GOVERNMENT E-SERVICE ACCEPTANCE AND USAGE OF PERSONAL INCOME TAX E-FILING SYSTEM

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ABSTRACT

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This research aimed to explain the current situation of the government service use via electronic systems for filing personal income tax returns, study the factors affecting the acceptance and use of government services through the electronic system for filing personal income tax returns and provide policy recommendations for developing government services via the electronic system for filing personal income tax returns. This research was mixed methods research, using the interviews with 9 experts and experts in government services via electronic systems and questionnaires with a total of 480 citizens who submitted personal income tax online via the website of the Revenue Department in the Bangkok area. Tools employed included questionnaires and interviews. Statistics for data analysis were mean, standard deviation with structural equation modeling (SEM).

The research results found that

1) The Revenue Department was an important government agency and provided services through an electronic system from e-Registration), e-filing, e-payment, e-Refund, e-tax Invoice, to e-Withholding Tax to help businesses and citizens access to tax transactions more conveniently and allow them to conduct tax transactions anywhere without needs to visit a local Revenue Department branch office.

2) Factors affecting the acceptance and use of government services via electronic systems for filing personal income tax returns were consistent with empirical data at the statistical significance level of 0.05 and it was also found that the acceptance and use of government services via the electronic system for filing personal income tax returns was directly influenced by the intention to use it.

3) Digital skills and abilities of government personnel regarding the use of

information technology should be improved to keep up with the changes which could enhance work efficiency and the ability to respond to the needs of the citizens respectively.

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Chayanee Naksukdee

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CHAPTER 1

INTRODUCTION

1.1 Background and Significance of the Study

In Thailand, e-government originated from a cabinet resolution in 1996. The cabinet resolution directed the development of Thailand's information system for the first five years in terms of the nation's infrastructure for its information system, human resources development, and improvement of government services and work procedures. From the first issue to the third issue of the policy, the strategies are concerned with achieving development targets in several aspects; in particular, a strategy for developing the government's information system (National Information Technology Committee Secretariate, 1996; National Information Technology Committee Secretariate, 2002; Ministry of Digital Economy and Society, 2011).

The Constitution of the Kingdom of Thailand, B.E. 2560 (2017) stipulates that the State establish the nation's strategy of serving the goals of sustainable development pertaining to the principles of governance. Thus, the direction of developing the e-government should be in line with the 2017 constitution with provisions of applying technology to public administration. One of those provisions specifies that an appropriate technology should be adopted to alleviate public administration and public services, with the aim of facilitating the public administration and the people. The core of those provisions is as follows:

1) The government agencies' databases are integrated into the information system for public administration and the Thai people.

2) The personnel management of public servants must be improved and developed to attract highly skillful and talented people to work for government agencies (The Secretariate of the House of Representatives, 2017).

In addition, the 20-year national strategy (2018-2037) stipulates that a strategy should be directed to develop public administration through applying innovation, big

data, and a digital workplace in an efficient manner that meets international standards. It is openly linked, providing opportunities to all sectors to participate in the government's e-service system in response to the demands of the people with speed, convenience, and transparency (Secretary General of the Office of the National Strategy Committee, 2018).

As mentioned above, government e-service has been developed and used in public-related services by different government agencies to meet the demands of the people and, at the same time, enhance convenient access to those public services. It effectively enhances public administration.

However, when using electronic systems to provide government services, there may be concerns that using the service will not create real benefits and will not be efficient enough to meet the needs of the service user. This includes the safety that service users should receive from using technology, to protect them or protect confidential information from being published without permission, including psychological risks. This may involve the feeling that the service is not be suitable for you for various reasons, such as being inappropriate for the age, or even risks that affect feelings, such as having a user experience that doesn't meet expectations or that causes an error. All of this can cause the mind to be affected, causing stress or anxiety, which is considered a psychological risk. As mentioned above, this may affect the acceptance and use of government electronic systems, in accordance with DeLone and McLean (2003), who said that measurement of the results of using the system will be effective only if the user is willing. The results can be measured by the frequency of use, usage time, the number of times of access to the system, usage patterns, etc. Therefore, the researcher would like to study what factors cause service users to accept and turn to government services through electronic systems.

In this research, the Revenue Department was chosen to be a case study for examining government e-service. In particular, this research focuses on personal income tax filings. This form of government e-service plays a vital role in facilitating the people to file their personal income tax documents to make tax payments required by law. Those tax payments are then used to develop the country. The factors that would be employed for influencing the acceptance and use of government e-services were based on the technology acceptance model (TAM1-3). The principle of this

theory suggests that perceived usefulness and ease of use are the predictors of the government e-service's acceptance by the people. Moreover, the theory of planned behavior is adopted, explaining that human actions are influenced by their intentions. Most importantly, perceived behavioral control affects individuals' intentions to use something. It is the factor that can promote or hinder an action in question. To succeed in applying the electronic system to personal income e-tax filing, system quality and service quality are other factors that have been derived from the information system success model (IS Success Model), which influences the intention to use the system. Perceived risk covering personal information and system effectiveness is also included in the conceptual framework, which corresponds to the concept of perceived risk. This concept suggests that perceived risk is an awareness of certainty in security. Ambiguity of personal information security and incomplete information of users can produce negative effects. This perceived type of risk can lead to dissatisfaction. Consequently, these theories and concepts are adopted as the conceptual framework.

This research is aimed at establishing new knowledge that can alleviate government e-service through a personal income tax e-filing system. Such alleviation is consistent with the real situation. Additionally, the target of efficient, convenient, and speedy public services that satisfies the needs and behavior of the people is also achieved. The ultimate goal is to provide better public services and minimize resources, coupled with flexible administration.

1.2 Research Questions

1) What is the current trend of using the government e-service through the personal income tax e-filing system?

2) What are the factors that influence acceptance and usage of the government e-service through the personal income tax e-filing system?

3) What are the current government policies on developing government e-services for the personal income tax e-filing system?

1.3 Research Objectives

1) The research is expected to explain the ongoing usage of the government e-service through its personal income tax e-filing system.

2) The research is expected to examine the factors influencing acceptance and usage of government e-service through the personal income tax e-filing system.

3) The research is expected to present policy recommendations for the development of government e-service for the personal income tax e-filing system.

1.4 Scope of the Study

This research focuses on the factors influencing acceptance and usage of the government e-service system through personal income tax e-filing**.** The following provides the details of scope of this study.

1.4.1 Scope of Content

1) The current situation of using government e-service by the people is directly referred to in the specific definition of government service as provided directly to the people. Such services allow the people to conduct their transactions through the government's information network. An example of those transactions includes sending and receiving electronic documents. These electronic documents are official correspondences that help the users retrieve and upload documents (files) on/from the Internet. This research covers transactions from January 2020 to June 2020.

2) The second scope of content includes factors that affect the acceptance and usage of government e-service through personal income tax e-filing. Such factors include safety and privacy, trust, availability, results demonstrability, perceived risk, perceived usefulness, perceived ease of use, intention to use, perceived behavioral control, service quality, and the service system. In other words, the technology acceptance model (TAM), theory of planned behavior (TPB), and information systems technology success model (IS Success Model) are applied as a conceptual framework.

3) The third scope of content covers policy recommendation for the development of government e-service, which is stated in Thailand's National Strategy B.E. 2561-2580. This scope also corresponds to the strategy of public sector rebalancing and development. The essence of this strategy states that the development of public sector management shall bring innovation, big data, and the digital workplace to applications in an efficient manner that meets international standards. It is openly linked, providing an opportunity to all sectors to participate in the government's e-service in response to the demands of the people with speed, convenience, and transparency.

1.4.2 Scope of Population

The people who have submitted personal income tax e-filings on the website of the Revenue Department and who live in Bangkok are treated as the population of this research. Since the number of this population is not known, the sample size is determined based on a statistical method with a 95 percent confidence interval. Therefore, 480 respondents would be expected to be the sample size for this research. A proportional sampling technique to draw the respondents for study from areas in Bangkok was utilized.

Step 1: The sample size is determined.

Step 2: All 50 areas of the Bangkok Metropolitan Region are divided into 3 groups. Those groups are the inner city of Bangkok with 20 areas, the urban fringe with 18 areas, and the suburbs with 11 areas.

Step 3: The samples are selected by using the method of lucky draw on the administrative areas in Bangkok (4 areas of the inner city, 3 areas of the urban fringe, and 3 areas of the suburb). Subsequently, quota sampling is applied to determine the sample size. As a result, 48 respondents would be assigned to each selected area of Bangkok.

Step 4: Accidental sampling is conducted.

In terms of qualitative research method, a semi-structured interview was adopted as a research instrument. Data collection was obtained from 9 experts, academic people, and advisors with extensive experience of government e-service.

1.4.3 Scope of Time

This research spent approximately 23 months, starting from the 1st of February 2023 and ending on the 31st of December 2024, to complete the project.

1.5 Expected Contributions

1) The trend of using the government e-service through personal income tax e-filing is revealed.

2) People's satisfaction, needs, and attitudes toward the use of the government e-service through the personal income tax e-filing system are derived.

3) The results of this research are expected to contribute to policy recommendations for the development of personal income tax e-filing, a form of the government's e-service. The recommendations are consistent with the real situation, allowing the objective of providing faster and more convenient public services to the people and related businesses to be achieved. Such recommendations are expected to improve better service quality, with minimum use of resources, and encourage flexible administration, which is also the tax collection target to be accomplished. The bottom line is the amount of income generated from tax payments that will be utilized to develop the country in various aspects.

CHAPTER 2

CONCEPTS, THEORIES AND LITERATURE REVIEW

In response to the research objectives and research questions, a conceptual framework and methodology are developed. They serve as the map that guides the research. In order to derive such conceptual framework and methodology, relevant concepts, theories and literature are reviewed to support and explain the variables that would be incorporated into the model to find their relationships.

Subsequently, it is necessary to identify the concepts, theories, and related studies that would lay the foundation for the study of "Acceptance and Usage of Government e-Services Through the Personal Income Tax e-Filling System". Those concepts, theories, and related studies are summarized as the following.

2.1 Related Concepts and Theories

2.1.1 Theories Related to New Public Management

2.1.1.1 New Public Management

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2.1.2 Concept of e-Government

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2.1 Related Concepts and Theories

2.1.1 Theories Related to New Public Management

2.1.1.1 New Public Management

New public management originated from criticism of the classical concepts and theories of public management in that they did not correspond to a changing society. In addition, there was a movement growing to propose an approach to a new public management concept or a search for public administration under a new definition. Then, the academic people and top executives in the public sector realized the problems and challenges that governments in many countries had to face, for example, problems with the countries' economies and finances. Moreover, an expansion of government agencies resulted in an increase in government spending, but it did not produce any outstanding administration of the people. Therefore, such expansions became the problem of the governments' legitimacy to administer their countries and solve the countries' economic problems. In particular, Western countries in the framework of the democratic system found that the way to fix such problems is by increasing taxes in anticipation of enhancing the effectiveness of the government's administration, thereby resulting in challenges for public administration and expectations of the people to shift to a new paradigm of public management.

People's participation in public health is another problem that has attracted attention. Moreover, attempts to reduce the role of the public sector from revolutionizers to supporters, a shift towards a results-based management, and the principle of the value of money triggered the search for a new paradigm of public management to meet the needs of the people. Such new paradigms had different terms, for example, new public management, market-oriented public management, and entrepreneurial government.

1) The essence of new public management

Hood (1991) states that new public management is an approach that applies the principles of private management to public services management and people orientation. In this respect, people are viewed as customers. The public sector faces many problems of management, such as traditional public management that does not meet the needs of the people, the expansion of government agencies, and reductions in government spending. As a result, a new paradigm for providing services to the people was needed. The principles of new public management are defined as the following:

(1) Professional public management.

(2) Standard, empirical performance assessments, and clear setting of strategies, objectives, and key performance indicators.

(3) Focusing on production control and outcomes rather than process, sharing resources, connecting rewards with work performance, and people empowerment.

(4) Focusing on deconcentrating government agencies, shifting to smaller structures such as production units, and budget distribution.

(5) Promoting competition among government agencies, focusing on contracts and the auction process, reducing government spending, and improving the standard.

(6) Applying the private working model to government agencies, shifting to public services and ethics, and emphasizing flexibility, contracts, and rewards.

(7) Stressing discipline and strictness when using resources.

2) Theoretical ground of new public management

New public management is grounded on two main schools of thought. Those schools are New Institutional Economics and Managerialism (Rhodes, 1997). New Institutional Economics covers the concepts that influence administrative reform-encouraging competition, alternatives for service users, transparent administration, and an incentives structure to enhance the effectiveness of performance. The concepts of new public management suggested by New

Institutional Economics are based on public choice theory, transaction cost theory, and agency theory.

In contrast, managerialism is a concept of business management applied to public management professionally. It provides discretionary power, independence management, organizational performance, key performance indicators, and an appropriate organizational culture.

However, managerialism has been only slightly mentioned, and its scope is not concrete. According to writings on managerialism, it is characterized by a collection of knowledge of management and ideology to establish an organizational and social system. Downgrading of the owner position of a government agency, attention to labor and civil society, management orientation and social ideals, trainings and promotions for building experts, and development of knowledge in the area of management to increase the effectiveness of driving business and society, are all applications of management developed by Henri Fayol and Federick Taylor. The following is a formula for managerialism.

Management + Ideology + Expansion = Managerialism

Therefore, managerialism is a set of management concepts that adhere to a belied attitude toward life and society. It is a concept that influences the leadership role in an organization, particularly its managers and top management. The interesting point lies in managing the benefits and the management role as individuals. It helps answer the main issues of how the organization is managed. Managerialism focuses on the knowledge and skills of professional executives by their management styles that can lead to successful practices. This emphasizes the importance of managers with knowledge and management techniques, along with skills for controlling technology in the modern management era.

Managerialism believes that economic growth is a way to the progress of society. Its assumptions are as follows:

(1) Management is essential and effective. Management styles also create successful organizations. Effective management and clear objectives help eliminate the problems of delay and failure within management.

(2) By nature, management requires discretion in its decision making. It pays attention to strategic decisions that lead to successful organizations. Therefore, managers need to have a high level of capacity when making decisions.

(3) Management comes with logic and neutral value. It is interested in having a set of empirical data. Planning, goal setting, and the use of information and technology without bias is the practice of management.

(4) Management is a general principle that is universally applicable to all types of organizations.

(5) A manager has the right to manage and use his/her discretion when making administrative decisions independently, with full authority and responsibility.

(6) Management practices by the private sector are superior. Public managerialism is based on the belief that work procedures in the private sector are more advanced and can be applied to the public sector.

In conclusion, the theory of management is grounded on the assumptions that management is a universal principle that can be applied to both public and private sectors. A paradigm shift of resources usage, from input factors and adherence to regulations to the results of outcome-based management, including development of service quality, builds people satisfaction. In this respect, modern management techniques are applied. Such techniques include strategic planning, quantitative key performance indicators, and the basic values of management ideology.

New Institutional Economics emerged with a new doctrine in 1970. At that time, economists were of the view that governments were the cause of economic stagnation; as a result, they proposed an idea to the government to intervene in the country's economy. Those economists demanded that public services or social welfare should be changed. They should be handled by the private sector. So, the government created competition within market mechanisms.

This principle is consistent with the concepts of New Institutional Economics by combining different concepts of social sciences. Policy analysis is encouraged, along with comparative institutional economics, offering

concepts of new public management in the framework of new institutional economics. Public choice theory, agent theory, and transaction cost theory were also included, with the following details.

Public choice theory was developed by James Buchanan, who won the Nobel prize for economics in 1986, and Gordon Tullock working in the field of public choice. It was written in his work entitled, Calculus of Consent, in 1962 that work applied economic tools to the analysis of political structure and the US constitution. It examined political and voting behavior, and the results revealed that such behavior is not much different from common sense.

Public choice theory also focuses on positive analysis, such as "what is". It is applied to normative objectives or "What ought to be". It is designed to identify the problem, and then search for the solution using public choice theory. This theory is more or less similar to social choice theory, in that it depends on a mathematical method to analyze the interests. Examples of such interests are social welfare or voting.

Public choice theory applies the principles of economics and market behavior to decision making for increasing the effectiveness of government operations. In the view of Sanya Khenaphum (2016), the push for public choice theory is aimed at developing the content of public administration so that it can be used to fix social problems. Moreover, the association of public choice was established. This theory has criticized traditional public management as being centralization of the chain of command, which poses obstacles.

Important assumptions of the public choice theory are as follows:

(1) Individuals are selfish. They need choices that come with benefits. Thus, a balance of power and competition is needed.

(2) Public management style allows governments to satisfy the people's needs. The diversity of people in society must be taken into consideration.

(3) Management styles must be adjusted in order to fit each type of product and service.

(4) Centralization lacks effectiveness. Decentralization needs to be promoted to allow the people to access and receive the benefits of public services.

It can be concluded that public choice theory emphasizes the behavior of an interest group. Its objective is to investigate the causes and motivations of those people, for example, participation in public activities. The theory explains the behavior of government agencies in providing public services and their effects on individual behavior as service recipients or consumers. It seeks an appropriate and effective structure and management style for the people, for instance, promotion of people participation in the development of public services.

Agent theory is a concept that separates ownership and control. It is popular among large and modern organizations. It searches for incentives to serve as an agent to follow objectives for the sake of the owners. The agent's actions are under the supervision of the owners/shareholders. Contracts of the agent's benefits are made, creating balances, responsibilities, and objective achievements. The people are the owners of taxes or the country. The State is an agent that responds to the needs of the people.

Transaction cost theory is a management of production unit structure, or a business unit that matches the transaction. It is vital to decision-making when two choices between self-operation and outsourcing depends on the minimum costs of those choices.

In conclusion, new public management emerges as a result of realizing the problems of traditional public management that do not meet the needs of people, control of expanding the government agencies, and reductions in the government budget. A new paradigm of providing services to the people is thus needed. In the new public management, people are viewed as customers. It adopts business practices, reduces the role of the public sector in managing public services, and shifts to result-based management and the role of supporters. In addition, the theory focuses on strategic goals, bringing in modern techniques and tools to increase effectiveness of service and respond to the needs of the people.

Although new public management is the mainstream of administrative reform in the developed and developing countries, it is criticized over

its status of viewing citizens as customers. It relies heavily on business concepts which ignore citizenship. Such ignorance can create social inequality. Thus, considerations of public management should take not only the management of financial limitations, but also the principle of value for money. The question is the extent to which public services strengthens social justice. This is the challenge for new public management. Therefore, a new concept has been developed which focuses on good governance. It is explained in the following section (Pairote Pattaranarakon, 2018).

2.1.1.2 New Public Governance

The Theory of new public cooperation management is an administrative paradigm that attempts to present a new perspective of public management. It is different from traditional public management, which has been criticized over its focus on the chain of command. Traditional public management also uses sizable resources; however, it is not effective. It responds to the needs of government agencies rather than the people. The paradigm of new public management has been developed to fix the problems caused by traditional public management by shifting to capitalism. In other words, business administration practices are applied to the public administration aspect. For example, regulations, procedures, and chain of command are reduced. It switches to a market system and independent contractor system. Discretion is given to the public sector's top management which allows them to be more professional and guide the direction of public administration.

1) The essence of the theory

The theory of new public cooperation management emphasizes managing cooperation and governance mechanisms in a way that allows civil society, the business sector, community private development organizations, professionals, and different stakeholders to participate in public services. Such services are in the form of cooperation partnerships. For example, public and private sectors cooperate with local agencies to plan local and regional development. The community is in partnership with the government to organize education, child development centers, senior citizens' health, networks for preserving the community's forest resources, and promotion of community-based participation in cultural tourism. Such partnerships allow the members to prove their success.

The concept of this partnership is a new form of public management that views civil society, businesses, and stakeholders not to permanently be recipients of public services, but instead to become partners of success and enthusiasm as active participants, joining in the process of policy formulation, policy implementation, and their monitoring and evaluation. This new kind of management overcomes the old relationships that separate service providers and service recipients, or the directors and customers. It is a form of successful partnership in providing public services that open up public areas for different partnerships to participate in. New public cooperation management corresponds to pluralism and the plural state that possesses a variety of channels for receiving information and the needs of citizens in the policy process.

Pestoff (2010) suggests that theory of new public cooperation management is an approach to management based on co-production. It is a type of public management that includes many related parties, covering welfare services provided by a third party. This type of public management strengthens democracy in society by the citizens participating in the production of said public services directly. Innovation stems from changes in working procedures and dissemination of successful styles of management in other organizations.

The concept of new public cooperation management is obviously different from traditional public management and new public management. It views the people as a partner to co-produce public services equally. The people are no longer service recipients or customers. This concept is grounded on the network theory, institutional theory, the mechanism for network-based resources management, relationship-based agreements, trust, and expectations of the role of top executives in the public sector to be network coordinators.

The key principles of a governance paradigm are the methods of public management with a focus on practices. Coordination between institutions and various actors in the society is made. Government agencies remove the border line between the public sector and private sector to fix the problems of society together, which stresses the quality and effectiveness of the government using a governance system or good management by insisting on being a good government. The principles also build good relationships with related institutions to perform

collective actions and promote a network of self-management that is independent among doers.

New public cooperation management contains the following components.

(1) Decentralization to local administration and civil society is the focus, particularly the transfer of political power, resources allocation, the mission of local administration organizations, and non-governmental organizations that allow the people to participate more in public activities. Civil society becomes a cooperation partnership, a strong social partner to achieve the goal of developing the people and the economy.

(2) New public cooperation management is based on the concept of management. Although public services shall be the responsibility of the State, it will not retain the responsibility only to its own. The State maintains openness to civil society in order to participate in the public services owned by the State. In this respect, the State serves as a coordinator and controller. It is not necessarily a direct producer of goods and services.

(3) New public cooperation management promotes network practices that consist of many partnerships. Such partnerships include government agencies at different levels, business organizations, communities, professional private development organizations, interest groups, volunteer organizations, foreign development organizations, and international organizations. These partners can enhance the potential of work that comes with structural problems or complex public problems.

It can be concluded that this new concept is a way to remove weaknesses and limitations of centralization that determine the direction from a top-down management. It also lifts the limitations of market mechanisms under a new public management that allows the operation to correspond to the management environment in the context of pluralism and a plural state. A switch to network management indicates the importance of cooperation and a horizontal relationship between individuals and government agencies. Such cooperation can meet a changing society and adjust the relationships between the State, civil society, and community organizations.

Partnership plays an important role in strengthening the potential of the organization, personnel's capacity, and a new values system. It adjusts the relationship of system management to be in the form of self-management, which allows citizens to participate in the process of policy formulation and public services. In this respect, the citizens and stakeholders are partnerships rather than being only service recipients, which leads to the network relationship being between agencies that are independent from the State and the creation of administrative innovation.

2.1.2 Concept of e-Government

Electronic government, or e-government, is a tool of administration and development by government agencies. It is offered to the people through the electronic system, which is a new public management system. Information technology and communication networks are also applied to increase the efficiency of the government's work, thus improving the services provided to the people. Data services provided to the people are included. Such a system allows the people to be closer to the public sector.

The procedure for e-government is putting all public services online on their website via the Internet network. Therefore, electronic platforms play an important role in allowing the people to access public services. The success of e-government lies in cooperation between the public sector and the people. The outcome of e-government produces governance and transparency in its bureaucratic work procedures. In this regard, government agencies are required to expose their data; at the same time, people can inspect the government's transparency. This inspection helps reduce corruption, which yields an example of e-government on the website www.gprocurement.go.th. It is a source of the government's procurements.

The e-government is a new form of government work that develops effectiveness in the public works, enhancing the modern procedure of public administration. It contributes to the benefit and happiness of the people.

The e-government is categorized into public services provided to the people based on the following principles:

1) "One place" refers to the place where the people can get all public services at one government agency.

2) “Promptly” is defined as the government agencies providing public services via the electronic channel to the people.

3) “Anywhere” is explained as the place where the people can access the e-government, from any place across the country.

4) “Anytime” is described as public services that can be accessed by the people whenever they want.

5) “Coverage and equality” refers to e-government services that all people can access, meaning all public services, equally and thoroughly.

6) “Transparency and governance” is defined as public services that are provided to the people in a transparent manner.

2.1.2.1 Types of e-Government Services

The e-government shifts work procedures of government agencies. There are four types of service recipient, as in the following:

1) Government to citizen (G2C) refers to basic public services provided directly to the people from the government agencies.

2) Government to business (G2B) is basic public services provided to the private sector from the public sector or government agencies.

3) Government to government (G2G) refers to transactions between government agencies through the use of information technology.

4) Government to employee (G2E) is the creation of e-government that is provided to civil servants and government officials.

2.1.2.2 The Development of e-Government in Thai Society: The Digital Era

Rewat Sangsuriyong (2019) suggests that e-government is the development of a website to the web 2.0. It allows the public sector to use the website to connect or interact with users in two-way communication. Web 2.0 encourages more participation from the people. Meanwhile, the public sector can share information, conveniently creating cooperation between agencies. The term “government 2.0” has come into existence (GOV 2.0), however, such innovation is just a small wave in the software dimension (Obi & Iwasaki, 2011), it cannot transform the e-government into a new paradigm.

With the influence of information and communication technologies (ICT), especially smartphones, 3G technology allows people to use the Internet on their mobile devices with high broadband. As smartphones have become popular, it has reduced the use of desktop computers. As a result, governments across the globe have shifted to the development of e-government that can be accessed through smartphones. Such development is based on the concept of the smart government.

At present, the term “digital government 2” is the most popular, instead of the terms “e-government” and “government 2.0”. This is due to the fact that not only smartphones can connect to the Internet and the large amount of data and information on the cyberspace, but also other technological emergences can. It is known as the “Internet of Things” (IoT), which creates big data in a virtual society that truly reflects the lifestyles and livelihoods of people. It also establishes the power of the government’s decision-making on administration. Therefore, governments around the world have revised their policy by placing the importance on their new e-government with an emphasis on the data and imagination. New technologies are applied to the governments’ mission with the term “Digital Government”.

2.1.2.3 The Formation of Digital Society in Thailand

The spread of digital technology into Thai society has occurred for some time prior to the adoption of digital technology in public services. In 1996, information technology policy in the first phase B.E.2539-2543 (IT 2000) specified that Thailand was in the forefront of developed countries such as the United States of America, Great Britain, Australia, and Japan. This was because Thailand had the splitters that used digital technology in 71 percent of all networks of mobile phones. It was transmitted via digital technology in 90 percent. At the end of 1994, Thailand had half a million mobile phones connected on the analog and digital systems, which accounted for 17 percent of the fixed lines.

The transformation of telecommunications infrastructure from an analog system to digital technology allowed for the development and rapid expansion of the Internet in Thai society. In this respect, people turned to the use of the Internet domestically and internationally. The World Bank (World Bank, 2016) developed the digital adoption index (DAI) to analyze the digital utilization of each country around the world. The results showed that, in Thailand, digital technology had penetrated

Thai society, and the rates of adoption at the organizational and individual levels were higher than global mean scores, which is illustrated in Diagram 1.

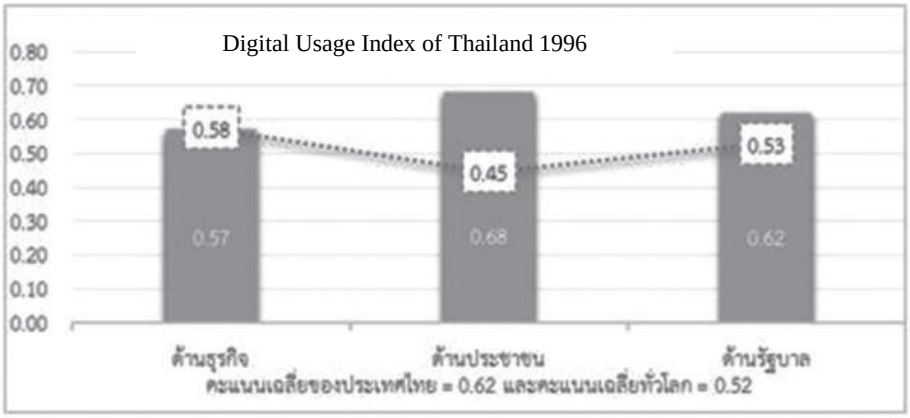

Figure 2.1 Diagram 1 Displaying the Digital Usage Index of Thailand in 1996
Source: World Bank (2016).

Digitalization in Thailand has grown continually. Related parties realize the importance of such digital technology. In 2010, a brainstorming meeting took place to develop a policy framework of information and communications technology for the years 2011-2020. The creation of a digital ecosystem was proposed to incorporate all parties in Thai society. Public services programs in mobile form were established and promoted to be consistent with the lifestyles of the people (Ministry of Digital Economy and Society, 2011). Later, in the draft of the third information technology and communication master plan B.E. 2557-2561, although it was not officially announced, the goals were set to get Thailand prepared for the digital era in the social, economic, and government dimensions.

2.1.2.4 Thailand's digital policy

After the 2014 coup d'etat, Thailand's digital policy was officially evident. The national council for peace and order's government formulated new digital policies in different dimensions. With the influence of digital technology, the government adopted innovation/digital technology to drive the mechanisms for society, the economy, and public administration.

In 2017, the government announced Thailand 4.0 as a conceptual framework to develop the country to be in the first tier. The country was driven by an innovation-based economy with the aim to alleviate Thailand from being a middle-income country to becoming a high-income country. In 2016, the Digital Economy Plan B.E. 2559 (Digital Thailand) was officially announced as the replacement of the information technology and communication (3rd issue). It was expected to push digital technology to serve as the main mechanism to drive the country's development and society.

Although Thailand 4.0 uses the word "innovation", its meaning is broad in practice. It refers to new inventions. With the influence of digital technology and following the country's concept model, with the spread and expansion of ideas, Thailand 4.0 has adopted digital technology in all aspects of the policy. Germany is the country concept model, with Industries 4.0 set to develop its cyber-physical systems (CPS). In its production, Industries 4.0 replaces previous innovations such as machines, computer systems and automation.

Since then, the formulation of the policy at all levels in Thailand has adopted the Thailand 4.0 model as a basis for continuity. It started with the 12th national economic and social development plan (2017-2021). This plan served as an important policy and compass for developing a digital government. The plan stipulates that digital technology should be adopted to public administration and services. The public sector's employees are skillful and capable of adapting to an increased use of digital technology. The public sector is reformed by using that digital technology. Such usage should be in a systematic manner, with a network that connects to data for integration running throughout the central data system. The infrastructure for providing electronic services and data services is thus built, which allows access from a single point. The service recipients serve as the center of these services. User authentication is utilized, and managing the patents is through an ID smart card or electronic user account. A feedback channel is provided to fix any problems or complaints from the people. Accessing the needs of the people is by a proactive approach. The quality of life of the people is lifted with assistance in an integrative and proactive manner. The effectiveness of the labor is also enhanced through integration of the labor market.

In the Constitution of the Kingdom of Thailand B.E. 2560, Section 65 stipulates that the State establishes the national strategy using goals to develop the country in a sustainable manner. The national strategy is also based on governance principles. It is used as a framework for making plans in an integrative and consistent manner to reach common goals. From now on, the direction for developing a digital government using the public sector's agencies must follow the 2017 Constitution of the Kingdom of Thailand. Its provisions specify that digital technology is applied to public administration, which is written in the following paragraphs:

1) Digital technology is appropriately applied to the public administration and public services for the sake of public administration and facilitation of the people.

2) The government agencies' databases are integrated to serve as data systems for public administration and the people.

3) The public sector's personnel management is improved and developed to motivate talented people to work for the government agencies. Those are expected to bring in creativity and innovation that contribute to effective bureaucratic work and public administration.

The national strategy B.E. 2561-2580 specifies that the development of public administration should apply innovation, big data, and digital work procedures that meet international standards. Openness, connectivity, and opportunities for all people to participate are provided in response to the needs of the people in a convenient, speedy and transparent manner.

2.1.3 Concept of Perceived Risk

Perceived risk refers to individuals' awareness toward security, personal information privacy, and incomplete information that the users would receive. It produces negative impacts, which lead to dissatisfaction toward the service of such perceived risks (Pradtanaarali Mohammad Al-quraish, 2020).

It is another variable that influences the behavior of service recipients. Perceived risk is the state of being worried if he/she makes a wrong decision which yields errors. In this respect, decision making would be delayed. Usage is not accepted. Each dimension of risk is defined with the following 4 factors:

1) Effective usage risk is explained as being worried about a service that would not deliver any benefit. It is not effective as expected by the service recipients.

2) Privacy risk is concerned with the attitude toward honesty of the service providers, who are commercial banks and service providers of communication networks that do not disclose the users' information in order to prevent personal information from being stolen or having unauthorized access to the system. Security that the users would be provided, from the use of technology or information protections to not disclose without permission is included. Examples of security are asset robbery from a mobile phone network, and robbery by modifying the bank account during transfers.

3) Financial risk is concerned with the attitude and belief of expenses, or the amount of money that would be unusually lost from the service.

4) Time risk refers to the users' risk of time, facilitation of services per period of time, and value of wasted time per expectation of service by the technology during financial transactions.

Demirdogen et al. (2010) states that types of perceived risk and literature on customers' perceived risk can be divided in various dimensions. Nevertheless, those types and concepts are similar or repetitive. The factors of perceived risk can be presented as follows:

1) Financial risk refers to the attitude and belief toward expenses or the amount of money that would be potentially lost from the use of services at an unusual rate. In other words, it is the feeling of making decisions on using services that are not worth it financially, since other service providers may offer lower charges for using such services or better benefits. In this case, customers do not decide to use the service at the first glance. They would ask about the services changed from the service provider. The customers believe that there must be other service providers who offer similar services at lower charges. It can be a condition that makes service charges cheaper in the future.

2) Effective usage risk is explained as the effectiveness of using a service. It is directly related to the quality of the internet service provider (ISP) and access to the Internet network by the users. The connection quality of the internet

depends on the internet technology that the users select. Such internet technology includes Wi-Fi, GPRS, EDGE, and ADSL. If these two components do not perform well, problems of usage can occur. Such problems can be errors that happen during the use of services caused by the service provider. It can create damage, for instance, a not on time transfer of money, obstacles for accessing the system, or accessing the website. Effective usage risk covers the feeling of being uncertain or usure about using the system if the decision to apply for the service is made, which results in damages. It is also the feeling that the service system will not provide actual benefits.

3) Security risk is defined as the attitude, belief, or feeling that insecurity would take place during the usage of services, yielding loss, such as through robbery of assets via the Internet network, robbery by modifying genetic codes, or illegally accessing personal information without authorization. It involves attitude and belief in honesty of the service provider to cover up personal information of the users to other unrelated organizations.

4) Social risk is concerned with perceptions at the individual level from other individuals. It influences users' opinions about whether they should use the new system. This influence can determine acceptance or creation of the behavior toward the use of new technology. Social influence can be compared to the average of thought that is shaped by other people's opinions. Whether or not the customer decides to use the service can be a result of the use of the service by family members and the influences of intimacy. For example, individuals feel that their decision will not be accepted by those people staying close around them. It can be a distortion of thought and attitudes of those close to the individuals, along with information related to the services. The impact of transactions can cause social risk, such as data breaches, robbery of assets, and information changes made by thieves.

5) Psychological risk is related to feelings toward the services that are not suitable for users for many reasons. For example, maybe it does not fit their age. In this respect, risks that can affect feelings are included. Such feelings are caused by the usage experience if it did not meet expectations. Moreover, this experience produces errors which affect psychology, covering stress and worry, which is a psychological risk.

6) Time risk refers to transactions that do not produce expected results. If errors take place during the transaction, the time to learn how to use the system and access the system on the Internet is wasted. Each user has a different level of perceived risk, which depends on the experience and their realization of the service's importance. Such perceived risk affects usage behavior.

7) Privacy risk is explained as personal data infringement, using it without authorization. It is related to the service provider's honesty.

2.1.4 The Technology Acceptance Model

2.1.4.1 Theory of Reasoned Action (TRA)

The theory of reasoned action is a concept that studies the general behavior of humans. Any actions taken by humans are based on the use of reason and information for decision making - whether to do it or not to do it. To predict human behavior, the factors related to human decision making are taken into consideration. The factors that influence individual behavior is their intention to act, which is influenced or driven by attitudes and subjective norms (Pramote Launam, 2011).

The theory of reasoned action (Tsvetkov et al., 2019) was developed in 1975 by Icek Ajzen and Martin Fishbein. It is a basic theory that has been widely adopted to examine human behavior. The theory explains the relationship between belief and attitudes toward the behavior. Any changes in belief would result in a change in human behavior. This theory assumes that humans would use a rationale before taking any action.

The theory of reasoned action also explains that there are two factors that shape individuals' actions. Those factors are attitude and subjective norms, which are illustrated in Figure 2.2.

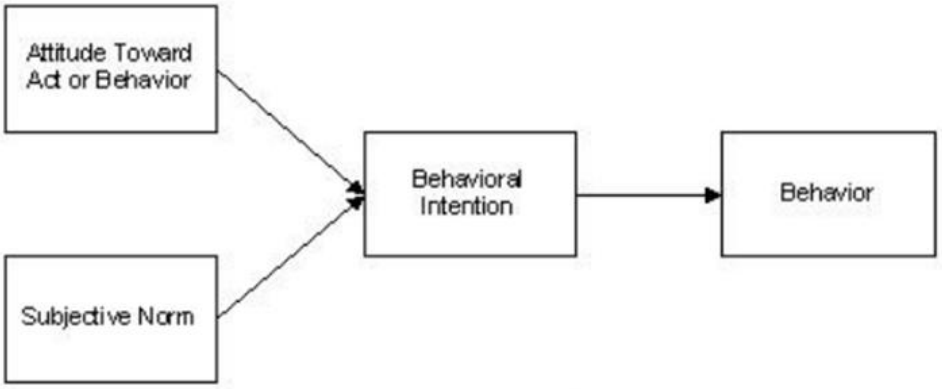

Figure 2.2 Theory of Reasoned Action
Source: Fishbein and Ajzen (1975).

Attitude toward an act or behavior refers to an individual evaluation of overall behavior, including the consequences of such behavior. Evaluations can be positive or negative. If the evaluation of behavior is positive, the individual shows a positive attitude toward the action or behavior. In contrast, if the evaluation of behavior is negative, the individual demonstrates a negative attitude toward the behavior.

Subjective norm is the perception of individuals toward the needs or expectations from society that can influence individuals. These individuals can be intimate people, such as a colleague or manager. To take or not to take any action in question, individuals would evaluate whether the subjective norm wants them to take that action. If the subjective norm wants them to take the action in question, the chance that they will perform that action increases. On the other hand, individuals will not perform the action in question if they learn that the subjective norm does not want them to take the action.

It can be concluded that although the theory of reasoned action is used to describe general behavior, it is applicable to predict the acceptance of technology. The attitude toward use and subjective norms are viewed as the factors that can trigger the intention to use the technology, which leads to the acceptance of that technology in the end (Yahyapour, 2008).

2.1.4.2 Theory of Planned Behavior (TPB)

The theory of planned behavior is a concept that links attitudes to behavior. It is an extension of the theory of reasoned action (Ajzen and Fishbein, 1980) to investigate the relationship between attitude, behavioral intention, and human behavior.

The theory of planned behavior suggests that any actions performed by humans are influenced by behavioral intention. The behavioral intention is composed of three elements which include attitude toward behavior, subjective norm toward behavior, and perceived behavioral control. In this regard, perceived behavioral control also influences human behavior. There are three factors governing the actions that could be taken by humans. Those factors are led by three beliefs. These beliefs are behavior, reference groups, and the ability to control. Each belief, subsequently, affects the following factors (Fishbein and Ajzen, 2010).

Attitude toward behavior stems from the belief of the results caused by the behavior (Behavioral Belief). It is an individual's evaluation toward overall behavior that comes from belief and its consequences. Individuals believe that if any actions are taken with positive results, a positive attitude toward that behavior occurs. In contrast, if any action is performed with negative results, a negative attitude toward that behavior emerges. When individuals have a positive attitude toward that action, their behavior intentionally occurs.

Subjective norm is the normative belief of individuals. It is an evaluation of when individuals see or receive information from the people in a society. People's reliability is assessed; if the people are reliable, the individuals will perform the action in question. Subjective norm assumes that humans believe and know that any person who is important to them, whom they give respect to, whom they trust, and whom they are close to, those individuals will conform to perform that action. The reference group of each individual plays a role differently, which depends on the behavior to be in line with the reference group.

Perceived behavioral control originates from the individual's belief toward the factors that promote or hinder the action in question. It is called control beliefs, which evaluates whether that behavior is easy or difficult to perform in a situation. Individuals would perceive or believe that he/she can perform that behavior

in the right direction. Internal factors play an important role in performing that behavior in question. If the internal factors are ready, individuals will intend to take that action. On the other hand, if the internal factors do not facilitate to perform the behavior or action, he/she is not inclined to take that action in question. Figure 2.3 displays the theory of planned behavior.

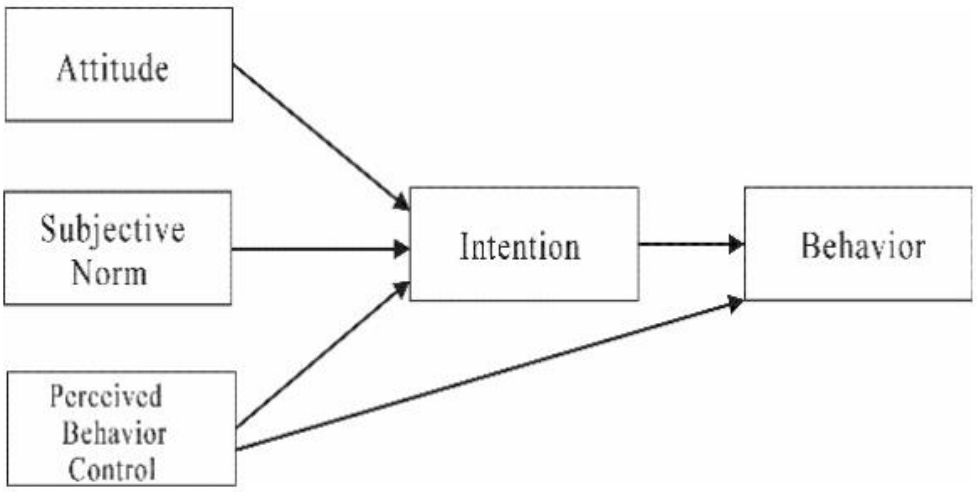

Figure 2.3 Theory of Planned Behavior
Source: Ajzen (1991).

The relationship between intention and/or behavior is influenced by attitude toward the behavior, subjective norm, and perceived behavioral control. In particular, perceived behavioral control to perform an action is the perception of ease or difficulty to perform that action. If an individual perceives that he/she has the ability to perform that action in the situation and can control desired outcomes, the possibility of that individual to perform that action is high. Besides, Ajzen also believes that individuals attempt to control both internal and external factors. Internal factors include knowledge and individual ability. The external factor is the facility to work. Perceived behavioral control is shaped by an individual's belief toward the factor (e.g., continuous use) that promotes and hinders that action. A perceived factor influences confidence of whether the individual can perform that action.

In conclusion, the theory of planned behavior is a psychological concept that is developed from the theory of reasoned action by adding another construct. That

construct is perceived behavioral control to address the limitations of theory of reasoned action. It can be used to explain intention and behavior in different contexts. The theory of planned behavior helps describe the acceptance of technology in each individual. Nevertheless, this theory contains certain limitations. In application, behavioral intention is not consistent with real behavior when time goes by. As a result, the technology acceptance model was developed to address such limitations.

2.1.4.3 Technology Acceptance Model (TAM)

The technology acceptance model (TAM) is a theory that has been accepted and popular for success indicators of technological usage. It is based on the theory of planned behavior. Although the technology acceptance model can predict the acceptance of information technology effectively, Taylor and Todde suggest that the technology acceptance model contains certain limitations. It cannot explain new needs. Therefore, it is necessary for the technology acceptance model to add variables to thoroughly examine the use of information technology. This theory studies factors influencing the behavioral intention of using technology. The four factors include perceived usefulness, perceived ease of use, and attitude toward the use of technology.

The technology acceptance model is used to explain individual acceptance of technology to prove its ease of use and perceived usefulness. These are important factors affecting the use of technology for each individual.

The technology acceptance model was developed based on the theory of reasoned action (Ajzen and Fishbein, 1975) by Fred Davis (1989). It is aimed at examining the factors that build motivation and interest in accepting and using technology. Those factors are perceived ease of use and perceived usefulness. Perceived ease of use refers to the level of an individual's expectation that the system will be easy to operate. Meanwhile, perceived usefulness is described as an increase in effectiveness of using the technology that occurs to the users. As well, the technology acceptance model also discovered that when the user perceives ease of use and usefulness, an interest and acceptance of information technology emerges. Relationships between the factors of the technology acceptance model are shown in Figure 2.4.

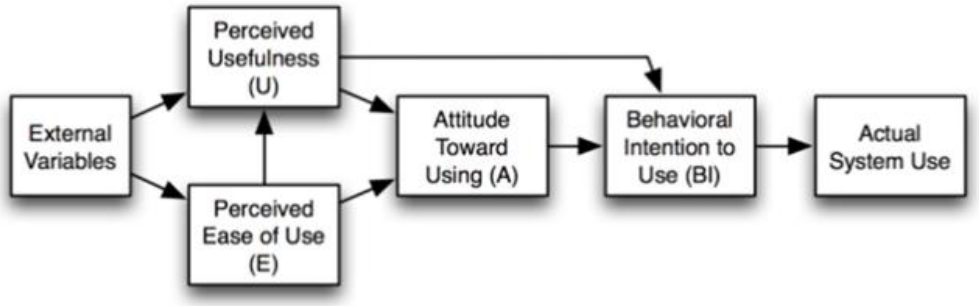

Figure 2.4 The Technology Acceptance Model 1
Source: Devis et al. (1989).

This model is used to test the behavior of accepting technology influenced by the behavioral intention of a system and its perceived usefulness, as well as perceived ease of use. It can be said that perceived usefulness and perceived ease of use are the main factors influencing the attitude toward the use of technology. Subsequently, it affects behavioral intention to use it and the actual usage behavior, respectively. This theory is an original concept that has been widely accepted and used in exploring the factors affecting the acceptance and use of information technology. It focuses on ease of use and usefulness of information technology, thereby resulting in an attitude toward the use of information technology, behavioral intention to use the information technology, and the behavior of actual acceptance.

Davis et al. (1989) used the technology acceptance model to monitor 107 users in the long run. These users were measured with their behavioral intention to use a system after a one-hour introduction of using the system. Then, measurements were taken for another 14 days. The first two results indicated a clear relationship between behavioral intention and actual usage. In this regard, perceived usefulness was the most influential factor of the individuals' behavioral intention. The results also revealed that perceived ease of use showed little effect on behavioral intention at statistical significance. It would continually decrease as time went by. However, the most important thing found from the experiment was that perceived usefulness and ease of use directly influenced behavioral intention. As a result,

attitude toward the use of technology can be removed from the model (Davis, Bagozzi, & Warshaw, 1989).

Nonetheless, the technology acceptance model has been criticized over its weakness that it cannot explain the causal factor of perceived usefulness. This model also ignores the factors that can be incorporated into the theory. For example, the effects of changes in society and humans are caused by the acceptance of new technology. For ease of use, the effects of changes in organizational structure occur. It can be the work procedures of employees.

Data collection made by the users is another issue that the technology acceptance model has been criticized for. It is measured by means of subjectivity. It is not as reliable as a data collection method from actual usage (Legis, Ingham, & Collerette, 2001). Paul et al. (2003) states that the technology acceptance model produces inconsistent results, especially of empirical research.

1) The Technology Acceptance Model 2 (TAM2)

In 2000, the objective of the technology acceptance model was to develop other variables added to the technology acceptance model, which could explain perceived ease of use and usage interest in the context of social influence and understanding. This was to understand an increase in the users' experience, which will increase the understanding toward perceived usefulness, and which leads to organizational management that accepts and uses new technologies.

Venkatesh and Davis (2000, as cited in Can Peker, 2010) state that the technology acceptance model is a theory that is useful for the study and analysis of factors affecting the users of information and technology. However, it has been found that this model also contains flaws. These flaws are the model's focus on perceptions and attitudes of the users. To reduce such flaws, Venkatesh (2000) developed the technology acceptance model 2 (TAM 2) by adding another two factors to the model. Those two factors are the social influence process, and cognitive instrumental process. The cognitive instrumental process influences perceived usefulness, which consists of result demonstrability, output quality, job relevance, and perceived ease of use. The components of social factors that can influence perceived usefulness are image, subjective norm, and voluntariness. These also correspond with Mei Ying Wu et al. (2011), who stated that technology acceptance model 2, as

developed by Venkatesh and Davis (2000), is grounded in the technology acceptance model. It includes two factors, which are social influence process (subjective norm, voluntariness, and image) and cognitive instrumental process (job relevance, outcome quality, result demonstrability, and perceived ease of use). These two are integrated into the model and used to examine the users' acceptance of the system.

The new concept is also proposed as a subjective norm being able to shape intention use, and exert its influence on the perceived usefulness of information technology. Positive image affects the parameters, such as experience and voluntariness, that connect to the subjective norm under the framework of behavior and intention to use. It was also found that antecedent variables such as perceived usefulness affect the acceptance of information technology positively. Under the conditions of forced usage and users with limited experience, it was also found that subjective norms positively influence the intention to use. Such relationships between the variables of technology acceptance model 2 are illustrated in Figure 2.5.

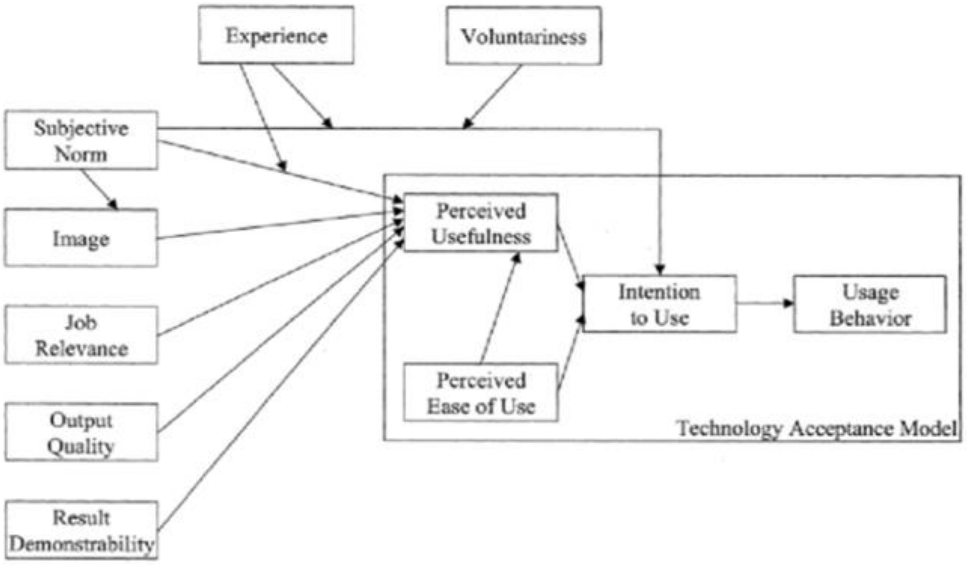

Figure 2.5 The Technology Acceptance Model 2
Source: Venkatesh and Davis (2000).

Venkatesh and Davis evaluated the effectiveness of technology acceptance model 2 by testing the model against forced usage and compared it with

voluntary conditions. This field research was conducted with 156 users who used 4 types of system, which included 2 forced systems and 2 voluntary systems. The researcher gathered the data related to users' perceptions and self-reported usage covering three periods of usage. Those periods are prior usage, after one-month of usage, and after 3-months of usage. The results of technology acceptance model 2 can explain deeper usage of the factors causing perceived usefulness in both a forced environment and voluntary conditions. It did not affect perceived usefulness in the voluntary conditions.

Although technology acceptance model 2 is improved for explaining perceived usefulness, it is still criticized over its weakness in explaining the causal factors of perceived ease of use of information technology.

2) The Technology Acceptance Model 3 (TAM3)

TAM3 is a theory that adds the factor affecting perceived ease of use to the model. The theory consists of the influence of perceived ease of use, which includes computer self-efficacy, computer anxiety, computer playfulness, perceived external control, perceived enjoyment, and objective usability. Meanwhile, perceived usefulness is composed of subjective norm, image, job relevance, outcome quality, and result demonstrability. This theory specifies the relationships between the variables. Experience will be increased, depending on outcome quality. Job relevance is positively related to perceived usefulness. Users' experiences and subjective norms affect perceived usefulness. There are also factors influencing perceived ease of use. Those factors are computer self-efficacy, computer anxiety, computer playfulness, and perceived external control. Subsequently, it influences perceived enjoyment and objective usability. In the end, the theory found that perceived usefulness plays an important role in predicting the acceptance and usage of information technology. The relationship between the factors of technology acceptance model 3 are shown in Figure 2.6.

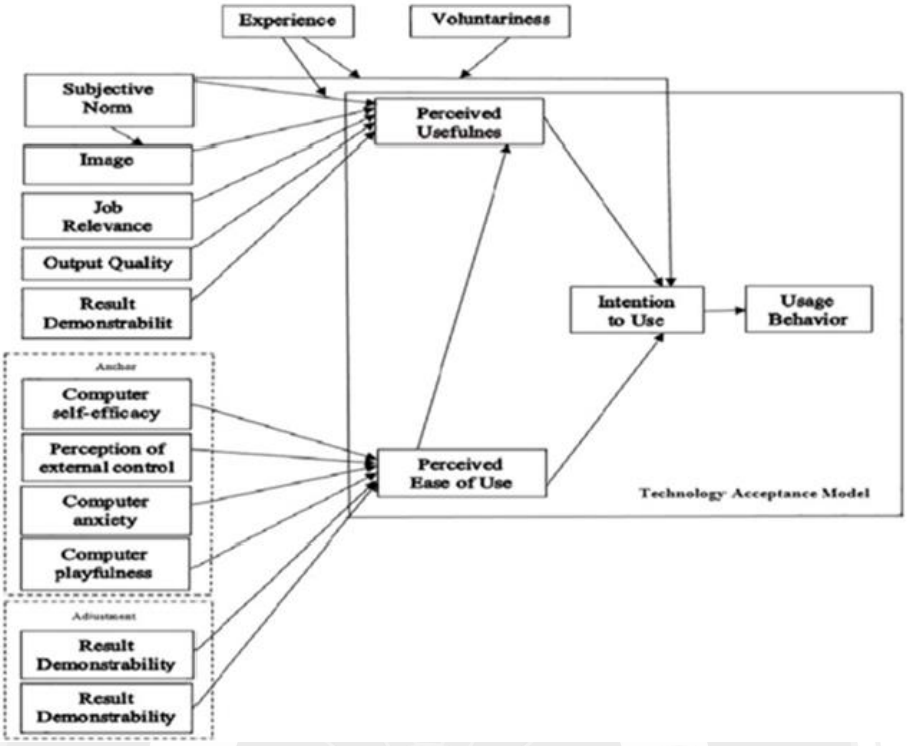

Figure 2.6 The Technology Acceptance Model 3
Source: Viswanath Venkatesh and Fred Davis (2000).

Technology acceptance model 3 was developed by combining technology acceptance model 2 with perceived ease of use. Its structure is shown in Figure 2.6.

Venkatesh and Bala conducted an experiment with technology acceptance model 3 using field research. The data were collected from 4 organizations that were preparing the installation of new information technology. Since these researchers wanted the technology acceptance model to be generalized, those four organizations were different in terms of size, industry, operation, and other related contexts. The types of information and technology that would be applied were completely different. The researcher gathered the data related to the questionnaire. It divided the testing period of time into 4 intervals, which were: after immediate system training, after one-month usage, after three-months usage, and after five-months usage. The results of technology acceptance model 3 show that the model can explain

the factors influencing ease of use of the information and technology at a high level for each time interval.

Besides, technology acceptance model 3 helps top management to decide on which method to intervene the system with. It is expected that in order to create an impact on the factors and a high chance that the employees in the organizations would accept the new information technology, that that one would be installed.

It can be concluded that the technology acceptance model can predict the use of information technology. It has been widely used in research. For this research, the researcher studies of factors affecting the acceptance and use of government services through the electronic system for filing personal income tax returns. Using collected data from the Bangkok area, in the study, only the Technology Acceptance Theory, or TAM 1, will be applied as a conceptual framework for the research, because Technology Acceptance Theory 2 is a development of technology acceptance theory by adding factors for consideration. In the context of social influence, this includes conformity to references and voluntariness, which is not consistent with the objectives of this research. This is a study of factors affecting the acceptance and use of personal income tax filing services, and those who are responsible for filing personal taxes will take into account factors such as perceived benefits, and greater ease of use. In order to accept and use the personal tax filing service via the electronic system or not, technology acceptance theory 3 was tested. The data used was taken from 4 organizations that were preparing to install a new information technology system for use. It was an internal matter of that organization, and it was brought in as a new information system to use in operations. Therefore, it is not consistent with the objectives of this research. The sample group consisted of citizens who are responsible for filing personal tax forms, in order to study what factors affect the acceptance and use of personal income tax filing services via the electronic system.

2.1.4.4 The Combined Technology Acceptance Model and Theory of Planned Behavior (C-TAM-TPB)

In 1995, Taylor and Todde proposed a theory that combines the technology acceptance model and theory of planned behavior (Combined-TAM-

TPB). It is a theory that collects the predictive factors of the technology acceptance model and the theory of planned behavior. Such predictive factors are the attitude toward the behavior (adapted from TRA/TPB) and subjective norm (adapted from TRA/TPB), perceived behavioral control (adapted from TPB), and perceived usefulness (adapted from TAM) to examine information technology.

The combined theory of TAM and TPB suggests that an action is influenced by behavioral intention. It stems from attitude, subjective norm, perceived behavioral control, and perceived usefulness. In this regard, perceived behavioral control is directly associated with the action. The indirect effects of intention, perceived usefulness, and perceived ease of use shape the attitude. Meanwhile, perceived ease of use directly affects perceived usefulness.

Taylor and Todde (1995) studied and confirmed this assumption since perceived usefulness, attitude, and perceived behavioral control are strong in cases when the users have solid experience. In contrast, the effects of subjective norms would be reduced under a high level of experience. In the view of the Taylor and Todde study, when the organization designs and uses an IT system, users' experience must be considered. Users with little experience bring in different factors. They would perceive the system more useful than experienced users at the beginning of implementing the system (Shamsuddin, 2016). Such relationships are demonstrated in Figure 2.7.

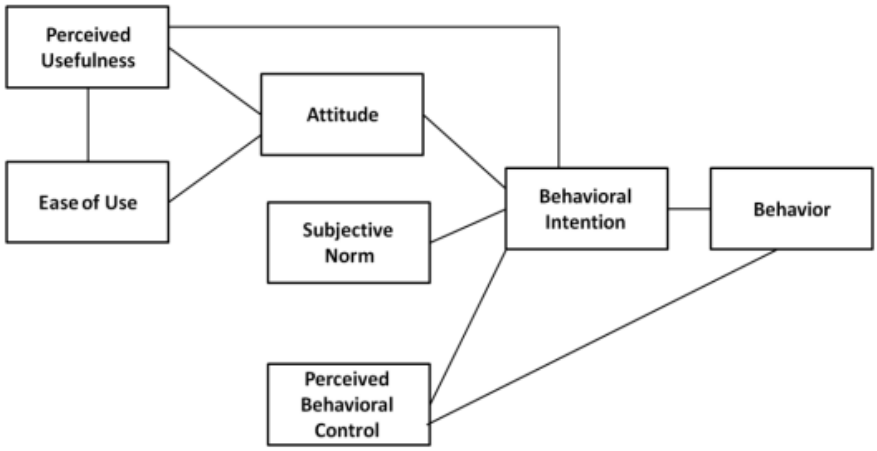

Figure 2.7 The Combination of the Technology Acceptance Model and Theory of Planned Behavior

Source: Taylor and Todd (1995).

It can be concluded that the assumption of theory of reasoned action and theory of planned behavior is that individuals use their rationale to perform actions (a decision). The theory of planned behavior focuses on intention and behavior. Consumers decide by considering the cost and the benefits against the choice that provides the maximum benefit. The theory of planned behavior is classified into a rational choice model. In some cases, the system's use is mandatory, without a choice. It can be explained that an extension of the TAM, combined with subjective norm and perceived behavioral control, is from the TBP and the TAM. This model allows for complicated data collection using perceived behavioral control of any actions. It identifies weaknesses of usage, such as limited skills of individuals. Subjective norm is specified for those in society who are important to the users' future.

2.1.4.5 Information System Success Model (IS Success Model)

The Information system success model (IS Success Model) was developed by William H. DeLone and Epharim R. McLean in 1992. It is called the D & M IS Success Model. This model measures the success of information technology. There are 6 key success indicators. Those indicators include system quality, information quality, usage, user satisfaction, individual impact, and organizational

impact. In the model, system quality and information quality affect usage and user satisfaction. Usage and user satisfaction influence individual impact and organizational impact, respectively (Thirada, 2018). The relationships between the factors in the model are displayed in Figure 2.8.

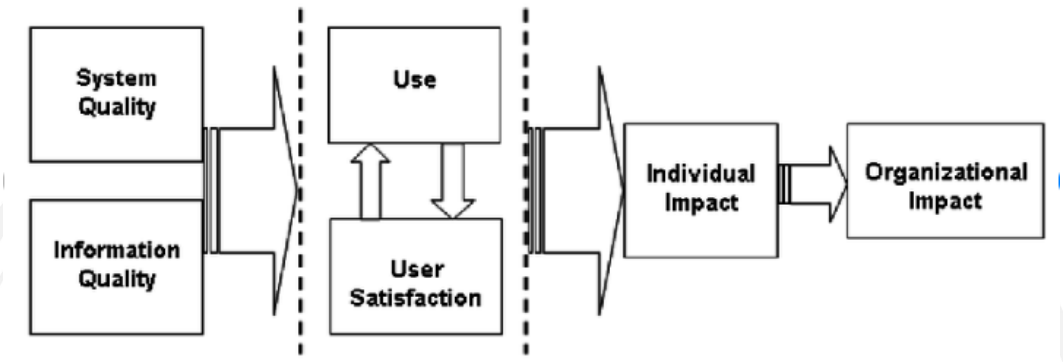

Figure 2.8 D & M IS Success Model
Source: DeLone and Mclean (1992).

In 2003, DeLone and McLean developed an extension of the model in a study of the success factors of e-commerce. The study adds and removes some factors to make the model complete. The model contains 6 factors, which include: system quality, information quality, service quality, intention to use (usage), user satisfaction, and net benefits.

1) System QUALITY

The quality of information technology in the success model developed by DeLone and Mclean (2003) states that measuring system quality can be conducted through the variables. The variables include ease of use, system stability, speedy response, availability, usage convenience, and system adaptability, which is consistent with research by Me (2014). This research explains that system quality is characterized by the information itself, which comes with 4 elements. Those elements are: computer self-efficacy, response, flexibility, and integration. It was also found that those four elements play an important role in satisfaction, which facilitates the Internet banking of the users.

Q. Li and Abdalla (2014) studied the information system success model to analyze mobile banking. System quality contains five elements, which are: computer self-efficacy, time response, reliability, user interface, and ease of use.

2) Information Quality

Cari et al. (2008) explains that information quality is characterized by several variables. In general, it refers to their appropriate use. Information quality is assessed by those who use the information. The users may have several opinions toward evaluation of a set of information.

The information system success model developed by Delone and MacLean (2003) suggests that the information quality is evaluated by the data sent out from the system. The users will measure the information quality from their use of data and information. The components of evaluating the information quality are: completeness, ease of understanding, personalization, relevance, and security.

Li (1997) states in the study on factors contributing to the information system's success, that measuring the information quality is conducted through data reliability, accuracy, freshness, completeness, correctness, and timeliness.

Stair, Reynolds, and Chesney (2008) suggest that the characteristics of information quality are as the following:

(1) Accessibility: the information quality should be accessible. The users have the right to access to the information legally and timely whenever the users want.

(2) Accuracy: accurate information is without any errors. Incorrect information comes from the transformation process of incorrect information to wrong information.

(3) Completeness: information completeness includes essential facts.

(4) Value for money: the information should be produced on an economical basis. It is worth the investment. Top management often considers the information against the price that would have to be paid to acquire such information.

(5) Flexibility: information quality can be used in different purposes and dimensions.

(6) Relevance: the information quality must correspond to the objectives and the needs of the of users for their decision making.

(7) Reliability: the information quality depends on a reliable method of data gathering that would be put into the system, which includes the sources of data and information.

(8) Security: the information must be designed and managed with security to protect from those unauthorized to access the data and information.

(9) Ease of understanding: the information quality must be understandable. It should not be difficult to understand, not showing too deep of details. The users of the information for decision-making could become confused. In this case, it is difficult to decide when the overload of information arrived. The information should be sufficiently provided.

(10) Timeliness: the information quality can be delivered to other users in a timely manner in response to their need of usage. For example, information about the weather forecast of the previous week does not help prepare for the clothes that one will be wearing this week. This is due to the fact that the information was not sent timely. With correctness, the information should be up to date and responsive to the needs of the users for their decision making.

(11) Validation: the information can be validated. The users can check the information to ensure that it is correct for decision making. The validation is performed by comparing similar information with different sources.

3) Service Quality

Service quality refers to those who deliver satisfaction of valuable services to customers to create outcomes resulting from good service. It results in customer satisfaction, which helps establish customer relationships. Service quality can encourage customers to repeat their purchase of the same services in the future (Customer Retention), establishing a customer base for long-run relationships. The bottom line of service quality is customer loyalty to the service (Parasuraman, Zeithaml, & Berry, 1985).

Lewis and Bloom (1983) define service quality as an indicator of delivering a service to the customers and the extent to which such service is consistent with the needs of the customers. Delone and McLean (2003) describe electronic service and the measurement of the information system's success as the perceptions of users in the quality dimension, which will contribute to the success of e-commerce, as well as the factors influencing an increase or decrease in the number of users. Service quality can be measured in three attributes. These attributes include warranty, attention, and responsiveness. Warranty refers to a service provider that can give any assistance to the customers when needed. Attention is explained as the service provider that pays attention to the users' problems. Responsiveness is when the service provider is willing to respond to give assistance when needed. These three attributes correspond to research on customer satisfaction toward using e-banking in China by Jing and Yoo (2013). In their research, responsiveness, warranty, and attention are the keys to shaping service quality and customer satisfaction.

4) Intention to Use or Usage

DeLone and McLean (2003) state that successful and effective measurement of a system would occur when the users do so voluntarily. It can be measured by the usage frequency, usage time, accessibility frequency, and effective decision making. Success indicators of e-commerce defined by DeLone and McLean (2003) contain usage, connectivity, and usage frequency.

5) User Satisfaction

Kotler (1997) defines satisfaction as the level of individuals' feelings, which come from the comparison of a product or service based on the individuals' understanding and experience.

DeLone and McLean (2003) suggest that satisfaction is a success factor of information systems. It occurs when the users' expectations are satisfied, as in the information system success model proposed by DeLone and McLean. In this respect, user satisfaction is evaluated by repeat purchase, repeat usage, and overall satisfaction.

Petter et al. (2008) mention that user satisfaction is a variable of the information system success model. In the model, it is the mediating variable that influences usage and usefulness that the users would receive. If the users are satisfied

or not satisfied with the information system, it will directly affect use of the information system, positively or negatively. Moreover, user satisfaction or dissatisfaction of the information system would determine the usefulness of the information system.

6) Net Benefits

Net benefits of the users refers to the level of individuals' confidence toward the use of the information system that would increase its effectiveness (Seddon, 1997). In the information system success model, net benefits were developed from the impact variable in 1992. It was a combination of individual impact and organizational impact, creating another variable as "net benefits".

The term "impact" may have positive and negative definitions. The variables that would measure net benefit are cost savings, sales growth, and time savings.

Doll and Torkzadesh (1998) divides net benefits into four attributes, listed as the following:

(1) Production capability refers to the system that enhances the effectiveness of improving the outcomes per time unit of the users.

(2) Innovation is the system that allows the users to create and try new ideas in their work.

(3) Satisfaction is the system that assists the users to create value to the internal and external service recipients of the organization. It provides maximum satisfaction.

(4) Management and control are the systems that help operations follow the plan as controlled.

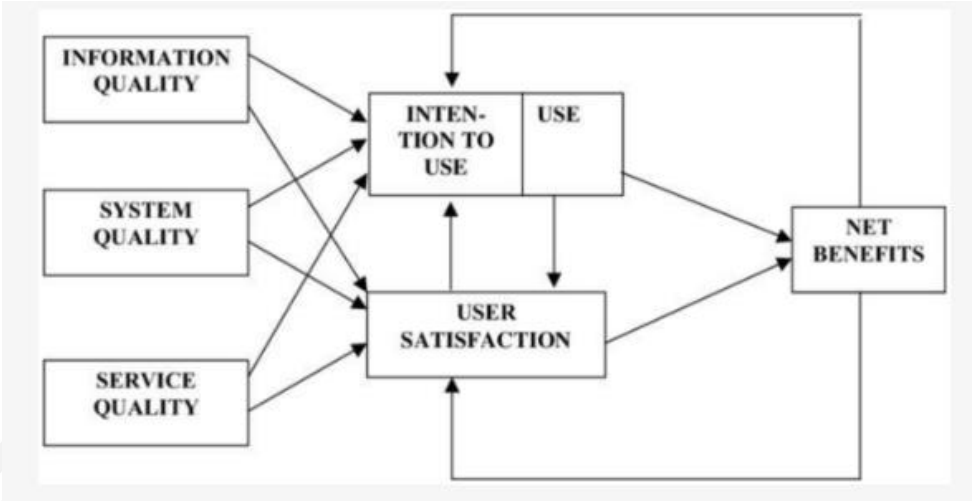

Figure 2.9 The Information System Success Model (IS Success Model)
Source: DeLone and McLean (2003).

It can be concluded that the information system success model is developed to measure the information system's success. There are six success indicators, which include: system quality, information quality, use, user satisfaction, individual impact, and organizational impact. In this regard, system quality and information quality are associated with use and user satisfaction. Subsequently, use and user satisfaction have effects on individual impact and organizational impact. This research applies service quality and information quality incorporated into the framework.

From the literature review above, it can be concluded that there are many important theories in technology acceptance. This is in order to be in line with the objective of the research - to study factors affecting the use of government services through the electronic system for filing personal income tax returns. Therefore, technological theory, namely the specific technology acceptance theory (TAM1), was applied to create the research concept because the theory is used to describe a person's acceptance of technology. It has been widely proven that perceived ease of technology and perceived usefulness of technology are important factors affecting the use of technology by each individual. The Theory of Planned Behavior (TPB) studies how human behavior is influenced by the intention to use something, and what influences the intention to use it is the perception of the ability to

control one's own behavior in displaying the behavior that arises from a person's beliefs about factors that may promote or hinder the performance of that behavior, including leading to success in using the electronic system to provide services for filing personal income tax returns. Therefore, the system quality factor has been taken into account, as well as service quality factors that affect the intention to use under the concept of a model for success in using information systems.

Regarding risk perception, both in terms of safety and to maintain personal information, the concept of risk perception states that risk perception is another key variable that is important and affects the behavior of service users. If service users are concerned and perceive uncertainty in their security, such as with errors in maintaining personal information that is not completely clear, this causes a delay in decision-making and may not lead to acceptance of the service. But if trust can be increased, it can lead to an increase in service rates. Electronic systems (Meftah, Gharleghi, & Samadi, 2015), readiness factors, and the results that appear, may affect perceived usefulness and perceived ease of use. They are also used in education.

2.2 Previous Studies

After the previous studies have been reviewed, research works, articles, and research reports in the Thai and English languages in relation to the acceptance and usage of the government e-service through personal income tax e-filing system are found and presented in the following sections.

2.2.1 Previous Studies on the Factors Influencing e-Government Services for the People

From the article entitled, “Development of Government e-Service to Create Better Experiences to the Public”, the Electronic Transactions Development Agency (2021) stated that citizens’ experience toward government e-services was an interaction and experience of the people that occurred after the use of the government e-service. Good citizens’ experience plays an important role in managing the relationship between the public sector and the people. It could be used as basic

information to design and develop services in response to the needs of people in all forms. An approach to the development of a better citizen's experience requires identifying the needs of the people. Such an electronic system should be used to increase the capacity of satisfying the needs of people. It could link the cooperation of the public based on the principle of collaborative governance and the private sector to strengthen public services. Defining indicators for quality service systems to control and measure success is also included. The article also presents the challenges of developing citizens' experience. It depends on readiness of the IT infrastructure, creation of a digital ecosystem, skills understanding, and the use of digital technology by government officials, as well as vision and direction when developing government e-service.

From the article entitled, "On the Path to the Development of e-Government in the Thai Society: in the Digital Era" (Rewat Sangsuriyong, 2019), e-government in Thailand was started with the adoption of computer to data processing. With the advancement of the Internet, government agencies could exchange the information. Many agencies could deliver their services to the people. The influence of digital technology caused government agencies to innovate their administrations and new services, such as with mobile services, the use of social media to publicize information, Cloud technology, and AI to analyze the behavior of people. However, government policy in response to changes in the technology was more advanced than the policy. The government should not only issue laws to govern such technology to support the adoption of new technology, but also the technology that became obsolete in a short period of time. This kind of technology could be replaced by new technology such as social media. In this respect, the government did not improve the current website quality. Application of digital technology to provide public services was slow. Most of the people in Thai society did not know about such applications. For the future e-government in Thailand, a traditional concept that applies contemporary technology to administration and public services should not be used. This is because there are a large number of technology owners who are ready to extend their knowledge and serve as service providers on behalf of the government. The public sector must improve public services to achieve the goal of providing services to the people.

The article entitled, “Power and Development of Government e-Service” proposed that government e-services is a public service through an online channel to meet the needs and behavior of the people and related parties in a timely manner. Governments around the world, including Thailand, are focused on the use of e-services to accomplish the goal of convenient and rapid public services. Such services have encouraged the formation of civil society, service improvement, economical use of resources, flexible management, and data for policy decision making. Many organizations in the Thai public sector have attempted to adapt to challenges using digital technology. This could be seen from the development of e-lands announcements, which are announcements by the Department of Land to reserve rights over the land via the Internet. It allows people to conveniently access it with cost savings for transportation, especially cross-country travel. Meanwhile, the Ministry of Finance has also offered e-services for tax by the Revenue Department, the Excise Department, and the Customs Department. Such systems are called “Tax Single Sign On”. One account name and password can be used to access the e-services and lighten the burden on passwords. Moreover, a security system via a one-time password (OTP) can be provided and sent to the users’ mobile phone and email. Although the public sector has adapted to these public services, the challenge that the public sector needs to pay attention to is the creation of awareness and confidence in the public toward public services through an electronic system. Another challenge is the protection of users’ personal information. The public sector must ensure that the information is kept and checked appropriately. Information accuracy and speed of services is significant. Technology to reduce or limit errors caused by information management must be developed. This is to create technological capacity and make the public confident to use public e-services more (Electronic Transactions Development Agency, 2021).

Kariuki, Ofusori, and Goyayi (2019) studied e-government services and the user experience in South Africa using Durban as the case study. It adopted mixed method research. Questionnaires and interviews were used to collect the data from municipality officials and the people. The results showed that the push for e-government services to be included in political policy was at a low level. The central system must pay attention to digital services by allowing all people access to the

system without taking economic and social conditions into consideration. Public awareness toward transparent services based on electronic governance was created along with co-investment between the private sector and civil society. In this regard, the government must allocate the budget to increase IT competitiveness to achieve the most important goal of all people having access to public services over the Internet.

Alawadhi and Morris (2008) investigated the attitude and perceptions of people in Kuwait. It was a developing country that had adopted e-government services. To be successful in adopting e-government services, it depended on support from the public sector and the people. To provide such services, real benefits must be provided. The system must be effective and responsive to the needs of specific individuals. For an effective service, a campaign toward awareness should be created, including goal setting for users to appropriately be informed of the benefits that the users would receive.

Alateyah, Crowder, and Wills (2013) examined the integration factors to make people accept e-government in Saudi Arabia. It was a challenge to carry out and accept e-government services by the people. The current world is connected through the Internet. People prefer to use online services due to their ease of use and speed. Accessing websites has become a tool in everyday life. It is regarded as an issue that government needs to address, to allocate and promote the services to use it,

Rehman, Esichaikul, and Kamal (2012) explored the factors that would make people accept e-government services. The model was developed by integrating the TAM, D&M and DOI models, and SERVQUAL in Pakistan. The people who had intentions to use e-government services to conduct transactions with the government understood and perceived the ease of use of e-government through the government website. The research can be used as a guideline for policy makers to formulate strategic development and promote the use of e-government services.

Alkraiji and Ameen (2021) presented a new form of people's loyalty toward e-government services by offering a combination of service quality and a theory of trust. Moreover, trust was divided into three factors, which were: trust in the government, trust on e-government services, and trust management. These three factors were adopted as the model. The results also recommended the role of

satisfaction and service quality that would lead to an increase in people's trust and loyalty toward the use of e-government services.

Ngo Tan Vu Khanh (2014) explored the factors influencing e-government services and the factors influencing people in Vietnam toward the acceptance of such a system. A framework was developed based on administrative reform. The data were collected from State officials. The study helped increase the rate of e-government usage.

Al-Adawi, Yousafzai, and Pallister (2005) presented the view of people toward e-government services, such as a response channel. The factors affecting usage through the technology acceptance model classified the level of difference of receiving the information by the people and intention of the people to use services for conducting transactions on the website. The model helped increase the acceptance of online services and created trust toward the use of e-government services.

Fakhruzzaman (2019) examined factors influencing the acceptance of e-government services in Indonesia. The study presented the benefits from the use of e-government. It was measured by the intention to use e-government among the people and the relationship between factors, such as social influence and trust, through the technology acceptance model as a conceptual framework.

Lallmahomed, Lallmahomed, and Lallmahomed (2017) studied e-government services in a small organization. The survey was conducted with the people of Mauritius island. It was found that performance expectancy, facilitation conditions, and value acceptance had positive relationships with the intention to use such services. Reliability produced the opposite results, which was resistant to change. The government should participate in such factors to improve the quality with security and privacy in order to increase trust and reduce change resistance.

Almaiah, Al-Khasawneh, Althunibat, and Khawatreh (2020) studied the factors affecting the decision to use e-government services among the people in Jordan. The research adopted UTAUT and presented a new structure which contained website quality, trust in the Internet, and trust in the government, to examine e-government services in the context of Jordan. The data were collected from people in the public and private sectors through an online survey.

Mofleh and Wanous (2008) suggested that, in developing countries, the initiation of an e-government project was essential, since its purpose was to improve accessibility to services and information provided by the government to the people. However, the governments had always designed their online public services without possible measurement, which covered the willingness of people to use the service and the lack of suppliers systematically. As a result, the governments did not have information about the channels for financial resources. The research proposed "the needs" as the variable that influenced the acceptance of e-government services among the people of Jordan. The data were collected by means of an online survey.

Patel and Jacobson (2008) studied factors influencing the acceptance of e-government among people through user characteristics and behavioral intention. It also reviewed empirical studies systematically in the context of G2C, including the limitations, research methods, and the importance of people's characteristics and organization. The research used e-government services in India as the case study. Results showed that the measurement of success of e-government projects was distorted in the area of transparency, time savings, and cost savings. Bridging the digital divide and accessibility to the e-government program, economic returns, effectiveness of trade partners or private sector, process reform, infrastructure, and personnel were the characteristics influencing the acceptance of e-government among the people. The State can fix such problems by adopting an information system which creates effective benefits for the people.

Alenezi, Tarhini, Alalwan, and Al-Qirim (2017) stated that most previous studies focused on qualitative data and effectiveness in private organizations. Few previous studies had examined the public organizations. Therefore, e-government was explored in Kuwait to identify the factors influencing or hindering the strategic benefits of e-government in Kuwait. The data were collected from civil servants working for the Ministry of Justice, Ministry of Finance, and Communication Agencies through interviews. The results showed that information quality, strategic benefits, and institutional values affected the achievement of providing e-services. The results illustrated that new factors were driving the e-government project. Those factors were cost savings and satisfaction. Obstacles were also found, though, such as

playing favoritism. These factors were significant to the improvement of effective e-government services.

Bwalya (2009) studied factors influencing the acceptance of e-government among people in Zambia. The country adopted e-government for 3 years. This e-government was the mechanism that enhanced the effectiveness of public administration. It offered transparency and people participation. Nonetheless, Zambia demonstrated a high level of ineffectiveness in terms of literacy given to the people on how to use public services. It was found that the country also faced the problems of corruption and ineffectiveness of e-government, which were caused by IT infrastructure, political intention, English and local languages, and the process of managing e-government systematically. These problems delayed the services of e-government in Zambia. Such issues would lead to the conceptual model and criteria of e-government in the developing country of South Africa with similar contexts.

Lean, Zailani, Ramayah, and Fernando (2009) studied factors influencing the intention to use e-government among people in Malaysia. The technology acceptance model and the diffusion of information theory were reviewed. Culture and trust in five dimensions were employed as the conceptual framework. The data were collected from a questionnaire with people in various communities in Malaysia. The results showed that trust, perceived usefulness, perceived competitive relationships, and image had positive relationships with the intention to use e-government. Meanwhile, perceived strength of the online system and not refusing to provide service had positive relationships with trust in using e-government.

Witarsyah, Sjafrizal, Fudzee, and Salamat (2017) stated that e-government service was the information and communication technology of the public sector for providing more services to people. E-government could be also be applied to the legislative branch and judicial branch to improve the effectiveness of democratic governance. However, the problems of technology, governance, and society must be carefully applied. The research examined factors influencing the adoption of e-government through information quality, trust, and service quality. The technology acceptance model and UTAUT were adopted as the conceptual framework. The results showed that performance expectancy, effectiveness expectancy, trust, effort

expectancy, social influence, facilitation conditions, and effective information quality had positive relationships with the intention to use e-government.

Alzahrani, Al-Karaghouli, and Weerakkody (2017) systematically reviewed the literature from 2000 to 2014 on people's trust toward e-government services. It focused on the factors influencing people's trust in accepting such services. The results of the literature review showed that there were many previous studies on e-government. The factors that had been explored included trust in the government, reliability of the Internet system, and limited consideration of people's trust. Such considerations were personality, culture, gender, experience, education, beliefs, and value. The results also showed that the framework of the information system success model by DeLone and McLean was recommended to improve the framework of work, which indicated confidence in accepting e-government services.

Meftah et al. (2015) presented an article entitled Acceptance of e-government among the people in Bahrain. Many governments around the world have invested heavily in their e-government projects as a growth strategy to provide public services to the people. However, the governments and researchers admitted that using e-government services by the people was at a low level. The question arose as to what the factors of not accepting e-government services were. Therefore, the research identified the factors in the view of culture, awareness, and trust, which were analyzed by using regression. The results showed that trust was the most influential in the relationship with the intention to use e-government. It revealed that creating trust should be paid more attention to by related agencies that provide e-government services in Bahrain. When trust increased, the rate of using e-government services rose.

Phang, Li, Sutanto, and Kankanhalli (2005) stated that e-government services are mechanisms that deliver public services to the people, including senior citizens. In many studies, there was a lack of accepting e-government services for senior citizens. This cohort is growing and not skilled in using the applications. The research examined such gaps by finding the right innovation of e-government that was suitable for senior citizens. The dependent variable was intention to use CPF e-withdrawal and the technology acceptance model was used as the grounded theory of perceived usefulness. It was found from the TAM that perceived security on the Internet, image,

and availability had indirect relationships with the intention to use CPF e-Withdrawal through perceived usefulness. Perceived ease of use had a direct positive relationship with perceived usefulness, use, and the intention to use CPF e-Withdrawal.

Siddique (2016) studied the factors shaping policy formulation of e-government services in Pakistan. The purpose of the research was to change and implement the policy on e-government services in two parts. The first one was to review the existing policy on e-government services. The second one was gap evaluation and the success factors that needed to be addressed. It was to follow the efficiency policy in Pakistan. The research provided recommendations about policy implementation of e-government services at all levels.

Alshehri, Drew, Alhussain, and Alghamdi (2012) presented an article on the effects of website quality toward acceptance of e-government in the Kingdom of Saudi Arabia. The technology acceptance model and UTAUT were adopted as the conceptual framework. The data were analyzed by structural equation modelling through AMOS. Results showed that the factors influencing the intention to use e-government services were performance expectancy, effort expectancy, facilitation conditions, website quality, supporting system, and social influence at a statistical significance. In particular, website quality and the supporting system were very influential for using e-government services. The results were useful for the public sector in modifying organizational strategies and progress plans when applying and disseminating e-government services successfully in Saudi Arabia.

Dimitrova and Chen (2006) studied the impact of insufficient information of population toward the acceptance of e-government in the USA. A combination between innovation theory and the technology acceptance model was adopted as a conceptual framework. The results demonstrated that insufficient information about the people influenced the acceptance of e-government. It was also found that perceived usefulness, perceived uncertainty, and people's awareness, communication impact, and suitable channels of communication were the predictors of accepting e-government.

Al-Shafi and Weerakkody (2010) studied factors affecting the acceptance of e-government in Qatar. The initiation of e-government was in the beginning phase in developing countries, so problems of implementation arose and spread. Although e-

government increased transparency and improved communication and accessibility for the people, a diffusion of digital information was costly for the public sector. The use of e-government was at an unsatisfactory level according to most people. The factors influencing the use of e-government were based on UTAUT. The results revealed that effort expectancy and social influence shaped people's behavior toward the use of e-government, meaning that facilitation conditions and behavioral intention defined the use of e-government by people in Qatar.

Tolbert and Mossberger (2006) studied the effects of e-government services on trust and confidence in the government. The current trust that the people had given was significantly reduced for 3 centuries. Therefore, e-government was proposed to regain and increase trust in the government, including evaluation by the people. It served as an indicator that it needed improvement. The research used a two-stage model to examine the relationship between the use of e-government and trust in the government. The results indicated that there was a relationship between trust and the website of the local governments at a statistical significance. Trust could be enhanced when interacting with the people and perceived responsiveness was improved. As a result, trust was the main issue of democratic governance in the public administration.

Carter and Bélanger (2005) studied using e-government with the factors of trust, innovation, and acceptance of e-government that increased facilitation of the people to access the public sector. Although e-government was useful, the public sector's accountability increased. Such accountability included more accessibility to public data. The government should be effective and consider value for money, for example, the success of e-government services like online voting and renewal of licenses. The development of success should adhere to the people. Thus, the public sector must know the factors influencing the acceptance of technology. The study adopted the technology acceptance model and innovation theory. The results demonstrated that perceived ease of use, compatibility, and belief were predictors of the intention to use e-government services.

Tan, Xiaoai, Qiushi, and Chen (2013) studied e-government services in China. The purpose of the research was to understand the use of e-government services in China, particularly Beijing, Shanghai, and Shenzhen. An online questionnaire was used to examine the level of usage awareness and satisfaction toward e-government in

those three cities. The results showed that e-government did not show progress at a high level that could meet the community's expectations. Online services management did not fit the value that the people would receive. Such problems were caused by diffusion of the information, such as a lack of the content and website design. The article provided recommendations to the local governments to improve their e-government services.

West (2004) presented an article entitled "e-government and service transformation and people's attitude". The impact of new technologies toward public services and people's attitude toward the government became significant issues. The article evaluated the consequences to the government. Besides, it surveyed the people's opinions to examine the capabilities of the e-government system to ensure its effectiveness of service and website content. Nonetheless, it was found that e-government lacked the capability to provide services, including trust in the government by the people.

Chatfield and Alhujran (2009) compared e-governments in Arab countries. However, most studies on e-government have focused on developed countries. The literature on e-government in Arab countries was scant. The articles gave in-depth information about the development of e-government. An analysis was performed by means of cross-country comparisons of the websites and their portals. They were used in 16 countries in the Arab region to assess the process and ability to provide democratic services through an electronic system. The results confirmed the differences in digital services among Arab countries and developed countries. The results also revealed the digital divide in a broad manner, especially in the development of capability to provide e-government services. These results were significant to the developing countries in terms of economic resources and non-economic resources to develop e-government services successfully.

Osei-Kojo (2017) reviewed articles related to e-government and public services quality in Gana. The potential of e-government produced the discourse, which helped improve public services by defining effective service quality, reduced economic costs, people's satisfaction, and accessibility. Previous studies confirmed the potential of e-government to improve public services by increasing effectiveness, reducing costs of operation, expanding accessibility and achieving customer

satisfaction. However, challenges also occurred, such as weak ICT infrastructure in villages with problems of electricity outages and illiteracy. In addition, the article recommended that such challenges could be handled by a clear policy on e-government.

Chan, Thong, Brown, and Venkatesh (2021) studied services design and people's satisfaction toward e-government services in various perspectives. The research investigated the relationship between service design and people's satisfaction toward e-government services based on various perspectives. The concept defined 3 principles of service, which included the main service, facilities, and supporting services. Each was designed differently, which influenced perceived service quality and satisfaction toward e-government. Perceived service that was consistent with design characteristics included: 1) perceived precise service, completeness, self-service capability, and ease of use, 2) perceived facilitation such as accessibility, privacy protection, security, and responsiveness, and 3) perceived individual support and transparency. These characteristics affected perceived service quality that led to people's satisfaction. It was also found that a three-way interaction between perceived quality and the role of users was associated with perceived service quality.

Alshawi and Alalwany (2009) presented an article entitled "Evaluation of e-Government in the View of the People in the Developing Countries". Evaluation of e-government had been proven theoretically and practically to be essential but complicated. The complicated evaluation stemmed from related views. Besides the difficulty of evaluation, it also depended on social and technical contexts of usage. Nonetheless, although evaluating e-government was important, the research revealed that such evaluation did not accomplish the goal of development and management. Therefore, the article developed criteria for evaluating overall characteristics of the e-government system. A problem that the developing countries had faced was caused by the lack of people's opinion. The people's opinion positively strengthened the understanding toward the factors that were useful for developing e-government.

Dada (2006) reviewed literature on the failure of e-government services in developing countries. The article provided in-depth information about e-government services in developing countries to show failure in the view of services. From the view of Ciborra (2005) about e-government, failure was caused by a gap between

technology design and the actual situation. Nevertheless, e-government was an investment by the developed countries in terms of stability using technology to control the operation. The important question was that the designer must select the technology that was consistent with the context, norm, structure, thought, and system. An evaluation of technology should be made consciously. The motivation and possibility of stakeholders of e-government should be considered, which helps reduce the gap of social and technical change.

Ndou (2004) presented an article entitled “Opportunities and Challenges in e-Government in the Developing Countries”. In developing countries, the economy is supported by changes in technology, which plays an important role in economic competition. It is necessary to formulate policies and strategies to promote the socioeconomic growth. It is believed that e-government is a process of establishing the relationship between the government and the people for transparency. It has helped increase the government’s capabilities and means to listen to the people’s opinions.

Sigwejo, Pather, and Bytheway (2014) studied the factors influencing the use of e-government by the people in developing countries. In the past few years, an increase in the use of e-government in developing countries has been seen, which is good for the stakeholders, and particularly the people. It ensures that public services by the government and interactions between the government and the people could facilitate ease of use and effective delivery of services. However, although the trend was positive, the rate of usage by the people was low. To measure satisfaction in such a situation, an approach to IT management was needed. It should be effective and strategic for system evaluation to be implemented. People-centric should be the core issue of evaluation. Results of the literature review indicated important factors, such as user awareness, service capabilities, trust, political support, skills, information value, and transparent government agencies.

Colesca and Dobrica (2008) studied the acceptance and use of e-government in Romania. It was the government’s effort to provide public services over the Internet. However, the success depended on the people. From a survey by the UN in 2008, Romania was found at the middle level that utilized e-government by 37 percent. The research surveyed the Romanians by adopting the technology acceptance

model as the conceptual framework. The results showed that perceived usefulness, perceived ease of use, quality, and trust in the e-government were at a high level. The research proposed that an awareness campaign should be used by setting the goal to be users with appropriate capabilities to be informed about usefulness.

Shovkovyy (2015) studied the acceptance of e-government services in Ukraine. The study identified the factors influencing the use of e-government through questionnaires and interviews with a case study. Mixed method research was used. The results showed that 8 factors could increase the rate of using e-government. Those factors included awareness toward computer literacy, perceived ease of use, perceived usefulness, perceived public value, individuals, cultural definition to avoid uncertainty, and trust in the government and the Internet.

Guerrini (2008) studied e-government and interaction between the online government and the people. The results showed the extent to which the internal structure of the administration and the impacts of restructuring the organization were integrated. It included the structure of online services, such as online delivery, tax payment, and registration. Service processes such as appointments with the doctor were taken. It was not only about analyzing accessibility to the information, but also covered information about behavior and preferences of the people from responses about services.

Mahmood, Osmani, and Sivarajah (2014) reviewed the literature on trust in accepting e-government. It was found that e-government was a concept that had been mostly adopted. Its purpose was to improve transparency between the public sector and the people. Another channel of communication with the government should be provided. It was found that this could link with trust and acceptance of e-government by the people. Trust played an important role in using e-government around the world. The research proposed that quantitative and mixed method research should be employed in any future research. A focus group was also encouraged.

Q. Li and Abdalla (2014) studied the potential challenges and obstacles of e-government in Sudan. Since information and communication technology became important factors in every aspect, Sudan established a national policy and strategy to promote information technology for the sake of the country's socio-economy. A significant challenge was the acceptance of e-government services, as it helped create

a relationship between the people and the government. It also increased transparency and the government's competitiveness. Obstacles included the channel of responses between the public sector and the people, so it needed to be promoted for accessibility.

Verkijika and De Wet (2018) studied the adoption of e-government services in the Sahara Desert region. Previously, there were numerous studies on the factors influencing the use of e-government services, so technology acceptance models were used. One of those models used was UMEGA, which was verified as the most effective model. The research developed a questionnaire to survey the people living in Sahara Desert areas in Africa. It was found that performance expectancy, social influence, perceived risk, and computer effectiveness were influential factors. Meanwhile, attitude, facilities, and trust in the government and the Internet were directly associated with behavioral intention. The research also presented the view of people toward e-government, which could be used to formulate strategies for providing e-government services.

Ali and Anwar (2021) analyzed factors influencing the acceptance of e-government services by people in Kurdistan, Iraq. A quantitative method of research was adopted. The results indicated that an increase in perceived ease of use of e-government would lead to an increase in perceived usefulness of e-government. It was also found that an increase in perceived ease of use resulted in an increase in the intention to use e-government services.

Al Mansoori, Sarabdeen, and Tchantchane (2018) Al conducted a survey of e-government service by Emirates people in Abu Dhabi. The UTAUT model was adopted. In the Abu Dhabi state, e-government was a new thing with rapid expansion. The objective of the research was to explore the factors encouraging the people to use e-government services. In-depth information would assist the leaders of the government to plan public services effectively. The results showed that reliability of the Internet and effective expectancy were the predictors of e-government services. Effort expectancy, facilitation conditions, and trust had effects on behavioral intention. However, social influence did not have any effect on gender and age at a statistical significance. Experience did not exert any influence on the relationship between social influence and behavioral intention. It was also found that the intention

to use e-government services was strongly associated with the use of e-government services.

Ebrahim (2005) studied e-government in Bahrain. During the past 2 centuries, information, communication and technology (ICT) had been rapidly developed in the public sector to provide public services. As a result, in order to support the improvement of such processes, the research was aimed at examining the effects of e-government and the government's ability to adopt e-government to provide services. Qualitative method research was adopted. Three government agencies of Bahrain were investigated. The results showed that the framework was a clear and objective setting for adopting e-government to provide public services. The requirements of IT were written. Readiness of the organizations must be examined. It also covered an assessment of environmental impacts. Moreover, such examinations were useful to the government for deciding strategic planning. Experts in the field of IT could use the results of the research as a framework to evaluate the capability of e-government services.

Siddiquee (2016) studied e-government and changes in public services in developing countries using Bangladesh as the case study. Since 2009, e-government has become the government's agenda to change or develop public services by applying e-government to provide services. This system helped promote governance and was a key to the country's development. Secondary data were used and obtained from government websites related to e-government services. Interviews were conducted with government officials who had in-depth knowledge about e-government in the main and local areas. Purposive sampling was used. The results revealed that although Bangladesh had some limitations, e-government services in the public sector showed complicated management of the information system. A guide for increasing facilitation for people was provided. The concluding remarks of the research were that, although e-government could not show any progress in governing and delivering services, it was the driver that could improve e-government services to become more effective.

Mugambi (2013) studied the strategic effects of e-government on government services in Kenya. e-government was a service related to the information system that could lead to transformation of work style, including information, knowledge, and

speedy communication with the people. Moreover, its ability to store data and information was more effective when coupled with knowledge exchanges and data processing at individual, business and organizational levels within or outside the public sector. The research adopted a survey. All the people in Kenya were the population. Open-ended questions were developed to acquire the expected data and information. The data were analyzed by SPSS, and the results were presented in frequency and percentage. The results showed that most people could not access public services via the online channel, although e-government helped reduce the costs of delivering services and the time for data processing. The research provided recommendations for improvement and promotion of ease of access to the online public services to the people.

Kamau (2017) studied user experience, use, and public values of e-government in Kenya. When the government's goal was to seek a better service provided to the people, its efforts to invest in e-government were seen. Evaluation in the attribute of effectiveness was essential to provide e-government services. At present, a significant indicator was public value. Interdisciplinary theories include the theories of technology, organization, the environment, structure theory, actor network theory, and public service theory. Mixed method research was adopted. The data were analyzed using structural equation modelling. The results showed that IT infrastructure such as e-commerce, system integration, availability, reliability and accessibility; human capital such as awareness, knowledge and skills with digital integration, incentive and reward; and governance such as policy framework and regulation, transparency, and users' participation in development of e-government services, were all factors influencing the use of e-government.

Albesher (2016) studied trust, an antecedent of long-term acceptance of e-government. The research pointed out that trust was the main obstacle to using e-government services among the people. If the people did not have trust, it would lead to their worry. The research examined factors influencing trust of the people toward behavioral intention to use e-government services in Saudi Arabia. Mixed method research was adopted. For the qualitative method research, a semi-structured interview was used to gain in-depth information and understanding. For the quantitative method research, a survey of the people's role in trust on e-government

services was employed. The results showed that social influence, trust in the Internet, reliability of government agencies, honesty, and the government's ability, had effects on the people's trust in using e-government services at a statistical significance.

Lönn (2016) studied the cooperation of e-government by the public sector in Sweden. Cooperation was the challenge. The public organizations needed to learn how to work together. However, the fact was that the public sector did not have any idea of the necessary style of co-working. The purpose of co-working is to improve the effectiveness and efficiency of public administration and public service quality. The results showed that the public sector needed to be more open to co-working via the information system. A new style of cooperation was thus presented, particularly a push for the people to participate in government activities that are facilitated through the electronic system. It should also meet the needs of the people.

Bertot, Jaeger, and McClure (2008) studied e-government services with a people-centric population. People's participation in developing e-government services enhanced the effectiveness of delivering services. It helped reduce the costs, since the needs and expectations were known.

Al-Hujran, Al-Debei, Chatfield, and Migdadi (2015) studied the influence of usage and acceptance of e-government. It creates transparency, accountability, and better public services. Therefore, the most important issue was how to make the people accept and use such systems and what factors could influence such acceptance and usage. To address this issue, the research adopted TAM, the formation of social, political, and cultural structures, trust, perceived public value, and foreign culture as the conceptual framework. Quantitative method research was utilized. The population was the people in Jordan. The results showed that ease of use and perceived public value were associated with the attitude toward the use of e-government at a statistical significance.

Durmuş (2012) studied the design of e-government websites by taking user-centric methods into consideration. Public services in the form of electronic systems helped reduce time and spending. To improve service quality, the Turkish government provided public services over the Internet in 2003. Government agencies were required to learn the effectiveness of the services for the sake of the people. The purpose of the research was to identify any problems with website design, with a

focus on the users. It was conducted by means of website evaluation and interviews with government officials. The results showed that the elements that needed to be considered were accessibility, software and hardware, and usage improvements. For accessibility, the website must be tested by a screen reader. Enclosed captions must be provided. For software and hardware, the website should be compatible with different browsers. For usage improvements, organization of the website must be clear, simple, and accessible to reduce the burden of understanding the website for the people. Protection of information privacy was provided. Such elements were tested on the public sector website in Turkey in response to the needs of the people and for the effectiveness of e-government services. The results could be used as the foundation for testing websites of the public sector in other countries.

Bakon, Elias, and Abusamhadana (2020) reviewed the literature on cultural influences and the digital divide toward the success of governments in developing countries. It was found that developing countries would invest heavily in e-government systems to provide speedy and efficient services. People were part of the decision-making process, which led to transparency and accountability toward policy formulation. Nevertheless, although e-government services were pushed, it could not reach success. This was also confirmed in a survey by the United National Thailand (2018) regarding e-government services. Information from the e-government development index EGDI) indicated that the mean score of EDGI of countries in South Africa was 0.3423, while for countries in Europe it was 0.7727. The factor that hindered e-government services in the developing countries was the digital divide. It could be said that access to the information system in the developing countries was limited, which resulted in a digital divide. Individual culture was the key success factor of e-government services in developing countries.

Karv (2015) studied e-government and the ability to curb corruption in a case study of Estonia. It was one country that successfully developed an e-government system. The results showed that transparency, accountability, intermediary disappearance, and connected gaps between government officials and people were the factors that could reduce corruption. Communication with government agencies through the Internet needed an intermediary. Interaction helped reduce corruption. Narrowing down the gap between government officials and the people relied on trust.

Goldfinch, Gauld, and Herbison (2009) studied the digital divide, political participation, and trust toward e-government systems in Australia and New Zealand. The results of interviews by telephone in Australia and New Zealand revealed that a digital divide in areas such as gender, nationality, income, and age was an important factor in using the e-government services at a statistical significance. Trust was also related to political participation, which explained that too much trust may lead to passive political participation. On the other hand, if trust was at a low level, it could lead to a conflict that results in decreased usage of e-government services. Trust was an essential factor to achieve e-government services.

Bhuasiri, Zo, Lee, and Ciganek (2016) presented an article entitled "the acceptance of e-government services of tax collection and payment through an electronic system in Thailand". The e-government was a service provided to the people in an increasingly efficient manner. However, the problem was how to increase the rate of acceptance by the people. The articles identified various factors that would lead to its acceptance. The factors incorporated in the model were derived from the technology acceptance model and the UTAUT. Such factors included perceived risk and perceived reliability. The results showed that performance expectancy, facilitation conditions, social influence, and perceived reliability played importance roles. Perceived independence and perception capability were important factors of performance expectancy and effort expectancy. Perceived risk and performance expectancy did not have any effect on the intention to use.

Lu and Nguyen (2016) studied the acceptance of e-government services in a case study of income tax e-filing systems. The research adopted the technology acceptance model, UTAUT, and the information system success model. The samples were those who made tax payments through an e-filing system. It was to examine the structural relationships between performance expectancy, effort expectancy, social influence, information quality, system quality, service quality, and the intention to use. The data were analyzed using SPSS 2.0. The results illustrated that the intention to use the tax e-filing system among Vietnamese taxpayers was influenced by those 6 factors. Thus, UTAUT was a conceptual framework that was useful for academic people and government policy makers to improve the e-filing system in Vietnam.

Mensah, Zeng, and Luo (2020) studied e-government through the application of UMEGA. The results indicated that performance expectancy, effort expectancy, and social influence were not predictors for using e-government services. However, facilitation conditions shaped behavioral intention and effort expectancy, including perceived service quality affecting trust in using e-government services.

W. Li (2021) presented an article entitled “The role of trust and risk of e-government in the view of the people’s acceptance through the UTAUT”. The objective of the article was to examine the extent to which confidence and perceived risk influenced people. The results showed that trust in the government and the Internet positively influenced the acceptance of e-government. It was found that perceived risk was negatively associated with the acceptance of e-government. The results also indicated that performance expectancy (PE), effort expectancy (EE), social influence, and facilitation conditions had positive effects on the people’s acceptance of e-government.

Mensah (2018) studied the readiness of people toward acceptance and usage of e-government services in Harbin, China. The research adopted the technology acceptance model to examine factors influencing acceptance and usage of e-government. The data were collected from respondents in Harbin. The results demonstrated that perceived ease of use, service quality, and people’s trust were positively associated with the intention to accept and use e-government services at statistical significance. Meanwhile, perceived usefulness was negatively associated with the intention to accept and use e-government services among the people in Harbin, China.

Abdelghaffar and Magdy (2012) studied m-government through mobile phones in a developing country in a case study of Egypt. Governments around the globe started to adopt m-government services to alleviate delivery of services and increase interaction with the people. However, not so many countries were successful with such adoption. Therefore, this research presented thinking patterns of the youth for accepting government services. The data were collected by means of a survey. The results indicated that perceived usefulness, compatibility, awareness, social influences, and confrontation were the predictors of the intention to use m-government services.

Almaiah and Nasereddin (2020) presented the adoption of m-government based on the concepts of GAM and UTAUT to identify factors affecting the use of m-government from GAM. Such factors included information quality, trust, and perceived behavioral control of technology, which shaped the use of m-government. In addition, the research confirmed that awareness, resource availability, and system compatibility were the key factors influencing the use of m-government. Referring to the UTAUT model, the results showed that expectation of effectiveness, the attempt to use, and conditional facilitation were factors that changed the application of m-government. Social influence did not show any significance. However, the effects of trust in the Internet, trust in the government, and perceived security of using m-government were important to the users. Thus, an increase in trust would lead to the acceptance and usage of m-government services.

Rodrigues, Sarabdeen, and Balasubramanian (2016) studied factors influencing the adoption of e-government services in the United Arab Emirates based on the unified theory of acceptance and the use of technology. The purpose of the research was to identify the structure and factors with a user-centered design. Results of the literature review showed 29 variables. Multiple regression was used to examine the influence of personal structures of overall satisfaction. Meanwhile, correlation analysis was employed to explore the relationship between Internet usage and user satisfaction. One-way ANOVA and a t-test were used to indicate the differences of the people and overall satisfaction toward e-government services. Moreover, the research revealed that user trust and attitude toward the technology were the keys to satisfaction.

Butt and Persuad (2005) presented an article about accepting e-government services with a user-centered design. The article was a case study of Canada, which was a leading country in e-government. The global mean score of using the government website was 30 percent, while that of Canada was 51 percent. Although the number was in a good direction, the majority of Canadians would access the government’s website to receive information rather than for interactions or transactions with the government. Therefore, this research examined the factors of such problems. The results revealed that the obstacles of online services were the lack of controlling where the information would go, who was using the information, and

what the purpose was. Nonetheless, the government could control personal data privacy through privacy impact assessments to ensure that transactions could be made safely. It was a chance for e-government services to increase trust among the people, which would lead to higher rates of usage.

Pérez, Cabrera, Rodríguez, and Raymundo (2019) studied an extension of accepting e-government services and public values in Peru. The current government accelerated the development of e-government services. However, people's participation was at a low level. Their research adopted the technology acceptance model and public value as the conceptual framework. The results showed that environmental sustainability was an external factor, and readiness to provide services by state officials affected the adoption of e-government services positively in Peru.

Mensah (2019) studied the influence of the intention to accept and use e-government services by university students in China. The unified theory of acceptance and use of technology (UTAUT) was adopted as the conceptual framework. The data were collected from 369 Chinese citizens who were university students in China. The data were analyzed by SPSS. The results demonstrated that facilitation, perceived service quality, trust in the government, and social influences were the predictors of the intention to accept and use e-government services among university students. The interesting point was that expectation toward effectiveness and attempt, and trust in the Internet were not the factors of intention to use e-government services. Instead, social influence played an important role in trust in the government. These discoveries were significant to the e-government services.

Verdegem and Verleye (2009) presented an article entitled, "e-Government system" as a users-centered study to measure user satisfaction through the ICT acceptance theory. New technology and communication offered a chance for the public sector to manage their work effectively for the people and business sectors. Nevertheless, an approach to e-government services that focused on user-centric development was proposed. The impact of e-government services on the people should be examined, as user satisfaction has played an important role in usage.

Y. Li and Shang (2020) studied service quality and perceived value, and the intention to use continuously among the people within e-government services, which was a case study in China. It was found that the intention to use by the people was at a

low level, which is a challenge for developing e-government services. The objective of the research was to explain the relationships between service quality of the government's website and perceived value, and the extent to which the relationships influenced the intention to reuse by the people. The data were collected from 1,650 citizens living in the municipality of four cities with high populations in China. The component of the service quality of e-government was tested using the partial least square (PLS). The conceptual model was analyzed with structural equation modelling. The results showed that the service quality of e-government included 8 dimensions. These dimensions were: system quality, reliability, security, accessibility, information quality, service capability, responsiveness, and interaction. Perceived value was an intermediary of the effectiveness between service quality, and intention to use continuously by the people. The intention to use was a result of service quality, and service value with satisfaction.

Holgersson and Karlsson (2014) presented an article on developing e-services by understanding the conditions of people's participation. This participation has led to the development of various systems. At present, it was expected that development of e-services would receive similar benefits. However, the existing research was only recommendations about participation of users in order to develop e-services. This research interviewed the people to survey their willingness and ability to participate in the development of e-service at three schools. The interviews were conducted with a user centric design, participation design, and user innovation. From the results of the interviews, it could be concluded that the intention of the people to participate was high. The factors influencing the willingness to participate included usage of e-services, e-services satisfaction, individual incentives, time, social attachments, and experiences of previous development of e-services. It was found that the ability of citizens to participate in a user-centered design and participatory design were at a high level. Nonetheless, they were still at a low level compared to user innovation. This was because the citizens did not have enough knowledge about the work of state agencies. The factors affecting the ability of people to participate included knowledge about state agencies, IT knowledge, and system development knowledge. Lastly, the reasons that the people would not participate were that time and interest in e-services were at a low level.

Karlsson, Holgersson, Söderström, and Hedström (2012) surveyed the participation of users in the development of e-public services. It was found that the participation of users was important when state agencies developed e-services. At the same time, a limitation of the research in the area of usefulness toward participation of users in developing e-services was also found. Three approaches were adopted for the analysis. Those approaches were: participation design, user centric design, and user innovation. To achieve the strategic goal of e-services in the European Union and United States of America, three approaches were taken into consideration. The first approach was that unclear groups of users may hinder the achievement of the goal. The second point was that, by nature, participation hindered democratic achievement. The third approach was the lack of skills, which were not enough to achieve the goal of effectiveness.

Karunasena and Deng (2012) studied the factors of evaluating public values of e-government services in Sri Lanka, in the view of public services and effectiveness of public organizations. In response to the research objectives, a conceptual framework was developed from a related literature review. It covered public services and the effectiveness of public organizations. The data were collected by a survey in Sri Lanka. The conceptual framework was tested and validated with an empirical experiment. Confirmatory factor analysis and structural equation modelling were employed for data analysis. The results indicated that the delivery of information and quality service, direction of information and service users, effectiveness and responsiveness of public organizations, and participation of public organizations toward environmental sustainability were key factors that measured the public values of e-government services in Sri Lanka. This was the first study on examining the factors that measured public values of e-government services in Sri Lanka. The results demonstrated that practices toward continuous improvement of e-government services in Sri Lanka and other countries in the world are statistically significant.

Alruwaie, El-Haddadeh, and Weerakkody (2020) studied the continued use of e-government services under the role of perceived behavioral control, result expectations, and satisfaction. The objective of the research was to examine the factors influencing the continued use of e-government services by integrating social cognitive theory, expectation confirmation theory, the information system success

model by DeLone and McLean, and E-S-QUAL. The data were collected from 471 citizens in the United Kingdom who participated in online public services. The results showed that pre-experience, social influence, information quality, service quality, individuals' results expectations, and satisfaction were the predictors of the intention to use e-government services among the people.

Alawneh, Al-Refai, and Batiha (2013) studied the measurement of user satisfaction toward e-government services in Jordan. Customer satisfaction played a significant role in using e-government services continuously. However, the success or failure of e-government service projects was a challenge for the Jordanian people. The main point was what shaped their satisfaction. The purpose of the research was to identify the factors of e-satisfaction among the Jordanian people and the portal of e-government services in Jordan. Results from the literature review defined 5 hypotheses and 5 factors (e.g., security and privacy, trust, accessibility, realization of public services, and public service quality) that may contribute to the level of satisfaction toward the portal of e-government services (www.jordan.gove.jo) among Jordanian people. A survey was conducted with 400 employees working at four universities in the north of Jordan. The data were used to test the hypotheses. The results of multiple regression and empirical analysis revealed various discoveries. Such discoveries pointed to usefulness and the importance of the factors driving e-satisfaction. Recommendations for creating the portal of e-government services corresponded to the needs, desires and expectations of the citizens. It was also found that the in-depth information was derived from employees and government policy makers at the operational level to improve the portal of e-government services through techniques, behavior, management and motivation.

Seo and Bernsen (2016) compared attitudes toward e-government services between users and non-users in rural areas and urban areas. Most of the studies focused on attitudes of the users during the beginning and post of using e-government services. They did not consider non-users or inexperienced users of e-government services. This research examined the attitude of non-users of e-government services in two places: one urban municipality and one rural municipality in the Netherlands. Although the urban municipality and rural municipality were uniquely different, which may affect the attitudes toward e-government, the recent literature had not

separated the difference between the people in those places. Thus, this research proposed a model to examine such differences using factors of the acceptance theory and resistance of the technology theories. It covered facilitating factors (e.g., perceived behavioral control), hindering factors (e.g., perceived risk), and other factors (e.g., trust and geographical closeness). This proposed model was tested by a survey from 337 non-users and users of e-government services living in a rural city and urban city in the Netherlands. The results revealed similarities and differences of those four groups, which disclosed another view of e-government.

de Jong, Neulen, and Jansma (2019) studied the intention of people to participate in a government co-creation project. A comparison of defining the value of creation in three forms was made. Those forms included idea competition, grassroots, and digital platform. At present participation was realized, since it could lead to improvement in providing e-government services. The research focused on the intention of the people to participate in the operational process. The framework would then evaluate the intention of the people to participate in the process. The results showed that education and interest in state institutions were associated with the citizens who would participate. Three factors influencing citizen participation included perceived value, perceived behavioral control, and expected satisfaction. The results emphasized that trust and true intention were additional factors for participating in e-service.

Shyu and Huang (2011) studied e-government systems in the view of the technology acceptance model. It explained that learning was essential to economic prosperity and social harmony. The learning of e-government refers to the use of government technology to facilitate ease of use while learning. The technology acceptance model was adopted to explain the learning of e-government in terms of perceived usefulness and perceived ease of use affecting the use of e-government. The data were collected from users of the government website in Taiwan.

Sukasame (2004) studied the development of e-services by the Thai government. The objective of the research was to identify the factors influencing e-service. The data were collected from undergraduate students at five universities that offered the portal of the government's website. The results revealed that there was a positive relationship between the perception of e-service on the website and five

factors. The factors included reliability, content, ease of use, connectivity, and self-service.

Okunola (2015) studied the user experience of e-government services of immigration services in Nigeria. The data were collected from online questionnaires in Nigeria and another 20 countries around the world. Some respondents were from developed countries such as Belgium, Canada, Denmark, France, Greece, Iceland, Ireland, the Netherlands, the United Kingdon, and the United States of America. There were also respondents from developing countries such as Gana, Gambia, Malaysia, Nigeria, Qatar, Singapore, South Africa, Tunisia, and United Arab Emirates. The respondents were identified and contacted via snowball sampling techniques. The results showed that user experience of e-government services was influenced by security and support, reliability, ease of use, website quality, information quality, usefulness, convenience and obstacles. The hypotheses were supported and related.

Suradi, Yusoff, and AlMashiki (2020) studied the factors influencing the adoption of e-government services among youth in Oman. The literature review identified factors such as usefulness, ease of use, risk, and trust in technology. The data were collected with a questionnaire from university students of Dhofar University. The results indicated that perceived ease of use of e-government services was one of the major factors promoting youth to use e-government services or the development of applications by the government. However, the researchers noticed that many university students did not know about e-government services. They lacked the knowledge that could affect the use of e-government services. Therefore, this research recommended that the government should disseminate the information via advertising and program trainings related to e-government services towards youth. It allowed the e-government services to be fully utilized in the future.

Sarisar (2015) studied the factors affecting the adoption of e-government services to Narog city. The data were collected by interviews with five key informants at the middle level to senior level. The results demonstrated that technology and safety were the main causes of hindering the development of e-government services. Moreover, the employees lacked the skills and did not meet the services, resulting in problems in responding to the needs of usage by the people. The research proposed

that e-government services should be reformed and restructured. The reform should not cover only the ability to use a computer in order to operate in government work. The best practices of other regions with a similar context of e-government service projects should be learned.

Sigwejo et al. (2014) studied the factors affecting e-government services among people in developing countries in recent years. Developing countries have demonstrated their readiness to provide e-government services at an increasing level. All parties would receive such benefits, particularly the people. It ensured that public services provided by the government are effective, including interactions between the government and the people, which it could facilitate and evaluate effectively. Although positive trends of such e-government services occurred, the rate of usage by the people was low. For this reason, it was necessary to manage information systems in order to identify the criteria for assessment and develop an effective method to adjust e-government services. The results showed that the adoption of people centric evaluation was small. Evaluating factors such as users, features, services, infrastructure, and the relationship with the government had effects on the adoption of e-government services among the people.

Abdullah (2021) studied factors influencing the adoption of e-government by the public sector. With development and digital transformation, e-government was adopted by public institutions. Survey research was used to collect the data through questionnaires. There were four factors of operating e-government services, which included: motivation, personal factors, technical factors, and trust. These factors were positively linked with the adoption of e-government. This research also proposed that the IT infrastructure should be developed along with training and realization of other public services that could motivate perceived usefulness. It could create successful adoption of e-government and become an important tool of public institutional reforms.

Khasawneh, Rabayah, and Abu-Shanab (2013) studied the factors affecting acceptance of e-government services that governments around the world had paid attention to. They helped increase the effectiveness of government agencies to use an automation system, such as a replacement of the old system. Trust and risk were the factors employed in the conceptual framework that could influence usage of e-

government among the people in Jordan. The results showed that increased trust of e-government application reduced the worry about using e-government services and risks of problems. The research recommended that future research should employ other factors based on the technology acceptance model. Such factors included usefulness and ease of use. Social influence of the theory of reasoned action was the other recommended factor that should be studied.

Ozkan and Kanat (2011) proposed an e-government model. The phenomenon of e-government had drawn considerable attention to usage around the globe. The research adopted the technology acceptance model and the theory of planned behavior as the conceptual framework, which corresponded to the requirements of e-government. Loan services were studied with 400 respondents in the association of loans at the university level in Turkey to test against the empirical data. Partial least squares and SEM were used to perform the data analysis. The results indicated that, in addition to the factors specified in the models, other factors were included. Such factors were trust, perceived behavioral control, and the attitude toward explanation of using e-government successfully.

Luqman, Nair, Vadeveloo, and Theethappan (2012) studied the experience of using technology by government employees when providing e-government services. The Malaysian government spent millions of Ringgits to build the confidence of expanding the IT infrastructure and facilities for the IT departments at government agencies. Such amounts of spending could be proved when the IT facilities were used. Officials in Kuala Terengganu, Malaysia were the samples, showing their readiness to use the facilities of e-government services. The results revealed that more than half of the officials were not ready to use the facilities of e-government services, and they admitted that they lacked the IT experience and the information of public services. In addition, the majority of the respondents were not used to the facilities of e-government service. Their level of IT knowledge was low. The website was not user-friendly. These were the obstacles that did not allow the use of e-government service. This research stated that such results helped the government and the public to use necessary measures to increase the rate of using e-government services. It was to ensure that the public would receive better service from the government. This research was preliminary qualitative research, and a quantitative method of research

was needed to use a larger number of samples to confirm the results and explore the IT experiences of the government officials who use e-government services.

Nurdin, Stockdale, and Scheepers (2016) studied the factors influencing sustainability of e-Government services in Indonesia. A failure of the e-government service was caused by problems such as resources, political stability, cooperation, legitimacy, and capital. Therefore, the research examined factors influencing the sustainability of e-government services. The results showed that factors such as professional organizations and employees, determination, cooperation and coordination, and shared responsibilities between local political institutions had effects on sustainability of e-government services. Besides, it was also found that e-government services were complicated, they needed cooperation and coordination between agents, along with shared responsibilities between local political institutions.

2.2.2 Previous Studies on the Factors Influencing Government e-Service Through a Personal Income Tax e-Filing System

Wantanee Mongkolsubkul, Anyanitha Distanont, Orapan Khongmalai, and Junjira Noppakunthammachart (2016) examined the factors affecting adoption of e-government services in a case study on e-revenue. The Revenue Department served as the case study. It used the technology acceptance model, unified theory of acceptance and use of technology (UTAUT), theory of reasoned action, the model of personal computer utilization (MPCU), diffusion of innovation theory (DOI), theories of motivation, social cognitive theory (SCT), and combined the technology acceptance model and the theory of planned behavior. The results showed that four factors influencing the use of information systems were perceived: ease of use, perceived usefulness, service quality, and trust.

Faralin Faditthakul (2019) Sstudied factors affecting the adoption of an individual tax filing and paying of personal income tax system through the Internet in Li District, Lamphun Province. Mixed method research was adopted. A questionnaire was the research instrument for the quantitative approach, while an interview form was for the qualitative approach. Quota sampling was used to collect the data. Five factors were employed in the framework. Those factors were perceived usefulness, perceived ease of use, the intention to use the technology, and attitude toward usage.

The results revealed that perceived usefulness, perceived ease of use, intention to use the technology, and attitude toward usage were the factors affecting the adoption of a individual tax filing and paying of personal income tax system through the Internet at a statistical significance of 0.01. Results of the interviews demonstrated that the system would be adopted when it was convenient, time-saving, and reduced work procedures. If the system is found to be useful, it helps reduce the costs, which results in perceived usefulness, and creates the chance for its adoption. The results were consistent with those of the quantitative method research. It helps encourage the use of such a system in the tax year.

Siriwat Plianbangyang (2015) studied the effectiveness of public services by government e-services through personal income tax e-filing. The objectives of the research were to examine the level of e-government services through personal income tax e-filing, explore the relationship between service quality of personal income tax e-filing and the acceptance of e-services toward the efficiency of public services through personal income tax e-filing, and examine the factors influencing the efficiency of public services through personal income tax e-filing, then identify the problems and obstacles of providing public services through personal income tax e-filing, and present guidelines for developing public e-services through personal income tax e-filing. The results indicated that the efficiency of e-public services through personal income tax e-filing in the dimension of user satisfaction had five attributes, which were: equal service, timely service, sufficient service, continuous service, and progress service, which were found at a high level of satisfaction. Moreover, it was found that the factors influencing electronic public services and the acceptance of electronic public services were associated with the efficiency of electronic public services through personal income tax e-filing at statistical significance of the 0.01 level. The results of interviews with experts in the field of tax and electric public services revealed that electronic service quality and the acceptance of electronic services had a relationship with the efficiency of electronic public services through personal income tax e-filing, which was consistent with the results of the quantitative method research.

Nakanda (n.d.) studied personal income tax filing through an online channel in Bangkok. The purpose of the research was to examine personal income tax filing

through an online channel in Bangkok and investigate the respondents' demographic factors. 400 samples were comprised of those who filed personal income tax through the online channel in Bangkok. A questionnaire was developed to serve as a research instrument to collect the data. Statistics used in the analysis included frequency, percentage, mean and standard deviation. Hypothesis testing was performed using One-way ANOVA. If a difference was found, the comparison was made by LSD. The results of hypothesis testing showed that different occupations influenced personal income tax filing through the online channel. However, different gender, age, status, education, and monthly income did not show any statistical difference with personal income tax filing through the online channel.

Phonphan (n.d.) studied the effects of demographic factors, process, and service quality of personal income tax e-filling (e-Revenue) on satisfaction toward the filing of personal income tax among private employees in Revenue Area 10. The objectives of the research were to study demographic factors, process, and service quality of personal income tax e-filing toward satisfaction of private employees in Revenue Area 10. A questionnaire was developed to collect the data from 400 samples. Statistics used in the data analysis included percentage and standard deviation. Simple regression was used to test the hypothesis. The relationship was analyzed using multiple regression. The results showed that differences in gender, age, status, education, average income, net income for tax filing, or the amount of requested tax refund did not have an effect on satisfaction toward personal income tax e-filing (e-Revenue). The process was associated with satisfaction toward personal income tax e-filing (e-Revenue) at the statistical significance of the 0.05 level. Other results demonstrated that service quality of personal income tax e-filling influences satisfaction toward personal income tax e-filling at the statistical significance of the 0.05 level.

Azmi, Kamarulzaman, and Hamid (2012) presented an article entitled, "Perceived risk and acceptance of tax filing through electronic public service". In many countries, such systems have been adopted in pursuant of government regulation. However, when e-service was available, personal income tax filing through an electronic channel was popular among the people in developing countries like Malaysia. The rate of perceived risk was high and there was no coordination

among the services providers. The research used the technology acceptance model to understand perceived risk and influences on the application. The results revealed that perceived risk was positively associated with the adoption of tax filing through an electronic channel. Different risks may affect e-tax filing and perceived usefulness differently.

Kamau, Njihia, and Wausi (2016) studied the experience of e-government in the view of public values using the iTax website for a case study in Kenya. The purpose of the research was to acquire in-depth information from the users of the iTax website and make the website responsive to users more easily. Qualitative method research was adopted to identify the factors affecting the user experience. It was useful to collect the required data and information, since it could provide in-depth information about the users' opinions in the view of public values. The results showed that the iTax website needed improvements that allowed the users to enter their information easily. In addition, when errors occurred, an explanation of such errors should be provided in order to inform the users about the errors and solutions. The iTax system should be integrated into other systems of government agencies to reduce repetitive information. In conclusion, the government should pay more attention to the measurement of public service values in order to increase the usage and reliability of the website in terms of e-government. In other words, the public sector must produce valuable services for the people who have a right to receive the benefits.

Akram, Malik, Shareef, and Goraya (2019) explored the relationship between technology and the behavior of filing personal income tax through an electronic channel. Perceived risk served as a controlled variable. The data were collected from 409 users of an e-revenue system in a growing economy. The results confirmed that perceived functional benefit, expectation, and satisfaction played an important role in the intention to file tax through electronic channels. The results also showed a relationship between perceived functional benefit and satisfaction. Continued intention depended on the perceived risk of the users.

Based on the literature review, the technology acceptance model, the theory of planned behavior, and the information system success model were adopted as the conceptual framework of this research.

2.3 Conceptual Framework of the Research

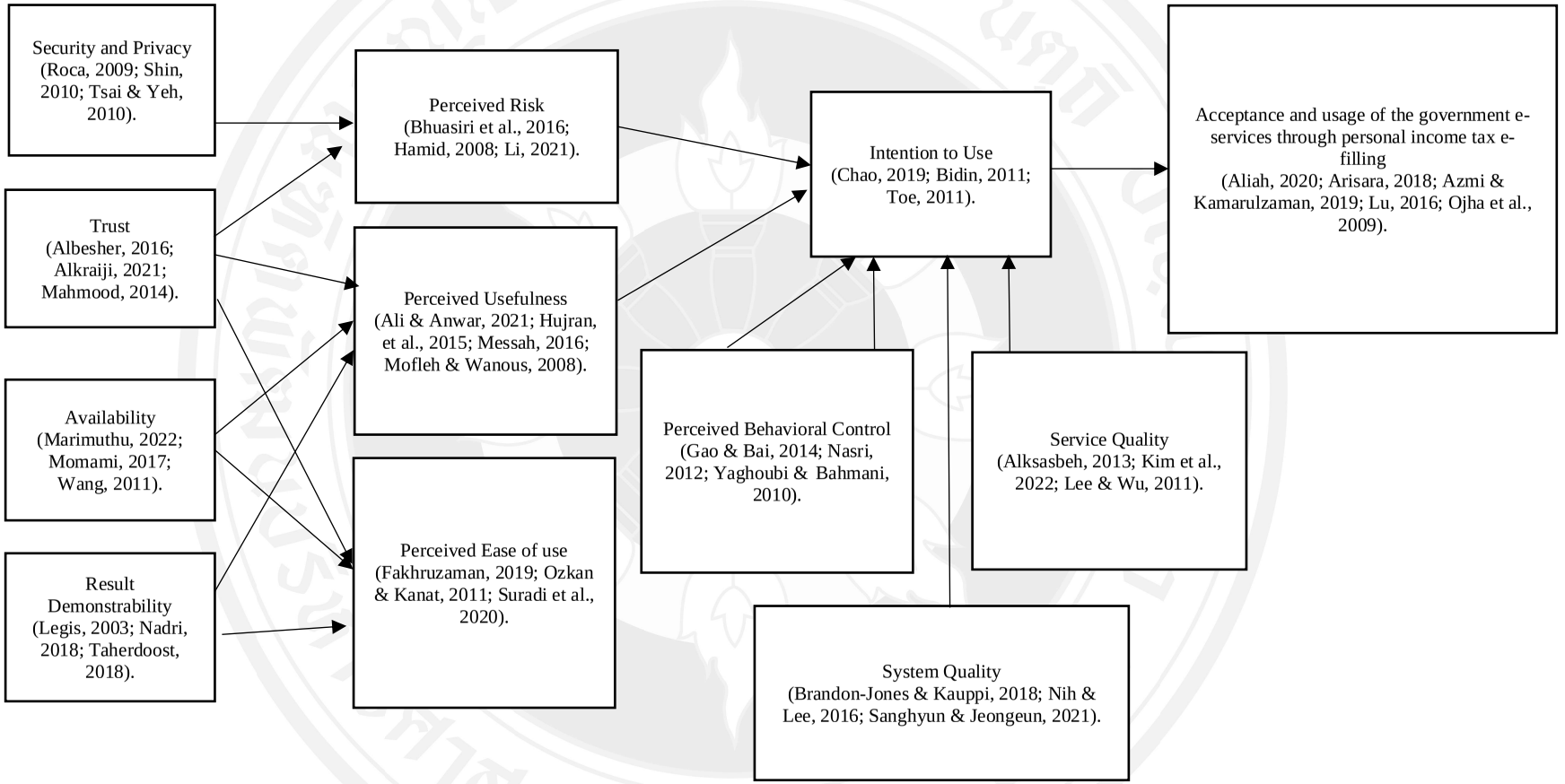

Figure 2.10 Concept Framework

Note: Adapted from TAM (1), TPB, Is Success Model TA Theory

2.4 Research Hypotheses

Relationships between Theories and Research Hypotheses

2.4.1 Theory of the Technology Acceptance Model

The purpose of the technology acceptance model is to explore the factors that influence individuals' motivation and interest in accepting and using information technology. The theory suggests that there are two variables of such influence. The variables include perceived ease of use and perceived usefulness. Perceived ease of use refers to the expectations that a user has toward the level of difficulty to operate a system. Meanwhile, perceived usefulness is concerned with the use of a system that results in increased effectiveness for the user. In addition, the technology acceptance model has been adopted in the government's e-services system (Che Azmi, Kamarulzaman, & Hamid, 2012) (Lean, & Rind, 2008; Sipior, Ward, & Connolly, 2011; Belanche, Casaló, & Flavián, 2012; Yusup et al., 2015). The results indicate that when the user believes the ease of use of the system (Schaupp and Carter 2005; Lala, 2014; Vathanophas et al. 2009; Wangpipatwong et al. 2008; (Fakhruzzaman, 2019; Mensah, 2018) and perceives the usefulness of information technology (Ali & Anwar, 2021; Phang et al., 2005) Carter, 2008; Chang, Sun, Pan, & Wong, 2015; Shyu, & Huang, 2011; Lee, & Lei, 2007; Isaac, Abdullah, Ramayah, Mutahar, & Alrajawy, 2018; Hung, & Chang, 2012), their interest, acceptance, and usage of information technology occur (Marakarkandy, Yajnik, & Dasgupta, 2017; Yang, Yang, & Chang, 2023; Hooda et al., 2022; Jayawardena et al., 2022). As a result, three hypotheses are formulated and proposed as the following:

Hypothesis 1 (H1): Perceived ease of use has a positive effect on perceived usefulness.

Hypothesis 2 (H2): Perceived ease of use has a positive effect on the intention to use.

Hypothesis 3 (H3): Perceived usefulness has a positive effect on the intention to use.

The intention to use, or usage, is defined as availability or possibility of an individual to take an action in question (Fishbein & Ajzen, 2010). Furthermore,

DeLone and McLean (2003) suggest that measuring the use of a system would be effective when the user is intending to use it. It can be measured by the usage frequency, usage time, number of times accessing the system, and usage patterns. The intention to use is also related to personal impact in terms of effectiveness of work and decision making. Thus, a hypothesis can be formulated and proposed as the following:

Hypothesis 4 (H4): The intention to use has a positive effect on acceptance and usage of personal income tax e-filling.

2.4.2 Concept of Perceived Risk

Perceived risk is a main factor that contributes to the behavior of the users (Al-Adawi et al., 2005)(Fu et al., 2006; Hung et al., 2006; Alsaghier et al., 2009). In other words, it is a state of concern if decision making is made with errors. Therefore, that decision-making would be postposed, and the user does not accept and use the services (Khasawneh et al., 2013; Suradi et al., 2020).

Demirdogen et al. (2010) state that perceived risk is an awareness of certainty in security (Colesca, 2009; Liu and Zhou, 2010; Beldad et al., 2011) and personal privacy (Ayyash et al., 2013; Abu-Shanab, 2014; Hoque, Susanto, Shah, Khatimah, & Mamun, 2023). Incomplete and unclear information that the user receives leads to service dissatisfaction, which is caused by perceived risk. Thus, the hypotheses are formulated as the following:

Hypothesis 5 (H5): Perceived risk has a positive effect on the intention to use.

Hypothesis 6 (H6): Security and privacy have a positive effect on perceived risk.

2.4.3 Trust

Trust refers to individuals' positive expectations or confidence toward the other persons that he/she would perform an action as expected. Trust increases when positive expectation is satisfied. Trust decreases when positive expectation is met at a level below expectation, or not met. Individuals' faith toward intention and future

action would take place following appropriate behavior of honesty and ability (Ling, Daud, Piew, Keoy, & Hassan, 2011; Grazioli & Jarvenpaa, 2000).

Trust plays an important role in perceived risk that a user has toward online service providers in terms of security and personal information privacy. When the user finds out the features of security on the service provider's website, an intention of the service provider can be perceived with regard to security and personal information privacy during online transactions (Al-Adawi et al., 2005)(Chang and Chen, 2008; Zhu et al., 2009; Schnall et al., 2015; Ashoer, 2016). Examples of such transactions include security policy and electronic payments security. This creates more trust among the users. It increases the perception of trust among users, which helps reduce the risk of incomplete transactions. Online transactions are promoted. As a result, the following hypothesis is proposed.

Hypothesis 7a (H7a): Trust has a positive effect on perceived risk.

Previous studies also present trust in the view of users toward the government e-services system through the technology acceptance model (TAM). The model comes with the factor of perceived usefulness (Schnall et al., 2015; Abu-Shanab, 2017; Santhanamery and Ramayah, 2018; Sebetci, 2015; Pulungan and Imani, 2022) and perceived ease of use (Schnall et al., 2015; Hansen and Benson, 2018; Chan and Aklikokou, 2020). Examples of perceived usefulness are channels of response and system quality and effectiveness. Examples of perceived ease of use include easy navigation and fast response. Therefore, the following hypotheses are proposed.

Hypothesis 7b (H7b): Trust has a positive effect on perceived usefulness.

Hypothesis 7c (H7c): Trust has a positive effect on perceived ease of use.

2.4.4 Availability

Availability refers to a stable system that can respond to use whenever the users want. In the dimension of information technology, availability is regarded as a significant factor that leads to the use of electronic services. Song et al. (2009), Wanjara, and Ogembo (2024), and Yang et al (2014) studied the factor of availability

in the framework of the technology acceptance model. The factor was perceived usefulness from information technology. Karunasena and Deng (2012); Kim and Shin (2015), Gangwar (2020); Dutot, Bhatiasevi, and Bellallahom (2019) examined the factor of perceived ease of use. The technology acceptance model has been widely used and offers patterns of decision making on predicting the acceptance of information technology successfully. Therefore, there are two hypotheses that would be proposed.

Hypothesis 8a (H8a): Availability has a positive effect on perceived usefulness.

Hypothesis 8b (H8b): Availability has a positive effect on perceived ease of use.

2.4.5 Result Demonstrability

Result demonstrability is one of the external factors that has been developed in technology acceptance model 2. It is defined as a perception of individuals toward results that would be demonstrated after the use of information technology. Result demonstrability is an external factor that can influence perceived usefulness, which is consistent with the research of Mun et al. (2006), Gow, Wong, and Lim (2019), Hubert et al. (2019); Driediger and Bhatiasevi (2019). It can also affect the ease of use, which is in line with studies by Muthu, Thurasamy, Alzahrani, Alfarraj, and Alalwan (2016), Hubert et al. (2019), and Rouidi et al. (2022). These studies examined result demonstrability that can affect perceived usefulness and perceived ease of use. Ultimately, it results in interest or acceptance and usage of information technology. Thus, the following hypotheses are proposed.

Hypothesis 9a (H9a): Result demonstrability has a positive effect on perceived usefulness.

Hypothesis 9b (H9b): Result demonstrability has a positive effect on perceived ease of use.

2.4.6 Theory of Planned Behavior

The theory of planned behavior states that individuals' actions are influenced by the intention to act. There are 3 main factors of such influence, which are: attitude

toward the behavior, subjective norm, and perceived behavioral control. In this research, perceived behavioral control is the only factor that is incorporated in the conceptual framework of research (Chu and Wu, 2004; Kim-Soon, Ahmad, & Ibrahim, 2016; Taking and Chang, 2020; Hussain, & Alhabash, 2021; Kobylinska, 2022). This corresponds with Fishbein and Ajzen (2010), suggesting that self-perceived behavioral control is caused by an individual's belief toward the factors that may promote or hinder an action in question. It is an individual's assessment of performing the action in a suitable direction. To perform the action in question, individuals would consider the internal factors that facilitate that action. If the internal factors are well-prepared, the intention of individuals to perform the action occurs. On the other hand, if the internal factors are not prepared, the intention of individuals to perform that action will not take place. Therefore, the following hypothesis is proposed.

Hypothesis 10 (H10): Perceived behavioral control has a positive effect on the intention to use.

2.4.7 Information System Success

DeLone and McLean developed their model through the study of success factors of e-commerce. Some factors have been removed, and some are added to make the model perfect. In this research, system quality and service quality are adopted. System quality is explained as measurement of a system with the following variables: ease of use, stable system, speedy response, availability, usage convenience, and system adjustment. This is in line with research by Me (2014), explaining that system quality is a feature of information that contains four elements. These elements are: convenience of access, responses, flexibility of system, and integration of the system which can influence the intention to use. It is consistent with studies by Akram et al. (2019); Al-debei (2013); Sani, Khristiana, Zailani, & Husain (2020); Lu and Nguyen (2016); Masunga et al. (2020). Service quality is described as an individual who delivers service satisfaction to customers. It is the creation of results from providing good service to the customers, which results in customer satisfaction. Customer satisfaction helps establish a customer relationship that can encourage repeated purchases. This is called customer retention that can create a

customer base with a long-term relationship. Such relationships lead to customer loyalty (Parasuraman, Zeithaml and Berry, 1985). It is also in line with research by Al-debei (2013); Ayyash et al. (2013); Bwalya (2009); Rehman et al. (2012); Abdulkareem and Mohd Ramli (2010), Wallis, and Zhao (2018), stating that customer loyalty is a key to shaping the intention to use the service. Thus, two hypotheses are proposed.

Hypothesis 11 (H11): System quality has a positive effect on the intention to use.

Hypothesis 12 (H12): Service quality has a positive effect on the intention to use.

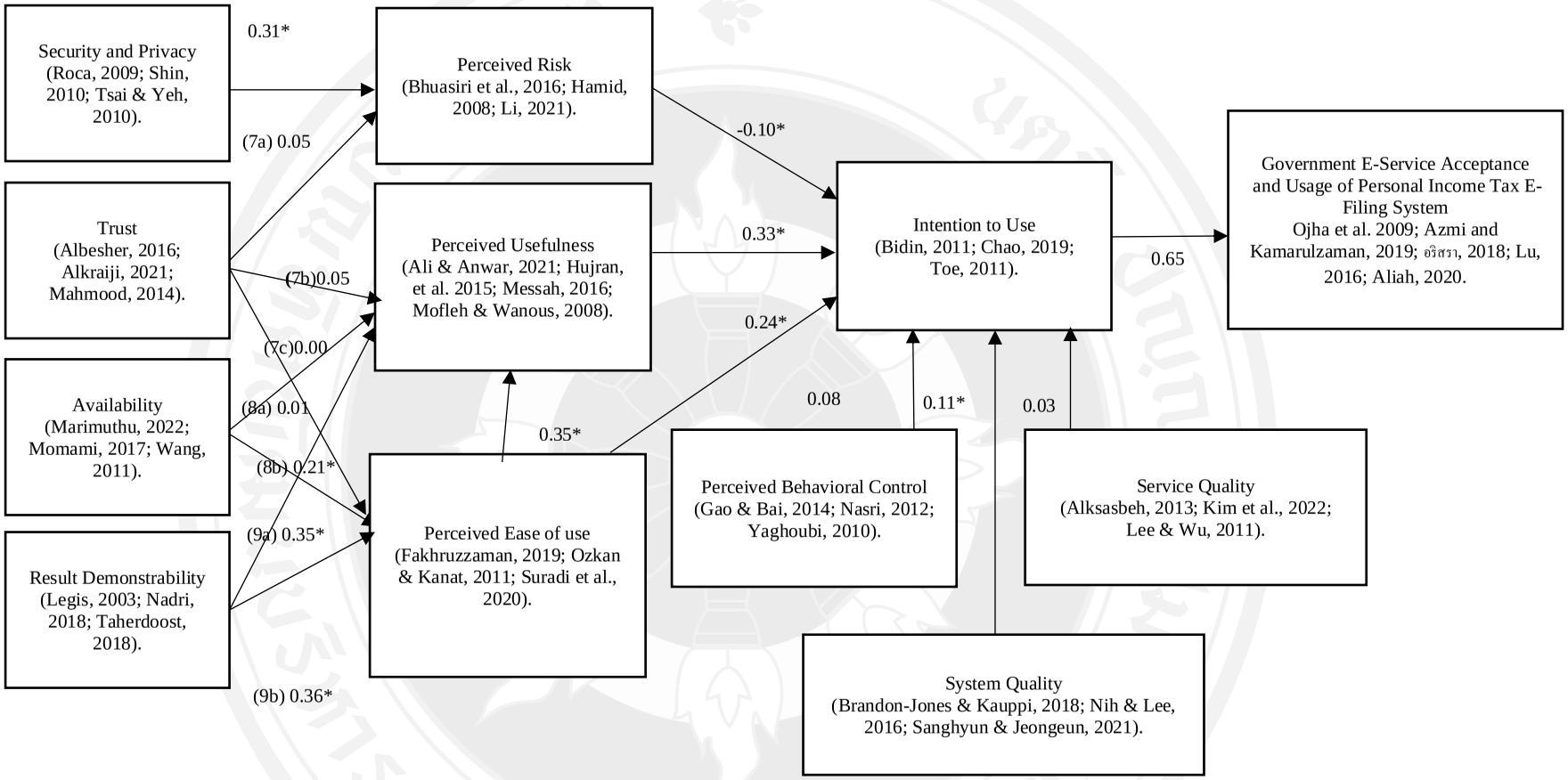

Figure 2.11 Research Hypotheses

Note: From the relationship between the theory and the research hypotheses above (Picture 2: Research Hypothesis)

*Statistically significant at the 0.05 level

Table 2.1 Summarizing the Research Hypotheses and Related Literature Reviews

Research Hypotheses	Researchers
Hypothesis 1 (H1): Perceived ease of use has a positive effect on perceived usefulness.	Lean, 2008; Connolly, 2011; Belanche ,2012; Yusup et al. 2015 (Che Azmi et al., 2012).
Hypothesis 2 (H2): Perceived ease of use has a positive effect on the intention to use.	Schaupp and Carter 2005; Tan et al. 2008; Vathanophas et al. 2009; Wangpipatwong et al. 2008; (Fakhruzzaman, 2019; Mensah, 2018).
Hypothesis 3 (H3): Perceived usefulness has a positive effect on the intention to use.	(Ali & Anwar, 2021; Phang et al., 2005). Carter, 2008; Chang et al. 2005; Hu et al. 2009; Lee and Lei, 2007; Lee and Rao, 2008; Hung and Chang, 2012;
Hypothesis 4 (H4): The intention to use has a positive effect on the acceptance and usage of personal income tax e-filling.	Rauniar et al. 2013; Chang et al.2019; Hooda et al. 2022; Jayawardena et al. 2022
Hypothesis 5 (H5): Perceived risk has a positive effect on the intention to use.	(Al-Adawi et al., 2005; Khasawneh et al., 2013; Suradi et al., 2020). Fu et al. 2006; Hung et al. 2006; Alsaghier et al. 2009
Hypothesis 6: Security and privacy have a positive effect on perceived risk.	Colesca, 2009; Liu and Zhou, 2010; Beldad et al. 2011; Ayyash et al. 2013; Abu-Shanab, 2014; Hoque et al. 2023
Hypothesis 7a (H7a): Trust has a positive effect on perceived risk.	Adawi et al. 2005; Chang and Chen, 2008; Zhu et al. 2009; Schnall et al. 2015; Ashoer, 2016
Hypothesis 7b (H7b): Trust has a positive effect on perceived usefulness.	Schnall et al. 2015; Abu-shanab, 2017; Santhanamery and Ramayah,

Research Hypotheses	Researchers
	2017; Chan and Aklikokou ,2020; Pulungan and Imani, 2022
Hypothesis 7c (H7c): Trust has a positive effect on perceived ease of use.	Schnall et al. 2015; Hansen and Benson, 2018; Chan and Aklikokou, 2020;
Hypothesis 8a (H8a): Availability has a positive effect on perceived usefulness.	Song et al. 2009; Wanjara, 2013; Yang et al. 2014.
Hypothesis 8b (H8b): Availability has a positive effect on perceived ease of use.	Shin, Kim, & Yuh, 2015; Gangwar 2020; Dutot, Bhatiasevi, & Bellallahom, 2019
	(Karunasena & Deng, 2012).
Hypothesis 9a (H9a): Result demonstrability has a positive effect on perceived usefulness.	Mun et al. 2006; Lee et al. 2011; Hubert et al. 2019; Driediger and Bhatiasevi, 2019
Hypothesis 9b (H9b): Result demonstrability has a positive effect on perceived ease of use.	Blut et al. 2016; Hubert et al. 2019; Rouidi et al. 2022
Hypothesis 10 (H10): Perceived behavioral control has a positive effect on the intention to use.	Chu and Wu, 2004; Kim-Soon et al. 2016; Taking and Chang, 2020; Hussain, 2021; Kobylinska, 2022
Hypothesis 11 (H11): System quality has a positive effect on the intention to use.	Al-debei, 2013; (Akram et al., 2019; Lu & Nguyen, 2016); Sani et al. 2020; Masunga et al. 2020
Hypothesis 12 (H12): Service quality has a positive effect on the intention to use.	(Bwalya, 2009; Rehman et al., 2012) Abdulkareem, & Mohd Ramli, 2022; Wallis, & Zhao, 2018; Ayyash et al. 2013; Al-debei, 2013

CHAPTER 3

RESEARCH METHODOLOGY

Both quantitative and qualitative research methods are adopted in this study in response to the objective of examining acceptance and usage of government e-services through the personal income tax e-filing system. This chapter is organized into 7 sections, as follows:

3.1 Research Design
3.2 Population and Sample
3.3 Research Instruments
3.4 Development of Research Instruments
3.5 Data Collection
3.6 Data Analysis
3.7 Statistics Used in the Data Analysis

3.1 Research Design

This research integrates both quantitative and qualitative approaches. A quantitative method is intended to investigate factors influencing the acceptance and usage of government e-services through a personal income tax e-filing system. Meanwhile, qualitative research explains the current situation of the personal income tax e-filing system. The results are expected to draw policy recommendations for development of the government's e-service personal income tax e-filing system. The research methodology is presented in the following sections.

3.1.1 Quantitative Research Method

1) Concepts, theories, academic documents, textbooks, and research articles related to factors influencing the acceptance and use of government e-services through a personal income tax e-filing system were studied.

2) A survey was conducted by means of an online questionnaire. It was designed with a five-point Likert scale, which measures the factors affecting acceptance and use of the government e-service through its personal income tax e-filing system.

3.1.2 Qualitative Research Method

1) Concepts, theories, academic documents, textbooks, and research articles concerned with qualitative research are reviewed.

2) Interviews were conducted with 9 key informants in person. Those key informants included experts, academic people, and senior experts who possess extensive experience in government e-services. Moreover, semi-structured interviews were carried out together with the quantitative research approach.

3.2 Population and Sample

This research employs quantitative and qualitative methods. The population and sample of each method are explained in the next paragraphs.

3.2.1 Quantitative Research Method

3.2.1.1 Population

Those who file personal income tax through the Revenue Department's website and who live in Metropolitan Bangkok are the population for this research.

3.2.1.2 Sample Size

Since the exact number in the population for this study is not known, the sample size is determined based on the following formula (W.G. Cochran, as cited in Kanlaya Wanichbancha, 2007):

$$n = \frac{P\,(1-P)\,Z^2}{d^2}$$

Where	n	Represents	Sample size
	P	Represents	The proportion of population at 0.5

Z Represents The confidence level or statistical significance at 0.05 or 1.96 (95 percent confidence level)

d Represents The margin of error at the 95 percent confidence level, or 0.05

Then, it's plugged into the formula:

$$n= \frac{0.05\ (1-0.50)1.96^2}{0.05^2}$$

$$= 384.16 = 385$$

Based on calculation, the sample size that has been derived is the number 385. To be more convenient with the analysis of data, a sample size of 400 is expected. However, to avoid incomplete or missing data in the questionnaires, a 20-percent increase in the sample size was applied (Gupta et al., 2016). Therefore, the required number of sample size in this research is 480.

3.2.1.3 Sampling Techniques

In this research, proportional stratified sampling is the technique chosen to select samples from the population. The technique is based on the strata with the following steps:

Step 1: The sample size is determined based on the population who files personal income tax documents on the Revenue Department's website.

Step 2: All administrative areas of Bangkok are divided into three groups based on designated locations (Office of the Permanent Secretary for the Bangkok Metropolitan Administration, 2017). Those groups include the inner city, the urban fringe, and the suburbs.

The inner city of Bangkok consists of 20 administrative areas. Those areas are: Phra Nakhon District, Pom Prap Sattru Phai District, Bang Rak District, Samphanthawong District, Pathumwan District, Yan Nawa District, Bangkok Yai District, Sathorn District, Bang Kho Laem District, Dusit District, Bang Sue District, Phaya Thai District, Ratchathewi District, Din Daeng District, Huai Khwang District,

Khlong Toei District, Chatuchak District, Thonburi District, Khlong San District, Bangkok Noi District, and Watthana District.

The urban fringe of Bangkok is composed of 18 administrative areas. Those areas include Phra Khanong District, Prawet District, Bang Khen District, Bang Kapi District, Saphan Sung District, Lat Phrao District, Bueng Kum District, Bang Phlat District, Phasi Charoen District, Sai Mai District, Chom Thong District, Rat Burana District, Suan Luang District, Bangna District, Thung Khru District, Bang Khae District, Wang Thonglang District, and Khan Na Yao District.

The suburbs of Bangkok include 11 administrative areas. Those areas are: Minburi District, Don Mueang District, Nok Chok District, Lat Krabang District, Taling Chan District, Nong Khaen District, Bang Khun Thian District, Lak Si District, Khlong Sam Wa District, Bang Bon District, and Thawi Watthana District.

Step 3: The samples are selected from the population by a lucky draw for the administrative areas of Bangkok. The results are presented as follows:

The inner city of Bangkok: 4 administrative areas are derived. These areas include Khlong Toei District, Phaya Thai District, Chatuchak District, and Huai Khwang District.

The urban fringe of Bangkok: 3 administrative areas are obtained. These areas contain Phra Khanong District, Prawet District, and Bang Kapi District.

The suburbs of Bangkok: 3 administrative are acquired. These areas are Minburi District, Don Mueang District, and Lak SI District.

Subsequently, quota sampling was performed. 48 samples are assigned to each selected administrative area. Thus, the total of samples in this research is 480.

Step 4: Accidental sampling is used to collect data from targeted respondents in the communities in Bangkok. Those communities are shopping malls, markets, government buildings, and communities.

3.2.2 Qualitative Research Method

Interviews were conducted on the issues of current government e-services, and policy recommendations for developing those government e-services. Nine key informants were recruited, including experts, academic people and senior experts with solid experience in government e-services.

3.3 Research Instruments

Because both quantitative and qualitative approaches are utilized in this research, the research instruments were developed separately for collecting the required data and information. For the quantitative research, a questionnaire was selected as the research instrument. In contrast, an interview form was developed to collect data for the qualitative research method.

3.3.1 Quantitative Research Method

A questionnaire was developed to include 64 questions/items in order to examine factors influencing the acceptance and use of government e-services through the personal income tax e-filing system. The research instrument consists of 3 sections.

Section 1: asks about general information of the respondents.

Section 2: assesses twelve factors influencing acceptance and use of government e-services through personal income tax e-filing. Those factors include security and privacy, trust, availability, result demonstrability, perceived risk, perceived usefulness, perceived ease of use, intention to use, perceived behavioral control, service quality, system quality, and acceptance and use of the personal income tax e-filing system.

Section 3: asks about policy recommendations for development of the personal income tax e-filing system. To gain more insight from the respondents, open-ended questions were utilized in this section.

Twelve variables or factors are measured by level of agreement on a five-point Likert scale. The scale ranges from 1 to 5 for factors influencing acceptance and usage of government e-services through the personal income tax e-filing system.

Scale	A level of agreement
5	Strongly agree
4	Agree
3	Moderately agree
2	Disagree
1	Strongly disagree

Table 3.1 Questionnaire

Section 2:	
Question Items of Security and Privacy	
1. You think that your personal information stored in the government e-service through the personal income tax e-filing system is safe.	Adapted from Kanaan et al. (2023), Sarabdeen et al. (2014), Munyoka et al. (2019), Alharbi (2014), and Hwang et al. (2012)
2. You think that your personal information will not be distorted.	
3. You think that your information provided on the government's e-service through the personal income tax e-filing system will not be exposed without willingness.	
4. You feel safe when you use the personal income tax e-filing system.	
5. The personal income tax e-filing system does not allow others to access your personal information.	
6. Government e-service through the personal income tax e-filing system is secure. It can protect your information by not allowing others access to your information without permission.	
7. Your personal information is protected when you access government e-services through the personal income tax e-filing system.	
Question Items of Trust	
8. You trust the technology of the personal income tax e-filing system that the Revenue Department has provided.	Adapted from Venkatesh et al. (2012), Alshehri et al. (2012), Chen et al. (2015), Wenjuan
9. Government e-services through the personal	

Section 2:	
income tax e-filing system can be trusted for online transactions. 10. You trust that government e-services through the personal income tax e-filing system is dependable. 11. The Internet system is dependable.	(2021), and Aranyossy (2022).
Question Items of Availability	
12. Government e-services through the personal income tax e-filing system can be accessed anytime and anywhere. 13. Government e-service through the personal income tax e-filing system is easily accessible. 14. The personal income tax e-filing website is always updated.	Adapted from Chatursen (2013), Bartram (2010), and Jinhua et al. (2010).
Question Items of Result Demonstrability	
15. Government e-service through the personal income tax e-filing system facilitates faster transactions. 16. Government e-service through the personal income tax e-filing system offers a channel for transactions. 17. Government e-service allows the people to have easier transactions with the government. 18. Government e-service through the personal income tax e-filing system corresponds to your current usage. 19. You have to spend a longer time using the government e-service through its personal income tax e-filing system (e.g., data entry). 20. You can easily access government e-services through the personal income tax e-filing system.	Adapted from Nadi (2012), Yuan et al. (2021), and Wong et al. (2019).

Section 2:	
21. You think that you can communicate with other people regarding the consequences of using the government's e-service through the personal income tax e-filing system.	
Question Items of Perceived Risk	
22. When using government e-services through the personal income tax e-filing system, you risk failure uploading personal income tax documents within the specified time period (Risk of outcomes). 23. When using government e-services through the personal income tax e-filing system, you risk your personal privacy (Privacy risk of personal information). 24. When using government e-services through the personal income tax e-filing system, you risk failure caused by the Revenue Department's Internet system (system risk). 25. You are worried about using the personal income tax e-filing system (Risk of users).	Adapted from Ejdys et al. (2019), Khattab et al. (2015), Bhuasiri et al. (2016)
Question Items of Perceived Usefulness	
26. Using government e-services through the personal income tax e-filing system improves the government services. 27. Using government e-services through the personal income tax e-filing system provides faster transactions. 28. Using government e-services through the personal income tax e-filing system creates more benefits for you. 29. You think that the Revenue Department's website	Adapted from Ayyash et al. (2011), Wangpipatwong et al. (2008), Horst et al. (2007), Alanezi et al. (2019), and Rabayah et al. (2022).

Section 2:	
for making personal income tax e-filing increases the effectiveness of transactions with the government. 30. Using the government's e-service for personal income tax e-filing helps reduce your costs of transportation. 31. Using the government's e-service for personal income tax e-filing helps reduce waiting time for services. 32. The outcome of using the government's e-service for personal income tax e-filing is empirically evident.	
Question Items of Perceived Ease of Use	
33. You think that the Revenue Department's website for making personal income tax e-filing is easy to operate. 34. You think that the Revenue Department's website for personal income tax e-filing can be self-taught for its use. 35. You think that the Revenue Department's website for personal income tax e-filing is up to date and convenient to use. 36. You can access the website for making personal income tax e-filing easily. 37. You can download a form or other kinds of documents for making personal income tax e-filing easily. 38. You can successfully conduct your transactions through the personal income tax e-filing system.	Adapted from Lopez-Sisniega (2009), Pavlou, & Vryonides (2009), Alryalat et al. (2013), Roy et al. (2016), Hussein et al. (2015), Falco et al. (2020), Almahamid et al. (2010).
Question Items of Intention to Use	
39. You consider using the government e-service for	Adapted from

Section 2:	
personal income tax e-filing as your first choice. 40. You intend to increase your use of the personal income tax e-filing service. 41. In the near future, you intend to use the personal income tax e-filing system.	Venkatesh et al. (2012); Alshehri et al. (2012)
Question Items of Perceived Behavioral Control	
42. You use your experience to conduct personal income tax e-filing. 43. You use your basic skills to conduct personal income tax e-filing. 44. You are able to use the personal income tax e-filing system via suggestions from Revenue Department officials. 45. You are able to use the personal income tax e-filing system through the user manual	Adapted from Hung, Ku, & Chien (2008), Susanto et al. (2017), and (Ozkan & Kanat, 2011)
Question Items of System Quality	
46. You can access the website to upload documents for personal income tax e-filing (Ease of use). 47. You can enter related links available at the homepage successfully. 48. Searching for the database to make personal income tax e-filing is speedy and responsive. 49. Information on the website for conducting personal income tax e-filing stays updated. 50. The website's guidelines help you conduct personal income tax e-filing clearly. 51. The personal income tax e-filing system helps you access information easier. 52. The personal income tax e-filing system is dependable.	Adapted from R. K. Sapru and Y. Sapru (2014), Smitha et al. (2012), Rani and Chakraverty (2012), and Lee-Geiller and Lee (2019).

Section 2:	
53. The personal income tax e-filing system is flexible.	
Question Items of Service Quality	
54. Staff are available to help when you face problems on the website's personal income tax e-filing service. 55. Services and the entire system of personal income tax e-filing can be used as usual. 56. The transactions of personal income tax e-filing are stable. 57. The personal income tax e-filing system can be accessed anytime. 58. The transactions of personal income tax e-filing are secure. The system protects your privacy. 59. The personal income tax e-filing system focuses on each user. 60. The personal income tax e-filing system will inform you whenever errors occur.	Adapted from Bhuvana and Vasantha (2020), Tilahun (2015), Gupta et al (2019), Chaudhary (2017).
Question Items of Accepting and Using the Personal Income Tax e-Filing System	
61. You intend to use the personal income tax e-filing system via the Internet network. 62. You intend to distribute information to others to help them use personal income tax e-filing via the Internet network. 63. You understand and realize more the importance of personal income tax e-filing via the Internet network. 64. You think that personal income tax e-filing via	Adapted from Kumar, Lall, & Mane, 2007; Gibert, Balestrini, & Littleboy, 2004 (Carter & Bélanger, 2005)

Section 2:

the Internet network is more effective beyond your expectations.

Section 3: Asking about policy recommendations for the development of the government e-service for the personal income tax e-filing system.

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3.3.2 Qualitative Research Method

A semi-structured interview protocol was used with nine key informants. Open-ended questions were developed to acquire the required data and information that could explain the current situation of government e-services and provide policy recommendations for the development of government e-service. The protocol is divided into two sections, as follows.

Section 1: Asking for general information from key informants.

Section 2: Asking for opinions from experts, academic people, and senior experts who have extensive knowledge of government e-services. Questions are related to the current situation and policy recommendations for the development of government e-services.

Interview forms (Adapted from Girish, Yates, & Williams, 2012; Abu Nadi, 2013):

1) What is the policy for developing government e-services through the personal income tax e-filing system?

2) What are the factors influencing acceptance and usage of government e-services through the personal income tax e-filing system?

3) What are the indicators that promote service quality of government e-services through the personal income tax e-filing system?

4) How does government e-service for the personal income tax e-filing system affect the government agency's performance?

5) What are ways to promote acceptance and usage of the government's e-service through the personal income tax e-filing system?

3.4 Development of Research Instruments

There are two types of research instruments developed for this research. The first type is an online questionnaire for a quantitative method of research, while the second one is a semi-structured interview. The details of developing the research instruments are described as follows

3.4.1 Online Questionnaire

An online questionnaire is employed in the quantitative method of research to explore the acceptance and usage of government e-services through its personal income tax e-filing system. The steps of constructing the online questionnaire are written as follows:

1) Creation of an online questionnaire is studied under the research focus, which is the acceptance and usage of government e-services through personal income tax e-filing.

2) The scope of the question items and variables that will be measured are defined. There are 12 variables in this research. Those variables include: security and privacy, trust, availability, result demonstrability, perceived risk, perceived usefulness, perceived ease of use, intention to use, perceived behavioral control, service quality, system quality, and acceptance and usage of government e-service through personal income tax e-filing.

3) The questionnaire is then developed, which is in line with the conceptual framework of research. After completion, the questionnaires are submitted to two experts to assess content validity and review coverage of the question items, which measure 12 variables.

4) When the reviewed questionnaires are returned, any needed revisions to the questionnaire are made in the areas of content and language. Moreover, the length of the questionnaire is considered, as time spent taking the questionnaire should be appropriate.

5) Pretesting of the questionnaire is conducted with thirty persons who share certain similarities with the target respondents. This step is expected to evaluate the reliability of the questionnaire. Reliability is further analyzed using the coefficient

alpha. To be reliable, the value of the reliability should be greater than 0.7 (Jump, 1978). SPSS is used to estimate the value of reliability of the questionnaire. The overall value of reliability of the questionnaire is thus calculated at 0.889, which indicates a high level of reliability. The results of reliability analysis can be interpreted as follows:

Reliability Coefficient	Interpretation
0.00-0.20	None or extremely low level
0.21-0.40	Low
0.41-0.70	Moderate
0.71-1.00	High

6) After the revisions, the questionnaire is used for data collection from the targeted respondents.

3.4.2 Semi-structured Interview

There are five steps in constructing the interviews. Those steps are explained in the following paragraphs.

1) Previous studies on government e-services of a personal income tax e-filing system are reviewed. Results of the review will lay the foundation for creating the interview form.

2) Policies and recommendations related to government e-services through the personal income tax e-filing system are studied from documents, textbooks, and research articles. Such studies serve as a guideline for establishing the interview form.

3) The interview form is constructed in accordance with the research objectives.

4) After the interview form has been finished, it is submitted to the thesis advisor for consideration of its correctness. Suggestions for improvement are also provided to make the interview form suitable for data collection.

5) The interview form that has been reviewed by the thesis advisor is revised. Subsequently, it is used to collect data from the key informants.

3.5 Data Collection

To collect both quantitative and qualitative data, the researcher asked for and received permission documents from the Graduate School of Public Administration of National Institute of Development Administration, which were subsequently given to those who use the government e-service for personal income tax e-filing and key informants. An explanation of research objectives, use of responses, characteristics of the questionnaire and interview form, and the researcher's name and address are put on the first page of the questionnaire and interview form. Regarding the explanation part of the questionnaire and interview form, it is stated that the responses will not be revealed individually, and not affect the respondents or key informants. The respondents and key informants' privacy are protected.

Data collection was conducted from January 2024 to March 2024 over three months. After the data collection, data screening was performed to prepare for data analysis. For the qualitative data, the researcher reviewed all responses during the interview. This ensured that the data and information provided by the key informants was understood in the same way between the researcher and the key informants.

3.6 Data Analysis

Research objective 1: It is expected that the data will explain ongoing use of the government's e-service through personal income tax e-filing. In response to the research objective, secondary data collected from relevant academic documents, textbooks, and research articles are reviewed, organized systematically, and subsequently verified.

Research objective 2: It is expected that the research will examine the factors influencing acceptance and use of the government's e-service system through personal income tax e-filing.

Both descriptive and inferential statistics are employed to perform data analysis for this research objective.

3.6.1 Analysis of the Questionnaire

SPSS Statistics is a statistical program used to analyze the data. Prior to the analysis, all responses are transformed into assigned codes and saved onto the program. The analytical methods include two statistical techniques, which are written in the following paragraphs.

1) Descriptive analysis is a basic statistic that analyzes the responses of the questionnaires. Descriptive statistics used in this research are explained as follows.

(1) Percentage explains the general information of the respondents, which is placed in the first section of the questionnaire. The respondents' general information includes gender, age, education, and income.

(2) Mean score describes the data obtained from Section 2 of the questionnaire. These data include the variables measuring security and privacy, trust, availability, result demonstrability, perceived risk, perceived usefulness, perceived ease of use, the intention to use, perceived behavioral control, service quality, system quality, and acceptance and usage of the government e-service through personal income tax e-filing.

(3) Standard deviation indicates the characteristics of the data in Section 2 of the questionnaire. The data are: security and privacy, trust, availability, result demonstrability, perceived risk, perceived usefulness, perceived ease of use, the intention to use, perceived behavioral control, service quality, system quality, and acceptance and usage of the government e-service through personal income tax e-filing.

2) Inferential statistics is used to assess the hypotheses.

(1) Hypothesis 1 (H1): Perceived ease of use has a positive effect on perceived usefulness.

(2) Hypothesis 2 (H2): Perceived ease of use has a positive effect on the intention to use.

(3) Hypothesis 3 (H3): Perceived usefulness has a positive effect on the intention to use.

(4) Hypothesis 4 (H4): The intention to use has a positive effect on acceptance and usage of the personal income tax e-filing system.

(5) Hypothesis 5 (H5): Perceived risk has a positive effect on the intention to use.

(6) Hypothesis 6 (H6): Security and privacy has a positive effect on perceived risk.

(7) Hypothesis 7a (H7a): Trust has a positive effect on perceived risk.

(8) Hypothesis 7b (H7b): Trust has a positive effect on perceived usefulness.

(9) Hypothesis 7c (H7c): Trust has a positive effect on perceived ease of use.

(10) Hypothesis 8a (H8a): Availability has a positive effect on perceived usefulness.

(11) Hypothesis 8b (H8b): Availability has a positive effect on perceived ease of use.

(12) Hypothesis 9a (H9a): Result demonstrability has a positive effect on perceived usefulness.

(13) Hypothesis 9b (H9b): Result demonstrability has a positive effect on perceived ease of use.

(14) Hypothesis 10 (H10): Perceived behavioral control has positive effect on the intention to use.

(15) Hypothesis 11 (H11): System quality has a positive effect on the intention to use.

(16) Hypothesis 12 (H12): Service quality has a positive effect on the intention to use.

Structural equation modelling (SEM) is adopted to predict the factors of acceptance and usage of government e-service through the personal income tax e-filing system. In other words, it is employed to assess the sixteen hypotheses.

3.7 Statistics Used in the Data Analysis

Statistics used in the data analysis are as follows.

1) Basic statistics include percentage, mean, and standard deviation.

(1) Percentage is indicated with the following formula:

$$\mathbf{P} = \frac{F}{N} \text{ X } 100$$

Where *P* represents percentage

F represents frequency of the numbers that would be transformed into percentage

N represents all frequencies

(2) Mean, with the formula suggested by Ferguson (1981):

$$\overline{X} = \frac{\sum X}{N}$$

Where X represents mean

$\sum X$ represents the summation of all scores

N represents the number of samples

(3) Standard deviation, with the formula suggested by Ferguson (1981):

$$S.D. = \sqrt{\frac{n\sum X^2 - (\sum X)^2}{n(n-1)}}$$

Where **S.D.** represents the value of standard deviation

$\sum_x 2$ represents the square root of the sum

$(\sum X)^2$ represents the total sum of square

n represents total number of observations

2) Statistics used in the testing of hypotheses

Structural equation modelling is applied. AMOS is a statistical technique that performs the analysis of structural equation modelling to find relationships between the model and the hypotheses. Those variables are measured on a five-point Likert scale for continuity of the data that have been collected. In addition, maximum likelihood (ML) is also used to investigate the direct and indirect effects among the variables.

Confirmatory factor analysis (CFA) is employed to assess construct validity and reliability, and measurement invariance. AMOS is a statistical technique for analyzing confirmatory factor analysis in this research. It is aimed at examining the effects of security and privacy, trust, availability, result demonstrability, perceived risk, perceived usefulness, perceived ease of use, intention to use, perceived behavioral control, service quality, and system quality on the acceptance and usage of the government e-service through personal income tax e-filing. In this regard, chi-square, relative chi-square, goodness of fit (GFI), comparative fit index (CFI), and the root mean square error of approximation (RMSEA) are the statistics used for confirmatory factor analysis (Savalei, Brace, & Fouladi, 2023).

Research objective 3: It is expected that the research will present recommendations about policy on development of government e-services through personal income tax e-filing. Semi-structured interviews are conducted with experts, academic people, and senior experts who have experience in government e-services.

An analysis of interviews: Data obtained from the interviews are analyzed in the following steps:

1) Step 1: Data validation is performed.

2) Step 2: The data are sorted and organized systematically. In other words, the data are systematically classified into groups (Crabtree & Miller, 2022).

3) Step 3: The data are analyzed by analytic induction, which is an analytical method that gathers data from phenomena for analysis to draw conclusions about the issues (Suk, 2021).

4) Step 4: The results of each phenomenon gained from the analysis are further written as the research results.

CHAPTER 4

ANALYSIS AND DISCUSSION

This research utilized a Mixed Method approach, using surveys as a tool for Quantitative research, and interviews as a tool for Qualitative research. The objective of the research was to explain the current situation of using electronic systems to submit personal income tax returns to the government. The study aimed to examine factors influencing the acceptance and use of electronic systems for tax filing, and to develop policy recommendations for improving government services through electronic systems. The research utilized Technology Acceptance Models 1-3 (TAM1-3), the Theory of Planned Behavior (TPB), and the Information System Success Model (IS). The sampling method used was Proportional Stratified Sampling, with the sample group being individuals who file their tax returns through the website of the Revenue Department, totaling 480 respondents. The survey was divided into three parts as follows:

Part 1: General Information of Survey Respondents

Part 2: Survey on factors influencing the acceptance and use of electronic systems for tax filing, using a 5-level Likert Rating Scale.

Part 3: Testing of Hypotheses

Statistical analysis was conducted using Descriptive Statistics to describe the characteristics of the sample group, including basic statistics such as percentages, means, maximum and minimum values, and standard deviations. The study also utilized Structural Equation Modeling (SEM) with the AMOS program to test the relationships between the model variables and hypotheses of the study. All variables were measured using a 5-level Likert scale, and Confirmatory Factor Analysis (CFA) was conducted to confirm the following components of the model.

1) General information of survey respondents.

2) Information on factors influencing acceptance and use of government services through electronic systems for filing personal income tax returns.

3) Analysis of the relationship pathways and testing of hypotheses.

4.1 Part 1: General Information of Survey Respondents

Analysis of the general information of survey respondents includes gender, age, education level, average monthly income, and devices used to access government services through electronic systems for filing personal income tax returns, as shown in the following table:

Table 4.1 General Information of Survey Respondents

General Information		Number of People (n)	Percentage (%)
Gender	Male	305	63.50
	Female	175	36.50
Age	18 - 25 years	47	9.80
	26 - 35 years	212	44.20
	36 - 60 years	221	46.00
Level of education	Less than high school	76	15.83
	High school diploma	3	0.62
	Associate's degree	27	5.63
	Bachelor's degree	76	15.83
	Master's degree	291	60.63
	Higher than a Master's degree	7	1.46
Average monthly income	10,001 - 15,000 baht	41	8.54
	15,001 - 30,000 baht	164	34.17
	30,001 - 45,000 baht	175	36.46
	> 45,000 baht	100	20.83

General Information		Number of People (n)	Percentage (%)
The device used to access government services through electronic systems for filing income taxes.	Smartphone	212	44.17
	Desktop computer	130	27.08
	Laptop computer	95	19.79
	Tablet	43	8.96
Total		**480**	**100.00**

From Table 4.1, general information shows that the majority of the sample group was males, accounting for 63.50%, while females accounted for 36.50%. The majority of the sample group were aged between 36-60 years, accounting for 46.00%, followed by those aged 26-35 years at 44.20%, and the least being those aged 18-25 years at 9.80%. The majority had education level at a Master's degree, accounting for 60.63%, followed by those with education levels lower than high school and bachelor's degree, both at 15.83%, with the least being those with high school/vocational certificate at 0.62%. In terms of monthly income, the majority earned between 30,001-45,000 baht, accounting for 36.46%, followed by those earning between 15,001-30,000 baht at 34.17%, and the least earning between 10,001-15,000 baht at 8.54%. Regarding the devices used to access government services through the electronic system for filing personal income tax, the majority use smartphones at 44.17%, followed by desktop computers at 27.08%, and the least being tablets at 8.96%.

4.2 Part 2: Survey on Factors Influencing the Acceptance and Use of Electronic Systems for Tax Filing

As for Part 2, information on factors influencing the acceptance and use of government services through the electronic system for filing personal income tax for

ordinary individuals includes the following factors: security and privacy factors, trust factors, usability factors, perceived outcome factors, risk perception factors, perceived benefit factors, perceived ease of use factors, intention to use factors, perceived self-efficacy factors, service quality factors, system quality factors, and factors influencing the acceptance and use of government services through the electronic system for filing personal income tax for ordinary individuals. Details are as follows:

Table 4.2 Factors Affecting Acceptance and Use of Government Services through Electronic Systems for Individual Income Tax Filing

Factors Influencing Acceptance and Use of Government Services Through Electronic Systems in Filing Personal Income Tax Returns	**MIN**	**MAX**	**$\bar{x}$**	**SD**	**Results**
1. Factors of safety and privacy	2	5	3.72	0.52	Great
2. Factors of trust	2	5	3.56	0.53	Great
3. Factors of usability	2	5	3.75	0.57	Great
4. Factors of observed outcomes	2	5	3.79	0.47	Great
5. Factors of risk awareness	2	5	3.53	0.74	Great
6. Factors of perceived benefits	3	5	3.85	0.45	Great
7. Factors of perceived ease of use	3	5	3.77	0.47	Great
8. Factors of intention to use	2	5	3.96	0.53	Great
9. Factors of self-control ability	2	5	3.76	0.56	Great
10. System quality factors	2	5	3.82	0.44	Great
11. Service quality factors	2	5	3.80	0.47	Great
12. Acceptance and use of government services through electronic tax filing for individuals	2	5	3.92	0.52	Great
Total	**2.83**	**5.00**	**3.79**	**0.36**	**Great**

From Table 4.2, factors influencing the acceptance and use of government services through electronic systems for individual income tax filing were found to be

high overall (“X” = 3.79, SD = 0.36). When considering each aspect, it was found that all aspects were at a high level, with the highest average value being the factor of perceived usefulness (“X” = 3.96, SD = 0.53), followed by acceptance and use of government services through electronic systems for individual income tax filing (“X” = 3.92, SD = 0.52), and the lowest being the factor of perceived risk (“X” = 3.53, SD = 0.74).

Table 4.3 Shows Factors Influencing the Acceptance and Use of Government Services Through Electronic Systems for Individual Income Tax Filing, Regarding Factors of Security and Privacy

Factors of Security and Privacy	MIN	MAX	$\bar{x}$	SD	Result
1. Do you think that personal information in the government service system through electronic filing of individual income tax returns is secure?	1	5	3.71	0.67	Great
2. You think that the personal information you provide will not be distorted.	2	5	3.67	0.72	Great
3. Do you think that the information provided through the government service via electronic system for filing personal income tax returns will not be disclosed if not willing?	1	5	3.68	0.76	Great
4. You feel safe using the government's electronic system to file personal income tax returns.	1	5	3.69	0.73	Great
5. Providing government services through electronic systems for individual income tax filing will not allow other individuals to access your personal information.	2	5	3.79	0.78	Great
6. Providing government services through electronic systems for individuals to file income tax returns has security features to	2	5	3.79	0.78	Great

Factors of Security and Privacy	MIN	MAX	$\bar{x}$	SD	Result
protect the public's information from unauthorized access.					
7. I have control over my personal data when using government services through the electronic system for filing individual income tax returns.	2	5	3.70	0.72	Great
Total	**2**	**5**	**3.72**	**0.52**	**Great**

From Table 4.3, factors influencing the acceptance and use of government services through electronic systems for individual income tax filing, in terms of security and privacy, were found to be high ("X" = 3.72, SD = 0.52). When considering each item individually, all items were rated as high. The item with the highest average score was that government service provided through electronic systems for individual income tax filing shows characteristics of security to protect citizens' data from unauthorized access, and the government service provided through electronic systems for individual income tax filing does not allow others to access your personal information ("X" = 3.79, SD = 0.78). Following that, respondents believed that personal data in the system used for government services through electronic systems for individual income tax filing is secure ("X" = 3.71, SD = 0.67), and least of all, respondents believed that the personal data provided will not be tampered with ("X" = 3.67, SD = 0.72).

Table 4.4 Shows the Factors Influencing Acceptance and Use of Government Services Through Electronic Systems for Individual Income Tax Filing, in Terms of Trust

Factors of Trust	MIN	MAX	$\bar{x}$	SD	Result
8. You have confidence in the technology that the Revenue Department uses to provide electronic tax filing services for individual taxpayers.	2	5	3.68	0.67	Great

Factors of Trust	MIN	MAX	$\bar{x}$	SD	Result
9. The electronic tax filing services provided by the government can be trusted for online transactions.	1	5	3.54	0.72	Great
10. You have confidence that the electronic tax filing services provided by the government for individual taxpayers are reliable.	2	5	3.53	0.76	Great
11. The internet system is trustworthy.	1	5	3.50	0.73	Great
Total	**2**	**5**	**3.56**	**0.78**	**Great**

From Table 4.4, factors influencing acceptance and use of government services through electronic systems for individual income tax filing, the trust factor was found to be high ($\bar{X}$=3.56, SD=0.78). When considering each item, all were at a high level, with the highest average being trust in the technology used by the Revenue Department to provide government services through electronic systems for individual income tax filing ($\bar{X}$=3.68, SD=0.67). Following that was the ability to trust government services through electronic systems for individual income tax filing for online transactions ($\bar{X}$=3.54, SD=0.72), and the least was trustworthiness of the internet system ($\bar{X}$=3.50, SD=0.73).

Table 4.5 For Factors Influencing Acceptance and Use of Government Services Through Electronic Systems for Individual Income Tax Filing, the Availability Factor is Considered

Availability Factor	MIN	MAX	$\bar{x}$	SD	Result
12. The government's electronic system for filing personal income tax returns can provide services online at all times.	1	5	3.75	0.73	Great
13. The government's electronic system for filing personal income tax returns is easily accessible to ordinary individuals.	2	5	3.84	0.69	Great

Availability Factor	MIN	MAX	$\bar{x}$	SD	Result
14. The website is constantly updated for providing government services through the electronic system for filing personal income tax returns.	2	5	3.64	0.70	Great
Total	**2**	**5**	**3.75**	**0.57**	**Great**

From Table 4.5, factors influencing acceptance and use of government services through electronic systems for individual income tax filing, it was found that the Availability factor was at a high level (mean=3.75, SD=0.57). When considering each item, it was found that all items were at a high level. The item with the highest average was the ease of access to government services through electronic systems for individual income tax filing (mean=3.84, SD=0.69). Following that was the ability of government services through electronic systems for individual income tax filing to be available online at all times (mean=3.75, SD=0.73), and the lowest was the constant improvement of the website for government services through electronic systems for individual income tax filing (mean=3.64, SD=0.70).

Table 4.6 Shows the Factors Influencing Acceptance and Use of Government Services Through Electronic Systems for Individual Income Tax Filing, with the Resulting Factors

Result Demonstrability Factor	MIN	MAX	$\bar{x}$	SD	Result
15. Using State services through the electronic system to file personal income tax returns helps to expedite transactions.	2	5	3.74	0.70	Great
16. Using State services through the electronic system to file personal income tax returns helps to improve the quality of transaction channels.	2	5	3.79	0.69	Great
17. Using State services through the electronic system makes transactions with the	2	5	3.79	0.69	Great

Result Demonstrability Factor	MIN	MAX	$\bar{x}$	SD	Result
government easier.					
18. Using State services through the electronic system to file personal income tax returns is in line with your current usage needs.	2	5	3.84	0.70	Great
19. Using State services through the electronic system to file personal income tax returns for individuals takes too much time to process (e.g. data entry).	2	5	3.71	0.74	Great
20. It is not difficult for individuals to use State services through the electronic system to file personal income tax returns.	2	5	3.88	0.71	Great
21. Do you think you can communicate with others about the consequences of using State services through the electronic system to file personal income tax returns for individuals?	1	5	3.80	0.73	Great
Total	**2**	**5**	**3.79**	**0.47**	**Great**

From Table 4.6, factors influencing acceptance and use of government services through electronic systems for individual income tax filing, the results show that overall satisfaction is high ($\bar{X}$=3.79, SD=0.47). When considering each item individually, all items are rated as high. The item with the highest average score is that it is not difficult for you to use the government service system through electronic systems for individual income tax filing ($\bar{X}$=3.88, SD=0.71). Following that is that using government services through electronic systems for individual income tax filing meets your current usage needs ($\bar{X}$=3.84, SD=0.70), and the lowest is that using government services through electronic systems for individual income tax filing requires too much time for operations (such as data entry) ($\bar{X}$=3.71, SD=0.74).

Table 4.7 Shows Factors Influencing Acceptance and Use of Government Services Through Electronic Systems for Individual Income Tax Filing in Terms of Risk Perception

Perceived Risk Factor	MIN	MAX	$\bar{x}$	SD	Result
22. Using government services through electronic systems to file personal income tax returns, you risk failing to submit the tax return within the specified time (outcome risk).	1	5	3.55	0.93	Great
23. Using government services through electronic systems to file personal income tax returns, you risk losing personal data (privacy data risk).	2	5	3.47	0.82	Great
24. Using government services through electronic systems to file personal income tax returns, you may encounter risks from errors that occur in the internet system of the Revenue Department (system risk).	1	5	3.69	0.96	Great
25. You may have concerns about the experience of using the electronic system to file personal income tax returns (user risk).	1	5	3.39	0.80	Medium
Total	**2**	**5**	**3.53**	**0.74**	**Great**

From Table 4.7, factors influencing the acceptance and use of government services through electronic systems for individual income tax filing, it was found that the risk perception factor was at a high level (mean = 3.53, SD = 0.74). When considering each item, it was found to be at a moderate to high level, with the highest average being the risk of errors from the internet system of the Revenue Department (system risk) (mean = 3.69, SD = 0.96). Following that was the risk of failing to submit tax returns on time (outcome risk) (mean = 3.55, SD = 0.93), and the least

concern was about the user experience in using the electronic system for tax filing (user risk) (mean = 3.39, SD = 0.80).

Table 4.8 Shows the Factors Influencing Acceptance and Use of Government Services Through Electronic Systems for Individual Income Tax Filing in Terms of Perceived Usefulness Factor

Perceived Usefulness Factor	MIN	MAX	$\bar{x}$	SD	Result
26. Using government services through electronic systems to file personal income tax returns will improve the quality of government services.	2	5	3.72	0.67	Great
27. Using government services through electronic systems to file personal income tax returns helps you to conduct transactions more quickly.	1	5	3.81	0.71	Great
28. Using government services through electronic systems to file personal income tax returns helps you to receive more benefits from the government.	2	5	3.77	0.70	Great
29. Do you think that the website of the Revenue Department for filing personal income tax returns helps to increase the efficiency of government transactions?	2	5	3.78	0.69	Great
30. Using government services through electronic systems to file personal income tax returns helps you to reduce travel expenses.	2	5	4.01	0.65	Great
31. Using government services through electronic systems to file personal income tax returns helps you save time waiting for service.	2	5	3.99	0.68	Great

Perceived Usefulness Factor	MIN	MAX	$\bar{x}$	SD	Result
32. The results of using government services through electronic systems to file personal income tax returns can be displayed publicly.	2	5	3.84	0.68	Great
Total	**3**	**5**	**3.85**	**0.45**	**Great**

From the Table of 4.8 factors influencing the acceptance and use of electronic government services for individual income tax filing, it was found that perceived usefulness was high ($\bar{X}$=3.85, SD=0.45). When considering each item, all were found to be high, with the highest average being the use of electronic government services for individual income tax filing helping to reduce travel expenses ($\bar{X}$=4.01, SD=0.65). Following that was the use of electronic government services for individual income tax filing helping to reduce waiting time for service ($\bar{X}$=3.99, SD=0.68), and the lowest was the use of electronic government services for individual income tax filing improving the quality of government service ($\bar{X}$=3.72, SD=0.67).

Table 4.9 Shows 9 Factors That Affect the Acceptance and Use of Government Services Through Electronic Systems for Individual Income Tax Filing, Factors Include Perceived Ease of Use

Perception Factors for Ease of Use	MIN	MAX	$\bar{x}$	SD	Result
33. Do you think the website of the Revenue Department for individual income tax filing is easy to use?	2	5	3.89	0.65	Great
34. Do you think the website of the Revenue Department for individual income tax filing is easy to learn how to use on your own?	2	5	3.62	0.75	Great
35. Do you think the website of the Revenue Department for individual income tax filing is user-friendly?	2	5	3.71	0.66	Great
36. Can you easily log onto the website for	2	5	3.76	0.63	Great

Perception Factors for Ease of Use	MIN	MAX	$\bar{x}$	SD	Result
individual income tax filing?					
37. Can you easily download forms or other documents for transactions through the individual income tax filing system?	2	5	3.86	0.69	Great
38. Can you successfully complete transactions through the individual income tax filing system?	1	5	3.80	0.65	Great
Total	**3**	**5**	**3.77**	**0.47**	**Great**

From Table 4.9, factors influencing the acceptance and use of government services through electronic systems for individual income tax filing, the factor of perceived ease of use was found to be high ("X" = 3.77, SD = 0.47). When considering each item individually, all items were rated as high. The item with the highest average score was that you think the website of the Revenue Department for individual income tax filing is easy to use ("X" = 3.89, SD = 0.65). Following that, you can easily download forms or other documents for transactions through the system for individual income tax filing ("X" = 3.86, SD = 0.69), and the lowest was that you think the Revenue Department website for individual income tax filing can be learned for use on your own ("X" = 3.62, SD = 0.75).

Table 4.10 Shows Factors Influencing the Acceptance and Use of Government Services Through Electronic Systems for Individual Income Tax Filing, Focusing on the Factor of the Intention to Use It

Intention to Use Factor	MIN	MAX	$\bar{x}$	SD	Result
39. You consider using the service of filing personal income tax returns electronically as the first option.	2	5	3.86	0.68	Great
40. You intend to increase the use of the service for filing personal income tax returns electronically.	1	5	4.00	0.66	Great

Intention to Use Factor	MIN	MAX	$\bar{x}$	SD	Result
41. In the future, you intend to use the service of filing personal income tax returns electronically.	1	5	4.02	0.67	Great
Total	**2**	**5**	**3.96**	**0.53**	**Great**

From Table 4.10, the factors influencing the acceptance and use of electronic government services for individual income tax filing are perceived ease of use, which was at a high level ($\bar{X}$=3.96, SD=0.53). When considering each item, all were at a high level, with the highest average being the intention to use electronic tax filing services in the future ($\bar{X}$=4.02, SD=0.67), followed by the intention to increase the use of electronic tax filing services ($\bar{X}$=4.00, SD=0.66), and the lowest being considering electronic tax filing services as the first choice ($\bar{X}$=3.86, SD=0.68).

Table 4.11 Shows Factors Influencing the Acceptance and Use of Electronic Government Services for Individual Income Tax Filing in Terms of Perceived Behavioral Control

Perceived Behavioral Factor	MIN	MAX	$\bar{x}$	SD	Result
42. You use your experience when using the personal income tax filing service via electronic systems.	1	5	3.93	0.68	Great
43. You use basic skills when using the personal income tax filing service via electronic systems.	1	5	3.96	0.73	Great
44. You are able to use the personal income tax filing service via electronic systems based on recommendations from Revenue Department officials.	1	5	3.57	0.86	Great
45. You are able to use the personal income tax filing service through the User's Manual.	1	5	3.58	0.79	Great
Total	**2**	**5**	**3.76**	**0.56**	**Great**

From Table 4.11, factors influencing the acceptance and use of electronic government services for individual income tax filing, the perception of self-control ability was found to be high ($\bar{X}$=3.76, SD=0.56). Considering each item, all were at a high level. The item with the highest average was the basic skills you have for using the electronic system for individual income tax filing ($\bar{X}$=3.96, SD=0.73), followed by the experience you have for using the electronic system for individual income tax filing ($\bar{X}$=3.93, SD=0.68), and the lowest was the ability to use the electronic system for individual income tax filing based on recommendations by Revenue Department officials ($\bar{X}$=3.57, SD=0.86).

Table 4.12 Factors Influencing the Acceptance and Use of Electronic Government Services for Individual Income Tax Filing, Regarding Quality of the System

System Quality Factor	MIN	MAX	$\bar{x}$	SD	Result
46. You can easily access the website to file personal income tax forms.	1	5	3.72	0.68	Great
47. You can successfully access related links on the homepage.	2	5	3.83	0.67	Great
48. Searching the database within the system for filing personal income tax forms is responsive.	2	5	4.01	0.71	Great
49. The information within the system for filing personal income tax forms is constantly updated.	2	5	3.84	0.78	Great
50. The website's practices can help you use the system for filing personal income tax forms clearly.	2	5	3.91	0.69	Great
51. The system for filing personal income tax forms allows you to access information easily.	1	5	3.81	0.67	Great
52. The system for filing personal income	2	5	3.69	0.68	Great

System Quality Factor	MIN	MAX	$\bar{x}$	SD	Result
tax forms is reliable.					
53. The system for filing personal income tax forms is flexible	1	5	3.74	0.69	Great
Total	**2**	**5**	**3.82**	**0.44**	**Great**

From Table 4.12, factors affecting the acceptance and use of electronic government services for individual income tax filing, the quality of the system was found to be high ($\bar{X}$=3.82, SD=0.44). When considering each item, all were at a high level, with the highest average being the ability of the system to quickly respond to searches for information within the individual income tax filing system ($\bar{X}$=4.01, SD=0.71). Following that, practical guidelines of the website can help users clearly use the individual income tax filing system ($\bar{X}$=3.91, SD=0.69), and the least was the reliability of the individual income tax filing system ($\bar{X}$=3.69, SD=0.68).

Table 4.13 Factors Affecting the Acceptance and Use of Electronic Government Services for Individual Income Tax Filing, in Terms of Service Quality

Service Quality Factors	MIN	MAX	$\bar{x}$	SD	Result
54. There are staff available to provide advice when encountering issues while using the personal income tax filing service through the website.	1	5	3.53	0.83	Great
55. The service and overall system for filing personal income tax returns can be used normally.	2	5	3.98	0.72	Great
56. Transactions through the system for filing personal income tax returns are stable.	1	5	3.73	0.68	Great
57. The service for filing personal income tax returns can be accessed at any time when needed.	1	5	3.84	0.73	Great
58. Transactions within the system for filing	1	5	3.78	0.71	Great

Service Quality Factors	MIN	MAX	$\bar{x}$	SD	Result
personal income tax returns are secure and protect privacy.					
59. The system for filing personal income tax returns is personalized.	2	5	3.79	0.66	Great
60. The system for filing personal income tax returns will always notify users of any errors that occur.	2	5	3.74	0.76	Great
Total	**2**	**5**	**3.80**	**0.47**	**Great**

From Table 4.13, factors influencing acceptance and use of government services through electronic systems for individual income tax filing, in terms of service quality factors, were found to be high (“X” = 3.80, SD = 0.47). When considering each item, all items were at a high level. The item with the highest average score was: the service and overall system of filing individual income tax returns can be used normally (“X” = 3.98, SD = 0.66), followed by the ability to access the system for filing individual income tax returns at any time when needed (“X” = 3.84, SD = 0.73), while the lowest was having staff available for consultation when encountering problems while using the service for filing individual income tax returns through the website (“X” = 3.53, SD = 0.83).

Table 4.14 Factors Influencing Acceptance and Use of Government Services Through Electronic Systems for Individual Income Tax Filing

Factors of Acceptance and Use of Government Services Through Electronic Systems	MIN	MAX	$\bar{x}$	SD	Result
61. Do you intend to use the system to file personal income tax returns through the internet network?	1	5	3.86	0.69	Great
62. Do you intend to disseminate and provide information to stakeholders on the	2	5	3.93	0.66	Great

Factors of Acceptance and Use of Government Services Through Electronic Systems	MIN	MAX	$\bar{x}$	SD	Result
use of the system to file personal income tax returns through the internet network?					
63. Do you understand and realize the importance of using the system to file personal income tax returns through the internet network more?	2	5	3.97	0.62	Great
64. Do you think that using the system to file personal income tax returns through the internet network is more efficient than expected?	2	5	3.53	0.71	Great
Total	**2**	**5**	**3.92**	**0.52**	**Great**

From Table 4.14, it is found that the acceptance and use of government services through electronic systems for individual income tax filing was at a high level (mean=3.92, SD=0.52). When considering each item individually, all items were at a high level. The item with the highest average was: you understand and realize that the importance of using the electronic system for filing individual income tax returns through the internet network has increased significantly (mean=3.97, SD=0.62). Following that was your intention to disseminate and provide information to stakeholders in using the electronic system for filing individual income tax returns through the internet network (mean=3.93, SD=0.66), while the lowest was that you think that using the electronic system for filing individual income tax returns through the internet network is more efficient than expected (mean=3.53, SD=0.71).

4.3 Part 3: Testing of Hypotheses

Results of the analysis of the Structural Model using Structural Equation Modeling.

In analyzing the Structural Model using analysis of the structural equation model of factors influencing acceptance and use of government services through electronic systems for filing individual income tax returns, the results are as shown in Figure 4.1. The researchers have defined diverse variables to make it easier to understand, as follows:

A Represents the factor of security and privacy

B Represents the factor of trust

C Represents the factor of usability

D Represents the factor of perceived outcomes

E Represents the factor of risk perception

F Represents the factor of perceived benefits

G Represents the factor of perceived ease of use

H Represents the factor of intention to use

I Represents the factor of self-efficacy

J Represents the factor of system quality

K Represents the factor of service quality

Y Represents acceptance and use of government services through electronic systems for filing individual income tax returns.

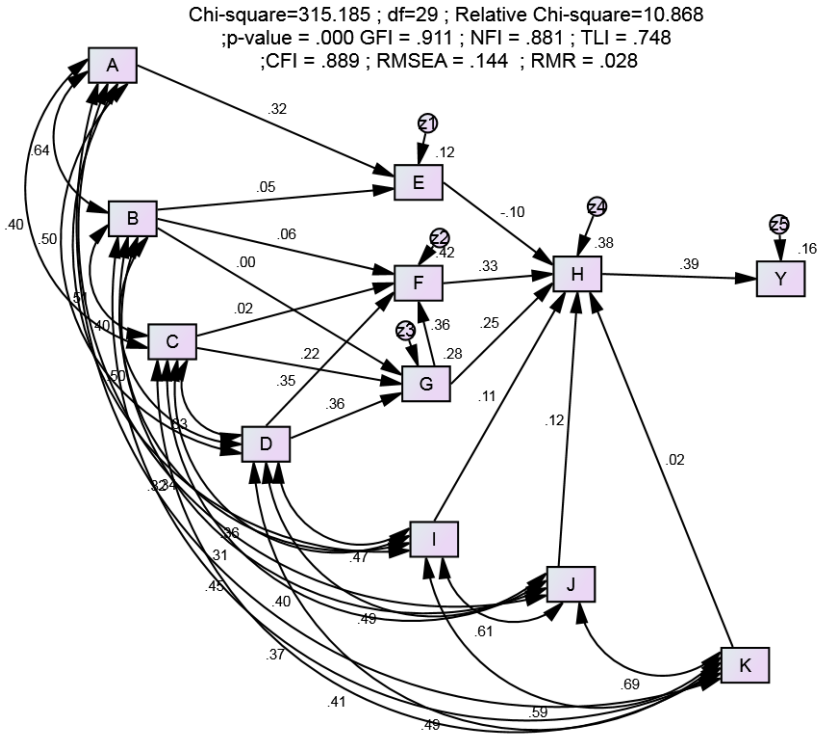

Figure 4.1 Shows the Initial Model of the Structural Equation Model of Factors Influencing Acceptance and Use of Government Services through Electronic Systems for Individual Income Tax Filing

Analysis of the initial model of the structural equation model of factors influencing acceptance and use of government services through electronic systems for individual income tax filing was conducted by comparing the index of data fit with the criteria. Results of the analysis are shown in Table 4.15.

Table 4.15 Shows the Index of Data Fit of the Initial Model of the Structural Equation Model of Factors Influencing Acceptance and Use of Government Services Through Electronic Systems for Individual Income Tax Filing with Perceptual Data

Criteria for Goodness of Fit Index (n = 480)		**Fit index**	**Meaning**
Degrees of freedom (Df)	> 0.00	29	Not conforming
P-value	> 0.05	0.000	to goodness-of-fit
Chi-square/degrees of freedom (χ2/df)	< 2.00	10.868	
Goodness-of-Fit Index (GFI)	> 0.90	0.911	
Comparative Fit Index (CFI)	> 0.90	0.889	
Root Mean Square Residual (RMR)	< 0.05	0.028	
Root Mean Square Error of Approximation (RMSEA)	< 0.05	0.144	

From Figure 4.1 and Table 4.15, the results from estimating the model by analyzing the model structure in terms of congruence with observational data show that the Chi-square (χ2) value = 315.185, degrees of freedom (df) = 29, P-value = 0.000 (according to the standard, it should be greater than 0.05), χ2/df = 10.868 (according to the standard, it should be less than 2), GFI = 0.911 (according to the standard, it should be greater than 0.90), CFI = 0.889 (according to the standard, it should be greater than 0.90), RMR = 0.028 (according to the standard, it should be less than 0.05), and RMSEA = 0.144 in order (according to the standard, it should be less than 0.05). These indices indicate that the model is congruent with the theoretical model as shown in the table above. It was found that 4 values did not meet the criteria, which were χ2/df = 10.868, GFI = 0.911, RMSEA = 0.144, and p-value = 0.000, which did not fully conform to the observational data because the values obtained did not meet all the criteria. The researchers then adjusted the model to allow for some correlation errors.

The final model analysis of the structural equation model of factors influencing acceptance and use of government services through electronic systems for filing personal income tax returns is shown in Figure 4.2.

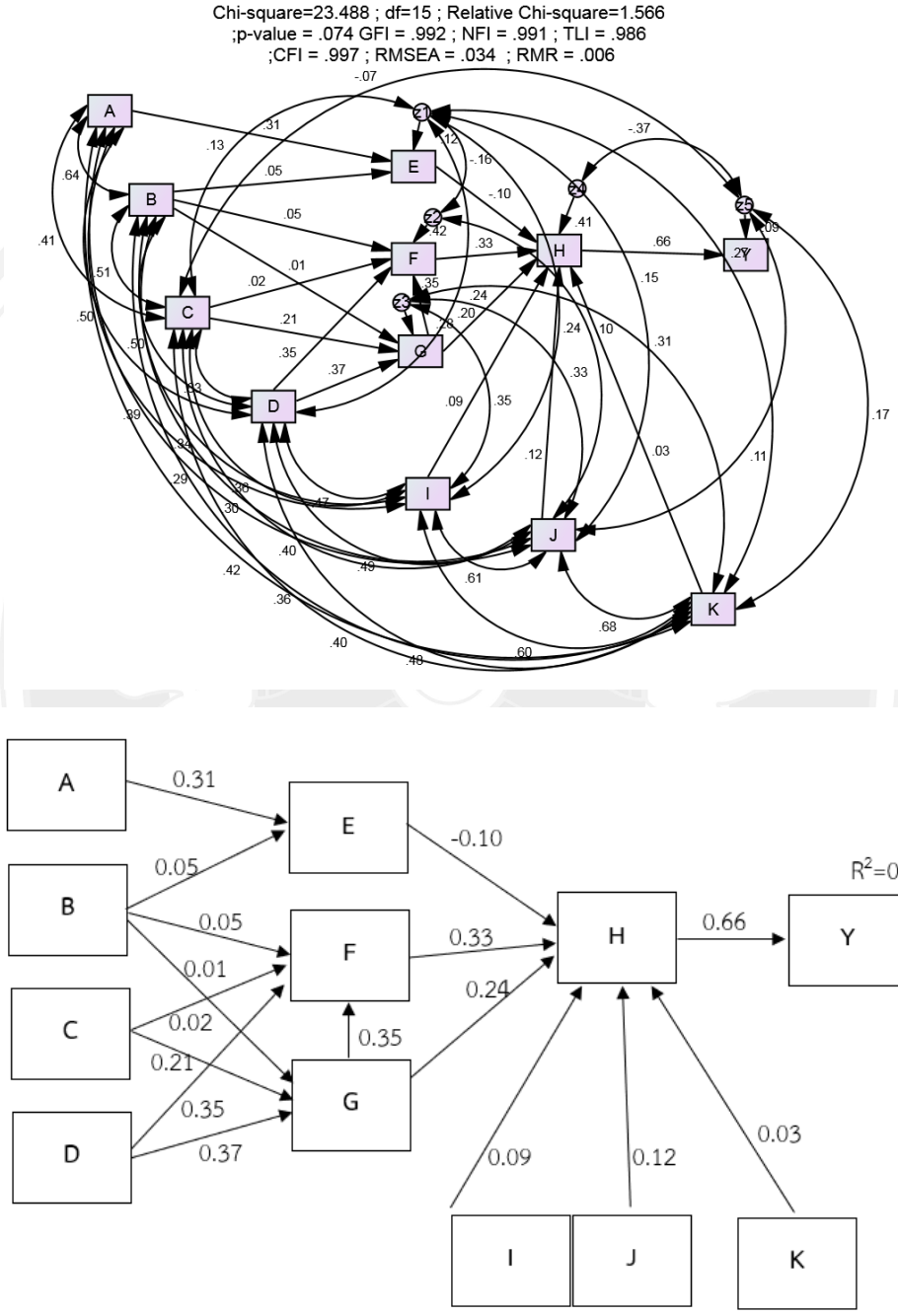

Figure 4.2 Shows the Final Model of the Structural Equation Model of Factors Influencing Acceptance and Use of Electronic Government Services for Individual Income Tax Filing

In The Analysis of the Final Model of the Structural Equation Model of Factors Influencing Acceptance and Use of Electronic government services for individual income tax filing, the researchers examined the goodness-of-fit index of the data compared with the criteria, as well as the criteria of the initial model. The results of analysis are shown in Table 4.16.

Table 4.16 Shows the Goodness-of-Fit Index of the Final Model of the Structural Equation Model of Factors Influencing Acceptance and Use of Electronic Government Services for Individual Income Tax Filing with Empirical Data

Criteria for Goodness-of-Fit Index (n = 480)		**Fit index**	**Meaning**
Degrees of freedom (Df)	> 0.00	15	Conforming to goodness-of-fit
P-value	> 0.05	0.074	
Chi-square/degrees of freedom (χ2/df)	< 2.00	1.566	
Goodness-of-Fit Index (GFI)	> 0.90	0.992	
Comparative Fit Index (CFI)	> 0.90	0.997	
Root Mean Square Residual (RMR)	< 0.05	0.006	
Root Mean Square Error of Approximation (RMSEA)	< 0.05	0.034	

From Figure 4.2 and Table 4.16, results of the confirmatory factor analysis show that the model fits the observed data well. The Chi-square (χ2) value = 23.488, degrees of freedom (df) = 15, P-value = 0.074 (which should ideally be greater than 0.05), χ2/df = 1.566 (which should ideally be less than 2), GFI = 0.992 (which should ideally be greater than 0.90), CFI = 0.997 (which should ideally be greater than 0.90), RMR = 0.006, and RMSEA = 0.034 (which should ideally be less than 0.05). These indices indicate that the model fits the theoretical model as shown in the table. It is found that the model meets the criteria and fits well with the observed data.

As for Section 3, analysis of the relationship path and hypothesis testing, when analyzing the relationship path of the structural equation model of factors affecting the acceptance and use of electronic government services for individual income tax filing, the statistical values for testing the hypotheses and the results of hypothesis testing are shown in the following table.

Table 4.17 Statistical Values for Testing the Hypotheses of the Structural Equation Model of Factors Affecting the Acceptance and Use of Electronic Government Services for Individual Income Tax Filing

Effect Model	**Hypothesis**	**Structural Path Relationship**	**P**	**Standardized**	
				Regression Coefficient	
				DE	**IE**
Direct	H1	G → F	.000***	.354	-
Effect	H2	G → H	.000***	.243	-
	H3	F → H	.000***	.333	-
	H4	H → Y	.000***	.657	-
	H5	E → H	.005	-.104	-
	H6	A → E	.000***	.310	-
	H7a	B → E	.365	.050	-
	H7b	B → F	.190	.055	-
	H7c	B → G	.900	.006	-
	H8a	C → F	.723	.017	-
	H8b	C → G	.000***	.215	-
	H9a	D → F	.000***	.352	-
	H9b	D → G	.000***	.366	-
	H10	I → H	.065	.086	-
	H11	J → H	.029	.117	-
	H12	K → H	.560	.031	-
Indirect		A → E → H	-	-	-.032
Effect		B → E → H	-	-	-.005
		B → F → H	-	-	.018
		B → G → H	-	-	.001

Effect Model	Hypothesis	Structural Path Relationship	P	Standardized Regression Coefficient	
				DE	IE
		C → F → H	-	-	.006
		C → G → H	-	-	.052
		D → F → H	-	-	.117
		D → G → H	-	-	.089

From Table 4.17, results of the adjusted model analysis of factors influencing acceptance and use of government services through electronic systems for individual income tax filing show that acceptance and use of government services through electronic systems for individual income tax filing are directly influenced by the intention to use them, with a coefficient of 0.657.

Table 4.18 Hypothesis Testing Results

Assumptions	Variables	Coefficient Value	Testing Results
	Causal Effect	Direct Standard	
H1	G → F	.354***	Accepted
H2	G → H	.243***	Accepted
H3	F → H	.333***	Accepted
H4	H → Y	.657***	Accepted
H5	E → H	-.104**	Accepted
H6	A → E	.310***	Accepted
H7a	B → E	.050	Rejected
H7b	B → F	.055	Rejected
H7c	B → G	.006	Rejected
H8a	C → F	.017	Rejected
H8b	C → G	.215***	Accepted
H9a	D → F	.352***	Accepted
H9b	D → G	.366***	Accepted

Assumptions	Variables	Coefficient Value	Testing Results
	Causal Effect	Direct Standard	
H10	I → H	.086	Rejected
H11	J → H	.117*	Accepted
H12	K → H	.031	Rejected

Note: *p<0.05, **p<0.01, ***p<0.001

From Table 4.18, results of the analysis of the structural equation model of factors influencing acceptance and use of government services through electronic systems for filing personal income tax returns are summarized as follows:

Hypothesis 1 (H1): Perceived ease of use has a positive impact on perceived benefits. The research accepts the hypothesis, with the coefficient of perceived ease of use (G) on perceived benefits (F) being 0.345 (t=8.748, p<0.001).

Hypothesis 2 (H2): Perceived ease of use has a positive impact on intention to use. The research accepts the hypothesis, with the coefficient of perceived ease of use (G) on intention to use (H) being 0.234 (t=5.315, p<0.001).

Hypothesis 3 (H3): Perceived benefits have a positive impact on intention to use. The research found accepts the hypothesis, with the coefficient of perceived benefits (F) on intention to use (H) being 0.333 (t=8.102, p<0.001).

Hypothesis 4 (H4): Intention to use has a positive impact on acceptance and use for filing personal income tax returns. The research accepts the hypothesis, with the coefficient of intention to use (H) on acceptance and use for filing personal income tax returns (Y) being 0.657 (t=9.590, p<0.001).

Hypothesis 5 (H5): Perceived risk has a positive impact on intention to use. The research accepts the hypothesis, with the coefficient of perceived risk (E) on intention to use (H) being -0.104 (t=-2.824, p<0.01).

Hypothesis 6 (H6): Security and privacy have a positive impact on perceived risk. The research accepts the hypothesis, with the coefficient of security and privacy (A) on perceived risk (E) being 0.310 (t=5.649, p<0.001).

Hypothesis 7a (H7a): Trust has a positive impact on perceived risk. The research rejects the hypothesis, with the coefficient of trust (B) on perceived risk (E) being 0.050 (t=0.907, p>0.05).

Hypothesis 7b (H7b): Trust has a positive impact on perceived benefits. The research rejects the hypothesis, with the coefficient of trust (B) on perceived benefits (F) being 0.055 (t=1.310, p>0.05).

Hypothesis 7c (H7c): Trust has a positive impact on perceived ease of use. The research rejects the hypothesis, with the coefficient of trust (B) on perceived ease of use (G) being 0.006 (t=0.126, p>0.05).

Hypothesis 8a (H8a): Usability has a positive impact on perceived usefulness. The research rejects the hypothesis, as usability (C) has a direct and significant effect on perceived usefulness (F) equal to 0.017 (t=0.354, p>0.05).

Hypothesis 8b (H8b): Usability has a positive impact on perceived ease of use. The research accepts the hypothesis, as perceived usefulness in usability (C) has a direct and significant effect on intention to use (G) equal to 0.215 (t=4.133, p<0.001).

Hypothesis 9a (H9a): Results have a positive impact on perceived usefulness in use. The research accepts the hypothesis, as perceived usefulness in use (D) has a direct and significant effect on perceived usefulness in use (F) equal to 0.352 (t=7.247, p<0.001).

Hypothesis 9b (H9b): Results have a positive impact on perceived ease of use. The research accepts the hypothesis, as the results (D) have a direct and significant effect on intention to use (G) equal to 0.366 (t=7.074, p<0.001).

Hypothesis 10 (H10): Perceived self-efficacy has a positive impact on intention to use. The research rejects the hypothesis, as perceived self-efficacy (I) has a direct and significant effect on intention to use (H) equal to 0.086 (t=1.848, p>0.05).

Hypothesis 11 (H11): System quality has a positive impact on intention to use. The research accepts the hypothesis, as system quality (J) has a direct and significant effect on intention to use (H) equal to 0.117 (t=2.180, p<0.05).

Hypothesis 12 (H12): Service quality has a positive impact on intention to use. The research rejects the hypothesis, as service quality (K) has a direct and significant effect on intention to use (H) equal to 0.031 (t=0.583, p>0.05).

4.3.1 Summary of Data Analysis

Analysis of model fit with the research framework and data using structural equation modeling and path analysis, including hypothesis testing, found that the structural equation model fits the data significantly at the 0.05 level of significance. It was also found that accepting and using government services through electronic systems to file personal income tax returns is influenced directly by the intention to use them.

4.3.2 Results of Qualitative Data Analysis

1) When setting policies to develop the electronic filing system for individual income tax returns, it is important to consider the following:

From interviews on policies to develop the electronic filing system for individual income tax returns, it was found that there are 5 key points:

Firstly, policy setting has a broad impact on people, so it is important to establish guidelines for collaboration between relevant parties in both the public and private sectors to work towards the goal of developing the electronic filing system for individual income tax returns. These policies must be accepted and supported in order to be implemented effectively. For example, the Revenue Department's various expenses under measures set by the government each year for programs such as the “Shop Dee Mee Kuen” project, or loan interest deductions for buying or building homes.

Secondly, policies must consider individual factors, divided into 2 factors:

(1) Occupational factors: Small business owners and traders usually have a large number of supporting documents for filing. The Revenue Department should have a document scanning program stored in the user's account in advance. When it comes time to file, users can easily attach these documents to simplify the process and reduce the burden on taxpayers.

(2) User age factors: The Revenue Department's website should be user-friendly and have experts available to provide guidance if needed.

Thirdly, policies must create confidence in the potential of government services through electronic systems and pushing for transparency, such as by:

(1) Updating and modernizing the website to be user-friendly.

(2) Ensuring security in accessing the system, such as using digital IDs or digital identity verification to enhance security and trust in the system.

(3) Regularly updating the tax calculation system to comply with current laws.

(4) Developing an internet network system that is stable 24 hours a day and has the ability to accommodate a large number of simultaneous users.

Issue 4: Setting policies for both IT and state-level personnel with skills in electronic or digital systems to collaboratively develop and efficiently solve problems in a mutually supportive direction.

IT plans, such as system quality and data quality, are detailed as follows:

(1) Factors affecting system quality improvement and development of the online tax filing system to make it easier for ordinary people to use, reduce complexity, categorize income types and various deductions, or design the system to be user-friendly and improve the online tax filing system and allow for the correction of some items in the case of additional tax returns. Pull data from the first tax return and develop the system to allow for online tax filing for individuals in previous years or after the online tax filing period has expired. In addition, the interviewee suggested improvements to the printing of receipts immediately after tax payments, or the ability to send receipts via email to those who filed online. Also, improve and develop the document delivery system to be more stable and easier to use, especially during peak usage periods, such as the last period of tax filing, and to quickly correct system errors with minimal time. Also, suggest that the online tax filing system for individuals provides easy-to-understand instructions for tax filing and uses language that the general public can read and understand, and provide interesting learning media on the online tax filing website for first-time users.

(2) Factors affecting data quality should ensure that the system is linked to various necessary agencies for online tax filing, such as income data, including salary deductions, and tax payments and remittances to the Revenue Department, as well as interest income data from banks. It is proposed to link data to support the online tax filing system electronically and to pull dividend data directly

from the stock market without having to manually select each dividend or retrieve data from the Stock market first. In addition to income information, various deduction listings are also important information that interviewees agree should be supported in the filing process, such as life insurance, health insurance, mortgage interest, retirement savings, social security, or various fund purchases. In addition to supporting linked data, interviewees also suggested updating linked data in a timely manner for the filing period of personal income tax through the electronic system.

(3) A leveling plan for both public and private sector personnel in electronic and digital systems.

(4) Training plans should be established for personnel at all levels, such as courses, target groups for training, training formats, etc., in order to develop the quality of public sector personnel that can keep up with changes in the digital government era.

Issue 5: Policies used should come from user participation to truly meet the needs, such as:

(1) Providing a platform for feedback.

(2) Providing various channels for complaints or problem reporting in usage.

(3) There should be faster contact channels than a call center, such as having a Chatbot or a line channel for the Revenue Department to answer questions or address doubts among the public for faster problem solving.

(4) Support research and development to ensure that the policies or plans used are in line with the needs of users and changing situations.

After the above policy recommendations, interviewees also mentioned factors that influence the acceptance and use of electronic government services in filing personal income tax returns.

2) What factors influence the acceptance and use of electronic government services in filing personal income tax returns?

What factors influence the acceptance and use of electronic government services in filing personal income tax returns? The answer is divided into 4 factors:

Factor 1: Ease of use of the personal income tax filing website.

Organizations should prioritize communication so that users can use it without relying on experts for guidance. This can be done easily to reduce user errors.

Factor 2: Data Security and Perceived risk.

Currently, information plays a significant role in business operations. However, one of the top business risks is adopting technology without considering adequate security levels. Therefore, maintaining security for information systems within organizations is crucial. Organizations need to review and enhance their security levels, especially for personal data that is considered valuable, such as ID numbers, bank account numbers, phone numbers, and birthdates. Protecting personal data is essential to prevent financial fraud, criminal activities, identity theft, and misuse for marketing or political purposes.

To protect personal data, service providers of electronic transactions create Privacy Policies or data protection policies on their websites and applications. Users must prioritize disclosing personal information while protecting and ensuring the security of personal data to the public. Additionally, implementing the National Digital ID (NDID) system can enhance the security and trustworthiness of electronic transactions by verifying identities digitally. This system links various government and private sector agencies to standardize and improve the electronic transaction process, making it convenient, fast, and secure for users.

Factor 3: Recognizing the benefits of time and cost.

Recognizing the benefits of time:

(1) Filing personal income tax returns online has become more convenient, as it is available 24 hours a day.

(2) Online filing saves time by allowing filing from anywhere at any time.

(3) It reduces the time and speed of filing tax returns.

Perceiving the benefits of cost:

(1) It helps save travel expenses to the Revenue Department office in the area.

(2) It reduces costs and resource usage, such as reducing paper use for copying supporting documents for filing, reducing work processes, and so on.

(3) It reduces the risk of having to pay additional fees (interest) in case of miscalculating taxes and having to pay additional taxes after filing later.

Factor 4: Productivity efficiency

(1) Personal income tax forms filed Online are accurate.

(2) Personal income tax forms filed Online reduces the chance of calculating taxes incorrectly. Then additional payments must be made later.

(3) Personal income tax forms filed Online offer better security of confidential information than filing on paper forms.

Factor 5: Perceived intention to use

(1) t can be processed successfully.

(2) Stored personal information receives data security.

(3) Transactions receive the expected results.

3) The most important indicator in promoting the quality of government services through the electronic filing of individual income tax returns

The most important indicator is the number of e-filing forms submitted (93% of all types of forms: Revenue Department, 2566). This indicator shows the results clearly, and it can be verified. If the number of users meets or exceeds the target, it means that the electronic service is efficient. On the other hand, if the number of users does not meet the target, the agency may investigate the causes and take corrective actions to improve efficiency and meet the users' needs.

4) The impact of providing services through the electronic filing of individual income tax returns on the operations of the government

Government e-Service is the management of government services through electronic channels to meet the needs and behaviors of the public and related sectors. Many governments around the world, including Thailand, aim to provide convenient and fast public services through electronic systems to promote public participation. Society then improves on the quality of those services, to make them more efficient in resource utilization, flexible in management, and able to use various data for policy-making decisions. From interviews, it was found that challenges in providing government services through electronic systems are (1) transforming the role of the government to be a facilitator of digital convenience, (2) enhancing the digital capabilities of government personnel, (3) building awareness and trust among

the public in the government's electronic service system, and (4) despite the high investment in digital technology, the public will benefit in the long run.

In the digital age, many countries prioritize providing government e-services by managing various government services for the public through online channels. This increases convenience and efficiency for the public, as they can access services online instead of physically visiting government offices, thereby reducing gaps and barriers in accessing government information and services. The government can also provide useful information to the public through the electronic system, which records all details online, reducing the time and effort of paperwork for government officials.

Consumer needs and behavior have rapidly changed, especially with the increasing use of online platforms in daily life for various activities. Therefore, online channels can meet consumer needs and have a continuously high growth rate. Consumers expect these services to meet their personalization needs and provide comprehensive access to information. Therefore, the government needs to adapt and prioritize the use of digital technology and the development of public services through electronic systems to meet the needs and behavior of the public and relevant sectors.

The benefits of using electronic systems for government management include convenience and speed, as the electronic system is designed for easy and efficient use, linking tasks between government agencies, known as “One Stop Service.” This allows the public to access government information quickly and reduces time and effort.

(1) Not using paper reduces various complicated steps during communication, and most importantly, there will be no time and location constraints because people can access the electronic system at any time or place.

(2) In terms of participation and transparency, besides being able to access the government's electronic system, people can also track and verify the results of the work as mandated by law for government agencies to disclose information, or so-called Open Government Data of Thailand, to facilitate public access. Therefore, people can provide feedback, suggestions, complaints, and news or information in the public sector, as well as use the data released by the government to further develop various innovations. It also shows that using electronic systems helps people access

the government more easily and become closer, breaking down barriers between the government and the people, or even between government agencies themselves.

(3) In terms of the quality of public services, the government's service delivery system through electronic systems is like a tool that the government uses to allocate various public services for people to use conveniently, creating mutual trust and reducing the financial burden on people by reducing fees, charges, fines and other expenses, as well as responding to problems and needs promptly and accurately.

(4) In terms of resources and government processes, using the government's service delivery system through electronic systems makes government operations more flexible, able to use technology instead of humans, while saving budget and creating more value, and helping government agencies achieve their goals faster because the electronic service delivery system reduces unnecessary coordination time, steps and details.

(5) In terms of policy decision-making processes, government agencies can use large amounts of data in the service delivery system through electronic systems, as well as share data among agencies for analysis and appropriate policy-making to meet needs and address problems accurately, leading to policy decision-making processes and identifying ways to improve or enhance various public services in sequence.

5) Guidelines for promoting acceptance and use of individual income tax filing services through electronic channels

From interviews on promoting acceptance and use of individual income tax filing services through electronic channels, 3 guidelines can be summarized, as follows:

Guideline 1: Promote the benefits of filing individual income tax returns through electronic systems, such as getting tax refunds faster and with clearer details, through public relations. This can be done through influential individuals on social media platforms such as Facebook, Instagram, TikTok, Twitter, or YouTube, who create content in various formats such as photos, videos, articles, or through advertising billboards in various locations, especially at the local level.

Guideline 2: Use remote access by recruiting volunteers in the community to provide knowledge about filing individual income tax returns through electronic systems along with the benefits and various deductions available.

Guideline 3: Demonstrate the quality of service, system quality, and data security measures, such as numerical and narrative indicators compared to standards or goals, and present results on websites and online media to build user confidence.

In summary, the operation of tax authorities in providing individual income tax filing services through electronic channels still faces challenges. Although some tasks can be carried out immediately, there are still many limitations that prevent successful implementation within the set timeframe. Therefore, it is necessary to invest in digital technology to cover all activities, and develop the digital skills of public sector employees to keep up with changes, which will affect work efficiency and the ability to meet the needs of the public. However, due to the large number of public sector employees, developing skills and changing behaviors to align with the digital development direction of the country present other challenges that cannot be achieved widely in a short period of time. Building awareness and confidence in the public for government services through electronic systems, and ensuring the protection of personal data, are also challenging, as the government must ensure that the data is stored and checked properly, and that the information provided is accurate and reliable. Therefore, it is important to develop technology to help reduce errors in information management and build technological capabilities to increase public confidence in using government electronic systems.

4.3.3 Results Discussion

In this study, the researchers discuss the research findings as follows:

Regarding safety and privacy factors, trust factors, usability factors, perceived outcome factors, risk perception factors, perceived benefit factors, perceived ease of use factors, intention to use factors, perceived self-efficacy factors, service quality factors, system quality factors, and factors influencing the acceptance and use of electronic tax filing services for individual taxpayers, they were found to be consistent with the empirical data. This may be because individuals vary in their lifestyles, work,

responsibilities, and social factors, which influences their acceptance and use of electronic tax filing services for individual taxpayers. The sample group found electronic tax filing services for individual taxpayers to be beneficial, as it helps save travel expenses and time, ensures safety for life and property during travel, facilitates tax payments/refunds, allows for quick tax filing, and ensures the accuracy and precision of data, as well as ease of use. Electronic tax filing services for individual taxpayers are efficient, as they save resources and promote recommendations/word-of-mouth referrals, increasing the use of electronic tax filing services by individual taxpayers. Even though the system is available for electronic tax filing services for individual taxpayers every day, allowing filing anytime and anywhere, including additional and retrospective filings, it aligns with Rogers (1983, as cited in Pitchpiya Pengphong, 2015) concept that individuals decide to fully adopt new technology because they perceive it as better and more beneficial than existing alternatives. The process of technology acceptance varies among individuals due to personal characteristics and technology features.

From the research, it was found that factors influencing the acceptance and use of government services through electronic systems for individual income tax filing are as follows:

4.3.3.1 Security and Privacy Factors

Security and privacy factors are at a high level. This includes the arrangement of confidentiality, accuracy, availability, and protection of important data and personal information in electronic systems. Protection of personal data of the users, whether individuals or other organizations, from being collected and used for various purposes is crucial. Currently, privacy issues are becoming increasingly important as personal data can be used in various ways. Ensuring security and privacy will be one of the factors leading to the acceptance and use of government services through electronic systems for individual income tax filing. This is consistent with Okunola (2015) research on e-Government service users' experiences, where factors such as security, support, trustworthiness, usability, website quality, data quality, benefits, convenience, and obstacles were found to be interrelated and supportive. Similarly, Lallmahomed et al. (2017) studied the implementation of e-Government in small organizations by surveying residents in Mauritius and found that the

government should be involved in understanding the factors for using e-Government in small organizations in order to improve quality by considering security and privacy to increase trust and reduce resistance to change. Carter et al. (2011) also emphasized the role of security and trust in using online tax filing services. That study used the UTAUT model along with personal perceptions, security, and trust factors to explain the adoption of online tax filing systems.

4.3.3.2 Trust Factors

Trust is a key factor in the acceptance and use of government services through electronic systems for individual income tax filing. User data is verified before accessing electronic systems, and improvements are made to ensure that international security standards are met when using the electronic tax filing system. This builds confidence and trust among taxpayers in using the electronic tax filing system. Trust in the electronic tax filing system for individual income tax filing is built through the filing and payment of taxes.

To date, the technology system is running smoothly without any glitches. Continuous system development and improvement have resulted in increased trust in the system, leading to acceptance and use of electronic government services for personal income tax filing. This is in line with the research of Boonrat (2018) on the factors influencing the decision to file personal income tax returns through the PromptPay service for individual taxpayers via the internet in Nakhon Pathom Province. It was found that the users' trust level was high, consistent with the research of Ozkan and Kanat (2011), who proposed a model of e-Government usage, indicating the increasing importance of e-Government usage worldwide. Their research found that, in addition to the factors identified in the concept of technology acceptance, there are also trust factors that affect the intention to use e-Government, leading to successful outcomes, consistent with the research of Khasawneh et al. (2013) on factors accepting e-Government. Governments worldwide that are emphasizing the importance of increasing the efficiency of public sector agencies by using automated systems instead of traditional services. The study found that increased trust in e-government applications helps reduce user apprehension and minimize the risk of problems, consistent with the research of Meftah et al. (2015), who presented the acceptance of e-Government by the public in Bahrain. The study

found that a high level of trust in the intention to use e-Government services indicates that trust-building is increasingly considered by relevant agencies when providing e-Government services in Bahrain. If trust can be increased, it will lead to an increase in e-Government service usage, consistent with the research of Albesher (2016) on trust as a source of long-term acceptance of e-Government. That research found that internet trust, organizational and government credibility, government integrity, and government capability significantly impact public trust in using e-Government services, which is consistent with the research of Rodrigues et al. (2016) on factors influencing e-Government usage in the Arab Emirates, based on the UTAUT concept. The research found that user trust and attitudes towards technology are key drivers of satisfaction, and also consistent with the research of Witarsyah et al. (2017) on the role of trust and risk in e-Government acceptance from the perspective of public acceptance through the UTAUT theory. That study found that trust in the government and trust in the e-Government system have a significant positive impact on the intention to accept and use e-Government, and is consistent with the research of Mensah (2018) on public readiness to accept and use e-Government services in Harbin, China. This study used the Technology Acceptance Model (TAM) to examine factors influencing the acceptance and use of e-Government by respondents in Harbin, China. The research found that perceived ease of use, perceived service quality, and public trust significantly impact the intention to accept and use e-Government, while perceived benefits have a significant negative impact on the intention to accept and use e-Government in Harbin, China, consistent with the research of Alkraiji and Ameen (2021) on a new model of public trust in e-Government services, combining service quality and trust theory. Their study divided trust into three factors: trust in the government, trust in the e-Government system, and trust management, and then used all three factors to create a model. The study also highlighted the role of satisfaction and service quality in increasing public trust and acceptance of e-Government services, consistent with the research of W. Li (2021) on the role of trust and risk in e-Government from the perspective of public acceptance through the UTAUT theory. The study found that trust in the government and trust in the internet system have a positive impact on the acceptance of e-Government.

4.3.3.3 Availability Factor

Regarding the availability factors for use, the availability factor is high. The stability of the system allows users to access the service at any time, which is considered a significant factor leading to the use of services through electronic systems. Whether it is software or hardware, availability is essential for users to be able to use government services for personal income tax filing promptly. This is consistent with the research of Pérez et al. (2019) on the expansion of e-Government acceptance and value to the public in Peru. The research found that sustainability of the external environment and the availability of government officials to provide services are positive factors for the adoption of e-Government in Peru, which is consistent with the research of Ali and Anwar (2021) on the factors influencing public acceptance of e-Government in Kurdistan, Iraq. That study found that the increasing perception of availability to use e-Government leads to an increased awareness of the benefits of e-Government. Aligned with W. Li (2021) research, the article discusses the role of trust and risk in e-Government systems from the perspective of public acceptance through the UTAUT and TAM theories. The study found that expectations of efficiency, effort, social influence, convenience conditions, and readiness to use, all have a positive influence on the public acceptance of e-Government.

4.3.3.4 Result Demonstrability Factor

The resulting factors are at a high level, mainly due to Result Demonstrability being one of the external factors developed in the technology acceptance theory. The resulting factors are the level of personal perception towards the outcomes that appear after using the information system. These resulting factors are considered external factors that affect the perception of benefits, aligning with Meftah et al. (2015) research on public acceptance of e-Government in Bahrain. That study found that trust has the highest level of influence on the intention to use e-Government services, indicating that building trust is increasingly considered by the relevant agencies providing e-Government services in Bahrain. Increasing trust can lead to increased e-Government service usage rates, aligning with Lallmahomed et al. (2017) research on implementing e-Government in small organizations, while surveying residents in Mauritius. The study found that expectations of performance, convenience conditions, and acceptance of value, have a positive relationship with the

intention to use the services; meanwhile, trust has an opposite effect on resistance to change, aligning with Alenezi et al. (2017) research on e-Government in Kuwait. Their study found that data quality, strategic benefits, and institutional value are significantly related to achieving better e-Government service delivery goals. Additionally, the research shows new driving factors such as cost savings, customer satisfaction, and obstacles like attachment to familiar choices. These factors are crucial for improving the efficiency of e-Government services, aligning with Kamau (2017) research on user experience factors, usage, and the public value of e-Government in Kenya. The study found that factors related to infrastructure, information technology, human capital, awareness, knowledge and skills, digital inclusion, motivation, reward systems, and governance factors are crucial for the development of e-Government services.

Using e-Government also aligned with the research of Alruwaie et al. (2020), who studied the continuous use of e-Government services by citizens: the role of self-efficacy, outcome expectations, and satisfaction. They found that past experience, social influence, data quality, service quality, personal outcome expectations, and satisfaction are important predictors of citizens' intention to use e-Government.

4.3.3.5 Perceived Risk Factors

Perceived risk factors are high. This may be due to the fact that taxpayers generally understand well that using government services through electronic systems to file personal income tax returns may lead to errors while entering information on the electronic system. For example, entering the wrong marital status can result in miscalculations of deductions, or entering the wrong amount can still allow the submission of the form. This could lead to the possibility of being audited later or being asked to submit additional documents later. Therefore, the responsible unit for processing personal income tax returns through electronic systems should ensure that the system provides warnings to check the accuracy of the data entry at critical points where users should be extra cautious. This aligns with the research of Anassayapa Boonrod (2018) on factors influencing decisions to request tax refunds for personal income tax returns through PromptPay services for taxpayers filing personal income tax returns online in Nakhon Pathom Province. It was found

that the perception of risk is high, and consistent with the research of Verkijika and De Wet (2018) on the use of e-Government in the Sahrawi Arab Democratic Republic, who found that risk perception had a significant influence. W. Li (2021) also proposed a paper on the role of trust and risk in e-Government systems from the perspective of public acceptance through the UTAUT theory. The study found that risk perception has a negative relationship with acceptance of e-Government. The results also indicated that perceived effectiveness (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC) had a positive influence on public acceptance of e-Government.

4.3.3.6 Perceived Benefit Factors

Perceived benefit factors are high. This may be because using government services through electronic systems to file personal income tax returns helps income earners have more convenience, save time, reduce travel expenses, have no registration fees, reduce errors in tax payments, and be accurate and secure. These benefits are highly beneficial to users. Therefore, the perceived benefits of using the system affect the acceptance and use of government services through electronic systems to file personal income tax returns. This aligns with the concept of Agarwal and Prasad (1999, as cited in Nuengruethai Chaiyala, 2020), stating that important variables in technology acceptance models include perceived benefits of use. If individuals believe that using information technology will increase their capabilities and efficiency at work, and that the technology they use can create benefits and offer good alternatives for work, using this new technology will improve the quality of work or make work faster. Perceived benefits are a key factor that demonstrates the intention to accept and use technology resulting from the perception of its benefits, which directly affects acceptance behavior, while perceived benefits indirectly affect usage behavior. This is due to acceptance behavior. The electronic system for filing personal income tax returns has been developed and designed based on problem-solving principles to reduce complexity, allowing users to benefit more from filing and paying taxes electronically at the local tax office. The benefits users receive will lead to increased use of the electronic system for filing personal income tax returns, which will help the Revenue Department collect taxes and reduce tax evasion by taxpayers. This aligns with the theory of the importance of tax compliance, which

states that if taxpayers see the benefits or importance of paying taxes, their willingness or cooperation in paying taxes to the state will increase. Additionally, it saves energy, time, and travel expenses when filing personal income tax returns, aligning with the research of Anassayapa Boonrod (2018) on factors influencing decisions to request tax refunds for personal income tax returns through PromptPay services for taxpayers filing personal income tax returns online in Nakhon Pathom Province. It was found that factors influencing acceptance of the system for filing personal income tax returns online and paying taxes through the internet network by income earners in Li district, Lamphun Province, include perceived benefits at a statistically significant level of .05, which is consistent with the research of Akram et al. (2019) who investigated the relationship between technology and tax filing behavior through electronic systems. The results confirmed perceived functional benefits in usage.

4.3.3.7 Perceived Ease of Use Factors

Perceived ease of use factors are high. This may be because the system is designed to be user-friendly, clear, and easy to understand, with accurate and complete tax calculation steps, trustworthy data linkage with various agencies, no need to submit supporting documents for filing personal income tax returns, easy and quick printing of tax return forms and receipts.

Filing individual income tax returns can be made easier by increasing the ease-of-use factor, which affects the acceptance and use of government services through electronic systems for filing individual income tax returns. This aligns with the concept of Radner and Rothschild (1975, as cited in Chontikarn Titsathien, 2021), stating that the perception of ease-of-use leads users to believe that using the system will be effortless. Effort is limited and arises from responsibilities to do various things. Therefore, systems that are perceived as easier to use than others are more likely to be accepted by users. Currently, information systems are efficient and have been developed to be user-friendly, allowing users to learn how to use them without much effort. This increases the confidence of taxpayers when filing individual income tax returns through the internet system, which is available 24 hours a day, every day, including public holidays. This is in line with the research of Anassayapa Boonrod (2018), who studied the factors influencing decisions to request tax refunds for

individual income taxes through the PromptPay service via the internet system in Nakhon Pathom Province. The study found that the sample group had opinions on factors influencing their decision to request tax refunds for individual income taxes through the PromptPay service, particularly in terms of accepting technology related to the perception of ease of use at a high level. This aligns with the research of Faralin Faditthakul (2019) studying the factors influencing acceptance of the system for filing and paying individual income tax through the internet network of income earners in Li district, Lamphun Province. The research found that factors influencing acceptance of using the system for filing and paying individual income tax through the internet network for income earners in Li district, Lamphun Province, include a significant perception of ease of use, at the .05 level, which is consistent with the quantitative analysis results affecting acceptance of using the system for filing and paying individual income tax through the internet network by income earners in Li district, Lamphun Province. This helps encourage income earners to use the system more each tax year. This is in line with research by Shovkovyy (2015), studying the acceptance of e-Government services in Ukraine, which confirmed 8 factors that keep the rate of e-Government service usage low, including computer literacy, perceptions of convenience, perception of benefits, perceptions of public value, individual characteristics, cultural value orientation to avoid uncertainty, trust in healthcare, and trust in the internet. This aligns with the research of Mensah (2018), studying public readiness to accept and use e-Government services in Harbin, China, which found that the perception of ease of use significantly impacts the intention to accept and use e-Government. This also aligns with the research of Suradi et al. (2020), studying factors influencing e-Government service usage among youth in Oman, which found that perceiving the ease of using e-Government services is one of the key factors in promoting youth to use e-Government services or develop government e-Service applications.

4.3.3.8 Intention to Use Factor

The factor of intention to use was at a high level. This may be due to the fact that filing personal income tax returns is quite complicated and involves a lot of documentation. The government has designed an electronic system for filing personal income tax returns for individuals to lighten the burden of managing documents for

taxpayers, providing convenience and guidance in the process of filling out various documents. Therefore, the intention to use is one of the factors that influences the acceptance and use of government services through e-Government systems for filing personal income tax returns, which is consistent with Kamau (2017) research on factors related to infrastructure, information technology, human capital factors, awareness, knowledge and skills, digital inclusion, motivation and reward systems, and governance factors. These factors have been identified as important factors influencing the use of e-Government services, and consistent with Al Mansoori et al. (2018) study on e-Government services in the United Arab Emirates using the UTAUT model. The study found that internet trust and performance expectations are the clearest predictors of intention to use e-Government services, and expectations of effort facilitation and trust have a positive impact on behavioral intention. The study also found that behavioral intention to use e-Government services has a significant influence on the use of e-Government websites, consistent with Mensah (2018) study on the readiness of people to accept and use e-Government services in Harbin, China. The study found that perceived ease of use, perceived service quality, and trust of the people have a significant positive impact on the intention to accept and use e-Government services in Harbin, China, and are consistent with Alruwaie et al. (2020) study on the continuous use of e-Government services by citizens: the role of self-efficacy, outcome expectations, and satisfaction. The study found that past experience, social influence, data and service quality, personal outcome expectations, and satisfaction are important predictors of citizens' intention to use e-Government services.

4.3.3.9 Perceived Behavioral Control Factor

The factor of perceived behavioral control is at a high level. The theory used to predict individual behavior and understand the behavior of individuals was developed from the theory of reasoned action, which suggests that humans are rational and systematic in their use of information, so actual behavior is reasoned behavior (Ajzen and Fishbein, 1980). Intention influences human behavior, and what influences intention influences behavior. It consists of three main factors: 1) attitude towards behavior, 2) subjective norms related to behavior, and 3) perceived behavioral control in performing the behavior. These three factors arise from beliefs

that lead to three factors: 1) beliefs about behavior, 2) beliefs about reference groups, and 3) beliefs about control ability (Wiwat Chanakijtong, 2014), which is consistent with de Jong et al. (2019) study on citizens' intention to participate in government co-creation projects. The study found that education level and interest in government institutions are related to citizens' intention to participate. The three factors that influence citizen participation are perceived value, perceived behavioral control, and expected satisfaction. Additionally, trust in genuine intention is an additional factor for initiating participation in e-service usage, consistent with Ozkan and Kanat (2011) study on e-Government usage. The study found that factors such as trust-building, perceived behavioral control, and attitude towards behavior explain the intention to use e-Government services successfully, which is consistent with Mensah et al. (2020) study on e-Government service acceptance and usage through the Unified Theory of Acceptance and Use of Technology (UTAUT). Their study found that expectations of performance, expectations of effort, and social influence did not predict attitude towards e-Government service usage, but convenience facilitation conditions determined that both behavioral intention to use and effort expectation, as well as perceived service quality, influences trust in using e-Government services.

4.3.3.10 Quality of Service Factor

Quality of service is at a high level. The quality factors of service affect the acceptance and use of government services through the electronic system for individual income tax filing. This may be because when filing tax returns, users can do so themselves. If they have any doubts or questions about using the electronic system, they can directly contact the officials through direct communication technology, and user-friendly functions help explain complex details in an easy and clear manner. It is important to choose a language that is not complex and accessible to all users, without the need for in-depth knowledge of taxes. The quality of service affects the acceptance and use of the government service through the electronic system for individual income tax filing, which is consistent with the research of Worapun Nuttaro (2020) on the factors affecting the use of individual income tax filing services via the internet at the Tha Ma Kha branch of the Kanchanaburi Revenue Office. The study found that the overall quality of service is at the highest level, consistent with the research of Chan et al. (2021) on the design of e-

Government services and public satisfaction: a multidimensional perspective. The research found that the perception of service quality affects public satisfaction. Additionally, the study also found a three-way interaction between user perception, user role, and the perception of service quality, consistent with the research of Alkraiji and Ameen (2021), who presented a new model of public trust in e-Government services, combining service quality and trust theory. Furthermore, the study suggested the role of satisfaction and service quality in increasing public trust and affection for e-Government services, consistent with the research of Lönn (2016) on the collaboration of e-Government in Sweden. Collaboration in e-Government is challenging, and the government needs to learn how to work together. The study found that collaboration through information technology requires the government to be more open and offer new forms of cooperation, especially in promoting public participation in government activities to facilitate convenience through electronic systems and meet the needs of the public, consistent with the research of Y. Li and Shang (2020) on the quality of service, perceived value, and continuous intention of the public to use e-Government in China. The research found that the concept of e-Government service quality has eight dimensions, including system quality, reliability, security, accessibility, data quality, service capability, interaction, and response. The perceived value of the service is an effective mediator between service quality and the continuous intention of the public to use e-Government. The intention to use is influenced by service quality, service value, and satisfaction, consistent with the research of Alruwaie et al. (2020) on the continuous use of e-Government services: the role of self-efficacy, outcome expectations, and satisfaction. The study found that service quality is a significant predictor of public intention to use e-Government.

4.3.3.11 System Quality Factors

Overall system quality factors are at a high level. The government agencies have developed electronic systems for individual income tax filing to reduce the complexity of paper tax returns. When using the system, individuals can file taxes themselves. The system’s quality affects the acceptance and use of the government service through the electronic system for individual income tax filing, which is consistent with the success model of information systems, as well as the research of

Lönn (2016) on e-Government collaboration in Sweden. The study found that collaboration through information technology requires the government to be more open and offer new forms of cooperation, especially when promoting public participation in government activities to facilitate convenience through electronic systems and meet the needs of the public, consistent with the research of Y. Li and Shang (2020) on the quality of service, perceived value, and continuous intention of the public to use e-Government in China. The research found that the concept of e-Government service quality has eight dimensions, including system quality, reliability, security, accessibility, data quality, service capability, interaction, and response. The perceived value of the service is an effective mediator between service quality and the continuous intention of the public to use e-Government. The intention to use is influenced by service quality, service value, and satisfaction.

4.3.3.12 Acceptance and Use Factors of Government Services through Electronic Systems for Individual Income Tax Filing Factors

The factors affecting acceptance and use of government services through electronic systems for individual income tax filing by ordinary individuals are at a high level. Davis and Good state that attitude towards the system is necessary before there is an intention to use the system. In the TAM theory, creating a good attitude towards the system comes from users' feelings, and perceiving that the system is useful (Perceived Usefulness) for improving their work efficiency. Additionally, users perceive and feel that the system is easy to use and not complicated (Perceived Ease of Use), or that they do not need to make an effort to understand how the system works. Other components such as security and privacy, system and data quality, trust, readiness to use, perceived results, and perceived ability to control their own behavior also play a role. This is consistent with the research of Almaiah et al. (2020), who studied important factors in the decision to use e-Government services by the public in Jordan. The study found that website quality, internet trust, and government trust affected the decision to use e-Government services.

Similarly, Fakhruzzaman (2019) studied factors influencing the acceptance of e-Government services in Indonesia. That study presented the benefits of using the services, measured by the intention of the public to use them, and the

relationship between various factors such as social influence and trust, through the Technology Acceptance Model (TAM) framework.

Furthermore, Azmi et al. (2012) presented an article on “Perception of Risk and Acceptance of Electronic Tax Filing Systems” in several countries where the system was used to encourage compliance with government regulations. However, despite the availability of e-Services, electronic tax filing was not popular among the public, especially in developing countries like Malaysia, due to the high perceived risk of using the service and the lack of coordination among service providers. The study used the TAM framework to understand the perception of risk and its impact on usage. It found that the perception of risk has a positive relationship with the use of electronic tax filing systems. Additionally, different levels of risk may affect the use of electronic tax filing and the perceived benefits of different systems.

CHAPTER 5

SUMMARY OF RESEARCH RESULTS AND RECOMMENDATIONS

This research on the acceptance and use of government services through electronic systems in filing income tax returns by ordinary individuals has the objectives of 1) explaining the current situation of using government services through electronic systems in filing income tax returns for ordinary individuals, 2) studying the factors affecting the acceptance and use of government services through electronic systems in filing income tax returns for ordinary individuals, and 3) developing policy recommendations for improving government services through electronic systems in filing income tax returns for ordinary individuals. The sample groups were divided into 2 groups: 1) The quantitative research included individuals who filed income tax returns online through the Revenue Department website and are located in Bangkok, with a sample size of 480 people sampled using Accidental Sampling, and 2) the qualitative research, which involved key informants such as experts, academics, and individuals with relevant experience and expertise in providing government services through electronic systems, both in the current situation and for policy recommendations. Regarding policy on developing state services through electronic systems, there are 9 research tools, divided into 3 parts. Part 1 consists of questions to gather general information about the respondents. Part 2 consists of questions about factors influencing the acceptance and use of state services through electronic systems for submitting individual income tax returns. It is further divided into 12 aspects, including the factors of security and privacy, trust, usability, perceived outcomes, risk perception, perceived benefits, perceived ease of use, intention to use, perceived ability to control one's behavior, service quality, system quality, and acceptance and use of state services through electronic systems for submitting individual income tax returns. Part 3 consists of questions about using state services through electronic

systems for submitting individual income tax returns in terms of recommendations. A semi-structured interview protocol was divided into 2 parts: Part 1 interviewed respondents about general information from the questionnaire, and Part 2 interviewed experts, academics, and qualified individuals regarding the development of state services through electronic systems, both in the current situation and concerning policy recommendations for development. Data analysis was divided into the two parts: 1) Descriptive Statistics Analysis, which includes frequency, percentage, mean, standard deviation, and maximum and minimum values, and 2) Inferential Statistics Analysis, which tests hypotheses using Structural Equation Modeling (SEM). The researcher presents the following in order:

5.1 Research Summary

1) The current situation of using government services through electronic systems to submit personal income tax returns

By researching information from documents, academic textbooks, articles, and interviews, it can be concluded that from a ministerial resolution in 1996, a policy was issued specifying the development of information technology in Thailand. In the first 5 years, this was in order to develop a National Information Infrastructure and human resource development, improve work processes, and provide government services. From the issuance of Policy No. 1, and continuing until No. 3, it set out strategies for development towards goals in many areas, especially in the area of strategies for developing information technology in the public sector. Stated in the Constitution of 2017, the State should establish a national strategy. This is the goal of sustainable national development according to the principles of good governance. Therefore, the direction for developing e-government must be carried out in accordance with the Constitution. It has provisions for applying technology in government administration, for example, one of the provisions is that appropriate technology shall be applied in the administration of government, and provide public services for the benefit of its management. As a result, the provision of government services through electronic systems (Government e-Service) has been developed and used to provide public services in many government agencies. To meet both the needs of the people and help

increase convenience for citizens in accessing the government sector, it also helps to make the administration within the government sector more efficient.

The Revenue Department is an important government agency and provides services through an electronic system. Starting in 1969, the Revenue Department brought computers to use in operations for the first time, starting with the compilation of statistical data first. Later, in the year 1979, the Revenue Department established a tax return processing center to record tax information using the computer system; then in 1982, the center was elevated to the Tax Form Processing Division. The technological development of the Revenue Department did not stop with the introduction of computers for use in operations. In 1985, the Revenue Department began studying the feasibility of a nationwide computer network system project.

In the year 1987, there was an online system in the central area. Computer centers had been established in Bangkok, with 9 district revenue offices, including data backup centers totaling 11 centers, and an online system that could retrieve taxpayer information nationwide was developed. When the internet and intranet began to be used in Thailand, the Revenue Department created the Revenue Department website, www.rd.go.th, (internet system) alongside the Revenue Department network, (Intranet system). Then, in the year 2001, which was the beginning of the digital era, the Revenue Department focused on becoming the Electronic Revenue Department, (e-Revenue), by implementing the e-Revenue project, starting with tax return filing and tax payment services via the internet on the Revenue Department's website. The Revenue Department is considered to be the first government agency to be in e-government and have electronic transactions. It was at the same time that the Electronic Transactions Act B.E. 2001 was enacted, as well, in the implementation of the said project. The Revenue Department established a center for filing forms via the internet network as an agency that provides information about taxes and provides tax return filing and tax payment services. Later, in 2002, the Revenue Department developed tax return filing and tax payment services of the personal income tax type (Por.Ngor.Dor. 91). Up to now, it has expanded the service of filing tax returns and paying taxes via the internet for all tax types (Revenue Department Annual Report, 2018).

On October 6, 2021, the Revenue Department raised the level of electronic tax filing and payment services by enabling a new e-filing system for filing forms and paying taxes electronically, and opened a system for submitting forms and paying additional or overdue taxes. On September 29, 2021, it opened the system usage rights management system in order to campaign and publicize the use of the Revenue Department's e-Service to achieve its objectives. The business sector and the public now have widespread knowledge, understanding, and voluntary use of e-Services. Responding to the Revenue Department's policy of making the doing of taxes easier, it adjusted services and procedures to be 100% digital to meet the needs of taxpayers and Revenue Department officials. So, they created a project: "Campaign and publicize the use of e-Service of the Revenue Department in 2023", which has the objective of providing the business sector and the public with knowledge and understanding about e-Services. The Revenue Department creates incentives to use e-Service voluntarily, including increasing the number of new people to submit returns, and creating a good view to taxpayers of the Revenue Department. The expected result is the number of forms that can be submitted electronically according to the target. Thus, taxpayers with knowledge and understanding can use e-Services effectively. Moreover, it is convenient, it speeds up tax returns and reduces backlogs. This affects satisfaction with services, and strengthens the willingness to pay taxes, which drives the strategy in the area of Digital Transformation, as well as drives the filing of forms through Digital Services in the direction of making taxes easy.

There was information on the number of people filing personal income tax returns via the Revenue Department's website starting from 1-January to 31-March 2020. For the 2019 tax year, there were 11.80 million people filing personal income tax returns, for the 2020 tax year from 1-January to April 18th, 2021, there were 7.42 million people who filed personal income tax forms via the Revenue Department's website. For the 2021 tax year from 1-January to 8-April 2022, there were 10.30 million people who filed personal income taxes via the website, and for the 2022 tax year from 1-January to 1-May 2023, there were 11.52 million people who filed personal income taxes through the website (www.Posttoday.com, 26 January 2023).

Summarized in a table as follows:

Table 5.1 Number of People Filing Personal Income Tax Returns Via the Revenue Department Website

Tax Year (Period)	Number of People Filing Personal Income Tax Returns Via the Revenue Department Website
Tax Year 2019 (1 Jan. – 31 Mar. 2020)	11.80 million People
Tax Year 2020 (1 Jan. – 18 Apr. 2021)	7.42 million People
Tax Year 2021 (1 Jan. – 8 Apr. 2022)	10.30 million People
Tax Year 2022 (1 Jan. – 8 Apr. 2023)	11.52 million People

2) Factors influencing acceptance and use of government services through electronic systems for individual income tax filing are detailed as follows:

5.1.1 Quantitative Data Analysis Results

5.1.1.1 General Information of Survey Respondents

General information revealed that the majority were males at 63.50%, and females at 36.50%, aged 36-60 at 46.00%, with a Master's degree at 60.63%, an average monthly income of 30,001 - 45,000 baht at 36.46%, and the devices used to access government services through electronic systems for individual income tax filing were mainly smartphones, at 44.17%, followed by desktop computers at 27.08%, and tablets at 8.96%.

5.1.1.2 Factors Influencing Acceptance and Use of Government Services Through Electronic Systems for Individual Income Tax Filing

Factors influencing the acceptance and use of government services through electronic systems for individual income tax filing were overall at a high level ($\bar{X}$=3.79, SD=0.36). When considering each aspect, all aspects were at a high level, with the highest average being the intention perception factor for usage ($\bar{X}$=3.96, SD=0.53), followed by acceptance and use of government services through electronic systems for individual income tax filing ($\bar{X}$=3.92, SD=0.52), and the lowest

being the risk perception factor ($\bar{X}$=3.53, SD=0.74). Detailed information for each aspect is as follows:

1) Security and privacy factor was at a high level ($\bar{X}$=3.72, SD=0.52), with the highest average in the security feature of protecting personal data from unauthorized access and not allowing access to personal information by others ($\bar{X}$=3.79, SD=0.78).

2) Trust factor was at a high level ($\bar{X}$=3.56, SD=0.78), with the highest average in trust in the technology used by the Revenue Department for providing government services through electronic systems for individual income tax filing ($\bar{X}$=3.68, SD=0.67).

3) Availability factor was at a high level ($\bar{X}$=3.75, SD=0.57), with the highest average in the ease of access to government services through electronic systems for individual income tax filing ($\bar{X}$=3.84, SD=0.69).

4) Result Demonstrability factor was at a high level ($\bar{X}$=3.79, SD=0.47), with the highest average in the ease of using the system for providing government services through electronic systems for individual income tax filing ($\bar{X}$=3.88, SD=0.71). The next was the use of government services through electronic systems for filing personal income tax returns, which meets the current usage needs ($\bar{X}$=3.84, SD=0.70) and the least was the use of government services through electronic systems for filing personal income tax returns, which takes too long to process (e.g. data entry) ($\bar{X}$=3.71, SD=0.74).

The Perceived Risk factor was high ($\bar{X}$=3.53, SD=0.74), with the highest average being the use of government services through electronic systems to file personal income tax returns, encountering risks from errors in the internet system of the Revenue Department (system risk) ($\bar{X}$=3.69, SD=0.96). Next was the risk of failure to submit tax returns on time when using government services through electronic systems for individual income tax filing (outcome risk) ($\bar{X}$=3.55, SD=0.93), and the lowest was concerns about the user experience when using electronic systems for individual income tax filing (user risk) ($\bar{X}$=3.39, SD=0.80).

Perceived Usefulness was high ($\bar{X}$=3.85, SD=0.45), with the highest average being the use of government services through electronic systems for individual income tax filing, helping to reduce travel expenses ($\bar{X}$=4.01, SD=0.65).

Next was the reduction of waiting times for service when using government services through electronic systems for individual income tax filing ($\bar{X}$=3.99, SD=0.68), and the lowest was that using government services through electronic systems for individual income tax filing will improve the quality of government service ($\bar{X}$=3.72, SD=0.67).

Perceived Ease of Use factor was high ($\bar{X}$=3.77, SD=0.47), with the highest average being the ease of use of the Revenue Department website for individual income tax filing ($\bar{X}$=3.89, SD=0.65). Next was the ease of downloading forms or other documents for transactions through electronic systems for individual income tax filing ($\bar{X}$=3.86, SD=0.69), and the lowest was the ability to learn how to use the Revenue Department website for individual income tax filing on one's own ($\bar{X}$=3.62, SD=0.75).

The Intention to Use factor was high ($\bar{X}$=3.96, SD=0.53), with the highest average being the intention to use electronic systems for individual income tax filing in the future ($\bar{X}$=4.02, SD=0.67). Next was the intention to increase the use of electronic systems for individual income tax filing ($\bar{X}$=4.00, SD=0.66), and the lowest was considering electronic systems for individual income tax filing as the first choice ($\bar{X}$=3.86, SD=0.68).

The Perceived Behavioral Control factor was high ($\bar{X}$=3.76, SD=0.56), with the highest average being the use of basic skills for electronic systems for individual income tax filing ($\bar{X}$=3.96, SD=0.73). Next was the use of experience for electronic systems for individual income tax filing. The service of filing individual income tax returns through the electronic system ($\bar{X}$=3.93, SD=0.68) was rated as high, with the lowest being recommendations from Revenue Department officials ($\bar{X}$=3.57, SD=0.86).

As for the System quality factor, it was rated as high ($\bar{X}$=3.82, SD=0.44), with the highest average score being the quick responsiveness of the system in searching the database for individual income tax returns ($\bar{X}$=4.01, SD=0.71). The next highest was clarity of the website's guidelines for using the system ($\bar{X}$=3.91, SD=0.69), and the lowest was trustworthiness of the system for filing individual income tax returns ($\bar{X}$=3.69, SD=0.68).

Regarding the Service Quality factor, it was rated as high ($\bar{X}$=3.80, SD=0.47), with the highest average score being the normal usability of the service and system for filing individual income tax returns ($\bar{X}$=3.98, SD=0.66). The next highest was 24/7 accessibility of the service for filing individual income tax returns ($\bar{X}$=3.84, SD=0.73), and the lowest was the availability of staff for consultation when encountering issues while using the service ($\bar{X}$=3.53, SD=0.83).

The acceptance and use of government services through the electronic system for filing individual income tax returns was rated as high ($\bar{X}$=3.92, SD=0.52), with the highest average score being the increased understanding and awareness of the importance of using the system for filing individual income tax returns through the internet network ($\bar{X}$=3.97, SD=0.62). The next highest was the intention to disseminate and provide information to stakeholders on using the system for filing individual income tax returns through the internet network ($\bar{X}$=3.93, SD=0.66), and the lowest was the efficiency of using the system for filing individual income tax returns through the internet network exceeding expectations ($\bar{X}$=3.53, SD=0.71).

5.1.1.3 Analysis of Structural Equation Modeling

The factors of acceptance and use of government services through the electronic system for filing individual income tax returns include security and privacy factors, trust factors, usability factors, perceived outcome factors, risk perception factors, perceived benefit factors, perceived ease of use factors, intention to use factors, perceived self-control factors, service quality factors, and system quality factors. These factors were consistent, with observational data indicating a Chi-square value of 23.488, with degrees of freedom (df) of 15 and a P-value of 0.074. The Chi-square/df ratio was 1.566, indicating a good fit.

The Goodness-of-Fit Index (GFI) was equal to 0.992, Comparative Fit Index (CFI) was equal to 0.997, Root Mean Square Error of Approximation (RMSEA) was equal to 0.034, and Root Mean Square Residual (RMR) was equal to 0.006. The model's fit with the observational data was confirmed through various statistical tests. It was found that the acceptance and use of electronic government services for filing individual income tax returns were consistent with observational data. Additionally, it was found that acceptance and use of electronic government

services for filing individual income tax returns were directly influenced by the intention to use.

5.1.1.4 Hypothesis Testing Results

Hypothesis testing results for the structural equation model factors affecting the acceptance and use of electronic government services for filing individual income tax returns found that the hypotheses were largely accepted. These Factors included: perceived ease of use positively impacted perceived benefits (H1), perceived ease of use positively impacted intention to use (H2), perceived benefits positively impacted intention to use (H3), intention to use positively impacted acceptance and use for filing individual income tax returns (H4), perceived risk positively impacted intention to use (H5), security and privacy positively impacted perceived risk (H6), readiness for use positively impacted perceived ease of use (H8b), displayed results positively impacted perceived benefits (H9a), displayed results positively impacted perceived ease of use (H9b), and system quality positively impacted intention to use (H11). The hypotheses that were rejected included: trust positively impacting perceived risk (H7a), trust positively impacting perceived benefits (H7b), trust positively impacting perceived ease of use (H7c), readiness for use positively impacting perceived benefits (H8a), perceived self-efficacy positively impacting intention to use (H10), and service quality positively impacting intention to use (H12).

5.1.2 Qualitative Data Analysis Results

5.1.2.1 Policy for Developing the Electronic Filing System for Individual Income Tax Returns Through Electronic Channels

From interviews on policy for developing the electronic filing system for individual income tax returns through electronic channels, there were 5 main points.

Issue 1: Policy setting impacts a wide range of people, so it is important to establish guidelines for collaboration between relevant parties, both in public and private sectors, to work towards the goal of developing a tax income filing system for individuals through electronic channels. These policies must be accepted and supported by various organizations or groups involved in order to drive the policy

forward. For example, the Revenue Department's various expenses according to the measures set by the government each year, such as the "Shop Dee Mee Kuen" project, home loan interest deductions, etc.

Issue 2: The policies implemented must consider individual factors, and are divided into two factors:

1) Occupational factors: Business owners and individuals usually have a lot of supporting documents for tax filing. The Revenue Department should have a document scanning program stored in the user's account in advance. When it comes time to file taxes, taxpayers can easily attach these documents to simplify the process and reduce the burden on taxpayers.

2) Age factors of users: The Revenue Department's website should be user-friendly and have experts ready to provide guidance if needed.

Issue 3: The policies implemented must create confidence that they enhance the efficiency of government services through electronic systems and promote transparency, such as:

1) Updating and developing the website to be modern and user-friendly.

2) Ensuring security in accessing the system, such as using Digital ID or digital identity verification to enhance security and user confidence.

3) Regularly updating the tax calculation system to comply with current laws.

4) Developing internet networks to be stable 24/7 and capable of handling a large number of simultaneous users.

Issue 4: Setting policies for both IT and human resource development in the public sector to enhance digital skills and efficiency in problem-solving in a collaborative manner.

IT plans, such as system quality and data quality, should be detailed as follows:

1) System quality factor: Improving the online tax income filing system for individuals to be user-friendly, less complex, and categorized efficiently.

Income, various deduction items, and system design should make it easy to use and friendly to users. Also, improving the online form submission system to allow for editing some items in cases where a tax return shows additional income. Pulling data from the initial tax return submission and developing the system to allow for online submission of individual income tax returns in previous years, or after the deadline for online submission has passed. Additionally, are suggestions for improvements to the printing of receipts immediately after tax payment has been made, or the ability to send receipts via email to the taxpayer. Improving and developing document submission systems to be more stable and user-friendly, especially during peak usage times, such as the final period of tax return submission, and the need for quick system error corrections. Providing guidance on how to submit tax returns online for individuals to easily understand, using language that the general public can read and understand. and providing interesting learning materials on the individual income tax return website for users to study.

2) Regarding the data quality factor, the system should link data with various agencies necessary for individual income tax return submission electronically, such as salary data that companies deduct tax from and submit to the Revenue Department, as well as interest income data from banks. Propose linking data to support the online submission system electronically and the ability to pull data from the stock market without having to manually select each dividend or obtain data from the stock market beforehand. In addition to income data, other necessary deduction items include important information that interviewees agree should be supported in the tax return submission, such as life insurance, health insurance, mortgage interest, retirement savings, social security, and various fund purchases. In addition to linking data to support, interviewees also suggest updating linked data promptly in line with the tax return submission period for doing individual income tax returns electronically.

Plans to upgrade both public sector personnel skills in electronic and digital systems.

Training plans should be established for personnel at all levels, such as courses, target groups for training, training formats, etc., in order to develop

the quality of public sector personnel needed to adapt to the changing digital government era.

Issue 5: Policy implementation should involve user participation to truly meet the needs, such as providing platforms for feedback, various channels for complaints or issue reporting, and faster communication methods like Chatbots or dedicated lines for quick problem resolution.

Supporting research and development to ensure that policies align with user needs and changing circumstances is also crucial.

5.1.2.2 Factors Influencing Acceptance and Use of Electronic Government Services for Tax Filing by Individuals Should be Identified and Addressed

What factors influence the acceptance and use of electronic government services in filing personal income tax returns? Divided into 4 factors

Factor 1: Ease of use of the personal income tax filing website.

Organizations should prioritize communication so that users can use it without relying on experts for guidance. This can be done easily to reduce user errors.

Factor 2: Data Security and Perceived risk

Currently, information plays a significant role in business operations. However, one of the top business risks is adopting technology without considering adequate security levels. Therefore, maintaining security for information systems within organizations is crucial. Organizations need to review and enhance their security levels, especially for personal data that is considered valuable, such as ID numbers, bank account numbers, phone numbers, and birthdates. Protecting personal data is essential to prevent financial fraud, criminal activities, identity theft, and misuse for marketing or political purposes.

To protect personal data, service providers of electronic transactions create Privacy Policies or data protection policies on their websites and applications. Users must prioritize disclosing personal information, protecting and ensuring the security of personal data to the public. Additionally, implementing the National Digital ID (NDID) system can enhance the security and trustworthiness of electronic transactions by verifying identities digitally. This system links various government

and private sector agencies to standardize and improve the electronic transaction process, making it convenient, fast, and secure for users.

Factor 3: Recognizing the benefits of time and cost

Recognizing the benefits of time:

1) Filing personal income tax returns online has become more convenient, as it is available 24 hours a day.

2) It saves time by allowing filing from anywhere at any time.

3) It reduces the time needed for filing tax returns.

Perceiving the benefits of cost:

4) It helps save travel expenses to the Revenue Department office in the area.

5) It reduces costs and resource usage, such as reducing paper use for copying supporting documents for filing, reducing work processes, and so on.

6) It reduces the risk of having to pay additional fees (interest) in case of miscalculating taxes and having to pay additional taxes from filing late.

Factor 4: Productivity efficiency

1) Personal income tax forms filed online are accurate.

2) Personal income tax forms filed online reduces the chance of calculating taxes incorrectly, with additional payments having to be made later.

3) Personal income tax forms filed online offer better security of confidential information than filing paper forms.

Factor 5: Perceived intention to use

1) They can be processed successfully.

2) You can store personal information and data with security.

3) Transactions receive the expected results.

5.1.2.3 What is the Most Important Indicator in Promoting the Quality of Government Services Through Electronic Systems in Filing Individual Income Tax Return Forms?

The most important indicator is the number of e-filing forms submitted (93% of all types of forms: Revenue Department, 2566). This indicator shows the results of measuring data clearly and it can verify the data. The agency will set targets for the number of users. If the target is met or exceeded, it means that providing

services through electronic systems is efficient. Conversely, if the number of users through electronic systems does not meet the set target, the agency may investigate the causes and take corrective action to improve operational efficiency in order to respond to user needs effectively.

5.1.2.4 Providing Services Through Electronic Channels for Filing Individual Income Tax Return Forms Affects the Operations of the Government

From interviews, the benefits of using electronic systems in managing government operations can be summarized as follows:

1) Convenience and speed, as the electronic system is designed for easy and convenient use, linking tasks between government agencies, known as “One Stop Service.” Therefore, the public can access various government information quickly, reducing time, paper use, and complexity in communication. Importantly, there are no time or location constraints, as people can access electronic systems anytime, anywhere.

2) Participation and transparency can be achieved, as the public can not only access government electronic systems, but also track and verify the results of government operations as required by law. Government agencies disclose information, known as “Open Government Data of Thailand,” to facilitate public access. Therefore, the public can provide feedback, suggestions or complaints, and share information in the public sector. Additionally, using government data can further develop various innovations. In conclusion, using electronic systems can help improve transparency and public participation.

People have easier access to the government and are getting closer to each other, which is considered breaking down the walls between them, both between the government and the people, or even between government agencies themselves.

3) Quality of public service through the electronic government system is a tool that the government uses to allocate various public services for the people to use conveniently. This helps build trust and reduce the financial burden on people, such as by reducing fees, service charges, fines, and other expenses. It also helps people receive responses to their problems and needs promptly and accurately.

4) Resources and government operations processes are more flexible with the electronic government service system. It allows government operations to be more efficient, saving budget and achieving goals faster. The electronic government service system helps reduce unnecessary coordination time and details.

5) Policy decision-making processes can benefit from the large data available through the electronic government service system. Sharing data among government agencies can help analyze and develop appropriate policies to meet needs and solve problems effectively. This can lead to improved public services.

5.1.2.5 Ways to Promote Acceptance and Use of Electronic Tax Filing Services for Individuals:

From interviews on promoting acceptance and use of electronic tax filing services for individuals, three main approaches were identified:

Guideline 1: Promote acceptance and use through public relations about the benefits of filing tax returns electronically for individuals, which can lead to faster tax refunds and clearer details. This can be done through influential individuals on social media platforms such as Facebook, Instagram, TikTok, Twitter, or YouTube, who create various content formats related to topics of interest or through advertising billboards in various locations, especially at the local level.

Guideline 2: Use remote access to the area, which may involve setting up volunteers in the community to provide information about filing personal income taxes electronically and the benefits and deductions available.

Guideline 3: Demonstrate the quality of service, system quality, and data security in a fair manner, such as using numerical and narrative indicators to compare with standards or goals, and presenting results on websites and online media to build user confidence.

In summary, the challenge of transitioning the tax agency's operations to electronic filing for individual income taxes remains. While some tasks can be carried out immediately, there are still many limitations that prevent successful implementation within the set timeframe. This includes the significant investment required to cover all activities with digital technology, as well as the need to develop digital skills among public sector employees to keep up with changes and improve

efficiency in meeting public demands. The large number of public sector employees presents a challenge in aligning their skills and behavior with the country's digital development goals, making it difficult to achieve widespread success quickly.

Building public awareness and confidence in the government's electronic services and protecting personal data are also challenging. The government must ensure that the data is securely stored and regularly checked for accuracy, as well as develop technology to reduce errors in information management. This will enhance technological capabilities and increase public confidence in using government electronic services.

5.1.3 Links between Quantitative Research and Qualitative Research

From the results of quantitative data analysis, it was found that all 11 factors were at a high level overall. When considering each aspect, it was found that every aspect was at a high level. The side with the highest average was regarding factors of perception and intention to use. Next came the factor of perceived benefits, and the least was Risk perception factors. This was consistent with the results of the interviews on what factors affect the acceptance and use of the personal tax filing service via the electronic system, it was suggested that people's behavior will be influenced by their intention to use it and the functioning of the system. Efficient measures according to the number of systems accesses Period of use and usage patterns. Or, it can be said that Intention to use is a result of service quality, value of service, and satisfaction. As for the factor of perceived usefulness, it means that when the system is used, it increases efficiency for the user. The interviewee added that when the person knows that the personal tax return is filed via the Revenue Department's website, they also know it helps to save on travel expenses and time to complete each step, and they can also submit the form at any time according to the specified period. When in doubt, they can immediately contact the staff via the website. In addition, the interviewees agreed on the issue regarding risk perception. This is a perception of certainty in security during the storage of personal information. If there is incompleteness of the information received by the purchaser or user of the service, it will cause negative impacts, leading to dissatisfaction in using services that are perceived to be risky.

In addition, when considering the issue of establishing policies to develop tax filing services through the electronic system of the Revenue Department, one may take into account factors of perception of intention to use perceived benefits and risk perception factors or other remaining factors, coming to a total of 11 factors, to be applied in order to enable the public to accept and use the tax filing service via the electronic system. 1) Taking into account personal factors such as occupational factors like operating a private business, most merchants will have many supporting documents for submitting forms. The Revenue Department should have a document scanning program saved in user accounts in advance. When the time for submitting the form comes, the form filer can use this part of the document to attach to the form submission. This will help the form filer. It's easier to use and it can reduce the burden on taxpayers. 2) As for the User age factor, the Revenue Department website should be improved to have an easy-to-use format, as well as prepare experts who are ready to give advice if there are any doubts, etc. 3) The policy that is adopted must create confidence that it is a policy that clearly raises the potential of government service delivery through electronic systems and pushes all dimensions to become concrete, such as by improving and developing the website to have a modern format. When there is security in accessing, such as bringing a digital ID (Digital ID) or verifying digital identity, it helps create safety, gains confidence in using it, and regularly improves the tax calculation system so that it is consistent with current laws, etc. 4) Setting policies for both IT plans and plans for upgrading government personnel skills in electronic systems lets all parts join in thinking together to develop and help solve problems with maximum efficiency in a way that is consistent with the IT plan. There should be a plan to upgrade both government personnel skills in electronic and digital systems. 5) Set training plans for personnel at all levels, such as courses, target groups for training, training formats, etc., in order to develop the quality of government personnel needed to keep up with changes in the era of digital government. And 6), policies that are adopted should come from the participation of service users in order to be able to truly meet today's needs. When the policies adopted can develop government services through electronic systems, it brings awareness of service value and satisfaction. There has then been acceptance and use

of government services through the electronic system for filing personal income tax returns.

Summarized as follows:

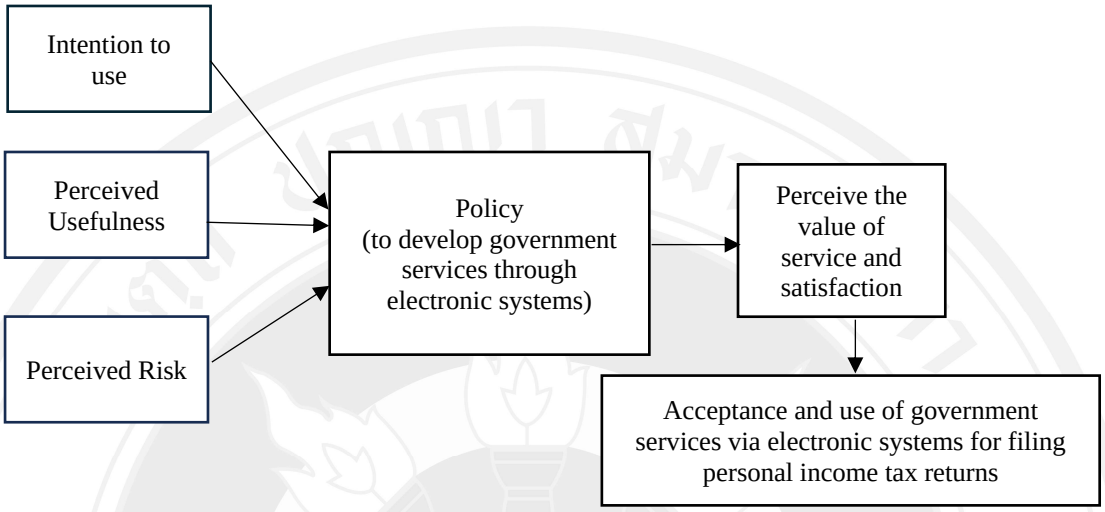

Figure 5.1 Link between Quantitative Research and Qualitative Research

5.1.4 Policy Recommendations for Developing Government Services through the Electronic System for Filing Personal Income Tax Returns

1) Starting with senior executives, support from senior management of the Revenue Department will be the impetus for change. Because e-government is a matter that requires cooperation from officials in all departments and the use of technology to develop and improve the work of the Revenue Department, there must be budgetary support from senior executives to encourage personnel to train and learn how to use new information technology to develop and improve government service systems through the electronic system for filing personal income tax returns.

2) Revenue Department policy and clarity of supporting regulations will cause the establishment of a clear standard framework for exchanging information, leading to a clear exchange of information, and leading to the exchange and linking of information effectively. Therefore, clarity in information sharing should be specified at various levels within the agency and between agencies in order to provide service quickly, including the need to set a budget framework, legal

framework and information security, such as linking financial information and setting clear boundaries with private sector agencies when citizens are responsible for filing tax forms. Use your right to deductions according to government regulations.

3) The development of information systems used to provide personal income tax return filing services and telecommunications infrastructure is considered an important factor, because if there is an electronic work system, the government service system and government information network system are complete. It will be able to increase efficiency in information technology management. It makes it convenient, fast, timely and accurate. However, the availability of equipment and hardware tools, the Software and database must all be adequate, modern, and convenient to use. Websites of government agencies must also be developed and improved to meet standards and be able to link between government agencies, because if data can be linked between government agencies in the form of an interconnected data network, then it will create a more efficient work process, both in the development of information systems and the personal tax filing system. In addition, the results of the analysis of factors affecting the acceptance and use of the electronic personal tax filing service obtained from this research study may be used to determine areas to be developed, such as the factor of Perceived benefits, the Ease of use factor, System quality factors, service quality, data security and privacy factors, and factors of intention to use. That said, measuring results from system usage will be effective and effective only if the user is willing, and the results can be measured by the frequency of use, usage time, number of times to access the system, usage patterns, etc., which are related to personal effects in terms of work efficiency and efficiency in decision making

4) Give importance to the satisfaction of service users, which is consistent with Kotler (1997), who defined satisfaction as the level of feeling that a person has as a result of comparing the performance of a product or service as seen or understood with the person's expectations. In addition, DeLone and McLean (2003) stated that satisfaction is an important factor for the success of the information system. This is due to the service users' needs being met successfully as expected. In DeLone and McLean's information system success model theory, there are variables that use user satisfaction, including return to purchase. Returning to use again as

Overall satisfaction is summarized as a user satisfaction variable in the concept of information system success. It is an interstitial variable that influences usage and overall benefits that users receive. If the user is satisfied or dissatisfied with the information system, it can directly affect use of the information system, either positively or negatively. And if the user is satisfied or is no longer satisfied with the information system, that user can decide whether the information system is useful or not.

5) Personnel and personnel knowledge and understanding. If the government agency has skilled personnel who have sufficient information technology capabilities and can help develop the information technology skills of other personnel in the agency, including personnel to be ready to change organizational culture, that information has been shared with each other. It will lead to benefits in working and providing public services. Because government agency personnel can be considered as a practitioner, if there is a lack of understanding or acceptance of change, it will cause delays, which can affect success in practice.

6) Performance measurement by The Office of the Civil Service Commission (Office of the Public Sector Development Commission) has established a framework for evaluating government agencies according to measures to improve efficiency in the civil service revolution. Fiscal year 2022 consists of an evaluation of operational effectiveness, which is the main mission of the agency that is under the national strategy, master plan, National Economic and Social Development Plan No. 12, national reform plan, government policy, or assessment of operational potential. To develop the organization towards being digital, the Revenue Department has set indicators based on efficiency improvement measures in performing government work for fiscal year 2022, such as indicators from the number of e-filing forms (93 percent of all forms (Revenue Department, 2023), which is an indicator that measures results from information that is clearly displayed and can be verified. The agency will set a target for the number of service users. If it is met as specified or higher, it means that providing services through the electronic system is effective. On the other hand, if the number of users using the electronic system does not reach the set goal, the agency may use those results to investigate in order to determine the cause and

expedite corrective action to improve the efficiency of the agency's operations so that the service can truly respond to the needs of users.

7) By realizing the importance of public relations and knowledge related to form submission through the electronic system for filing personal income tax forms, we can see the benefits. And most importantly, channels should be found to provide knowledge to all citizens in order to persuade and promote the successful use of channels for filing personal income tax returns. It is also used to update information, develop the system for efficiency, and respond to the needs of service users as much as possible

5.1.5 Comparison of Differences with Another Related Research

Table 5.2 Summary Table of Another Related Research

No.	Title (Author)	Theories Used to Create the Conceptual Framework	Methodology	Sample Size	Research Results
1.	Perceived Risk and the Adoption of Tax E-Filing (Azmi et al., 2012).	TAM Model	SEM	249 Malaysian taxpayers	Risk perception is positively related. Towards the implementation of the electronic tax filing system
2.	Modelling the determinants of electronic tax filing services' continuance usage intention (Ramdhony, Liébana-Cabanillas, Gunesh-Ramlugun, & Mowlabocus, 2022).	- Trust Theory - Information System Success Model	SEM	315 users of e-filing ser-vices in Mauritius.	Intention to use electronic tax collection is influenced by perceived benefits. User satisfaction and service quality.
3.	The Role of Tax Complexity, Prior Experience, and Perceived Risk in Continuance Usage of E-filing (Gabrielle Albay & Thanyaporn 'Main' Soontornthum, 2022).	- Model of Expectation. Confirmation (ECM) - Information System Success Model	PROCESS Macro for SPSS	300 e-filing users in the Philippines.	Tax complexity has a moderating effect on the relationship between system quality and satisfaction, while perceived risk has a moderating effect on the relationship between satisfaction and continuance intention.
4.	The effects of e-government,	TAM Model	SEM	430 Indonesian	The application of e-government had a

No.	Title (Author)	Theories Used to Create the Conceptual Framework	Methodology	Sample Size	Research Results
	e-billing and e-filing on taxpayer compliance: A case of taxpayers in Indonesia (Rokhmana et al., 2022).			taxpayer	positive and significant effect on taxpayer compliance, the application of e-billing had a positive and significant effect on taxpayer compliance, and the application of e-SPT had a positive and significant effect on taxpayer compliance.
5.	Online Tax Filing—E-Government Service Adoption Case of Vietnam (Lu & Nguyen, 2016).	- UTAUT Model - Information System Success Model	SPSS	156 Vietnamese taxpayer	E-filing intention to use of Vietnamese taxpayers is influenced by both six factors of the model. Hence, the conceptual model has served as a useful framework for academicians and government policy decision makers to evaluate and improve the e-filing system (e-government service) in Vietnam.

From the above table, when compared with the research study, the following differences were found

1) Theories used to create the conceptual framework from the literature review, it was found that there are many important theories of technology acceptance. In order to be consistent with the objective of the research that studies the factors affecting the use of government services via electronic systems for filing personal income tax returns, the technology theory, namely the Specific Technology Acceptance Theory (TAM1), was applied to create the research conceptual framework because the theory is used to explain the acceptance of technology by individuals and it has been widely proven that the perception of ease of technology and the perception of usefulness of technology are important factors affecting the use of technology by individuals. The Theory of Planned Behavior (TPB) studies the display of human behavior that is influenced by the intention to use it. And what influences the intention to use it is the perception of the ability to control one's own behavior in displaying behaviors that are caused by the individual's beliefs about factors that may promote or hinder the display of such behavior. And to lead to the success of using the electronic system for the service of filing personal income tax returns, the system quality factors and service quality factors that affect the intention to use it were used under the concept of the information system success model, including the perception of risks in terms of security and personal data protection. Consistent with the concept of risk perception, it can be explained that risk perception is another important variable that affects the behavior of service users. If service users are concerned and aware of uncertainty in security, unclear and incomplete personal data storage, errors occur, causing delays in decision-making and no acceptance of service use. If trust can be increased, it will lead to an increase in the rate of service use. Electronic systems and readiness factors and the results that appear to affect the perception of benefits and the perception of ease of use are also used in the study.

2) Research Methodology This research is quantitative and qualitative research or a mixed research method. Quantitative research is used to study the factors of acceptance and use of government services via electronic systems for filing personal income tax forms and qualitative research is used to explain the current situation of using government services via electronic systems for filing personal

income tax forms and to make policy recommendations for developing government services via electronic systems for filing personal income tax forms. Therefore, the research results provide both quantitative data and in-depth information from the interviews. Such data can be used to benefit both policy recommendations or to develop and improve the efficiency of government services via electronic systems to meet the needs of service users

3) Group size Most of the research presented in the table has a group size not exceeding 350 people. For this research, the researcher obtained a sample of 385 people for the study. To facilitate the evaluation and data analysis, the researcher used a total sample size of 400 people. To prevent sample loss and incompleteness of the questionnaire in this study, the sample group was increased by using a sample loss rate of 20 percent, resulting in a sample size of 480 people. The data was collected from personal taxpayers in the Bangkok area. The number of questionnaires returned was also 480 people, making the collected data clear about which factors affect the acceptance and use of government services via electronic systems.

4) Data analysis method This study used the popular SEM analysis, which is suitable for analyzing a relatively large number of variables, which is consistent with this research that has 13 variables in total. In addition, the analysis technique was used to check whether the conceptual framework created from the theory was consistent with the empirical data or not, and Path Analysis was used to examine the direct and indirect relationships between the sets of variables.

5) Link between quantitative and qualitative research from the analysis of quantitative data, it was found that all 11 factors were at a high level. When considering each aspect, it was found that all aspects were at a high level. The aspect with the highest average value was the factor of perceived intention to use, followed by the factor of perceived benefit, and the factor of perceived risk was the least. This is consistent with the interview results on the issue of factors affecting the acceptance and use of the personal tax filing service via the electronic system. It was proposed that people’s behavior will be influenced by their intention to use and the efficient operation of the system, as measured by the number of system accesses, the duration of use, and the usage pattern. In other words, the intention to use is a result of the quality of service, the value of the service, and the satisfaction. For the factor of

perceived benefit, it means that when the system is used, it increases the efficiency of the user. The interviewee added that when the person knows that filing a personal tax form via the Revenue Department website saves travel expenses and time in performing each step and can also file the form at any time within the specified time frame. When in doubt, they can contact the officer via the website immediately. In addition, the interviewees agreed on the issue of perceived risk, which is the awareness of the certainty of security and the preservation of personal information. If there is unclear or incomplete information that the buyer or service user receives, it will have a negative impact leading to dissatisfaction with the service that is aware of the risk. In addition, when considering the issue of policy determination to develop the Revenue Department's electronic tax filing service, the factors of perceived intention to use, perceived benefits, and perceived risk factors, or other factors, totaling 11 factors, may be applied to encourage people to accept and use the electronic tax filing service, taking into account the following factors: 1. Personal factors, such as occupational factors, self-employed business, and vendors, most of whom have a lot of supporting documents for filing. The Revenue Department should have a program to scan documents and save them in the user account in advance. When the time comes to file, the filer can use this document to attach to the filing, which will help make it easier for the filer and reduce the burden on the taxpayer. 2. Factors related to the age of the user. The Revenue Department's website should be improved to be easy to use, with experts ready to provide advice if there are any questions, etc. 3. The policy used must create confidence that it is a policy that enhances the potential of government services via the electronic system and pushes all dimensions to be clearly tangible, such as improving and developing the website to be modern and safe to use, such as introducing a digital ID or digital identity verification and authentication, which will create safety and confidence in its use. Improve the tax calculation system regularly to be consistent with current laws, etc. 4. Determining policies for both the IT plan and the plan to upgrade government personnel in terms of electronic or digital skills, so that all parties participate in thinking, developing, and helping to solve problems efficiently in a way that is consistent with the IT plan, the plan to upgrade government personnel in terms of electronic and digital skills. 5. Determining a training plan for personnel at all levels, such as courses, target groups,

training formats, etc., to develop the quality of government personnel to keep up with changes into the era of digital government. And 6. The policies used should come from the participation of service users in order to truly meet the needs. When the policies used can develop government services via electronic systems, it leads to the recognition of service value and satisfaction, resulting in acceptance and use of government services via electronic systems in filing personal income tax returns.

5.1.5.1 Research Limitations

This research study collected data in the Bangkok area only. As a result, the personal data of respondents will be different, such as gender and educational levels. Most of the respondents were male, and had a Master's degree level of education. This may cause the results of the data analysis on factors affecting the overall acceptance and use of government services via electronic systems to be no different.

5.1.5.2 Suggestions for Future Research

1) Study additional factors that may affect the acceptance and use of government services through the electronic system for filing income tax returns for ordinary people, such as satisfaction, attitudes, expectations, social influence, and service processes, in order to understand the needs of the public in using government services through the electronic system for filing income tax returns for ordinary people, and to improve or create a more reliable system for greater efficiency and future use.

2) Study individuals who use services to file and pay taxes in other tax categories, such as corporate income tax, value-added tax, etc., in order to diversify the research results even more.

3) Further study should be conducted on the reasons for not choosing to file personal income tax returns online.

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