

**CONTINUANCE INTENTION TO USE SELF-SERVICE  
TECHNOLOGY OF MASS RAPID TRANSIT SYSTEM IN THAILAND**

**NATTHAKARN CHANMATAKULVAT**

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE  
REQUIREMENT FOR THE DEGREE OF MASTER OF BUSINESS  
ADMINISTRATION IN INDUSTRIAL BUSINESS ADMINISTRATION  
KING MONGKUT'S INSTITUTE OF TECHNOLOGY LADKRABANG  
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## **ABSTRACT**

Within the worldwide service industry, Mass Rapid Transit is one of the biggest transport services applies technology to enhance operation and service's quality in various perspectives. To serve such principles and demands, self-service technology is implemented significantly. This mechanical function provides new progressive idea of giving service with incredible support of advancement without human association to user. Ticket vending machine, automated top-up machine, and self-service storage installed at Mass Rapid Transit station in Thailand will be reasonably selected as pilot self-administration innovations for this research. Therefore, this study tries to determine the influence of information system qualities, performance expectancy, and social-related factors on user satisfaction and continuance intention to use self-service technology. A conceptual evaluation model was developed mainly based on IS success model and other supportive models which are UTAUT and ECM. The users' perspective is studied by conducting of quantitative method research design with collecting the final sample of 400 questionnaires to ensure and strengthen the more reliability of the research study. All the study variables were measured in the form of 5-point Likert Scale.

The Statistical Package for Social Science (SPSS) for window version 26 were used to do data processing and analysis in terms of frequencies, distribution, percentage, arithmetic mean,

and standard deviation, Skewness, and Kurtosis. Moreover, IBM SPSS AMOS version 6.0 were used to perform for critical analysis related to Confirmatory Factor Analysis and Structural Equation Model analysis. The results revealed that system quality, service quality, social influence are positively and significantly influence on user satisfaction (DE=0.265, DE=0.190, and DE=0.694,  $P<0.05$  respectively) and performance expectancy is positively but insignificantly influence on user satisfaction (DE=0.026,  $P<0.05$ ). Whereas, information quality is negatively and insignificantly on user satisfaction (DE=-0.029,  $P<0.05$ ). Furthermore, the study showed that social influence and user satisfaction are positively and significantly influence on continuance intention to use (DE=0.116 and DE=0.810,  $P<0.05$ ). However, the result of statistical result from Goodness of Fit Index was completely confirmed the relationship among study variables in the research framework. The study highlights the importance on influence factors of user perception and creating a satisfactory feeling of involvement and acceptance by user to continuance use of self-service technology. Overall, the findings of this study suggest that service providers should understand the user's perception in dimensional aspects and the tendency of their demands on SST adoption. This would help service providers to formulate the practical strategic planning and implement such effective strategies in order to enhance the way to serve the user's needs, also improve on service productivity and efficiency to create the sustainable future of organization service operation management especially in term of technology implementation.

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# CHAPTER 1

## INTRODUCTION

During the age of globalization, the emerging relationship of the world's economies, societies, and populaces are realized by interexchange of ventures, innovation, and the stream of individuals and data. It has been beheld that today business industries have evolved drastically. The transformative utilization of Information and Communication Technologies (ICT) and novel interrelated digital systems, namely, the Internet of Things (IOT), big data, and artificial intelligence have changed the people's lifestyle and way of conducting commercial activity. Particularly, the advancement in technology will provide both opportunities and challenges for the service provider to adapt the business to survive in such monetary circumstances. The trading transformation to reach ultimate-value service has become more and more important than the service provider should be aware of being competitive in the current industrial condition (Nantapaiboon, 2012). With the innovative and digital contribution, service businesses are endeavoring to utilize such benefits for various purposes, such as specific upgrading of service efficiency, reducing labor costs, and conveying another service method to customers (Curran, 2005). Beatson (1985) stated that SST is a self-automatic linkage that empowers users to mutual conduct activity with computerization rather than a close relationship with service agents. In other words, with SSTs customers do not merely have to confront with an innovation, but also create the service by themselves. This technology is making service exchanges progressively effective, exact, and lively. Self-Service Technology (SST) or Technology-Based Self-Service (TBSS) can be characterized as a mechanical interface that empowers users to deliver independent service from direct service work inclusion (Lin, 2007). SSTs have confirmed an advance innovation for people in various circumstances. Particularly, when it is carried out, it can create immense transformation in improving the people's living standards for everyday comforts and how organizations arrange their business forms. There are advantages both increasing

the standard of service, reducing labor costs, and delivering a new way of services to clients (Curran, 2005). In the course of recent decades, the implementation of self-service technology has changed the idea of administration and how worth is made (Bitner, 2000). Administrations are progressively being given to clients using SSTs. The retail bank industry is at the front of this pattern. Since 2011, JP Morgan Chase Bank has started to send new administration booths to its outlet. Approximately 90% of exchanges performed by tellers would now be able to be looked after by these SSKs.

Likewise, the most significant bank in China, the Industrial and Commercial Bank of China, has prepared 60% of its branches with intelligent teller machines, through which over 90% of teller administrations can be given. The multiplication of self-service technologies in administration businesses depends on the reason that effective SSTs advantage both specialist organizations and clients. In particular, SSTs increases administration framework profitability and diminish operational expenses (Bitner, 2000), while upgrading client experience and diminishing holding up time (Wang, 2011). Nonetheless, scientists have noticed that all clients grasp SSTs (Meuter, 2003). Research concentrating on drivers of the SSTs' utilization has discovered that there are two classifications of precursors to clients' utilization of SSTs, in particular, SSTs attributes and individual contrast factors (Meuter, 2005; Wang, 2013). Self-service technologies' trademark factors incorporate usability and handiness (Lin, 2007; Weijters, 2013). Singular distinction factors include demeanor (Lin, 2007), control, hazard (Lee, 2002), and fun (Dobholkar, 2002).

## **1.1 Mass Rapid Transit System in Thailand**

As an industrialized country, Thailand is putting its strong emphasis on various viewpoints to enhance citizen's subsistence. Mobility infrastructure is one of the main essential foundations that serve people in their comfortable and convenient journey and lifestyle. Mass Rapid Transit (MRT) is a subsidiary of transportation services. It is a high-capacity open vehicle found in the metropolitan territory (UITP, 2011) that both government and private sectors have

spent huge investment on expanding facilities to serve commuters and travelers to keep away from unpleasant journey among traffic gridlock (Ninkitsaranon, 2017). Mass Rapid Transit is included in various lines, namely MRT, BTS, and ARL. The Mass Rapid Transit Authority of Thailand (MRTA) is a leading organization in the mass rapid transit system of Thailand. The primary responsibilities are study, analysis, development, and implementation of MRT construction projects in the city and suburbs to link the public transit systems to cover all areas and to meet the public's needs of a fast and safe mode of transportation. This is a very important part in promoting the future developments of the country in other areas as well. The first public Mass Rapid Transit line was operated in late 1999. Then new lines have continued to be added or extended such as present (Ninkitsaranont, 2019) to serve the increasing amount of ridership who selects to travel by Mass Rapid Transit system with various reason namely, to avoid the traffic congestion and to save the traveling cost compare with other transportation methods.

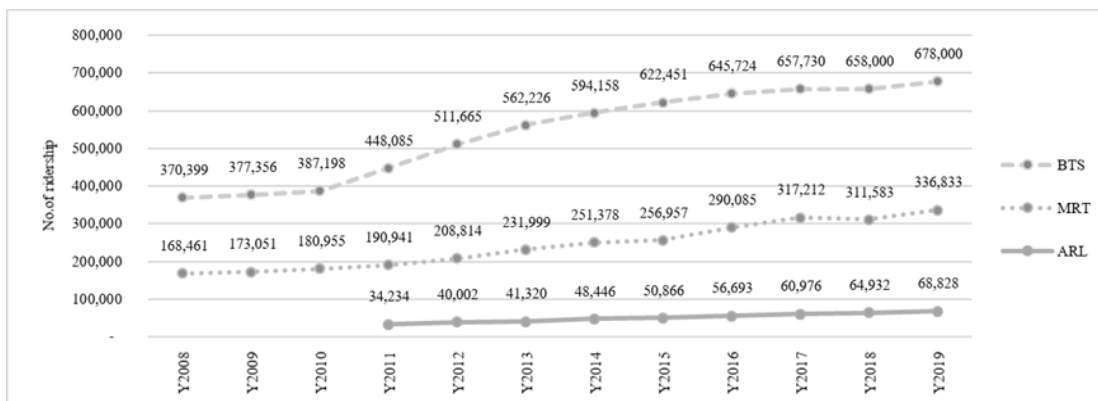
Throughout its years of operations, the Mass Rapid Transit Authority of Thailand (MRTA) has been operated by adhering to the vision of the organization. "To be a leading organization in providing efficient and complete Mass Rapid Transits service to enhance the people's quality of life." As a result of adhering to this vision, MRTA has accelerated to implement the MRT projects by starting the new MRT projects with considerable progress from the fiscal year 2014. For example, the construction of MRT purple line project with a distance of 23 kilometers (from Bang Yai to Bang Sue section). The construction was commenced since 2009 and the official services was launched in 2016. Furthermore, The MRT blue line project considering as extension line from Hua Lampong to Bang Khae and Bang Sue to Tha Pha sections. These project was began since 2016 and the service was started in 2019 and the MRT green line project was commenced in early 2013 and plan to start service in 2020 respectively.

The "Rail Mass Transit Master Plan in Bangkok and its Vicinities" conducted by Office of Transport and Traffic Development, forecast that the total number passengers for all systems of mass transit by rail in 2014 will be 1,840,000 people - trips per day and will rise to 4,384,000 people - trips per day in 2019 and 7,680,000 people - trips per day in 2029, upon an average of 8.22% per year. The percentage of the passenger number transferring from one mass transit by

rail line to another in 2014 is forecast to be about 14.89% and rising to 26.98% and 34.86% of the total number of passengers in 2019 and 2029, respectively. The MRT Blue Line Project: Hua Lamphong - Bang Khae and Bang Sue - Tha Phra Sections will enjoy the highest percentage of line transfers 31 - 40% of the total passenger number. This is consistent with the survey result of the modes of travel that most passengers want to use to travel into the city center.

BTS group holding PCL focuses primarily on the Mass Transit business, which operates via its majority-owned subsidiary, Bangkok Mass Transit System Public Co., Ltd. (BTSC). BTSC is the exclusive concessionaire and operator of the BTS SkyTrain Core Network, the Bus Rapid Transit system, the exclusive operator of specific extensions to the Core Network, the Gold Line, and future operator and lead partner of the Pink and Yellow monorail lines. Subsequently, contracts for an additional 95.3 kilometers of new rail mass transit lines have been secured; Northern and Southern Green Line extensions (from Mo Chit to Khu Khot and Bearing to Kheka, respectively) in March 2017 as well as the Pink Line (from Khae Rai to Min Buri) and the Yellow Line (from Lad Prao to Sam Rong) in June 2017. BTS's Network coverage will increase by approximately 2.7 times from its current size. In the next 2-3 years, Mass Transit business is well underway to operate a network that will increase by 2021 span 133.4 kilometers in length. When all these lines become operational, Mass Transit revenue is expected to increase significantly and also has higher operating and maintenance expenses to accommodate more than 800,000 passengers per day.

The 28 kilometers line in the Thailand capital links Suvarnabhumi Airport with the Phaya Thai station. The Airport Link offers its passengers not only fast and reliable transit but also a desirable and ecologically-friendly alternative to the car. Siemens is one of the consortium members and responsible for: train control and the signaling system, telecommunication, automatic fare collection, railway E & M systems (platform screen doors and tunnel equipment), power supply systems (traction and station power supply and overhead contact line), trackwork, depot and workshop equipment, baggage handling, check-in facilities, and the rolling stock. The project has collected data showed the average daily passengers merely 30,000 which was composed of 29,000 City Line riders and 1,000 Express Line riders in 2019.



**Figure 1.1** The Average Daily Ridership of Mass Rapid Transit during Y2008 to Y2019

**Source:** (1) Annual Report of Mass Rapid Transit Authority of Thailand, 2018

(2) <https://investor.bemplc.co.th/th/ridership-report/ridership>

(3) <http://www.btsgroup.co.th/en/investor-relations/bts-ridership>

(4) <http://www.srtet.co.th/index.php/th/career/transportation-stratistic>

According to Figure 1.1, it was shown that the number of passengers who travel by Mass Rapid Transit service, including BTS, MRT, and ARL had been continuously increasing every year. To enhance the Mass Rapid Transit's technology with high service efficiency, the Mass Rapid Transit business providers should pay more attention to technology adoption in order to make them be strong and operate a more competitive response to the public's needs.

## 1.2 Self-Service Technology Adoption in Mass Rapid Transit System

It is a good idea to implement self-service technology for Mass Rapid Transit system. Instances of these Self-Service Technologies (SSTs) incorporate nearby alternatives, for example, a ticket vending machine and off-SSTs choices, for example, buying a self-ticket, topping up money on card, and getting travel data from interactive traveling kiosk. Likewise, Increasing in operation expenses and developments in innovation have added to the development of innovation-based self-administrations. Many specialist co-ops have received a broad scope of advances during the time spent administration conveyance. Clients use the new advancements to

create and expend administrations without direct close to home contact with firm delegates (Chairunnisa, 2018).

The pattern for self-administration advancements will proceed as Self-Service Technologies are progressively executed in client firm cooperation, and they are innovation interfaces that empower clients to exploit an administration with no administration worker association. To enhance the Mass Rapid Transit's system quality and serve the customer with high service efficiency, the Mass Rapid Transit business providers are paying more attention to technology system adoption and try to make them be strong within the same industry.

The obvious self-service technology that being used in Thailand is a ticket vending machine. It can be easily explained as the mechanical system that produces the ticket both electronic ticket and token or even recharges a smart ticket card, namely the system issue train tickets at railway stations for the passenger. The system of ticket vending machines of BTS, MRT, and Airport Rial link can be including journey token, journey card, and One day Pass. TVMs provide the convenience step for all travelers and commuters. They also help to minimize time and support easy access to the tickets whenever needed.

Beyond benefits and privileges provided to the BTS SkyTrain's passengers, BTS Group continues to develop the ticketing system to support modern city lifestyle needs, aiming to improve the quality of living and leverage the convenience of the mass rapid transit network in Thailand, to a similar extent as international standards. Nowadays, living habits and financial services are changing rapidly and continuously in align with technology advancement. Moreover, the Bank of Thailand aims to make Thailand a cashless society in the future. This is in line with the BTS Group's strategy and long-term goals for the service business to bring Bangkok to Cashless Society through Micro Payment service in electronic commerce. With this, BTS Group has developed "Rabbit" to be more than BTS Sky Train and BRT Pass. And BR buses. In addition to the development and operation of the "Rabbit Card," a ticketing platform across Bangkok's BTS network and partnered with retail stores. Within the services business, there are over 6 million Rabbit cards in circulation joint venture with Line to create Rabbit Line Pay marks the beginning of the evolution of card-based offline payment channel into an integrated offline-

online nationwide payment platform. This expansion will also provide a valuable online database to deepen and improve our media business offering.

Self-storage service, Lockbox, is another self-service technology system available at Mass Rapid Transit hubs. It is the privately-run locker service to accommodate the travelers. This service is operated in the areas of MRT and BTS stations or outside the exits and also provides 24-hour access. This service is very supportive and enhances the convenience for the traveler with no need to carry the extra weight during their journey.

However, there is a restricted comprehension of what impacts clients' observation and selection of SSTs. Since these innovations have changed the idea of user correspondence and administration, it is important to examine how users survey the qualities of the Self-Service Technology administration and how administration results are influenced (Niina, 2008). Although users are progressively modern in their innovative communications, they may avoid certainly to adopt SST if awkward, notwithstanding when advantages are evident.

### **1.3 Self-Service Technology in Other Service Area**

Nowadays, Self-Service technologies have been implemented to create an immense transformation and are providing an idea of giving services. They are offering facilities due to advancements in innovation. Mechanical improvements that communicate straightforwardly with clients have likewise diminished the requirement for preparing staff in the client relations division. Additionally, there has been an expanded interest of Self-Service checkouts that set aside work costs and the need to procure more representatives. Although extant research contributes to a better understanding of customers' trial intention or initial use, only limited attempts have been made to investigate factors that influence customers' continued use of SST. Compared to initial adoptions, the continuance of customer adoption on SST is more critical to service firms. Repeated and continued use is not only a necessary stage to customer commitment and loyalty but also a return on the substantial investment in self-service technologies (Bitner, 2000). Furthermore, although substantial numbers of in-lobby SSTs have been employed by

service firms (e.g., banks, hotels, fast-food restaurants, and supermarkets), extant research provides very little knowledge about the factors that drive customers' continuance intentions toward them.

The increase in labor costs has created the need to utilize delivery services in such a way to allow consumers to carry out services themselves (Grönroos, 1993). New developments in innovative technologies have changed the services industry enabling them to improve their operations, increase efficiency, and provide better functions to benefit the consumer as much as possible. Many service providers allow their customers to interact with the service without any type of human interaction. This means that consumers interact with Self-Service Technology rather than employees to produce any kind of service outcomes (Parthasarathy, 1998). There is a rapid growth in the many companies switches towards new technologies to deal directly with customers rather than using human interaction. For this purpose, Self-Services Technologies have been gaining popularity. For better customer services and long-term business success, Self-Service Technologies have become vital to organizations. They will be the gateway and support the service business to reach a worldwide level.

Advanced self-service technology is being widely applied in numerous industries, for example, in supermarkets, banks, hotels, and hospitals. The concept of self-service has been introduced since the 1990s, but with basic applications like Automated Teller Machines (ATM). The advent of the Internet led to the concept of Internet banking and online shopping, which are other examples of self-service technology. As we entered the 21st century, computer software was integrated with smart technology to create more and more complex systems that help create the self-service such as self-filling of fuel, using check-in and check-out procedures in hotels by oneself and others. Self-service technology has newly entered the banking sector in a different form, namely self-service bank branches. Hypothetically, in self-service branches, there will be no employee-customer interaction; just an SST-customer interaction will exist. There have been some attempts by a bank in the UK to move such technology, but the results are still not apparent. Turkey-led by one of its significant banks may as well be a pioneer in introducing such

technology. It has been submitted and put into action but still has not become very widely known among the banking industry, let alone customers themselves.

Technology also is one of the most critical drivers of change. This is since companies that do not withhold the status quo and do not keep up to date with the newest technologies will eventually fail. With the advent of smartphones, banks started providing services through smartphones. Now, it is almost impossible to find a reputable bank that does not provide banking through the Internet or mobile phone. Recently, the release of the apple watch was followed immediately with banking through your apple watch. This shows how important keeping up with recent technology is for financial institutions. Recently a new form of SST has been used through the banking industry, which has been named as eXtreme Transaction Machine (XTM). This SST can be described as an advanced ATM that provides video conferencing and aims at providing the best of traditional bank branches and ATMs (Kahlilov, 2012). Nowadays, self-service technologies are widely used in Thailand, but it is still a very new thing. Many companies start to apply this kind of technology as part of their service operations. For example, MK restaurants have introduced tablets to help with ordering food, Air Asia introduced a self-check-in system via interactive kiosk or online application, reduces waiting times for queues to check-in at the airport. Moreover, Nectec developed and handed over health checkup kiosks to many hospitals in Thailand where the patients can do the basic health checkup by themselves before seeing the doctors. Nevertheless, most of them are still in the process of experimentation and overall performance evaluation. In addition, the application of self-service technology into the Thai context still has some limitations, which vary according to the nature of the industry, which is an influence that comes from demographic differences of Thai economy and culture (Jakranukul, 2015). In any case, not every person prefers to utilize SST or content with these advances (Bateson, 1983). The application of novel technology in Thailand may need to be studied the performance of the system in various aspects, including the user's feedback from adopting that service s. Finally, it may be needed to be adjusted as appropriate to Thai society and the environment.

## **1.4 Research Objectives**

1. To examine the effect of Information quality, System quality, Service quality, Performance expectancy, and Social influence on Users' satisfaction. Also, their influence on Continuance intention to use Self-Service Technology of Mass Rapid Transit in Thailand as well.
2. To study the direct effects of Social influence on continuance intention to use self-service technology of Mass rapid Transit in Thailand.

## **1.5 Research Questions**

1. How do the quality factors of Information system, Performance expectancy, and Social Influence affects the Users' satisfaction and how it consequently influences on Continuance intention to use Self-Service Technology?
2. What effects do Social influence have directly on Continuance intention to use Self-Service Technology?

## **1.6 Significance of The Study**

As an industrialized country, Thailand is putting its strong emphasis on various viewpoints to enhance citizen's subsistence. Mobility infrastructure is one of the main important foundations that serve people in their comfortable and convenient journey and lifestyle. The self-service technology system is implemented as a high demand to upgrade the service level in accordance with customer satisfaction enhancement. However, Thailand is still not fully implemented of self-service technology, partial support of service employee can be seen. Differently, numerous developed countries, where completely accessed of high technology is treated to use the self-service technology without any human encounter. Therefore, this study will

explore and provide useful information on how information system quality, performance expectancy, and social influence factors influence on user satisfaction and have a consequential effect on the intention to continue using the self-service technology of Mass Rapid Transit. This can guide service providers to consider developing and investing in a full self-service system to serve the customer with seamless digital service performance in state of the art. Moreover, the examination result of this research will be a pilot study about alternative service technology that can be extended further study in other service industries.

### **1.7 Contribution to Existing Work**

This research project will effectively contribute to existing work done by many researchers on self-service technology. In this work, the researcher will work on the information system quality, technology's performance expectation, and social-related factors that influence users on the adoption of self-service technologies and continuance using it. Many researchers have written about self-service technology adoption in different sectors, and this research project is solely about continuance intention to use self-service technology in Mass Rapid Transit system in Thailand. This research project will include information quality, system quality, and service quality that represents the information system quality factors and the satisfaction of users who felt that the self-service technology system could be served their needs without any force. Performance expectancy is about the user's expectation of the ability of self-service technology and believes that using it may support them to complete their task. Also, social influence factor that concerns how the external circumstance and other opinions affect the consumer to imitate using it.

## **1.8 Scope of Research**

### **1.8.1 Population and Sample**

To study the user perception and their willingness to continue use of self-service technology of Mass Rapid Transit, the target population is passengers who has experienced with travelling by Mass Rapid Transit in Thailand and also used to adopt the self-service technology system namely, ticket vending machine, self-storage locker, Information Interactive Kiosk. Since the The number of passenger is an infinite and from diverse population; therefore, the researcher plans to conduct the multi-stage smapling procedure that includes quota, cluster, and convenience sampling method for this sample selection. The final target respondents are 400 people in accordance with the approach of Maximum Likelihood Estimation (MLE) as suggested by Nunally (1967).

### **1.8.2 Study Variables**

In this study, there are in total of 7 latent variables and 20 observed variables, which are information quality (format, accuracy, and timeliness), system quality (ease of process, responsiveness, usability), service quality (technological service and human service), performance expectancy (perceived usefulness, job-fit, and relative advantages), social influence (subjective norm, social factors, and image), user satisfaction (user satisfaction 1, 2, and 3), and continuance intention to use (continuance intention to use 1, 2, and 3).

### **1.8.3 Timeframe of Research**

The research is separated into two sections. The fisrt section is reviewing of background, significance, and literature in order to the study's subject to establish and diagram a conceptual framework. Thus, a proposal is arised which includes three chapters: Introduction, Literature review, and Research methodology. Also, the questionnaire will be presented for this proposal. The second part is distributing the questionnaires to target respondents and collecting these questionnaires back from to use for data processing, afterwards implementing the statistical

technique to analyze the replied data. Finally, writing the result of analyzed data, discussing the contents in accord with the hypothesis testing result, concluding, and presenting the entire thesis to respected committees.

<b>Timeline</b>	<b>Feb-July 2019</b>	<b>Aug-Dec 2019</b>	<b>Jan-June 2020</b>	<b>July 2020</b>
1. Literature review and Construct the conceptual Framework	→			
2. Write Proposal		→		
3. Collect and Analyse data			→	
4. Full thesis presentation				→
5. Review and Revise to final version				→

**Figure 1.2** Research Timeline

## 1.9 List of Abbreviation Used

The following Table 1.1 describes the significant list of numerous abbreviations used throughout the thesis.

**Table 1.1** The List of Abbreviations Used in This Research

<b>Abbreviation</b>	<b>Meaning</b>
MRT	Mass Rapid Transit system
BTS	The Bangkok Mass Transit System
MRT	The Metropolitan Rapid Transit
ARL	The Airport Rail Link
TVM	Ticket Vending Machine
SST	Self-Service Technology

**Table 1.1** The List of Abbreviations Used in This Research (Continue)

Abbreviation	Meaning
ICT	Information and Communication Technology
TBSS	Technology-Based Self-Service
TAM	Technology Acceptance Model
IS SUCCESS MODEL	Information System Success Model
ECT	Expectation Confirmation Theory
ECM	Expectation Confirmation Model
CFA	Confirmatory Factor Analysis
SEM	Structural Equation Model

## 1.10 Technical Definition

The definitions in this research are described below.

**1.10.1 Self-Service Technology** referred to a mechanical interface that empowers clients to deliver a service free of direct service worker inclusion, namely, Ticketing Vending Machine and Self-Service Ordering Kiosk.

**1.10.2 Ticket Vending Machine** referred to the mechanical system that produces the ticket both electronic ticket and token or even recharges a smart ticket card, namely the system issue train tickets at railway stations for passengers.

**1.10.3 The Rabbit Card** referred to a rechargeable contactless stored value smart card used to transfer electronic payments in systems in Thailand. It was launched in May 2012 to collect fares for the BTS Skytrain and the Bangkok BRT. The card can be recharged at minimum THB100 at a time at all BTS and BRT ticket offices. This card can be used for payment at partner convenience stores, supermarkets, restaurants, cinemas, and other point-of-sale applications such as service stations and vending machines.

**1.10.4 Interactive Kiosk** means an interactive computer device that allows customers to access products or services on their own. Many shapes are depending on the purpose of usage. The self-service kiosk is self-service technology that is used in the service industry most often. The challenge for the self-service kiosk is a way to deal with system failure during its use that will affect the user's experience and future deployment.

**1.10.5 Information Quality** referred to the quality of the information that self-service system can able to store, produce, and deliver and is used to measure the result of information system in various angles, for example, the accuracy of user needs and information resolution, reliability of information current status, completeness of information are variables that influence the intention to use and lead to use. It also has a positive impact on the user and to the organization.

**1.10.6 System Quality** referred to the overall quality of a self-service system. It is generally voluntary and can be evaluated from operating frequency time of use, the number of times to access the system and usage patterns that related to individual impacts in terms of efficiency and decision-making efficiency.

**1.10.7 Service Quality** referred to an extension of service process and service organization that can satisfy or dissatisfy the expectation to the person. Service quality has been an extensive inquiry that has emerged now in the form of Self-Service Technology (SST). It has profound effects on the way customers interact with firms to create positive service outcomes, i.e., customer satisfaction, loyalty, and Behavioral Intentions. For example, a customer who is unfamiliar with a travel agency will pay for an online ticket and will have no idea how the travel will be. At best, the customer will rely on the promise of the travel agency that the experience will be unforgettable. But again, there is nothing that is tangible about the travel agency's promise.

**1.10.8 Performance Expectancy** is defined as the degree to which an individual believes that using the self-ervice system will help him or her to attain gains. The perceived

service quality concept was based on analyzing consumer behavior and how expectations of services developed due to post-consumption evaluations.

**1.10.9 Social Influence** referred to the change in people's behavior that pressured by the idea from one or group of people to perform intentionally or unintentionally; therefore, the way the changed person perceives themselves in relationship to the influencer, other people, and society in general.

**1.10.10 User Satisfaction** is defined as the sum of one's feelings or attitudes toward the assessment of a product or service, namely the perception of computer use and adoption by end-users has met their needs or expectation. In the self-service technology context, it can be referred to as how satisfied users are with systems after actual usage.

**1.10.11 Continuance Intention to Use** referred to the intention of the user to continue using the self-service system with initial user experience. Customers have more clues about what managerial practices have been adopted and how service procedures have been conducted.

## **CHAPTER 2**

# **LITERATURE REVIEW**

This chapter will explore the literature that relevant to the influence of information system quality factors, expectations of technology's performance, social influence on usability, user's satisfaction, and continuance intention to use self-service technology of Mass Rapid Transit system in Thailand. The theoretical background, relevant concepts, related research that are used for establishing a conceptual framework for the study are explained as the following topics;

2.1 General Information of Self-Service Ticketing Vending Machine at Mass Rapid Transit System in Thailand

2.2 Theoretical Background and Evolution of Information Systems Success Model (IS Success Model)

2.3 Concept and Theories Related to Information Quality

2.4 Concept and Theories Related to System Quality

2.5 Concept and Theories Related to Service Quality

2.6 Concept and Theories Related to User Satisfaction

2.7 Concept and Theories Related to Performance Expectancy

2.8 Concept and Theories Related to Social Influence

2.9 Concept and Theories Related to Continuance Intention to Use

2.10 Conceptual Framework Diagram and Summary of Hypothes

## **2.1 General Information of Self-Service Ticket Vending Machine of Mass Rapid Transit System in Thailand**

In recent years, many transportation businesses have been frozen the number of manpower to control labor costs and try to manage operating hours of their ticket counters due to the increase of overhead expenses. In Thailand, the concept of implementing self-service technology become an alternative way to challenge such a force. Mass Rapid Transit System adopted technology-based innovation such as a self-service ticket vending machine or can be called an automated fare collection system to serve the customer with quick and easy service. It will help and allow the riders to buy ticket efficiency. This system is now used through BTS, MRT, and Airport Rail Link. The researcher will focus on this kind of system as the technological study concerned.

### **2.1.1 Definition of Self-Service Ticket Vending Machine and How It Works**

Self-service ticket vending machines can be explained as the mechanical system that produces the ticket both electronic ticket and token or even recharges a smart ticket card, namely the system issue train tickets at railway stations for passengers. The system of ticket vending machine of BTS, MRT, and Airport Rial link can be including a single journey token, single journey card, and One-day Pass. Usually automated ticket vending machines (TVM) will sell only one-trip tickets. It accepts both coins, banknotes, and QR codes for payment. The central system of the Ticket vending machine which are MRT, BTS, and ARL currently implemented. Moreover, Rabbit top-up machines can support passengers on adding the value into contactless smart cards such as Rabbit card. Below is the picture of the Ticket Vending Machine of each Mass Rapid Transit business provider and Rabbit Top-Up machine.



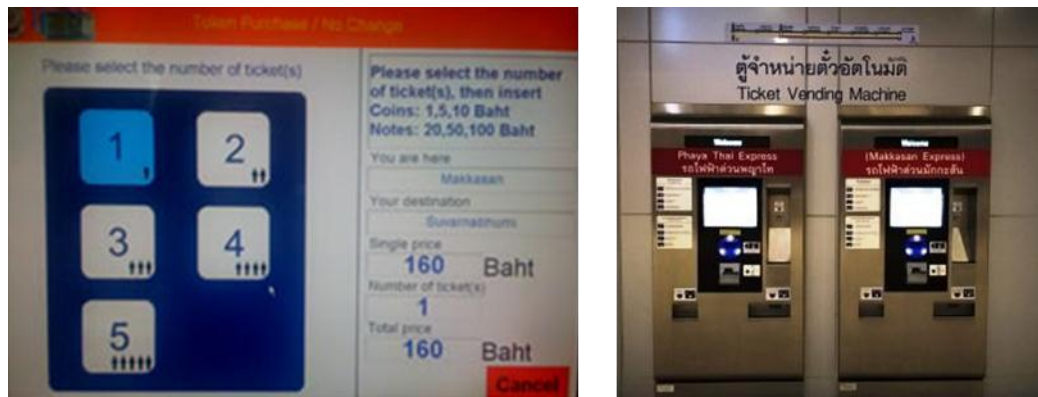
**Figure 2.1** BTS's Ticket Issuing Machine and Ticket Vending Machine

**Source:** <http://www.customer/th/01-machine-ticketing-tim.aspx>



**Figure 2.2** MRT's Ticket Vending Machine

**Source:** <http://www.pantip.com/topic/36769186>



**Figure 2.3** ARL's Ticket Vending Machine

**Source:** [http://www.sawadee.co.th/bangkok/airport/airport\\_link.html](http://www.sawadee.co.th/bangkok/airport/airport_link.html)



**Figure 2.4** Rabbit Top-Up Machine

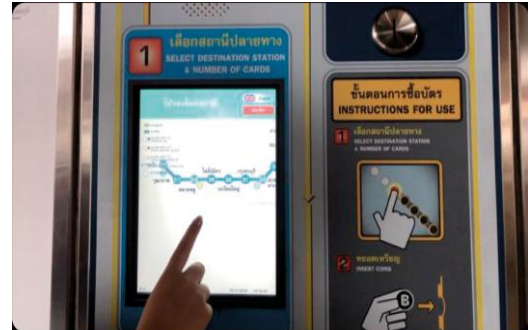
**Source:** <https://naiwaen.debuggingsoft.com/2018/07/cr-rabbit-card-top-up-machine/>

The example of BTS typical process on how to buy the ticket card via a digital display interface is shown in Figure 2.5

**Step 1:** Touch the screen on your destination area. The Route map will then zoom in to area selected.



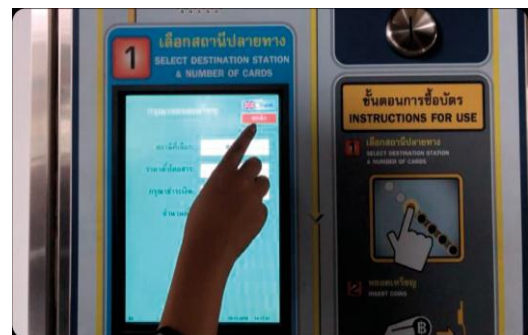
**Step 2:** Swipe to find your destination station.



**Step 3:** Select destination by pressing on the circular area of station code.



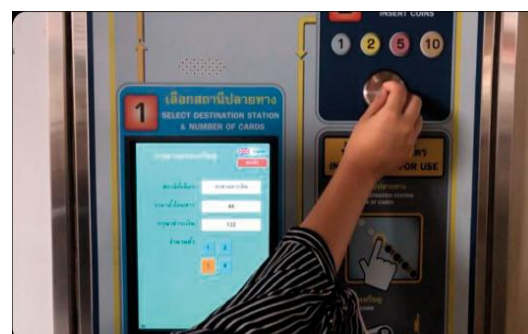
In case of wrong selection, press the cancel button and select station again

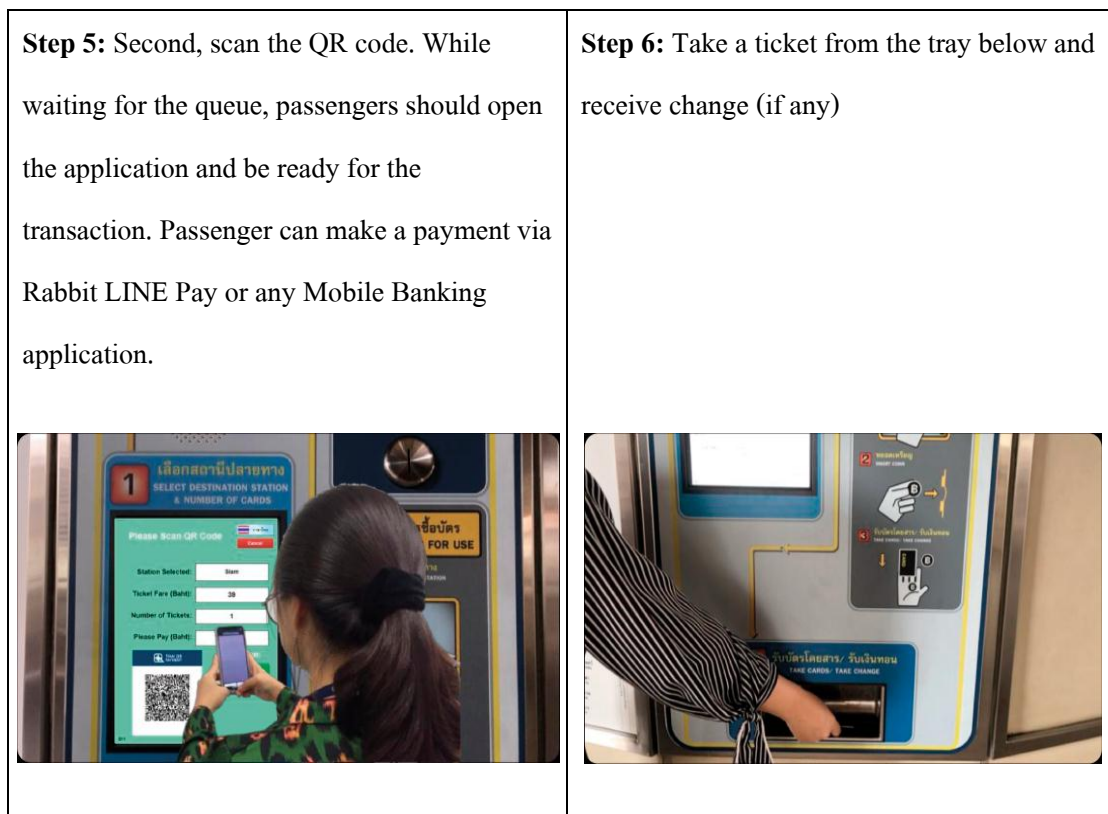


**Step 4:** Select the number of tickets. Ticket Machine issue a maximum of 4 cards. If no quantity selected, then one card will automatically be dispensed.



**Step 5:** There are two ways to make a payment. First insert coins or banknote





**Figure 2.5** The Example of How to Buy The Ticket from BTS's TVM

Nowadays, there are at least 3-4 self-ticket kiosks available at Mass Rapid Transit station. The service providers have continuously spent investment on an increasing number of machines.

### 2.1.2 Advantages and Disadvantages of Ticket Vending Machine

Currently, more innovations and technologies are being created to support user self-transactions and also help the business provider to reduce their operation cost. Ticketing vending machine was implemented for this reason at Mass Rapid Transit area. However, this kind of self-service technology provides both advantages and disadvantages to use.

In terms of the benefits, Ticket Vending Machine (TVM) gives the ease of life to both passengers and workers. The machining process and make the tickets distribution. Users can alternatively pay the money to exchange coins or tickets by cash or QR code scanning. For operation hours, TVM is available when ticket offices are closed in hours. It can help the user to save time to access the tickets whenever they needed. By adopting of TVM, the passengers can avoid waiting for the long queue and suitable for some people who do not prefer to interact with

the ticket seller. From a business point of view, TVM can replace the human service to minimize the overhead cost while maximizing the profit to the organization.

On the contrary, some disadvantages can be a barrier for people to ignore using TVM. They can be both on the confidence level of machine capability, namely, Information and system quality provided and the passenger ability itself to adopt the TVM. Even though the machine was produced and supplied with a high intelligent interface system, the information and system quality may not be designed well to match with every level of user. Therefore, a small minority was fearful of technology or uncomfortable to use it.

### **2.1.3 Advantages and Disadvantage of Rabbit Top-Up Machine**

The biggest advantage is the added speed with which customers can top-up and pay rather than dealing with long lines that get backed up by customers waiting. People can quickly make transactions by using self-service kiosks themselves. This can be especially helpful during a busy time when people finish their work hours. This can also reduce the length of checkout lines and wait times, which should keep customers happy while minimizing the stress on employees. Since multiple kiosks can be placed in a relatively small area, stores can take care of customer transactions with minimal space.

Many tech-savvy people can navigate their way through self-service technology with ease; it can also be problematic for others, sometimes system sophistication or customers need assistance. Even with relatively intuitive navigation menu instructions, this system can be frustrating to some users, and many customers do not feel comfortable with the process or simply do not want to do the work by themselves. Despite the efficiency of this system, many customers may prefer to have a one-on-one interaction with people rather than dealing with a faceless machine; these customers enjoy a brief conversation with employees because they need the multiple services and the personal attention they receive.

## **2.2 Theoretical Background and Evolution of Information System Success Model (IS Success Model)**

DeLone and McLean firstly proposed the Information System Success Model (IS Success Model) in 1992. It has been widely accepted and used as an important guideline in evaluating the

quality of information systems in various aspects. The DeLone and McLean's IS success model was considered as a model for reference in Information systems research (Rai, 2002).

### 2.2.1 The Definition of System

There are numerous scholars/ Researchers give the definitions of System as in the table below:

**Table 2.1** Definitions of System

Scholars/ Researchers	Definitions
Koontz & Weihrich (1978)	A set or integration of linked, sub-components, or depend on each other by arranging them in a complex form for achieving one objective.
FitzGerald & FitzGerald (1987)	The collection of sub-components that are related to each other. When combined, they will fulfill their goals.
Smith (1993)	A set of sub-components that are interrelated to each other and aim for the same goal.

Overall, System is relevant to a group of subsystems or various components that work together to achieve the goals set, including four main components, which are input, process, output, and feedback (Stair, 2006).

### 2.2.2 The Definition of Information System

Suchada (1998) defined the meaning of the information system as a system consisting of various parts, including hardware, software, networking, system database, system quality related to personnel, and expert. All of these components work together to define, collect, and store data, process data and send results or information obtained to support the planning, decision making, work management, control analysis, and tracking the performance of users.

Information systems are the application of system-related components for the recording, collection, processing, and forwarding of information for the benefit of planning, control, management, and support for administrative decisions (McLeod, 2006).

### **2.2.3 The Definition of Success of Information System**

DeLone and McLean (1992) stated that the success of an information system could be measured at three different levels which are (1) Technical level related to measurement of accuracy and system efficiency, (2) Meaning level associated with the measurement of intention to convey the meaning of information, and (3) Effectiveness level related to measurement level of information impact on users (DeLone & McLean, 1992). DeLone and McLean also emphasized that system usage variables can measure the success of an information system because if the user's system is used and shows that the system has enough value to use; therefore, it is considered the success of the information system (DeLone & McLean, 2002). Afterward, DeLone and McLean (2003) explained that a mid-growth of information systems and electronic commerce system, the system quality voluntarily is more important than the system quality only because the system has both usage, function, or use since it forced. Still, voluntary use is the use of user intent that is valuable and is the best measure of system success (DeLone & McLean, 2003). Later on, DeLone and McLean (2004) proposed metrics in 6 areas using to measure the success of an electronic commerce system which are (1) System quality, (2) Information quality, (3) Service quality, (4) Use, (5) Satisfaction/User Satisfaction, and (6) Intention to use (DeLone & McLean, 2004)

### **2.2.4 Theoretical Background and Evolution of Information System Success Model**

Regarding DeLone and McLean (1992), they have initially developed a model for Information system success which are consisting of 6 related variables as follows;

1) System quality is the measurement of the work process of the information system, which has a description of measures such as the convenience of access, the flexibility of the

system, integration of the system, response time, realization of user expectations and system stability and reliability, etc.

2) Information quality is the measurement of the information's attribute that received from the output system, which has the scope of the evaluation, such as accuracy, currency, understandability, relevance, completeness, conciseness, timeliness, etc.

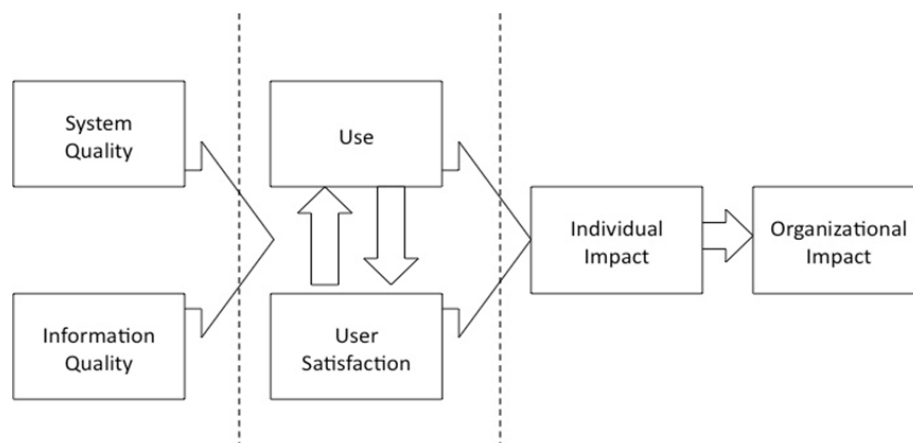
3) Use is the measurement of the use of information system by the application which has the scope of measurement, namely use or nonuse, frequency of use, the extent of use, motivation to use, etc.

4) User satisfaction is a measure of satisfaction or the user's response to the results of the information system, which has a scope of the evaluation, such as user satisfaction and enjoyment.

5) The individual impact is an assessment of the effects of information on the behavior of users of the information system. The term "Impact" is a measure of how information systems have caused users to have in making better decisions after receiving the information that is information has improved user decision-making conditions. There are scopes of measurement, namely, user confidence, quality of decision analysis, efficient decisions, and time is taken to complete a task, and change in decision behavior, etc.

6) Impact on the organization (Organizational Impact) is the impact of information on the potential of the organization, which has the scope of assessment, such as profit performance, sales growth, production efficiency, etc.

The framework for the success of information systems is as shown below.



**Figure 2.6** Information system success model (1992)

**Source:** DeLone, W. (1992). Information systems success: The quest for the dependent variable. *Information Systems Research*, 3, 60-95.

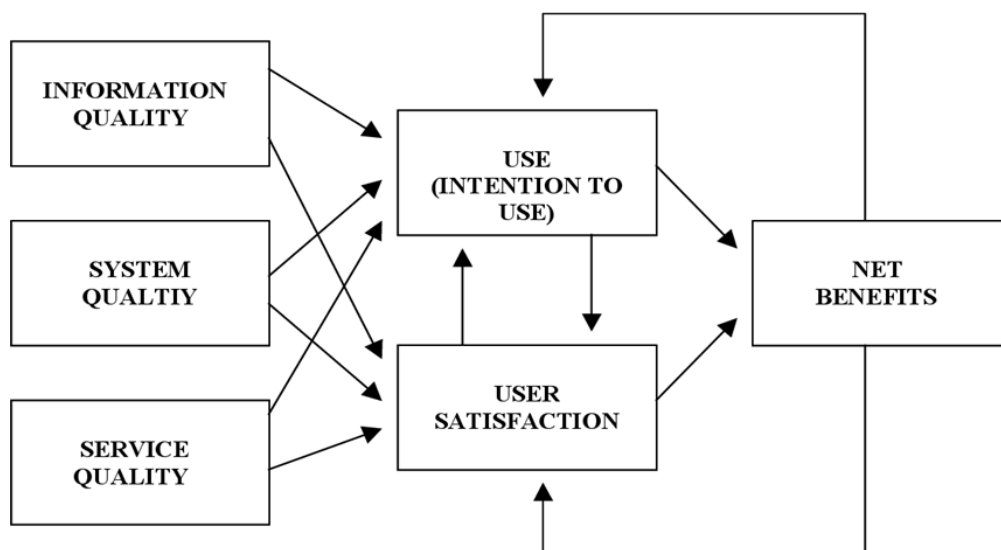
In summary, the successful model of the information system in Figure 2.6 attempts to reflect the relevant variables. It is the natural process of the success of information system. 6 variables in the framework are more than 6 independent variables in success; however, they are 6 variables that are interrelated in the dimension of technology success. This model of success is critical to the development and inspection before being used as an indicator and is a tool for measuring the success of information systems (DeLone & McLean, 1992).

By considering the information system success model, the most important thing is to pay attention to the definition and the evaluation of each variable that has an impact on the selected parameters and the dimensions of the success of the system should mainly depend on the purpose and the context of the research (DeLone & McLean, 1992)

Later on, DeLone and McLean revised the success model of the information system that they published in 1992 by reviewing the variable success metrics in the conceptual framework. New variants have been added, such as, Service Quality which can be measured in the dimensions of tangibles, reliability, responsiveness, assurance, and empathy. Therefore, the main conceptual framework consisted of 3 quality variables; system quality, information quality, and service quality. The difference in weight of all 3 variables depends on the level of analysis and context. In measuring the success of a single system (quality system) of information, the system quality is the most essential ingredient in quality components. For measuring the overall success of the information system department, the service quality may become a critical variable for such research (DeLone & McLean, 2002).

DeLone and McLean (2002) also revised and combined the impact on individual users and the impact on the organization to only 1 variable and change its name to “Intention to use.” Use variables are variables that are difficult to interpret. DeLone and McLean (2002) suggested that the Intention to use is the best way to measure usage. Intention to use is an attitude. Usability is behavior, both of which promote each other. By usage variables and the user

satisfaction variables are closely related, affecting each other in a loop (DeLone & McLean, 2002).



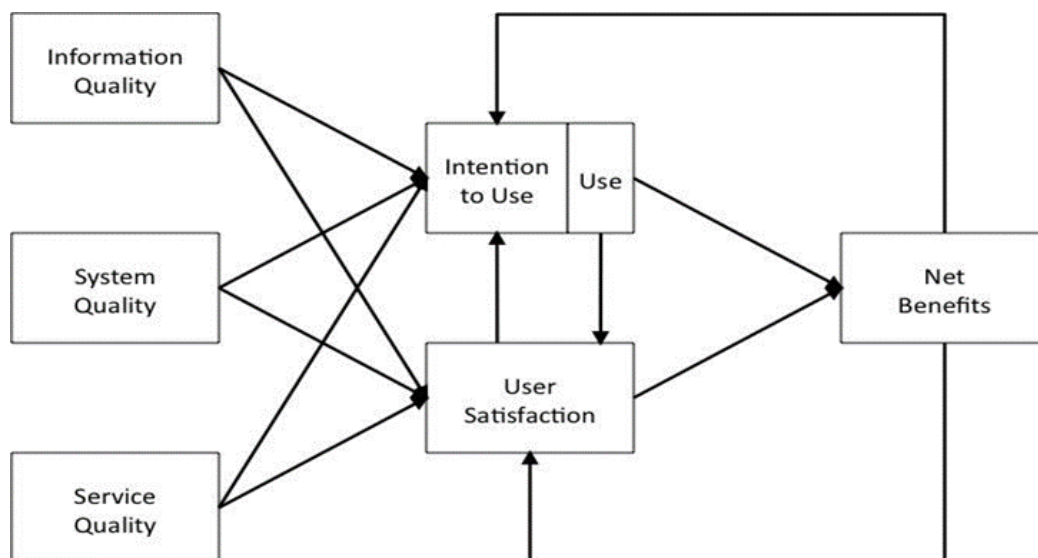
**Figure 2.7** The Reformulated of IS Success Model

**Source:** DeLone, W. (2002). Information system success revisited. *Proceedings of Hawaii International Conference on System Sciences (HICSS 02)*, 8, 238.

DeLone and McLean have improved the information system success model called the updated DeLone & McLean's IS Success Model in 2003. This updated version is developed from the information system success model of DeLone and McLean written in 1992, and DeLone & McLean's reformulated IS Success Model composed in 2002 (DeLone & McLean, 2003). Although the updated model was not yet passed the empirical validation, it is a guideline for continuing research for other researchers in various disciplines. Many researchers are attempting to study relationships in diverse dimensions to measure information system success based on DeLone & McLean models for example, Rai and team did the study to assess the validity of IS Success Model by conducting empirical test and theoretical analysis (Rai, 2002).

For the development of the DeLone & McLean model based on research that is empirical and demonstrates the theoretical benefits, which is a reference to the model of DeLone and McLean. In 2002, the usage variables were measured in the dimension of intention by using unity, but the model that was improved in 2003 has separate usage variables. With the variables of intention to use clearly which will result in the satisfaction of users until the result is clearly

reflected and more concrete, that is to say, the use of the user, if it leads to the satisfaction of the user, it will result in the intention to use again and once you use it still will lead to satisfaction (DeLone & McLean, 2003). The continuous loop as shown in Figure 2.8



**Figure 2.8** DeLone and McLean's updated information system model

**Source:** DeLone, W. (2003). The DeLone and McLean model of Information system success: A ten-year update. *Journal of Management Information Systems*, 19, 9-30.

According to Figure 2.8, the newly updated of information system success framework in 2003 was divided the quality into 3 dimensions: Information Quality, System Quality, and Service Quality, which each variable would be separated from the measurement because each variable will affect the use and satisfaction of users. Also, the use and user satisfaction are very closely related; that is, in the process, sense usage will lead to satisfaction. In a causal sense, a positive experience leads to increased use, which generally leads to increase satisfaction. Intention to use, user experience, and user satisfaction can be directed to the Net Benefits, which is one of the variables in the Information system success model loop with reference to DeLone and McLean model (DeLone & McLean, 2003).

DeLone and McLean (2003) also suggested that the Intention to use can be used as an alternative measurement in some situations. As mentioned above, intention to use is an attitude, whereas usability is behavior. Both attitude and behavior are interrelated; therefore, it is difficult to measure the results. As a consequence, many researchers choose to leave only one variable that is Use dimension.

## 2.3 Concept and Theories Related to Information Quality

### 2.3.1 The Definition of Information

There are numerous scholars/ researchers give the definitions of Information as in the table below:

**Table 2.2** Definitions of Information

Scholars/ Researchers	Definitions
Wuttisak (1993)	The presentation of data that were collected and processed to gain the result that are useful for decision making.
Gordon & Gordon (1999)	The processing of data it will be managed, interpreted, formatted, analyzed and summarized.
Natthaphan & Paiboon (2002)	The result of systematic processing from stored data that can be used for work or support management decisions. This allow executives to be able to solve problems or have effective operational alternatives.

From the above definitions in Table 2.2, it could be concluded that Information refers to the data that were processed by managing, analyzing, interpreting, and summarizing to be beneficial use for supporting decision making. It is valuable to people or groups at any time, more or less, can be considered in many ways. For example, when thinking economics, it can be seen in terms of benefits; while focusing on marketing, it can be understood in terms of exchanges.

### 2.3.2 The Definition of Information Quality

The information quality can be conceptualized as the quality of the information where system is able to store, produce, and deliver. This also can be used to measure the result of information system in various angles, for example, the accuracy of user needs and information resolution, reliability of information current status, completeness of information are variables that influence the intention to use and lead to use. It also has a positive impact on the user and to the organization (DeLone & McLean, 1992). Also, Stair and Reynolds (2003) stated that the value of information depends on how information can help people with corporate decision-making. It can make the goals of the organization successful or achieve the goals of the organization by using that information. If there is a lot, that information will also have a high value. From reviewing concepts, theories, and other scholars' research, various factors were studied by many researchers in term of information quality, the list and explanation are in the table below:

**Table 2.3** Definitions of Timeliness

Scholars/ Researchers	Definitions
Wuttisak (1993)	Information that is received in time will have value. On the other hand, the use of certain information will be decreased in value over time, or information that is too slow is not useful to consumers, namely news in newspaper and securities trading number.
Stair et al. (2008)	Timely good information must be delivered to users in a timely manner, not in time and in time when they need it
Ong, Day, & Hsu (2009)	The ability of the system to provide current information and keep up with user needs

**Table 2.4** Definitions of Format

<b>Scholars/ Researchers</b>	<b>Definitions</b>
Bailey & Pearson (1983)	The type of information presented which is designed, arranged, and displayed to meet the requirement of users.
DeLone & McLean (1992)	The information presented to users, allowing users to be able to see what the information is doing

**Table 2.5** Definitions of Accuracy

<b>Scholars/ Researchers</b>	<b>Definitions</b>
Bailey & Pearson (1983)	Information that is accurate following the user's demand
DeLone & McLean (2003)	Information is that users can recognize that information given is correct.
Stair et al. (2008)	Accurate information must be free from any errors. Incorrect information comes from the conversion process from wrong information to wrong information.

**Table 2.6** Definitions of Completeness

<b>Scholars/ Researchers</b>	<b>Definitions</b>
Wuttisak (1993)	The comprehensive information that is not compromised and not distorted. Fast and correct information but not complete cannot be utilized completely and confidently.
Bailey & Pearson (1983)	Information that is completed and covered according to the needs of users.

**Table 2.6** Definitions of Completeness (Continue)

<b>Scholars/ Researchers</b>	<b>Definitions</b>
DeLone & McLean (2003)	The ability of the system to provide necessary information for users' needs.

Moreover, by reviewing Information quality theories, concepts, and related articles, there are various information quality attributes proposed by many scholars/ researchers.

1) Certainty: Reliable information provides value in terms of information dependability. Information that is fast, but without certainty, there is no value.

2) Accumulation: Quality information must have a continuous accumulation of data with coordination to the same content and not scattered. Huge information that is fast, accurate, and complete, but without continuity, will immediately become less meaningful.

3) Accessible: Quality information should be easy to access, which can be approached by users with the right format and at the right time with reference to the needs of users.

4) Economical: Information should be produced with savings and reasonable worth the price. Executives always consider the value of information and the price that must be paid for the acquisition of that information.

5) Flexible: Quality information should be able to use for many different purposes, such as inventory reports. The salesperson may use it to check if there are any products left in the warehouse, enough for sales. As well as, the production manager uses this report to help decide on how much more products to produce.

6) Relevant: Quality information must be consistent with objectives and meet user needs for decision-making.

7) Reliable: The reliable information depends on the reliability of the data collection methods, and the security may also rely on the information source.

8) Secure: Information must be designed and managed to be safe from those who do not have access to that information.

9) Simple Understanding: Quality information must be easy to understand. Showing with complicate and too deep details will cause user confusing in decision-making on which information that is necessary or truly necessary and truly meet the needs.

10) Verifiable: Information must be verified. That is, users can check the information to make sure they are correct for decision making, which may be examined by comparing the same data from multiple sources.

The quality of the information in terms of content is the information displayed on self-service technology displayed during use, complete, sufficient, clear, and accurate according to the needs of users (Doll, 1988).

Besides, Zwass (1998) stated that the quality of information depends on the accuracy, straightness, completeness, timeliness, accuracy, compactness, and right format (Zwass, 1998).

In summary, from the concept and theories review, information quality can be implied in terms of the quality of information output. Therefore, the researcher grouped the attribution and selected format, accuracy, and timeliness of the information output/display as the 3 observed variables under the information quality.

## **2.4 Concept and Theories Related to System Quality**

Davis (1989) expressed his view on the use of information systems that it the users believe that an active information system can improve the efficiency of their work and achieving the goal on perceived usefulness of user who uses the system is at a high level (David, 1989).

DeLone & McLean (2003) stated that system quality could be explained in terms of the overall quality of a system. It is generally voluntary and can be evaluated from operating frequency time of use, a number of times to access the system and usage patterns that related to individual impacts in terms of efficiency and decision-making efficiency. Similarly, Petter and his team (2008) said that system usage refers to the level and nature of how users use system capabilities, operating frequency, the purpose of use, and the impact of utilization on users (Petter, 2008). As informed by Seddon (1997), the user will use information systems only when they perceive that the system is useful. In some cases, the lack of users does not mean that the

system is inefficient or poor quality. Inactivity can occur as a result of users who not being involved in information systems or technology; therefore, usage variables cannot be measured as clearly as measuring the benefits obtained from the use of information systems. He also summarized that the use of information systems, the system must be well designed and significant for users or organizations (Seddon, 1997).

DeLone and McLean (2004) proposed that system quality is an important variable in measuring reliability. The success of electronic commerce (e-commerce), especially the use of customer systems often voluntarily and the number of uses is 2 keys indicators to measure the success of the system. To measure the quality of the system, numerous researchers adopted the original dimensions proposed by DeLone and McLean in the initial model, namely, ease of use, flexibility, usability (Peres, 2013) reliability, ease of learning, response time, functionality, sophistication, etc. Dominantly, perceived ease of use is the most common use to evaluate the system quality related to the Technology Acceptance Model (TAM) (David, 1989). Nevertheless, many other researchers either attempted to develop additional indexes to assess of system quality by themselves but still related to the original concept of D & M such as portability, maintainability, effectiveness, economy, etc. (Coombs, 2001) or by their review based on the system quality's literature (Gable, 2003).

In summary of the literature review, system quality can be implied in terms of the quality of the process. Therefore, the researcher grouped the attribution and selected ease of process, flexibility, and usability as the 3 observed variables under the system quality.

## **2.5 Concept and Theories Related to Service Quality**

As proposed by Cronin and Taylor (1992), basic concepts in service quality consist of three main concepts; customer satisfaction, service quality, and customer value/purchase intentions. Customer satisfaction on service is the psychological behavior that a person has toward or received the service (Oliver, 1993). Satisfied or dissatisfied is a matter of comparing the experience of clients receiving services with the expectation that the client has during the time receiving the service and is something that helps to measure service quality (Cronin, 1992). As

for the quality of service provided in the marketing viewpoint, Rust and Zahorik (1993) have defined service quality as an extension of the service process and service organization that can satisfy or satisfy the expectations of the person (Rust, 1993). The basic concept of service quality through a satisfaction framework can be supported by another academics. For example, Bitner (1992), who studied the impact of physical surroundings on customers, explained that service quality could be measured through the satisfaction of the client. From above, many researchers are interested in studying service quality based on the basic concept aimed at measuring satisfaction in various dimensions. On the other hand, numerous researchers measure the service quality by the basic concept of the SERVQUAL model. Service quality was derived from marketing literature, SERVQUAL, and afterward other researchers have suggested this variable, Service quality, to be added to the DeLone and McLean model. It became one of the notable factors within the IS Success literature. The SERVQUAL was originally developed by Parasuraman, Zeithaml, and Berry in 1985 to be used for evaluating service quality based on an evaluation of the perceived basis of the client. It also can define the difference between customer expectations of service and perceived service. If expectations are more significant than performance, then perceived quality is less than satisfactory, and hence customer dissatisfaction occurs (Lewis, 1990). While trying to seek for the definition of the service quality and factors that determine the quality of service, the ideas and development of Parasuraman and his team initiate a research to about the factors that influence on quality of giving service. signatures that influence the quality of giving service. Service has divided the phase of research into 4 phases (Parasuraman, 1985);

*Phase 1* studied qualitative research among the clients and service providers of many leading companies and used the results to develop the quality model of service

*Phase 2* was empirical research focusing on the customers especially using the service quality model from phase 1 to improve it as a tool called SERVQUAL and improve that criteria used to judge the quality of service as perceived and the expectation of service recipients

*Phase 3* conducted empirical research as in Phase 2 but aimed to expand the research result to cover more organizations. There are many steps involved. The research begins with 89 offices of 5 leading service companies by bringing the research work for all 3 phases to study

together in which conducting seminars for client and service providers in-depth interviews with the management and finally conducting survey research in all groups, then conducting a study again in 6 types of service businesses, namely maintenance services, credit card services, insurance services, long-distance telephone services, banking services, sub-branch and brokerage services.

*Phase 4* is specifically aimed at the expectations and perceptions of service providers.

The general conclusion from the above research, Zeithaml et al. (1990), has determined the dimension of service quality (Zeithamal, 1990). There are ten leading indicators with 22 service satisfaction gauges, which are widely popular in the service industry (Somwong, 2007). Additionally, Parasuraman and team initially created ten key variables in 1985 to measure service quality, namely, tangibles, reliability, responsiveness, communication, credibility, security, competence, courtesy, understanding the customer, and access. Subsequently, after the models and the service quality evaluation method or SERVQUAL were re-tested and evaluated by using the completed study methodology with reliability and validity test, it was found that SERVQUAL can be grouped into five main dimensions while still related to the ten dimensions of service quality. The newly renovated SERVQUAL will collapse some dimensions from the original; thus, the new updated SERVQUAL will have consisted of 5 main dimensions (Parasuraman, 2005) as follows;

*Dimension 1:* Reliability means the ability to provide services that match the contract given to the client. Every service provided must be accurate, appropriate, and effective at all points of the service. This consistency makes clients feel that the service they receive is reliable or can be trusted.

*Dimension 2:* Responses to customers 'Responsiveness' means readiness and willingness to serve, which can respond to the needs of clients promptly; service recipients can access the service quickly and get the convenience from using the service, including the need to spread the service thoroughly quickly.

*Dimension 3:* Assurance means the ability to build trust with customers Service providers must demonstrate skills, knowledge. The ability to provide services and respond to the needs of

clients with politeness, softness, good manners, Use effective communication, and ensure that clients receive the best service.

*Dimension 4:* Empathy means the ability to take care of clients according to the different needs of each client.

*Dimension 5:* Tangibility refers to physical characteristics that appear in various facilities, including locations, personnel, equipment, tools for communication, and symbols. Including an environment that makes clients feel that they are cared for and cared for by service providers Services that are presented in a precise manner will make the client aware of the service more clearly.

However, the SERVQUAL model was conventionally designed to conduct the study on the customer to employee interaction but not customer directly to the self-service technology interface. Many researchers contradicted that SERVQUAL may not be able to measure the different perspectives of SST's service quality. To evaluate the service quality in terms of technological services directly, Parasuraman et al. (2005) also further developed a context-specific service quality measurement scale called the E-S QUAL scale. This can be used to be the measurement of both pre- and post-e-service quality point of view (Parasuraman, 2005). Moreover, the dimensions of E-S-QUAL were developed by conduction the study and running data gained from respondents who perceive actual service quality experience on Internet shopping (Kim, 2006).

*Dimension 1:* Efficiency is defined as the ease and speed of accessing and using the site service (Parasuraman, 2005). Efficiency is considered very important in self-service, particularly in saving time and convenience that make the users do the activity with little effort and difficulty (Kiosks, 2016).

*Dimension 2:* Fulfillment refers to the site's confirmation on producing correct commands, affirming product availability, and delivering on-time (Parasuraman, 2005). This dimension can be one of the indicators to evaluate service quality processing by a self-service technology system. Once the promised service is produced, and accurate order is fulfilled, the service quality can be led to customer satisfaction, or dissatisfaction depended on the customer's actual perception (Yang, 2004).

*Dimension 3:* System Availability can be comprehended as the readiness and accurate technical functioning of the site platform (Parasuraman, 2005). When the customer conducts the service by themselves and found the system is applicable with well working; therefore, they feel that utilizing great function can improve their tasks and increase operational effectiveness, and give practical benefits for them (Townsend, 2010).

*Dimension 4:* Privacy is the degree to which the site is safe and protects customer information. Some people are uncomfortable accepting self-service technologies due to privacy and security issues. The risk level will be more intense if there is no privacy assurance by the service provider. A lack of privacy may become an obstacle in SSTs adoption.

Moreover, Lin and Hsieh (2011) also developed the service quality of SSTs scales (SSTQUAL) with different dimensions, such as functionality, convenience, enjoyment, security, design, customization and assurance, which take into account the customer's perception of the quality of the service provided by SSTs (Lin, 2011).

E-S-QUAL and SSTQUAL is widely used for studying in the service industry business, particularly in the context of electronic and self-service quality. The organization can use this multiple-item scale to assess and understand the perception of the customer according to the overall automatic service quality, value, and loyalty intentions. In addition, these measurement constructs can be used to comprehend the personnel's perceptions of service quality with an important goal to make the service development successful.

Since the Mass Rapid Transit system in Thailand is not fully operated with a full self-service technology system but partial support by human service. To measure of Service quality; therefore, the research divided it into 2 aspects: Technological service and Human service. Both of them will be assigned as 2 observed variables for this study.

## **2.6 Concept and Theories Related to User Satisfaction**

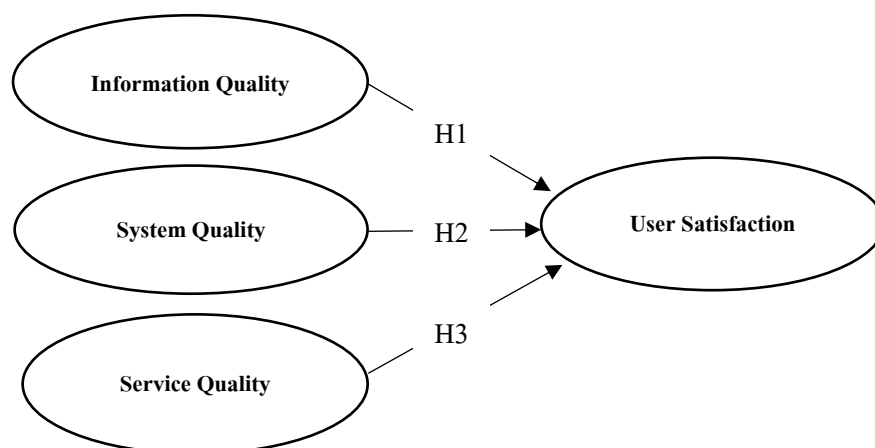
Jittinun (1996) stated that satisfaction is a feeling of preference that can vary depending on the factors that are relevant to the expectations of each person in each situation. At times, one person may become dissatisfied with something because they do not meet their expectations.

However, in another period, If the anticipated response was received correctly, a person can instantly change his or her feelings for that thing even if they are the opposite feelings. In addition, satisfaction is a feeling that can be expressed on a very small level. It depends on the difference between evaluating what is received and what is expected. Likewise, Wirunphan (1999) said that satisfaction is a feeling that occurs within the human mind that is different in each person. It all depends on the individual's expectations of what they do. If there is a high expectation and the response is good enough to be very satisfied. On the contrary, if going in the opposite direction, maybe disappointed or very dissatisfied (Wirunphan, 1999).

In terms of user satisfaction, DeLone and McLean (2003) explained that user satisfaction is a measure of how satisfied users are with information systems and is an important factor in measuring the success of information systems. The satisfaction of users is in the influence on the recipient level, which evaluates the users' decision of the system. It also has a high level of face validity, which is difficult to deny that system is not caused by quality determinants namely, system quality, information quality, and service quality (DeLone & McLean, 1992). Petter and others (2008) also emphasized that user satisfaction concerning the D & M model is an essential measure of the success of information systems in various dimensions such as information quality, system quality, and net benefit that users received. In customer satisfaction's point of view, DeLone & McLean (2003) proposed that user satisfaction can be used as a critical variable to measure customer opinions in an electronic commerce system and covers the customer experience cycle from searching for information, making payments, receiving products and services.

Similar to Oliver (1980), he defines customer satisfaction as the perception of the consumer after the actual use of product or service. It starts with the expectation of the user and then finalizes with the perceived performance based on assessing customer attitudes (Oliver, 1980). Customers can be either contentment or disappointment resulting from the comparison between their actual recognition and expectations (Eagle, 1993). The fulfillment of customer is influenced by overall quality, price, expectancies, company image, and people yearnings.

From the above 3 quality factors and 1 influential factor conveyed from the theory of the Information system Success model. The conceptual framework was first developed and constructed to show the interrelationship as the detail below.



### ***Information Quality, System Quality, Service Quality, and User Satisfaction***

Information quality is one of the significant factors in the success of an information system model. It is defined as the quality of the attribute of information and also comprehended as the value of information for a particular use (DeLone & McLean, 1992). This factor has been widely studied for a decade both in emerging and developed countries to examine the relationship of information quality with others. The research of Garcia and Effken in 2013, they studied the development and evaluation of Information system success model related to the medical context. The research reveals that the attributes of information quality, which are completeness, accuracy, and format has a positive impact on user satisfaction with using the medical information system (Garcia, 2013). Generally, the information quality can be measure in various dimension such as format, timeliness, compactness, relevance, accuracy, and others (DeLone & McLean, 1992), which potential influence on the expectation and then intention use of the system. If the SSTs of the Mass Rapid Transit system in Thailand provide sufficient, clear, and accurate information according to the needs of users, it will inevitably result in positive user behavior. Then the user will have the demand to use the self-service technology regularly for a variety of purposes and will intend to use as many as possible. It also helps to create value for the user both inside and outside the organization to ultimately satisfaction (Torksadeh, 1999).

System quality can be described as the technical quality of the information system itself. It can be measured in various indexes, for instance, ease of use, flexibility, responsiveness, functionality, and others (DeLone & McLean, 2003). This quality factor is at the top level of evaluating the success of the information system since the system quality should be highly reliable and fast interaction with the user's command (Rai, 2002). When the self-service

technology is filtered to a certain user's expectation and finally perceived its quality, they will feel confident in use. Supportively, the study of Wang and Chao related to system quality, user satisfaction, and benefits that users gain from mobile network services. The results revealed that the quality of the system of 3.5G mobile phone network has a positive impact on user satisfaction and then lead to the user benefits. High quality of the system but simplicity will increase the user contentment since the system will be more amicable and effective in its use (Wang, 2011).

Service quality can be conceptualized as the perceptive understanding of user needs in accordance with the service delivery. People agree that service quality depends on the level of actual service performance that meets users' needs and expectations (Grönroos, 1993). According to the study of Muhammad Shahid Iqbal and his team, they researched to examine how self-service technology impacts customer satisfaction, loyalty, and Behavioral Intentions in the service sector of Pakistan. The data of 238 self-service technology users was collected through the online survey and then the model was tested by SEM via LISREL program. The results showed a positive and significant relationship between technology-based service in terms of service quality, loyalty, and behavioral Intentions directly and indirectly via customer satisfaction. In conclusion, these results provide insights for the service sector of Pakistan to consider investing in the new technology in order to enhance the consumer experience, satisfaction, loyalty, and Intentions (Iqbal, 2018). Even though humans interact directly with machines without any support by the servicer, service quality has to be considered regarding system service convenience, time-saving, and service feature availability as well. Confirmation is portrayed as the point of view assessment of user on the distinction in the experience of desire and real use (Zeithaml, 1993). In this manner, in the post-selection setting, Bhattacharjee (2001b) clarified that clients' desire develops with the expanded involvement, and post appropriation desire will be found on the genuine user experience. User will be fulfilled when self-administration technology meets expectations and assist them in their activities in various aspects (Bhattacharjee, 2001b). Particularly, when the gap between service perception and service performance is completely filled, it will lead to higher service quality and therefore reach higher user satisfaction (Parasuraman, 1985).

Therefore, the following research hypothesis was formulated:

**H1:** Information Quality has a positive influence on User Satisfaction

**H2:** System Quality has a positive influence on User Satisfaction

**H3:** Service Quality has a positive influence on User Satisfaction

## **2.7 Concept and Theories Related to Performance Expectancy**

The UTAUT was proposed by Venkatesh et al. (2003) as an integrated framework of eight related technology acceptance theories or models. Those theories or models include the diffusion of innovation theory, the TRA, the TPB, the motivation theory, the hybrid model of TPB and TAM, the original TAM, the PC utilization model, and the social cognitive theory. The perceived ease of use and the perceived usefulness were incorporated in this model by using the effort expectancy and the performance expectancy dimensions. In addition to the two most important constructs of performance expectancy and effort expectancy, the other constructs, which include the social influence, the facilitating conditions, the intentions to use, and the usage behaviors, were also included in this model. Venkatesh et al. (2003) examined the three constructs consisting of self-efficacy, anxiety, and attitude toward using technology in UTAUT model. However, these three constructs have no strong impact on others. Thus, three constructs are removed from UTAUT model (Venkatesh, 2003).

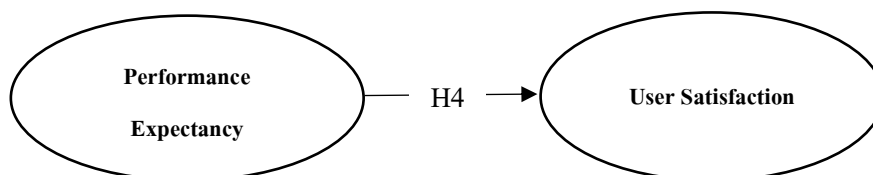
It is worth noting that Venkatesh et al. (2003) successfully advanced one of the most inclusive and parsimonious models to explain technology usage by including constructs that capture the most meaningful cognitive, social and environmental drivers of technology adoption (Bagozzi, 2007). Furthermore, UTAUT enriches the understanding of technology acceptance by debating the moderating impact of age, gender, experience, and voluntariness (Venkatesh, 2012). Importantly, UTAUT was the first model to be able to explain 70 % of the variance in behavioral intention. This compares to the approximately 40% variance the former models are able to explain (Venkatesh, 2003). Additionally, UTAUT has been broadly employed by many scholars to understand the adoption of different types of technologies from both the perspective of organizations and individuals within different cultural contexts-this strengthens the generalizability of UTAUT (Al-Gahtani, 2007; Venkatesh, 2012). UTAUT's reach has been

extended by targeting new segments of users, for instance, customers and citizens (Chiu, 2010). However, since UTAUT was proposed to explain the adoption of technology from an employee's perspective, there are concerns related to the applicability of UTAUT in the context of customers (Venkatesh, 2012). Performance expectancy is defined as the degree to which the people believe that using the system will assist them in achieving job performance (Venkatesh, 2003). The five constructs from the different models that pertain to performance expectancy are perceived usefulness (TAM/TAM2 and C-TAM-TPB), extrinsic motivation (MM), job-fit (MPCU), relative advantages (IDT), and outcome expectations (SCT). The performance expectancy constructs within each model is the strongest predictor of intention and remains significant at all points of measurement in both voluntary and mandatory settings, consistent with previous model tests.

In the Self-service technology context, performance expectancy can be defined in terms of the benefits and utilities that can be expected from using SST, such as increased efficiency and effectiveness, and appropriateness of spatial and temporal demands. According to previous studies, performance expectancy has been considered a significant predictor of customer adoption of SST (Wang, 2009; Chiu, 2010; Abu-Shanab, 2010; Yu, 2012; Yen, 2009). It reflects perceived benefits and utilities that can be expected from self-service technology adoption. This can enhance service performance and efficiency and user's living. Nevertheless, the impacting role of performance expectancy is more likely to vary with age and gender differences (Venkatesh, 2003). Consistently, Abu-Shanab et al., (2010), Wang and Shih, (2009), and Park et al. (2007) support the significant moderating influence of age and gender on the causal relationship between performance expectancy and the customer's intention to adopt the technology. However, Yu and Chien (2012) empirically found that there were no significant differences in the influence of performance expectancy either on behavioral intention or adoption when considering age and gender differences. Regarding the research of Madara, the mobile Internet has become one of the most popular mobile services for customers worldwide, reflecting the importance of mobile internet. The study aims to clarify factors that influence mobile Internet adoption and usage in Latvia, especially to determine the current level of mobile Internet use and acceptance. The data collection of 2,000 respondents via e-questionnaires using the Mobile Internet Prevalence Model. The results reveal that performance expectancy, effort expectancy, and facilitating conditions are

factors that strongly affected to Behavioral intention in using mobile Internet. It can be summarized that Internet users realize the benefits and options of mobile Internet, and then they reuse such service (Binde, 2013).

As the expectation confirmation theory, it explains that when a user's expectation and real perception is approved, it will lead to user satisfaction. Therefore, performance expectancy will impact user satisfaction if the users' belief is fulfilled by system assistance. Based on the above clarification, Referring to the concept and theories review, the researcher conducted perceived usefulness, job-fit, and relative advantages as the 3 observed variables of performance expectancy. From the review of performance expectancy and user satisfaction, the researcher assumed the relationship of 2 variables and then proposed as the conceptual framework as below.



Then, the following hypothesis was established

**H4:** Performance Expectancy has a positive influence on User Satisfaction

## 2.8 Concept and Theories Related to Social Influence

Social influences are conceptualized generally in term of how people change their beliefs, revises their opinions, or adapts their behavior to meet the demand of social environment and social interactions with others. Both human relations or external stimulation can impact it. Supportively, Venkatesh et al. (2003) determined a social influence in the study of UTAUT model as social influence can be counted as a potential determinant of individuals' information system use intention. By his review, social Influence can be presented in three constructs: subjective norm, social factors, and Image (Venkatesh, 2003).

Subjective norm can be explained by Ajzen (1991) in the theory of planned behavior as an individual's belief that a famous person or group of people wants them to perform a particular behavior in a certain manner, and their motivation conforms to people's views. Subjective norms

significantly influence attitude and behavior toward intentions. The intention is conceptualized as a feeling of enthusiasm to act in a specific manner and show how much time and how severe an individual is voluntary to spend and try in order to perform a behavior (Ajzen, 1991).

Social factors can be determined as the individual's internalization of the reference groups' subjective culture, and specific interpersonal arrangement that the individual has agreed with others, in particular social situations (Thompson, 1991).

The image can be defined as a way of using innovation in order to promote one's image or status in one's social system (Moore, 1991).

Moreover, Social influence is explained by Friedkin and Johnsen (1999) as comments or actions which result from others, resulting in compliance or decision-making (Friedkin, 1999).

Burger (2002) proposed the social influence as the way people change behavior or thinking resulting from others' actions, orders, or requests. However, they also shift their attitudes and practices regarding what they perceive others might act or intend. It was divided by various social psychologists into three major types; conformity, compliance, and obedience.

Conformity occurs in situations in which individuals change their behavior to suit standards or beliefs, which is generally accepted may be in line with the norms of the groups. The key factor that leads to the release in the pressure from the group. This can be seen from the example that children and youth tend to want to follow their group very much. The more peer groups have the same thoughts, the more influential they are. People in that group have to think more and more accordingly. For people who are in the same group, there may be some people who refuse to follow, non-conformity, which we will always see. In this group of refugees, it is divided into 2 categories; the first category is less developed, and still with resistance to those who like (counter conformity), the second category does not resist and always put yourself away from the group (Independence).

Compliance is a behavior that arises as a result of accepting requests from others to do so wholeheartedly but not undeniably whether they are considerate and self-conscious at all times or not or get too loose to get it for treatment.

Obedience occurs when a person obeys the commands with authority over them. For example, a student follows a teacher, and a child obeys a mother. In general, the person issuing

the order must be the person who controls the action of the person receiving orders, and the issuer must be able to find a way to make that command effective in practice.

However, Cialdini (2007) suggested that persuasion is also realized to be a critical part of social influence behavior. Persuasion can be determined as the type of communication in the matter of changing one's minds, thoughts, or beliefs, including behavioral changes. Other persuaders must try to make the proposed idea or reasonable argument and to be credible. Nevertheless, some mistakes are often duplicated by persuasion as the easiest way to influence others. Psychologists have successfully studied methods of persuasion; there are essential components. In the collection of social psychologists' research results, it was found that the communicators with attractive characteristics meant having good appearance, and good behavior can made the listeners feel good. Additionally, a positive effect for the listener, including a good presentation (style), namely the process of speaking, writing, showing a person who speaks fast without stammering is the person who makes the listener think they are people who have true knowledge of what they say. Be polite and effective; it will often make the recipient trust in what he has to offer and be credible (credibility) with an expert in the matter (expertise) or a person with a history of trust in honesty, not deceiving anyone before doing anything for themselves (trustworthiness) (Cialdini, 2007).

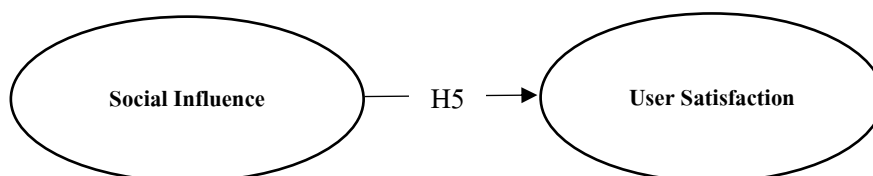
In the self-service technology context, social influence could be summarized as the impact of the surrounding social circumstance on a user's intention to use SST. Prior studies support the influencing role of social influences on customers' volition to adopt self-service technology (Yen, 2009; Wang, 2009; Chiu, 2010; Abu-Shanab, 2010).

In this research, the researcher would like to explain the social Influence in adopting self-service technology provided at the Mass Rapid Transit system area. The human society will compliance to use such technology through the persuasive action. Their decision may be caused by people around them or repeated advertisements in the service area. Therefore, the trend of adopting self-service technology is becoming popular and then lead to the reuse of that system because of people's encouragement. In other words, it is initiated by the process of transferring behavior and ideas of the relevant group in a community that likes the modernization of technology or think that it is beneficial for them. In this study, the researcher attempts to explore

and explain the social influence caused by people and communities to intention to reuse of self-service technology system. The research will be studied both the direct and indirect relationship of user satisfaction and continuance intention to use the system.

Referring to the concept and theories review, the researcher conducted subjective norm, social factors, and image as the 3 observed variables of social influence.

From the review of social influence and user satisfaction, the researcher assumed the indirect relationship of 2 variables and then proposed as the conceptual framework as below.



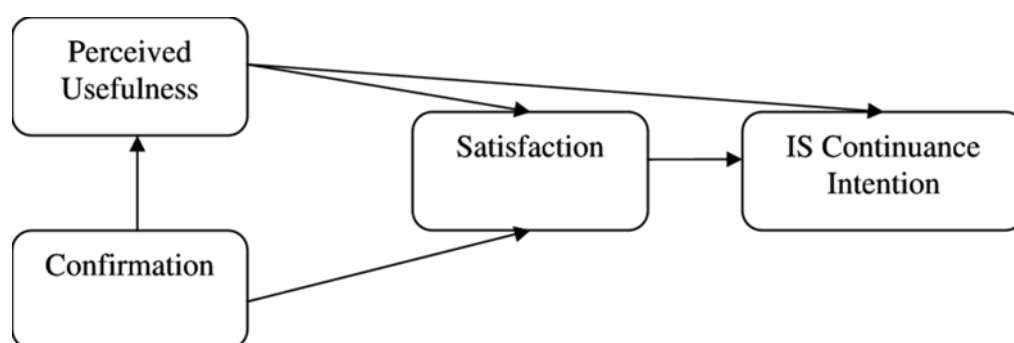
Then, the following hypothesis was established.

**H5:** Social Influence has a positive influence on User Satisfaction

## 2.9 Concept and Theories Related to Continuance Intention to Use

According to the information system success model, DeLone and McLean said that the user's intention to use is like the user prefer to use that information and anticipate to receive benefits from using such information; therefore, it can be called Net benefit. The user's net benefit is the most important measure of success. itis a balance between positive impact and the negative impact of electronic commerce on the customer, employees, marketing organizations, industries, economies, and even associations which the net benefit cannot be analyzed and can understand it without measuring the system and information quality (DeLone & McLean, 2003). Petter et al. (2008) said that the net benefit of users is information systems that create success for individuals, groups, industry organizations, and countries. Likewise, Seddon (1997) declared the net profit of the user is the level that the user believes that the use of information systems will increase his performance. In addition, he mentioned benefits that users of the system get "System Importance" is important to the variables that the system quality receive, for example between the importance of the system and the benefits that if the system is very important, even if the system

is very difficult to use the benefits that users gain from the information system are still very much. As well as if the system is very important, the user's satisfaction will also be increased. On the other hand, if any information systems are not important to users, no matter how well the information system is designed or how easy it is to use, it will not benefit the users (Seddon, 1997). Although the intention to uses can be understood as one of the parameters in the IS success model and also is comprehended as the net benefit after adopting the system, it cannot be explored entirely the sequence intention to use of technology by the user. The Expectation-Confirmation Theory can be additionally used for this study. Oliver introduced expectation Confirmation Theory (ECT) (1980), used to identify and predict satisfaction and repurchase intention (Rahi, 2019). ECT model has been widely used in Marketing, concerned about consumer behavior, and also adopted in the field of Management Information System since the 1980's (Chiu, 2012). This model explained where consumers have some prior expectations before carrying out the purchase process, and subsequently, the perceived performance happens. If the perceived performance is as same as the expectation, it will lead the confirmation state. The satisfaction happens when the expectation meets the confirmation, and it will drive the repurchase intention (Shih, 2010). ECT consists of four determinants, which are Expectation (E), Perceived Performance (PP), Confirmation (C), and Satisfaction (S). ECT is simplicity and ease of implementation in terms of customer satisfaction evaluation when compared to other models such as Assimilation Theory and Contrast Theory. Afterward, Bhattacharjee developed and proposed an expectation-confirmation model (ECM) in 2001 following IS continuance (see Figure 2.9).

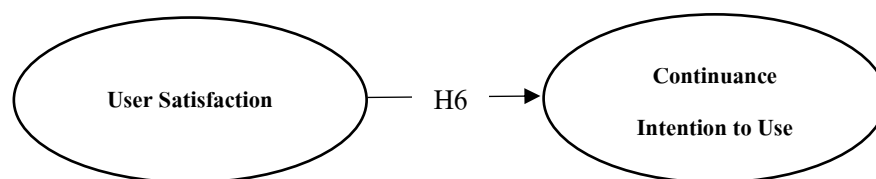


**Figure 2.9** Expectation-Confirmation Model (ECM)

**Source:** Jjinpo, et al. (2006). An integrative model to predict the continuance use of electronic learning systems: Hints for teaching. *International Journal on E-Learning*, 5(2).

Bharracherjee (2001b) insisted that IS user's continuance decisions are similar to consumers' readoption decisions because both are influenced by the initial user experience of the IS or, and such decisions are intimately involved with user satisfaction. Therefore, the continuance intention to use can be understood that the intention of the user to continue using the information system. Previously, the ECM has been widely adopted by numerous researchers to study and verify the users' continuance intentions in IS context. For example, Susanto adapted the structure of ECM to explore the determinants of continuance intention to use smartphone banking services using the main measurement items of Bhattacharjee (Susanto, 2016). In addition, Li and Shang studied the interrelationship influences citizen's reuse intention regarding e-government by analyzing 1,650 citizen users who had prior experience with e-government service (Li, 2020).

From the review of user satisfaction and continuance intention to use, the researcher assumed the relationship of 2 variables and then proposed as the conceptual framework as below.

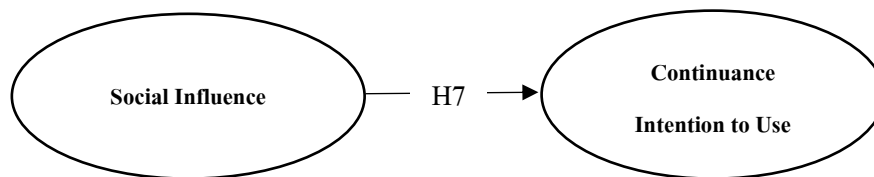


#### ***User Satisfaction and Continuance Intention to Use***

DeLone and McLean (2003) explained that user satisfaction means a measure of how satisfied users are with the information system. The satisfaction of users is in the influence on the recipient level, which evaluates the users' decision of system (DeLone & McLean, 1992). It is an assessment of how it meets or beyond user expectations. Continuance intention to use (CI) can be seen as the net benefit of the success of information (Bharracherjee, 2001b). When the users perceive that SST supports them in various situations with excellent quality and thus, they satisfy their initial experience, it can lead to continuance intention to use and also its relationship with user satisfaction. According to the research conducted by Phalawang in 2018, He studies factors influencing continuance intention to use mobile banking based on IS Success Model, which are information quality, system quality, and service quality, and satisfaction, and other factors, namely corporate image, security, and customer loyalty. The study aims to determine the determinants that impact the continuance intention to use of M-banking. The data was collected

from 200 participants who have experience in using mobile banking. The results expose that Continuance intention to use is affected by the satisfaction of users, which are influenced by corporate image, information quality, and security, respectively. This study finally implies entrepreneurs and M-banking developer to realize the important factors which should be applied to improve M-banking for customer usage experience and continuance (Phalawang, 2018). Thus, the researcher established hypothesis as follows;

**H6:** User satisfaction has a positive influence on continuance intention to use.



#### ***Social Influence and Continuance Intention to Use***

Social Influence refers to the way in which people change their beliefs, revise their opinions, or adapt their behavior to meet the demand of social environment and social interactions with others. In the age of globalization, social influence plays an important role in interconnected society and industrial organization. As discussed by many researchers, social influence can be counted as a potential determinant of individuals' Information System use intention (Venkatesh, 2003). It can influence both human relations or external stimulation, namely, press media and non-human information. In this study, the researcher would like to explore and attempt to explain the social influence caused by people (both relative and non-relative) and community to intention to reuse of the self-service technology system of Mass Rapid Transit service. The human society will compliance to use such technology through the persuasive action. Their decision may be caused by people around them or repeated advertisements at the MRT service area. Therefore, the trend of adopting Self-Service Technology is becoming popular and then lead to the reuse of that system because of people's encouragement. It is initiated by the process of transferring behavior and ideas of the relevant group in the community that like the modernization of technology or think that it is beneficial for them. Numerous marketers pay attention to this kind of phenomenon that can be implemented to increase the profitability of the organization. Due to the review of social influence and continuance intention to use, the researcher assumed the direct relationship

between them. Therefore, the last parameter of the conceptual framework was set. The researcher would like to study the relationship between social influence and intention to reuse of the system. Hence, the research hypothesis is proposed as following:

**H7:** Social Influence has a direct positive influence on Continuance Intention to Use

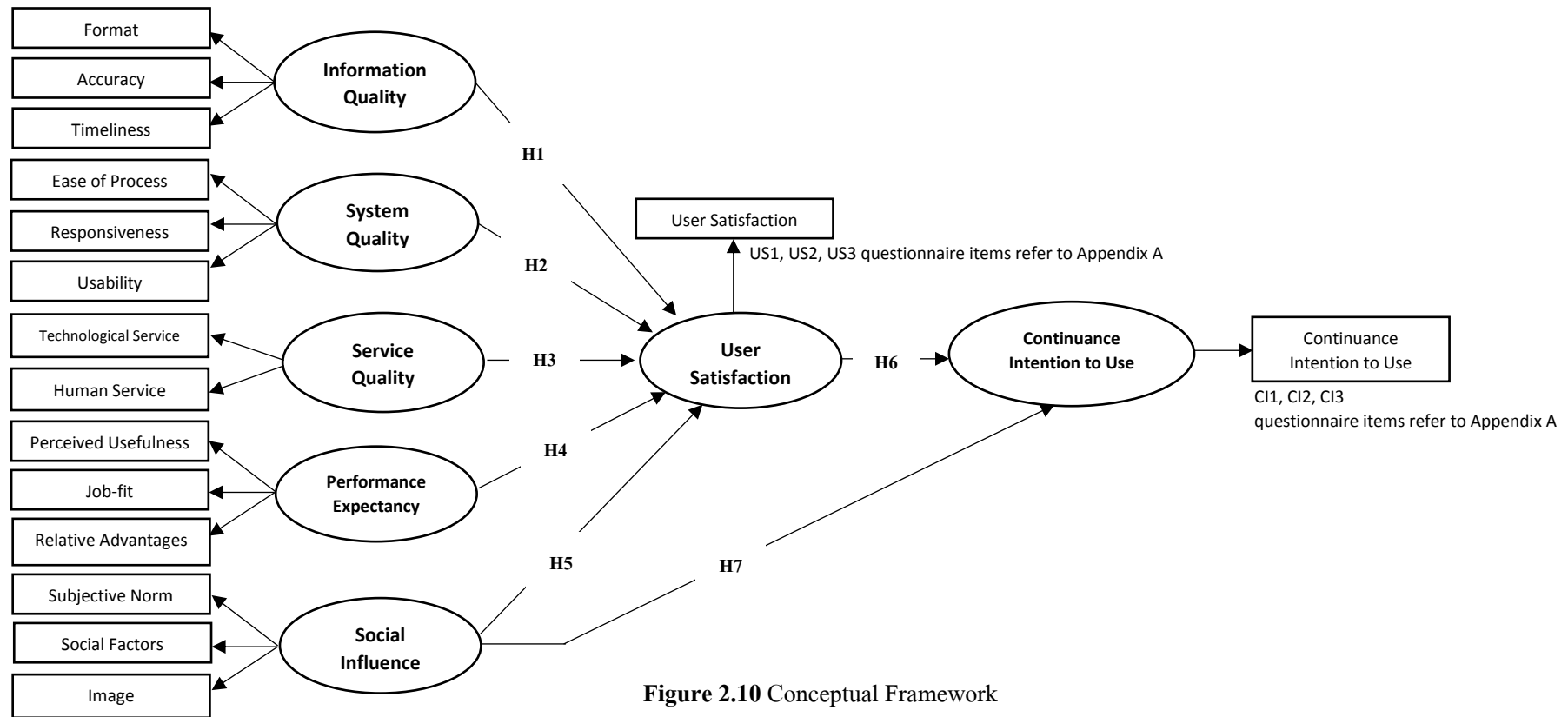
The proposed hypotheses are summarized in Table 2.7. as follows;

**Table 2.7** Summary of The Hypotheses

<b>Hypothesis No.</b>	<b>Relationship/Hypothesis</b>
H1	Information Quality has a positive influence on User Satisfaction
H2	System Quality has a positive influence on User Satisfaction
H3	Service Quality has a positive influence on User Satisfaction
H4	Performance Expectancy has a positive influence on User Satisfaction
H5	Social Influence has a positive influence on User Satisfaction
H6	User satisfaction has a positive influence on Continuance Intention to Use
H7	Social Influence has a directly positive influence on Continuance Intention to Use

## 2.10 Conceptual Framework Diagram

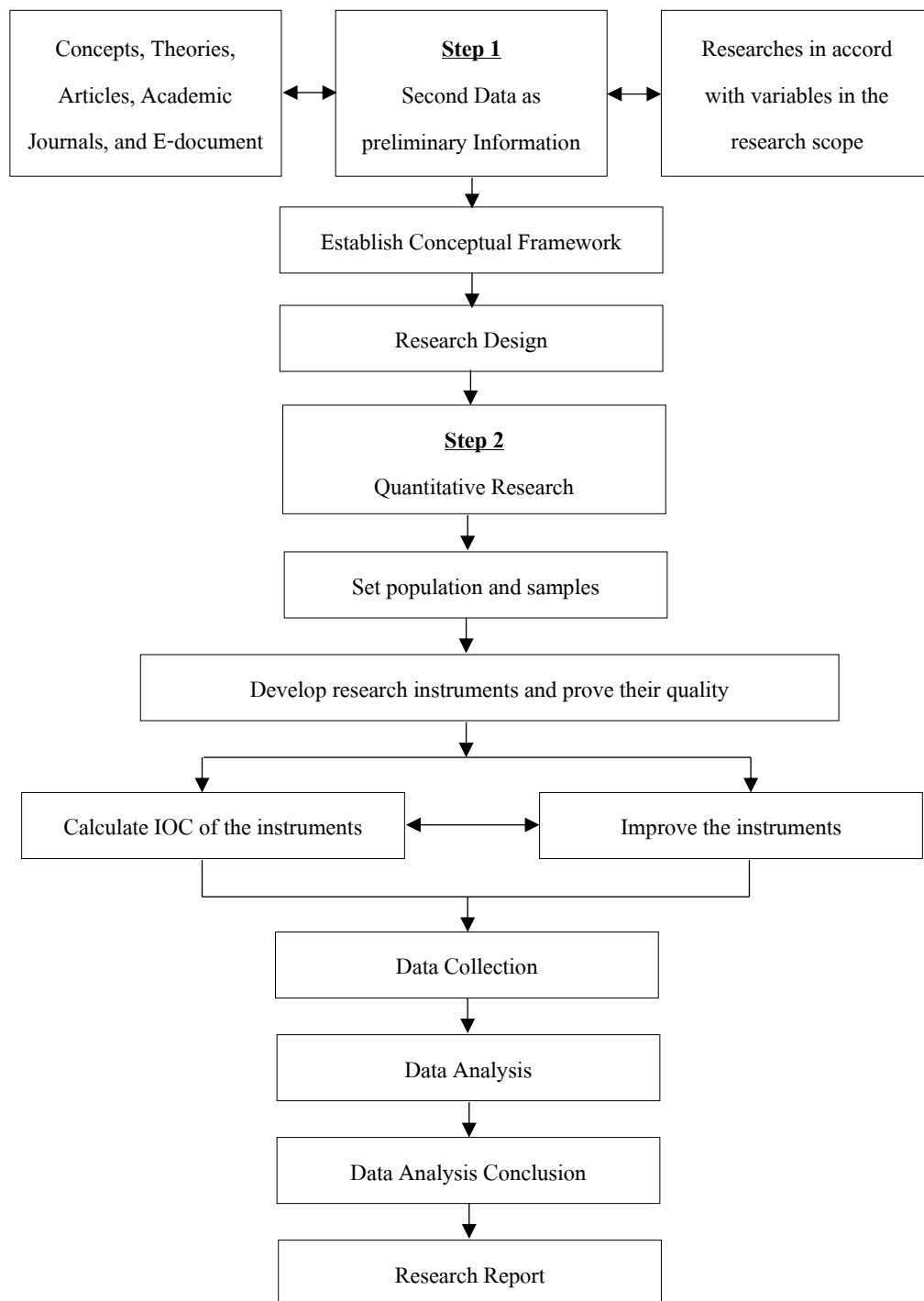
According to the above literature review, the researcher synthesized the relevant concepts and theories and assumed the relationship between variables related to research objective. Therefore, the completed research framework was diagrammed in Figure 2.10 as follows;



## **CHAPTER 3**

# **RESEARCH METHODOLOGY**

This chapter is related to research design, population, sample size, and sample selection, research tools, data collection, analytical strategy, and ethical consideration. This study is involved with the influence of Information system quality factors, user's technology performance expectation, and social-related factors about self-service technology adoption on user satisfaction and continuance intention to use it. This research project is conducted as quantitative research. The exploration will be founded on essential information accumulation, and all data is collected from the primary source. The questionnaire is used for this reason. This strategy is reasonable for this sort of research with practical and utilizable time successful. The Confirmatory Factor Analysis (CFA) and Structural Equation Model (SEM) will be applied for data analysis. In this study, the research procedure is diagrammed, as in Figure 3.1, to accomplish the research with the potential steps and enhance the quality of the study.



**Figure 3.1** Research Procedures

According to the Figure 3.1, the study is conducted by two-step procedures which are; Step (1) the researcher reviewed the concepts, Theories, Articles, Academic Journals, and E-document in relevant to variables in the research scope. After reviewing related literature from

numerous research/scholars, the researcher established conceptual framework which identifies latent variables and observed variables which were used in the research and then Step (2) the researcher conducted quantitative research using a research process, starting with setting up the population and samples, developing research instruments, reconfirming the instrument quality by applying of IOC, processing data collection, analyzing the data by CFA and SEM, and making the conclusion and report of research result.

### **3.1 Population and Sample Size Selection**

#### **3.1.1 Population Used in the Research**

To gain the data for this research project, the population consisted of passengers who experience with traveling by Mass Rapid Transit in Thailand and also used to adopt the self-service technology system, namely, ticket vending machine, top-up machine, self-storage locker, and Information Interactive Kiosk. The number of passengers is an infinite population. Therefore, the selection is an important factor in the research methodology of this research project.

#### **3.1.2 Sample Used in the Research**

##### **3.1.2.1 Sample Size**

Major respondents for this research project mainly included Mass Rapid Transit users in Thailand. By specifying sample size and analyzing structural equation model data with AMOS program, Hair (2006) recommends that sample should be at least 200 samples for cases in which the model is not very complex (Hair, 2006). Nunnally (1967) suggests using the Maximum Likelihood Approach for AMOS model analysis (Nunnally, 1967). The sample size should be at least 10-20 times the number of observed variables. This research contained 7 latent variables and 20 observed variables in total. Therefore, the proper sample size by this study should be at least equal to 400 people (calculated from  $20 \times 20$ ). Accordingly, the researcher planned to collect the samples equal to 400 to ensure and strengthen the more reliability of the research study.

### 3.1.2.2 Sample Selection

To study the continuance intention to use self-service technology at Mass Rapid Transit in Thailand. The numbers of ridership who travel by MRT, BTS, and ARL approximately 396,568,873 passengers were displayed. However, the number of populations who experienced adopting the Self-Service Technology of Mass Rapid Transit in 2019 cannot be exactly identified. Therefore, in very large and diverse populations, the researcher conducted a multi-stage sampling procedure that includes quota, cluster, and convenience sampling methods to be done for this sample selection. The procedure can be concluded as the following step.

**Step 1:** Calculate and set the sample size

**Step 2:** Obtained the number of Mass Rapid Transit passengers in accordance with the 2019 annual report of Mass Rapid Transit Authority of Thailand, and website of BTS, MRT, and ARL directly and used quota sampling to divide and give a proportion of sample size into each group.

**Step 3:** Implemented cluster sampling by the stations and purposive choosing the top 3 stations of BTS, MRT, and ARL were the most ridership using the service and then conducted the quota sampling again to share the proportion of sample group depended on selected stations.

**Step 4:** Used convenience sampling to select the participants from each group at downstairs of Mass Rapid Transit's station since they are promptly and easily available (Harmed, 2016).

**Table 3.1** Selection of the Sample Size for Each Mass Rapid Transit Service Provider and Station Based on Proportions Compare with The Number of BTS, MRT, and ARL Ridership in 2019

Mass Rapid Transit Service Provider	Total Ridership (Yearly)	Proportion	Sample According to Mass Rapid Transit Service Provider	Top 3 Stations	Total Ridership (yearly)	Sample from The Station
BTS	247,470,000	62.40%	250	Siam	41,099,000	101
				Asoke	31,061,500	77
				Mo Chit	29,017,500	72
MRT	122,944,045	31.00%	124	Sukhumvit	35,066,050	54
				Phra Ram 9	23,567,999	37
				Phetchaburi	21,150,420	33
ARL	26,154,828	6.60%	26	Phaya Thai	4,380,000	11
				Makkasan	3,650,000	8
				Lat Krabang	2,920,000	7
<b>Total</b>	<b>396,568,873</b>	<b>100.00%</b>	<b>400</b>		<b>191,912,469</b>	<b>400</b>

**Source:** (1) <https://investor.bemplc.co.th/th/ridership-report/ridership>

(2) <http://www.btsgroup.co.th/en/investor-relations/bts-ridership>

(3) <http://www.srtet.co.th/index.php/th/career/transportation-statistic>

(4) <http://www.prachachat.net>

### 3.2 Variables in the Research

According to the variables used in the research, the researcher derived from reviewing, collecting, and studying relevant theories, concepts, literature, and prior research, and then the variable extracted and established as below.

## 1. Exogenous Latent Variables

1.1 Information Quality: This contained 3 observed variables as follows.

1.1.1 Format

1.1.2 Accuracy

1.1.3 Timeliness

1.2 System Quality: This contained 3 observed variables as follows.

1.2.1 Ease of Process

1.2.2 Responsiveness

1.2.3 Usability

1.3 Service Quality: This contained 2 observed variables as follows.

1.3.1 Technological Service

1.3.2 Human Service

1.4 Performance Expectancy: This contained 3 observed variables as follows.

1.4.1 Perceived Usefulness

1.4.2 Job-Fit

1.4.3 Relative Advantages

1.5 Social Influence: This contained 3 observed variables as follows.

1.5.1 Subjective Norms

1.5.2 Social Factors

1.5.3 Image

## 2. Endogenous Latent Variables

2.1 User satisfaction: This contained 3 observed variables as follows.

2.1.1 User Satisfaction

2.2 Continuance Intention to Use: This contained 3 observed variables as follows.

2.2.1 Continuance Intention to Use

### 3.3 Research Tool

This research used the questionnaire as a tool for data collection. The questionnaire is one of the major methods for data collection from the respondents in a survey. The research tool was created step by step in the following details.

1. Retrieved and reviewed relevant theories, concepts, and other researches to study and prepare the questionnaire composition.

2. Filtered the information that related to the selected latent and observed variables and afterward grouping and developing them into questionnaire structure.

3. Arranged questionnaires by the study context. Then, they were submitted to 3 experts, namely, professors and academicians, to find out the index of item-objective congruence (IOC) to evaluate the consistency between the questions and study objectives. The complete evaluation was identified by three rating scales range from -1 to 1. The items that were given higher than or equal to 0.5 were considered as proper as measuring. Whereas, the items with a score of less than 0.5 were considered improper as unclear content and needed to be adjusted in accordance with the professor's advice (Turner, 2002).

4. Tested the adjusted questionnaires on at least 30 samples before actual distribution to consider the clearness and conformity of the questions to make sure that the respondent will be a mutual understanding.

5. Brought the results of the questionnaire completed by 30 respondents to measure by Cronbach's alpha to confirm the instrument reliability.

6. Finally revised and reviewed the latest version of the questionnaire that will be applied for the actual use of data collection.

These questionnaires were developed and divided into 8 parts which are;

Part 1: Questionnaire about respondent's socio-demographic and general user information, consisting of 6 items, such as gender, age, education level, monthly income, occupation, and travelling frequency, which is a one-to-one answer question to determine the different result from dissimilarity characteristics.

Part 2, 3, 4, 5, 6, 7, and 8: The evaluation form was separated into 6 major topics. Each topic is separately into information quality, system quality, service quality, performance Expectancy, social influence, user satisfaction, and continuance intention to use. The opinion about the perception level through self-service technology adoption of Mass Rapid Transit System in Thailand was asked. The proper measurement items are created to gain the customers' view. In the questionnaire, the questions were derived from previous studies done by many researchers, and afterward, they were modified to fit with the current study context.

**Table 3.2** The Source (Creator) of Questionnaire Items

<b>Latent Variables</b>	<b>Observed Variables</b>	<b>Questionnaire Sources</b>
Information Quality	1) Format	Bailey & Pearson (1983)
	2) Accuracy	Wixom & Todd (2005)
	3) Timeliness	Gable et al. (2008)
System Quality	1) Ease of use	Doll et al. (2004)
	2) Responsiveness	Hamilton & Chervany (1981) Chang & King (2005)
	3) Usability	Brooke (1996) Peres (2013)
Service Quality	1) Technological service	Lin and Hsieh (2006) Lin and Chang (2011)
	2) Human service	Parasuraman et al. (1988) Pitt et al. (1995)
Performance Expectancy	1) Perceived Usefulness	Davis (1989)
	2) Job-Fit	Thompson et al (1991)
	3) Relative Advantages	Moore and Benbasat (1991)
Social Influence	1) Subjective Norms	Venkatesh et al. (2003) Ajzen (1991)
	2) Social Factors	Thompson et al. (1991)
	3) Image	Moore& Benbasat (1991)

**Table 3.2** The Source (Creator) of Questionnaire Items (Continue)

<b>Latent Variables</b>	<b>Observed Variables</b>	<b>Questionnaire Sources</b>
User Satisfaction	1) User Satisfaction	Lin & Hsieh (2006) Rai et al. (2002)
Continuance Intention to Use	2) Continuance Intention to Use	Bhattacharjee (2001)

**Table 3.3** The Questionnaire Composition

<b>Variable</b>	<b>Total Questions</b>	<b>Question No.</b>	<b>Form/Scale</b>
Questions for screening targeted respondents	1	-	Nominal
Part 1: Respondent's Socio-Demographic and General Information	7	-	Scale/Ordinal Scale
Part 2: Question about The Latent Variables			Ratio Scale/ Interval Scale
2.1 Information Quality			
2.1.1 Format	3	1-3	
2.1.2 Accuracy	2	4-5	
2.1.3 Timeliness	2	6-7	
2.2 System Quality			
2.2.1 Ease of Process	2	8-9	
2.2.2 Responsiveness	2	10-11	
2.2.3 Usability	2	12-13	
2.3 Service Quality			
2.3.1 Technological Service	3	14-16	
2.3.2 Human Service	3	17-19	
2.4 Performance Expectancy			
2.4.1 Perceived Usefulness	2	20-21	
2.4.2 Job-Fit	2	22-23	
2.4.3 Relative Advantages	2	24-25	

**Table 3.3** The Questionnaire Composition (Continue)

Variable	Total Questions	Question No.	Form/Scale
2.5 Social Influence			Ratio Scale/ Interval Scale
2.4.1 Subjective Norm	2	26-27	
2.4.2 Social Factors	2	28-29	
2.4.3 Image	2	30-31	
2.5 User Satisfaction	3	32-34	
2.6 Continuance Intention to Use	3	35-37	
<b>Total</b>	<b>45</b>		

The researcher used a five-point scale (5 Likert rating scale) that allows the respondents to show expression of how much they agree or disagree with specific questions. The scoring details are as following (Vagias, 2006);

“5” point means Strongly Agree

“4” point means Agree

“3” point means Neither Agree or Disagree

“2” point means Disagree

“1” point means Strongly Disagree

To interpret the mean value from data analysis, the researcher applied the criteria to scale rating of class interval proposed by Best (1970). The calculation formula was as follows.

$$\begin{aligned}
 \text{Class interval} &= \frac{\text{Maximum-Minimum}}{\text{Class number}} \\
 &= \frac{5-1}{1} \\
 &= 0.8
 \end{aligned}$$

Concerning the above calculation, it was found that the distance of each interval would be 0.80. Thus, the variables' evaluation criteria were identified, as shown in Table 3.4.

**Table 3.4** The Variables' Evaluation Criteria

Level of Average Point	Meaning
4.21-5.00	Strongly Agree (Absolutely True)
3.41-4.20	Agree (True to a high degree)
2.61-3.40	Neutral (True to a moderate degree)
1.81-2.60	Disagree (True to a minimal degree)
1.00-1.80	Strongly Disagree (Not true at all)

In addition, the questionnaire was initially prepared in English and then translated into Thai for survey purposes at Mass Rapid Transit stations in Thailand. After that, the Thai version of the questionnaire was reviewed and checked by conducting of the back-translation process to assure that there is no discrepancy and no loss of meaning during the translation as suggested by (Zikmund, 2003).

### 3.4 Data Collection

By this data collection, the researcher plan to collect data by themselves with support of colleagues as assistant researchers to distribute the questionnaire and collect full questionnaires. There is no outside company help at all. Therefore, to be helped by the colleagues as the research assistant, the researcher has to explain the clear objectives of the study and guide them with the procedure on how to collect the data without forcing the respondents.

#### 3.4.1 Data Collection Procedure

Details of the data collection process are as follows;

**Step 1:** The researcher and colleagues will screen and focus on the people who have experience using the self-service technologies at Mass Rapid Transit in Thailand. Afterward, the

researcher will request their cooperation and distribute the questionnaire. The questionnaire distribution and collection period will take time for approximately one month.

**Step 2:** Collect the questionnaire and evaluating the number of questionnaires returned to be completed, at least as sample commitment. The researcher distributed 400 questionnaires. The researcher conducted the study by collecting the primary data from the respondents. The reliability of primary data is better than secondary data because it is actually gained directly in the first form of data (Lin, 2007).

### 3.5 Analytical Strategy

To study the research on Continuance Intention to use the self-service technology of the Mass Rapid Transit system in Thailand, the researcher set the strategy to check the validity and reliability of Instrument and statistical analysis of collected data as follows.

#### 3.5.1 Validity of the Instrument

To assure the content validity and item consistency, the questionnaires were submitted to three professors to consider and review whether all details were simple to comprehend and meet the points or not. Each question was given point with reference to IOC's index (The Item-Objective Congruence). The IOC calculation formula is as follows.

$$\text{IOC} = \frac{\sum R}{N}$$

R = Congruence value of each question

N = The number of professors

Since the score range of IOC is between -1 to 1, the acceptable question must be close to 1. The item that had scored lower than 0.5 should be revised; whereas, the items that gained scored higher than 0.5 can be reserved. The explanation of the score range is as follows.

+1 = When the professor perceived that the question was fully consistent with the content

0 = When the professor found that the question was doubtful whether it was consistent with the content or not

-1 = When the professor did not understand the question and perceive that it was inconsistent with the content

To assure the consistency and validity of the instrument, the questionnaire was assessed by two professors and one expert who has an abundance of knowledge and experience in terms of Information system and technology to consider and review whether all details were simple to comprehend and meet the points or not. Firstly, Asst.Prof.Dr. Sutti Soompon, Assistant Dean of College of Educational Innovation Research who responsible and specialize in online education. Secondly, Asst. Prof. Dr. Chalita Srinuan, who has skillful and expert in the area of Administration and Business Management. Lastly, Dr. Suthep Panpeng, President of State Railway of Thailand, specializes in railway transportation system management. The total score of each item was presented in Appendix C. In general; almost the items had evaluated and give score higher than 0.5, except the items “3. I believed that using the self-service technology can save times during rush hours.”, “4. I believed that using the self-service technology will increase the quality during my travel such as using automated self-storage service”, and “6. Checking service data via self-service technology is more convenient when comparing with asking from the service provider (such as, number of travel times and remaining money in card)”, which had evaluated the score less than 0.5. Afterward, all those three items were revised under the professors’ comments and then gave back to them to reevaluate. After that, all experts have assessed these three questions with score one that meant all these three questions were consistent. Hence, the instrument was revised to the final version and will be used for the survey.

### **3.5.2 Reliability Testing**

Quality inspection of instruments is carried out in precision check. The Cronbach’s Alpha coefficient method was conducted as the reliability procedure for checking the quality of the equipment. This method was developed by Lee Cronbach in 1951 and widely used for precision measurement. It was mainly applied to measure the reliability or internal consistency, especially the unweaving quality of the inspection unit in the study. Cronbach’s alpha tested to see whether the multiple question Likert scale surveys are reliable or not. By conducting a reliability testing with a computerized program to analyze the precision of gauges, the alpha

coefficient should have a level of 0.70 or higher (Cronbach, 1951). The standardized calculation formula is as follows.

$$\alpha = \frac{K\bar{r}}{1 + \bar{r}(K - 1)}$$

$\alpha$  : Reliability Coefficient

K : Number of Items

$\bar{r}$  : Average Item Correlation

$\alpha \geq 0.7$  : High reliability

$0.5 \leq \alpha \leq 0.65$  : Moderate reliability

$\alpha \leq 0.5$  : Low reliability

To check the accuracy and internal consistency, the researcher examined the accuracy of both the experimental data (n=30) and the actual data (n=400) collected by users who have experienced to adopt the self-service technology of Mass Rapid Transit in Thailand.

After obtaining the data from 30 people who are pilot group, the researcher used the SPSS version 26 to analyze the data. Cronbach's alpha of this questionnaire was 0.964, which was above 0.7 (see table 3.5). Thus, the questionnaire was highly reliable (Cronbach, 1951).

**Table 3.5** Cronbach's Alpha from 30 Respondents (Pilot Group)

**Case Processing Summary**

		N	%
Cases	Valid	30	100.0
	Excluded <sup>a</sup>	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.964	.967	37

The results of the analysis of reliability for continuance intention to use the self-service technology of Mass Rapid Transit in Thailand are the basic data for inspecting the initial agreement for multivariate statistical analysis, confirmatory element analysis, and finally, structural equation model analysis.

Finally, the questionnaire had presented its validity and reliability through the Index of Congruence (IOC) and Cronbach's Alpha. Therefore, the questionnaire is appropriate and prompt to release to targeted respondents. The final questionnaire version is shown in Appendix B.

### **3.5.3 Statistical Analysis**

#### **3.5.3.1 General Data Analysis**

To examine the general data and factor involving information quality, system quality, service quality, performance expectancy, social influence, user satisfaction, and continuance intention to use by statistics namely, frequencies, distribution, percentage, arithmetic mean, and standard deviation, Skewness, and Kurtosis, the researcher used the SPSS version 26 in the data processing and analysis. The results were organized and summarized through a descriptive statement.

Moreover, to test the proposed model and hypotheses, the researcher conducted a two-step approach as offered by Anderson and Gerbing (1988) for this research project. The confirmatory factor analysis (CFA) is run to check whether the data fit a hypothesized measurement model or not. Afterwards, the structural equation model is implemented to perform model testing (Anderson, 1988).

#### **3.5.3.2 Confirmatory Factor Analysis and Structural Equation Modelling**

Analyzed the measurement model of factors involving continuance intention to use and the structural equation model of factors affecting continuance intention to use assumption model with empirical data by the Confirmatory Factor Analysis (CFA) and Structural Equation Modelling (SEM) for testing models. The research assumptions were the relationships between variables were analyzed with a clear framework and theory. The model analysis was applied to evaluate the correctness of the model built by the researcher. The researcher adopted the IBM SPSS AMOS version 6.0 to perform for this critical analysis. The measure comprised two parts,

for instance (1) Overall Model Fit Measure and (2) Component Fit Measure (Nonglak, 2012). The measures were used for the next model development. In this research, the table of model fit indices, and criteria on the model measure was shown and described as follows.

**Table 3.6** The Model Fit Indices and The Level of Acceptance

Fit indices	Symbol	Criteria
Chi-square (Probability Level)	$X^2$	$p > 0.05$
Chi-square	CMIN/DF	$< 2.00$
Goodness of Fit Index	GFI	$\geq 0.90$
Adjust Goodness of Fit Index	AGFI	$\geq 0.90$
Normal Fit Index	NFI	$\geq 0.90$
Incremental Fit Index	IFI	$\geq 0.90$
Comparative Fit Index	CFI	$\geq 0.90$
Root Mean Square Error of Approximation	RMSEA	$< 0.05$
Standardized Root Mean Square Residual	RMR	$< 0.05$
Squared Multiple Correlation	$R^2$	$\geq 0.90$

Part (1) is related to the Overall Model Fit Measure, the statistics applied were;

- 1.1) Chi-square Statistic was applied to test whether the covariance matrices of the population and the expected covariance matrices were different (Bollen, 1989) with Type I Error at the statistical significance level of 0.05. If the chi-square was not significant at the statistical significance level of 0.05, the covariance matrices of the population and the evaluated covariance matrices were indifferent. It was summarized that the model was fitted to the empirical data.
- 1.2) The Fit Index represents the goodness of fit between the model and the empirical data, namely the Goodness of Fit Index (GFI), the Adjust Goodness of Fit Index (AGFI), the Normal Fit Index (NFI) and the Incremental Fit Index (IFI). The value ranks between 0-1. The value is higher than 0.90 means that the model is fitted to the empirical data (Arbuckle, 1995). The value near 1 means that the model is mostly fitted to the empirical data

(Bollen, 1989). The Comparative Fit Index (CFI) is between 0-1, provided that CFI near 1 means that the model is fitted to empirical data.

1.3) Root Mean Square Error of Approximation (RMSEA) is developed since Chi-square depends on the sample size (n) per Degree of Freedom (df). Higher numbers of parameters make Chi-square lower, resulting in insignificant testing results. RMSEA represents unfit between the model and the covariance matrices of the population. Accepted RMSEA should be lower than 0.05 (Brown, 1993)

1.4) Root Mean Square Residual (RMR) measures the residual average from a comparison between variances and covariance matrices of the population variable and measure. The index works well if all observed variables are standard variables. The value near 1 means that the model is fitted to the empirical data (Bollen, 1989).

1.5) Chi-square statistic comparing the tested model and the independent model with the saturated model (CMIN/DF) is used to compare the model fit with the value CMIN/DF lower than 3 means that the model is fitted to the empirical data (Carmines, 1981).

Part (2) is related to the Component Fit Measure after the Overall Model Fit Measure. It is an important factor to be measured is the accuracy and reasonability of results on each part. With this measure, it is found whether the model of each relationship between variables is exactly fitted to the empirical data or not. In this research, two groups of parameters were considered as follows.

2.1) The standard error should below. Interpretation of whether the standard error is high or low is based on the significant level of the parameter. If the parameter is significant, the standard error is low. If the parameter is insignificant, the standard error is high, and thus the model is not good (Nonglak, 2012). For the Error estimated by AMOS Model, OLS will be accurate if the most observed variables of the model are normally distributed (Joreskog, 1993) or vice versa (Nonglak, 2012). AMOS Model expanding 40% of the variable variance is considered good and acceptable (Sarlis, 1984).

### **3.6 Ethical Consideration**

In this research project, the researcher considered all ethical considerations during the data collection and analysis process. The researcher made ensure that collected data for this specific project only. The respondents were not asked too personal questions, and their personal information did not share with any other. Research ensured the privacy of all information gathered from participants (Wilcox, 2012). Efforts were made that participants should not be harmed in anyways, and their dignity should be respected in all ways. Before asking a question in a survey, full consent from all the respondents was taken.

## **CHAPTER 4**

### **ANALYSIS AND FINDINGS**

This present chapter intends to accomplish the objectives of the study by investigating the various dimensions of continuance intention to use self-service technology at Mass Rapid Transit system in Thailand. Therefore, this chapter displayed the findings result from the analytical procedures discussed in chapter three. The chapter is divided into six sections. The first section starts with the respondents' details, which is supported by demographic data. The second section is the opinion level of users about factors influencing the self-service technology adoption, namely, information quality, system quality, service quality, performance expectancy, social influence, user satisfaction, and continuance intention to use. The descriptive analyses were executed for each item. The third section will describe the result of the Normality Test and Correlation Coefficient ( $r$ ). The fourth section will demonstrate the results of the Measurement Model by using the Confirmatory Factor Analysis. In other words, the analysis results of the factors involving Continuance Intention to Use of Self-service technology. The fifth section will indicate the results of Structural Equation Model Analysis related to the factors affecting Continuance Intention to Use of Self-service technology. The last section shall summarize the findings of this study.

To complete this study, a total of 400 questionnaires has been distributed to the people who use Mass Rapid Transit system for their journey that are mentioned earlier in chapter 3. Due to the different proportions of the ridership of each station, the questionnaires are allocated unequally.

There were 400 questionnaires which had been collected after a period of 2 weeks. The data from questionnaires are screened out by the researcher and via SPSS version 26. It was found that 27 respondents are not met with the criteria; therefore, 27 questionnaires have been removed to ensure the cleanliness of the data. However, the researcher continuously distributed the questionnaires and collected the remaining 27 respondents to complete 400 questionnaires in order to process the next analysis stage. Finally, the total of 400 completed questionnaires were received.

#### 4.1 Socio-Demographic Information

Based on the sample collected through the distribution of questionnaires, the respondents' socio-demographic data in this section. The descriptive analysis of the socio-demographic information is presented in Table 4.1, and the descriptive analysis of the opinion level of users who had experienced adopting self-service technology at Mass Rapid Transit in Thailand is also shown in Table 4.2.

**Table 4.1** Frequencies and Percentages of Sample Demographics (N=400)

<b>Demographic</b>	<b>N</b>	<b>%</b>
<b>Gender</b>		
Male	169	42.3
Female	231	57.8
<b>Ages</b>		
Less than 20 years	62	15.5
21-30 years old	213	53.3
31-40 years old	107	26.8
41-50 years old	12	3.0
51 years above	6	1.5
<b>Education Level</b>		
Below Bachelor degree (High school/ Vocational Certificate, High Vocational Certificate)	61	15.3
Bachelor Degree	263	65.8
Master Degree	76	19.0
<b>Income per Month</b>		
Less than or equal to 10,000 baht	40	10.0
10,000-20,000 baht	82	20.5
20,001-30,000 baht	165	41.3

**Table 4.1** Frequencies and Percentages of Sample Demographics (N=400) (Continue)

<b>Demographic</b>	<b>N</b>	<b>%</b>
30,001-40,000 baht	42	10.5
40,001-50,000 baht	18	4.5
Above than 50,000 baht	53	13.3
<b>Occupation</b>		
Private Company Employee	253	63.3
Government Employee/State Enterprise Officer	34	8.5
Entrepreneur/Business Owner	2	0.5
Private business/ Freelance Worker	22	5.5
Student	89	22.3
<b>Frequency of traveling by Mass Rapid Transit</b>		
Daily (7 days/week)	18	4.5
4-6 days/week	186	46.5
1-3 days/week	74	18.5
Less than 3 days/week	84	21.0
Other	38	9.5

The sample consisted of 169 (42.3%) male respondents and 231 (57.8%) female respondents. The majority of the respondents are from the age group of 21 to 30 years old for 231 (53.3%) respondents and 31-40 years old for 107 (26.8%) respondents, less than 20 years old for 62 (15.5%) respondents and minimal respondents fell within the range of 41-50 years old for 12 (3.1%) and 51 years above for 6 (1.5%) respectively. From the education level, the greater number of respondents is achieved Bachelor Degree for 263 (65.8%), followed by Master Degree for 76 (19.0) respondents, and below Bachelor Degree (High School, Vocational Certificate, and High Vocational Certificate) for 61 (15.3%) respondents. In term of income per month, most of the respondents earned 20,001-30,000 baht for 165 (41.3%), followed by 10,000-20,000 baht for 82 (20.5%), Above than 50,000 baht for 53 (13.3%), 30,001-40,000 baht for 42 (10.5%), Less than

or equal to 10,000 baht for 40 (10.0%), and 40,001-50,000 baht for 18 (4.5%). Refer to the occupation, the private company employee occupied the highest amount for 253 (63.3%) respondents, followed by the student for 89 (22.3%) respondents, government employee/state enterprise officer for 34 (8.5%) respondents, private business/ freelance worker for 22 (5.5%) respondents, and entrepreneur/business owner for 2 (0.5%) respondents respectively. Focusing on the frequency of traveling by Mass Rapid Transit, the majority of respondents are traveled 4-6 days per week for 186 (46.5%), followed by less than 3 days per week for 84 (21.0%), 1-3 days per week for 74 (18.5), other (namely, 3 times per month and less than 2 times per year) for 38 (9.%), and Daily, 7 days per week, for 18 (4.5%).

## **4.2 Opinion Level of The User**

The following section is a description of the seven study variables in the research framework. There are five independent variables which are (1) information quality, (2) system quality, (3) service quality, (4) performance expectancy, and (5) social influence, and two dependent variables which refer to user satisfaction and continuance intention to use. All observed variables are measured by using 5 point-Likert-scale with remark of Mean value as follows:

Mean value between 1.00-1.80 is “Strongly disagree”

Mean value between 1.81-2.60 is “Disagree”

Mean value between 2.61-3.40 is “Neutral”

Mean value between 3.41-4.20 is “Agree”

Mean value between 4.21-5.00 is “Strongly Agree”

Then, the descriptive analysis of these variables is presented as follows:

### **4.2.1 Information Quality**

There are three observed variables included in this latent variable, which are format, accuracy, and timeliness. The descriptive analysis, mean and standard deviation of Information quality, is shown in Table 4.2. The analysis result is an outcome from data of 400 respondents.

**Table 4.2** The Mean and Standard Deviation of Information Quality

Information Quality	Level of opinion					Mean	S.D.	Level
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree			
	Frequency/ Percentage							
<b>Format</b>						<b>4.00</b>	<b>0.596</b>	<b>Agree</b>
1. The display of self-service technology is presented in well-organized format	0 (0.0)	0 (0.0)	170 (42.5)	182 (45.5)	48 (12.0)	3.70	0.673	Agree
2. The output of self-service technology is easy to read with proper front size and clear color	0 (0.0)	0 (0.0)	77 (19.3)	197 (49.3)	126 (31.5)	4.12	0.703	Agree
3. The output of self-service technology is easy to understand	0 (0.0)	0 (0.0)	70 (17.5)	190 (47.5)	140 (35.0)	4.18	0.704	Agree
<b>Accuracy</b>						<b>4.31</b>	<b>0.545</b>	<b>Strongly Agree</b>
1. Self-service technology shows the result correctly every time	0 (0.0)	0 (0.0)	27 (6.8)	213 (53.3)	160 (40.0)	4.33	0.598	Strongly Agree
2. Self-service technology provides reliable information (such as, the ticket fee and remaining money in card)	0 (0.0)	0 (0.0)	23 (5.8)	237 (59.3)	140 (35.0)	4.29	0.568	Strongly Agree

**Table 4.2** The Mean and Standard Deviation of Information Quality (Continue)

Information Quality	Level of opinion					Mean	S.D.	Level
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree			
	Frequency/ Percentage							
<b>Timeliness</b>						<b>4.11</b>	<b>0.673</b>	<b>Agree</b>
1. Self-service technology provides me information in timely manner	0 (0.0)	6 (1.5)	82 (20.5)	196 (49.0)	116 (29.0)	4.06	0.744	Agree
2. Self-service technology provides me with up-to-date information (such as, real time update of remaining money in card after topping-up)	0 (0.0)	0 (0.0)	68 (17.0)	197 (49.3)	135 (33.8)	4.17	0.693	Agree
<b>Overall</b>						<b>4.14</b>	<b>0.523</b>	<b>Agree</b>

In term of format, it indicated that the first ranked of respondents' format were in the items of "The output of self-service technology is easy to understand" (mean of 4.18) followed by the item of "The output of self-service technology is easy to read with proper front size and clear color" (mean of 4.12). The item of "The display of self-service technology is presented in the well-organized format" (mean of 3.70). Overall, the respondents' group of format is at Agree level (mean of 4.14).

In term of accuracy, it indicated that the first ranked of respondents' accuracy were in the item of "Self-service technology shows the result correctly every time" (mean of 4.33) and followed by the item of "Self-service technology provides reliable information (such as the ticket fee and remaining money in card)" (mean of 4.29). Overall, the respondents' group of accuracy is at Strongly agree level (mean of 4.31).

In term of timeliness, it indicated that the first ranked of respondents' timeliness were in the item of "Self-service technology provides me with up-to-date information (such as the real-time update of remaining money in the card after topping-up)" (mean of 4.17) and followed by the item of "Self-service technology provides me information in a timely manner" (mean of 4.06). Overall, the respondents' group of timeliness is at the Agree level (mean of 4.11).

The overall mean of information quality equals to 4.14, and the standard deviation equals to 0.523, which can be interpreted that the users perceive of good quality of the information provided by self-service technology of Mass Rapid Transit.

#### 4.2.2 System Quality

There are three observed variables included in this latent variable, which are ease of the process, responsiveness, and usability. The descriptive analysis, mean and standard deviation of System quality is shown in Table 4.3. The analysis result is an outcome from data of 400 respondents.

**Table 4.3** The Mean and Standard Deviation of System Quality

System Quality	Level of opinion					Mean	S.D.	Level
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree			
	Frequency/ Percentage							
<b>Ease of Process</b>						<b>4.16</b>	<b>0.691</b>	<b>Agree</b>
1. Self-service technology is easy to use	0 (0.0)	6 (1.5)	49 (12.3)	194 (48.5)	151 (37.8)	4.23	0.715	Strongly Agree

**Table 4.3** The Mean and Standard Deviation of System Quality (Continue)

System Quality	Level of opinion					Mean	S.D.	Level
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree			
	Frequency/ Percentage							
2. It is easy for me to remember how to perform task using the self-service technology system	0 (0.0)	18 (4.5)	62 (15.5)	185 (46.3)	135 (33.8)	4.09	0.816	Agree
<b>Responsiveness</b>						<b>3.94</b>	<b>0.815</b>	<b>Agree</b>
1. Self-service technology is always up-to-date and running as necessary	6 (1.5)	16 (4.0)	96 (24.0)	184 (46.0)	98 (24.5)	3.88	0.876	Agree
2. Self-service technology responds my request quickly enough	0 (0.0)	22 (5.5)	66 (16.5)	204 (51.0)	108 (27.0)	4.00	0.810	Agree
<b>Usability</b>						<b>4.01</b>	<b>0.659</b>	<b>Agree</b>
1. Self-service technology is unnecessarily complex	0 (0.0)	12 (3.0)	42 (10.5)	243 (60.8)	103 (25.8)	4.09	0.689	Agree
2. Self-service technology is flexible to switch the operating menu	0 (0.0)	17 (4.3)	79 (19.8)	223 (55.8)	81 (20.3)	3.92	0.752	Agree
<b>Overall</b>						<b>4.03</b>	<b>0.647</b>	<b>Agree</b>

In term of ease of the process, it pointed out that the first ranked of respondents' ease of process were in the items of "Self-service technology is easy to use" (mean of 4.23) and followed by the item of "It is easy for me to remember how to perform a task using the self-service technology system" (mean of 4.09). Overall, the respondents' group of ease of process is at the Agree level (mean of 4.16).

In term of responsiveness, it pointed out that the first ranked of respondents' responsiveness were in the items of "Self-service technology responds my request quickly enough" (mean of 4.00) and followed by the item of "Self-service technology is always up-to-date and running as necessary" (mean of 3.88). Overall, the respondents' group of responsiveness is at the Agree level (mean of 3.94).

In term of usability, it pointed out that the first ranked of respondents' usability were in the items of "Self-service technology is unnecessarily complex" (mean of 4.09) and followed by the item of "Self-service technology is flexible to switch the operating menu" (mean of 3.92). Overall, the respondents' group of usability is at the Agree level (mean of 4.01).

The overall mean of system quality equals to 4.03, and the standard deviation equals to 0.647, which can be interpreted that the users perceive of good quality of system provided by self-service technology of Mass Rapid Transit.

#### **4.2.3 Service Quality**

There are two observed variables included in this latent variable, which are technological service and Human service. The descriptive analysis, mean, and standard deviation of service quality are shown in Table 4.4. The analysis result is an outcome from data of 400 respondents.

**Table 4.4** The Mean and Standard Deviation of Service Quality

Service Quality	Level of opinion					Mean	S.D.	Level
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree			
	Frequency/ Percentage							
<b>Technological Service</b>						<b>4.08</b>	<b>0.659</b>	<b>Agree</b>
1. Self-service technology has operating hours convenience to user	6 (1.5)	10 (2.5)	37 (9.3)	228 (57.0)	119 (29.8)	4.11	0.784	Agree
2. Self-service technology has features that meets my needs	0 (0.0)	17 (4.3)	42 (10.5)	252 (63.0)	89 (22.3)	4.03	0.705	Agree
3. Self-service technology makes my life easier	0 (0.0)	11 (2.8)	54 (13.5)	218 (54.5)	117 (29.3)	4.10	0.727	Agree
<b>Human Service</b>						<b>3.94</b>	<b>0.711</b>	<b>Agree</b>
1. Service provider can explain how to use the self-service technology properly	0 (0.0)	0 (0.0)	123 (30.8)	185 (46.3)	92 (23.0)	3.92	0.730	Agree
2. Service provider is always willing to serve user	0 (0.0)	16 (4.0)	104 (26.0)	165 (41.3)	115 (28.8)	3.95	0.841	Agree
3. Service provider provides service to user fairly	0 (0.0)	10 (2.5)	100 (25.0)	193 (48.3)	97 (24.3)	3.94	0.769	Agree
<b>Overall</b>						<b>4.01</b>	<b>0.592</b>	<b>Agree</b>

In term of technological service, it indicated that the first ranked of respondents' format were in the items of "Self-service technology has operating hours convenient to the user" (mean of 4.11) followed by the item of "Self-service technology makes my life easier" (mean of 4.10), and the item of "Self-service technology has features that meet my needs" (mean of 4.03) respectively. Overall, the respondents' group of technological services is at the Agree level (mean of 4.08).

In term of human service, it indicated that the first ranked of respondents' human service were in the item of "Service provider is always willing to serve user" (mean of 3.95) and followed by the item of "Service provider provides service to user fairly" (mean of 3.94). The item of "Service provider can explain how to use the self-service technology properly" (mean of 3.92), respectively. Overall, the respondents' group of human service is at the Agree level (mean of 3.94).

The overall mean of Service quality equals to 4.01, and the standard deviation equals to 0.592, which can be interpreted that the users perceive of good quality of service provided by both service provider and the self-automated machine itself at Mass Rapid Transit.

#### **4.2.4 Performance Expectancy**

There are three observed variables included in this latent variable, which are Perceived usefulness, Job-fit, and relative advantages. The descriptive analysis, mean, and standard deviation of Performance expectancy is shown in Table 4.5. The analysis result is an outcome from data of 400 respondents.

**Table 4.5** The Mean and Standard Deviation of Performance Expectancy

<b>Performance Expectancy</b>	<b>Level of opinion</b>					<b>Mean</b>	<b>S.D.</b>	<b>Level</b>
	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly agree</b>			
	<b>Frequency/ Percentage</b>							
<b>Perceived Usefulness</b>						<b>4.48</b>	<b>0.548</b>	<b>Strongly Agree</b>
1. I perceived that using the self-service technology would enable me to accomplish tasks more quickly (such as, buying the ticket, top-up contactless card, purchasing items, and leaving the baggage)	0 (0.0)	0 (0.0)	19 (4.8)	189 (47.3)	192 (48.0)	4.43	0.584	Strongly Agree
2. I perceived that using the self-service technology would make me easier to do the task (such as, buying the ticket, contactless top-up card, purchasing items, and leaving the baggage)	0 (0.0)	0 (0.0)	16 (4.0)	156 (39.0)	228 (57.0)	4.53	0.574	Strongly Agree

**Table 4.5** The Mean and Standard Deviation of Performance Expectancy (Continue)

Performance Expectancy	Level of opinion					Mean	S.D.	Level
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree			
	Frequency/ Percentage							
<b>Job-Fit</b>						<b>4.26</b>	<b>0.598</b>	<b>Strongly Agree</b>
1. I believed that using self-service technology can save times during rush hours	0 (0.0)	17 (4.3)	21 (5.3)	173 (43.3)	189 (47.3)	4.34	0.764	Strongly Agree
2. I believed that using the self-service technology will increase the quality during my travel such as using automated self-storage service	0 (0.0)	0 (0.0)	50 (12.5)	229 (57.3)	121 (30.3)	4.18	0.630	Agree
<b>Relative Advantages</b>						<b>3.91</b>	<b>0.765</b>	<b>Agree</b>
1. Self-service technology is very well when compared with buying the ticket from the service provider	0 (0.0)	27 (6.8)	73 (18.3)	220 (55.0)	80 (20.0)	3.88	0.800	Agree

**Table 4.5** The Mean and Standard Deviation of Performance Expectancy (Continue)

Performance Expectancy	Level of opinion					Mean	S.D.	Level
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree			
	Frequency/ Percentage							
2. Checking service data via self-service technology is more convenient when comparing with asking from the service provider (such as number of travel times and remaining money in card)	11 (2.8)	12 (3.0)	53 (13.3)	238 (59.5)	86 (21.5)	3.94	0.845	Agree
<b>Overall</b>						<b>4.22</b>	<b>0.504</b>	<b>Strongly Agree</b>

In term of perceived usefulness, it pointed out that the first ranked of respondents' perceived value were in the items of "I perceived that using the self-service technology would make me easier to do the task (such as, buying the ticket, contactless top-up card, purchasing items, and leaving the baggage)" (mean of 4.53) and followed by the item of "I perceived that using the self-service technology would enable me to accomplish tasks more quickly (such as, buying the ticket, contactless top-up card, purchasing items, and leaving the baggage)" (mean of 4.43). Overall, the respondents' group of perceived usefulness is at Strongly agree level (mean of 4.48).

In term of job-fit, it pointed out that the first ranked of respondents' job-fit were in the items of "I believed that using the self-service technology can save times during rush hours" (mean of 4.34) and followed by the item of "I believed that using the self-service technology will

increase the quality during my travel such as, using of automated self-storage service” (mean of 4.18). Overall, the respondents’ group of job-fit is at Agree level (mean of 4.26).

In term of relative advantages, it pointed out that the first ranked of respondents’ relative advantages were in the items of “Checking service data via self-service technology is more convenient when comparing with asking from the service provider (such as number of travel times and remaining money in card)” (mean of 3.94) and followed by the item of “Self-service technology is very well when comparing with buying the ticket from the service provider” (mean of 3.88). Overall, the respondents’ group of relative advantages is at the Agree level (mean of 3.91).

The overall mean of Performance expectancy equals to 4.22, and the standard deviation equals to 0.504, which can be interpreted that the users perceive that self-service technology of Mass Rapid Transit support their daily journey and make their everyday life better.

#### 4.2.5 Social Influence

There are three observed variables included in this latent variable, which are the subjective norm, social factors, and image. The descriptive analysis, the mean and standard deviation of social influence is shown in Table 4.6. The analysis result is an outcome from data of 400 respondents.

**Table 4.6** The Mean and Standard Deviation of Social Influence

Social Influence	Level of opinion					Mean	S.D.	Level
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree			
	Frequency/ Percentage							
<b>Subjective Norm</b>						<b>3.48</b>	<b>0.774</b>	<b>Agree</b>
1. I want to use self-service technology because I saw my friends or relatives use it	5 (1.3)	24 (6.0)	156 (39.0)	171 (42.8)	44 (11.0)	<b>3.56</b>	<b>0.814</b>	Agree

**Table 4.6** The Mean and Standard Deviation of Social Influence (Continue)

Social Influence	Level of opinion					Mean	S.D.	Level
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree			
	Frequency/ Percentage							
2. I want to use self-service technology because I saw people in my family use it.	5 (1.3)	41 (10.3)	172 (43.0)	154 (38.5)	28 (7.0)	3.40	0.813	Neutral
<b>Social Factors</b>						<b>3.32</b>	<b>0.837</b>	<b>Neutral</b>
1. I use self-service technology because of presenters, actors, and celebrities use this system	20 (5.0)	70 (17.5)	187 (46.8)	88 (22.0)	35 (8.8)	3.12	0.966	Neutral
2. I use self-service technology because people around me support to use this system	4 (1.0)	43 (10.8)	147 (36.8)	155 (38.8)	51 (12.8)	3.52	0.884	Agree
<b>Image</b>						<b>3.51</b>	<b>0.834</b>	<b>Agree</b>
1. People who use self-service technology looks fashionable	5 (1.3)	26 (6.5)	172 (43.0)	156 (39.0)	41 (10.3)	3.51	0.813	Agree

**Table 4.6** The Mean and Standard Deviation of Social Influence (Continue)

Social Influence	Level of opinion					Mean	S.D.	Level
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree			
	Frequency/ Percentage							
2. People who use self-service technology is knowledgeable (good at technology)	11 (2.8)	21 (5.3)	175 (43.8)	135 (33.8)	58 (14.5)	3.52	0.901	Agree
<b>Overall</b>						<b>3.44</b>	<b>0.707</b>	<b>Agree</b>

In term of subjective norm, it indicated that the first ranked of respondents' subjective norm were in the items of "I want to use self-service technology because I saw my friends or relatives use it" (mean of 3.56) and followed by the item of "I want to use self-service technology because I saw people in my family use it" (mean of 3.40.) Overall, the respondents' group of the subjective norm is at the Agree level (mean of 3.48).

In term of social factors, it indicated that the first ranked of respondents' social factors were in the item of "I use self-service technology because people around me support to use this system" (mean of 3.52) and followed by the item of "I use self-service technology because of presenters, actors, and celebrities use this system" (mean of 3.12). Overall, the respondents' group of social factors is at the Neutral level (mean of 3.32).

In term of image, it indicated that the first ranked of respondents' image were in the item of "People who use self-service technology is knowledgeable (good at technology)" (mean of 3.52) and followed by the item of "People who use self-service technology looks fashionable" (mean of 3.51). Overall, the respondents' group of images is at the Agree level (mean of 3.51).

The overall mean of social influence equals 3.44, and the standard deviation equals 0.707, which can be interpreted that users feel that the people around them and circumstances

influence them to adopt self-service technology of Mass Rapid Transit. In other words, users imitate the use of self-service technology from others.

#### 4.2.6 User Satisfaction

The three questions were used to collect the data from 400 respondents. The outcome, descriptive analysis, mean and standard deviation of user satisfaction is shown in Table 4.7.

**Table 4.7** The Mean and Standard Deviation of User Satisfaction

User Satisfaction	Level of opinion					Mean	S.D.	Level
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree			
	Frequency/ Percentage							
<b>User Satisfaction</b>								
1. Using self-service technology is my best choice	5 (1.3)	10 (2.5)	69 (17.3)	230 (57.5)	86 (21.5)	3.96	0.774	Agree
2. Self-service technology exceeds my expectation	5 (1.3)	23 (5.8)	144 (36.0)	170 (42.5)	58 (14.5)	3.63	0.845	Agree
3. Overall, I am satisfied with the use of self-service technology	0 (0.0)	18 (4.5)	64 (16.0)	246 (61.5)	72 (18.0)	3.93	0.719	Agree
<b>Overall</b>						<b>3.84</b>	<b>0.682</b>	<b>Agree</b>

According to user satisfaction, it indicated that the first ranked of respondents' user satisfaction were in the items of "Using self-service technology is my best choice" (mean of 3.96), followed by the item of "Overall, I am satisfied with the use of self-service technology" (mean of 3.93), and the item of "Self-service technology exceeds my expectation" (mean of 3.63) respectively. The overall mean of user satisfaction equal to 3.84, and the standard deviation

equals 0.682, which can be interpreted that users feel satisfied with adopting self-service technology because this technology is beyond their expectation, and it will become the wise choice of the user.

#### 4.2.6 Continuance Intention to Use

The three questions were used to collect the data from 400 respondents; the outcome, descriptive analysis, mean and standard deviation of continuance intention to use is shown in Table 4.8.

**Table 4.8** The Mean and Standard Deviation of Continuance Intention to Use

Continuance Intention to Use	Level of opinion					Mean	S.D.	Level
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree			
	Frequency/ Percentage							
<b>Continuance Intention to Use</b>								
1. I intend to continue using self-service technology	0 (0.0)	12 (3.0)	59 (14.8)	236 (59.0)	93 (23.3)	4.03	0.708	Agree
2. I will continue using self-service technology rather than using any alternative means	5 (1.3)	22 (5.5)	66 (16.5)	222 (55.5)	85 (21.3)	3.90	0.838	Agree
3. I will surely use any other additional self-service technology in the future	0 (0.0)	6 (1.5)	55 (13.8)	195 (48.8)	144 (36.0)	4.19	0.722	Agree
<b>Overall</b>						<b>4.04</b>	<b>0.673</b>	<b>Agree</b>

According to user satisfaction, it indicated that the first ranked of respondents' user satisfaction were in the items of "Using self-service technology is my best choice" (mean of

3.96), followed by the item of “Overall, I am satisfied with the use of self-service technology” (mean of 3.93), and the item of “Self-service technology exceeds my expectation” (mean of 3.63) respectively. The overall mean of user satisfaction equal to 4.04 and the standard deviation equals 0.673, which can be interpreted that experienced users perceived satisfaction with using this kind of technology rather than other methods and will continue to use it rather than other methods. Moreover, they are willing to trial/use the additional new self-service technology in the future.

### 4.3 Normality Test and Correlation Coefficient Result

The following section explained the result of the Normality test using the criteria of Skewness and Kurtosis and the Correlation Coefficient.

#### 4.3.1 Normality Test

The normal distribution related to Skewness and Kurtosis was declared in the Table 4.9 based on seven unobserved variables that included twenty observed variables which are; information quality 3 observed variables (format, accuracy, and timeliness), system quality 3 observed variables (ease of process, responsiveness, and usability), service quality 2 observed variables (technological service and human service), social influence 3 observed variables (subjective norm, social factors, and image), user satisfaction 3 observed variables, and continuance intention to use 3 observed variables.

**Table 4.9** Normality Test Result

Variables	Skewness	Kurtosis	Normal Distribution
FOR	0.02	-0.83	✓
ACC	-0.05	-0.84	✓
TIME	-0.10	-0.96	✓
EASE	-0.54	0.15	✓
RESP	-0.64	0.44	✓
USA	-0.52	1.00	✓
TECH	-0.70	1.38	✓

**Table 4.9** Normality Test Result (Continue)

<b>Variables</b>	<b>Skewness</b>	<b>Kurtosis</b>	<b>Normal Distribution</b>
HUMAN	-0.07	-0.94	✓
PU	-0.58	-0.59	✓
JF	-0.45	-0.52	✓
RA	-0.72	1.40	✓
SN	-0.29	0.34	✓
SF	0.05	0.11	✓
IMAGE	-0.24	0.20	✓
US1	-0.70	1.84	✓
US2	-0.30	0.13	✓
US3	-0.63	0.72	✓
CI1	-0.55	0.54	✓
CI2	-0.69	1.15	✓
CI3	-0.55	-0.11	✓

From the table above, it was found that the Information quality measured from 3 variables has Skewness range from -0.10 to 0.02, and Kurtosis range from -0.96 to -0.83. The system quality measured from 3 variables have Skewness range from -0.54 to -0.52 and Kurtosis range from 0.15 to 1.00. The service quality measured from 2 variables have Skewness range from -0.70 to -0.07 and Kurtosis range from -0.94 to 1.38. The performance expectancy measured from 3 variables have Skewness range from -0.72 to -0.58 and Kurtosis range from -0.52 to 1.40. The social influence measured from 3 variables have Skewness range from -0.24 to 0.05 and Kurtosis range from 0.11 to 0.34. The user satisfaction measured from 3 variables have Skewness range from -0.63 to -0.30 and Kurtosis range from 0.13 to 1.84. The continuance Intention to use measured from 3 variables have Skewness range from -0.69 to -0.55, and Kurtosis range from -0.11 to 0.54. All the result of Skewness and Kurtosis are normal distribution because the absolute value of Skewness is not over than 0.75, and Kurtosis is not over 1.5 (Hooland, 1998). After approving of the normal distribution, this data is appropriate to use for further Confirmatory Factor Analysis (CFA) and Structural Equation Model Analysis (SEM). We assumed that the

result of CFA and SEM analysis is precise and correct because the variables are normal distribution. On the other hand, if the variables are out of normal distribution, the model deviation will be underestimated and cause the incorrect consistency of model and empirical data (Nonglak, 2012).

#### **4.3.2 Correlation Coefficient**

The Correlation Coefficient was used to measure the strength of the relationship between the relative movement of two variables. In this research, the result of the Correlation Coefficient was described based on the analysis of twenty observed variables. Testing of the relationship between the observed variables of the Information quality found that the correlation is range from 0.574 to 0.699, the system quality's correlation is range from 0.675 to 0.739, the service quality's correlation is 0.491, the performance expectancy's correlation is range from 0.471 to 0.566, the social influence's correlation is range from 0.530 to 0.729, the user satisfaction's correlation is range from 0.557 to 0.683. The continuance intention to use ranges from 0.554 to 0.699. The mentioned result has shown that the absolute value of the correlation coefficient is not less than 0.30 (Nonglak, 2012) which implies that the variables are proper to use for CFA analysis. The correlation coefficient is not over than 0.80; therefore, Multicollinearity does not occur, which means the variables are appropriate and ready to use for SEM analysis. The result of the correlation coefficient, as shown in Table 4.10.

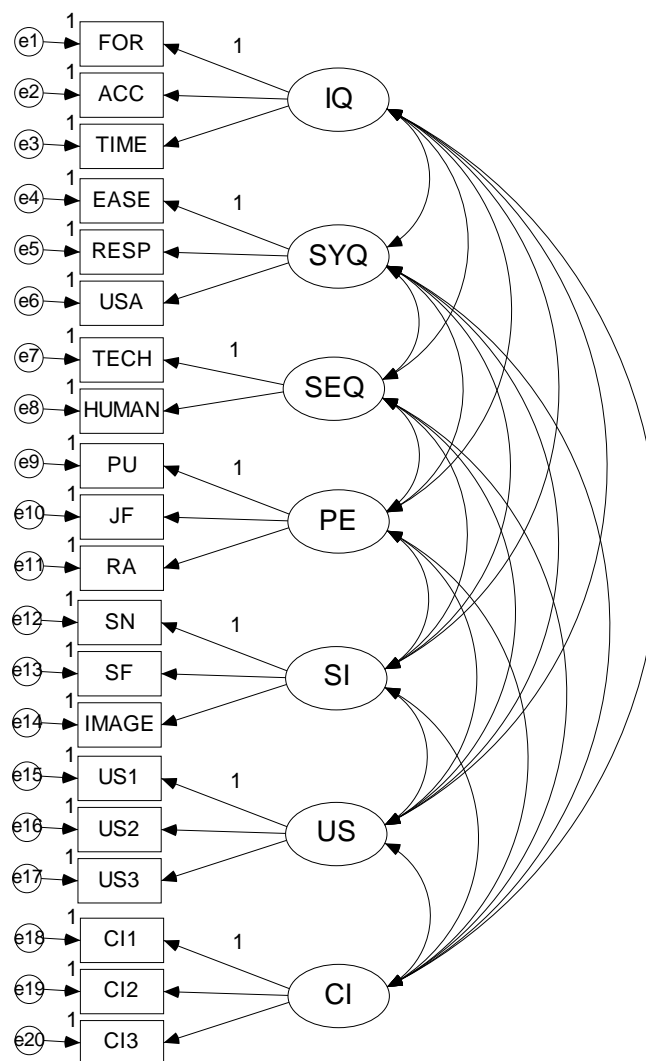
**Table 4.10 Correlation Coefficient**

Variables	PU	JF	RA	FOR	ACC	TIME	EASE	RESP	USA	TECH	HUMAN	SN	SF	IMAGE	US1	US2	US3	CI1	CI2	CI3	
<b>PU</b>	1.000																				
<b>JF</b>	0.566	1.000																			
<b>RA</b>	0.471	0.486	1.000																		
<b>FOR</b>	0.207	0.329	0.384	1.000																	
<b>ACC</b>	0.364	0.225	0.100	0.574	1.000																
<b>TIME</b>	0.273	0.311	0.265	0.588	0.699	1.000															
<b>EASE</b>	0.240	0.312	0.142	0.506	0.497	0.593	1.000														
<b>RESP</b>	0.187	0.238	0.179	0.617	0.578	0.703	0.675	1.000													
<b>USE</b>	0.193	0.278	0.188	0.622	0.511	0.525	0.705	0.739	1.000												
<b>TECH</b>	0.146	0.120	0.188	0.513	0.576	0.609	0.620	0.772	0.715	1.000											
<b>HUMAN</b>	0.116	-0.001	0.106	0.376	0.402	0.516	0.405	0.519	0.449	0.491	1.000										
<b>SN</b>	0.098	0.156	0.217	0.431	0.325	0.378	0.274	0.409	0.397	0.468	0.296	1.000									
<b>SF</b>	-0.058	0.126	0.267	0.441	0.198	0.260	0.272	0.428	0.414	0.416	0.256	0.729	1.000								
<b>IMAGE</b>	0.068	0.245	0.347	0.457	0.259	0.312	0.372	0.431	0.568	0.334	0.180	0.530	0.625	1.000							
<b>US1</b>	0.084	0.315	0.442	0.462	0.227	0.406	0.500	0.415	0.438	0.356	0.256	0.444	0.484	0.606	1.000						
<b>US2</b>	0.085	0.192	0.250	0.526	0.236	0.413	0.456	0.567	0.587	0.536	0.351	0.642	0.626	0.712	0.683	1.000					
<b>US3</b>	0.134	0.118	0.155	0.402	0.370	0.381	0.502	0.508	0.657	0.531	0.273	0.437	0.443	0.577	0.557	0.688	1.000				
<b>CI1</b>	0.215	0.201	0.131	0.321	0.324	0.376	0.458	0.300	0.384	0.334	0.166	0.360	0.281	0.456	0.528	0.548	0.625	1.000			
<b>CI2</b>	0.149	0.239	0.320	0.458	0.269	0.398	0.391	0.318	0.360	0.301	0.245	0.547	0.528	0.622	0.685	0.684	0.571	0.699	1.000		
<b>CI3</b>	0.221	0.176	0.124	0.391	0.391	0.397	0.526	0.302	0.479	0.474	0.139	0.231	0.207	0.377	0.455	0.502	0.649	0.721	0.554	1.000	

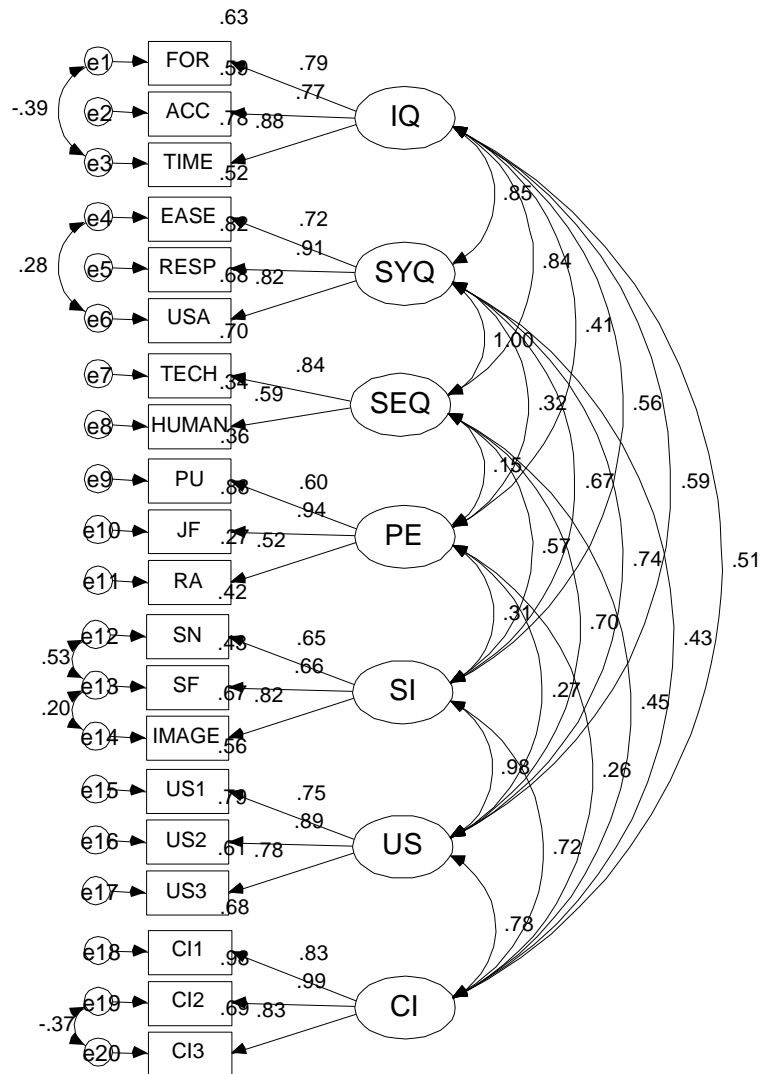
\*p <0.05 Remark: Multicollinearity will reduce the estimation's accuracy of the coefficient which occurred only in the positive correlation. In the case of negative correlation, multicollinearity will provide accurate estimation and will be more accurate as the negative correlations increased. The way to solve such problem is to take out the highly-correlated observed variable.

#### 4.4 The Measurement Model of Seven (7) Dimensions

From this study, the CFA has seven dimensions include information quality (IQ), system quality (SYQ), service quality (SEQ), performance expectancy (PE), social influence (SI), user satisfaction (US), and continuance intention to use (CI). For the initial model, the seven dimensions represented seven latent variables (Figure 4.1). This indicates that the initial model does not fit well with the empirical data. As such, the modification indices provided by AMOS were used as a guideline for improvement of the model.



**Figure 4.1** Measurement Model of Factors Involving Continuance Intention to Use



$\chi^2=431.062$ ,  $df=144$ ,  $GFI=0.967$ ,  $RMR=0.961$ ,  $RMSEA=0.048$

**Figure 4.2** Analysis Results Measurement Model of Factors Involving Continuance Intention to Use

According to Figure 4.2, the results of CFA in term of Overall Model Fit Measure (after adjusting the model) shown that Chi-square ( $c^2$ ) is equal to 431.062 with probability level is  $>0.05$ , and  $CMIN/DF$  is equal to 2.993 which is less than 3.00 mean it is within the accepted value. Moreover, the group of accepted Index range greater than 0.9 which are  $GFI = 0.967$ ,  $AGFI = 0.961$ ,  $NFI = 0.906$ ,  $IFI = 0.925$ , and  $CFI = 0.924$  found that all is passed the criteria. The group of accepted Index range lower than 0.05, which are  $RMR = 0.041$ , and  $RMSEA = 0.048$  found that all is passed the criteria as well. The researcher adjusts to model fit by linking the two-

tailed arrow between the error of parameters according to the guideline of Modification Indices (MI) five parameters which include 1) error of e13 and e12, 2) error of e6 and e4, 3) error of e14 and e13, 4) error of e3 and e1 and 5) error of e20 and e19 respectively. Each parameter was adjusted and reanalyzed until the CMIN/DF to be less than 3.00 (Krit Rangsunogoen, 2011). When comparing with the model before adjusting, the model does not fit well with empirical data. The CMIN/DF is equal to 3.253, which is higher than 3.0 means not to pass the criteria. Also, the group of accepted Index range lower than 0.05, which are RMR = 0.051 and RMSEA = 0.055, found that all is passed the criteria. However, the group of accepted Index range greater than 0.9 which are GFI = 0.824, AGFI = 0.811, NFI = 0.866, IFI = 0.885, and CFI = 0.883 found that all is not passed the criteria. All the mentioned details were indicated in Table 4.11.

**Table 4.11** The Overall Measurement Model of Factors Involving Continuance Intention to Use Fit Indices

Indices	Criteria	Statistic values	
		Before	After
1. CMIN/DF	<3	3.253	2.993
2. GFI	$\geq 0.90$	0.824	0.967
3. AGFI	$\geq 0.90$	0.811	0.961
4. NFI	$\geq 0.90$	0.866	0.906
5. IFI	$\geq 0.90$	0.885	0.925
6. CFI	$\geq 0.90$	0.883	0.924
7. RMR	<0.05	0.051	0.041
8. RMSEA	<0.05	0.055	0.048
<b>Conclusion</b>		<b>Model does not Fit</b>	<b>Model Fit</b>

Moreover, after the researcher checked the model validity by considering of the Component Fit Measure in term of Measurement Model, the results of CFA show the details of t-value at a 0.001 confidence level and Lambda scores ( $\lambda$ ), or factor loading as follows;

In term of information quality (IQ), we found that timeliness (TIME) holds the maximum factor loading scores of 0.885 with square multiple correlations of 0.783 that can explain most of the variance in information quality at 78%, followed by format (FOR) with the factor loading scores of 0.791 and square multiple correlations of 0.626 that was able to explain the variance at 63%, and accuracy (ACC) with the minimum factor loading scores of 0.766 with square multiple correlations of 0.587 that can describe the variance at 76% respectively.

In term of system quality (SYQ), we found that responsiveness (RESP) holds the maximum factor loading scores of 0.907 with square multiple correlations of 0.823 that can explain most of the variance in system quality at 82%, followed by usability (USA) with the factor loading scores of 0.825 and square multiple correlations of 0.680 that was able to explain the variance at 68%, and ease of process (EASE) with the minimum factor loading scores of 0.722 and square multiple correlations of 0.522 that can describe the variance at 52% respectively.

In term of service quality (SEQ), we found that technological service (TECH) holds the maximum factor loading scores of 0.838 with square multiple correlations of 0.702 that was able to explain the most of variance in service system at 84%, whereas, human service (HUMAN) is with the minimum factor loading scores of 0.586 and square multiple correlations of 0.344 that can represent the variance at 34%.

In term of performance expectancy (PE), we found that job-fit (JF) holds the maximum factor loading scores of 0.939 with square multiple correlations of 0.811 that can explain most of the variance in performance expectancy at 81%, followed by perceived usefulness (PU) with the factor loading scores of 0.600 and square multiple correlations of 0.359 that can represent the variance at 36%, and relative advantages (RA) with the factor loading scores of 0.517 with square multiple correlations of 0.267 that can describe the variance at 27% respectively.

In term of social Influence (SI), we found that image (IMAGE) holds the maximum factor loading scores of 0.816 with square multiple correlation of 0.666 that can explain most of variance in social influence at 67%, followed by social factors (SF) with the factor loading scores of 0.658 and square multiple correlation of 0.432 that can represent the variance at 43%, and

subjective norm (SN) with the factor loading scores of 0.649 with square multiple correlation of 0.422 that can describe the variance at 42% respectively.

In term of user satisfaction (US), we found that US2 holds the maximum factor loading scores of 0.887 with square multiple correlation of 0.788 that can explain most of variance in user satisfaction at 79%, followed by US3 with the factor loading scores of 0.780 with square multiple correlation of 0.609 that was able to describe the variance at 61%, and US1 with the factor loading scores of 0.749 with square multiple correlation of 0.562 that can represent the variance at 56% respectively.

In term of continuance intention to use (US), we found that CI2 holds the maximum factor loading scores of 0.987 with square multiple correlation of 0.975 that can explain most of variance in continuance intention to use self-service technology at 98% , followed by CI3 with the factor loading scores of 0.833 with square multiple correlation of 0.693 that was able to describe the variance at 69%, and CI1 with the factor loading scores of 0.827 with square multiple correlation of 0.684 that can represent the variance at 68% respectively.

In this case, the score of construct reliability ( $\rho_c$ ) of each dimension was greater than 0.6 (Hair & other, 2010), indicating that the construct is reliable. The score of average variance exacted ( $\rho_v$ ) of each dimension also higher than 0.5 means that the average amount of variation that a latent construct can explain in the set of observed variables. All the mentioned details were indicated in Table 4.12.

**Table 4.12** Factor Loading by Measurement Model of Factors Involving Continuance Intention to Use

Variables		Factor Loading ( $\lambda$ )			t	$R^2$
Latent Variables	Observed Variables	b	S.E.	Beta		
IQ	FOR	1.000		0.791		0.626
	ACC	0.886	0.058	0.766	15.364*	0.587
	TIME	1.263	0.077	0.885	16.480*	0.783
		$\rho_c=0.856, \rho_v=0.550$				

**Table 4.12** Factor Loading by Measurement Model of Factors Involving Continuance

Intention to Use (Continue)

Variables		Factor Loading ( $\lambda$ )			t	R <sup>2</sup>
Latent Variables	Observed Variables	b	S.E.	Beta		
SYQ	EASE	1.000		0.722		0.522
	RESP	1.481	0.082	0.907	18.063*	0.823
	USA	1.088	0.057	0.825	19.156*	0.680
		$\rho_c=0.861, \rho_v=0.548$				
SEQ	TECH	1.000		0.838		0.702
	HUMAN	0.755	0.059	0.586	12.731*	0.344
		$\rho_c=0.680, \rho_v=0.577$				
PE	PU	1.000		0.600		0.359
	JF	1.709	0.178	0.939	9.616*	0.881
	RA	1.206	0.136	0.517	8.841*	0.267
		$\rho_c=0.739, \rho_v=0.577$				
SI	SN	1.000		0.649		0.422
	SF	1.095	0.067	0.658	16.372*	0.432
	IMAGE	1.354	0.100	0.816	13.490*	0.666
		$\rho_c=0.753, \rho_v=0.583$				
US	US1	1.000		0.749		0.562
	US2	1.293	0.069	0.887	18.799*	0.788
	US3	0.966	0.060	0.780	16.209*	0.609
		$\rho_c=0.848, \rho_v=0.553$				
CI	CI1	1.000		0.827		0.684
	CI2	1.413	0.062	0.987	22.817*	0.975
	CI3	1.028	0.059	0.833	17.547*	0.693
		$\rho_c=0.915, \rho_v=0.530$				

**Remark:** Parameter = 1 in position FOR, EASE, TECH, PU, SN, US1, and CI1. Therefore, there is no have S.E. and t value

\*P<0.05

In the next stage, the model was firstly formed and examined with multiple criteria including Chi-square value ( $X^2$ )/ degrees of freedom (CMIN/DF), Comparative Fit Index (CFI), Goodness of Fit Index (GFI), Root Mean Square Error of Approximation (RMSEA), and Root Mean Square Residual (RMR). This study uses seven latent variables to develop the model, according to CFA.

Furthermore, a close investigation of the overall construct reliability for all constructs reveals that all constructs have acceptable construct reliability scores within an acceptable range of factor loadings (0.600 and above) as shown in Figure 4.2, which is a diagram for the Measurement Model Fit. Given that most of the model fit indices present the acceptable fit score, including Chi-square (431.062), df (144), CFI (0.924), GFI (0.967), RMSEA (0.048), and RMR (0.961), if compare with the model fit indices and the level of acceptance mentioned in Chapter 3.

With reference to the Measurement Model Fit, Confirmatory Factor Analysis (CFA) may be used to confirm that the indicators sort themselves into factors corresponding to how the researcher has linked the indicators to the latent variables. Confirmatory Factor Analysis plays an important role in the structural equation model. CFA model in SEM is used to assess the role of measurement error in the model, to validate a multifactorial model, to determine the group effects on the factors. Using CFA for examining the relationship between observed and latent variables, the objective of CFA is to examine how well the observed variables measure the latent variables, constructs, and then test the fit of a measurement model. In this study, all of the observed variables load at a minimum cutoff value greater than 0.30 on each latent variable, as shown in Figure 4.2. It can be concluded that the latent variables are valid underlying constructs for the observed variables and that the observed variables, in turn, are reliable measures of the latent variables. The statistical significance of the loading was tested with t-value. The conclusion, therefore, could be drawn that the proposed CFA model accurately accounts for the variance and covariance in the data and that the model satisfactorily explains the relationship between the observed variables and their corresponding latent constructs. Having confirmed that the observed

variables account accurately for the latent variables, it is appropriate now to examine the fit of the structural model to the empirical data on how the latent constructs are related.

#### **4.5 The Structural Equation Model of Seven (7) Dimensions**

Model of continuance intention to use self-service technology of Mass Rapid Transit system in Thailand has been conducted to study about a causal relationship which effecting the continuance intention to use by focusing causal relationship between Information quality (IQ) which includes Format (FOR), Accuracy (ACC), and Timeliness (TIME), System quality (SYQ) which includes Ease of Process (EASE), Responsiveness (RESP), and Usability (USA), Service quality (SEQ) which includes Technological service (TECH) and Human service (HUMAN), Performance Expectancy (PE) which provides for Perceived usefulness (PU), Job-fit (JF), and Relative advantages (RA), Social Influence (SI) which includes Subjective norm (SN), Social factors (SF), and Image (IMAGE) with User satisfaction (US) and lead to Continuance intention to use (CI) self-service technology of Mass Rapid Transit system in Thailand. This model uses AMOS Model analysis to test the assumption model with empirical data by the Structural Equation Model Analysis (SEM) for testing models that the researcher has integrated has the following details:

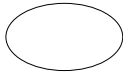

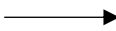

##### **4.4.1 Multicollinearity**

The observed variables that used to construct this model consisted of 20 variables, as mentioned above. They have a moderate positive correlation ( $r < 0.80$ ), which could not generate multicollinearity. Therefore, it is not necessary to take out any of the observed variables from the AMOS Model Analysis (Leahy, 2001).

##### **4.4.2 Overview of Terms**

Structural Equation Modeling (SEM) was used to test the hypothesized model. Within the SEM approach, the causal relationships on the proposed model are represented by a series of structural equations that are then tested simultaneously to determine how well the model represents the data. AMOS version 6.0 was applied in this study.

**Table 4.13** The Symbol Used for Structural Equation Model

	= Latent Variable
	= Observed Variable
	= Casual Relationship
	= Non causal relationship

**Table 4.14** The Abbreviation of Variables Used for Statistical Analysis

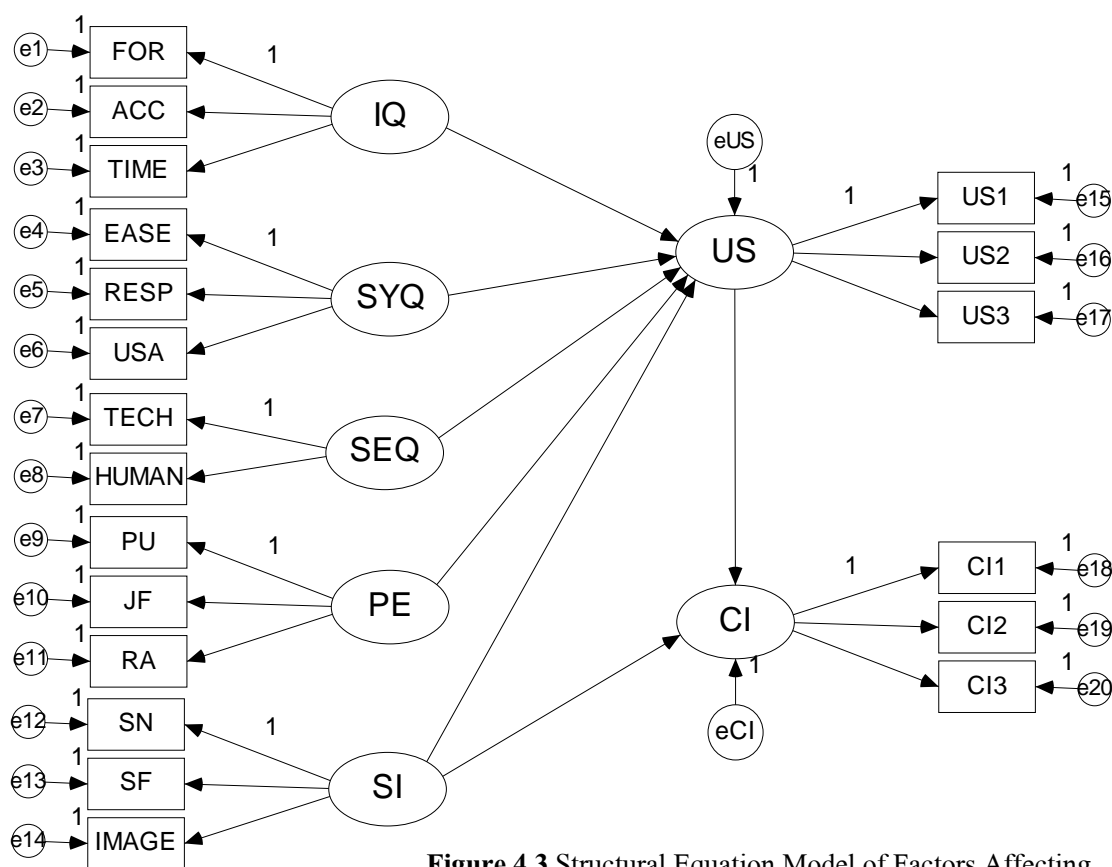
<b>Kind of Variables</b>	<b>Abbreviation</b>	<b>Meaning</b>
Latent Variable	IQ	Information Quality
Observed Variable	FOR	Format
Observed Variable	ACC	Accuracy
Observed Variable	TIME	Timeliness
Latent Variable	SYQ	System Quality
Observed Variable	EASE	Ease of Process
Observed Variable	RESP	Responsiveness
Observed Variable	USA	Usability
Latent Variable	SEQ	Service Quality
Observed Variable	TECH	Technological service
Observed Variable	HUMAN	Human service
Latent Variable	PE	Performance Expectancy
Observed Variable	PU	Perceived Usefulness
Observed Variable	JF	Job-Fit

**Table 4.14** The Abbreviation of Variables Used for Statistical Analysis (Continue)

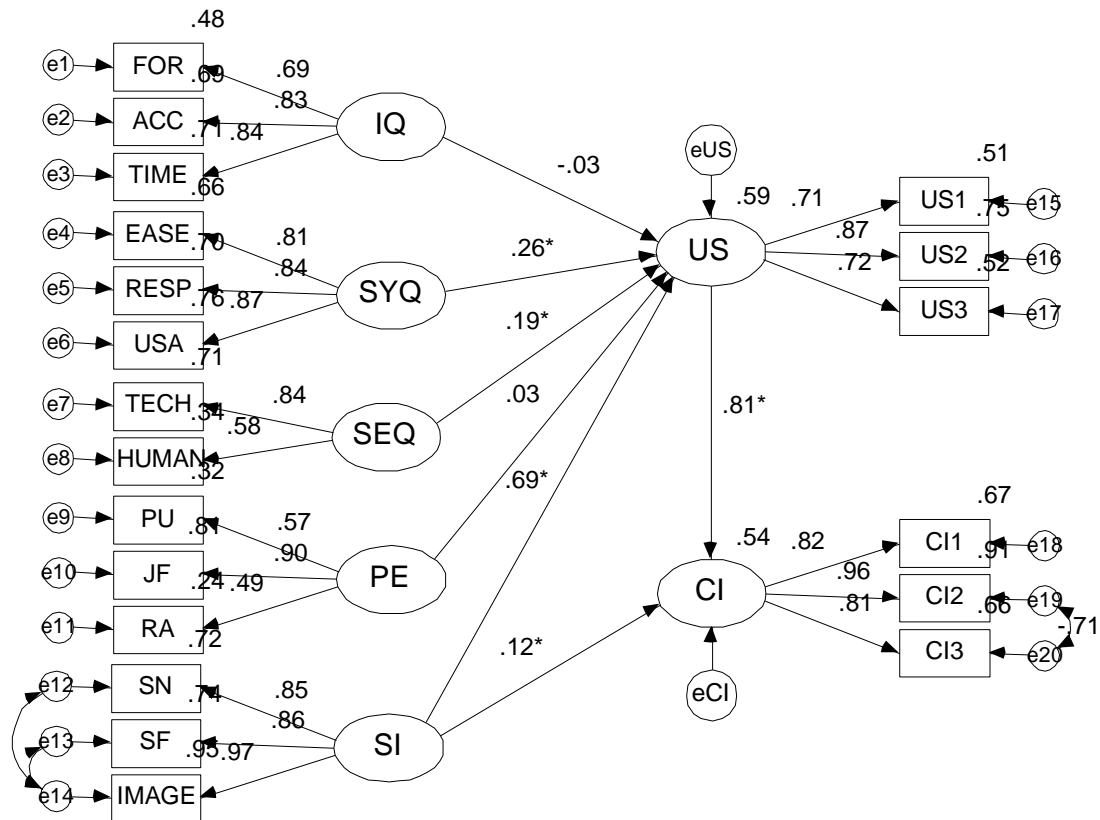
Kind of Variables	Abbreviation	Meaning
Observed Variable	RA	Relative Advantages
Latent Variable	SI	Social Influence
Observed Variable	SN	Subjective Norm
Observed Variable	SF	Social Factors
Observed Variable	IMAGE	Image
Latent Variable/Observed Variable	US	User Satisfaction
Latent Variable/Observed Variable	CI	Continuance Intention to Use
Error Variable	e	Error Variable (e1-e20, eUS,eCI)

The Hypothesized Model to be tested.

Based on the literature review, the following model was framed and developed.



**Figure 4.3** Structural Equation Model of Factors Affecting Continuance Intention to Use



$$\chi^2=436.790, df=160, GFI=0.951, RMR=0.039, RMSEA=0.045 (*P<0.05)$$

**Figure 4.4** Analysis Results Structural Equation Model of Factors Affecting Continuance

#### Intention to Use

From Figure 4.4, The results of SEM in terms of Overall Model Fit Measure (after adjusting the model) shown that Chi-square ( $\chi^2$ ) is equal to 436.790, which no have statistical significance the 0.05 ( $P>0.05$ ) following the specified criteria. The CMIN/DF is equal to 2.730, which is less than 3.00 mean it is within the accepted range. Moreover, the group of accepted Index range greater than 0.9 which are GFI = 0.951, AGFI = 0.942, NFI = 0.932, IFI = 0.949, and CFI = 0.947 found that all is passed the criteria. The group of accepted Index range lower than 0.05, which are RMR = 0.039, and RMSEA = 0.045 found that all is passed the criteria as well. The researcher adjusts to model fit by linking the two-tailed arrow between the error of parameters according to the guideline of Modification Indices (MI) three parameters which include 1) error of e14 and e12, 2) error of e19 and e20, and 3) error of e14 and e13 respectively. Each parameter was adjusted and reanalyzed until the CMIN/DF to be less than 3.00 (RangSungnoen, 2011). When comparing with the model before adjusting, the model does not fit

well with empirical data. The CMIN/DF is equal to 3.139, which is higher than 3.0 means not to pass the criteria. The group of accepted Index range greater than 0.9 which are GFI = 0.830, AGFI = 0.823, NFI = 0.805, IFI = 0.821, and CFI = 0.819 found that all is not passed the criteria. Moreover, the group of accepted Index range lower than 0.05, which are RMR = 0.148, and RMSEA = 0.190 found that all is not passed the criteria. After the final adjusting model, fit can be concluded that the Model of Continuance Intention to Use Self-Service Technology of Mass Rapid Transit System in Thailand is fit well with empirical data. All the above-mentioned details were indicated in Table 4.15.

**Table 4.15** The Overall Structural Equation Model of Factors Affecting Continuance Intention to Use Fit Indices

Indices	Criteria	Statistic values	
		Before	After
1. CMIN/DF	<3	3.139	2.730
2. GFI	≥0.90	0.830	0.951
3. AGFI	≥0.90	0.823	0.942
4. NFI	≥0.90	0.805	0.932
5. IFI	≥0.90	0.821	0.949
6. CFI	≥0.90	0.819	0.947
7. RMR	<0.05	0.148	0.039
8. RMSEA	<0.05	0.190	0.045
<b>Conclusion</b>		<b>Model does not Fit</b>	<b>Model Fit</b>

Furthermore, after the researcher inspected the model validity by considering of the Component Fit Measure in term of Measurement Model, the results of SEM show the details of t-value at a 0.001 confidence level and Lambda scores ( $\lambda$ ), or factor loading as follows;

In term of information quality (IQ), we found that timeliness (TIME) holds the maximum factor loading scores of 0.885 with square multiple correlations of 0.783. This can explain most of the variance of information quality at 73%. Followed by accuracy (ACC), it is the indicator with the factor loading scores of 0.830 with square multiple correlations of 0.689 that was able to

explain the variance at 68%, and format (FOR) with the minimum factor loading scores of 0.694 with square multiple correlations of 0.481 that can represent the variance at 48% respectively.

In terms of system quality (SYQ), we found that usability (USA) holds the maximum factor loading scores of 0.873 with a square multiple correlations of 0.762. This can explain most of the variance of system quality at 76%. Followed by responsiveness (RESP), it is the indicator with the factor loading scores of 0.837 and square multiple correlations of 0.701 that was able to describe the variance at 70%, and ease of process (EASE) with the minimum factor loading scores of 0.814 and square multiple correlations of 0.662 that can represent the variance at 66% respectively.

In terms of service quality (SEQ), we found that technological service (TECH) is with the maximum loading scores of 0.841 and square multiple correlation of 0.708 that can explain the most of the variance in service quality at 71%. Whereas human service (HUMAN) is with the minimum factor loading scores of 0.584 and square multiple correlation of 0.341, which implied the variance at 34%.

In terms of performance expectancy (PE), we found that job-fit (JF) holds the maximum factor loading scores of 0.900 and square multiple correlation of 0.810. This can explain the most of the variance in performance expectancy at 81%. Followed by perceived usefulness (PU) with the factor loading scores of 0.566 and square multiple correlation of 0.321 that was able to explain the variance at 32%, and relative advantages (RA) is the indicator with the minimum factor loading scores of 0.486 and square multiple correlation of 0.236 that can represent the variance at 24% respectively.

In term of social influence (SI), we found that image (IMAGE) holds the maximum factor loading scores of 0.972 and square multiple correlation of 0.945. This can explain the most of the variance in social influence at 95%. Followed by Social Factors (SF), it is the indicator with the factor loading scores of 0.857 and square multiple correlation of 0.735 that was able to explain the variance at 74%, and Subjective norm (SN) with the factor loading scores of 0.851 and square multiple correlation of 0.725 that can represent the variance at 73% respectively.

In term of user satisfaction (US), we found that US2 holds the maximum factor loading scores of 0.868 with square multiple correlation of 0.753. This can explain the most of the

variance of user satisfaction at 75%. Followed by US3, it is the indicator with the factor loading scores of 0.721 and square multiple correlation of 0.520 that was able to explain the variance at 52%, and US1 with the minimum factor loading scores of 0.711 and square multiple correlation of 0.505 that can represent the variance at 51% respectively.

In term of continuance intention to use (US), we found that CI2 holds the maximum factor loading scores of 0.956 with square multiple correlation of 0.914. This can explain the most of the variance of continuance intention to use self-service technology at 91%. Followed by CI1, it is the indicator with the factor loading scores of 0.818 and square multiple correlation of 0.668 that was able to describe the variance at 67%, and CI3 with the minimum factor loading scores of 0.814 and square multiple correlation of 0.663 that can represent the variance at 81% respectively.

In this case, the score of construct reliability ( $\rho_c$ ) of each dimension were greater than 0.6 (Hair, 2018), indicating that the construct is reliable and the score of average variance exacted ( $\rho_v$ ) of each dimension also greater than 0.5 means that the average amount of variation that a latent construct can explain in the set of observed variables. All the mentioned details were indicated in the Table 4.16.

**Table 4.16** Factor Loading by Structural Equation Model of Factors Affecting Continuance Intention to Use

Variables		Factor Loading ( $\lambda$ )			t	R <sup>2</sup>
Latent Variables	Observed Variables	b	S.E.	Beta		
IQ	FOR	1.000		0.694		0.481
	ACC	1.094	0.080	0.830	13.622*	0.689
	TIME	1.374	0.101	0.844	13.611*	0.712
		$\rho_c=0.834, \rho_v=0.557$				
SYQ	EASE	1.000		0.814		0.662
	RESP	1.213	0.067	0.837	18.111*	0.701
	USA	1.023	0.055	0.837	18.621*	0.762
		$\rho_c=0.879, \rho_v=0.543$				

**Table 4.16** Factor Loading by Structural Equation Model of Factors Affecting Continuance Intention to Use (Continue)

Variables		Factor Loading ( $\lambda$ )			t	R <sup>2</sup>
Latent Variables	Observed Variables	b	S.E.	Beta		
SEQ	TECH	1.000		0.841		0.708
	HUMAN	0.750	0.211	0.584	3.554*	0.341
$\rho_c=0.681, \rho_v=0.576$						
PE	PU	1.000		0.566		0.321
	JF	1.928	0.289	0.900	6.682*	0.810
	RA	1.199	0.139	0.486	8.628*	0.236
$\rho_c=0.700, \rho_v=0.588$						
SI	SN	1.000		0.851		0.725
	SF	1.089	0.071	0.857	15.382*	0.735
	IMAGE	1.359	0.107	0.972		0.945
$\rho_c=0.923, \rho_v=0.527$						
US	US1	1.000		0.711		0.505
	US2	1.285	0.080	0.868	16.160*	0.753
	US3	0.939	0.069	0.721	13.597*	0.520
$\rho_c=0.812, \rho_v=0.564$						
CI	CI1	1.000		0.818		0.668
	CI2	1.356	0.073	0.956	18.515*	0.914
	CI3	1.017	0.067	0.814	15.207*	0.663
$\rho_c=0.899, \rho_v=0.534$						

Remark: Parameter = 1 in position FOR, EASE, TECH, PU, SN, US1, and CI1. Therefore, there is no have S.E. and t value (\*P<0.05)

#### 4.4.3 Testing of The Causal Relationship

To analyze causal relationship, it is necessary to determine the standardized total effect; direct effect and indirect effect (See Table 4.17)

**Table 4.17** Direct Effect, Indirect Effect, Total Effect by Structural Equation Model of Factors Affecting Continuance Intention to Use

Dependent Variables	Effect	Independent Variables					
		IQ	SYQ	SEQ	PE	SI	US
US	DE	-0.029	0.265*	0.190*	0.026	0.694*	
	IE	-	-	-	-	-	
	TE	-0.029	0.265*	0.190*	0.026	0.694*	
	R <sup>2</sup>	0.589					
CI	DE	-	-	-	-	0.116*	0.810*
	IE	-0.023	0.215*	0.154*	0.021	0.562*	-
	TE	-0.023	0.215*	0.154*	0.021	0.678*	0.810*
	R <sup>2</sup>	0.539					

\*P<0.05

Consequently, the Structural Equation Model: SEM could be proposed.

$$US = -0.029 IQ + 0.265* SYQ + 0.190* SEQ + 0.026 PE + 0.694* SI; R^2=0.589$$

$$CI = 0.116* SI + 0.810* US; R^2=0.539$$

Referring to the testing of Direct and Indirect effects as show in the Table 4.17, the total effects could be ranked from the highest effect as follows:

1) User satisfaction has direct effects on Continuance Intention to Use at 0.05 statistical significance (DE = 0.810\*)

2) Social influence has direct effects on User Satisfaction at 0.05 statistical significance (DE = 0.694\*)

3) System quality has direct effects on User Satisfaction at 0.05 statistical significance (DE = 0.265\*)

4) Social influence has both direct and Indirect effects on Continuance Intention to Use at 0.05 statistical significance (DE = 0.116\* and IE = 0.562\*)

5) Service quality has direct effects on User Satisfaction at 0.05 statistical significance (DE = 0.190\*)

6) Performance expectancy has direct effects on User Satisfaction at 0.05 statistical significance (DE = 0.026\*)

7) Information quality has direct effects on User Satisfaction (DE = -0.029)

#### 4.4.4 Hypothesis Testing

AMOS Model Analysis Technique tests all the hypotheses in this study. This hypothetical testing was done by comparing t-statistic with t-table value of 1.95 (significance at 0.05). The results of hypothesis testing are presented in Table 4.18 below:

**Table 4.18** Result of Hypothesis Testing

Hypothesis Testing	Result	
	Effect	Accept/Reject
H1: Information Quality (IQ) → User Satisfaction (US)	DE = -0.029	Reject
H2: System Quality (SYQ) → User Satisfaction (US)	DE = 0.265*	Accept
H3: Service Quality (SEQ) → User Satisfaction (US)	DE = 0.190*	Accept
H4: Performance Expectancy (PE) → User Satisfaction (US)	DE = 0.026	Reject
H5: Social Influence (SI) → User Satisfaction (US)	DE = 0.694*	Accept
H6: Social Influence (SI) → Continuance Intention to Use (CI)	DE = 0.116*	Accept
H7: User Satisfaction (US) → Continuance Intention to Use (CI)	DE = 0.810*	Accept

\*P<0.05

Based on table 4.18 above, interpretation from hypothesis testing result toward seven variables in this study is explained as follows:

**H1:** Information Quality has a positive influence on User Satisfaction

The result of hypotheses testing shown that Information Quality has an insignificant direct effect on user satisfaction on adopting self-service technology available at Mass Rapid

Transit in Thailand, which provides the causal relationship value as -0.029. This explains that even though the quality of Information in terms of output and display from a self-automated machine is higher or lower, there is no impact on user satisfaction. According to this result, the hypothesis that proposes Information quality has a positive influence on user satisfaction is therefore rejected.

**H2: System Quality has a positive influence on User Satisfaction**

The result of hypothesis testing shown that the system quality has a significant direct effect on user satisfaction on adopting self-service technology available at Mass Rapid Transit in Thailand at 0.05 statistical significance level, which provides the causal relationship value as 0.265. This explains that a higher quality of system would bring higher user satisfaction. According to this result, system quality has a positive influence on user satisfaction is therefore accepted.

**H3: Service Quality has a positive influence on User Satisfaction**

The result of hypothesis testing shown that the service quality has a significant direct effect on user satisfaction on adopting self-service technology available at Mass Rapid Transit in Thailand at 0.05 statistical significance level, which provides the causal relationship value as 0.190. This explains that a higher quality of service would bring higher user satisfaction. According to this result, service quality has a positive influence on user satisfaction is therefore accepted.

**H4: Performance Expectancy has a positive influence on User Satisfaction**

The result of hypotheses testing shown that performance expectancy has an insignificant direct effect on user satisfaction on adopting self-service technology available at Mass Rapid Transit in Thailand, which provides the causal relationship value as 0.026. This clarifies that whether the users perceive higher or lower performance of SST based on their expectation, there is no impact on user satisfaction. According to this result, the hypothesis that proposes performance expectancy has a positive influence on user satisfaction is therefore rejected.

**H5: Social Influence has a positive influence on User Satisfaction**

The result of hypothesis testing shown that the social influence has a significant direct effect on user satisfaction on adopting self-service technology available at Mass Rapid Transit in

Thailand at 0.05 statistical significance level, which provides the causal relationship value as 0.694. This clarifies that higher impact from social influence would bring higher user satisfaction. Based on this result, social influence has a positive influence on user satisfaction is therefore accepted.

**H6:** User satisfaction has positive influence on Continuance Intention to Use

The result of hypothesis testing shown that user satisfaction has a significant direct effect on continuance intention to use of self-service technology available at Mass Rapid Transit in Thailand at 0.05 statistical significance level, which provides the causal relationship value as 0.116. This clarifies that higher user satisfaction would bring a higher impact on the user's continuance intention to use the SST. In other words, if the users satisfy with all various aspects of quality provided by the self-service technology system and accept the motivation of circumstance, they are willing to continue use of this kind of technology repeatedly. Based on this result, user satisfaction has a positive influence on continuance intention to use is therefore accepted.

**H7:** Social Influence has a direct positive influence on Continuance Intention to Use

The result of hypothesis testing shown that the social influence has a significant direct effect on continuance intention to use of self-service technology available at Mass Rapid Transit in Thailand at 0.05 statistical significance level, which provides the causal relationship value as 0.810. This clarifies that the higher impact from Social influence would bring higher user's continuance intention to use the SST. Based on this result, social influence has a direct positive influence on continuance intention to use is therefore accepted.

## CHAPTER 5

# DISCUSSION AND CONCLUSION

The objective of the research on “Continuance Intention to Use Self-Service Technology of Mass Rapid Transit System in Thailand are mainly to: 1) to examine the effect of Information quality, System quality, and Service quality, Performance expectancy, and Social influence on Users’ satisfaction which in turn influence on Continuance intention to use self-service technology of Mass Rapid Transit in Thailand and 2) to study the direct effects of Social influence on continuance intention to use self-service technology of Mass Rapid Transit in Thailand. This research contained 7 latent variables and 20 observed variables in total. The research was begun by collecting the data equal to 400 samples by using the questionnaire to ensure and strengthen the more reliability of the research study. Moreover, the descriptive statistics via the SPSS program (Statistical Package for Social Science) were implemented to analyze and explain the socio-demographic data. To test the proposed model and hypotheses, the Confirmatory Factor Analysis (CFA) and the Structural Equation Model (SEM) via AMOS program (Analysis of Moment Structures) was implemented to perform on model testing. Therefore, this study can guide service providers and consider developing a full self-service system to serve the customer with seamless digital service performance in numerous aspects within state of the art. This chapter shall summarize the main findings emerging from the research, discussion, and propose theoretical and practical implications and recommendations of the study.

### 5.1 Conclusion

From this study, in terms of characteristics of target respondents, it was found that the majority of respondents were female (57.8%), from the age group of 21-30 years old (53.3%). Most of them were Bachelor's degrees (65.8%) and earned income from 20,001-30,000 baht per month (41.3%). The greatest number of respondents were doing occupation as a private company employee (63.3%). Lastly, most of the respondents spent traveling time by MRT at 4-6 days per

week (46.5%). According to the model of continuance intention to use self-service technology of Mass Rapid Transit system in Thailand, the analysis finding from SEM with respect to overall model fit measure (after adjusting model) via AMOS represents that the Chi-square ( $\chi^2$ ) differs from zero which no have statistical significant at 0.05 in accordance with specified criteria ( $\chi^2 = 436.790$ ;  $df = 160$ ;  $GFI = .951$ ;  $RMR = .039$ ;  $RMSEA = .045$ ;  $\text{Chi-square}/DF = .273$ ). From this result, it was shown that the proposed model is consistent with empirical data. In other words, construct validity is consistent with statistical value. By considering from model fit indices, Goodness of Fit (GFI) is equal to .951 and Adjust Goodness of Fit (AGFI) is equal to .942 which both GFI and AGFI are greater than .90 implies that this model is consistent with empirical data especially when the value is closer to 1. Moreover, the Root Mean Square Error of Approximation (RMSEA) is equal to .045, which less than .050, which implies that this model is quite consistent with empirical data. When considering Relative Chi-square, it was found that the Chi-square per degree of freedom (CMIN/DF) is equal to 2.73, which less than 3. All indexes are passed the criteria. In the overall model of continuance intention to use self-service technology of Mass Rapid Transit system in Thailand, have factor loading of each observed variable range from .956 to .972 with statistical significance at 0.05 and found that the residual error is range from .236 to .945.

## **5.2 Discussion**

The conceptual framework of this research was proposed based on the theories, articles, and reports. It is composed and presented in Chapter 2 Literature review. There are seven hypotheses which were proposed in the research framework. The causal relationship between the study variables was demonstrated in table 4.16. The hypothetical testing was done, and the results are presented in Chapter 4. In this section, a more detailed discussion from the hypothesis obtained in this study can be described as follows.

### **5.2.1 Influence of Information Quality on User Satisfaction**

The result of the study showed that the Information quality of self-service machines available at Mass Rapid Transit in Thailand has an insignificant direct effect on user satisfaction on adopting such technology ( $DE = -0.029$ ). Our finding indicates that if the information is not

easily interpretable, difficult to understand, or inconsistent, users may avoid using the information and look for other ways to receive this information. That is, when representational quality is perceived as an obstacle to their task completion and workarounds are manifested, organizations or service providers should redesign the format of the information to make it easier to comprehend, more concise, and more consistent (Alter, 2006). Representational information quality focuses on the characteristics of information itself (Strong, 2002). These characteristics are related to the way the information is presented (Alter, 2006; Strong, 2002), independent of how information is used for a particular task. Information might be useful for a particular task, but if it is not presented in an interpretable way, it is useless for a user. Consequently, when users perceive the representational information characteristics as negative or threatening, their satisfaction with an Information system providing this kind of information is low (Petter S. , 2008; Rai, 2002). The importance of information quality, we argue that if users perceive the format or presentation of information as a threat, this will lower the benefits of the information for organizations and organizations should redesign the format of the information (DeLone & McLean, 2003). However, when users perceive the usability of information and support to their task or processing activity, their satisfaction with the Information system would occur and they will recognize their information's benefit. This finding is following the study of Garcia and Effken (2013). The study's results reveal that the attributes of information quality, which are completeness, accuracy, and format has a positive impact on user satisfaction with using the medical information system. In line with this paper that identifies and analyzes different dimensions of information quality to better guide organizations or service providers in improving and increasing the quality level of information provided to enhance user satisfaction and to avoid the manifestation of workarounds (Petter, 2012). In line with the study of Alzahrani and teams (2017), their results indicate that Information quality is one of the strong predictors for user satisfaction. It clearly explains that if the digital library was updated with new resource information, students as main users would be more contented. They would like eagerness to visit the digital library for updated information on the the digital library system for their study purposes, such as updated reading material and new connectivity with scholarly publisher databases (Alzahrani, 2017). In prior research studies, information quality was measure in terms

of accuracy, timeliness, consistency, ease of understanding, accuracy, relevance, personality (Gable, 2008; Petter, 2012). Researchers focus primarily on information quality as a single construct when researching user satisfaction and have not included further dimensions of information quality (e.g. Gable, 2008). However, some approaches have indicated that there are additional dimensions that can use to evaluate the quality of information. For example, Lee et al. (2002) have suggested a methodology for information quality assessment that contains four dimensions, which are intrinsic, contextual, representational, and accessibility. The quality of the information in terms of content is the information displayed on self-service technology during use, complete, sufficient, clear, and accurate according to the needs of users (Doll, 1988). Since the self-service machine is working on the interactive-based system, several things could create user satisfaction by using self- innovative technology of Mass Rapid Transit namely, ease of access to function needs, ease of use via the information displayed, speed of information output, well-organized format, clarity of instruction, the correctness of information output, and fun of use. In line with Heijden's research (2004) which has been the focus on considering the patients' interest in use during gaining information that influences on their contentment, the study result reveals that the ease of use and the fun of use is relative to the use of it (Heijden, 2004). In addition, the study result can be supported by Malek and Bassam (2017), who studying factors that affect the acceptance of mobile banking by integrating quality features into TAM framework. The finding of this study reveals that completeness, understandability, security, and availability influence the perceived usefulness and perceived ease of use. When the user perceives that the information of the mobile application is useful and easy to use, the relationship with benefits and fun to use will have occurred (Alksasbeh, 2017). Based on the result in this study, the information quality in term of display and output of self-service technology at Mass Rapid Transit has a direct effect. Still, in negative and insignificant effect, therefore, it implies that the information quality factors and information quality itself are not associated with each other and are not related to user satisfaction, in other words, for the respondent who used self-service technology at Mass Rapid Transit, information quality variable owned by self-service technology is not an important variable for creating user satisfaction.

### **5.2.2 Influence of System Quality on User Satisfaction**

The result of hypothesis testing shown that the system quality has significant direct effects on user satisfaction on adopting self-service technology at Mass Rapid Transit system in Thailand at 0.05 statistical significance. System quality can be conceptualized as the competency of IS to carry out a transaction, which includes software and data components. The assessment of system quality primarily concentrates on estimating the performance characteristics of the system under study (Alksasbeh, 2017). Supportively, as stated by Seddon (1997), the user will use information systems only when they perceive that the system is useful. In some cases, the lack of users does not mean that the system is inefficient or poor quality. Inactivity can occur as a result of users who not being involved in information systems or technology; therefore, usage variables cannot be measured as clearly as measuring the benefits obtained from the use of information systems. This study's finding is similar and in line with the study of Seddon and Keaw (1994), where system quality has a positive and significant effect toward satisfaction of interface-based system users (Seddon, 1994). The result of this study is also by Daheeb and his team's research (2016) that system quality in terms of usability, efficiency, and reliability was positively related to user satisfaction (Dreheeb, 2016). In addition, it is in line with the research of Kumala (2015) who his study focuses on the impact of system quality on user satisfaction, which has been a recognition of the bank employees' preference in quality of using the system from BRINETS web-based systems. His research stated that system quality partially influences on user satisfaction by various dimensions, namely, trustfulness, responsiveness, usability, usefulness, ease of access, etc. The higher the system quality used, user satisfaction will increase, whereas if system quality low, then user satisfaction will decrease. In this study focus on the system quality of technology-based self-service, from the finding result can imply that when users adopt self-service technology for various purpose, the main concerned goes to system quality rather than other quality because they interact with it by themselves and expect support from the system use. They care about the easy of the process they can confront while using the system. The rapid response of the system after commanding their order via provided functions and adaptable of the system to meet various user needs changing. If the system quality meets the user's expectation and their needs at the required time, the users surely preference that quality and happy to use it. However, if a program or database from a self-service system is overload, it might lead to

customer's dissatisfaction and make them stop using it with finding other choices to support their needs, such as human service support (Kulama, 2015). Based on the result in this study, the system quality of self-service technology has a direct, positive, and significant effect. Thus, higher system quality of self-service technology of Mass Rapid Transit would cause higher customer satisfaction to use it on a regular basis. Since it is a significant effect, the system quality variable seems to be one of the important predictors that need to determine by the service provider to enhance the system to meet the customer's contentment in adopting the self-service technology.

### **5.2.3 Influence of Service Quality on User Satisfaction**

The result of the study showed that Information quality of self-service machines available at Mass Rapid Transit in Thailand has a significant direct effect on user satisfaction on adopting such technology at 0.05 statistical significance level, which provides the causal relationship value of 0.190. Service quality refers to the conscious understanding of customer needs in accordance with service delivery. People agree that service quality depends on the level of actual service performance in meeting user's needs and expectations (Grönroos, 1993). This result is in accord with the theory stated by Zeithaml et al. (1990) that customer satisfaction is customer perception from the service experience provided. In line with Lyu and Lim's research about the relationship between service quality and revisit intention concerning self-service retail technology, the result reveals that service quality has a positive impact to customer satisfaction and also confirms the relationship between the service quality and intentions to revisit the self-service retails (Lyu, 2019). This result is supported by the statement of many researchers that there is a positive correlation between service quality and customer satisfaction (Taylor, 1992; Veloso, 2017; Zaibaf, 2013; Zhang, 2005; Zhang, 2012; Zeithaml, 1996; Zeithaml, 2003). Similar to the result gained in this study, the service quality in terms of human service implies that even though self-service technology is an interactive automated machine, sometimes it also needs human support. Therefore, human service characteristics need to consider to serve customers to meet their satisfaction in various aspects. For example, the willingness to help customers and provide prompt service, ability to perform service with professional manner, and caring when providing service to customer fairly. The study of Naik (2010) conducted a study on measures of

service quality and its effect on customer satisfaction in retailing. The study found that the customer has high expectations of the promptness of service quality, the accuracy of transactions, and speed of response (Naik, 2010).

Contradictorily, many researchers argued that only SERVQUAL might not be able to measure the different perspectives of self-service technology's service quality. To evaluate the service quality in terms of technological services directly, Parasuman et al. (2005) also further developed context-specific service quality called E-S QUAL measurement scale to assess both pre- and post-e-service quality points of view (Parasuraman, 2005). Moreover, Lin and Heish (2011) developed key factors in seven dimensions called SSTQUAL to study influencing SST service quality. These dimensions were adopted by Iqbal and his friends (2018) to study the factors impact on SST acceptance in the region of Pakistan, and the study results reveal that all 7 dimensions which are functionality, enjoyment, security, assurance, design, convenience, and customization have a positive influence on user satisfaction (Iqbal, 2018). In line with the study of Spiros, Sergios, and Vlasis (2010), who found that there is positive and significant in the relationship between SSTs service quality and customer satisfaction (Gounaris, 2010). Likewise, the study of Bitner (1992) who concentrate on the impact of physical surrounding through a framework of satisfaction which can explain that service quality can be measured through the contentment of client (Bitner, 1992). Based on this finding and the above explanation, it brought the means that higher quality of service of self-service technology offered at Mass rapid Transit would create higher user satisfaction to use of self-service technology. In line with the result of many researchers who stated that the high quality of SSTs service quality leads to a higher level of customer satisfaction (Ganguli, 2011; Johnson, 2008; Yen, 2005). Since it is a significant effect, the service quality variable is one of the important variables that need to consider by the service provider to meet the customer's satisfaction in adopting self-service technology.

#### **5.2.4 Influence of Performance Expectancy on User Satisfaction**

In this study, we found that performance expectancy has a positive insignificant direct effect on user satisfaction on adopting such technology at 0.05 statistical significance level, which provides a causal relationship value of 0.026. This was because performance expectancy referred to the benefits and utilities that can be expected from using self-service technology, in this context

means this technology will support on saving time while promoting convenience when the user used Mass Rapid Transit. The result was consistent with Xiaomeng (2015), who studied the effect of performance expectancy on the decision to use the mobile payment of Chinese customers in Bangkok. The research results revealed that performance expectancy did not affect the decision to the used mobile amount of Chinese customers in Bangkok (Xiaomeng, 2018). The study of Yu and Chen (2012) is also in accord with this study results that there are no significant dissimilarities in the influence of performance expectancy on user adoption and satisfaction in terms of age and gender (Yu, 2012). Likewise, the study of Mu-Cheng Wu (2016) exposed that performance expectations do not have a significant impact on usage intent for popular mobile applications such as ISportsGo. The influence of performance expectations on user intervention may alter due to insufficient memory function of the interface. This leads to unavailable services, for example, identifying user personal information, automatic heart detection, and improving interpersonal interactions.

Nevertheless, it did not go along with the previous study by Brown et al. (2016). They found that performance expectancy was the extent to which using a mobile payment that would provide benefit to users and led to performance gains. Due to this result's study, performance expectancy has a direct effect but insignificant influence. Thus, it implies that performance expectancy determinants are virtually not associated. In other words, for a respondent who used self-service technology at Mass Rapid Transit, performance expectancy variables owned by self-service technology is not an essential variable for making user satisfaction.

### **5.2.5 Influence of Social Influence on User Satisfaction and Continuance**

#### **Intention to Use**

The result of hypothesis testing reveals that the social influence has a significant direct effect on user satisfaction on adopting self-service technology installed at Mass Rapid Transit in Thailand at 0.05 statistical significance level. Moreover, the result of hypothesis testing shown that the social influence has a significant direct effect on continuance intention to use self-service technology available at Mass Rapid Transit in Thailand at 0.05 statistical significance level. The desire of those who want to be valuable when compared to others is accepted by people who live together in each society. The interaction is created among people in society. Social factors can be

conceptualized as the individual's internalization of reference groups' subjective culture, and specific interpersonal arrangement that the individual has agreed with others, in a particular social situation (Thompson, 1991). This determinant arises from environment, culture, society, religion, others, which affect the individual to think and act in a certain way. Furthermore, Social images are related to respect, honor, social status, fame, recognition, and networking in society (Bao, 2003). When considering social factors and images in the context of the use of technology, it also means that technology users are accepted and appreciated by people around you, friends, relatives, and others in the social network that is a member exists as a result of using technology. People try to imitate each other to adopt an innovative technology if they perceive that doing this will not make them different from others and can be seen as a part of such society (Lin, 2010). In line with Bouwman et al. (2007), they stated the recognition of the benefits of technology. The consumers gain society that plays an important role in stimulating an awareness, in particular the new generation of consumers who want to be accepted by society such as, friends and people around. Therefore, both social factors and images play a role in technology acceptance and online transactions, where credibility is the priority element, then with service users providing is very important for choosing an online service that can build comfort, convenience, trust, and safe in use (Bouwman, 2007). This is consistent with Taylor and Todd (1995) because the users as a new generation have experience in using technology more than other groups of users. Therefore, the motivation that makes people want to use technology to facilitate various fields because they think that technology can benefit them (Taylor, 1995). Recognition of social image is a catalyst for people to accept the technology while the technology provides functions that are considered easy to use (Bouwman, 2007). In other words, people will use the service technology when they perceive that the service provider can provide them with the convenience of use without difficulty. Thus they can gain benefit from such technologies. Self-service technology at Mass rapid Transit or any service technology that allows users to access service or get products by self-employed without any interaction or employee assistance, one of the technologies deployed in the value of service delivery process instead of direct interaction with people. This changes the way from the only single relationship from user and seller, whereas creating value interpersonal relationships among users and people around. Moreover, people are starting to imitate the use of

technology by notification of actors or celebrities at the place. The repeated advertisement at the place is also one of the social factors that induce people to try to use the technology automatically. The findings of this study are also in agreement with Nasco et al. (2008) and Kelman (2006) about the impact of social influence on adoption in terms of attitude. The result revealed that social influence has strong direct effect on people's attitudes toward adopting a high technology product. This means that people are more willing to use a new product even if they are not personally favorable toward it, as long as it is desirable to an important reference group (Nasco, 2008). Ajzen (1991) stated an important person or group of people wants them to perform a particular behavior in a certain manner, and their motivation conforms to people's views. Subjective norms significantly influence attitude and behavior toward intentions. The intention is conceptualized as a feeling of enthusiasm to act in a specific manner and show how much time and how difficult an individual is voluntary to spend and try to perform a behavior (Ajzen, 1991). Since it is a significant both direct and indirect effect, the social influence variable is regarded as a considerable predictor that needs to recognize by the service provider to reach the customer's satisfaction and then influence them in reusing of self-service technology in the future.

#### **5.2.6 Influence of User Satisfaction toward Continuance Intention to Use**

In this study, we found that user satisfaction has a positive and significant direct effect on continuance intention to use self-service technology at Mass Rapid Transit, which high causal relationship at 0.810 at 0.05 statistical significance level. With this number, it is shown that there is an immensely strong relationship between these two factors. In line with the research by Hong Thong Chasalow and Dhillon (2011), who studied acceptance in the modern information systems of the user, the adoption of the participants was depended on satisfaction factors in user and perception in benefits, also the demand to use higher information systems. It found that various factors caused user acceptance. The two individuals are associated with technology verification and require users to continue their needs to be used (Hong, 2011). Similarly, Lu and Su (2009) studied factors that impact the interest in the use of online sales websites by phone concerning the fun of use factors, benefits, and value consistency. Experience and demand are factors that are associated with the interest in using internet sales websites on mobile phones (Lu, 2009). This result is a rhyme with Hong Thong Chasalow and Dhillon (2011) about the recognition in the

modern information system of users. In line with the study result of Hidayat-ur-Rehman and his friends related to the analysis of consumers' continuance intention towards online shopping. The result reveals that satisfaction and confirmation of user's expectations play an important role in continue using of online shopping (Rehman, 2016). In terms of user satisfaction itself, DeLone and McLean (2003) explained that user satisfaction is a measure of how satisfied users are with information systems and is an essential factor in measuring the success of information systems. Moreover, in the customer's perspective, DeLone and McLean (2003) proposed that user satisfaction can be used as a critical variable to measure customer opinion on post-adoption and validate customer experience cycle in any service activity, namely, making payments, accessing service, and gaining product. When concentrating on this study results, the significant effects of satisfaction was validated and strongly supported by many previous types of research, for example, the research of Bhattacharjee (2001a) explained that when the overall satisfaction of users with smartphone banking increases, they will tend to reuse the system and the research of Balasubramanian (2003) intensifies that higher satisfaction may conduct the user to repeat their utilization in the future, in other words, may lead to user loyalty. In the context of self-service technology adoption, users can evaluate their satisfaction once they experience an actual service. If overall facilities support users in relevance with their expectations, it indeed leads to their satisfaction. More than that, it can influence on a repeat of using, also willing to use new self-service technology in the future instead of other means (Balasubramanian, 2003). Based on the above results, it could be said that higher user's overall preference would bring higher willingness on the intention to continue the use of self-service technology provided at Mass Rapid Transit in Thailand. Since it performs in a strong relationship and significant direct effect, thus user satisfaction has become an important variable to determine in improving user intention to proceed of use. However, by Oliviera (2017) focuses on electronic-based services. It would need more laborious efforts to create customer intention to use and continue the use of this up-to-date service method compared with traditional service methods (Oliveira, 2017).

### **5.3 Implication**

This study concentrates on the influence of the Information system quality, user's expectation,

and external factors on user satisfaction and continuance intention to use self-service technology. The analysis results, thus, reveal that most determinants have a strongly positive influence in accord with the proposed hypothesis. This study proved the user's positive perception of the use and willingness to continue use of such technology. This can imply the quality of the provided self-innovated system. By this study's results, it made significant contributions by extending current theoretical and empirical knowledge on self-service technology in the transportation service area and further suggestion to other industries and providing managerial implications. Both implications are discussed in the following details;

### **5.3.1 Theoretical Implications**

Altogether, the model and results of this study contribute importantly to the theoretical understanding of the determinants that influence users' continuance intentions towards self-service technology adoption (Meuter, 2005). Firstly, although the theories used in this study were not new, they were combined in ways that have not been done previously. The integration of IS success model and some factors from ECM and UTAUT were formed to be the main conceptual framework of this research. This proposed model is the focal construct investigated multi-dimensions of factors relevant to user's perception, decision, and willingness to continue the use of this technology such as information system quality in term of information, system, and service, the expectation of SST's performance, and the external social factors that affect continuing use of such system. Since this study was designed to concentrate on self-service technology of Mass rapid Transit area, the perspective of a user who has experience of using the SST and their decision on a continuance to use such a system in this area was individually examined. This research not only significantly provides the knowledge implication about the various aspects of quality of the system itself but also the social-related variables that drive the user's continued use of self-service technology of Mass Rapid Transit. Apart from the human interaction of service, the use of technology-based service allows the user to face the different service climate, which influences their self-service technology continuance intention. Secondly, this study examined the direct effect of the social-related variable on both user satisfaction and continuance intention to use self-service technology. Although the relationship of this variable has been investigated among few researchers in term of the influence of people's attitude and decision on adopting of

new technology and product (Nasco, 2008; Kelman, 2006), there was a lack of research exactly on MRT's user who adopted self-service technology. However, through the results of the structural equation model, this study insists that social influence has a significant direct effect on both user satisfaction and continuance intention to use self-service technology among MRT's users. Thirdly, this study results reveal that partial predictors such as system quality, service quality, and social influence impact on user satisfaction and continuance intention to use of self-service technology lend to the statement proposed by DeLone & McLean (2003) about the success of information system usage. They explained that user satisfaction is a measure of how satisfied users are with information systems and is an important factor in measuring the success of information system. Once the user perceives the contentment of using it, it can lead to net benefits. This empirical research intensifies that not only the system itself but also external factors are determinants of continuance intention to use the self-service technology of Mass Rapid Transit.

### **5.3.2 Practical Implication**

Due to the transformation of technology, many service providers intense on using the technological service innovations in their operations and business models to achieve the maximum benefits at marginal cost and customer service point of view. Globally, customers relationship in the adoption of self-service technology in the service process is showing a consistently increasing trend. By this study, it provides several practical implications for both government and private sector in the context of self-service technology implementation. First, the service providers should deeply determine how users respond to the attributes of installed self-service technology such as information, system, and service quality toward the willingness to continue the use of such technology. This can help service providers to evaluate the effectiveness of the system continuously and predict the response of users to consider the further investment of this technology in the future. Second, the service providers could use this study results to support an organization to improve and increase the service level to reach the highest of user's needs. This suggestion was supported as proposed by Berry et al. (1990) that management should consider improving problem-resolution as a way to challenge user perceptions, especially those that the company does not recognize (Berry, 1990). Particularly, when an organization establishes

or revise the goal and strategic plan to create mechanisms that could attract more user to adopt self-service technology and maintain their loyalty to use it. Third, the service providers should understand the user's perception and the tendency of their demands on SST adoption since implementing of self-service technology is not only popular in transport service but also overall of service industry due to saving labor cost as the organization does not need to hire many employees for their operation service. The more the organization reduces operation costs, the more organization gain higher profits. Although numerous service organization is still wondering that implementing self-service technology might have negative effects on user service perceptions, the result of this study revealed a positive influence of technological service of self-service technology on user satisfaction. For example, convenient operation hours and personalized features are interactive services that enhance user satisfaction and service fealty, respectively. Forth, to make the user on continuance use of self-service technology and induce more people to use this system, the service providers with the support of design and machine specialists should understand user's different characteristics and knowledge of the user in technology-based self-service circumstances to evaluate better and develop the more efficient function to suit with all user type. Users who are very acquainted with and knowledgeable on how to complete their service via self-service technology may use it well and fluent without any support from the servicer. On the other hand, users who have limited knowledge of self-service technology may need help from servicers to use such technology. Concerning the level of user knowledge and skill in adopting self-service technology, the service provider could implement proper strategies. Moreover, an additional special interactive service, namely, speaking user guide or shortcut instruction, should be considered to support specific groups which are younger children, elderly people, and disable users. The most important is service provider should make the self-service technology easier to use for everyone, for example, machine designer and programmer should design and develop user-friendly interface technology by using of QR code scanning or RFID technology which is accessible with single step throughout self-service technology can be another solution for promoting perceived ease of process. It is not only influence user adoption experience and satisfaction but also determines their continuance intention. Fifth, apart from the self-service technology's quality attributes and user's performance

expectation, social-related factors should be highlighted by the service provider. The service organization should observe the behavior of the user in term of social imitation to establish the strategies to increase the use of self-service technology, for example, user tries to use self-service technology first time because they saw their beloved actor/actress use it and students may use this technology because of their friends motivate them to use. These results already proved that social influence, namely, subjective norm, social factors, and the image has a causal relationship with user satisfaction and continuance intention towards self-service technology adoption. Finally, the service providers should promote and stimulate all factors, which will lead to the acceptance of self-service technology and continuance use of such technology as well as creating a trust to maintain service and user loyalty. The user could share their opinions about the quality of the provided self-service technology. Then the service providers pay more attention to such improvement continuously.

#### **5.4 Limitation and Recommendation of This Research**

The study has the following limitations and recommendations. Firstly, this study measured the user's satisfaction and continuance intention to use self-service technology based on a single industry context by evaluating some positive aspects. However, the user's perception has different levels in the different context of the industry because the technology-based self-service have different functions to serve the user in a different industry context. Therefore, it would be better if the SST usage's opinion level will be collected from the participants who have experience in using of SST in other industries. Secondly, since this research applied the only quantitative method to obtain the opinion level of SST's user; however, to understand deeply about the user's perception, the qualitative should be implemented in the future. The researcher has the opportunity to interview and gain a deeper understanding as well as further reinforcing the current results. Thirdly, since the present study only adopts some factors from IS theories such as IS success model, ECM, and UTAUT, future research can be done by studying other approaches by applying other theories or other factors from the same theories involving user acceptance of technology, customer adoption behavior, and customer preferences in this area of service

encounter to enrich our understanding of the issues facing the service industry in Thailand. Moreover, Further research could also explore how SST usage influences consumer loyalty and, ultimately, revenue and profitability. Despite the increase in SSTs that firms are offering, scholars are just beginning to learn about how the absence of human interaction affects the bond between consumers and firms (Selnes, 2001). It is important to understand the long-term implications of shifting customers away from interpersonal interactions, which are traditionally viewed as important elements for establishing trust and loyalty in service contexts. Finally, additional research could extend the study of coproduction beyond SSTs to other contexts. This rich area of inquiry would benefit from studies in multiple contexts to determine what relevant antecedents increase consumer readiness and the differential influence of role clarity, motivation, and ability on trial in other high-customer-participation settings.

## REFERENCES

- Abu-Shanab, E. (2010). Internet banking and customers' acceptance in Jordan: The unified model's perspective. *Communications of the Association for Information Systems, 26*, 493-525.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179-211.
- Al-Gahtani, S. J. (2007). Information technology (IT) in Saudi Arabia: Culture and the acceptance and use of IT. *Information & Management, 44*(8), 681-691.
- Alksasbeh, M. (2017). Integrating quality features into technology acceptance model for examining the acceptance of mobile banking. *Journal of Theoretical and Applied Information Technology, 95*.
- Alter, S. (2006). *The work system method: connecting people, processes, and IT for business results*. MI: XanEdu originalworks.
- Alzahrani, A. (2017). Modelling digital library success using the DeLone and McLean information system success model. *Journal of Librarianship and Information Science, 51*.
- Anderson, J. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin, 103*(3), 414-423.
- Arbuckle, J. (1995). *AMOS user's guide*. Chicago: Small Waters Corporation.
- Bagozzi, R. (2007). The legacy of the technology acceptance model and a proposal for a paradigm shift. *Journal of the Association for Information Systems, 8*(4).
- Bailey, J., & Pearson, S. (1983, May). Development of a tool for measuring and analyzing computer user satisfaction. *Management Science, 29*(5), 530-545.
- Balasubramanian, S. (2003, July). Customer satisfaction in virtual environments: a study of online investing. *Management Science, 49*(7), 871-889.
- Bao, Y. (2003). Face consciousness and risk aversion: How do they affect consumer decision-making?. *Psychology and Marketing, 20*, 733-755.

- Bateson, J. (1983). *Self-service consumer: An exploratory study*. London: London Business School.
- Bentley, T. (1999). *Managing information: Avoiding overload*. London: CIMA Publishing.
- Berry, L. P. (1990). Five imperatives for improving service quality. *MIT Sloan Manage*, 31, 9-38.
- Bharracherjee, A. (2001b). Understanding information systems continuance: An expectation-confirmation model. *MIS quarterly*, 351-370.
- Binde, J. (2013). Mobile technologies and services development impact on mobile internet usage in Latvia. *Procedia Computer Science*, 41-50.
- Bitner, B. (2000). Self-service technologies: Understanding customer satisfaction with technology-based service encounters. *Journal of Marketing*, 50-64.
- Bitner, M. (1992). Servicescapes: The impact of physical surroundings on customers and employees. *Journal of Marketing*, 57-71.
- Bollen, K. (1989). *Structure equations with latent variables*. NY: John Wiley & Sons.
- Bouwman, H. C. (2007). Barriers and drivers in adopting actual and future mobile services in Finland. *Telematics and Informatics*, 24(2), 145-160.
- Brooke, J. (1996). *SUS-A quick and dirty usability scale*. London: Taylor & Francis.
- Brown, M. C. (1993). *Alliterative ways of assessing model fits in testing structural equation model*. NJ: Sage Publication.
- Brown, T. (2006). *Confirmatory factor analysis for applied research*. NY: Guilford Press.
- Carmines, E. (1981). *Analyzing models with unobserved variables: Analysis of covarinace structures*. Beverly Hills: Sage Publications.
- Chairunnisa, A. (2018). Designing service blueprint of self-service technology (SST) based public transportation service in Indonesia using SSTQual, Kano model, and QFD. *MATEC Web of Conference*, 237, 1-6.
- Chiu, C. (2012). Re-examining the influence of trust on online repeat purchase intention: The moderating role of habit and its antecedents. *Decision Support Systems*, 53(4), 835-845.
- Chiu, Y. S. (2010). Early versus potential adopters: Exploring the antecedents of use intention in the context of retail service innovations. *International Journal of Retail and Distribution Management*, 38, 443-459.

- Cialdini, R. B. (2007). *Influence: The psychology of persuasion*. NY: Harper Collins.
- Cialdini, R. B. (2006). *Influence: The psychology of persuasion*. NY: Harper Business.
- Compeau, D. A. (1995, June). Computer self-efficacy: Development of measure and initial test. *MIS Quarterly*, 19(2), 189-211.
- Coombs, C. C. (2001). The importance of user ownership and positive user attitudes in the successful adoption of community information systems. *Journal of End User Computing*, 13, 5-6.
- Cronbach, L. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16, 297-334.
- Cronin, J. (1992). Measuring service quality: A reexamination and extension. *Journal of Marketing*, 56(3), 55-68.
- Curran, J. (2005). Self-service technology adoption: comparing three technologies. *Journal of Service Marketing*, 19(2), 103-113.
- David, F. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340.
- Davis, F. (2006). Extrinsic and intrinsic motivation to use computers in the workplace<sup>1</sup>. *Journal of Applied Social Psychology*, 22, 1111-1132.
- DeLone, W. (1992). Information systems success: The quest for the dependent variable. *Information Systems Research*, 3, 60-95.
- DeLone, W. (2002). Information system success revisited. *Proceedings of Hawaii International Conference on System Sciences (HICSS'02)*, 8, 238.
- DeLone, W. (2003). The DeLone and McLean model of Information system success: A ten-year update. *Journal of Management Information Systems*, 19, 9-30.
- DeLone, W. (2004). Measuring e-commerce success: Applying the DeLone & McLean information systems success model. *International Journal of Electronic Commerce*, 9, 31-47.
- Dobholkar, P. (2002). An attitudinal model of technology-based self-service: moderating effects of consumer traits and situational factors. *Journal of the Academy of Marketing Science*, 30(3), 184-201.

- Doll, W. (1988, June). The measurement of end-user computing satisfaction. *MIS Quarterly*, 12(2), 259-274.
- Doll, W., & Xia, W. (2004). The meaning and measurement of user satisfaction: A multigroup invariance analysis of the end-user computing satisfaction instrument. *Journal of Management Information Systems*, 21, 227-262.
- Dreheeb, A. (2016). Impact of system quality on users' satisfaction in continuation of the use of E-learning system. *International Journal of E-Education, E-Business, E-Management, and E-Learning*, 6, 13-20.
- Eagle, J. (1993). *Consumer behavior* (8th.). Fort Worth: Dryden Press.
- Eoghan, K. C. (2016). Self-service technology adoption: An analysis of customer to technology interactions. *Procedia Computer Science*, 100, 103-109.
- FitzGerald, J., & FitzGerald, A. F. (1987). *Fundamental of system analysis: Using structured analysis and design techniques*. NP: Wiley.
- Friedkin, N. (1999). Social influence networks and opinions change. *Advances in Group Processes*, 16(1), 1-29.
- Gable, G. (2003). Enterprise systems success: A measurement model. *Proceedings of International Conference on Information Systems (ICIS 2003)*, 576-591, Washington, USA.
- Gable, G. C. (2008). Re-conceptualizing information system success: the IS-impact measurement model. *Journal of the Association for Information Systems*, 9, 377-408.
- Ganguli, S. (2011). Generic technology-based service quality dimensions in banking: Impact on customer satisfaction and loyalty. *International Journal of Bank Marketing*, 29, 168-189.
- Garcia, S. D. (2013). Development and initial evaluation of the clinical information systems success model (CISSIM). *International Journal of Medical Informatics*, 82(6), 539-552.
- Gordon, J., & Gordon, S. (1999). *Information systems: A management approach* (2th). Orlando: Harcourt Brace.
- Gounaris, S. (2010). An examination of the effects of service quality and satisfaction on customers' behavioral intentions in e-shopping. *Journal of Services Marketing*, 24, 142-156.

- Grönroos. (1993). A service quality model and its marketing implications. *European Journal of Marketing*, 18(4), 36-44.
- Hair, J. F., Black, B., Babin, B., Anderson, E. R., & Tatham, L.R. (2006). *Multivariate Data Analysis* (6th.). New Jersey: Pearson Prentice Hall.
- Hair, J. F., Black, B., Babin, B., & Anderson, E. R. (2018). *Multivariate data analysis*. New Delhi: Cengage India.
- Hamilton, S., & Chervany, N. (1981). Evaluating information system effectiveness - Part I: Comparing evaluation approaches. *MIS Quarterly: Management Information Systems*, 5, 55-69.
- Harmed, T. (2016). Sampling methods in research methodology; How to choose a sampling technique for research. *International Journal of Academic Research in Management*, 5, 18-27.
- Heijden, H. (2004). User acceptance of hedonic information systems (HIS). *MIS Quarterly*, 28(4), 695-704.
- Hidaya-ur-Rehman, I. (2016). An empirical analysis of consumers's continuance intention towards online shopping. *Mediterranean Journal of Social Science*, 7, 95-104.
- Hong, W. (2011). User acceptance of agile information systems: A model and empirical test. *Management Information Systems*, 28, 235-272.
- Hooland, J. (1998). Robustness studies in covariance structure modeling: An overview and meta-analysis. *Sociological Methods & Research*, 26, 329-367.
- Hox, J. J. (1999). An introduction to structural equation modeling. *Family Science Review*, 11, 354-373.
- Hu, L. B., & Bentler, M. P. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modelling: A Multidisciplinary Journal*, 6(1), 1-55.
- Iqbal, M. (2018). Impact of self-service technology (SST) service quality on customer loyalty and behavioral intention: The mediating role of customer satisfaction. *Cogent Business & Management*, 5(1).

- Jakranukul, C. (2015). *Perspectives of self-service technology (SSTs) from emerging economy*.(Master's thesis). Thammasat University, Faculty of Commerce and Accountancy.
- Johnson, D. (2008). Understanding how technology paradoxes affect customer satisfaction with self-service technology: The role of performance ambiguity and trust in technology. *Psychology and Marketing*, 25(5), 416-443.
- Joreskog, K. (1993). *Lisrel 8: Structural Equation Modeling with the Simplis Command Language*. Chicago: Scientific Software International.
- Kahlilov, M., & Mucahit, G. (2012). XTM: An alternative delivery channel in Turkish banking sector. *Procedia-Social and Behavioral Sciences*, 57, 373-380
- Kelman, H. (2006). Interests,relationship,identities:three central issues for individuals and groups in negotiating their social environment. *Annual Review of Psychology*, 57, 1-26.
- Kheeranan, N.,& Kiattikomol, P. (2002). *Management Information System*. Bangkok: Chulalongkorn University.
- Kim, M. (2006). Online service attributes available on apparel retail websites: an E-S-QUAL approach. *Managing Service Quality*, 16(1), 51-77.
- Kiosks. (2016, August 4). Re: The rise of self-service kiosk [Web blog message]. Retrieved from <http://worldlinkintegration.com/the-rise-of-self-service-kiosks/>
- Kiranandana, S. (1998). *Statistical information technology*. Bangkok: Chulalongkorn University.
- Koontz, H., & Weihrich, H. (1978). *Essentials of management*. Singapore: McGraw-Hill.
- Kulama, R. A. (2015). The impact of Information quality and system quality on user satisfaction in web-based information system. *Journal Administration Business (JAB)*, 2(2), 1-12.
- Leahy, K. (2001). *Multicollinearity: When the solution is the problem in Data mining cookbook: Modelling data for marketing, risk and customer relationship management*. NY: Wiley
- Lee, J. (2002). Effects of personal control on adoption of self-service technology innovations. *Journal of Services Marketing*, 16(6), 553-572.
- Lewis, B. (1990). Defining and measuring the quality of customer service. *Marketing Intelligence& Planning*, 8(6), 11-17.

- Li, Y. (2020). Service quality, perceived value, and citizens' continuance-use intention regarding e-government: Empirical evidence from China. *Journal of information & Management*, 57(3), 103-197.
- Lin, C., & Pei-Ling, H. (2007). The influence of technology readiness on satisfaction and behavioral intentions toward self-service technologies. *Computers in Human Behavior*, 23(3), 1597-1615.
- Lin, C., & Pei-Ling, H. (2010). Extending technology usage models to interactive hedonic technologies: A theoretical model and empirical test. *Information Systems Journal*, 20(2), 163-181.
- Lin, J. (2007). The influence of technology readiness on satisfaction and behavioral intentions toward self-service technologies. *Computer in Human Behavior*, 1597-1615.
- Lin, J. (2011). Assessing the self-service technology encounter: development and validation of SSTQUAL scale. *Journal of Retailing*, 87(2), 194-206.
- Lin, J., & Hsieh, P. (2006). The role of technology readiness in customers' perception and adoption of self-service technologies. *International Journal of Service Industry Management*, 17(5), 497-517.
- Lu, H. P. (2009). Factors affecting purchase intention on mobile shopping websites. *Internet Research*, 19(4), 442-458.
- Lyu, F., Lim, H., & Choi, J. (2019). The relationship between service quality and revisit intention based on self-service retail technology, *23rd Pacific Asia Conference on Information Systems (PACIS 2019)*. 1-14.
- McLeod, R., & Schell, G. (2006). *Management information systems*. NJ: Prentice Hall.
- Meuter, M. (2003). The influence of technology anxiety on consumer use and experiences with self-service technologies. *Journal of Business Research*, 899-907.
- Meuter, M. (2005). Choosing among alternative service delivery modes: an investigation of customer trial of self-service technologies. *Journal of Marketing*, 69(2), 61-83.
- Mohson, T. A. (2011). Making sense of cronbach's alpha. *International Journal of Medical Education*, 2, 53-55.

- Moore, G., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, 2(3), 192-222.
- Naik, C. (2010). Service quality (servqual) and its effect on customer satisfaction in retailing. *European Journal of Social Sciences*, 16, 231-243.
- Nantapaiboon, J. (2012). *The art of service*. Bangkok: V.Print.
- Nasco, S. (2008). The CAT model: Extensions and moderators of dominance in technology acceptance. *Psychology and Marketing*, 25, 987-1005.
- Niina, M. (2008). An empirical investigation of mobile ticketing service adoption in public transportation. *Pers Ubiquit Comput*, 57-65.
- Ninkitsaranon, P. (2017, December 10). *Modern trade*. Retrieved from [https://www.krungsri.com/bank/getmedia/f1e844b6-74af-44df-9ba4-23dc9d0f7427/IO\\_Modern\\_Trade\\_2017\\_TH.aspx](https://www.krungsri.com/bank/getmedia/f1e844b6-74af-44df-9ba4-23dc9d0f7427/IO_Modern_Trade_2017_TH.aspx). [in Thai]
- Ninkitsaranont, P. (2019, December 10). *Thailand industry outlook*. Retrieved from [https://www.krungsri.com/bank/getmedia/9fa1e9ce-7b5f-4191-af82-d4d6041d1914/IO\\_Modern\\_Trade\\_190829\\_EN\\_EX.aspx](https://www.krungsri.com/bank/getmedia/9fa1e9ce-7b5f-4191-af82-d4d6041d1914/IO_Modern_Trade_190829_EN_EX.aspx)
- Nonglak, W. (2012). *LISREL: Analytical statistics for research in social science and behavioral science*. Bangkok: Chulalongkorn Publishing.
- Nunnally, J. (1967). *Psychometric theory*. NY: Mcgraw-Hill.
- Oliveira, T. (2017). Modelling and testing consumer trust dimensions in e-commerce. *Computer in Human Behavior*, 71, 153-164.
- Oliver, R. (1980). A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of Marketing Research*, 17(4), 460-469.
- Oliver, R. (1993). Cognitive, affective, and attitude bases of the satisfaction response. *Journal of consumer research*, 20(3), 418-430.
- Ong, C., Day, M., & Hsu, W. (2009). The measurement of user satisfaction with question answering systems. *Information & Management*, 46(7), 397-403.
- Parasuraman, A. (1985). A conceptual model of service quality and its implication. *The Journal of Marketing*, 49, 41-50.

- Parasuraman, A. (2005). E-S-QUAL: a multiple-item scale for assessing electronic service quality. *Journal of Service Research*, 7(3), 213-233.
- Parasuraman, A., & Berry, L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64(4), 12-40.
- Parthasarathy, M., & Bhattacharjee, A. (1998). Understanding post-adoption behavior in the context of online services. *Information system research*, 9, 362-379.
- Peres, S. (2013). Validation of the system usability scale (SUS). *Proceedings of Human Factor and Ergonomics Society*, 57, 192-196.
- Petter, S. (2008). Measuring information system success: models, dimensions, measures, and interrelationships. *European Journal of Information Systems*, 17, 236-263.
- Petter, S. (2012). The past, present, and future of "IS success". *Journal of the Association of Information Systems*, 13(5), 341-362
- Phalawang, T. (2018). Study of factors affecting continuance usage intention of m-banking: perspectives of corporate image & applications quality. *Journal of Information System Business (JISB)*, 4(4), 64.
- Plouffe, C. (2001). Research report: Richness versus parsimony in modeling technology adoption decisions—understanding merchant adoption of a smart card-based payment system. *Information Systems Research*, 12(2), 208-222.
- Rahi, S. (2019). Integration of expectation confirmation theory and self-determination theory in internet banking continuance intention. *Journal of Science and Technology Policy Management*.
- Rai, A., Lang, S., & Welker, R. (2002). Assessing the validity of IS success models: an empirical test and theoretical analysis. *Information Systems Research*, 13(1), 50-69.
- Rust, R. (1993). Customer satisfaction, customer retention, and market share. *Journal of Retailing*, 69(2), 193-215.
- Saris, W. (1984). *Causal modeling non experimental research: An introduction to the LISREL approach*. Barcelona: Sociometric Research Foundation.
- Sauro, J. (2001). *A practical guide to the system usability scale*. SC: CreateSpace Independent Publishing Platform.

- Schermelleh-Engel, K. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online*, 8(2), 23-74.
- Seddon, P. (1997). A respecification and extension of the DeLone and McLean model of IS success. *Information System Research*, 8(3), 240-253.
- Seddon, P., & Kiew, N. Y. (1994). A partial test and development of DeLone and McLean's model of IS success. *Australasian Journal of Information Systems*, 4(1),
- Selnes, F. (2001). The potential hazard of self-service in developing customer loyalty. *Journal of Service Research*, 4(2), 79-90.
- Shih, T. (2010). Comparative analysis of marketing strategies for manufacturers and retailers brands. *International Journal of Electronics Business Management*, 8, 56-67.
- Siriwichitakun, N. (2009). *A study of user factors and satisfaction of information system users using open source software in higher education institutions by using models of DeLone and McLean*. Bangkok: Thammasat University.
- Somwong, P. (2007). *Service marketing tips: The secret of service marketing*. Bangkok: UBCL Book.
- Stair, R. (2006). *Principles of Information System* (7th.). Cambridge: Course Technology.
- Stair, R., Chesney, T., & George, R. (2008). *Principles of business information systems* (3rd.). MA: Course Technology Cengage Learning.
- Stair, R., Chesney, T., & George, R. (2003). *Principles of information systems* (6th.). MA: Course Technology Cengage Learning.
- Strong, D. (2002). AIMQ: a methodology for Information quality assessment. *Information & Management*, 40(2), 133-146.
- Susanto, H.T. (2016). Determinants of continuance intention to use the smartphone banking services: An extension to the expectation-confirmation model. *Industrial Management & Data systems*, 116(3), 508-525.
- Taylor, S. A. (1995). Understanding information technology usage: A test of competing model. *Information Systems Research*, 6(2), 144-176.
- Thompson, R., & Howell, J. (1991). Personal Computing: Toward a conceptual model of utilization. *MIS Quarterly*, 15(1), 124-143.

- Torksadeh, G. (1999). The development of a tool for measuring the perceived impact of information technology on work. *Omega*, 27(3), 327-339.
- Townsend, C. (2010). Built environment and pedestrian behavior at rail rapid transit stations in Bangkok. *Transportation*, 37, 317-330.
- Turner, R.C., & Balkin, R.S. (2002). Computing indices of item congruence for test development validity assessments. 1-5.
- Ullman, J. (2001). *Structural equation modeling*. MA: Allyn & Bacon.
- Vagias, W. (2014, July 31). Re: Likert-type scale response anchors [Web blog message]. Retrieved from <https://sawtoothsoftware.com/resources/knowledge-base/design-and-methodology-issues/likert-scale-response-anchors>
- Venkatesh, V. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425-478.
- Venkatesh, V. (2012, March). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 36(1), 157-178.
- Wang, C. (2013). The roles of habit, self-efficacy, and satisfaction in driving continued use of self-service technologies: a longitudinal study. *J.Serv.*, 400-414.
- Wang, E. Y. (2011). System quality, user satisfaction and perceive net benefits of mobile broadband services. In *8th Asia-Pacific Regional ITS Conference*. Taipei: International Telecommunications Society.
- Wang, Y. (2009). Why do people use information kiosk? A validation of the unified theory of acceptance and use of technology. *Government Information Quarterly*, 26(1), 158-165.
- Weijters, B. (2013). Reverse item bias: An integrative model. *Psychological Methods*, 320-334.
- Wilcox, A. (2012). Research data collection methods: from paper to tablet computers. *Medical carer*, 50, 68-73.
- Wirunphan, D. (1999). People's satisfaction with the services of the Ministry of Interior in Muang District, Mae Hong Son province (Unpublished Master Thesis). Chiang Mai University, Chiang Mai.
- Wuttisak, N. (1993). *Information and research* (2nd.). Bangkok: DD Book Store.

- Xiaomeng, D. (2018). *Performance expectancy, effort expectancy, social influence, facilitating conditions, and relative advantage affecting chinese customers' decision to use mobile payment in bangkok*. (Independent study). Bangkok University. Retrieved from <http://dspace.bu.ac.th/bitstream/123456789/3779/1/Dong2.pdf>.
- Yang, Z. (2004). Online service quality dimensions and their relationships with satisfaction: A content analysis of customer reviews of securities brokerage services. *International Journal of Service Industry Management*, 15(3), 302-326.
- Yen, H. (2005). An attribute-based model of quality satisfaction for Internet self-service technology. *The Service Industries Journal*, 5, 641-659.
- Yen, Y. (2009, January). User acceptance of internet banking service in Malaysia. *Web Information Systems and Technologies*, 1(1), 1-19.
- Yu, C. (2012, January). Factors affecting individuals to adopt mobile banking empirical evidence from the UTAUT model. *Journal of Electronic Commerce Research*, 13(2), 104-121.
- Zeithamal, P. (1990). *Delivering quality service-balancing customer perceptions and expectations*. NY: The Free Press.
- Zeithaml, V. (1993). The nature and determinants of customer expectations of service. *Journal of the Academy of Marketing Science*, 21(1), 1-12.
- Zikmund, W. (2003). *Business Research Methods* (7th). OH: Thomson South Western.
- Zwass, V. (1998). *Foundation of Information Systems*. NY: McGraw-Hill College.

## **APPENDIX**

**APPENDIX A**  
**THESIS APPROVAL LETTER**



ประกาศคณะกรรมการบริหารและจัดการ  
สถาบันเทคโนโลยีพระจอมเกล้าเจ้าคุณทหารลาดกระบัง  
ที่ 011 / 2563  
เรื่อง ผลการพิจารณาหัวข้อและเค้าโครงวิทยานิพนธ์

คณะกรรมการบริหารและจัดการ สถาบันเทคโนโลยีพระจอมเกล้าเจ้าคุณทหารลาดกระบัง โดยความเห็นชอบของคณะกรรมการพิจารณาหัวข้อและเค้าโครงวิทยานิพนธ์ ขอประกาศรายชื่อหัวข้อและเค้าโครงวิทยานิพนธ์หลักสูตรบริหารธุรกิจมหาบัณฑิต สาขาวิชาบริหารธุรกิจอุตสาหกรรม (นานาชาติ) ซึ่งได้รับอนุมัติเมื่อวันที่ 4 กุมภาพันธ์ พ.ศ. 2563 ให้ดำเนินการดังนี้

นางสาวณัฐกานต์ จันเมธากุลวัฒน์ รหัสประจำตัว 61611079 ให้ทำวิทยานิพนธ์ เรื่อง “Continuance Intention to Use Self-Service Technology of Mass Rapid Transit System in Thailand”

โดยมี ผู้ช่วยศาสตราจารย์ ดร.สิงหะ ฉวีสุข เป็นอาจารย์ที่ปรึกษาวิทยานิพนธ์ และ

ผู้ช่วยศาสตราจารย์ ดร.วอนชนก ไชยสุนทร เป็นอาจารย์ที่ปรึกษาวิทยานิพนธ์ร่วม

ทั้งนี้ ให้นักศึกษาค้นคว้าและเขียนวิทยานิพนธ์ โดยปรึกษากับอาจารย์ที่ปรึกษาวิทยานิพนธ์ ให้เสร็จสิ้นภายในเวลาที่กำหนด ในระเบียบสถาบันเทคโนโลยีพระจอมเกล้าเจ้าคุณทหารลาดกระบัง

ประกาศ ณ วันที่ 9 มีนาคม 2563

(ผู้ช่วยศาสตราจารย์ ดร.สุตาพร สาวม่วง)

คณบดีคณะกรรมการบริหารและจัดการ

## APPENDIX B

### RESEARCH INSTRUMENT

#### Questionnaire

**Subject:** Continuance Intention to Use Self-Service Technology of Mass Rapid Transit System in Thailand

(ความตั้งใจในการใช้เทคโนโลยีประเภทเครื่องให้บริการตัวเองของรถไฟฟ้าขนส่งมวลชนในประเทศไทยอย่างต่อเนื่อง)

**Researcher:** Miss Natthakarn Chanmatakulvat

**Course:** Degree of Master Business Administration in Industrial Business Administration

(International program)

(ปริญญาโท บริหารธุรกิจอุตสาหกรรม (หลักสูตรนานาชาติ))

King Mongkut's Institute of Technology Ladkrabang Business School

(คณะบริหารธุรกิจแห่งสถาบันเทคโนโลยีพระจอมเกล้าเจ้าคุณทหารลาดกระบัง)

#### 1. Questionnaire Objectives

(วัตถุประสงค์)

- To study the influence of Information quality, System quality, Service quality, Performance expectancy, and Social Influence on user satisfaction and continuance intention to use of self-self-service technology adoption.

(เพื่อศึกษาอิทธิพลของคุณภาพของข้อมูล คุณภาพของระบบ คุณภาพของการบริการ ความคาดหวังด้านประสิทธิภาพ และ อิทธิพลทางสังคมต่อความพึงพอใจของผู้ใช้งานและความตั้งใจในการใช้เทคโนโลยีประเภทเครื่องให้บริการตัวเองอย่างต่อเนื่อง)

#### 2. Questionnaire structure

\*Note: This questionnaire is developed based on the conceptual framework. The answers to this questionnaire are strictly confidential. Collected data from this

questionnaires is analyzed by statistics technique and conclusion draw from data analysis is from average of consented respondent only.

(หมายเหตุ แบบสอบถามนี้พัฒนาจากกรอบแนวคิดการวิจัย คำตอบที่ได้ถือเป็นความลับและจะมีการรวบรวมวิเคราะห์ข้อมูลโดยใช้วิธีเทคนิคทางสถิติจากผู้ตอบแบบสอบถามที่ได้รับการยินยอมเท่านั้น)

### Part 1: General Information of respondents

Instruction: Please mark ✓ in the box  in front of the item that best describes your reality.

#### 1. Gender

Male (ชาย)

Female (หญิง)

#### 2. Age

Less than 20 years (ต่ำกว่า 20 ปี)

21-30 years (21-30 ปี)

31-40 years (31-40 ปี)

41-50 years (41-50 ปี)

51 years or above (51 ปี หรือ มากกว่า)

#### 3. Education level

Secondary school or lower (ต่ำกว่าหรือเทียบเท่ามัธยมต้น)

Below Bachelor Degree (ต่ำกว่าปริญญาตรี)

Bachelor Degree (ปริญญาตรี)

Master Degree (ปริญญาโท)

Doctoral Degree (ปริญญาเอก)

#### 4. Income per month

Less than or equal to 10,000 baht (น้อยกว่า หรือเท่ากับ 10,000 บาท)

10,001-20,000 baht (10,001-20,000 บาท)

20,001-30,000 (20,001-30,000 บาท)

30,001-40,000 baht (30,001-40,000 บาท)

40,001-50,000 baht (40,001-50,000 บาท)

Above than 50,000 baht (มากกว่า 50,000 บาทขึ้นไป)

## 6. Occupation

- Private Company Employee (พนักงานบริษัทเอกชน)
- Government employee/ State enterprise officer (ข้าราชการ/ พนักงานของรัฐ)
- Entrepreneur/ Business owner (ผู้ประกอบการ/ เจ้าของกิจการ)
- Private business/ Freelance worker (ธุรกิจส่วนตัว/ พนักงานอิสระ)
- Student (นักเรียน/ นักศึกษา)
- Other (please specify).....(อื่นๆ (โปรดระบุ.....))

## 7. How often do you travel by Mass Rapid Transit in Thailand

- Daily (7 days/week) ทุกวัน (7 วัน/สัปดาห์)
- 4-6 days/week (4-6 วัน/สัปดาห์)
- 1-3 days/week (1-3 วัน/สัปดาห์)
- Less than 3 days/week (น้อยกว่า 3 วัน/สัปดาห์)
- Other (please specify)..... (อื่นๆ (โปรดระบุ.....))

## Part 2: Opinions about The Performance Expectancy on Adopting of Self-Service Technology of Mass Rapid Transit in Thailand (ส่วนที่ 2 ความคิดเห็นเกี่ยวกับความคาดหวังในประสิทธิภาพที่ได้จากเทคโนโลยีประเภทเครื่องให้บริการตัวเองที่รถไฟฟ้าขนส่งมวลชน)

Instruction: Please choose the level of opinions and mark ✓ in the column that best suits your feelings and please fill out all questions to complete the questionnaire (คำชี้แจง: โปรดเลือกระดับความคิดเห็นและทำเครื่องหมาย ✓ ที่ตรงกับความรู้สึกของตัวท่านมากที่สุดและโปรดกรอกให้ครบทุกคำถาม)

5 = Strongly agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly disagree

(5 = เห็นด้วยมากที่สุด, 4 = เห็นด้วย, 3 = เฉยๆ, 2 = ไม่เห็นด้วย, 1 = ไม่เห็นด้วยอย่างยิ่ง)

Performance Expectancy on adopting of self-service technology of Mass Rapid Transit in Thailand	Opinion Level				
	5	4	3	2	1
<b>Perceived Usefulness (ความคาดหวังในประโยชน์)</b>					
<p>1. I perceived that using the self-service technology would enable me to accomplish tasks more quickly (such as, buying the ticket, top-up contactless card, purchasing items, and leaving the baggage).</p> <p>(ฉันคาดหวังว่าเครื่องจะทำให้ฉันใช้บริการรถไฟฟ้าขนส่งมวลชนได้เร็วขึ้น เช่น ซื้อตั๋วโดยสาร, เติมเงินในบัตร, ซื้อของ, ฝากสัมภาระ)</p>					
<p>2. I perceived that using the self-service technology would make me easier to do task (such as, buying the ticket, top-up contactless card, purchasing items, and leaving the baggage).</p> <p>(ฉันคาดหวังว่าเครื่องจะทำให้ฉันใช้บริการรถไฟฟ้าขนส่งมวลชนได้ง่ายขึ้น เช่น ซื้อตั๋วโดยสาร, เติมเงินในบัตร, ซื้อของ, ฝากสัมภาระ)</p>					
<b>Job-Fit (ความเหมาะสมกับการใช้งาน)</b>					
<p>1. I believed that using the self-service technology can save times during rush hours.</p> <p>(ฉันเชื่อว่าการใช้เครื่องให้บริการตัวเองจะช่วยให้คุณประหยัดเวลาได้ในช่วงเวลาเร่งรีบ)</p>					
<p>2.I believed that using the self-service technology will increase the quality during my travel such as, using of automated self-storage service</p> <p>(ฉันเชื่อว่าการใช้เครื่องให้บริการตัวเองจะช่วยเพิ่มคุณภาพในการเดินทางของฉันได้ เช่น การใช้บริการตู้รับฝากสัมภาระอัตโนมัติ)</p>					

Performance Expectancy on adopting of self-service technology of Mass Rapid Transit in Thailand	Opinion Level				
	5	4	3	2	1
<b>Relative Advantages (ข้อได้เปรียบเชิงเปรียบเทียบ)</b>					
1. Self-service technology is very well when comparing with buying the ticket from service provider. (การซื้อตั๋วจากผู้เป็นสิ่งที่ดีมากเมื่อเทียบกับซื้อตั๋วจากพนักงานโดยตรง)					
2. Checking service data via self-service technology is more convenient when comparing with asking from service provider (such as, number of travel times and remaining money in card). (การตรวจสอบข้อมูลการใช้บริการจากผู้สะดวกกว่าเมื่อเทียบกับการสอบถามจากพนักงาน เช่น จำนวนรอบที่ใช้งานและเงินคงเหลือในบัตร)					

**Part 3: Opinions about The Information Quality of Self-Service Technology of Mass Rapid Transit in Thailand (ส่วนที่ 3 ความคิดเห็นเกี่ยวกับคุณภาพของข้อมูลที่ได้จากเทคโนโลยีประเภทเครื่องให้บริการตัวเองที่รถไฟฟ้าขนส่งมวลชน)**

Instruction: Please choose the level of opinions and mark ✓ in the column that best suits your feelings and please fill out all questions to complete the questionnaire (คำชี้แจง: โปรดเลือกระดับความคิดเห็นและทำเครื่องหมาย ✓ ที่ตรงกับความรู้สึกของท่านมากที่สุดและโปรดกรอกให้ครบทุกคำถาม)

5 = Strongly agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly disagree

(5 = เห็นด้วยมากที่สุด, 4 = เห็นด้วย, 3 = เฉยๆ, 2 = ไม่เห็นด้วย, 1 = ไม่เห็นด้วยอย่างยิ่ง)

Information Quality of Self-Service Technology of Mass Rapid Transit in Thailand (Focus on Output and Display)	Opinion Level				
	5	4	3	2	1
<b>Format (Display) (การแสดงผล)</b>					
1.The display of self-service technology is presented in well-organized format. (การแสดงผลของเครื่องให้บริการตัวเองมีรูปแบบที่สวยงาม)					
2.The output of self-service technology is easy to read with proper front size and clear color. (การแสดงผลของเครื่องให้บริการตัวเองอ่านง่าย มีขนาด สี และตัวอักษรเหมาะสม)					
3.The output of self-service technology is easy to understand. (การแสดงผลของเครื่องให้บริการตัวเองทำความเข้าใจได้ง่าย)					
<b>Accuracy (Output)</b>					
1. Self-service technology shows the result correctly every time. (ผลลัพธ์ที่ได้จากเครื่องให้บริการตัวเองมีความถูกต้องทุกครั้ง)					
2. Self-service technology provides reliable information (such as, the ticket fee and remaining money in card). (ผลลัพธ์ที่ได้จากเครื่องให้บริการตัวเองที่รถไฟฟ้านขนส่งมวลชนเชื่อถือได้ เช่นจำนวนเงินที่ต้องจ่ายเพื่อซื้อตั๋วโดยสาร และจำนวนเงินคงเหลือในบัตร)					
<b>Timeliness (Output)</b>					
1. Self-service technology provides me information in timely manner. (เครื่องให้บริการตัวเองแสดงผลได้อย่างรวดเร็ว)					

Information Quality of Self-Service Technology of Mass Rapid Transit in Thailand (Focus on Output and Display)	Opinion Level				
	5	4	3	2	1
2. Self-service technology provides me with up-to-date information (such as, real time update of remaining money in card after topping-up) (เครื่องให้บริการตัวเองแสดงข้อมูลที่อัปเดตตลอดเวลา เช่น ข้อมูลจำนวนเงินอัปเดตทันทีที่เติมเงินสำเร็จ)					

**Part 4: Opinions about The System Quality of Self-Service Technology of Mass Rapid Transit in Thailand (ส่วนที่ 4 ความคิดเห็นเกี่ยวกับคุณภาพของระบบที่ได้จากเทคโนโลยีประเภทเครื่องให้บริการตัวเองที่รถไฟฟ้าขนส่งมวลชน)**

Instruction: Please choose the level of opinions and mark ✓ in the column that best suits your feelings and please fill out all questions to complete the questionnaire (คำชี้แจง: โปรดเลือกระดับความคิดเห็นและทำเครื่องหมาย ✓ ที่ตรงกับความรู้สึกของท่านมากที่สุดและโปรดกรอกให้ครบทุกคำถาม)

5 = Strongly agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly disagree

(5 = เห็นด้วยมากที่สุด, 4 = เห็นด้วย, 3 = เฉยๆ, 2 = ไม่เห็นด้วย, 1 = ไม่เห็นด้วยอย่างยิ่ง)

System Quality of Self-Service Technology of Mass Rapid Transit in Thailand (Focus on Process)	Opinion Level				
	5	4	3	2	1
<b>Ease of Process (ด้านความง่ายของกระบวนการใช้งาน)</b>					
1. Self-service technology is easy to use. (เครื่องให้บริการตัวเองใช้งานง่าย)					
2. It is easy for me to remember how to perform task using the self-service technology system. (ฉันสามารถจดจำวิธีการใช้เครื่องให้บริการตัวเองได้)					

System Quality of Self-Service Technology of Mass Rapid Transit in Thailand (Focus on Process)	Opinion Level				
	5	4	3	2	1
<b>Responsiveness (ด้านการตอบสนองของระบบ)</b>					
1. Self-service technology is always up-and-running as necessary. (เครื่องให้บริการตัวเองพร้อมแก่การใช้งานเสมอ)					
2. Self-service technology responds my request quickly enough. (เครื่องให้บริการตัวเองที่รถไฟฟ้าขนส่งมวลชนมีขั้นตอนที่ ยืดหยุ่น สามารถสลับเมนูไปมาได้)					
<b>Usability (ด้านการใช้งาน)</b>					
1. Self-service technology is unnecessarily complex. (เครื่องให้บริการตัวเองที่รถไฟฟ้าขนส่งมวลชนมีขั้นตอนที่ ไม่ซับซ้อน)					
2. Self-service technology is flexible to switch the operating menu. (เครื่องให้บริการตัวเองที่รถไฟฟ้าขนส่งมวลชนมีขั้นตอนที่ ยืดหยุ่น สามารถสลับเมนูไปมาได้)					

**Part 5: Opinions about The Service Quality of Self-Service Technology of Mass Rapid Transit in Thailand (ส่วนที่ 5 ความคิดเห็นเกี่ยวกับคุณภาพของการบริการได้จากเทคโนโลยีประเภทเครื่องให้บริการตัวเองที่รถไฟฟ้าขนส่งมวลชน)**

Instruction: Please choose the level of opinions and mark ✓ in the column that best suits your feelings and please fill out all questions to complete the questionnaire (คำชี้แจง: โปรดเลือกระดับความคิดเห็นและทำเครื่องหมาย ✓ ที่ตรงกับความรู้สึกของคุณมากที่สุดและโปรดกรอกให้ครบทุกคำถาม)

5 = Strongly agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly disagree

(5 = เห็นด้วยมากที่สุด, 4 = เห็นด้วย, 3 = เฉยๆ, 2 = ไม่เห็นด้วย, 1 = ไม่เห็นด้วยอย่างยิ่ง)

Service Quality of Self-Service Technology of Mass Rapid Transit in Thailand	Opinion Level				
	5	4	3	2	1
<b>Technological service (การบริการโดยเทคโนโลยี)</b>					
1. Self-service technology has operating hours convenience to user. (การให้บริการของเครื่องเป็นการอำนวยความสะดวกแก่ผู้ใช้งานได้ตลอดเวลา)					
2. Self-service technology has features that meets my needs. (การให้บริการของเครื่องสามารถตอบสนองความต้องการของฉัน)					
3. Self-service technology makes my life easier. (การให้บริการของเครื่องทำให้ชีวิตของฉันง่ายขึ้น)					
<b>Human Service (การบริการโดยบุคลากร)</b>					
1. Service provider can explain how to use the self-service technology properly. (บุคลากรสามารถอธิบายวิธีใช้ได้เป็นอย่างดี)					
2. Service provider is always willing to serve user. (บุคลากรเต็มใจให้บริการเสมอ)					
3. Service provider provides service to user fairly. (บุคลากรที่ดูแลเครื่องให้บริการแก่ผู้ใช้ทุกคนอย่างเท่าเทียม)					

**Part 6: Opinions about The Social Influence on Adopting of Self-Service Technology of Mass Rapid Transit in Thailand (ส่วนที่ 6 ความคิดเห็นเกี่ยวกับอิทธิพลในสังคมต่อการเลือกใช้เทคโนโลยีประเภทเครื่องให้บริการตัวเองที่รถไฟฟ้าขนส่งมวลชน)**

Instruction: Please choose the level of opinions and mark ✓ in the column that best suits your feelings and please fill out all questions to complete the questionnaire (คำชี้แจง: โปรดเลือกระดับความคิดเห็นและทำเครื่องหมาย ✓ ที่ตรงกับความรู้สึกของท่านมากที่สุดและโปรดกรอกให้ครบทุกคำถาม)

5 = Strongly agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly disagree

(5 = เห็นด้วยมากที่สุด, 4 = เห็นด้วย, 3 = เฉยๆ, 2 = ไม่เห็นด้วย, 1 = ไม่เห็นด้วยอย่างยิ่ง)

Social Influence on Adopting of Self-Service Technology of Mass Rapid Transit in Thailand	Opinion Level				
	5	4	3	2	1
<b>Subjective Norm (บรรทัดฐานของบุคคล)</b>					
1. I want to use self-service technology because I saw my friends or relatives use it. (ฉันเห็นเพื่อนหรือคนสนิทใช้เครื่องเป็นเหตุให้ฉันอยากใช้บริการ)					
2. I want to use self-service technology because I saw people in my family use it. (ฉันเห็นบุคคลในครอบครัวใช้เครื่องเป็นเหตุให้ฉันอยากใช้บริการ)					
<b>Social Factors (ปัจจัยทางสังคม)</b>					
1. I use the self-service technology because of presenters, actors, and celebrities use this system. (ฉันใช้เครื่องให้บริการตัวเองที่รถไฟฟ้าขนส่งมวลชนตามพิธีเซนต์เตอร์, ดารา, คนสำคัญของสังคม)					
2. I use the self-service technology because people around me support to use this system. (ฉันใช้เครื่องให้บริการตัวเองที่รถไฟฟ้าขนส่งมวลชนเพราะคนรอบข้างสนับสนุนให้ฉันใช้)					
<b>Image (ภาพลักษณ์)</b>					
1. People who use self-service technology looks fashionable. (คนที่ใช้เครื่องให้บริการตัวเองที่รถไฟฟ้าขนส่งมวลชนดูเป็นบุคคลที่ทันสมัย)					

Social Influence on Adopting of Self-Service Technology of Mass Rapid Transit in Thailand	Opinion Level				
	5	4	3	2	1
2. People who use self-service technology is knowledgeable (good at technology) (คนที่ใช้เครื่องให้บริการตัวเองที่รถไฟฟ้าขนส่งมวลชน เป็นคนที่มีความรู้ (ใช้เทคโนโลยีเก่ง))					

**Part 7: Opinions about The User Satisfaction on Using Self-Service Technology of Mass Rapid Transit in Thailand (ส่วนที่ 7 ความคิดเห็นเกี่ยวกับความพึงพอใจของผู้ใช้งานต่อระบบเทคโนโลยีประเภทเครื่องให้บริการตัวเองที่รถไฟฟ้าขนส่งมวลชน)**

Instruction: Please choose the level of opinions and mark ✓ in the column that best suits your feelings and please fill out all questions to complete the questionnaire (คำชี้แจง: โปรดเลือกระดับความคิดเห็นและทำเครื่องหมาย ✓ ที่ตรงกับความรู้สึกของท่านมากที่สุดและโปรดกรอกให้ครบทุกคำถาม)

5 = Strongly agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly disagree

(5 = เห็นด้วยมากที่สุด, 4 = เห็นด้วย, 3 = เฉยๆ, 2 = ไม่เห็นด้วย, 1 = ไม่เห็นด้วยอย่างยิ่ง)

User Satisfaction on using self-service technology of Mass Rapid Transit in Thailand	Opinion Level				
	5	4	3	2	1
1. Using self-service technology is my best choice. (การเลือกใช้เครื่องให้บริการตัวเองที่เป็นทางเลือกที่ดีที่สุดสำหรับฉัน)					
2. Self-service technology exceeds my expectation. (เครื่องให้บริการตัวเองให้ผลลัพธ์เกินความคาดหมาย)					
3. Overall, I am satisfied with the use of self-service technology (โดยรวมฉันรู้สึกพึงพอใจกับเครื่องให้บริการตัวเอง)					

**Part 8: Opinions about The Continuance Intention to Use of Self-Service Technology (ส่วนที่**

**8) ความคิดเห็นเกี่ยวกับความตั้งใจในการใช้ระบบเทคโนโลยีประเภทเครื่องให้บริการตัวเองอย่างต่อเนื่องของรถไฟฟ้าขนส่งมวลชน)**

Instruction: Please choose the level of opinions and mark ✓ in the column that best suits your feelings and please fill out all questions to complete the questionnaire (คำชี้แจง: โปรดเลือกระดับความคิดเห็นและทำเครื่องหมาย ✓ ที่ตรงกับความรู้สึกของท่านมากที่สุดและโปรดกรอกให้ครบทุกคำถาม)

5 = Strongly agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly disagree

(5 = เห็นด้วยมากที่สุด, 4 = เห็นด้วย, 3 = เฉยๆ, 2 = ไม่เห็นด้วย, 1 = ไม่เห็นด้วยอย่างยิ่ง)

Continuance Intention to Use of self-service technology system	Opinion Level				
	5	4	3	2	1
1.I intend to continue using self-service technology. (ฉันตั้งใจที่จะใช้เครื่องให้บริการตัวเองอย่างต่อเนื่อง)					
2. I will continue using self-service technology rather than using any alternative means. (ฉันตั้งใจที่จะใช้เครื่องให้บริการตัวเองมากกว่าการใช้วิธีการอื่นแน่นอน)					
3. I will surely use any other additional self-service technology in the future. (ในอนาคตหากมีเครื่องให้บริการตัวเองในลักษณะนี้เพิ่มเติมฉันจะใช้บริการอย่างแน่นอน)					

\*\*\* Thank you for devoting your time to answer these questions. \*\*\*

\*\*\*ขอบคุณที่ท่านสละเวลาและให้ความร่วมมือในการตอบแบบสอบถามนี้\*\*\*

## APPENDIX C

# INSTRUMENT'S RELIABILITY AND VALIDITY ASSESSMENT

### THE INDEX OF CONGRUENCE (IOC)

Index of Item-Objective Congruence (IOC) is considered as tool to assess the content validity in the questionnaire. Therefore, item that gained scored higher than 0.5 can be used as question in questionnaire.

$$\text{IOC} = \frac{\sum R}{N}$$

R = Congruence value of each question

N = The number of professors/experts

The score range of IOC is between -1 to 1, the acceptable question must be close to 1. The item that had scores lower than 0.6 should be revised; whereas, the items that gained scored higher than 0.5 can be reserved. The explanation of the score range is as follow.

+1 = When the professor perceived that the question was fully consistent with the content

0 = When the professor found that the question was doubtful whether it was consistent with the content or not

-1 = When the professor did not understand the question and perceive that it was inconsistent with the content

In order to assure the content validity and item consistency, the questionnaires were submitted to two professors and one expert, which have abundance of knowledge and experience in term of Information system and technology, to consider and review whether all details was simple to comprehend and meet the points or not. Firstly, Asst.Prof.Dr.Sutti Sooampon, Asssistant Dean of College of Educational Innovation Research who responsible and specialize in

online education. Secondly, Asst.Prof.Dr. Chalita Srinuan who has skillful and expert in the area of Administration and Business Management. Lastly, Dr.Suthep Panpeng, President of State Railway of Thailand, specialize in railway transportation management. The result is presented in table below:

<b>Items</b>	<b>Dr. Sutti</b>	<b>Dr. Chalita</b>	<b>Dr. Suthep</b>	<b>Total Score</b>	<b>The IOC Index</b>
1. I perceived that using the self-service technology would enable me to accomplish tasks more quickly (such as, buying the ticket, top-up contactless card, purchasing items, and leaving the baggage).	1	1	1	3	1
2. I perceived that using the self-service technology would make me easier to do task (such as, buying the ticket, top-up contactless card, purchasing items, and leaving the baggage).	1	1	1	3	1
3. I believed that using the self-service technology can save times during rush hours.	1	1	1	3	1
4. I believed that using the self-service technology will increase the quality during my travel such as, using of automated self-storage service	1	1	1	3	1

<b>Items</b>	<b>Dr. Sutti</b>	<b>Dr. Chalita</b>	<b>Dr. Suthep</b>	<b>Total Score</b>	<b>The IOC Index</b>
5. Self-service technology is very well when comparing with buying the ticket from service provider.	1	0	1	2	0.67
6. Checking service data via self-service technology is more convenient when comparing with asking from service provider (such as, number of travel times and remaining money in card).	1	0	1	2	0.67
7. The display of self-service technology is presented in well-organized format.	1	1	1	3	1
8. The output of self-service technology is easy to read with proper front size and clear color.	1	1	1	3	1
9. The output of self-service technology is easy to understand.	1	1	1	3	1
10. Self-service technology shows the result correctly every time.	1	1	1	3	1
11. Self-service technology provides reliable information (such as, the ticket fee and remaining money in card).	1	1	1	3	1

<b>Items</b>	<b>Dr. Sutti</b>	<b>Dr. Chalita</b>	<b>Dr. Suthep</b>	<b>Total Score</b>	<b>The IOC Index</b>
12. Self-service technology provides me information in timely manner.	1	1	1	3	1
13. Self-service technology provides me with up-to-date information (such as, real time update of remaining money in card after topping-up)	1	1	1	3	1
14. Self-service technology is easy to use.	1	1	1	3	1
15. It is easy for me to remember how to perform task using the self-service technology system.	1	1	1	3	1
16. Self-service technology is always up-and-running as necessary.	1	1	1	3	1
17. Self-service technology responds my request quickly enough.	1	1	1	3	1
18. Self-service technology is unnecessarily complex.	1	1	1	3	1
19. Self-service technology is flexible to switch the operating menu.	1	1	1	3	1

<b>Items</b>	<b>Dr. Sutti</b>	<b>Dr. Chalita</b>	<b>Dr. Suthep</b>	<b>Total Score</b>	<b>The IOC Index</b>
20. Self-service technology has operating hours convenience to user.	1	1	1	3	1
21. Self-service technology has features that meets my needs.	1	1	1	3	1
22. Self-service technology makes my life easier.	1	1	1	3	1
23. Service provider can explain how to use the self-service technology properly.	1	1	1	3	1
24. Service provider is always willing to serve user.	1	1	1	3	1
25. Service provider provides service to user fairly.	1	0	1	2	0.67
26. I want to use self-service technology because I saw my friends or relatives use it.	1	1	1	3	1
27. I want to use self-service technology because I saw people in my family use it.	1	1	1	3	1
28. I use the self-service technology because of presenters, actors, and celebrities use this system.	1	1	1	3	1

<b>Items</b>	<b>Dr. Sutti</b>	<b>Dr. Chalita</b>	<b>Dr. Suthep</b>	<b>Total Score</b>	<b>The IOC Index</b>
29. I use the self-service technology because people around me support to use this system.	1	1	1	3	1
30. People who use self-service technology looks fashionable.	1	1	1	3	1
31. People who use self-service technology is knowledgeable (good at Technology)	1	1	1	3	1
32. Using self-service technology is my best choice.	1	1	1	3	1
33. Self-service technology exceeds my expectation.	1	1	1	3	1
34. Overall, I am satisfied with the use of self-service technology	1	1	1	3	1
35. I intend to continue using self-service technology.	1	1	1	3	1
36. I will continue using self-service technology rather than using any alternative means.	1	1	1	3	1
37. I will surely use any other additional self-service technology in the future.	1	1	1	3	1

### THE RELIABILITY OF THE INSTRUMENT

The Cronbach's Alpha coefficient method was conducted as the reliability procedure for checking the quality the equipment. The items which have Cronbach's alpha coefficient should have a level of 0.70 or higher. The value above than 0.70 are considered to be highly reliable (Cronbach, 1951).

$$\alpha = \frac{K\bar{r}}{1 + \bar{r}(K - 1)}$$

$\alpha$  : Reliability Coefficient

K : Number of Items

$\bar{r}$  : Average Item Correlation

$\alpha \geq 0.7$  : High reliability

$0.5 \leq \alpha \leq 0.65$  : Moderate reliability

$\alpha \leq 0.5$  : Low reliability

#### Case Processing Summary

		N	%
Cases	Valid	400	100.0
	Excluded <sup>a</sup>	0	.0
	Total	400	100.0

a. Listwise deletion based on all variables in the procedure.

#### Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.951	.951	37

## APPENDIX D

### CFA ANALYSIS RESULT

**Title****Groups****Group number 1 (Group number 1)****Notes for Group (Group number 1)**

The model is recursive.

Sample size = 400

**Variable Summary (Group number 1)****Your model contains the following variables (Group number 1)**

Observed, endogenous variables

TIME

ACC

FOR

USA

RESP

EASE

HUMAN

TECH

RA

JF

PU

IMAGE

SF

SN

US3

US2

US1

CI3

CI2

CI1

Unobserved, exogenous variables

IQ

e3

e2

e1

SYQ

e6

e5

e4

SEQ

e8

e7

PE

e11

e10

e9

SI

e14

e13

e12

US

e17

e16

e15

CI

e20

e19

e18

**Variable counts (Group number 1)**

Number of variables in your model:	47
Number of observed variables:	20
Number of unobserved variables:	27
Number of exogenous variables:	27
Number of endogenous variables:	20

**Parameter summary (Group number 1)**

	Weights	Covariances	Variances	Means	Intercepts	Total
Fixed	27	0	0	0	0	27
Labeled	0	0	0	0	0	0
Unlabeled	13	26	27	0	0	66
Total	40	26	27	0	0	93

**Models****Default model (Default model)****Notes for Model (Default model)****Computation of degrees of freedom (Default model)**

Number of distinct sample moments:	210
Number of distinct parameters to be estimated:	66
Degrees of freedom (210 - 66):	144

**Result (Default model)**

Minimum was achieved

Chi-square = 431.062

Degrees of freedom = 144

Probability level = .000

**Group number 1 (Group number 1 - Default model)**

**Estimates (Group number 1 - Default model)**

**Scalar Estimates (Group number 1 - Default model)**

**Maximum Likelihood Estimates**

**Regression Weights: (Group number 1 - Default model)**

		Estimate	S.E.	C.R.	P	Label
TIME	<--- IQ	1.263	.077	16.480	***	
ACC	<--- IQ	.886	.058	15.364	***	
FOR	<--- IQ	1.000				
USA	<--- SYQ	1.088	.057	19.156	***	
RESP	<--- SYQ	1.481	.082	18.063	***	
EASE	<--- SYQ	1.000				
HUMAN	<--- SEQ	.755	.059	12.731	***	
TECH	<--- SEQ	1.000				
RA	<--- PE	1.206	.136	8.841	***	
JF	<--- PE	1.709	.178	9.616	***	
PU	<--- PE	1.000				
IMAGE	<--- SI	1.354	.100	13.490	***	
SF	<--- SI	1.095	.067	16.372	***	
SN	<--- SI	1.000				
US3	<--- US	.966	.060	16.209	***	
US2	<--- US	1.293	.069	18.799	***	
US1	<--- US	1.000				

		Estimate	S.E.	C.R.	P	Label
CI3	<--- CI	1.028	.059	17.547	***	
CI2	<--- CI	1.413	.062	22.817	***	
CI1	<--- CI	1.000				

**Standardized Regression Weights: (Group number 1 - Default model)**

		Estimate
TIME	<--- IQ	.885
ACC	<--- IQ	.766
FOR	<--- IQ	.791
USA	<--- SYQ	.825
RESP	<--- SYQ	.907
EASE	<--- SYQ	.722
HUMAN	<--- SEQ	.586
TECH	<--- SEQ	.838
RA	<--- PE	.517
JF	<--- PE	.939
PU	<--- PE	.600
IMAGE	<--- SI	.816
SF	<--- SI	.658
SN	<--- SI	.649
US3	<--- US	.780
US2	<--- US	.887
US1	<--- US	.749
CI3	<--- CI	.833
CI2	<--- CI	.987
CI1	<--- CI	.827

**Covariances: (Group number 1 - Default model)**

	Estimate	S.E.	C.R.	P	Label
IQ <-->SYQ	.200	.020	9.784	***	
SYQ<-->SEQ	.278	.026	10.801	***	
SEQ <-->PE	.027	.011	2.341	.019	
PE <-->SI	.051	.012	4.279	***	
SI <-->US	.285	.030	9.426	***	
US <-->CI	.265	.027	9.631	***	
IQ <-->SEQ	.217	.021	10.228	***	
IQ <-->PE	.063	.011	5.626	***	
IQ <-->SI	.134	.018	7.297	***	
IQ <-->US	.161	.020	8.188	***	
IQ <-->CI	.140	.018	7.923	***	
SYQ<-->PE	.053	.011	4.774	***	
SYQ<-->SI	.167	.021	7.830	***	
SYQ<-->US	.213	.024	9.001	***	
SYQ<-->CI	.124	.018	6.897	***	
SEQ <-->SI	.159	.022	7.127	***	
SEQ <-->US	.223	.025	8.992	***	
SEQ <-->CI	.144	.020	7.021	***	
PE <-->US	.051	.012	4.147	***	
PE <-->CI	.050	.011	4.448	***	
SI <-->CI	.210	.025	8.510	***	
e13 <-->e12	.195	.023	8.453	***	
e6 <-->e4	.050	.011	4.664	***	
e14 <-->e13	.062	.018	3.506	***	
e3 <-->e1	-.045	.011	-4.231	***	
e20 <-->e19	-.162	.015	-10.726	***	

**Correlations: (Group number 1 - Default model)**

	Estimate
IQ <--> SYQ	.854
SYQ<--> SEQ	1.000
SEQ <--> PE	.149
PE <--> SI	.309
SI <--> US	.980
US <--> CI	.782
IQ <--> SEQ	.836
IQ <--> PE	.408
IQ <--> SI	.565
IQ <--> US	.588
IQ <--> CI	.509
SYQ<--> PE	.325
SYQ<--> SI	.667
SYQ<--> US	.737
SYQ<--> CI	.426
SEQ <--> SI	.573
SEQ <--> US	.699
SEQ <--> CI	.446
PE <--> US	.268
PE <--> CI	.262
SI <--> CI	.715
e13 <--> e12	.527
e6 <--> e4	.279
e14 <--> e13	.203
e3 <--> e1	-.394
e20 <--> e19	-.371

**Variances: (Group number 1 - Default model)**

	Estimate	S.E.	C.R.	P	Label
IQ	.222	.025	8.767	***	
SYQ	.249	.030	8.191	***	
SEQ	.304	.033	9.279	***	
PE	.107	.019	5.801	***	
SI	.252	.037	6.854	***	
US	.336	.039	8.636	***	
CI	.342	.034	9.918	***	
e3	.098	.014	6.791	***	
e2	.122	.010	12.080	***	
e1	.132	.014	9.681	***	
e6	.139	.011	12.094	***	
e5	.117	.013	8.889	***	
e4	.228	.017	13.086	***	
e8	.331	.025	13.297	***	
e7	.129	.017	7.438	***	
e11	.428	.033	12.896	***	
e10	.042	.021	1.977	.043	
e9	.192	.016	11.812	***	
e14	.231	.028	8.141	***	
e13	.397	.031	12.660	***	
e12	.346	.028	12.545	***	
e17	.202	.016	12.690	***	
e16	.151	.015	9.943	***	
e15	.262	.020	12.975	***	
e20	.160	.020	8.149	***	
e19	.017	.006	2.888	***	
e18	.158	.014	11.561	***	

**Squared Multiple Correlations: (Group number 1 - Default model)**

	Estimate
CI1	.684
CI2	.975
CI3	.693
US1	.562
US2	.788
US3	.609
SN	.422
SF	.432
IMAGE	.666
PU	.359
JF	.881
RA	.267
TECH	.702
HUMAN	.344
EASE	.522
RESP	.823
USA	.680
FOR	.626
ACC	.587
TIME	.783

**Matrices (Group number 1 - Default model)**

**Total Effects (Group number 1 - Default model)**

	CI	US	SI	PE	SEQ	SYQ	IQ
CI1	1.000	.000	.000	.000	.000	.000	.000
CI2	1.413	.000	.000	.000	.000	.000	.000
CI3	1.028	.000	.000	.000	.000	.000	.000
US1	.000	1.000	.000	.000	.000	.000	.000

	CI	US	SI	PE	SEQ	SYQ	IQ
US2	.000	1.293	.000	.000	.000	.000	.000
US3	.000	.966	.000	.000	.000	.000	.000
SN	.000	.000	1.000	.000	.000	.000	.000
SF	.000	.000	1.095	.000	.000	.000	.000
IMAGE	.000	.000	1.354	.000	.000	.000	.000
PU	.000	.000	.000	1.000	.000	.000	.000
JF	.000	.000	.000	1.709	.000	.000	.000
RA	.000	.000	.000	1.206	.000	.000	.000
TECH	.000	.000	.000	.000	1.000	.000	.000
HUMAN	.000	.000	.000	.000	.755	.000	.000
EASE	.000	.000	.000	.000	.000	1.000	.000
RESP	.000	.000	.000	.000	.000	1.481	.000
USA	.000	.000	.000	.000	.000	1.088	.000
FOR	.000	.000	.000	.000	.000	.000	1.000
ACC	.000	.000	.000	.000	.000	.000	.886
TIME	.000	.000	.000	.000	.000	.000	1.263

**Standardized Total Effects (Group number 1 - Default model)**

	CI	US	SI	PE	SEQ	SYQ	IQ
CI1	.827	.000	.000	.000	.000	.000	.000
CI2	.987	.000	.000	.000	.000	.000	.000
CI3	.833	.000	.000	.000	.000	.000	.000
US1	.000	.749	.000	.000	.000	.000	.000
US2	.000	.887	.000	.000	.000	.000	.000
US3	.000	.780	.000	.000	.000	.000	.000
SN	.000	.000	.649	.000	.000	.000	.000
SF	.000	.000	.658	.000	.000	.000	.000
IMAGE	.000	.000	.816	.000	.000	.000	.000
PU	.000	.000	.000	.600	.000	.000	.000

	CI	US	SI	PE	SEQ	SYQ	IQ
JF	.000	.000	.000	.939	.000	.000	.000
RA	.000	.000	.000	.517	.000	.000	.000
TECH	.000	.000	.000	.000	.838	.000	.000
HUMAN	.000	.000	.000	.000	.586	.000	.000
EASE	.000	.000	.000	.000	.000	.722	.000
RESP	.000	.000	.000	.000	.000	.907	.000
USA	.000	.000	.000	.000	.000	.825	.000
FOR	.000	.000	.000	.000	.000	.000	.791
ACC	.000	.000	.000	.000	.000	.000	.766
TIME	.000	.000	.000	.000	.000	.000	.885

**Direct Effects (Group number 1 - Default model)**

	CI	US	SI	PE	SEQ	SYQ	IQ
CI1	1.000	.000	.000	.000	.000	.000	.000
CI2	1.413	.000	.000	.000	.000	.000	.000
CI3	1.028	.000	.000	.000	.000	.000	.000
US1	.000	1.000	.000	.000	.000	.000	.000
US2	.000	1.293	.000	.000	.000	.000	.000
US3	.000	.966	.000	.000	.000	.000	.000
SN	.000	.000	1.000	.000	.000	.000	.000
SF	.000	.000	1.095	.000	.000	.000	.000
IMAGE	.000	.000	1.354	.000	.000	.000	.000
PU	.000	.000	.000	1.000	.000	.000	.000
JF	.000	.000	.000	1.709	.000	.000	.000
RA	.000	.000	.000	1.206	.000	.000	.000
TECH	.000	.000	.000	.000	1.000	.000	.000
HUMAN	.000	.000	.000	.000	.755	.000	.000
EASE	.000	.000	.000	.000	.000	1.000	.000
RESP	.000	.000	.000	.000	.000	1.481	.000

	CI	US	SI	PE	SEQ	SYQ	IQ
USA	.000	.000	.000	.000	.000	1.088	.000
FOR	.000	.000	.000	.000	.000	.000	1.000
ACC	.000	.000	.000	.000	.000	.000	.886
TIME	.000	.000	.000	.000	.000	.000	1.263

**Standardized Direct Effects (Group number 1 - Default model)**

	CI	US	SI	PE	SEQ	SYQ	IQ
CI1	.827	.000	.000	.000	.000	.000	.000
CI2	.987	.000	.000	.000	.000	.000	.000
CI3	.833	.000	.000	.000	.000	.000	.000
US1	.000	.749	.000	.000	.000	.000	.000
US2	.000	.887	.000	.000	.000	.000	.000
US3	.000	.780	.000	.000	.000	.000	.000
SN	.000	.000	.649	.000	.000	.000	.000
SF	.000	.000	.658	.000	.000	.000	.000
IMAGE	.000	.000	.816	.000	.000	.000	.000
PU	.000	.000	.000	.600	.000	.000	.000
JF	.000	.000	.000	.939	.000	.000	.000
RA	.000	.000	.000	.517	.000	.000	.000
TECH	.000	.000	.000	.000	.838	.000	.000
HUMAN	.000	.000	.000	.000	.586	.000	.000
EASE	.000	.000	.000	.000	.000	.722	.000
RESP	.000	.000	.000	.000	.000	.907	.000
USA	.000	.000	.000	.000	.000	.825	.000
FOR	.000	.000	.000	.000	.000	.000	.791
ACC	.000	.000	.000	.000	.000	.000	.766
TIME	.000	.000	.000	.000	.000	.000	.885

**Indirect Effects (Group number 1 - Default model)**



	CI	US	SI	PE	SEQ	SYQ	IQ
SN	.000	.000	.000	.000	.000	.000	.000
SF	.000	.000	.000	.000	.000	.000	.000
IMAGE	.000	.000	.000	.000	.000	.000	.000
PU	.000	.000	.000	.000	.000	.000	.000
JF	.000	.000	.000	.000	.000	.000	.000
RA	.000	.000	.000	.000	.000	.000	.000
TECH	.000	.000	.000	.000	.000	.000	.000
HUMAN	.000	.000	.000	.000	.000	.000	.000
EASE	.000	.000	.000	.000	.000	.000	.000
RESP	.000	.000	.000	.000	.000	.000	.000
USA	.000	.000	.000	.000	.000	.000	.000
FOR	.000	.000	.000	.000	.000	.000	.000
ACC	.000	.000	.000	.000	.000	.000	.000
TIME	.000	.000	.000	.000	.000	.000	.000

### Model Fit Summary

#### CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	66	431.062	144	.000	2.993
Saturated model	210	.000	0		
Independence model	20	6354.405	190	.000	33.444

#### RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.041	.967	.961	.726
Saturated model	.000	1.000		

Model	RMR	GFI	AGFI	PGFI
Independence model	.221	.220	.138	.199

### Baseline Comparisons

Model	NFI	RFI	IFI	TLI	CFI
	Delta1	rho1	Delta2	rho2	
Default model	.906	.944	.925	.967	.924
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

### Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.858	.711	.724
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

### NCP

Model	NCP	LO 90	HI 90
Default model	1087.062	978.748	1202.821
Saturated model	.000	.000	.000
Independence model	6164.405	5907.317	6427.835

### FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	3.085	2.724	2.453	3.015
Saturated model	.000	.000	.000	.000
Independence model	15.926	15.450	14.805	16.110

### RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.048	.131	.145	.000
Independence model	.285	.279	.291	.000

**AIC**

Model	AIC	BCC	BIC	CAIC
Default model	1363.062	1370.395	1626.498	1692.498
Saturated model	420.000	443.333	1258.208	1468.208
Independence model	6394.405	6396.627	6474.234	6494.234

**ECVI**

Model	ECVI	LO 90	HI 90	MECVI
Default model	3.416	3.145	3.706	3.435
Saturated model	1.053	1.053	1.053	1.111
Independence model	16.026	15.382	16.686	16.032

**HOELTER**

Model	HOELTER	HOELTER
	.05	.01
Default model	257	261
Independence model	15	15

**Execution time summary**

Minimization:	.016
Miscellaneous:	.047
Bootstrap:	.000
Total:	.063

## APPENDIX E

### SEM ANALYSIS RESULT

**Title****Groups****Group number 1 (Group number 1)****Notes for Group (Group number 1)**

The model is recursive.

Sample size = 400

**Variable Summary (Group number 1)****Your model contains the following variables (Group number 1)**

Observed, endogenous variables

TIME

ACC

FOR

USA

RESP

EASE

HUMAN

TECH

RA

JF

PU

IMAGE

SF

SN

US1

US2

US3

CI1

CI2

CI3

Unobserved, endogenous variables

US

CI

Unobserved, exogenous variables

IQ

e3

e2

e1

SYQ

e6

e5

e4

SEQ

e8

e7

PE

e11

e10

e9

SI

e14

e13

e12

e15

e16

e17  
 e18  
 e19  
 e20  
 eUS  
 eCI

### Variable counts (Group number 1)

Number of variables in your model: 49  
 Number of observed variables: 20  
 Number of unobserved variables: 29  
 Number of exogenous variables: 27  
 Number of endogenous variables: 22

### Parameter summary (Group number 1)

	Weights	Covariances	Variances	Means	Intercepts	Total
Fixed	29	0	0	0	0	29
Labeled	0	0	0	0	0	0
Unlabeled	20	3	27	0	0	50
Total	49	3	27	0	0	79

### Models

#### Default model (Default model)

#### Notes for Model (Default model)

#### Computation of degrees of freedom (Default model)

Number of distinct sample moments: 210  
 Number of distinct parameters to be estimated: 50  
 Degrees of freedom (210 - 50): 160

**Result (Default model)**

Minimum was achieved

Chi-square = 436.790

Degrees of freedom = 160

Probability level = .000

**Group number 1 (Group number 1 - Default model)****Estimates (Group number 1 - Default model)****Scalar Estimates (Group number 1 - Default model)****Maximum Likelihood Estimates****Regression Weights: (Group number 1 - Default model)**

		Estimate	S.E.	C.R.	P	Label
US	<--- IQ	-.033	.042	-.781	.435	
US	<--- SYQ	.224	.033	6.712	***	
US	<--- SEQ	.163	.051	3.211	.001	
US	<--- PE	.039	.052	.758	.449	
US	<--- SI	.500	.044	11.330	***	
CI	<--- US	.943	.091	10.395	***	
CI	<--- SI	.098	.041	2.394	.017	
TIME	<--- IQ	1.374	.101	13.611	***	
ACC	<--- IQ	1.094	.080	13.622	***	
FOR	<--- IQ	1.000				
USA	<--- SYQ	1.023	.055	18.621	***	
RESP	<--- SYQ	1.213	.067	18.111	***	
EASE	<--- SYQ	1.000				
HUMAN	<--- SEQ	.750	.211	3.554	***	
TECH	<--- SEQ	1.000				

		Estimate	S.E.	C.R.	P	Label
RA	<--- PE	1.199	.139	8.628	***	
JF	<--- PE	1.928	.289	6.682	***	
PU	<--- PE	1.000				
IMAGE	<--- SI	1.359	.107	12.679	***	
SF	<--- SI	1.089	.071	15.382	***	
SN	<--- SI	1.000				
US1	<--- US	1.000				
US2	<--- US	1.285	.080	16.160	***	
US3	<--- US	.939	.069	13.597	***	
CI1	<--- CI	1.000				
CI2	<--- CI	1.356	.073	18.515	***	
CI3	<--- CI	1.017	.067	15.207	***	

**Standardized Regression Weights: (Group number 1 - Default model)**

		Estimate
US	<--- IQ	-.029
US	<--- SYQ	.265
US	<--- SEQ	.190
US	<--- PE	.026
US	<--- SI	.694
CI	<--- US	.810
CI	<--- SI	.116
TIME	<--- IQ	.844
ACC	<--- IQ	.830
FOR	<--- IQ	.694
USA	<--- SYQ	.873
RESP	<--- SYQ	.837
EASE	<--- SYQ	.814
HUMAN	<--- SEQ	.584

		Estimate
TECH	<--- SEQ	.841
RA	<--- PE	.486
JF	<--- PE	.900
PU	<--- PE	.566
IMAGE	<--- SI	.972
SF	<--- SI	.857
SN	<--- SI	.851
US1	<--- US	.711
US2	<--- US	.868
US3	<--- US	.721
CI1	<--- CI	.818
CI2	<--- CI	.956
CI3	<--- CI	.814

**Covariances: (Group number 1 - Default model)**

	Estimate	S.E.	C.R.	P	Label
e14<-->e12	-.249	.038	-6.626	***	
e19<-->e20	-.152	.017	-8.849	***	
e14<-->e13	-.207	.044	-4.705	***	

**Correlations: (Group number 1 - Default model)**

	Estimate
e19<--> e20	-.713

**Variances: (Group number 1 - Default model)**

	Estimate	S.E.	C.R.	P	Label
IQ	.170	.023	7.333	***	

	Estimate	S.E.	C.R.	P	Label
SYQ	.316	.034	9.386	***	
SEQ	.306	.089	3.441	***	
PE	.096	.020	4.803	***	
SI	.434	.047	9.312	***	
eUS	.093	.014	6.522	***	
eCI	.141	.021	6.755	***	
e3	.130	.019	6.758	***	
e2	.092	.013	7.341	***	
e1	.184	.016	11.625	***	
e6	.103	.014	7.620	***	
e5	.198	.021	9.271	***	
e4	.161	.016	10.154	***	
e8	.333	.053	6.304	***	
e7	.127	.047	2.698	***	
e11	.446	.036	12.273	***	
e10	.000	.047	-3.002	***	
e9	.203	.019	10.651	***	
e14	-.104	.044	-2.356	***	
e13	.185	.030	6.211	***	
e12	.165	.025	6.474	***	
e15	.250	.020	12.557	***	
e16	.138	.015	8.948	***	
e17	.208	.017	12.457	***	
e18	.146	.015	10.036	***	
e19	.051	.023	2.200	.028	
e20	.155	.021	7.554	***	

**Squared Multiple Correlations: (Group number 1 - Default model)**

Estimate

	Estimate
US	.589
CI	.539
CI3	.663
CI2	.914
CI1	.668
US3	.520
US2	.753
US1	.505
SN	.725
SF	.735
IMAGE	.945
PU	.321
JF	.810
RA	.236
TECH	.708
HUMAN	.341
EASE	.662
RESP	.701
USA	.762
FOR	.481
ACC	.689
TIME	.712

**Matrices (Group number 1 - Default model)**

**Total Effects (Group number 1 - Default model)**

	SI	PE	SEQ	SYQ	IQ	US	CI
US	.532	.042	.173	.238	-.035	.000	.000
CI	.560	.037	.151	.207	-.031	.871	.000

	SI	PE	SEQ	SYQ	IQ	US	CI
CI3	.374	.037	.153	.211	-.031	.886	1.017
CI2	.499	.050	.205	.281	-.042	1.181	1.356
CI1	.368	.037	.151	.207	-.031	.871	1.000
US3	.500	.039	.163	.224	-.033	.939	.000
US2	.684	.054	.223	.306	-.045	1.285	.000
US1	.532	.042	.173	.238	-.035	1.000	.000
SN	1.000	.000	.000	.000	.000	.000	.000
SF	1.089	.000	.000	.000	.000	.000	.000
IMAGE	1.359	.000	.000	.000	.000	.000	.000
PU	.000	1.000	.000	.000	.000	.000	.000
JF	.000	1.928	.000	.000	.000	.000	.000
RA	.000	1.199	.000	.000	.000	.000	.000
TECH	.000	.000	1.000	.000	.000	.000	.000
HUMAN	.000	.000	.750	.000	.000	.000	.000
EASE	.000	.000	.000	1.000	.000	.000	.000
RESP	.000	.000	.000	1.213	.000	.000	.000
USA	.000	.000	.000	1.023	.000	.000	.000
FOR	.000	.000	.000	.000	1.000	.000	.000
ACC	.000	.000	.000	.000	1.094	.000	.000
TIME	.000	.000	.000	.000	1.374	.000	.000

**Standardized Total Effects (Group number 1 - Default model)**

	SI	PE	SEQ	SYQ	IQ	US	CI
US	.694	.026	.190	.265	-.029	.000	.000
CI	.678	.021	.154	.215	-.023	.810	.000
CI3	.363	.017	.125	.175	-.019	.660	.814
CI2	.426	.020	.147	.205	-.022	.775	.956
CI1	.365	.017	.126	.175	-.019	.663	.818
US3	.500	.019	.137	.191	-.021	.721	.000



	SI	PE	SEQ	SYQ	IQ	US	CI
IMAGE	1.359	.000	.000	.000	.000	.000	.000
PU	.000	1.000	.000	.000	.000	.000	.000
JF	.000	1.928	.000	.000	.000	.000	.000
RA	.000	1.199	.000	.000	.000	.000	.000
TECH	.000	.000	1.000	.000	.000	.000	.000
HUMAN	.000	.000	.750	.000	.000	.000	.000
EASE	.000	.000	.000	1.000	.000	.000	.000
RESP	.000	.000	.000	1.213	.000	.000	.000
USA	.000	.000	.000	1.023	.000	.000	.000
FOR	.000	.000	.000	.000	1.000	.000	.000
ACC	.000	.000	.000	.000	1.094	.000	.000
TIME	.000	.000	.000	.000	1.374	.000	.000

**Standardized Direct Effects (Group number 1 - Default model)**

	SI	PE	SEQ	SYQ	IQ	US	CI
US	.694	.026	.190	.265	-.029	.000	.000
CI	.116	.000	.000	.000	.000	.810	.000
CI3	.000	.000	.000	.000	.000	.000	.814
CI2	.000	.000	.000	.000	.000	.000	.956
CI1	.000	.000	.000	.000	.000	.000	.818
US3	.000	.000	.000	.000	.000	.721	.000
US2	.000	.000	.000	.000	.000	.868	.000
US1	.000	.000	.000	.000	.000	.711	.000
SN	.851	.000	.000	.000	.000	.000	.000
SF	.857	.000	.000	.000	.000	.000	.000
IMAGE	.972	.000	.000	.000	.000	.000	.000
PU	.000	.566	.000	.000	.000	.000	.000
JF	.000	.900	.000	.000	.000	.000	.000
RA	.000	.486	.000	.000	.000	.000	.000





**Model Fit Summary****CMIN**

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	50	436.790	160	.000	2.730
Saturated model	210	.000	0		
Independence model	20	6354.405	190	.000	33.444

**RMR, GFI**

Model	RMR	GFI	AGFI	PGFI
Default model	.039	.951	.942	.796
Saturated model	.000	1.000		
Independence model	.221	.220	.138	.199

**Baseline Comparisons**

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.932	.963	.949	.981	.947
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

**Parsimony-Adjusted Measures**

Model	PRATIO	PNFI	PCFI
Default model	.842	.532	.545
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

**NCP**

Model	NCP	LO 90	HI 90
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Model	NCP	LO 90	HI 90
Default model	2176.790	2024.146	2336.808
Saturated model	.000	.000	.000
Independence model	6164.405	5907.317	6427.835

**FMIN**

Model	FMIN	F0	LO 90	HI 90
Default model	5.857	5.456	5.073	5.857
Saturated model	.000	.000	.000	.000
Independence model	15.926	15.450	14.805	16.110

**RMSEA**

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.045	.178	.191	.000
Independence model	.285	.279	.291	.000

**AIC**

Model	AIC	BCC	BIC	CAIC
Default model	2436.790	2442.346	2636.364	2686.364
Saturated model	420.000	443.333	1258.208	1468.208
Independence model	6394.405	6396.627	6474.234	6494.234

**ECVI**

Model	ECVI	LO 90	HI 90	MECVI
Default model	6.107	5.725	6.508	6.121
Saturated model	1.053	1.053	1.053	1.111
Independence model	16.026	15.382	16.686	16.032

**HOELTER**

	HOELTER	HOELTER
Model	.05	.01
Default model	233	235
Independence model	15	15

**Execution time summary**

Minimization:	.016
Miscellaneous:	.062
Bootstrap:	.000
Total:	.078

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