิจิทัลในประเทศไทย

Received: *May 9, 2023*
Revised: *November 17, 2023*
Accepted: *November 21, 2023*

Ladda Pinta ลัดดา ปินตา[1,*] Phichapop Panpare พิชาภพ พันธุ์แพร[2]
Vanasanan Pongpaw วนันนันท์ ผ่องแผ้ว[3]

[1] Ph.D Lecturer, Master Business Administration (M.B.A.) Faculty of Business Administration and Liberal Arts, Rajamangala University of Technology Lanna
[2] Ph.D Associate Professor, Master Business Administration (M.B.A.) Faculty of Business Administration and Liberal Arts, Rajamangala University of Technology Lanna
[3] M.B.A. Research Assistant, Master Business Administration (M.B.A.) Faculty of Business Administration and Liberal Arts, Rajamangala University of Technology Lanna
[1] ปร.ด อาจารย์., บริหารธุรกิจมหาบัณฑิต (M.B.A.) คณะบริหารธุรกิจและศิลปศาสตร์ มหาวิทยาลัยเทคโนโลยีราชมงคลล้านนา เชียงใหม่. ประเทศไทย
[2] ปร.ด รองศาสตราจารย์., บริหารธุรกิจมหาบัณฑิต (M.B.A.) คณะบริหารธุรกิจและศิลปศาสตร์ มหาวิทยาลัยเทคโนโลยีราชมงคลล้านนา เชียงใหม่. ประเทศไทย
[3] บ.ธ.ม. ผู้ช่วยนักวิจัย., บริหารธุรกิจมหาบัณฑิต (M.B.A.) คณะบริหารธุรกิจและศิลปศาสตร์ มหาวิทยาลัยเทคโนโลยีราชมงคลล้านนา เชียงใหม่. ประเทศไทย

บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อศึกษา ปัจจัยที่มีอิทธิพลต่อการยอมรับเทคโนโลยี E-payment ของประชาชนในเขตภาคเหนือตอนบน ในยุคการขับเคลื่อนเศรษฐกิจดิจิทัลในประเทศไทย

* E-mail address: lemon_2910@hotmail.com

โดยใช้การสุ่มตัวอย่างแบบแบ่งชั้น จำนวน 430 ราย เครื่องมือสำหรับการเก็บข้อมูล คือ แบบสอบถาม โดยแบ่งเป็น 4 ส่วน ประกอบด้วย สภาพทั่วไปของผู้ตอบแบบสอบถาม ปัจจัยที่มีอิทธิพลต่อการยอมรับเทคโนโลยี E-payment การยอมรับเทคโนโลยี E-payment และข้อเสนอแนะ ซึ่งมีความเหมาะสมกับการวิเคราะห์ข้อมูลด้วยการใช้เครื่องมือทางเทคนิคสถิติสมการ โครงสร้าง (SEM) โดยการวิเคราะห์เส้นทาง (Path analysis) ด้วยโปรแกรม SMARTPLS V.3.3.3

ผลการศึกษาชี้ให้เห็นว่า ปัจจัยสิ่งอำนวยสะดวก (FAS) มีอิทธิพลทางอ้อมสูงสุดโดยผ่านปัจจัยการรับรู้ความยากง่ายในการใช้งาน(PEOU) และปัจจัยการรับรู้ประโยชน์(PU) ข้อค้นพบจากการศึกษา ประชาชนในเขตภาคเหนือตอนบนมีการใช้งานอินเตอร์เพื่อการทำธุรกรรมทางการเงินให้ความสำคัญกับปัจจัยสิ่งอำนวยความสะดวก มากที่สุดเนื่องจากการใช้บริการ E-payment เป็นเรื่องใหม่สำหรับประชาชน การที่ประชาชนจะยอมรับและเริ่มต้นใช้งานเทคโนโลยี E-payment นั้นจำเป็นต้องอำนวยสะดวกและใช้งานง่าย

คำสำคัญ: การยอมรับเทคโนโลยี เทคโนโลยี E-payment อิทธิพลทางสังคม การรับรู้ประโยชน์ การรับรู้ความยากง่ายในการใช้งาน

ABSTRACT

This research examined the factors influencing E-payment technology adoption among the people in the upper northern region of Thailand in the digital economy drive era. There were 430 samples selected by stratified random sampling. The tool for collecting data was a questionnaire, divided into 4 parts: general condition of the respondents, factors influencing the acceptance of E-payment technology, acceptance of E-payment technology and recommendations. It was suitable for data analysis using Structural Equation Modeling (SEM) as a statistical tool by path analysis with SMARTPLS V.3.3.3 program

The findings indicated that the facility factor (FAS) had the highest indirect effect through the perceived ease of use factor (PEOU) and perceived usefulness factor (PU). Furthermore, the study from the people in the upper northern region showed that they actively used the Internet for financial transactions focused on the facility factor the most since the use of E-payment service was new to them to accept and start the convenience and ease to use need to be provided.

Keywords: Technology Adoption, Technology E-payment, Social Influence, Perceived Usefulness, Perceived Ease of Use

INTRODUCTION

Due to the COVID-19 pandemic around the world during 2020 - 2021, lifestyle behaviors have changed, causing consumers to adapt more to the digital world, such as online shopping and payment due to the measures for social distance; some consumers avoid using cash for shopping. As Thailand has entered the digital economy world; therefore, technology has become more and more active in business and daily life activities various transactions, whether trading, business contract, financial transactions through digital platforms both domestically and internationally. It traditionally replaces transactions with the New Normal lifestyle and people who change because of the habit when repeating that behavior for a long time. There is a chance to become New Normal; however, not every behavior will become New Normal. In addition, consumer spending behavior trends during home quarantine include watching video streaming, playing online games, spending money via E-payment, ordering food, delivering food, cooking at home, and spending for home repairs such as furniture and home improvements be a home office. There reflect new behaviors of people in society (Thaicharoen, 2020).

Kasikorn Research Center (2021) considers that although COVID-19 will accelerate the market value of businesses selling goods or services between business owners (B) and individual consumers (C) (Business to Customer B2C E-commerce), it tends to expand higher than retail businesses as a whole. Nevertheless, this mentioned signal affects the picture of more challenging and intense matches due to the increase in the number of players among the purchasing power of most consumers who still spend cautiously. However, the growth of E-commerce may not be due to increased overall consumer spending. It is likely to face difficulties running a business. Also, new technology and the behavior of consumers in the future are constantly changing; It should change the competitive picture of the retail business further, and it is still difficult to decide who will become the market leader since each person has a challenge or problem as well. Consequently, the flexibility of entrepreneurial adaptation serving consumer behavior is always a crucial aspect of running the business under changes. This effect is reflected in decline in electronic card spending data. However, some businesses can still expand, such as supermarkets, health and beauty, and direct marketing. Moreover, we are seeing a rising star in the logistics business growing fast in line with online spending. This implies the economy because it helps support some of the unemployed workers. Therefore, it is considered that the trend of the digital economy, especially online sales, is an intense opportunity for Thai businesses and likely to continue to gain popularity since it is a directly

accessible channel to the needs of consumers including, it can be deployed at a low cost (Kongpalee, 2020).

Even though the usage of E-payment among Thai people is still limited in some groups, it cannot be denied that COVID-19 is one of the critical factors driving more E-payment usage. One reason is a concern about dealing with cash. Presently, this trend has taken place worldwide, reflecting from the search statistics for words related to "Cash and COVID" by the authors who compiled based on a study by the Bank for International Settlements (BIS). The findings revealed that searches increased from March to April 2020 because there had the highest epidemic. Surprisingly, the search statistics were consistent with each country's situation. For example, according to Figure 2, it shows that South Korea has the first high record since the end of January 2020, the starting of the epidemic, and rising again in May 2020, which has a second round of outbreaks while Singapore, Thailand, and around the world have statistics for search queries that have been increasing sequentially since February 2020 (Tonghui *et al.*, 2020).

Referring to a survey by the Kasikorn Research Center (2020), it was found that after the COVID-19 epidemic in Thailand had eased, the consumers using Mobile Banking and E-Wallet increased, while a new group of consumers also increased in usage. Mobile banking and E-Wallet usage continued to grow amid the new wave of the COVID-19 pandemic. Overall Thai consumers currently transfer money and pay for goods and services via mobile banking and E-Wallet 19 times a week. This surpassed the usage survey after the first wave of the August 2020 outbreak at 17 weekly usage rates. It has also seen increased usage, especially in the Work from the Home period, and reductions in travel to decrease the infection risk or the COVID-19 spread.

As consumers increased in purchases, there also increased by 350 baht per time from the previous survey, with the focus still on spending in the food and beverage segment, daily life consumer products, and fashion products as in the previous survey. However, Kasikorn Research Center expects that in 2021, the volume of money transfer and payment transactions via Mobile Banking will grow by 80.2 - 83.5 percent compared to the same period last year (YoY). It seems to be driven mainly by the use of G-Wallet (Paotang) from government aid projects that should be continued in 2021. Nevertheless, there are also groups of new entrepreneurs with credibility and potential who enter the market increasingly.

At present, people's electronic payments have a higher rate. One benefit the government gained is that the government will perceive the financial transaction information of the Thai people. In addition, the E-payment system will help to verify easily, fast, and transparently.

Thai people still use cash as their primary payment method. But it reflects a positive trend in the increased use of e-payments, which supports Thailand's journey towards becoming a less-cash society. (Bank of Thailand, 2021) Electronic financial transactions in Thailand still cannot build confidence for all people because many groups of people have not been ready to use them yet (Udomvejsakul, 2014) indicated that the main reason people refuse to apply Mobile Banking since it has a lack of confidence in the security system. Consequently, if bank entrepreneurs realize the factors affecting confidence in using financial services through Mobile Banking applications, they can implement the information obtained from research to improve and develop model technology or the function of using the Bank's Mobile Application service that can respond to the needs and create more confidence to the bank's customers (Muangling, 2015).

It included people in the upper northern provinces consisting of 9 provinces; in 2019, the total population of 10,743,414 million people and the number of Internet connections 54.9% have an Internet connection, and Mobile Banking rates are the lowest compared to other regions in Thailand. Therefore, the researchers were interested in investigating the factors influencing E-payment technology acceptance among the people in the northern region of Thailand's digital economy drive era for finding what factors the digital economy in Thailand can be driven by, to study the problems and obstacles of the people in using E-payment technology in the transition to the digital economy era and to be as a guideline for the government can implement the research results to improve policies to drive the Thai economy further

RESEARCH QUESTION

What factors influence the adoption of E-payment technology among people in the upper northern region in the digital economy drive era in Thailand?

RESEARCH OBJECTIVE

1. To study of the Level of Social Influence, Confidence in Technology, Knowledge and Understanding of Usage, Convenience, Perceived Ease of Use, Perceived Benefits, and Acceptance of E-payment Technology among the Population in the Upper Northern Region of Thailand in the Era of Digital Economic Development.

2. To examine the Influential Factors of Social Influence, Confidence in Technology, Knowledge and Understanding of Usage, Convenience, Perceived Ease of Use, Perceived Benefits, and Acceptance of E-payment Technology among the Population in the Upper Northern Region of Thailand in the Era of Digital Economic Development.

RESEARCH CONTRIBUTIONS

To identify the factors that drive the digital economy in Upper Northern Thailand and investigate the challenges and barriers faced by individuals in adopting E-payment technology during the digital economic era. The study aims to provide insights that can serve as guidelines for the government to enhance policies and propel the Thai economy forward.

LITERATURE REVIEW

E-payment Factors influencing E-payment Technology Adoption

Sociology Theory applied in studying the dissemination of Innovations DOI Innovations) by Rogers mentioned five factors or characteristics of innovation influencing a person's decision to accept or not accept the innovation. They consist of 1) Relative Advantage; 2) Compatibility; 3) Complexity; 4) Trialability; and 5) Observability (Rogers, 2003).

Other factors such as Social Influence is the individual level on the understanding of the importance with the belief that a new system should be practiced, three behavioral factors were identified as follows: 3.1 Subjective Norm: understanding of individuals and self-influenced behavior (TRA Model); 3.2 Social Factors: relationships between people expressing culture and agreement between individuals showing in that social situation (The Model of Personal Computer Utilization -MPCU Model); 3.3 Image: the degree of innovation usage or (system) that is understood to enhance the image or social status (The Innovation Diffusion Theory - IDT Model) (Social Influence; SI) as the level that others realize the importance and this new system should be applied. It is similar to the structure shown in the reference group based on The Theory of Planned Behavior (TPB), The Theory of Reasoned Action (TRA), Technology acceptance model-TAM, The Decomposed Theory of Planned Behavior (DTPB), the integration of TAM (TPB), social determinants (MPCU), and The Diffusion of Innovation (DOI) (Rogers, 2003). Compared between the models, it indicated that imitation of others was less important than self-volunteer. At the same time, being forced will lead people to obey in

the early stages. Therefore, rewards and punishments are used as tools for consumers to change behavior through technology.

Perceived Ease of Use (PEOU) is another key parameter of TAM. This refers to the degree to which the user expects the targeted technology to be used as easy and independent of effort (It is not used frequently, so it is easy.) The study results found that the technology that is easy to use and convenient without complication has the possibility of acceptance from users and indirectly influences use through accepting behavior (Agarwal and Prasad, 1999; Teo *et al.*, 1999; Venkatesh *et al.*, 2003).

Perceived Usefulness-PU of the technological application is defined as a person's attitude in the technological usage in a particular system to increase one's productivity (Davis *et al.*, 1989) or the perspective of analyzing and realizing the value or expected usefulness of technology. If the benefits of technology serve individual needs, it will lead to acceptance and usage. Perceived Ease of Use-PEOU is another aspect of technology considerations. It refers to a person's attitude and belief in an easy-to-understand technology algorithm. The level of confidence that an implementation does not require effort will determine whether it is perceived in terms of quantity or how successful it is to be met, the job Will succeed as expected (Davis *et al.*, 1989; Davis, 1986), so that technology users can learn how to use it without needing to be an expert in a particular field.

Adoption of E-payment Technology

The acceptance of E-payment technology refers to the agreement or understanding that users or organizations have regarding the use and support of online payment systems or E-payment. This acceptance includes a confident and willing perspective in utilizing this technology for financial transactions or payments through the internet. (Kim *et al.*, 2010)

Furthermore, acceptance of E-payment technology also signifies readiness, adaptation, and support for innovations in online payment. It is related to understanding the benefits and capabilities of E-payment technology in providing convenience to users, reducing transaction complexities, and enhancing efficiency in financial transactions.

Theories related to User/Individual Intention are fundamental in principles of human psychology and have been popularly applied as an approach or framework for studying factors influencing a person's attitude towards acceptance of something (such as innovation and information systems). It is a theory initiated by Davis *et al.* (1989) developed from an idea (Theory of Reasoned Action: TRA). TAM focuses on studying factors affecting the acceptance or decision to use a new technology or innovation. The main factor directly affecting user acceptance of technology or innovation is Perceived Ease of Use and Perceived Usefulness.

Three factors influence behavioral intention in applying technology: Perceived Ease of Use, Perceived Usefulness, and Attitude. The behavioral intention in technology application will influence the intention to use and adopt the technology.

Ajzen (1991) and Davis (1986) applied the theory of Technology Acceptance Model (TAM) (Davis *et al.*, 1989) to forecast behavior and human understanding; the details include External Variable which means the influence of external variables created from the perception of the individual with different influences, including experiences, cognition, beliefs, and social behaviors, etc.

Perceived Usefulness means the benefit perception arises from using it as a determinant of individual perception. It can be said that each person will perceive how technology will contribute to the development of their potential.

Perceived Ease of Use refers to the perception of ease for usage that determines perception whether the success will respond to their needs or not. Attitude toward Use refers to the attitude toward use that an individual has an interest in using the technology system or accepting it or not. Intention to Use means the intention to use technology depending on the individual's behavioral interest. Actual Systems Use means that an individual accepts the technology and uses it. Actual Systems Use refers to the person accepting the technology and using it in practice.

E-payment Technology System

E-payment (Electronic Payment System) is a system created to facilitate the people today. It is a system that can transfer money electronic payment via smartphone with the Internet system as an essential assistant. Moreover, we can also conduct financial transactions via credit card. The E-payment system will conveniently and quickly facilitate various financial transactions and economic activities. According to the strategic plan, it becomes an important mechanism for improving people's quality of life and strengthening the fiscal management system in the development of electronic payment system infrastructure. The National E-payment Master Plan will contribute to enhancing the country's competitiveness in terms of Thailand's competitiveness, Ranking ease of doing business, as well as Human Development Index: HDI.

As for the E-payment system in Thailand in 2020, it was revealed that Thais people had 10.7 million ATM cards, 64.1 million debit cards, 24.6 million credit cards, and 8,813,000 card accepting machines, including 103.6 million accounts of Mobile/Internet Banking. They had 9,898.7 million transaction volume, transactions valued as 66.9 million baht, QR code usage for 6.9 million payment points, and 56.2 million registered numbers of the PromptPay

system. Moreover, the statistic pointed out that 34.3 million ID card numbers, 21.1 million mobile phone numbers, 20.2 million average daily transactions, and 74.3 billion baht daily average transaction value (Bank of Thailand, 2021). Nevertheless, government and business digital payment volume also grew, and automatic transfers and advance payments of around were 63%. Therefore, the Covid-19 situation was a significant catalyst for the use of Mobile/Internet Banking to grow more than 70% in the public sector (Bank of Thailand, 2021).

RESEARCH MODEL AND HYPOTHESIS DEVELOPMENT

The E-payment Literature review finds the relationship between variables related to factors influencing E-payment adoption.

Relationship between Social Influence, Perceived Ease of Use: PEOU, and Perceived Usefulness

"Social influence" refers to the impact or influence on the behavior and values of individuals or groups in society. This influence can result from individuals, organizations, or various elements in society that affect individuals or groups in different ways. Examples include cultural values, communication, and the influence of social media online. Social influence can have a profound effect on the behavior and attitudes of individuals in various aspects of life. (Lu, 2014)

Social influence can stem from various sources, such as social media displays, peer groups, family, organizations, or mass media. It can be a source of changes in attitudes, behaviors, and opinions related to the daily lives of individuals or groups in society.

According to a study by academics, social influence significantly influences decision-making among consumers shopping from Shopee in Medan. Social influence can influence others to make behavioral decisions. It is related to external pressures. More and more people were surrounded by a person's environment for doing something unintentionally, which can influence that person's behavior.

Likely, the perceived ease of use factor significantly impacts consumers' purchasing decisions of Shopee in Medan. The perception of ease of use can positively affect consumers who shop from web stores by increasing spending. This is because they still feel comfortable interacting with online stores. When the consumers feel comfortable interacting with online e-commerce payments, they will consider shopping more beneficial. Therefore, hard-to-use systems are considered less useful by users and may be discarded by users. So are the

results of the study of Taylor and Todd (1995); Haryono and Brahmana (2015); Tan and Brahmana (2019); Wen *et al.* (2011).

H1: Social Influence has a positive influence on Perceived Ease of Use: PEOU.

H2: Social Influence has a positive influence on Perceived Usefulness.

Relationship between Technology Trust, Perceived Usefulness, and Perceived Ease of Use: PEOU

Confidence in using E-payment services refers to the trust and assurance that users have in internet-based transaction systems related to payments or online financial transactions (E-payment). This confidence stems from the belief that the system is secure, efficient, and capable of providing services that meet the users' needs appropriately.

A study by scholars showed that technology trust affects the application of electronic payment services through smart devices, and there is a positive correlation. If the users have more confidence in online systems, the technology acceptance for applying electronic payment services will also increase (Kaewtan, 2014). Trust (TR) occurs when one party has confidence in the reliability and integrity of an exchange partner, and the users are necessary to use more convenient, secure, and less risky new services. Numerous studies have concluded that trust benefits users' willingness to accept M-Payment (Alkhowaiter, 2020; Chawla and Joshi, 2017; Singh and Sinha, 2020; Alswaigh and Aloud, 2021).

H3: Technology trust has a positive influence on Perceived Ease of Use: PEOU.

H4: Technology trust has a positive influence on Perceived Usefulness.

Relationship between Cognitive Principles, Perceived Ease of Use: PEOU, and Perceived Usefulness

Knowledge and understanding of the use of E-payment services is important in order for users to conduct online financial transactions safely and efficiently. Related to types of E-payments, understanding how to use various E-payment services, including transaction procedures and methods for entering financial information. Learning about security measures that must be followed throughout using E-payment services. payment to prevent fraud Read and understand the privacy policies of E-payment service providers to know how they use

personal information. Learning how to check financial transactions, such as credit card transactions. Checking the transfer amount or other items. etc.

The cognition required is the combination of direct experience of one's attitude with relevant information from various sources. This cognition's result will commonly derive from the belief that the consumers have about anything from different aspects, and the occurring specific behaviors will lead to specific outcomes. The study results on external factors such as experience technological confidence showed that cognition is used as a measure of attitude on the acceptance of technological innovations was found to have a positive influence on Perceived Ease of Use and Perceived Usefulness. It also affects the acceptance of online forms of payment and E-payment (Manzano *et al.*, 2009; Hamner and Qazi, 2009).

H5: Cognitive Principles have a positive influence on Perceived Ease of Use: PEOU.

H6: Cognitive Principles have a positive influence on Perceived Usefulness.

Relationship between Facilitating, Perceived Usefulness, and Perceived Ease of Use: PEOU

Convenience refers to the factors that enable users to perform financial transactions and payments efficiently through online systems. It involves ease and speed, allowing users to carry out financial transactions online at their convenience and in a timely manner. The convenience and speed of online financial transactions enable users to make payments or conduct transactions anytime, anywhere. Cost Reduction: E-payment can reduce expenses in various forms, such as transaction fees, tolls, and other financial costs. Accessibility: E-payment systems provide users with general access to transactions, including payments, money transfers, or online purchases, without the need to physically travel to transaction locations. Variety of Services: The diverse range of E-payment services, including bank transfers, mobile payment services, credit cards, and other options, offers users a variety of choices.

Facilitating (FC) is the level to which an individual believes that the organizational and technical structures are meant to promote the use of this system in which the relevant model is the Perceived Behavior Control (TPB/DTPB) and the integration between the TAM-TPB facility (MPCU) and the Diffusion of Innovation (DOI). In comparison, it revealed that the relationship between intention and willingness or compulsion in training has an influence at the first time. However, such influence disappears a month after application. A study by Guo *et al.* (2015) also found that operational facilities such as comprehensive support systems will help the

users have the intention of applying the system. Significantly, facilitating positively influences digital payment acceptance (Musyaffi *et al.*, 2021; Mohan, 2014; Tripathi, 2014; Gaitán *et al.*, 2015).

H7: Facilitating has a positive influence on Perceived Ease of Use: PEOU.

H8: Facilitating has a positive influence on Perceived Usefulness.

Relationship between Perceived Ease of Use: PEOU, and Perceived Usefulness

Perceived benefit refers to an individual's awareness that the information system they are using brings about advantages. If there is an enhancement in the newly developed information system, it will lead to more efficient work. The perception of benefit directly influences the intention to use the information system (Davis, 1986).

The study of the positive relationship between Perceived Ease of Use (PEOU) and Perceived Usefulness has been confirmed by many researchers that they have a direct positive influence (Gefen and Straub, 2000; Venkatesh *et al.,* 2003; Dishaw and Strong, 1999).

This is consistent with the results of Athapaththu and Kulathunga (2018); LIN *et al.* (2010) on a case study of online shopping intentions in Sri Lanka, the results showed that Perceived Usefulness and Perceived Ease of Use are the significant factors affecting consumer acceptance intentions for Mobile Banking in China. Therefore, assumptions can be formulated as follows:

H9: Perceived Ease of Use: PEOU a positive influence on Perceived Usefulness.

Relationship between Perceived Ease of Use: PEOU, Perceived Usefulness, and E-payment Technology Adoption

Perceived Ease of Use refers to the individual's belief that a system or technology can be used effortlessly, without complexity, and with minimal effort.

The scholars as Alswaigh and Aloud (2021) pointed out that Perceived Usefulness positively influences E-payment technology acceptance of Mobile Wallets Users in Saudi Arabia. These findings support by the study of many scholars such as Chawla and Joshi (2017); Riskinanto *et al.* (2017); Najdawi *et al.* (2015) that Perceived Usefulness has an influence on E-payment technology adoption significantly. Therefore, assumptions can be formulated as follows:

H10: Perceived Ease of Use: PEOU has an influence on E-payment technology adoption.

H11: Perceived Usefulness has an influence on E-payment technology adoption.

According to the literature review, the researchers formulated the conceptual framework as follows:

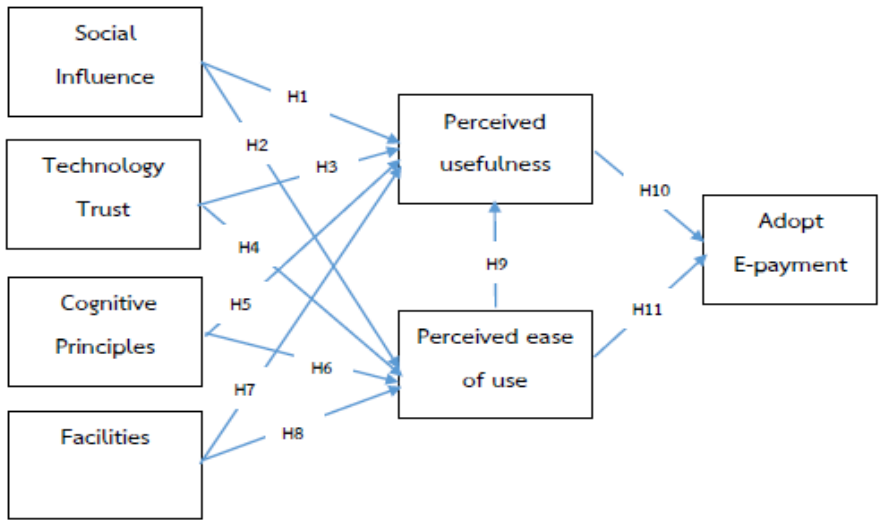

Figure 1: Conceptual Framework

Source: Researcher, 2023

RESEARCH METHODOLOGY

This research applied a questionnaire to collect data from the target population: people who use E-payment services in the upper northern region. The Westland (2010) sample size stipulates that the minimum sufficient sample size for research using the Structural Equation Modeling (SEM) to test hypotheses is ten samples per indicator or questions, but should not be less than 200 examples (Kline, 2011; Iacobucci, 2010). For this study, the researchers Structural Equation Modeling and the total number of questions was 43 items. The sample number should not be less than 430 samples, according to Westland (2010); Kline (2011); Iacobucci (2010) criteria. The sampling method was stratified random sampling from Table 1.

Table 1: Showing Population Numbers and Sample Groups

Province	Population	Sample Group	Percentage (%)
Chiang Mai	1,630,907	127	29.58
Chiang Rai	1,167,121	91	21.17
Lampang	715,974	56	12.98
Nan	472,747	37	8.57
Phayao	458,959	36	8.32
Phrae	430,009	34	7.80
Lamphun	396,469	31	7.19
Mae Hong Som	242,055	19	4.39
Total	5,514,241	430	100

Source: Office of Strategy and Information for Habitat, 2023

The questionnaire quality assessment was carried out on both the validity and the reliability as follows: a test of reliability focusing on the content validity of the measure. The first step: the three experts verified the questions with the completeness, correctness, conformity according to the relevant theory, including language check; the second step: the researchers revised the questionnaires based on the recommendations, and the third step: three more experts checked the content validity for the questions of seven variables that which were partially and wholly reconstructed to verify compliance with the objectives. In this study, the Index of Item-objective Congruence (IOC) was used for each question item with a consistency value of not less than 0.67 (Parish *et al.*,2010: 156). After the discussion with the experts, then the questionnaire was a checked to find ICO value and was not less than 0.7. The reliability test was done after the revision in the content validity. 30 people who used the E-payment service in Chiang Mai Province worked on the revised questionnaire to obtain reliability. This research applied a formula developed by Lee J. Cronbach as Cronbach's Alpha Coefficient, where the coefficient of each variable must not be less than 0.7 (Choudhary *et al.*, 2013; Carmeli *et al.*, 2006) of each variable is greater than 0.7. After distributing the questionnaire mentioned above and using it to find the confidence value or Cronbach's alpha coefficient, it was found that the coefficient of each variable was more significant than 0.7.

The results of validity and reliability of measurement, verification of the measurement using Cronbach's α-coefficient to calculate the mean of correlation coefficient found that the alpha coefficient was between 0.733 - 0.857, which is considered highly reliable

Data Analysis

This research started with the following steps for data screening:

Step 1: Outlier checking by Mahalanobis Distance Method

Step 2: Normality checking with skewness and Kurtosis

Step 3: reliability and validity checking of construct validity.

When the information has been screened successfully, subsequently, the hypothesis was tested using Partial Least Squares-Structural Equation Modeling: PLS-SEM) with SmartPLS 3.3.3 (Ringle *et al.*, 2015). PLS-SEM is popular or increased interest in business research (Becker *et al.*, 2012; Hair *et al.*, 2012; Sarstedt *et al.*, 2014; Hair *et al.*, 2014) since PLS-SEM can address issues that are routinely encountered in social science research, such as highly complex models (Hair *et al.*, 2014).

RESEARCH FINDINGS

Data Screening

Starting from Step 1: The Mahalanobis Distance investigation results showed that 10 out of 430 data were abnormal since the p-value was less than 0.001 ($P < 0.001$), thus the extraction of such data from the dataset was performed (Joo *et al.*, 2012; Vianello *et al.*, 2010; Beauchamp *et al.*, 2005). Therefore, only 420 data sets remained for further analysis. Step 2: The results of checking the normality with skewness and kurtosis revealed that the data was a normal distribution. Since a Skew Index (SI) of no greater than 2 was symmetrical or non-skewed, and a Kurtosis Index (KI) of less than 7 was a normal distribution (West *et al.*, 1995.), thus there were 420 data for further analysis. Step 3, the results of checking the reliability and validity of the structure, starting with the confidence with consideration based on Cronbach's Alpha Coefficient, indicated that all variables were confident. Since Cronbach's alpha coefficient was not lower than 0.7 (Choudhary *et al.*, 2013; Carmeli *et al.*, 2006), 40 questions remained for further analysis. The construct validity was determined by considering the factor loading of the questionnaire in each component from the exploratory factor analysis, and it was found that all the questions had construct validity.

Research Findings

The characteristics of the sample group reveal that the majority are female, accounting for 58.14%. The age range is predominantly between 19-24 years, constituting 25.116%. Business owners make up 15.476%, while those with a bachelor's degree represent 25.581%. The average income falls between 25,001 to 35,000 Baht, accounting for 21.395%. Additionally, 25.375% of the sample resides in Chiang Mai province.

Statistical Analysis

It reveals that the acceptance of E-payment technology is at the highest level. External factors, perception of ease of use, and perceived benefits affecting E-payment service usage follow. In terms of convenience, the population in the northern upper region finds it easier to conduct financial transactions. Using the E-payment system is more convenient than the previous system used. The integration of E-payment into lifestyle, perceived ease of use, simplicity, quick usage, and continuous usage are considered straightforward and can be used seamlessly.

In terms of perceived benefits, quick and convenient usage surpasses cash transactions. The E-payment system can be used instantly with various shops anytime and anywhere. Confidence in technology, maintaining the privacy of personal information, and the assurance that personal data will not be used with others' information are also significant factors.

Social influence plays a role, with family members, friends, and acquaintances recommending E-payment services. Motivation from marketing activities, such as advertising, and current societal trends, contributes to promoting the use of E-payment services. Family members, friends, and acquaintances stimulating the use of E-payment services also play a role.

In terms of knowledge and understanding, individuals have registered for E-payment on their own and have the ability to learn and acquire skills in using technology services.

Table 2: Average values of variables

Variables and Indicators	Average Score
Social Influence	**4.09**
E-payment Family members, friends, acquaintances encouraging you to use E-payment services	3.94
Family members, friends, acquaintances recommending E-payment services	4.20
Motivation from marketing activities such as advertising	4.12
Current societal trends promoting the use of E-payment services	4.09
Confidence in technology	**4.15**
Maintaining the privacy of personal information	4.19
Your personal information will not be used with others' information	4.10
Convenience factors	**4.29**
Easier financial transactions	4.36
More convenient than the previous system you used	4.28

Variables and Indicators	Average Score
Integration of E-payment into your lifestyle	4.23
Knowledge and understanding	**4.09**
You registered for E-payment by yourself the first time	4.12
You can learn and have skills in using technology services	4.07
Perceived benefits	**4.18**
Quick and convenient, more than using cash	4.32
Can be used anytime, anywhere with various shops	4.04
Perceived ease of use	**4.20**
Not complicated	4.28
Does not take much time	4.17
Easy and continuous usage	4.14
Acceptance of technology	**4.32**
External factors affect E-payment service usage	4.37
Perceived benefits affect E-payment service usage	4.20
Perceived ease of use affects E-payment service usage	4.21

Source: Researcher, 2023

Hypothesis Testing

Measurement Model or Outer Model, the result of evaluating the measurement model or the outer model, which was an assessment of reliability and validity. Reliability assessment was carried out by assessing internal consistency reliability, the assessment of convergent validity and discriminative validity, the assessment results are shown below.

Internal Consistency Reliability showed that each construct of variable was External factor (CR=0.899), Technology Trust (CR=0.910), Cognitive (CR=0.910), Facilitating in using (CR=0.910), Perceived Ease of Use (CR=0.910), and Perceived Usefulness (CR=0.882).

As Reflective Model, the quasi-report contains only one level of construct and the first-level latent variable as the index of the second-level latent variable. Measurement Model reported with the criteria of the Reflective Model. The Structure Model reported t with the normal criteria as R^2 f^2 and determined whether the path coefficient was significant or not (Jhantasana, 2020).

As the Reflective Model, it was considering the Internal Consistency Reliability of ρA ρc and α in an individual active variable was higher than 0.70. Subsequently, it had Internal Consistency Reliability and had the Consistency Reliability higher than 0.5. These could be

considered in accordance to the Loading of each index which was higher than 0.708, and Convergent Validity which is considered from AVE was higher than 0.50 as in Table 2

Table 3: Measurement model of Reflective-Reflective Type

	Loading	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
ESO		0.849	0.855	0.899	0.690
SI11	0.765				
SI12	0.856				
SI14	0.862				
SI15	0.836				
TIT		0.802	0.802	0.910	0.835
TT21	0.915				
TT22	0.912				
KNOW		0.802	0.803	0.910	0.835
CP45	0.918				
CP47	0.910				
FAS		0.851	0.854	0.910	0.771
FT51	0.854				
FT52	0.916				
FT54	0.863				
PEOU		0.851	0.852	0.910	0.771
PEOU71	0.850				
PEOU72	0.917				
PEOU74	0.866				
PU		0.733	0.740	0.882	0.789
PU61	0.902				
PU62	0.874				
EPAY		0.857	0.860	0.913	0.777
TAEP81	0.859				
TAEP82	0.877				
TAEP83	0.908				

Note: Measurements are as shown in Table 2.

Source: Researcher, 2023

Hypothesis testing with the evaluation of the path analysis (β) and the significant level of the path analysis both t-value and p-value based on Bootstrapping with 5,000 samples (Hair *et al.*, 2012) revealed that all the hypotheses were accepted as Figure 2.

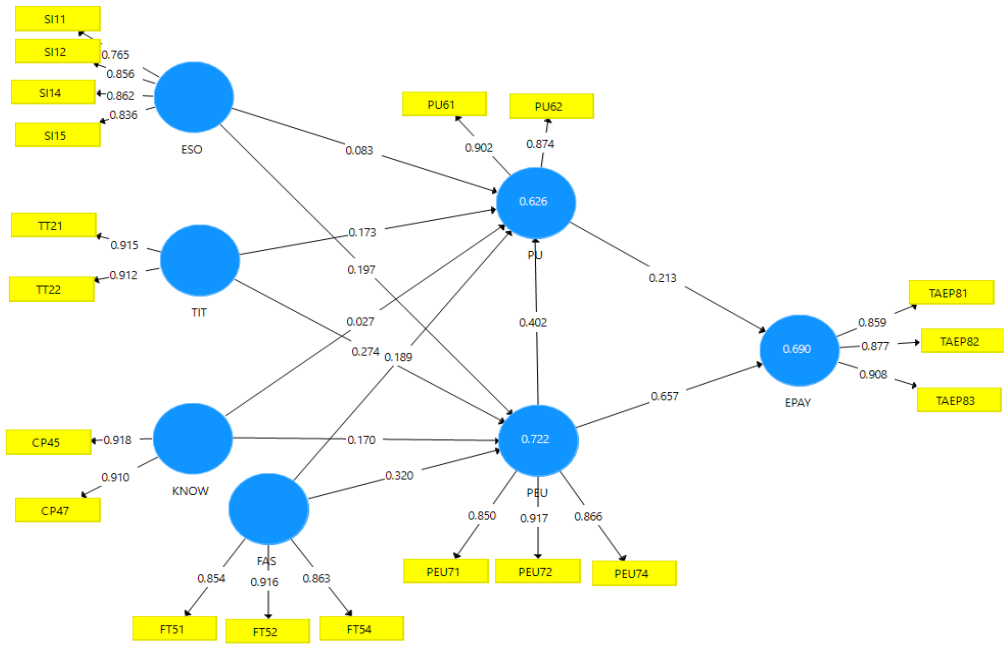

Figure 2: Structural Model Results

Source: Result, 2023

Structural Equation Model

According to the structural equation model, the researchers analyzed the quantitative data with Partial Least Squares. It was the data analysis for confirmatory factor analysis (CFA), which involved the assignment of manifest variable) Furthermore, latent variable and test the hypothesis of the research by showing it as a structural equation model, which was analyzed using a packaged program.

The results of validity and reliability of measurement, verification of the measurement using Cronbach's α-coefficient to calculate the mean of correlation coefficient found that the alpha coefficient was between 0.733 - 0.857, which is considered highly reliable.

In the case of measurement variables with the reflective model analysis tested for convergent validity, the consideration criterion was that the loading must be a positive quantity, and the indicator loading was greater than 0.707 and was statistically significant ($|t| \geq 1.96$) for all values. It indicated that the measure has convergent validity (Lauro and Vinzi, 2004; Henseler *et al.*, 2009) cited in Phiriyakul (2010). The results of the analysis are shown in Table 2 as follows:

Social Influence Factor (ESO), Technology Trust Factor (TIT), Cognitive Factor (KNOW), Facilitating Factor (FAS), all of them had a loading value starting from 0.707 and a

significant level of reliability of 95% (t-stat > 1.96). Therefore, it can be assumed that all factors directly influenced the perceived usefulness factor (PU) and ease of use factor (PEOU). Furthermore, it was found that the perceived benefit factor (PU) and the perceived ease of use factor (PEOU) were good mediators as connectors. Therefore, Social Influence Factor (ESO), Technology Trust Factor (TIT), Cognitive Factor (KNOW), Facilitating Factor (FAS) were found to have direct influence from the perceived ease of use factor (PEOU) on E-payment technology adoption (E-Pay) relatively high. That meant all four factors would affect E-payment technology adoption through the perceived ease of use factor (PEOU) and perceived usefulness factor (PU).

The results pointed out that facilitating factor (FAS) had the most significant indirect influence through the perceived ease of use Factor (PEOU) and perceived usefulness factor (PU) because the use of E-payment services is new to the public. Subsequently, it needs to be convenient and easy to use, leading to the E-payment technology adoption.

QUALITY OF MODEL FIT

Consideration of SRMR index less than 0.08

The SRMR index (Hu and Bentler, 1998) or the average mean square root index, if the result is less than 0.05, the model is of good quality (Byrne, 2013), but Henseler *et al.* (2015) found that the model can be good quality at an SRMR index greater than 0.06. As a result, Henseler *et al.* (2015) presented a level of 0.08. According to Hu and Bentler (1999) presented that typically, if an SRMR index is less than 0.1, it is acceptable that the model is suitable for the data. (Kock, 2017) or the model has good quality. The results showed that the three statistical values, SRMR, dULS, and dG of the Saturated and Estimated models, were considered good quality, as shown in Table 4.

Table 4: Bootstrap Statistical Testing of CCA (Concorde Anois)

	Saturated Model	**Estimated Model**
	Value	**Value**
SRMR	0.056	0.069
Chi-Square	1183.250	1269.798
NFI	0.782	0.766

Source: Research, 2023

Table 5: Reflective Model

Fornell-Larcker Criterion

	EPAY	ESO	FAS	KNOW	PEOU	PU	TIT
EPAY	**0.882**						
ESO	0.761	**0.830**					
FAS	0.788	0.715	**0.878**				
KNOW	0.756	0.738	0.705	**0.914**			
PEOU	0.819	0.761	0.760	0.728	**0.878**		
PU	0.712	0.677	0.687	0.633	0.759	**0.888**	
TIT	0.744	0.767	0.657	0.684	0.751	0.682	**0.914**

Note: R - Squared Correlation: AVE as diagonal

Source: Researcher, 2023

Table 6: Statistical Values of Composite Criteria

	Loading	Weight	T-Weight	VIF
ESO				
SI11	0.765	0.281	19.363	1.602
SI12	0.856	0.336	22.832	2.032
SI14	0.862	0.304	26.077	2.493
SI15	0.836	0.282	23.013	2.267
TIT				
TT21	0.915	0.553	37.447	1.812
TT22	0.912	0.542	37.437	1.812
KNOW				
CP45	0.918	0.559	31.680	1.814
CP47	0.910	0.536	34.706	1.814
FAS				
FT51	0.854	0.379	28.333	1.899
FT52	0.916	0.398	30.890	2.689
FT54	0.863	0.361	25.167	2.131
PEOU				
PEOU71	0.850	0.368	39.187	1.968
PEOU72	0.917	0.383	40.157	2.798
PEOU74	0.866	0.388	28.681	2.078
PU				
PU61	0.902	0.595	29.762	1.503
PU62	0.874	0.530	39.792	1.503

	Loading	Weight	T-Weight	VIF
EPAY				
TAEP81	0.859	0.352	33.783	2.022
TAEP82	0.877	0.388	31.886	2.084
TAEP83	0.908	0.394	33.755	2.502

Note: Variance inflation Factor (VIF) And Measurements are as shown in Table 2.

Source: Researcher, 2023

Table 7: The results of the Structural Equation Model

Direct Effect	Path Analysis	T-Test	Standard Errors	Cohen's f^2	Significance	Hypothesis
H1 : ESO -> PU	*0.229*	*1.132*	*0.073*	*0.005*	*0.258*	**inconsistency**
H2: ESO -> PEOU	0.313***	3.390	0.058	0.042	0.001	**consistency**
H3: TIT -> PU	0.314**	2.337	0.074	0.027	0.019	**consistency**
H4: TIT -> PEOU	0.376***	5.206	0.053	0.101	0.000	**consistency**
H5: KNOW -> PU	*0.183*	*0.352*	*0.077*	*0.001*	*0.725*	**inconsistency**
H6: KNOW -> PEOU	0.289**	2.705	0.063	0.039	0.007	**consistency**
H7: FAS -> PU	0.370**	2.243	0.084	0.034	0.025	**consistency**
H8: FAS -> PEOU	0.449***	4.989	0.064	0.151	0.000	**consistency**
H9: PEOU -> PU	0.557***	4.699	0.086	0.120	0.000	**consistency**
H10: PU -> EPAY	0.329***	3.540	0.060	0.062	0.000	**consistency**
H11: PEOU -> EPAY	0.765***	11.796	0.056	0.590	0.000	**consistency**
Indirect Effect	**Indirect Effect Coefficient**					
ESO -> EPAY	0.260***	3.497	0.047	-	0.000	**consistency**
FAS -> EPAY	0.394***	4.963	0.056	-	0.000	**consistency**
KNOW -> EPAY	0.226**	2.580	0.051	-	0.010	**consistency**
TIT -> EPAY	0.321***	5.669	0.042	-	0.000	**consistency**

****p<0.05, and *****p<0.001**

Note: Percentile Bootstrap Quartiles at 97.5% - 99.5%

Source: Researcher, 2023

Table 7 displays the overall statistical values of this study, showing deviations from the results. The statistical significance value of the two-star representation is the P-value <0.05, and the three-star representation is the P-value < 0.001 indicates the hypothesis test of this study. The results of the study accepted the consistency of all 9 hypotheses and rejected assumptions 1 and 5.

CONCLUSION AND DISCUSSION

The study results, it was found that the majority of the sample group was female, representing 58.14 percent. In the sample group, 25.116 percent were between the ages of 19 and 24, 15.476 percent were business owners, 25.581 percent had bachelor's degrees, and the average income level in the province was reported by 21.395 percent of people living there. Chiang Mai 25.375 percent.

Social Influence, Technology Trust, Cognitive, and Facilitating Factors had an influence on perceived usefulness and perceived ease of use. The results of the variable test were consistent with the research hypothesis. They indicated that if the service users were influenced by the family, friend, or acquaintance, including incentives from marketing activities, current trends, and high economic conditions, they would result in high perceived usefulness and if the users are aware of the ease of use in conjunction with perceived usefulness, the benefits will be perceived even higher. The findings are consistent with a study by Roca *et al.* (2009) investigated The Importance of Perceived Trust, Security and Privacy in Online Trading Systems) and LIN *et al.* (2010) studied The Adoption of Mobile Banking in China Applied to the Technology Acceptance Model (TAM). The finding showed that the perceived usefulness and the perceived ease of use are key factors influencing consumer adoption of mobile banking. Moreover, this is compatible with Delone and McLean (2003), who said that the IS Success Model has three important factors: quality of information, system quality, and service quality. This model is a measure of the level of user satisfaction of an information system with the quality of information, its usability, and its benefits, and user satisfaction is a key factor in measuring the success of the information system. However, Roca *et al.* (2009) investigated The Importance of Perceived Trust, Security, and Privacy in Online Trading Systems) Moreover, the results indicated that perceived ease of use was positively correlated with perceived benefit, and perceived benefit was positively correlated with behavioral intention, while perceived ease had no positive correlation with behavioral intention. The researchers analyzed that the website tool was easy to use, which is a fact. Nevertheless, perceived trust

had the most significant impact on behavioral intention. Perceived usefulness of its use had an impact on perceived trust when perceived privacy had no effect on perceived trust. It is also consistent with the results of other studies like Taylor and Todd, 1995; Haryono and Brahmana, 2015; Tan and Brahmana, 2019; Wen *et al.*, 2011.

Consideration on the perceived ease of use and the perceived usefulness, the results of the factor test are therefore consistent with the research hypothesis, showing that perceived ease of use facilitates the easier and less complicated use of the E-payment system. It also resulted in users' work with ease, convenience, and less time. The findings showed consistency with the findings of Gefen and Straub (2000); Venkatesh *et al.* (2003); Dishaw and Strong (1999) and study of Athapaththu and Kulathunga (2018) on online shopping intentions in Sri Lanka. Moreover, LIN *et al.* (2010) added that perceived usefulness and perceived ease of use were key factors influencing consumer adoption of mobile banking in China. Like Manzano *et al.*, (2009) studied consumer technology and perceived online banking risk. They were as main factors in research positively affecting the use of online banking. Studies have looked at different demographic factors and different behaviors among internet technology users. TAM is widely used to measure attitudes towards the adoption of technological innovations. Therefore, this research had been developed into the study of Internet adoption attitudes to develop as the model adoption of online payments and E-payment. The sample included Greek bank employees. The findings revealed that perceived usefulness was positively correlated with intention as perceived convenience was strongly correlated with active intention, consistent with the Alswaigh and Aloud (2021) study, which showed that perceived usefulness had a positive influence on the adoption of E-payment technology among users of Mobile Wallets in Saudi Arabia as well as the study of many scholars (Chawla and Joshi, 2017; Riskinanto *et al.*, 2017; Najdawi *et al.* (2015).

RECOMMENDATIONS

Recommendations from the research findings:

1. Policy Recommendations:

- The acceptance of E-payment services is crucial for enhancing convenience and security in online financial transactions. Policy recommendations that may be beneficial for developing and promoting user acceptance of E-payment services include:

- Implementing robust data security measures, such as utilizing encryption technology for internet data transmission.

- Promoting secure identity verification methods, such as employing One-Time Passwords (OTP) or fingerprint verification.
- Ensuring efficient service delivery by consistently updating and developing systems to enhance overall effectiveness.
- Soliciting and incorporating user feedback for continuous system improvement.
- Providing clear and comprehensive information on the usage of E-payment services.
- Offering guidance on preventing repudiation of services to users.

These policy suggestions aim to foster a secure and user-friendly environment for E-payment services, thereby encouraging broader acceptance and usageTop of Form

2. Professional Development Implications:

The findings of this study can serve as a guide for the development of alternative service delivery systems. For instance, enhancing international money transfers through faster mobile applications, facilitating the opening and closing of accounts via user-friendly applications, and enabling the verification of cashier's checks through mobile applications. Developing applications for these transactions can potentially lead to increased consumer satisfaction. These insights can be summarized and incorporated into policies, marketing plans, public relations strategies, and quality research and development.

It is crucial for the government to earnestly promote and support the digitization of government operations, known as E-Government, as a primary step. This is vital for driving the country's economy by leveraging digital technology to enhance efficiency, create competitive advantages, reduce costs, and expand business channels. The development of a comprehensive digital system to support end-to-end services is essential, ensuring that businesses and citizens receive services and information quickly and conveniently, ultimately reducing time and expenses. This involves bolstering the capabilities of e-commerce businesses and ensuring the security of digital technology through the enhancement and regular updates of legal frameworks. This will contribute to the increased stability and security of digital technology systems.

Academic Implications:

The study findings indicate that residents in the upper northern region of Thailand have demonstrated a positive reception of E-payment technology. External factors, particularly societal influence, play a pivotal role in motivating individuals to engage with E-payment

services. Additionally, factors such as the perception of ease of use, awareness of the benefits of using the service, and overall convenience contribute to this acceptance. These factors highlight their significance in influencing public adoption of E-payment services.

From an academic standpoint, the results suggest that if the government develops new technological products for public use, there should be extensive public relations efforts targeting relevant agencies. Additionally, the emphasis should be on developing user-friendly products and services, not only to simplify financial transactions but also to seamlessly integrate E-payment systems into users' lifestyles.

To further enhance technology adoption, the government should concentrate on widely promoting newly developed technological products. This involves not only public relations efforts but also continuous development to ensure ease of use, convenience, and efficiency. Users conducting electronic transactions place importance on accurate and trustworthy information regarding electronic transaction systems. Therefore, it is crucial for the government to provide precise and reliable information that aligns with user expectations, ultimately benefiting users. This includes furnishing information on modern financial transactions, as users depend on high-quality, up-to-date information for their benefit.

Recommendations for future research

There should be an expansion of the sample for the study on E-payment services adoption, for example, in other districts or provinces or the sample group in the Generation Baby Bloomer group, people born between 1946 - 1964 and Generation X group, people born 1965 - 1979, to compare the differences of E-payment services adoption.

REFERENCES

Agarwal, R. and Prasad, J. 1999. Are individual differences germane to the acceptance of new information technology? **Decision Sciences**. Vol. 30. 361 - 391.

Alkhowaiter, W.A. 2020. Digital payment and banking adoption research in Gulf countries: A systematic literature review. **International Journal of Information Management**. Vol. 53. No. 4. 102.

Athapaththu, J-C. and Kulathunga, D. 2018. Factors Affecting Online Purchase Intention: Effects of Technology and Social Commerce. **International Business Research**. Vol. 11. No. 10. 111.

Bank of Thailand. 2021. **The Consumption of Plastic Cards for Payment**. Retrieved December 23, 2023 from https://www.bot.or.th/App/BTWS_STAT/statistics/BOTWEBSTAT.aspx?reportID=683andlanguage=TH

Ajzen, I. 1991. The theory of planned behavior. **Organizational Behavior and Human Decision Processes.** Vol. 50 No. 2. 179 – 211.

Alswaigh, Y. N. and Aloud, E. M. 2021. Factors Affecting User Adoption of E-Payment Services Available in Mobile Wallets in Saudi Arabia**. International Journal of Computer Science and Network Security.** Vol. 21. No. 6. 222 - 230.

Beauchamp, M.R., Brayb, S.R., Fieldingc, A. Eysd, M.A. 2005. A multilevel investigation of the relationship between role ambiguity and role efficacy in sport. **Group Dynamics Theory Research and Practice**. Vol. 6. No. 3. 229 - 242.

Becker, J-M., Klein, K. and Wetzels, M. 2012. Hierarchical Latent Variable Models in PLS-SEM: Guidelines for Using Reflective-Formative Type Models. **Long Range Planning**. Vol. 45. No. 5 – 6. 359 – 394.

Carmeli, A., Meitar, R. and Weisberg, J. 2006. Self-leadership skills and innovative behavior. **International Journal of Manpower**. Vol. 27. No. 1. 75 - 90.

Chawla, D. and Joshi, H. 2017. Consumer perspectives about mobile banking adoption in India – a cluster analysis. **International Journal of Bank Marketing**. Vol. 35. 616 – 636.

Choudhary, S., Mutava, R.N., Shekoofa, A., Sinclair, T.R. and Vara Prasad, P.V. 2013. Is the Stay-Green Trait in Sorghum a Result of Transpiration Sensitivity to Either Soil Drying or Vapor Pressure Deficit? **Crop Science.** Vol. 53. No. 5.

Davis Jr, F. D. 1986. **A technology acceptance model for empirically testing new end-user information systems: Theory and results.** Doctoral dissertation. Massachusetts Institute of Technology.

Davis, F. D., Bagozzi, R. P. and Warshaw, P. R. 1989. User acceptance of computer technology: a comparison of two theoretical models. **Management science**. Vol. 35. No. 8. 982 - 1003.

DeLone, W. H. and McLean, E. R. 2003. The DeLone and McLean Modelof Information system success: A Ten-Year Update. **Journal of Management information System**. Vol. 19. No. 4. 9 – 30. M.E. Sharpe, Inc.

Dishaw, M.T. and Strong, D.M. 2019 1999. Extending the Technology Acceptance Model with Task-technology Fit Constructs. **Information and Management**. Vol. 36. 9 - 21.

Gaitán, J. A., Peral, B. P. and Jerónimo, M. A. R. 2015. Elderly and internet banking: an application of UTAUT2. **Journal of Internet Banking and Commerce**. Vol. 20. No. 1. 1 – 23.

Gefen, D. and Straub, D. 2000. The Relative Importance of Perceived Ease of Use in IS Adoption a Study of E-Commerce Adoption. **Journal of the Association for Information Systems**. Vol. 1. 1 - 28.

Guo, H., Huang, X. and Craig, P. 2015. Factors Influencing the User Acceptance of Alipay. **International Conference on Economy, Management and Education Technology (ICEMET 2015)** 344 - 347. Published by Atlantis Press.

Hair, J. F., Sarstedt, M., Hopkins, L. and Kuppelwieser, V. G. 2014. Partial Least Squares Structural Equation Modeling (PLS-SEM): An Emerging Tool in Business Research. **European Business Review**. Vol. 26. No. 2. 106 - 121.

Hair, J. F., Sarstedt, M., Pieper, T. M. and Ringle, C. M. 2012. The Use of Partial Least Squares Structural Equation Modeling in Strategic Management Research: A Review of Past Practices and Recommendations for Future Applications. **Long Range Planning**. Vol. 45. 320 - 340.

Hamner, M. and Qazi, R-ur-R. 2009. Expanding the Technology Acceptance Model to examine Personal Computing Technology utilization in government agencies in developing countries**. Government Information Quarterly**. Vol. 26. No. 1. 128 - 136.

Haryono, S. and Brahmana, R.K.M.R. 2015. The Effect of Shopping Orientation, Social Influence, and System on Customer Attitude through Perceived Ease of Use (Study at Apple Store). **Journal Management Pemasaran Petra**. Vol. 3. No. 1. 1 - 10.

Henseler, J., Ringle, C.M. and Sarstedt, M. 2015. A New Criterion for Assessing Discriminant Validity in Variance-based Structural Equation Modeling. **Journal of the Academy of Marketing Science**. Vol. 43. No. 1. 115 - 135.

Henseler, J., Ringle, C.M. and Sinkovics, R.R. 2009. The use of partial least squares path modeling in international marketing, Sinkovics, R.R. and Ghauri, P.N. (Ed.) New Challenges to International Marketing. **Advances in International Marketing.** Vol. 20. Emerald Group Publishing Limited. Bingley. 277 - 319. Retrieved September 24, 2022 from https://doi.org/10.1108/S1474-7979(2009)0000020014

Hu, L.-t., and Bentler, P. M. 1998. Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. **Psychological Methods**. Vol. 3. No. 4. 424 – 453. Retrieved September 24, 2022 from https://doi.org/10.1037/1082-989X.3.4.424

Jhantasana, C. 2020. Methods of Reporting Research Results of Second-order Construct of PLS-SEM. **Chulalongkorn Business Review.** Vol. 42. No. 3. 39 - 67.

Joo, Baek-Kyoo, Yoon, Hea Jun and Jeung, Chang-Wook. 2012. The Effects of Core Self - Evaluations and Transformational Leadership on Organizational Commitment. **Leadership and Organization Development Journal**. Vol. 33. No. 6. 564 - 582.

Kaewtan, J. 2014. **Factors Influencing the Acceptance of Electronic Payment Using Smart Phone Devices: in case of Bangkok and Pathum Thani.** Independent Study. Master of Business Administration. Faculty of Business Administration. Rajamangala University of Technology Thanyaburi.

Kasikorn Research Center. 2021. Business Trend Analysis, B2C E-commerce Product Group in 2021 Grew more than 30%. **Entrepreneurs Encounter the Problem of Purchasing Power and Intensive Competition**. Issue No. 3268.

Kim, C., Tao, W., Shin, N. and Kim, K.-S. 2010. An empirical study of customers' perceptions of security and trust in E-payment systems. **Electronic Commerce Research and Applications.** Vol. 9 . No. 1. 84 - 95.

Kline, R.B. 2011. **Principles and Practice of Structural Equation Modeling**. Guilford Press, New York.

Kock, N. 2017. **Factor-based SEM building on consistent PLS: An information systems illustration**. Laredo. TX: ScriptWarp Systems.

Kongpalee, T. 2020. Is Thai Society (going to) Cashless?. **Focus and Quick: FAQ. No. 169.** Bank of Thailand.

Iacobucci, D. 2010. Structural Equation Modeling: Fit Indices, Sample Size and Advanced Topics. **Journal of Consumer Psychology.** Vol. 20. 90 - 98.

Lauro, C. and Vinzi, V.E. 2004. **Some contribution of PLS path modeling and a system for the European customer satisfaction**. Dipartimento di Matematica e Statistica. Universita Federico II di Napoli. 201 - 210. Retrieved September 28, 2022 from http://tinyurl.com/k2fgqa9

Lin, J., Xiao, S. and Cao, Y. 2010. Predicting and Explaining the Adoption of Mobile Banking. Proceedings of Annual Conference of China Institute of Communications. **Scientific Research.** 421 - 424. Retrieved June 18, 2019 from http://file.scirp.org/pdf/6-4.15.pdf

Lu, J. 2014. Are personal innovativeness and social influence critical to continue with mobile commerce?. **Internet Research.** Vol. 24. No. 2. 134 - 159.

Manzano, J.A., Ruiz, C. and Blas, S.S. 2009. Exploring individual personality factors as drivers of M-shopping acceptance. June 2009. **Industrial Management and Data Systems**. Vol. 109. No. 6. 739 - 757.

Mohan, S. 2014. **Consumer's acceptance towards NFC mobile payments**. Master Thesis. University of Amsterdam.

Muangling, S. 2015. **Factors Affecting Consumer Confidence in Mobile Banking in the Bangkok Metropolitan Area.** Independent Study, Master of Business Administration. Faculty of Commerce and Accountancy. Thammasat University.

Musyaffi, A. M., Sari, D. A. P. and Respati, D. K. 2021. Understanding of Digital Payment Usage During COVID19 Pandemic: A Study of UTAUT Extension Model in Indonesia. **The Journal of Asian Finance, Economics and Business**. Vol. 8. No. 6. 475 - 482.

Najdawi, A., Chabani, Z. and Said, R. 2015. Factors Impacting Digital Payment Adoption: An Empirical Evidence from Smart City of Dubai. **Advances in Science, Technology and Engineering Systems Journal.** Vol. 6. No. 1. 1208 - 1214. ASTESJ ISSN: 2415-6698.

Office of Strategy and Information for Habitat. 2023. **Population and Housing Information Report 2022**. Pages 15 - 19. Retrieved February 24, 2023 from https://housingkc.nha.co.th/files/article/attachments/aed52b2717f2d051d449844fc4f1ddc6.pdf

Phiriyakul, M. 2010. **Some of the Least Squared Path Models.** The 11th Academic Conference on Statistics and Applied Statistics, 2010.

Ringle *et al.*, 2015. A New Criterion for Assessing Discriminant Validity in Variance-based Structural Equation Modeling. **Journal of the Academy of Marketing Science**. Vol. 43. No. 1. 115 - 135.

Riskinanto, A., Kelana, B. and Hilmawan, D. R. 2017. The Moderation Effect of Age on Adopting E-payment Technology. **Procedia Computer Science**. Vol. 124. 536 – 543.

Roca, C.J., Garcia, J.J. and José de la Vega, J. 2009.. The importance of perceived trust, security and privacy in online trading systems. **Information Management & Computer Security.** Vol. 17. No. 2. 96 - 113.

Rogers, E. M. 2003. **Diffusion of innovations.** 5th edition. New York: The Free Press.

Sarstedt, M., Ringle, C.M., Smith, M. and Reams, R. 2014. Partial Least Squares Structural Equation Modeling (PLS-SEM): A Useful Tool for Family Business Researchers. **Journal of Family Business Strategy**. Vol. 5. No. 1. 105 - 115.

Singh, N. and Sinha, N. 2020. How perceived trust mediates merchant's intention to use a mobile wallet technology. **Journal of Retailing and Consumer Services**. Vol. 52. No. March.

Tan, H., and Brahmana, R.K.M.R. 2019. The Effect of Perceived Value on Repurchase Intention Through Customer Satisfaction as Intervening Variables in Shopee. **AGORA.** Vol. 7. No. 1. 1 - 7.

Taylor, S. and Todd, P. 1995. Assessing IT usage: The role of prior experience. **MIS quarterly**. Vol. 19. No. 4. 561 - 570.

Teo, T. S. H., Lim, V. K. G. and Lai, R.Y.C. 1999. Intrinsic and extrinsic motivation in internet usage. **The International Journal of Management Science**. Vol. 27. No. 1. 25 - 37.

Thaicharoen, Y. 2020. Executive Vice President of Economic and Business Research Center, Siam Commercial Bank **Thailand after COVID-19 Part 2: Business Opportunity and Survival.**

Tonghui, T., Kongpalee, T. and Chimnoi, A. 2020. **Aiming for a Cashless Economy: Consumer Behavior and Opportunities of Thai businesses during COVID 19**. Retrieved October 4, 2023 from https://www.bot.or.th/Thai/Researchand Publications/articles/Pages/Article_21Jul2020.asp

Tripathi, P. 2014. Effects of Brand Endorsements by Opinion Leaders on Rural Consumer Buying Behavior. **International Journal of Multidisciplinary Approach and Studies**. Vol. 1. No. 4. 226 - 235.

Udomvejsakul, S. 2014. **Factors Influencing Confidence in Using M-Banking Application**. Master's thesis. Thammasat University. Faculty of Commerce and Accountancy.

Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. D. 2003. User acceptance of information technology: Toward a unified view. **MIS quarterly**. Vol 27. No. 3. 425 - 478.

Vianello, M., Galliania, E. M. and Haidtb, J. 2010. Elevation at Work: The Effects of Leaders' Moral Excellence. **The Journal of Positive Psychology**. Vol. 5. No. 5. 390 – 411.

Wen, Y., Parrish, J.Z., He, R., Zhai, R.G. and Kim, M.D. 2011. An Integrated Model for Customer Online Repurchase Intention. **Journal of Computer Information Systems**. Vol. 48. No. 1. 1 – 8.

West, S. G., Finch, J.F. and Curran, P.J. 1995. Structural equation models with nonnormal variables: Problems and remedies. In R. H. Hoyle (Ed.). **Structural equation modeling: Concepts, issues, and applications.** 56 – 75. Sage Publications, Inc.

Westland, J.C. 2010. Lower Bounds on Sample Size in Structural Equation Modeling. **Electronic Commerce Research and Applications**. Vol. 9. No. 6. 476 – 487.