FACTORS INFLUENCING THE ATTITUDES AND BEHAVIORAL INTENTIONS TO USE JUST WALK OUT TECHNOLOGY (JWOT) AMONG BANGKOK CONSUMERS

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A THESIS SUBMITTED IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF MANAGEMENT
COLLEGE OF MANAGEMENT
MAHIDOL UNIVERSITY
2017

Thesis
entitled

FACTORS INFLUENCING THE ATTITUDES AND BEHAVIORAL INTENTIONS TO USE JUST WALK OUT TECHNOLOGY (JWOT) AMONG BANGKOK CONSUMERS

was submitted to the College of Management, Mahidol University
for the degree of Master of Management
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September 11, 2017

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ACKNOWLEDGEMENTS

This master thesis would not be success without the guidance, help and support from several individuals throughout the research work.

First of all, I would like to express my deepest gratitude to Nathasit Gerdsri, Ph.D., Associate Professor of Technology and Innovation Management, Deputy Dean for Academic Programs and advisor for his precious time, well-round knowledge and invaluable advice, guiding me to complete this work successfully.

I would like to express my appreciation to Mr. Wasan Apinantasap, prior student from innovation program, CMMU, for his recommendation and tirelessly answering the questions on the statistics.

I would like to express my appreciation to Mr. Kittichai Kumar, CMMU librarian for his tirelessly guide about citation technique and bibliography.

I would like to thank my friends (Ms. Chatcharee Methachawalit and Ms. Akenaree Sakulnatee) for their friendship and support to my academic path. Also, thank to all my friends from Experience China Program 2017 at Tsinghua University for inspiration, broaden perspective and friendship.

Lastly, I would like to thank my family for their love, support and encouragement throughout my whole life.

Rin Chuawatcharin

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ABSTRACT

Just Walk Out Technology or JWOT is the latest technology in retail shopping especially in the convenience stores. It provides new shopping experience, convenience and saves user's time. In order to explain the relationship of user's attitudes, external factors and intentions to use JWOT, a survey of 400 respondents from Bangkokians was collected. The research framework is based on the previous empirical studies with TAM constructs and extended factors while the data analysis is conducted through SPSS with multiple regression analysis, independent sample t-test and ANOVA techniques to verify the hypotheses. The result indicates that there are positive relationships between original constructs and social norms. Attitudes play the most critical role in predicting the intention, while perceived usefulness and perceived ease of use also have a notable impact on the attitudes. However, the other extended constructs such as perceived entertainment value, trust, and technology anxiety show no significant effect on the adoption process. Furthermore, the difference of demographic characteristics and shopping habits are found to have the impact towards the JWOT acceptance. As in managerial contribution, this study provides the insight findings in terms of technology acceptance of JWOT among Bangkok consumers and presents the information to retail businesses in the decision to adopt JWOT in Thailand.

KEY WORDS: Technology Acceptance Model / TAM / Just Walk Out Technology / JWOT / Shopping experience

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CHAPTER I
INTRODUCTION

The retail business in Thailand generates a large percentage of GDP each year. According to economic indicators source (Trading Economics, 2017), average retail sales growth YoY in Thailand from 2001-2017 was 6.93 percent. In January of 2017, average growth is 7.5 percent compared to same month in the previous year as shown in Figure 1.1.

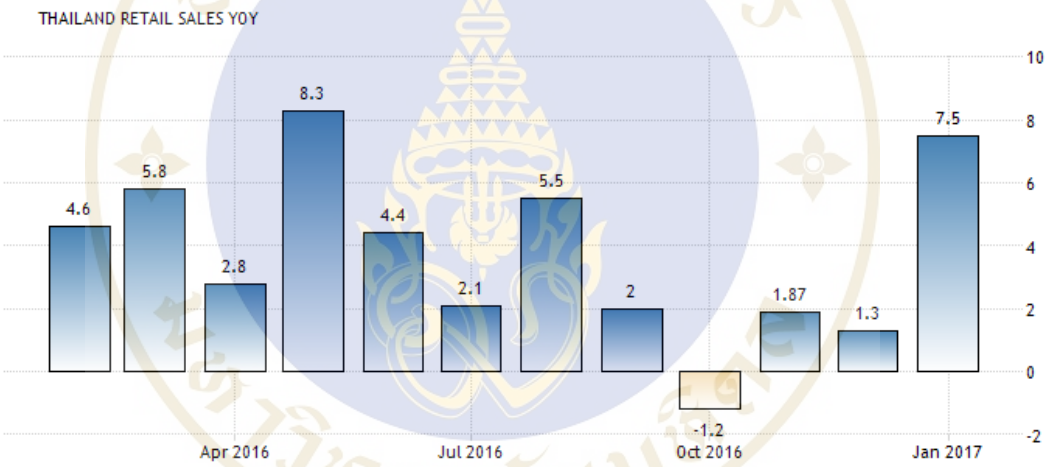

Figure 1.1 Thailand retail sales YoY (trading economics, 2017)

There has also been evolution and change in retail sectors, in which traditional grocery stores were replaced by modern trades and franchise stores. There has been a high growth rate specifically in convenience stores. The evidence lies in the number of new stores opened each year. Convenience stores can now be found in every corner of Bangkok and in major provinces. 7-11, the market leader which has a 70% market share of this sector, opened 710 new stores in 2016 and has 9,542 stores at the end of 2016, ranking Thailand second in term of store branches after Japan. The ratio of a number of convenience stores per citizen also rapidly increased from 64 stores per one million

people in 2005 to 203 stores per one million people in 2015. In addition, many technologies were adopted by retail businesses around the world and in Thailand. This chapter will explain the current situation in the Thai retail business especially in the convenience store sector, the cases of technologies that were adopted for a competitive advantage in the business, the explanation of Just-Walk-Out Technology (JWOT) and the technologies behind.

1.1 Current situation in the Thai retail business

1.1.1 Types of modern trades in Thailand

1.1.2 High competitive challenges in the Thai retail business

1.2 Adoption of the emerging technology into Thai retail business

1.2.1 Virtual stores and the adoption in Thailand

1.2.2 Self-checkout systems (SCS) and the adoption in Thailand

1.3 JWOT, the technology behind it, and how it works

1.1 Current situation in the Thai retail business

In Thailand, there are many types of modern trades that originated and evolved since the introduction of department stores or the incubation period of department stores in the 1960's until boom of foreign hypermarkets in the late 1990's after the economic recession resulted in legal changes that allowed foreign investors to own more than 50% of a company's stock. There were many shifts in the percentage of ownership in foreign retail companies. For instance, Tesco Lotus supermarket from the UK, BigC Supercenter from France.

1.1.1 Types of modern trades in Thailand

Modern trades in Thailand can be divided into 7 categories

1. Super centers or Hyper marts, which are huge retail stores targeting low and middle-class consumers, selling low-cost products. For example, Big C Supercenter or Tesco Lotus.

2. Department stores, which sell various types of products that are pricey and good quality. For example, Central or The Mall.
3. Supermarkets, which mainly sell food and commodities. For example, TOPS.
4. Convenience stores, which are the smallest in term of store area but have the m number of branches and focus on the modern management system. Convenience stores are normally located in highly populated areas. For example, 7-11, Lawson108, Family Mart.
5. Cash and carry, which customers have to be members. Cash and carry sell low-cost goods in bulk. For example, Makro.
6. Specialty Store focuses on selling specific and pricey items. For example, iStore, Watson
7. Category killers which are similar to specialty store except focusing on cheaper items. For example, Officemate, Powerbuy

1.1.2 High competitive challenges in the Thai retail business

According to a study of the retail business in Thailand (Srathongvien, 2010), it revealed that there have been momentum changes in the Thai retail business. The study explained that due to a change in consumer behavior, there was a transformation from traditional local stores to modern franchise retail systems in order to attain a trading advantage. Population in Bangkok increased rapidly due to the migration of people from rural areas looking for jobs, going to school or looking for the trendy city lifestyle. In addition, family size has been shrinking in provincial cities. Households have become smaller with fewer children and elders with more adults and middle-class consumers. At the same time, busy city lifestyles and work time constraints made urban consumers prefer to visit convenience stores or supermarkets near their workplaces or along their commute route. This placed a high demand for ready-to-eat food and imported branded products for those willing to pay for convenience and high-quality items. The compound annual growth rate (CAGR) for retail sales of

convenience stores from 2008-2013 was 12.9% which was faster than any other area in the grocery retail sector such as supermarkets or hyper marts as shown in Figure 1.2.

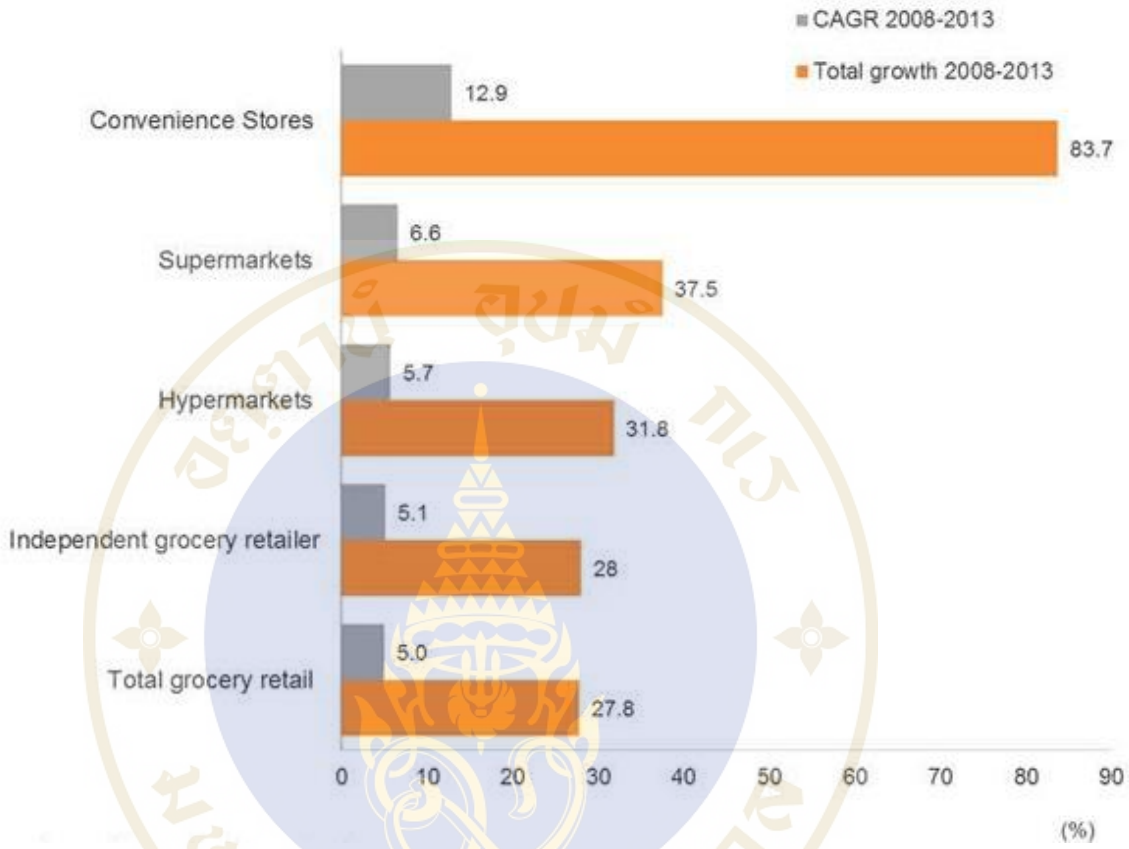

Figure 1.2 Growth of sales in each sector of the Thai retail industry from 2008-2013 (Yuan J., 2015).

Today the Thai retail business faces highly competitive challenges, particularly in the convenience store sector. Each player competes and fights for market share and growth. The market leader, 7-11, ranks first in terms of market share and a total number of branches in Thailand. At the end of 2016, 7-11 has 70% market share of the convenience store sector and 9,542 branches (CP ALL, 2017). These numbers are far greater than other competitors like Lawson108 or Family Mart. Still, this battle to attract customers and gain more market share continues to intensify.

7-11 plans to open new branches and surpass 10,000 stores by the end of 2017. While other competitors are trying their best to narrow the gap, for example, Family Mart aims to have 3,000 stores in the same year and Lawson 108 targets 1,000 stores in 2018.

All business textbooks state that location is the priority for opening any retail business shop. When companies get a good location, the next thing they do is offer products and services that will attract customers. For instance, 7-11 is famous for authentic Thai food, sticky rice and roast chicken, som-tam, mango salad or local fruits which can be hard to find in some areas. On the other hand, Lawson 108, which originated from Japan, targets Japan-loving customers and serves freshly made bento or Japanese baked goods.

These are place and product strategies. What is left in the 4P marketing mix to compete and gain higher market share is promotion and price strategies. Those cute stamps 7-11 cashiers give to customers to collect and redeem for the premium collection of cute mascots or use for a discount is a promotion strategy. Not only stamps, there are also product bundles, buy 2 get 1 campaigns from time to time. In order to compete with 7-11, Lawson108 launched a similar promotion campaign with a discount coupon attached to receipts that customers can use the next time they shop in Lawson 108.

1.2 Adoption of the emerging technology into Thai retail business

Every competitor focuses on all the 4Ps in the marketing mix. But entrepreneurs should always be reminded that customers can easily get bored and any 4P marketing mix can easily be copied by other competitors with adequate financial capital. Entrepreneurs can see the novel and exceptional technology emerging every other day in the world, that they can potentially utilize. Some technologies were

adopted into retail business as a strategy to be superior in product or service and create value for customers, for example, virtual stores and self-checkout systems.

1.2.1 Virtual stores and the adoption in Thailand

In 2009, the first virtual store was introduced in South Korea. Tesco (Homeplus) company in South Korea was the first retail company in the world to install QR code virtual shopping technology to offer a different shopping experience with the concept of 'let the store come to people'. While people are waiting at bus stops or on subway platforms, they able to shop without having to go to stores simply by scanning a QR code shown with a picture of groceries on the subway's or bus station's walls. Then those items will be delivered on the same day. Results showed a 76% increase in the number of customers and a 130% increase in revenue. Not long after that, other retail companies saw opportunities and implemented similar ideas to increase profits. Yihaodian, one of China's top e-commerce websites successfully installed 1,000 virtual stores overnight. John Lewis, a retail company in the United Kingdom, had a 54% increase in the number of customers using click & collect service from a QR code wall window that offered 'Top 30 favorite things for Christmas in 2011', allowing the store to be open 24/7. Likewise, in 2012 a grocery company in Philadelphia, US simplified life for shoppers by implementing QR code technology (Shop2mobi, 2016).

People in South Korea have the longest working hours in the world. Because of this, many South Koreans are too busy to go shopping for groceries. Virtual stores fulfilled the needs of the shopper in South Korea. In addition, higher internet access rates and lower prices for smartphones, made QR code virtual shopping a success, attracting many tech-savvy ultra-busy people who are already spending time waiting for trains or buses.

In Thailand, some retail companies tried employing virtual store technology into their business hoping to create a new shopping experience for their customers. BigC was the first to offer this service in 2012, by installing merchandise billboards

with QR codes attached that were aimed at busy and tech-savvy people commuting on the BTS Skytrain. This was followed by TOPS supermarket under the campaign of 'scan & shop with TOPS', which launched their virtual stores on the 7th floor at Central World and at other branches of Central Department Store around Bangkok. Tesco Lotus Thailand also joined and went further by using QR technology in gamification for a promotional campaign called 'Tesco Lotus Shopping Spree'.

Rapid advances in technology significantly influence the way retailers to offer new customer experiences, stay competitive in the market, earn customer loyalty and make profits in the long run. Some technologies were easily accepted and adopted by users, while some were not. Because of different cultural contexts, entrepreneurs may never be able to make use of some technologies. For Thailand, self-service technologies fall into the latter category.

1.2.2 Self-checkout system (SCS) and the adoption in Thailand

Self-service technologies (SSTs) may be defined as "...technological interfaces that enable customers to produce a service independent of direct service employee involvement (Meuter et al., 2000). Among many different types of SSTs, self-checkout systems (SCS) have become extremely popular in supermarkets around the world. SCS debuted in 1992 in the US. According to a survey conducted by the Food Marketing Institute (NCR, 2014), only six percent of supermarkets in the US offered self-checkout lanes in 1999; however, that share jumped to nearly ninety-five percent in 2007. Since then SCS has also been launched in other countries. Shoppers in Turkey quickly became accustomed to the new system, whereas, in the US, the self-service initially failed (Dabholkar, Bobbitt, & Lee, 2003). A 2014 NCR global study revealed that of the 2,803 consumers surveyed in Australia, France, Germany, Italy, Japan, Russia, Spain, UK, and the US, ninety percent identified themselves as users of self-checkout. Italy and Australia had the highest percentage of consumers who 'always use self-

checkout, with 13% and 9% respectively (NCR, 2014). There are many types of SSTs being used all over the world, however, the core technology is the same. The barcode scanning system can be from either the customers' mobile application or an ATM-like immobile kiosk at the stores' exit. SSTs are considered common by westerners; however, they might not be suitable in all countries.

The first retailer who adopted this technology was TOPS supermarket. Self-checkout machines were installed in selected branches of Central Group department stores around Bangkok. Customers were moderately satisfied. Consumers who were accustomed to using this shopping system abroad had no problems operating the machine, while those who had no previous experience with the system had problems operating the machine. Instead of delivering a convenient and time-saving experience to customers, it was a hindrance and a bad experience for first-time users who were not able to operate the machine smoothly. In addition, there was one blind spot that Thai entrepreneurs might have missed. Thai users often secretly slipped their shopping items into bags without scanning the barcodes, so consumers cheated when the machine could not detect them.

The highly competitive situation in the Thai retail business, especially in the convenience store sector made it important for entrepreneurs to find competitive advantages in order to increase market share and profits. One of the many possibilities is to bring technology into the retail process to deliver more convenience and satisfaction to customers. The challenge for CEO is whether to implement the technology or not. As was shown in the previous cases, there were both successes and failures in customer's acceptance and adoption of the technology. A failure in the adoption of any technology can cost a company large amounts of money, time or human capital invested; and in the worst case, spur customer rejection of the service. Systematic research on the factors that influence consumers' attitudes and behavioral intentions to use the technology with scientifically strong support can reduce risk and assist the CEO in the decision whether or not to invest in the technology.

1.3 JWOT, the technology behind it, and how it works

Amazon Go is the trade name of the store that uses JWOT. Patented in 2013, JWOT or Just Walk Out Technology was described as a system that uses many technologies combined, including RFID to detect when shoppers take an item from the shelves and sync data to their handheld devices (G.L., D., & S., 2013). The customers enter the store using a smartphone embedded with the Amazon Go application and registered with the Amazon account. Then at the store entrance, customers will use their smartphones to scan the QR reader for a check-in scan, sending the signal to the information system of the store to verify their identities. While they walk around the store, the GPS-based location service sends the information to the main system. When customers pick up goods, three technologies consisting of computer vision, sensor fusion, and deep learning algorithm will work together to increase the reliability and accuracy of the results and determine the items that customers picked up. The items are then automatically added to the virtual cart. When customers finish their shopping, they just walk out, pass through the same exit gate that they entered without having to wait in a line or be delayed by dealing with a cashier. The system will automatically charge the fee to the items and the electronic bill will be sent to the shopper's smartphone instantly.

In the promotional video presented by Amazon, a shopper strolled into the store, grabbed a sandwich, and walked out of the store within 10 seconds; the transaction and transfer of the item to the new owner completed. This could be an interesting innovation for retail businesses in the near future. It could encourage people to shop easier and more conveniently, and there would be no need to wait in a line for a cashier or hassle with notes and coins.

The benefits of adopting JWOT for convenience store businesses are convenience - being free from the checkout process - and a new customer experience, which can lead to customer satisfaction and expand the market share. On the other hand, entrepreneurs get the advantage of cost reduction both in terms of cashier staff

and physical check out areas. (PwC, 2017) has data that it took around 2-3% of labor costs in the checkout process from the total revenue and 10% of the physical space of the store for the checkout areas. Entrepreneurs can utilize these staff members for better customer service and replace the check out spaces with more shelves for merchandise. All in all, entrepreneurs would be able to attain cost advantage and set lower prices to compete with other stores.

The first Amazon Go store was launched as a prototype in Seattle at the end of 2016 and was limited to Amazon employees only. It scheduled to open to the public the following year and its target was 2,000 branches by the end of 2017. Although the previous patent documents referred to the RFID technology, Amazon said that it was not implemented in the stores. Amazon did not reveal any further details on the technology being used in the stores; only the information is given on the official website.

While JWOT is still new and cryptic and since there are no other academic publications which grant this technology an agreeable name besides its trade name, it is only a matter of time before Thai retail entrepreneurs will be faced with the question of whether or not this technology is worth employing in Thailand. In order to do that, they need to understand variables that influence the adoption of this technology. Furthermore, they need to know what needs to be adjusted before applying JWOT in Thailand, so it could result in them having a real competitive advantage, enhancing customer satisfaction, as well as a sustainable high market share and profit.

JWOT will be suitable and practical for adoption into convenience stores only; not other retail business stores such as supermarkets or department stores because of two reasons.

a) The main objective of convenience and customer satisfaction will be maximized in convenience stores only.
b) The current cost of technology required to invest will be too high in supermarkets or department stores.

CHAPTER II
LITERATURE REVIEW

2.1 Evolution of check out system

Many technologies were brought into retail businesses to change the way customers pay for goods. Traditional POS (point of sale) counters were replaced by new technologies. Many companies in retail businesses replaced transaction processes from the traditional way with mobile payment technologies such as Apple Pay and Samsung Pay that need to be used by electronic equipment e.g., tablets or mobile phones (Nallapureddy et al.). The main problem of checkout systems is in data capturing (scanning) and identification, which are often referred to as Automatic Identification Data Capture (AIDC). Barcode systems were adopted successfully around 40 years ago and became a major revolution that gave impact to AIDC. Barcodes were followed in the early 2000's by a self-checkout system that enabled faster speed and convenience. Disruptive changes in the near future that can be both an opportunity or a challenge to the retail industry, is RFID technology. See the evolution of check out in Figure. 2.1.

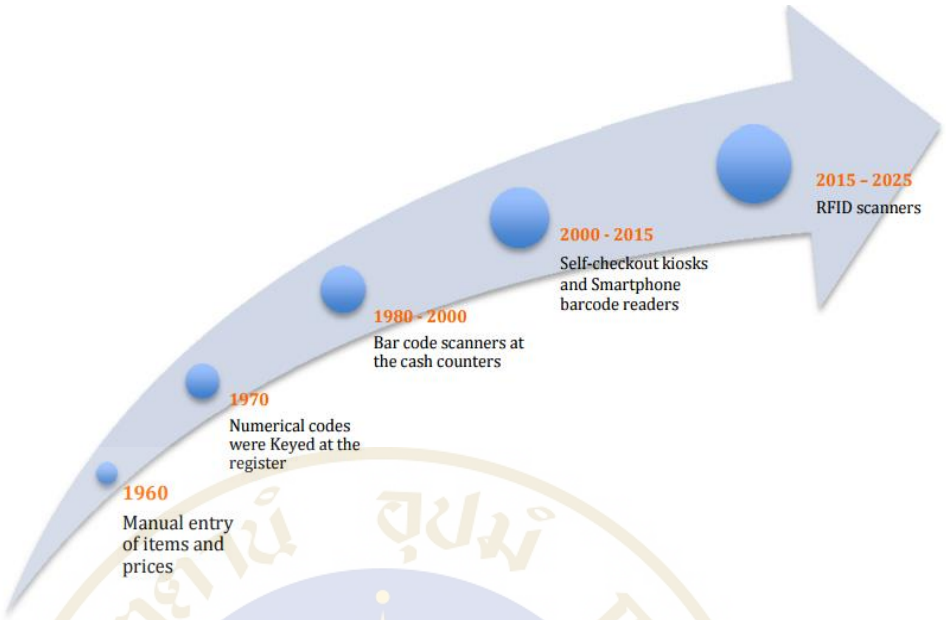

Figure 2.1 Evolution of checkout (Nallapureddy et al.)

One of the many technologies that can potentially create a disruption in convenience or grocery stores is the 'Just Walk Out Technology' that belongs to Amazon. Although Toshiba revealed a similar combining technology of 3Ds and facial recognition in NRF (National Retail Federation), a big show in New York in 2015, it seems to be in a testing period, not commercially announced yet, while Amazon went ahead and already launched the first prototype store that uses similar technology. In this regard, we can call Amazon a first-mover in this technology.

In order to explain and investigate JWOT's acceptance by Thai consumers, a framework will be developed to outline methods and the examination of the acceptance process. There are many theories that could be utilized; one of them, Technology Acceptance Model or TAM, is most suitable and appropriate for this study. The reason this study uses TAM is that it was widely used and accepted as a good and reliable model to study technology adoption in many previous studies. Before the explanation of TAM, there will be a discussion of the Theory of Reasoned Action (TRA), which is a human psychology theory that is the concept that TAM was based on. Moreover, e-TAM, which adds the hedonic function into the original TAM, considered the utilitarian function of technology only. Thus, it is suitable to the study

in web site-based technology and appropriate to take into consideration of the study of JWOT adoption. Furthermore, there will be a discussion of the studies that used the extended version of TAM, which have some variables that can be related to the JWOT study. Then, there will be literature review in previous studies that used TAM to analyze the adoption of JWOT-related technologies, such as virtual stores and self-service technology (SST).

2.2 Technology acceptance analysis

2.2.1 TRA

2.2.2 TAM

2.2.3 eTAM

2.2.4 Other extended TAM

2.3 Previous studies that use extended TAM to explain the adoption of technology similar to JWOT such as virtual stores, self-checkout systems (SCS)

2.3.1 Virtual store adoption studies

2.3.2 SSTs adoption studies

2.2 TAM

One of the most influential and widely used theories for the prediction and the explanation of user's behavior and the actual use of the system is the Technology Acceptance Model (TAM), which was proposed the first time by (Davis, Bagozzi, & Warshaw, 1989).

2.2.1 TRA

TAM is based on the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975). TRA is one of the social psychology theories that was occasionally used as the basic principle to study the human behavior. TRA explained the relationship between attitudes, beliefs and human behaviors. It suggested that the individual's attitude towards behavior is an important motivator of social behavior. TRA also explained that

the change in the human behavior is a result of the change in belief and that a person will behave according to the belief in the outcome of his/her behavior and the evaluation of the value of each of those outcomes.

2.2.2 TAM

TAM was developed by Davis (Davis et al., 1989), who proposed two important variables which are perceived usefulness and perceived ease of use. Perceived usefulness refers to "the degree to which an individual believes that using a particular system would enhance his/her job performance." Perceived ease of use refers to "the degree to which an individual believes that using a particular system would be free of physical and mental efforts." Based on TRA, TAM suggested that the individual's belief determined the attitude towards using the system, and the attitude leads to behavioral intention to use. As a result, the intention influences the decision of actual usage as original TAM in Figure 2.2.

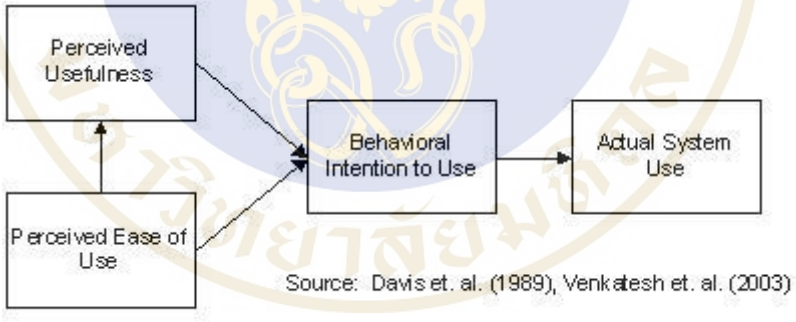

Figure 2.2 Technology acceptance model (Davis et al., 1989)

2.2.3 e-TAM

The following studies have applied other factors into the original TAM to study the acceptance of technology, information systems, and services. Another adapted version of TAM is the e-TAM framework, which is suitable for the website context (Van der Heijden, 2000). While perceived usefulness and perceived entertainment have a strong influence on the intention to revisit the websites, perceived

ease of use indirectly affects the intention to revisit the website, by influencing the perceived relative usefulness and perceived relative enjoyment. The e-TAM model not only supports the presence of utilitarian, but also hedonic motivations for online shopping (Childer, Carr, Ped, & Carson, 2001). Enjoyment is another factor that is also being added in studies of adoption of specific word processing and graphic programs (Davis, Bagozzi, & Warshaw, 1992), and in microcomputer usage.

2.2.4 Other extended TAM

Various studies have used extended TAM for predicting the relevant factors that influence the related JWOT adoption. Some research studies mentioned entertainment value as one of the many factors that affected the adoption process. They were included and examined in several types of technologies, including sensory-enabling technology (Kim & Forsythe, 2008), virtual try-on for online apparel shopping (Kim & Forsythe, 2008) virtual stores in Korea (Oh et al., 2009). The first and second cases used entertainment in their studies, except the last study, which applied entertainment in terms of playfulness. However, the author defined 'Playfulness' as individual's aspect to the level that "using the products or a service is perceived enjoyable in its own right, apart from any performance consequence that may be anticipated." The hedonic use of technology can be replaced with entertainment value, which plays an important role in online shopping

Some studies not only employed user-dependent variables, but also other external factors like internet availability - that might impact the adoption process in the online retail shopping businesses (Pavel & Rjagopal, 2015) and social influence which reported strong support of influence by subjective norms to the consumer's attitude in the adoption process of mobile services (Gerhardt, Oliver, & W., 2010). Amongst various literature about adoption, individual difference such as innovativeness and technology anxiety were also proposed. (Meuter et al., 2000; Mortimer, Neale, Hasan, & Dunphy, 2015)

2.3 Previous studies that use extended TAM to explain the adoption of similar JWOT such as virtual stores and self-check out systems (SCS)

2.3.1 Virtual stores adoption studies

Consumer adoption of virtual stores in the retail businesses that was previously mentioned in this paper's first chapter was studied in Korea by extended TAM (Oh et al., 2009). It can be used as reference technology to JWOT. Similarities in the QR code virtual store technology and JWOT are customer experience enhancers, the coordination of online-offline shopping experiences, convenience impact and types of goods shopped in the groceries category. The differences are that JWOT enables customers to touch and see the products before the buying process - which can be linked to the capability of self-checking expiry dates and browse nutrition facts – and in addition, customers of JWOT get the items promptly. On the other hand, virtual shoppers are not able to see and touch real products before transactions are over, and until the product they bought is delivered to them later on the same day, unlike JWOT which is immediate. Since JWOT is novel and not yet examined by any empirical studies, the QR code virtual adoption studies will be used as a reference for JWOT adoption behavior. A research about virtual store adoption (Oh et al., 2009) employed a more extended version of TAM to better comprehend the virtual store acceptance. The model addressed the further variables of the original TAM, which are individual-dependent variables, i.e. playfulness and trust; and external variables, i.e. information richness and system quality. TAM framework of this study was shown in figure 2.3.

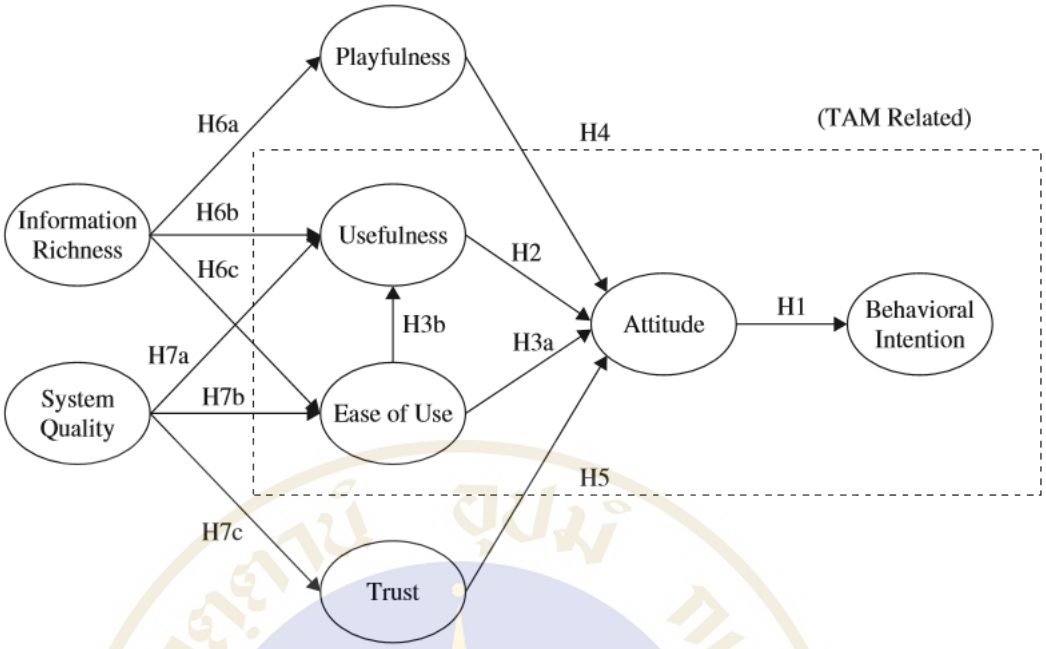

Figure 2.3 TAM framework in the virtual store adoption study (Oh et al., 2009)

The results show that despite the lack of effect of ease of use on usefulness, the lack of effect of system quality on trust, and the lack of effect of information richness on ease of use; customers' positive perception of virtual stores in terms of playfulness, trust, ease of use and usefulness have a significant positive influence on customers' attitudes. Moreover, results show that information richness determined playfulness and perceived usefulness, while system quality also contributed to perceived usefulness and perceived ease of use. The study recommended using these influential factors on the consumers' behavioral intention, to develop strategic plans for promoting the usage of virtual stores. For instance, as trust plays an important role in the attitudes of users, virtual stores should increase customers' trust in their handling of financial and personal information by shifting some controls over this information to customers and limiting the secondary use of this data. Another recommendation is implementing various kinds of communication channels to improve the information richness. These various kinds of communication channels can demonstrate product features, substituting for the lack of a physical experience. Also, applying a user-friendly interface to improve the ease of use and to reduce customer frustration, and

implementing many usability tests before actual use of products to improve systems quality will encourage customers to use virtual stores.

2.3.2 SSTs adoption studies

Another comparable technology to JWOT is a self-checkout system (SCS), which is one of the SST that was adopted by retail shopping. SCS is similar to JWOT in terms of business's cost cutting, convenience, benefits to retail shopping and the enhancement of the customer experience. There were many studies conducted on SST adoption, in which some were not modeled after TAM.(Orel & Kara, 2014) used SSTQUAL scale and seven dimensions that were proven to be suitable for the SSTs assessment (J.-S. C. Lin & Hsieh, 2011)

Many SST acceptance studies used a non-TAM framework. The UTAUT (Jia, Wang, Ge, Shi, & Yao, 2012), which included the individual differences (e.g., demographics and psychographics) that proposed to have an impact on user acceptance. Another study, the innovation diffusion theory (IDT) consisting of five major innovation characteristics (Rogers, 2003) and exclusively focusing on technology-related elements. Furthermore, in order to add weight and aid in determining important similarities or differences that drive and justify each conceptual development, a meta-analysis (Blut, Wang, & Schoefer, 2016) was conducted from 96 previous empirical studies representing 117 independent customer samples with a cumulative sample size of 103,729 respondents. The study revealed the difference between these various theories-based studies that, while UTAUT and IDT propose all determinants that impact technology adoption directly, TAM distinguishes between direct and indirect influences and proposes mediation mechanisms. Moreover, as seen in Table. 2.1, while only technology-based determinants (e.g., compatibility, Image, result demonstrability) appeared in IDT studies, demographic (e.g., age, gender) and psychographic (e.g, enjoyment, anxiety) were included besides technology-based components in TAM and UTAUT studies.

Another notification was about the similarity of these theories that some constructs were conceptually very alike, those overlaps help in pointing out the critical importance of these factors. There are also differences in cultural context, a study by (Mortimer et al., 2015) found that a model used in the SST intention to use evaluation does not work across two countries, Australia and Thailand. In other words, we need more comprehensive data sets that are found in the meta-analysis. Some studies revealed evidence for an empirical direct relationship between gender and SST acceptance (Meuter et al., 2000) that men are generally more interested in technology than women. However, the results show insignificant and weak impact from individual differences (E.g., age, gender) on adoption. They were not reliable predictors of SST acceptance and better used as control/moderator variables in the case of UTAUT. The meta-analysis framework that incorporated TAM, UTAUT and other theories as both direct and indirect impact on behavioral intention to use are presented in Figure 2.4.

Table. 2.1 Constructs definition and theoretical roots in SSTs meta-analysis study

			Theoretical Roots		
Category	Construct	Definition	TAM	UTAUT	Other
Outcomes	Usage behavior	Actual system use in the context of technology acceptance (Davis, Bagozzi, and Warshaw 1989)	x	x	x(IDT)
	Usage intention	The strength of one's intention to perform a specified behavior (e.g., using an SST; Davis, Bagozzi, and Warshaw 1989)	x	x	
Mediators	Attitude toward using	An individual's positive or negative feelings (evaluative affect) about performing the targeted behavior (Venkatesh et al. 2003)	x		
	Usefulness	The subjective probability that using a technology would improve the way a user could complete a given task (Davis, Bagozzi, and Warshaw 1989)	x	x(performance expectancy)	x(IDT; relative advantage)
	Ease of use	The degree to which a user would find the use of a technology to be free from effort (Davis, Bagozzi, and Warshaw 1989)	x	x(effort expectancy)	x(IDT; complexity)
Determinants	Subjective norm	A person's perception that most people who are important to him or her think he or she should or should not perform the behavior in question (Venkatesh et al. 2003)	x	x(social influence)	
	External control	The degree to which an individual believes that organizational and technical resources exist to support the use of the system (Venkatesh et al. 2003)	x	x(facilitating conditions)	
	Enjoyment	The extent to which the activity of using a specific system is perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use (Venkatesh 2000)	x	x(hedonic motivation)	
	Image	The degree to which an individual perceives that use of an innovation will enhance his or her status in his or her social system (Moore and Benbasat 1991)	x		x(IDT)
	Result demonstrability	The degree to which an individual believes that the results of using a system are tangible, observable, and communicable (Moore and Benbasat 1991)	x		x(IDT; observability)
	Self-efficacy	The degree to which an individual believes that he or she has the ability to perform a specific task/job using the computer (Venkatesh 2000)	x		
	Anxiety	The degree of an individual's apprehension, or even fear, when he or she is faced with the possibility of using computers (Venkatesh 2000)	x		
	Computer playfulness	The degree of cognitive spontaneity in microcomputer interactions (Venkatesh 2000)	x		
	Habit	The extent to which people tend to carry out behavior (e.g., using SSTs) automatically because of learning (Venkatesh, Thong, and Xu 2012)		x	
	Age	Customer age		x	
	Gender	Customer gender		x	
	Experience	A customer's prior experience using technology in general (Meuter et al. 2005)		x	
	Compatibility	The degree to which an innovation is perceived as being consistent with existing values, needs, and experiences of potential adopters (Moore and Benbasat 1991)			x(IDT)
	Trialability	The degree to which an innovation may be experimented with before adoption (Moore and Benbasat 1991)			x(IDT)
	Risk	Customer concerns about security, system failure, reliability, and other personal, psychological, or financial risks associated with using technology (Walker et al. 2002)			x(SST)
	Technology readiness	People's propensity to embrace and use new technologies to accomplish goals in home life and at work (Parasuraman and Colby 2015)			x(SST)
	Need for interaction	The desire to retain personal contact with others (particularly frontline service employees) during a service encounter (Dabholkar 1996)			x(SST)

Note. SST represents constructs outside TAM, UTAUT, and IDT, but relevant in SST research. Constructs in brackets are synonyms in respective theories. UTAUT = unified theory of acceptance and use of technology; SSTs = self-service technologies; IDT = innovation diffusion theory; TAM = technology acceptance model.

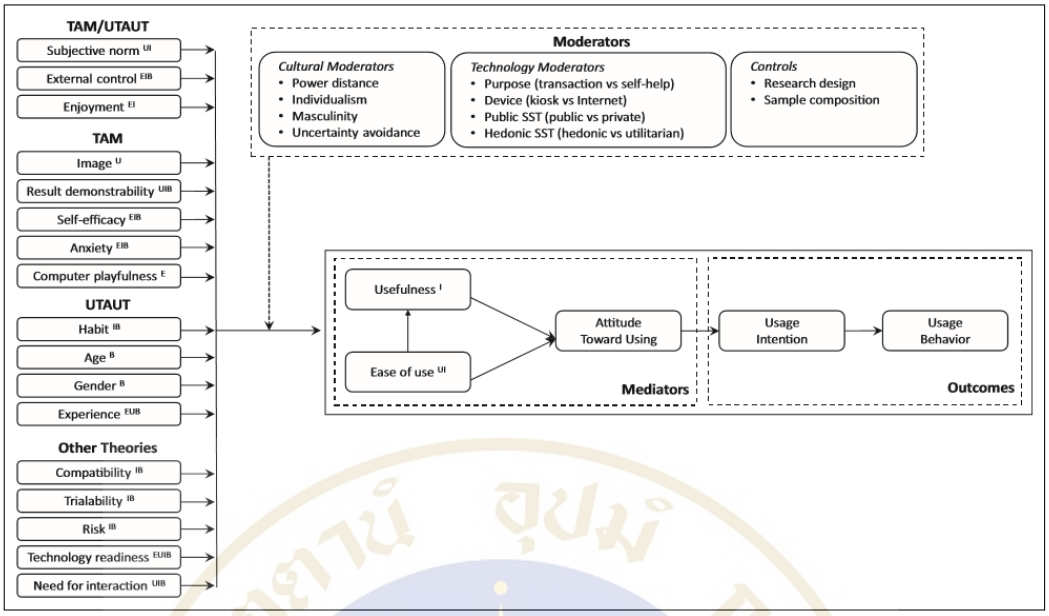

Figure 2.4 Self-service technology acceptance meta-analysis framework.

(Blut et al., 2016)

A number of studies suggested the different scales and dimensions measure, but all focused more on the system quality than TAM-based studies. These studies presented various points of view in research with factors that impact SCS acceptance behavior. Most included system attributes as factors to evaluate i.e., functionality, assurance, reliability, efficacy, and security. The objective of the studies was to address the quality of the system and relate to customer satisfaction and customer loyalty. On the other hand, TAM-based studies focused more on the individual dependent factors and attempted to find the causal relationship to user's intention to use. Overall, the results from both methods are used in similar ways, which are to understand the influential factors in technology acceptance and to find strategies to complement and adjust the system attributes that can increase customer usage and satisfaction.

The results from the meta-analysis on the SSTs acceptance study (Blut et al., 2016) show that the most influential variables are usefulness, ease of use, subjective norm, enjoyment, self-efficacy, compatibility, trialability, and technology readiness.

TAM is more suitable for the study of the JWOT adoption because the literature about information systems used TAM as a tool for explaining and predicting user acceptance (Davis et al., 1989; C.-H. Lin, Shih, & Sher, 2007). Since Davis proposed TAM in 1984, there have been various studies that proved that TAM was useful in determining factors, and the relationship between customer' attitude and behavioral intention towards the usage of the technology. TAM served as a solid conceptual framework for numerous technology acceptance studies. It has been widely accepted as a powerful research framework. In addition, Van der Heijden (Van der Heijden, 2000) extended the original TAM to be more applicable to web site context, called e-TAM, which acknowledged the presence of both utilitarian and hedonic motivations in online shopping. e-TAM was used to assess online retail shopping, because it reflects both functional (usefulness) and hedonic (entertainment) motivation that can explain online shopping better. (Childer et al., 2001)Diffusion of Innovation Theory by (Rogers, 2003)proposed that users will adopt a new technology only if they perceived benefit from actual usage. Studies of technology adoption with TAM-based theory showed that perception of technology attributes like a relative advantage (e.g. usefulness, entertainment value), the complexity of the technology (ease of use); and user difference (e.g. innovativeness, technology anxiety) can predict the adoption behavior. In this regards the perceived relative advantage of the JWOT on increasing the entertainment value of retail shopping, usefulness, perceived complexity, and technological anxiety of retail shoppers tend to impact the determination of JWOT adoption in Thailand.

CHAPTER III
RESEARCH METHODOLOGY

JWOT, the emerging technology applied to brick-and-mortar grocery stores by Amazon. JWOT seems to be promising to bring a new shopping experience and convenience to shoppers. Due to high competition in retail businesses, especially in convenience store sector; business in Thailand can expand market share and gain a competitive advantage by utilizing JWOT. This study aids in the decision to apply JWOT to convenience stores in Thailand by applying a TAM-based theory to determine and explain the important factors that influence shopper attitudes and behavioral intention to use JWOT in convenience stores in Bangkok. This chapter mainly focuses on the methodological discussion. The previous empirical study research is used to develop the research and measurement of this study. The conclusion is conducted by the report of the data collection and data screening.

3.1 Research objective

This study's objective is to find the important factors that have an influence on the attitudes and the behavioral intentions. Also, to explain the relationship between those factors towards the attitudes and the behavioral intention to use JWOT in Thai consumers.

3.2Research questions

There are 3 research questions.

3.2.1 What are the important variables that influence Thai consumer's attitudes and behavioral intentions to use JWOT?

3.2.2 How do we explain the relationship between those variables, the consumer attitude and the behavioral intention to use JWOT?

3.2.3 What do Thai retail entrepreneurs need to know to develop their business models, services or products for the successful adoption of JWOT in Thailand?

3.3 TAM framework to explain JWOT adoption in Thailand

JWOT are composed of artificial intelligence systems, deep learning algorithms combined with sensor fusion and image recognition, all technologies installed in the store's system. The need for interaction with consumers with JWOT is quite similar to mobile shopping in some contexts. There is the requirement of customers possessing the smartphones, the familiarity on the operation of the mobile application and a certain amount of trust in the online payment system. Considering that the number of smartphones subscriptions is rising each year, Ericsson mobility estimated that the number of smartphone subscriptions in Thailand will almost double from 40 million in 2015 to approximately 80 million by 2021. Moreover, the lower retail price of smartphones makes them more affordable to low-income consumers.

Furthermore, there was a report about the time consumption of the smartphones that consumers spent 4.2 hours per day which is significantly higher than other electronic devices, 1.5 hours on computers and 2.6 hours on television (Yozzo, 2016). For more detail on the 4.2 hours per day, communication was the most popular activity with 94 minutes, application use came in next place with 62 minutes or around a quarter of the total time spent on smartphones every day. The current high-speed broadband internet infrastructure in Thailand nowadays is able to facilitate large amounts of data transfer at a higher speed. This allows customers to shop online and make online payments smoothly. All reports above lead to the conclusion that Thai consumers spend a lot of time every day on their smartphones, these consumers are familiar with the application usage, and the number of smartphone subscriptions will continue to rise in the future. All of this contributes to the ease of adoption of JWOT in conveniences stores. The factors of the number of smartphones possession and familiarity in application usage won't be put in the extended model of this study.

One of the many factors mentioned in the previous paragraph is consumer trust in financial confidentiality because there have been many swindle and fraud cases by online criminals, who make use of banks' weak regulations to illegally extract the money from online banking transactions. A lack of trust may have a negative impact on attitude and behavioral intention to use. Because JWOT uses online payment that deducts money from a bank or credit card account through smartphones. With many fraud and swindle cases in Thailand lately, trust is predictably one of the important factors that have an influence on the adoption of JWOT.

Another factor related to trust that may play part in determining of the adoption of JWOT is a concern for privacy. Due to the image recognition and the sensor fusion technology in JWOT may postulate some anxiety or disturbance to consumers. For example, the consumers may not want to be captured or recorded at shops or spotted buying something. However, this privacy issue might not be highly aware or strictly regulate as in other western countries. Also, the idea of face recognition or being recorded is quite usual today that people view as a common thing. When the individual

exposed in the public places, it is almost unavoidable not to be recorded in any CCTV, car cameras or surveillance cameras installed in buildings, stores, or places. JWOT is no different. It places cameras on shelves for the accuracy of the item and the person identification.

Other factors that come into consideration are technology anxiety and social norms. Technology anxiety is fear people feel when thinking about using the unfamiliar technology-related devices. It links uneasiness and reluctant attitude toward that technology, which can instigate the avoidance of the actual usage in that technology-related activities. One of many cases that occurred in Thailand is the self-checkout system (SCS). Self-checkout kiosks were primarily installed by TOPS supermarket in the expectation of retail companies that it could reduce the customer queuing time and deliver the convenience in the checkout process. Nevertheless, due to the main population of the customer unfamiliarity to this new system, it adversely becomes the hindrance and the frustration, after that news traveled through the social media and the online communities. Other people who primarily keened on SCS, were informed of the failure cases. Finally, not only the failure-experienced users but also new users are implanted with technology anxiety toward SCS and hold a negative impact on reluctance behavior to use SCS. Thus, this study on adoption of JWOT shall also include technology anxiety as a factor that presumably impacts the attitude and the behavioral intention to use.

Social norms, which has already mentioned beforehand, can be seen through the case of the SCS adoption failure. In which people believe in the technology depend on social norms or major population's opinions. Thai culture is more inclined to be collectivism. Whereas individualism culture makes people prefer to act independently, placing high personal goals, motivations, and desire above the others, thus, the person's attitudes and behaviors are intensely propelled by individual preference and less by group needs; collectivism culture make people prefer to act depending on group behavior and being conformity-oriented (Geyskens, Steenkamp, & Kumar, 2006). The study stated that individualism is more to be found in western countries due

to the linkage to culture, people's value, and perspective. On the contrary, Asian countries naturally possess more of collectivism characteristics, which is related to education, tradition, and value people hold. Hence, it is likely that adoption of JWOT in Thailand will be influenced by subjective norms.

Original TAM is a compound of usefulness, ease of use factors, which impact attitude and contribute to behavioral intention to use. Last factors that will be included in the extended version of TAM on this study is entertainment value. The Keystone of implementing JWOT in the convenience store is for customer experience enhancer. In the prospect that customers will enjoy a new experience in grocery shopping from using JWOT, and from entertainment value can lead to good attitude and intention to use this technology. Entertainment value factor was mentioned in a number of studies in online shopping. (Childer et al., 2001; Davis et al., 1992). Given that many studies proved that hedonic use of the internet has an important impact on online shopping.

3.4 Hypotheses

With literature review on TAM and related studies, it was expected that the general causalities found in TAM are also applicable to JWOT context. In this regard, this study suggests the following hypotheses and extended TAM framework.

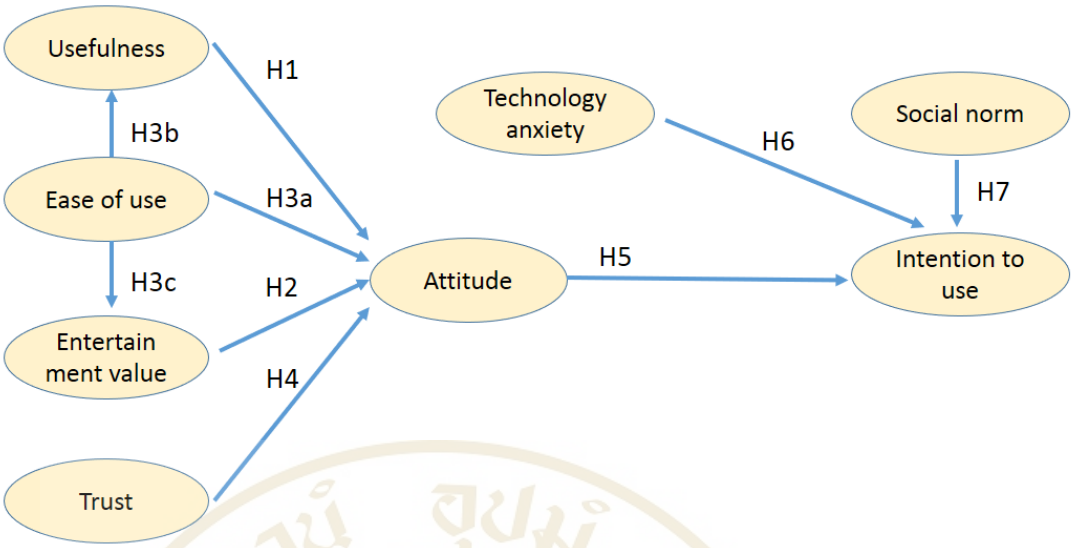

Figure 3.1 Extended TAM model for JWOT adoption in Thailand

H1: Perceived usefulness of JWOT will have a positive impact on attitude towards using JWOT in Thailand.

Some of the main advantages of SCS to customers are speed and convenience. Because customers can self-checkout easily with no need to wait in line for limited employee-based cashiers. This contributed to customer satisfaction and good shopping experience.(Orel & Kara, 2014) Similarly, JWOT able to deliver similar advantages to customers like SCSs. Waiting in line for checkout process can be time-consuming and frustrating for many customers especially nowadays that city lifestyle is busy and wasting time is not favorable. Therefore, JWOT will be technically useful to provide convenience and speed that can have a positive influence on attitude to use.

H2: Perceived entertainment value of JWOT will have a positive impact on attitude towards using JWOT in Thailand.

Many research had empirical evidence that entertainment value was the important factor that has a positive impact on the customer's attitude towards using that technology. Not only in the traditional shopping, but also in online shopping (Childer et al., 2001; Hoffman & Novak, 1996). JWOT give a future image of people

walk into the store, shop, and simply walk out of the store with a full shopping cart that automatically paid. Shoppers using JWOT receive the online-offline new shopping experience. Customers able to enjoy brick-and-mortar shopping that operates with the online system data transfer and the technology to detect and identify the items, then it can complete the transaction without having to wait in line for checkout.

H3a: Perceived ease of use of JWOT will have a positive impact on attitudes towards using JWOT in Thailand.

According to many previous studies, ease of use is the important factor that use to explain the attitude towards technology-based self-services (Dabholkar et al., 2003; Davis et al., 1992; Van der Heijden, 2000). A study by (Rogers, 2003) revealed that complexity is the antithesis of ease of use, it decreases an individual's willingness to adopt the systems. However, the direct influence of ease of use on the attitude is inconsistent in some studies. It was an irrelevance in the study of virtual try-on technology for online apparel shopping (Kim & Forsythe, 2008). but the ease of use is empirically supported to have a positive influence on consumer adoption of the virtual store in Korea (Oh et al., 2009). Thus, it is interesting to find out if ease of use in JWOT has a positive influence on attitude towards JWOT. Customers interaction with JWOT involves simpler process than traditional shopping. The customers only one-time register and choose their payment method which enables them to shop any other times by scanning QR code in their smartphones at the store entrance and exit.

H3b: Perceived ease of use of JWOT will have a positive impact on the perceived usefulness of JWOT in Thailand.

Based on the Theory of Reasoned Action (TRA), TAM proposes that when customers perceived a technology as simple to use, they are more likely to use it (Katja & Sattler, 2014). TAM also argues that ease of use is a direct determinant of usefulness. Because the less effort a technology requires, the more likely that use of

technology will increase the task performance. Presumably, ease of use in JWOT which there are not many necessaries to change in behavior or need to learn a complex method to pursue shopping activities with JWOT can influence consumer's perceived of usefulness in technology.

H3c: Perceived ease of use of JWOT will have a positive impact on the perceived entertainment value of JWOT in Thailand.

Research has confirmed that perceived complexity as in opposite to ease of use, was negatively correlated with perceived entertainment (Igbaria, Parasuraman, & Baroudi, 1996). While many research using TAM found inconsistent results regarding the direct impact of ease of use on the attitude, most studies shown the indirect impact of perceived ease of use on the attitude, mediated through entertainment and usefulness. Therefore, this study will test the hypothesis of indirect influence in perceived ease of use of JWOT to a positive attitude toward using through entertainment value construct.

H4: Perceived trust of JWOT will have a positive impact on attitude towards using JWOT in Thailand.

The determinants of trust are found to be honesty and responsibility from the other part, ethics and expertise, and mutual order disclosure (Crosby, Evans, & Cowles, 1990). JWOT involved with trust in transaction process when customers walk out of the store, the Internet-based transactions are made, and electronic receipts are sent to customers. In online shopping that have the Internet-based transactions, customers face varying degrees of uncertainty. Trust is formed when customers believe that entity of shopping system is reliable. Customers who are skeptical about the use of online payment may not feel comfortable using JWOT. This can deviate or cancel their purchase decisions. Trust was mentioned as one of many factors to take into account of assessment in the adoption process in order to improve virtual shopping and able to

provide cost effective quality retail service experience to customers. Many studies agreed that trust is the major important variable in online shopping and have a positive influence on purchasing through online shopping (Ha & Leslie, 2004; Ling, Chai, & Piew, 2010; Pavel & Rjagopal, 2015). Similar results clearly demonstrated in the adoption of virtual stores in Korea, that trust significantly influence consumer's attitude. (Oh et al., 2009)

H5: Attitude towards using JWOT will have a positive impact on behavioral intention to use JWOT in Thailand.

The Theory of Reasoned Action, on which TAM is based on, proposed that the more positive the attitude towards performing a behavior, the more likely an individual is to perform the behavior (Fishbein & Ajzen, 1975). Other literature also suggests that an individual's attitude towards using a novel technology influences adoption of that innovation (Rogers, 2003). Consumers who possess favorable attitudes towards online shopping tend to carry on through the final transactions (Pavel & Rjagopal, 2015).

H6: Consumer's technology anxiety will have a negative impact on behavioral intention to use JWOT in Thailand.

Roger (1995) suggested that people are more likely to adopt a novel technology that they feel comfortable. And consumers are strongly influenced by their perceived own ability to perform that behavior (Fishbein & Ajzen, 1975). Technology anxiety is the fear and apprehension people feel when thinking about or actually using technology-related equipment(Meuter et al., 2000). Consumers may avoid using new technology they are not comfortable with, even when they see benefits. According to SSTs literature, users with higher levels of technology anxiety use fewer SSTs and that technology anxiety is a strong predictor of SSTs usage.

H7: subjective norm will have a positive impact on behavioral intention to use JWOT in Thailand.

TAM argued that subjective norm has a direct effect on usage intention. The reason behind this concept is that people may intend to perform the behavior, even if they are not favorable or motivate towards the behavior or its consequences because they believe that one or more influential referent individuals approve of that behavior. Moreover, TAM also suggests that when the important referents communicate a belief in SST usefulness, people can change their own beliefs in agreement. A study reported a strong incidence of subjective norms in consumer's attitude to adopt mobile services.

H8: The differences in demographic characteristics have the impact on the adoption of JWOT.

After testing the relationship of each variable to find the explanation of the proposed research framework from hypothesis1 to hypothesis7, there will be the difference of these variables' results between each group in term of demographic characteristics such as age, gender, education level, salary. The results of finding the impact of demographic characteristics set as independent factors toward each variable set as dependent variables may provide the meaningful information that contributes to managerial implication.

H9: The difference in shopping habit and smart card experience have the impact on the adoption of JWOT.

The other independent variables that can be applied to find managerial insight are related to JWOT in context of shopping habit and smart card experience (i.e., the most frequently visited stores, improve issue in convenience stores, the frequency of the visit to the stores near BTS/MRT/ARL, smart card familiarity. This shopping habit and smart card experience are set as independent variables to find the difference of their impact toward each variable in this research framework.

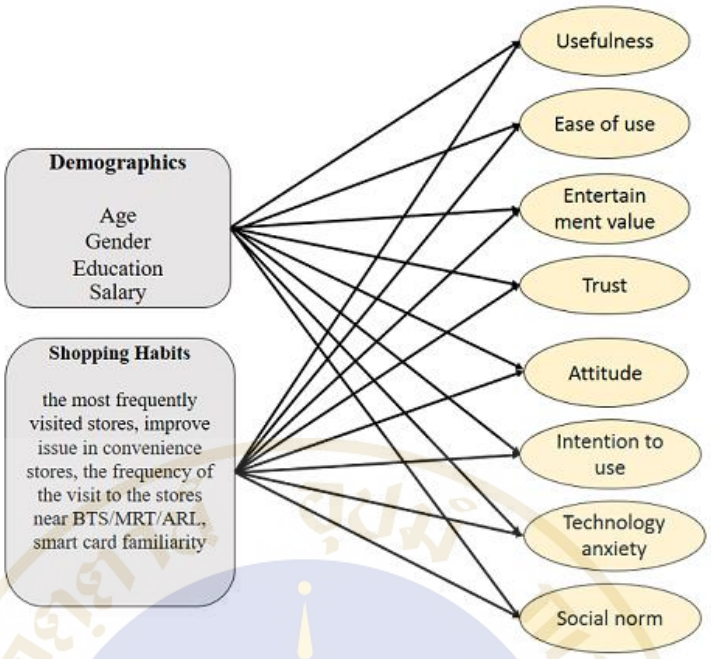

Figure. 3.2 Demographic characteristics and shopping habits set as the independent factors

3.5 Analytical approach

Research model is examined by using multiple regression analysis, independent-sample t-test, and one-way analysis of variance (ANOVA) through SPSS version 23.0 statistical software

3.6 Data collection

This study uses an online survey to assess the proposed model of just walk out technology adoption. Data is collected by Google survey link, which leads to questionnaires. The link to google survey will be sent through Line Application. Target size is 400 respondents who reside in Bangkok, capital of Thailand, where 7-11 branches reach a total number of 2744 (updated 28Feb Marketing Department CP All).

In order to get feedback from many respondents with various type of background, study's questionnaire items are arranged to cover all constructs in easy to

interpret manners. Each of the constructs is written into 2-3 attributes for further clarification and easy for respondents to comprehend. Closed-end questions are applied in this study. There are two types of questions; rating scale questions (five-point Likert scale) and checklist questions.

The five-point Likert scale was applied in part 1 to evaluate the respondent's important determinants that influence the JWOT adoption. The check-list scale was applied in part 1: respondents' shopping habits in convenience stores and digital gadgets/ smart cards usage experience, and part 2: Demographics. The definition of constructs in this research is provided in Table 3.1

Two trick questions were applied in question 13-14. As these question's content is opposite to question 2 and 4, this help to increase reliability and quality of the survey. Responses that have same rating score between question 2 and 13, 4 and 14 will be excluded from data input to further analyze the process.

Table 3.1 The definition of constructs in this research

Construct	Definition	Indicators
Perceived Usefulness (Davis et al., 1989)	The degree to which a person believes that using JWOT would enhance his/her shopping performance	Question 1-3
Perceived Entertainment Value (Childer et al., 2001)	The enjoyable feeling a person believes will gain from using JWOT	Question 4-6
Perceived Ease of Use (Davis et al., 1989)	The degree to which a person believes that using JWOT would require the least effort	Question 7-14, 17-20
Trust (Oh et al., 2009)	The degree of trust a person has toward transaction process	Question 21-23
Attitudes Toward Using (Davis et al., 1989)	The respondent's positive or negative feelings about using JWOT	Question 24
Behavioral Intention to Use (Davis et al., 1989)	The respondent's intentions to use JWOT based on the positive or negative effect	Question 24
Technology Anxiety (Meuter et al., 2000)	The degree to which a person fear or panic from using unfamiliar technology like JWOT	Question 25-27
Subjective norm (Gerhardt et al., 2010)	The degree to which a person believes other people's opinions/actions with JWOT	Question 28-30

In order to follow the purpose of the study and find the right sample size to collect data, the Taro Yamane's simplified formula (Israel, 1992) was applied to calculate the number of the sample with 95% confidence level to the 8.22 million Bangkok population (IPSR, 2017). Consequently, the calculation for the sample size by Yamane's formula is as shown in Equation 1.

$$n = \frac{N}{1 + Ne^2}$$ (Equation 1)

Given: n = sample size,

N = population, and

e = error of the sampling.

Thus, the sample size for this study can be calculated as below:

n = 8,220,000 / 1 + ((8,220,000)(0.05)^2)

= 399.99 or approximately 400 samples

Therefore, the sample size of 400 was applied in this research. The online questionnaires were distributed on the basis of convenience-based and snowball-based via smartphones through Line application to the target of Bangkokian who are 18 years old and older, own a smartphone and have application Line. The questionnaires are administered to target respondents in July 2017. Data collection will be monitored through Google Form Survey application and will be closed when eligible responses reach 400.

3.7 Expected outcomes

3.8.4 The identification of important variables that influence Thai consumer's attitude and behavioral intention to use JWOT.

3.8.5 The explanation on the relationship of those variables, user's attitude toward using and intention to use JWOT.

3.8.6 Perceive of what Thai retail entrepreneurs need to know in order to adapt their business models, services or products so that there are high possibilities of success that Thai consumers will adopt JWOT.

3.8 Research method

The research method used in this study is done by an online Google survey questionnaire to understand the important factors that influence JWOT adoption in Thailand. The model has been developed based on TAM and related empirical study from a prior literature review and adapted to JWOT acceptance context as shown in the hypotheses. The detail of study method is written below.

3.8.1 Survey administration

The data in this research is collected from online Google survey questionnaires. The link to the survey is sent through Line application. Base theory of TAM is used to determine the user's perception toward JWOT and to describe the relationship between the external factors and user's perception of usefulness and ease of use in technology adoption and also the negative impact of external factors on user's attitudes toward using which could constrain the technology adoption. In addition, user's demographic characteristics and shopping experience, which are independent factors, are incorporated to know the impact on technology acceptance.

3.8.2 Questionnaire development

The questionnaire is constructed based on prior JWOT-related studies on TAM. The introduction part in questionnaires tells the purpose of this research, data confidentiality and a brief definition of JWOT along with the Thai-subtitled video clip present the basic knowledge about the technology. The questionnaire consists of three parts. The first part mainly focuses on the closed-end questionnaire items to measure determinants of JWOT adoption. The second part questions try to identify the respondents' shopping habits particularly in convenience stores and digital gadgets/ smart cards usage experience since JWOT involve these familiarities. The questions in the last part are for demographic characteristics as illustrated in Table 3.2. Each of the questionnaire's items has attributes that reflect the context of JWOT adoption.

Table 3.2 The list of factors and detail in research framework

Demographics	Shopping habits	Construct
Age	Most frequently visit convenience store	Perceived usefulness
Gender	Improve issue in stores	Perceived Ease of Use
Education	Frequency of store visit near BTS/MRT/ARL station	Entertainment Value
Salary	Familiarity in smart card usage	Trust
	Experience in digital gadgets	Attitudes toward using
		Behavioral Intention to use
		Technology anxiety
		Subjective norm

The respondents are asked to fill the form of the survey with 23 questionnaire items to measure their attitudes with five-point Likert scale start by 1 ("Strongly Disagree") and 5 ("Strongly agree"). All questionnaire items appear in Appendix 1.

3.8.3 Interview focus group

Before the survey was conducted, the focus group was randomly selected to find the insight about JWOT by focus group interview method whether there should be any moderation in the questionnaires or valuable information that relate to this study. There are 7 people randomly selected to interview about their opinion toward JWOT, knowledge about this technology and the intention to use JWOT. The questions in this interview were shown Table 3.3.

Table 3.3 Questions for interview focus group

no.	Question
1	Have you ever heard of Just Walk Out Technology or Amazon Go before?
2	Which media have you heard from?
3	What do you think about this technology?
4	Do you think JWOT is useful? Do you have any positive attitude toward it?
5	Do you think there are any disadvantages or limitations?
6	Have you ever use similar technology (i.e., QR shopping, SCS)?
7	If JWOT is launched in Thai, do you have any intention to use it?

The result findings of all 7 respondents were shown in the Appendix. Most of the respondents (5 out of 7) have never heard or seen JWOT before. Two of them who have known JWOT before the interview has known JWOT by VDO clip from YouTube and Line Application. After informing the information and showing the VDO clip introducing JWOT to them, most of the respondents have positive opinions that JWOT is interesting and useful. However, one opinion claimed the confusing about how the system work to correctly detects the items being put into the virtual basket. One interviewee expressed concern about the difficulty in real usage and one opinion expressed concern about security and trust. From 7 respondents, 2 of them experienced using SCS and QR shopping respectively. One has seen friends using SCS. And another already knows about SCS from news on TV. For the final question that asks about the intention to use JWOT, there are various types of answer. Most of them answered with possibilities that maybe they will use JWOT depend on their friend, location of the store near their houses/places, the system is easy to use. Only one respondent firmly accepted to use if there is JWOT in Thailand.

3.8.4 Pilot Test

The pilot test was used to determine the questionnaire's validity and reliability whether the questionnaire function for the purpose intended in this research. (Blair, Czaja, & Blair, 2014; Neuman, 2007) The pilot test was arranged with 30 respondents to evaluate respondents' comprehension of items constructed in the questionnaire. The result shown that there was one-third of feedbacks complained about not able to understand the JWOT because they overlooked the VDO link present the introduction of JWOT thinking that is random advertisement VDO. And some of the feedback reported unclear comprehension of the technology after watching VDO. Thus, a clear explanation of JWOT and a notification to watch the VDO presenting information about JWOT is added. Figure 3.2 shows the four main pages of the online questionnaire used in the research.

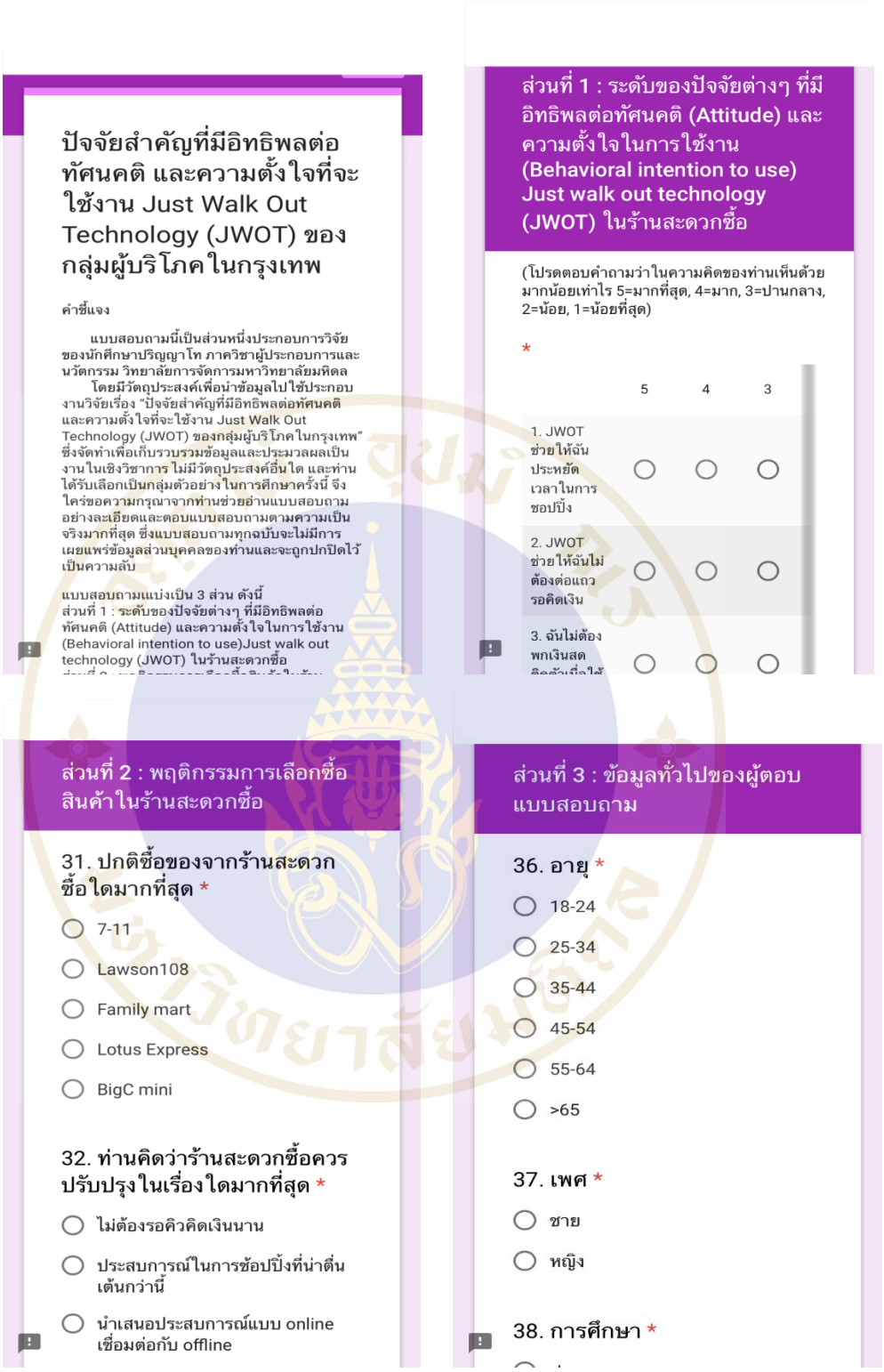

Figure 3.3 The online questionnaire in this research

CHAPTER IV
DATA ANALYSIS

This research mainly tries to find the explanation of the technology acceptance of JWOT in Bangkokian demographic data (gender, age, education, salary) is gathered together with the degree of each determinant which has the impact on respondents' attitude and behavioral intention to use JWOT. Moreover, it also collects shopping habits and digital gadgets experience to gain insights on the difference between each group of variables and able to see the impact they have on the technology acceptance. The analytical software SPSS version 23.0 is used to screen and analyze the data.

This chapter provides the questionnaire results of demographics, shopping habits and digital gadgets experience and the results of the statistical analyses from the obtained data. The analyzed data which include reliability and validity analysis is consists of the hypotheses verification by multiple regression analysis and the comparison of demographics, shopping habits, and digital gadgets experience over the technology acceptance factors by independent sample t-test and one-way ANOVA.

4.1 Summary and the questionnaire results

From 400 respondents, 51.2% of them are female while 48.8% are male. Most of the respondents are in the age of 45-54 years (22.5%), 35-44 years (21.0%) and 18-24 years which hold similar percentage at 20.3%. The majority of respondents have the highest education degree in Bachelor (62.3%), and those with a master degree at 27.3%. Among respondents, the dominating salary rate per month is ฿30,001-50,000 (41.8%) and those with ฿20,001-฿30,000 is accounted for 27.8%.

In term of shopping habit and digital gadgets experience, more than half of respondents point out that convenience store should most improve on the issue of the

checkout process to be faster (67.0%). More than three-quarters of 400 respondents usually go to the 7-11 convenience store at the number of 80.5%. The result also shows that most of them are frequent shoppers at the convenience store locate near BTS/MRT/ARL station at least once a day (24.5%) and 2-4 times a week (19.0%), however, there are respondents (17.0%) who are not frequent customers of these stores. Most of the respondents have experience in smart card usage (71.8%) and digital gadgets (100.00%). The detail of the questionnaire results for demographics, shopping habit, and digital gadget experience was shown in Appendices.

4.2 Reliability and validity assessment

It is important to assess the questions used in this research in term of their validity and reliability to assure that they represent the underlying theoretical construct. According to (Saunders, Lewis, & Thornhill, 2016), the validity test will ensure that the accurate data is measured under the concept the researcher tried to collect. The reliability assessment will proof the consistency in data collection

4.2.1 Validity assessment

The validity means the extent to which the methods of the data collection are accurately measured what they intended to measure. The validity refers to content validity, criterion-related validity and constructs validity (Saunders et al., 2016). The content validity is defined as the extent to which the measurements in the research model have sufficient coverage through research questions. This research has adequate content validity from the literature review, discussion with research advisor and adaptation of questions from prior TAM studies.

The criterion-related validity refers to the ability of the measurements to yield the accurate predictions. The evaluation is done by the Pearson's bivariate analysis to see the correlation coefficient between pairs of variables. In addition, the measurements were

applied from the previous empirical TAM studies on JWOT related technologies, thus the research measurements are presumably criterion-related validated.

The construct validity is defined as the extent to which the questions are actually measuring the presence of the construct as intended. Since Cronbach's alpha values are above 0.7 and all the correlation between measures of the same variables are positively correlated with each other, it validates that the measurement questions have the construct validity.

4.2.2 Reliability assessment

The reliability refers to the extent that data collection technique will provide consistent results, similar results would be made by other researchers and there is transparency in how sense was made from the raw data. The widely used method for a measurement of consistency of responses to a set of questions is Cronbach's alpha coefficient. The alpha value ranges from 0 and 1. The value of 0.7 or above provides that the questions combined in the scale are measuring the same thing (Saunders, et al., 2016).

Table 4.1 Reliability of the constructs

Construct	Number of Items	Cronbach's Alpha
Perceived Usefulness	3	0.757
Perceived Entertainment Value	3	0.749
Perceived Ease of Use	3	0.811
Perceived Trust	3	0.894
Attitude Toward Using	2	0.821
Behavioral Intention to Use	1	A
Technology Anxiety	3	0.937
Social Norm	3	0.807

Notes: reliability not calculated for on item scale

In this study, the technology anxiety's attributes based on the hypothesis that has adverse relationship compare with the other constructs. Because of the negatively phrased question, the reversed coding for the technology anxiety's attributed rating scale was conducted before reliability analysis to apply the Cronbach's alpha properly. The behavioral intention to use has only one item scale same as the previous empirical studies of TAM (Meuter et al., 2000). Cronbach's alpha values for other constructs were between 0.749 and 0.937, providing evidence of scale reliability.

4.3 Hypotheses testing result – external factors and TAM

The multiple regression analysis method was selected to test the hypothesis and explain the influence of each external factor toward the original TAM constructs and forecast Thai's intention to use JWOT.

4.3.1 Effect on the behavioral intention to use

This study applies multiple linear regression analysis to test the correlation between the user's behavioral intention to use (BI) fix as the dependent variable, and attitudes toward using (AT), technology anxiety (TA) and subjective norm (SN) fix as independent variables.

The overall model fits for this multiple regression model with two independent variables (AT and SN). Durbin-Watson value is near 2.0 in the range between (1.5-2.5) at 1.844 indicate that the construct's standard error is independent of each other, adding more confidence in this regression analysis.

The coefficient of determination value is 0.351. This indicates that there are other factors that may unexpectedly have the effect on the intention to use JWOT. Thus, further studies should also include those factors in the framework.

Two regression coefficients, attitude and social norm, are significant at the 0.01 level. Both of the variables have positive standardized regression coefficients (Beta). AT (Attitudes toward using) with the value of 0.546, showing a more marked effect (four times as much) than SN (Social norm) which is 0.134.

Table 4.2 Multiple regression analysis of the behavioral intention to use

Variable Entered: BI Behavioral Intention to Use

Multiple R	0.592
Coefficient of Determination (R^2)	0.351
Adjusted R^2	0.346
Standard error of the estimate	0.658
Durbin-Watson	1.844

Valuables Entered into the Regression Model

	Regression Coefficients			*Statistical Significance*		*Collinearity Statistics*	
Variables Entered	**B**	**Std. Error**	**Beta**	***T***	**Sig.**	**Tolerance**	**VIF**
(constant)	.321	.330		.973	.331		
Attitudes toward Using	.755	.057	.546	13.176	.000	.953	1.049
Technology Anxiety	-.043	.028	-.064	-1.538	.125	.954	1.049
Social Norm	.153	.047	.134	3.282	.001	.983	1.017

The tolerance value for the variables in the equation range from 0.953 (AT) to 0.983 (SN) while VIF value range from 1.017 (SN) to 1.049 (AT and TA), indicating a close range of multicollinearity effects. The impact of multicollinearity is insignificant with all three variables having tolerance value more than 0.40 and VIF value less than 10.

The overall respondent's perception on two independent variables (AT, SN) that have influence over the behavioral intention to use was high (mean 4.18-4.44). On the contrary, perception on technology anxiety which was proposed to have a negative

influence on behavioral intention to use was low (2.41). The regression coefficient (beta) of AT = 0.546 significantly at P < 0.01 and SN = 0.134 significantly at P < 0.01, thus H5 and H7 were supported. The hypothesis H6 was proposed that TA will have a negative influence on intention to use JWOT, however, the regression coefficient of TA is statistically insignificance with P > 0.05. Therefore, technology anxiety has no relevance with the behavioral intention to use, rejecting H6.

4.3.2 Effect on the attitudes toward using

In this multiple regression analysis, attitudes toward using (AT) was set as a dependent variable while perceived usefulness (PU), perceived ease of use (PEOU), perceived entertainment value (PE) and trust (TR) were set as independent variables.

The overall model fits for this multiple regression model with two independent variables (PU and PEOU). Durbin-Watson value is near 2.0 in the range between (1.5-2.5) at 1.846 indicate that the construct's standard error is independent of each other, adding more confidence in this regression analysis.

The coefficient of determination value is 0.145. This indicates that there are other factors that may unexpectedly have the effect on the attitude to use JWOT. Thus, further studies should also include those factors in the framework.

Two regression coefficients, perceived usefulness and perceived ease of use are significant at the 0.01 level. Both of the variables have positive standardized regression coefficients (beta), perceived ease of use (PEOU) with the value of 0.234, showing a stronger effect than perceived usefulness (PU) which is 0.169.

Table 4.3 Multiple regression analysis of the attitude

Variable Entered: AT Attitudes

Multiple R	0.381
Coefficient of Determination (R^2)	0.145
Adjusted R^2	0.137
Standard error of the estimate	0.547
Durbin-Watson	1.846

Valuables Entered into the Regression Model

	Regression Coefficients			*Statistical Significance*		*Collinearity Statistics*	
Variables Entered	**B**	**Std. Error**	**Beta**	***t***	**Sig.**	**Tolerance**	**VIF**
(constant)	1.240	.477		2.600	.010		
Perceived Usefulness	.313	.090	.169	3.480	.001	.919	1.088
Perceived Entertainment	.116	.069	.080	1.673	.095	.935	1.069
Value							
Perceived Ease of Use	.237	.051	.234	4.636	.000	.849	1.178
Trust	.041	.023	.088	1.786	.075	.895	1.117

The tolerance value for the variables in the equation range from 0.849 (PEOU) to 0.935 (PE) while VIF value range from 1.069 (PE) to 1.178 (PEOU), indicating a close

range of multicollinearity effects. The impact of multicollinearity is insignificant with all three variables having tolerance value more than 0.40 and VIF value less than 10.

The overall respondent's perception on two independent variables (PU, PEOU) that have influence over the behavioral intention to use was high (mean 4.32-4.75). The regression coefficient (beta) of PU = 0.169 significantly at P < 0.01 and PEOU = 0.234 significantly at P < 0.01, thus H1 and H3a were supported. The hypothesis H2 proposed that PE will have positive influence attitudes and hypothesis H4 proposed that TR will have positive influence attitudes, however, the regression coefficient of PE and TR were statistically insignificance with P > 0.05. Therefore, rejecting H2 and H4, perceived entertainment value and trust have no relevance with the attitudes.

4.3.3 Effect on the perceived usefulness

In order to find the effect of user's perceived ease of use toward perceived usefulness, the simple regression analysis was applied with perceived usefulness set as a dependent variable, while perceived ease of use set as an independent variable.

Table 4.4 Simple regression analysis of the perceived usefulness

Valuables Entered into the Regression Model

	Regression Coefficients			*Statistical Significance*	
Variables Entered	**B**	**Std. Error**	**Beta**	***t***	**Sig.**
(constant)	4.192	.116		36.201	.000
Perceived Ease of Use	.130	.027	.238	4.899	.000

The overall respondent's perception on the independent variables (PEOU) that have influence over the behavioral intention to use was high (mean 4.32). The regression

coefficient of perceived ease of use is significant at the 0.01 level with the positive standardized regression coefficients (beta) at 0.238, thus H3b was supported.

4.3.4 Effect on the perceived entertainment value

In order to find the effect of user's perceived ease of use toward perceived entertainment value, the simple regression analysis was applied with perceived entertainment value set as a dependent variable, while perceived ease of use set as an independent variable.

Table 4.5 Simple regression analysis of the perceived entertainment value.

Valuables Entered into the Regression Model

	Regression Coefficients			*Statistical Significance*	
Variables Entered	**B**	**Std. Error**	**Beta**	***t***	**Sig.**
(constant)	3.998	.151		26.503	.000
Perceived Ease of Use	.123	.035	.175	3.550	.000

The overall respondent's perception on the independent variables (PE) that have influence over the behavioral intention to use was high (mean 4.53). The regression coefficient of perceived ease of use is significant at the 0.01 level with the positive standardized regression coefficients (beta) at 0.175, thus H3c was supported.

The summary of the result in verifying the hypotheses of this research is shown in Table 4.6.

Table 4.6 Summary of hypotheses testing result for Hypotheses 1-7

Hypotheses	Beta	SE	Sig.	Supported
H1: PU→AT	0.169	0.090	0.001	Yes
H2: PE→AT	-	-	-	No
H3a: PEOU→AT	0.234	0.051	0.000	Yes
H3b: PEOU→PU	0.238	0.027	0.000	Yes
H3c: PEOU→PE	0.175	0.035	0.000	Yes
H4: TR→AT	-	-	-	No
H5: AT→BI	0.546	0.057	0.000	Yes
H6: TA→BI	-	-	-	No
H7: SN→BI	0.134	0.047	0.001	Yes

Figure 4.1 demonstrated the research framework with simple and multiple regression analysis results showing that all three variables (PU, PEOU and AT) in original TAM construct and only one proposed external variable (SN) have a significant impact on respondents' intention to use JWOT. The mediating effect of PEOU to AT via PU and PE were also proved to be significant; however, because of the sequentially insignificant impact of PE on AT, the ultimate impact of PEOU toward PE is considered to be insignificant. In addition, three other extended constructs (PE, TR, TA) were found to have no significant effect toward intention to use JWOT.

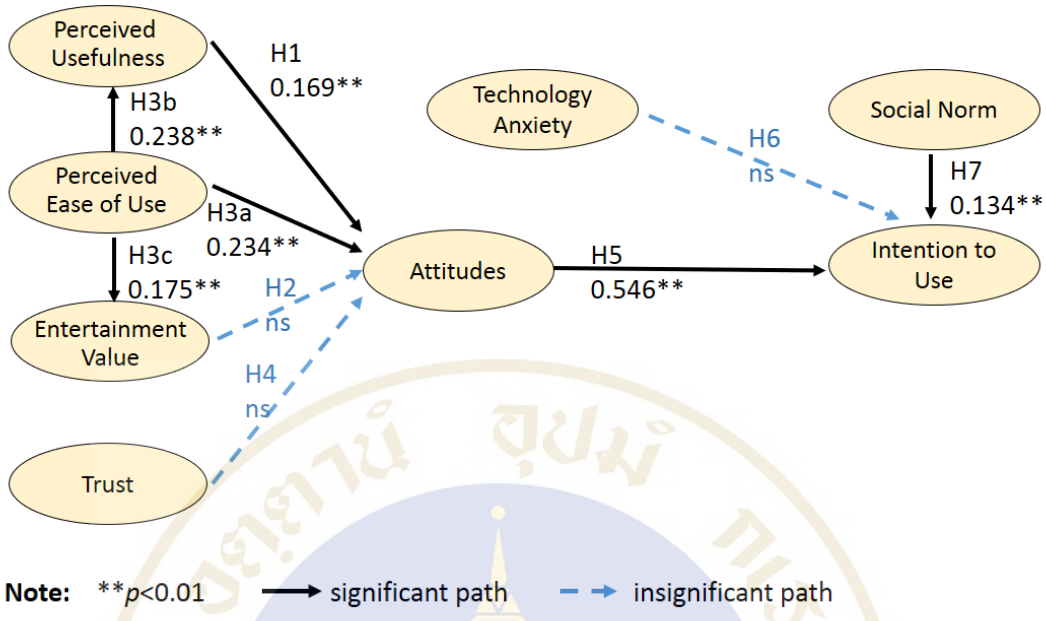

Figure 4.1 Research framework with simple and multiple regression analysis results

4.4 Hypotheses testing result – demographic and shopping habits

This research uses analysis method of independent-samples t-test and one-way analysis of variance (ANOVA) to test hypotheses between individual demographic characteristics and shopping habit, set as independent factors, and variables influencing the JWOT adoption, set as the dependent factors.

4.4.1 Hypothesis 8 the difference in demographic characteristics have impact on the adoption of JWOT

The result in Table 4.7 illustrated that two of respondents' demographic characteristics - education, and salary have an effect on respondents' acceptance for JWOT with the significant level at 0.05. For education factor, there are differences in PEOU, BI, and TA. While salary has an effect on TA and SN.

Table 4.7 Summary of hypotheses testing result for hypothesis 8

	Gender	Age	Education	Salary
Perceived Usefulness	H_0	H_0	H_0	H_0
Perceived Ease of Use	H_0	H_0	**H_1**	H_0
Perceived Entertainment value	H_0	H_0	H_0	H_0
Trust	H_0	H_0	H_0	H_0
Attitudes	H_0	H_0	H_0	H_0
Behavioral Intention to Use	H_0	H_0	**H_1**	H_0
Technology Anxiety	H_0	H_0	**H_1**	**H_1**
Social Norm	H_0	H_0	H_0	**H_1**

Note: H_1 significant at 0.05 level

4.4.2 Hypothesis 9 the difference in shopping habit and smart card experience have impact on the adoption of JWOT

The result in Table 4.8 revealed that 3 independent factors – the store that respondents visit most frequently, frequency of visit on stores locate near BTS/MRT/ARL station, and smart card familiarity have effects on respondents' acceptance for JWOT with the significant level at 0.05. The store that respondents visit most frequently has an effect on PE and TA. Moreover, the frequency of visit on stores located near BTS/MRT/ARL station has the effect on BI, TA, and SN. While smart card familiarity has effects on almost all constructs from the original TAM, except PU, smart card familiarity has an effect on PEOU, TR, and BI.

Table 4.8 Summary of Hypotheses Testing Result for Hypothesis 9

	Most Frequent Store	**Improve Issue**	**Station's Stores Visit Frequency**	**Smart Card Familiarity**
Perceived Usefulness	H_0	H_0	H_0	H_0
Perceived Ease of Use	H_0	H_0	H_0	**H_1**
Perceived Entertainment value	**H_1**	H_0	H_0	H_0
Trust	H_0	H_0	H_0	**H_1**
Attitudes	H_0	H_0	H_0	H_0
Behavioral Intention to Use	H_0	H_0	**H_1**	**H_1**
Technology Anxiety	**H_1**	H_0	**H_1**	H_0
Social Norm	H_0	H_0	**H_1**	H_0

Note: H_1 significant at 0.05 level

CHAPTER V
CONCLUSION

This chapter mainly focuses on the discussion of the significant findings related to result of the analytical data base on the proposed extended TAM for JWOT from the previous chapter. The research objectives are responded with the explanation of the important factors that have the influence on JWOT adoption, along with the relationships between the demographic characteristics/ shopping habits and technology acceptance factors. The managerial implications together with research limitations and future research are also included.

5.1 Data discussion

5.1.1 Predictors of technology acceptance for JWOT

In order to explain the JWOT acceptance among Bangkok consumers, this study is conducted, using various multiple regression analyses to find the relationship between original TAM constructs – perceived usefulness, perceived ease of use, attitudes toward using and the behavioral intention to use – also, apply the external constructs that propose to have influence over the adoption process such as, perceived entertainment value, trust, technology anxiety and social norms.

The result shows that all 3 proposed hypotheses relationship between the original TAM construct are significantly approved in the research findings, supporting the previous studies (Dabholkar et al., 2003; Davis et al., 1992) In addition, the indirect influence of perceived ease of use to the attitude via perceived usefulness is also supported. But it is rejected via perceived entertainment value. Moreover, only 1 out of 4 hypotheses for relationships between external factors and TAM constructs is

supported. The study reveals that the attitudes positively influence the behavioral intention to use. The perception of perceived ease of use influence the attitudes both directly and indirectly through perceived usefulness in the similar strength. The Social norm, which is the only external factor that is supported by the research, has a positive impact on the behavioral intention to use. The key findings presenting the significance of this study are explained in below details.

The attitudes toward using are the most powerful predictor of respondents/ intention to use JWOT, almost 4 times as much than the positive influence of perceived usefulness toward the attitudes. The perceived usefulness has a significantly lower effect than perceived ease of use toward the attitudes, contrast with the prior studies that usefulness is the ultimate determinant of one's use of a technology while ease of use is secondary determinant (Gao & Bai, 2014). Even though JWOT is the new technology and not many of Bangkokians have prior knowledge about it, the video clip and further explanation attached to the questionnaire had provided the respondents with all adequate principle, concept, and awareness-knowledge of JWOT before they respond to the questionnaire. The perceived ease of use that it is not difficult to use JWOT or require to change their shopping routine much, and perceived usefulness that customers do not need to wait in line or carry cash, encourage the respondents in perceived ease of use and usefulness.

Apart from attitudes toward using and perceived usefulness from the original TAM, the social norms also have the effect on respondents' intention to use as well. Social influence from commercials advertisement and mass media (mean = 4.20) would be more effective compared with peer influencers (mean = 4.08) such as friends or family. This provides the similar result with (Seneler, Basoglu, & Daim, 2010) that the individual's beliefs, news, commercials influence users' intention to use.

In this study, three proposed hypotheses of the relationship between external factors (PE, TR, and TA) and original TAM constructs, the one proposed hypothesis of indirect effect from PEOU toward PE were rejected. It can be concluded from the result that perceived entertainment value is not the important factor that consumers

will consider to adopt JWOT. Unlike previous studies on similar technology i.e. virtual try-on shopping or online shopping (Childer et al., 2001; Kim & Forsythe, 2008) which perceived entertainment values play the important role on these technology adoptions, JWOT does not. It is the technology that facilitates the brick and mortar shopping experience. From this result, it can be viewed that consumers do not have requirement of groceries or convenience shopping to be entertained or fun experience like they have in the online shopping. On the other hand, their perceptions on usefulness and ease of use are more important than entertainment value when they do shopping at the convenience store.

In term of the perceived trust, the result surprisingly opposes with the previous research studies. (Ling et al., 2010; Pavel & Rjagopal, 2015). This study was conducted targeting on Bangkokian, where most of them are already used to online shopping or paying with their e-wallet. This might be the reason why the result finding rejects that trust has the influence on users' attitudes. This inconsistency indicates the need for further investigation. For example, conducting the research study on Thai who resides in other areas besides Bangkok.

For technology anxiety, the reason why it was rejected to have the impact on JWOT adoption could be because the majority of this survey respondents' salary is between 30,001-50,000 baht (41.8%) and have the highest degree in Bachelor (62.3%). These are the group of people that have greater financial resources and have the well-educated society, thus increasing the opportunity to be familiar with new technologies and enabling to reduce technology fear or anxious, compare to other lower income groups.

Another reason is that JWOT is novel technology for Thai people. Even have been watched the JWOT VDO introduction in the questionnaires, all of the respondents never have co-experience shopping with JWOT and they did not see there would be any concern about trust issue or technology anxiety when using JWOT yet. Therefore, these two factors were rejected to have a significant impact on the intention to use.

5.1.2 The impact of demographic characteristics and shopping habit toward the technology acceptance of JWOT

From four demographic characteristics in this study, only education and salary have the significant effect on some constructs. Education has the impact on PEOU, BI, and TA. Respondents with different education levels will have different on perceived ease of use, behavioral intention to use and technology anxiety. The higher education group will have the higher perception on PEOU, less technology anxiety and the higher rate of intention to use, compared to those lower education group. Similarly, there is the impact of salary variable on technology anxiety and social norm. The respondents with higher income would have less technology anxiety and less subjective norm.

In terms of shopping habit and smart card experience, the store that respondents visit most frequently, the frequency of the visit on stores located near BTS/MRT/ARL station, and smart card familiarity have effects on some constructs of the extended TAM. The store that respondents visit most frequently have the impact on respondents' PE and TA, however, these two factors are insignificant and do not have the influence on the overall intention to use the multiple regression analysis results.

The difference in the frequency of the visit on stores located near BTS/MRT/ARL station will have the different effect on BI, TA, and SN. Respondents who are frequent customers of the stores near BTS/MRT/ARL station e.g. every day or once a week have higher intention to use, less technology anxiety and more social norms.

Smartcard familiarity has the different effect on PEOU, TR, and BI. Because customers who use JWOT would have to scan their QR-code from smartphones over the QR-reader at the entrance of the stores, respondents who are familiar with smart cards like Rabbit cards or 7-11 smart purse have more tendency to accept JWOT than those who do not. The result findings support this logic with respondents who are familiar with smart card usage have the higher perception of the ease of use, trust, and intention to use the technology.

Both demographic characteristics and shopping habits should be taken into account in order to retrieve information from the different perspective to present the significant impact to the overall technology acceptance model.

5.2 Implications of the research

5.2.1 Theoretical implication

This research has made general contributions and the implications to the researcher. It illustrates the comprehension of the external factor and original TAM variables from previous studies that have significant influence in the adoption of JWOT. The demographic characteristics and shopping habits are studied to find their impact with all variables in the research framework. After all, JWOT is still new technology at the time this study was conducted and there are limited empirical studies of TAM related JWOT adoption. This research study is the first study conduct to predict JWOT acceptance in Thai, specifically in Bangkok consumers. This research framework and findings help in creating the empirical studies in this field with the basic understanding of technology adoption for JWOT. Nevertheless, there are still many possible external factors (e.g. privacy, system quality, personal innovativeness) not incorporated in this study. Therefore, there are opportunities to develop a more understanding of intention to use JWOT.

5.2.2 Managerial implication

According to this research findings, there are prediction and explanation for several managerial implications for retail industry specifically in the convenience store sector. It provides these entrepreneurs with understandings of the key factors in developing technology and marketing strategies to the success in implementing JWOT in Thailand.

First of all, this study shows that respondents' attitudes toward using a technology have the most significant effect on the intention to use JWOT. Consequently, the positive perception of its usefulness and ease of use is required to generate the positive attitudes toward JWOT. The convenience stores should emphasize in presenting that JWOT is easy to use and it is not required to change much in their shopping routines. Also focusing on demonstrating the main benefit of this technology in providing convenience, helping them save times, making shopping easier and faster without having to wait in lines or carry cash. In addition, social influencers, TV commercials or news would have the positive influence from the social norms factors that would play the important role to encourage users' intention to use. The companies should launch marketing strategies focus on social influence to encourage users in JWOT adoption, for instance, social media, viral marketing, buzz marketing, powerful presenters. These marketing strategies would create social power and attract the soon-to-be users with word-of mouth strategy.

Secondly, according to this study findings, the higher education and income group have the higher perception on the overall intention to use, compare to those lower education and income group. This concurrently supports the innovation diffusion theory (IDT) that the first two group of the population to adopt the new technology are innovators and early adopters (Rogers, 2003). These two groups combined account for about 16% of the population and their dominant characteristics are high-educated, high income, being social leaders and possess individual innovativeness. The company should invest in the study of these group's insights and perception, in order to adapt their services or business model that will maximize the rate of success in technology adoption.

Thirdly, the findings from this research show that respondents who are frequent customers of the stores near BTS/MRT/ARL station e.g. every day or once a week have higher intention to use, compare to those who rarely go to these stores. This is the first target group with the higher possibility of success in technology adoption.

Therefore, the recommendation for convenience stores is to launch their first JWOT-operated systems in the convenience store that situated near BTS/MRT/ARL station.

Finally, the findings from this research will be the benefit for the other related-businesses such as supermarkets or special discount stores to have information about JWOT adoption in Bangkok. Whether they will consider apply JWOT in their stores or use as resources for further investigations to create their own competitive advantage that helps them plan for the sustainable strategy.

5.3 Limitation and future research

There are three limitations in this study that shall be noticed. Firstly, the sampling is selected through scanning that respondents must have smartphones and reside in Bangkok. This enables the confirmation of the respondents to be potential users of JWOT in Bangkok. In addition, there are two tricky reversed questions that help to screen the respondents who were not able to comprehend the survey and give their real perception. However, the results were concluded from 400 Thai respondents, who never have direct experience using JWOT. Therefore, they may not be able to raise any concern about trust issue or technology anxiety when using JWOT.

Secondly, new technology like JWOT may have other unexpected factors that differ from the previous empirical studies about JWOT-related TAM-based studies. So further studies need to be done to explore the other factors that may hold the positive or negative impact on the adoption of JWOT.

Thirdly, the geographic of the respondents are limited only in Bangkok. Thus, different perspective may be found if further studies are conducted about technology adoption in other geographic areas of Thailand. There might be a difference in some constructs e.g. technology anxiety, social norms, or perceived trust. For now, this study has the result of the prediction of JWOT acceptance in Bangkok, the most potential area to primarily adopt this technology. However, there are many opportunities for the

retail market in the countryside that entrepreneurs will have to do further research in their population's perspective before decide to implement JWOT.

For future research, after this study which applies TAM to the research framework. There are other types of model that could be applied in the study of technology adoption such as UTAUT, IDT, etc. By using the different model to study JWOT adoption and conduct the meta-analysis research, it can provide the different perspective and deepen understanding about the processes involved in technology acceptance.

5.4 Conclusions

The growth rate of convenience store sector of retail business in Thailand is increasing each year. Every player competes for each other to attract more customers with many marketing campaigns. We can see that there is new technology applied in Thai retail businesses such as QR code shopping or SCS; however, not every technology is widely accepted and attract Thai consumers. JWOT is the new innovation from Amazon that able to enhance customers' shopping experience, provide convenience and save their times by not having to wait in line or paying with cash. It provides benefits to the entrepreneurs by improving the effectiveness of the stores, increases customers' turnover rate, and reduce cost in the cashier employment.

This study is conducted to find understanding of the key driving factors that have the influence on users' decision to adopt JWOT by proposing extended TAM based on prior empirical TAM studies combine with demographic characteristics and shopping habits.

The result indicates that user's attitudes toward using JWOT are the most powerful predictor of the intention to use. The original TAM construct, perceived usefulness and perceived ease of use, also have notable influences in this study. It implies that JWOT benefits should be highlighted in order to increase positive

attitudes to users. Social norms have significant relationship toward intention to use JWOT. Thus, they should be taken into consideration as well.

The differences in demographic characteristics and shopping habits also have different effects on the customer's JWOT adoption. The high income and highly educated group of users could be targeted as innovators and early-adopter group and be focused on the marketing plan.

The author hopes that this study will provide the insight findings in terms of technology acceptance of JWOT among Bangkok consumers and contributes to increasing the empirical study of TAM in this field. Furthermore, serving as the information resource for entrepreneurs to aid in their decision to adopt JWOT in Thailand.

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APPENDICES

This survey is a part of the thesis in Master of management degree, Mahidol University College of Management, Entrepreneurship and Innovation program. The objective of this survey is to attain data collection for analysis in research topic 'Factors influencing the attitudes and behavioral intentions to use Just Walk Out Technology (JWOT) among Bangkok consumers', which is conducted to explain the important factors that have the influence toward JWOT adoption and their relationship with demographic characteristics and shopping habits.

This research project has no compensation nor costs in the participation. Respondents are free to choose whether to participate or not. All answers will be handled confidentially and will not to be released to the public or commercially used.

The survey should take approximately 5 minutes to complete. In order to understand more of how JWOT would work and function, below is the VDO link to a Thai-subtitled introduction to Amazon GO, which is the store that JWOT is applied. Please watch it before start filling in the questionnaires. Thank you for participating in this survey.

Questions are divided into 3 sections.

Section 1: The degree of influence on the attitude and behavioral intention to use Just Walk Out Technology (JWOT) at a convenience store.

Section 2: Behavioral of convenience store shopping

Section 3: Demographic data

Section 1: The degree of influence on the attitude and behavioral intention to use Just Walk Out Technology (JWOT) at a convenience store. (If you believe these following statements match your answer the most choose 5, least choose1)

	5	4	3	2	1
1. Using JWOT helps me save time shopping.					
2. Using JWOT, I don't have to wait in line for cashiers.					
3. Using JWOT, I don't have to carry cash.					
4. I find that using JWOT will be enjoyable.					
5. I find that using JWOT will be delightful.					
6. JWOT provides new exciting experience interacting between online-offline shopping.					
7. Refer from the video, I find JWOT is not difficult to use.					
8. Refer from the video, learning to use JWOT would be easy for me.					
9. I find that I don't have to change shopping routine much if I use JWOT.					
10. JWOT has high level of security protection in the online payment systems.					

11. I can check the history of my payments deducted from my bank accounts or credit cards when using JWOT.					
12. In JWOT, the stores have a security policy to limit the use of customer information by not releasing them to third parties.					
13. Using JWOT makes me have to wait longer in lines.					
14. I find that using JWOT will be boring.					
15. Overall, using JWOT will be beneficial.					
16. I have a generally favorable attitude toward using JWOT.					
17. I intend to use JWOT in the future.					
18. I feel fear towards unfamiliar technology like JWOT.					
19. Unfamiliar technology like JWOT makes me feel nervous.					
20. I don't feel comfortable using new technology like JWOT.					
21. I tend to use JWOT if my friends, family use and recommend it.					
22. I tend to use JWOT if it is used by strong influencers like famous actors/actresses, idols, singers.					
23. Commercials and news about JWOT can affect me positively.					

Section 2: Behavioral of convenience store shopping

31. Which convenience store do you go to most frequently?

- ❑ 7-11
- ❑ Lawson108
- ❑ Family mart
- ❑ Lotus Express
- ❑ BigC mini

32. What do you think convenience stores should improve?

- ❑ Faster checkout process
- ❑ More exciting experience in shopping
- ❑ Provide online-offline experience
- ❑ Automated cashiers
- ❑ Unnecessary promotional campaigns

33. How often do you shop at the convenience stores that situated near MRT/BTS/ARL stations?

- ❑ Everyday
- ❑ 2-4 times a week
- ❑ Once a week
- ❑ 2-3 times a month
- ❑ Once a month
- ❑ Rarely

34. Do you use any smart cards (for example office/condo smart cards, Rabbit card, 7-11 smart purse)?

- ❑ Yes
- ❑ No

35. Do you have any experience using digital gadgets (for example smartphones, tablets, smart watches)?

- ❑ Yes
- ❑ No

Section 3: Demographic data

36. Age

- ❑ 18 to 24 years
- ❑ 25 to 34 years

- ❑ 35 to 44 years
- ❑ 45 to 54 years
- ❑ 55 to 64 years
- ❑ 65 years or older

37. Gender

- ❑ Male
- ❑ Female

38. Education

- ❑ Primary school
- ❑ Secondary school
- ❑ Vocational college
- ❑ Bachelor degree
- ❑ Master degree
- ❑ Doctorate degree

39. Salary (Baht)

- ❑ <9000
- ❑ 9001-15000
- ❑ 15001-30000
- ❑ >30001-50000
- ❑ >50000

Interview focus group: questions and answers

Questions

no.	Question
1	Have you ever heard of Just Walk Out Technology or Amazon Go before?
2	Which media have you heard from?
3	What do you think about this technology?
4	Do you think JWOT is useful? Do you have any positive attitude toward it?
5	Do you think there are any disadvantages or limitations?
6	Have you ever use similar technology (i.e., QR shopping, SCS)?
7	If JWOT is launched in Thai, do you have any intention to use it?

Answers

Respondents1

no.	Answers
Gender	Male
Age	18
Education	High school
Salary	<10000 baht
1	No
2	N/A
3	Interesting.
4	Seem useful because there is no need to carry cash.
5	Will the systems miscalculate if buy too many items?
6	Have experience using SCS at Central Chidlom. (2times)
7	Maybe.

Respondents2

no.	Answers
Gender	Male
Age	62
Education	Bachelor degree
Salary	N/A
1	Yes
2	Website
3	Good
4	make shopping more convenient.
5	Concern about trust in online payment.
6	Have seen friends using SCS before.
7	Maybe.

Respondents3

no.	Answers
Gender	Female
Age	33
Education	Vocational college
Salary	25,000
1	No.
2	N/A
3	Modern technology.
4	Useful. Save time shopping by not having to wait in lines.
5	Afraid that if the smart phone was stolen, it can be used to buy things by other people.
6	No.
7	Have to see if friends will use JWOT or not.

Respondents4

no.	Answers
Gender	Female
Age	55
Education	Bachelor degree
Salary	55,000
1	No
2	N/A
3	Exciting and fun technology
4	Provide convenient and save times to wait at cashiers.
5	None
6	No.
7	If JWOT is installed in a supermarket near my house, I will certainly use it.

Respondents5

no.	Answers
Gender	Female
Age	24
Education	Bachelor degree
Salary	28,000
1	No
2	N/A
3	Interesting but a bit confusing about how the systems work to put items in the virtual carts and also the payment systems.
4	Save times. And no need of cash.
5	Worry that it will be difficult to use.
6	No
7	Have to see first, whether it is easy to use.

Respondents6

no.	Answers
Gender	Female
Age	49
Education	Bachelor degree
Salary	60,000
1	Yes
2	From VDO clip in Line application.
3	Modern and seem useful.
4	Convenient. No need to wait in line.
5	Because there is no need to pay in cash, there are some worries about overspending.
6	No. But have seen some of the news about SCS.
7	Yes, if it is installed in a convenience store near my office.

Respondents7

no.	Answers
Gender	Male
Age	29
Education	Master degree
Salary	45,000
1	Yes
2	YouTube
3	Modern technology
4	Save times from waiting in lines. Make payment in stores faster.
5	None
6	Yes. Have used QR shopping of Big C.
7	Certainly. It is novel technology that worth to try. If it work and really benefit in save times, I will be a regular customer.

Summary of Respondents' Demographics characteristics and shopping habits

Question	Categories	Number	Percentage
Gender	Female	205	51.2%
	Male	195	48.8%
Age	45-54 years	90	22.5%
	35-44 years	84	21.0%
	18-24 years	81	20.3%
	25-34 years	70	17.5%
	55-54 years	54	13.5%
	>65 years	21	5.3%
Education	Bachelor degree	249	62.3%
	Master degree	109	27.3%
	Vocational college	18	4.5%
	Secondary school	15	3.8%
	Doctorate degree	6	1.5%
	Primary school	3	0.8%
Salary	30001-50000 baht	167	41.8%
	20001-30000 baht	111	27.8%
	>50000 baht	74	18.5%
	10001-20000 baht	35	8.8%
	<10000 baht	13	3.3%
Most frequently visit stores	7-11	322	80.5%
	Lotus Express	36	9.0%
	BigC Mini	19	4.8%
	Family Mart	14	3.5%
	Lawson108	9	2.3%

Improve issue	Faster check out process	268	67.0%
	Automated cashiers	55	13.8%
	Provide online-offline experience	42	10.5%
	More exciting experience in stores	22	5.5%
	Unnecessary promotional campaigns	13	3.3%
Frequency of BTS/MRT/ARL located stores	Everyday	98	24.5%
	2-4 times a week	76	19.0%
	Rarely	68	17.0%
	2-3 times a month	63	15.8%
	Once a week	58	14.5%
	Once a month	37	9.3%
Smartcard experience	Yes	287	71.8%
	No	113	28.2%

Multiple regression analysis

Behavioral Intention to Use

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.592[a]	.351	.346	.658	1.844

a. Predictors: (Constant), Social Norm, Technology Anxiety, Attitude

b. Dependent Variable: Behavioral Intention to Use

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	92.558	3	30.853	71.357	.000[b]
	Residual	171.219	396	.432		
	Total	263.778	399			

a. Dependent Variable: Behavioral Intention to Use

b. Predictors: (Constant), Social Norm, Technology Anxiety, Attitude

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.321	.330		.973	.331		
	Attitude	.755	.057	.546	13.176	.000	.953	1.049
	Technology Anxiety	-.043	.028	-.064	-1.538	.125	.954	1.049
	Social Norm	.153	.047	.134	3.282	.001	.983	1.017

a. Dependent Variable: Behavioral Intention to Use

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	Attitude	Technology Anxiety	Social Norm
1	1	3.800	1.000	.00	.00	.01	.00
	2	.172	4.702	.00	.01	.86	.01
	3	.021	13.389	.02	.28	.00	.79
	4	.007	23.834	.98	.71	.12	.20

a. Dependent Variable: Behavioral Intention to Use

Attitudes toward using

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.381[a]	.145	.137	.547	1.846

a. Predictors: (Constant), Trust, Perceived Usefulness, Perceived Entertainment Value, Perceived Ease of Use

b. Dependent Variable: Attitude

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.069	4	5.017	16.788	.000[b]
	Residual	118.055	395	.299		
	Total	138.124	399			

a. Dependent Variable: Attitude

b. Predictors: (Constant), Trust, Perceived Usefulness, Perceived Entertainment Value, Perceived Ease of Use

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	1.240	.477		2.600	.010	.302	2.177		
	Perceived Usefulness	.313	.090	.169	3.480	.001	.136	.490	.919	1.088
	Perceived Entertainment Value	.116	.069	.080	1.673	.095	-.020	.253	.935	1.069
	Perceived Ease of Use	.237	.051	.234	4.636	.000	.137	.338	.849	1.178
	Trust	.041	.023	.088	1.786	.075	-.004	.087	.895	1.117

a. Dependent Variable: Attitude

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions				
				(Constant)	Perceived Usefulness	Perceived Entertainment Value	Perceived Ease of Use	Trust
1	1	4.907	1.000	.00	.00	.00	.00	.00
	2	.073	8.180	.00	.00	.01	.00	.94
	3	.012	20.172	.01	.01	.09	.96	.05
	4	.005	30.436	.06	.24	.83	.04	.01
	5	.002	48.341	.93	.74	.08	.00	.00

a. Dependent Variable: Attitude

Simple Regression Analysis

Perceived Usefulness

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.238[a]	.057	.055	.308	1.317

a. Predictors: (Constant), Perceived Ease of Use

b. Dependent Variable: Perceived Usefulness

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.284	1	2.284	24.004	.000[b]
	Residual	37.875	398	.095		
	Total	40.160	399			

a. Dependent Variable: Perceived Usefulness

b. Predictors: (Constant), Perceived Ease of Use

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.192	.116		36.201	.000
	Perceived Ease of Use	.130	.027	.238	4.899	.000

a. Dependent Variable: Perceived Usefulness

Perceived Entertainment Value

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.175[a]	.031	.028	.402	1.879

a. Predictors: (Constant), Perceived Ease of Use

b. Dependent Variable: Perceived Entertainment Value

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.035	1	2.035	12.600	.000[b]
	Residual	64.291	398	.162		
	Total	66.326	399			

a. Dependent Variable: Perceived Entertainment Value

b. Predictors: (Constant), Perceived Ease of Use

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.998	.151		26.503	.000
	Perceived Ease of Use	.123	.035	.175	3.550	.000

a. Dependent Variable: Perceived Entertainment Value

Analysis of Variance (ANOVA) and T-Test

Gender

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Perceived Usefulness	Equal variances assumed	.185	.667	1.348	398	.178	.043	.032	-.020	.105
	Equal variances not assumed			1.350	397.995	.178	.043	.032	-.020	.105
Perceived Entertainment Value	Equal variances assumed	7.937	.005	-.864	398	.388	-.035	.041	-.115	.045
	Equal variances not assumed			-.860	379.051	.390	-.035	.041	-.116	.045
Perceived Ease of Use	Equal variances assumed	7.335	.007	-1.280	398	.201	-.074	.058	a	.040
	Equal variances not assumed			-1.273	372.852	.204	-.074	.058	-.189	.040
Trust	Equal variances assumed	.381	.538	-1.241	398	.215	-.155	.125	-.401	.091
	Equal variances not assumed			-1.254	352.659	.211	-.155	.124	-.399	.088
Attitude	Equal variances assumed	3.880	.050	-.861	398	.389	-.051	.059	-.166	.065
	Equal variances not assumed			-.859	384.589	.391	-.051	.059	-.167	.065
Technology Anxiety	Equal variances assumed	.538	.464	-.216	398	.829	-.026	.122	-.266	.213
	Equal variances not assumed			-.215	394.815	.830	-.026	.122	-.266	.213
Social Norm	Equal variances assumed	.799	.372	-.134	398	.893	-.010	.071	-.149	.130
	Equal variances not assumed			-.134	395.068	.893	-.010	.071	-.150	.131
Behavioral Intention to Use	Equal variances assumed	.121	.728	-.549	398	.584	-.045	.081	-.205	.115
	Equal variances not assumed			-.548	395.950	.584	-.045	.081	-.205	.115

Age

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Perceived Entertainment Value	Between Groups	.537	5	.107	.643	.667
	Within Groups	65.790	394	.167		
	Total	66.326	399			
Perceived Usefulness	Between Groups	.482	5	.096	.956	.444
	Within Groups	39.678	394	.101		
	Total	40.160	399			
Perceived Ease of Use	Between Groups	1.452	5	.290	.860	.508
	Within Groups	133.080	394	.338		
	Total	134.532	399			
Trust	Between Groups	11.569	5	2.314	1.487	.193
	Within Groups	613.094	394	1.556		
	Total	624.662	399			
Attitude	Between Groups	.303	5	.061	.173	.972
	Within Groups	137.821	394	.350		
	Total	138.124	399			
Technology Anxiety	Between Groups	8.742	5	1.748	1.185	.316
	Within Groups	581.230	394	1.475		
	Total	589.972	399			
Social Norm	Between Groups	1.261	5	.252	.496	.779
	Within Groups	200.260	394	.508		
	Total	201.522	399			
Behavioral Intention to Use	Between Groups	3.249	5	.650	.983	.428
	Within Groups	260.528	394	.661		
	Total	263.778	399			

Education

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Perceived Entertainment Value	Between Groups	.653	5	.131	.784	.562
	Within Groups	65.673	394	.167		
	Total	66.326	399			
Perceived Usefulness	Between Groups	.632	5	.126	1.260	.280
	Within Groups	39.528	394	.100		
	Total	40.160	399			
Perceived Ease of Use	Between Groups	6.606	5	1.321	4.069	.001
	Within Groups	127.926	394	.325		
	Total	134.532	399			
Trust	Between Groups	2.682	5	.536	.340	.889
	Within Groups	621.980	394	1.579		
	Total	624.662	399			
Attitude	Between Groups	3.149	5	.630	1.838	.104
	Within Groups	134.975	394	.343		
	Total	138.124	399			
Technology Anxiety	Between Groups	34.917	5	6.983	4.957	.000
	Within Groups	555.055	394	1.409		
	Total	589.972	399			
Social Norm	Between Groups	3.194	5	.639	1.269	.276
	Within Groups	198.328	394	.503		
	Total	201.522	399			
Behavioral Intention to Use	Between Groups	8.025	5	1.605	2.473	.032
	Within Groups	255.752	394	.649		
	Total	263.778	399			

Salary

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Perceived Entertainment Value	Between Groups	1.272	4	.318	1.931	.104
	Within Groups	65.054	395	.165		
	Total	66.326	399			
Perceived Usefulness	Between Groups	.253	4	.063	.627	.643
	Within Groups	39.906	395	.101		
	Total	40.160	399			
Perceived Ease of Use	Between Groups	1.795	4	.449	1.335	.256
	Within Groups	132.737	395	.336		
	Total	134.532	399			
Trust	Between Groups	9.028	4	2.257	1.448	.217
	Within Groups	615.635	395	1.559		
	Total	624.662	399			
Attitude	Between Groups	.609	4	.152	.438	.781
	Within Groups	137.515	395	.348		
	Total	138.124	399			
Technology Anxiety	Between Groups	14.567	4	3.642	2.500	.042
	Within Groups	575.405	395	1.457		
	Total	589.972	399			
Social Norm	Between Groups	5.350	4	1.338	2.693	.031
	Within Groups	196.172	395	.497		
	Total	201.522	399			
Behavioral Intention to Use	Between Groups	.627	4	.157	.235	.918
	Within Groups	263.150	395	.666		
	Total	263.778	399			

Most frequent store

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Perceived Usefulness	Between Groups	.826	4	.207	2.075	.083
	Within Groups	39.333	395	.100		
	Total	40.160	399			
Perceived Entertainment Value	Between Groups	2.472	4	.618	3.823	.005
	Within Groups	63.855	395	.162		
	Total	66.326	399			
Perceived Ease of Use	Between Groups	.294	4	.073	.216	.929
	Within Groups	134.238	395	.340		
	Total	134.532	399			
Trust	Between Groups	2.547	4	.637	.404	.806
	Within Groups	622.116	395	1.575		
	Total	624.662	399			
Attitude	Between Groups	.412	4	.103	.295	.881
	Within Groups	137.713	395	.349		
	Total	138.124	399			
Technology Anxiety	Between Groups	26.193	4	6.548	4.588	.001
	Within Groups	563.779	395	1.427		
	Total	589.972	399			
Social Norm	Between Groups	.411	4	.103	.202	.937
	Within Groups	201.111	395	.509		
	Total	201.522	399			
Behavioral Intention to Use	Between Groups	1.929	4	.482	.728	.573
	Within Groups	261.848	395	.663		
	Total	263.778	399			

Improve Issue

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Perceived Entertainment Value	Between Groups	.810	4	.203	1.221	.301
	Within Groups	65.516	395	.166		
	Total	66.326	399			
Perceived Usefulness	Between Groups	.526	4	.131	1.310	.265
	Within Groups	39.634	395	.100		
	Total	40.160	399			
Perceived Ease of Use	Between Groups	.305	4	.076	.224	.925
	Within Groups	134.227	395	.340		
	Total	134.532	399			
Trust	Between Groups	2.184	4	.546	.346	.847
	Within Groups	622.479	395	1.576		
	Total	624.662	399			
Attitude	Between Groups	2.748	4	.687	2.004	.093
	Within Groups	135.376	395	.343		
	Total	138.124	399			
Technology Anxiety	Between Groups	8.003	4	2.001	1.358	.248
	Within Groups	581.969	395	1.473		
	Total	589.972	399			
Social Norm	Between Groups	1.573	4	.393	.777	.541
	Within Groups	199.948	395	.506		
	Total	201.522	399			
Behavioral Intention to Use	Between Groups	3.834	4	.958	1.456	.215
	Within Groups	259.944	395	.658		
	Total	263.778	399			

Frequency of the visit at stores near BTS/MRT/ARL

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Perceived Entertainment Value	Between Groups	1.027	5	.205	1.239	.290
	Within Groups	65.300	394	.166		
	Total	66.326	399			
Perceived Usefulness	Between Groups	.310	5	.062	.614	.689
	Within Groups	39.849	394	.101		
	Total	40.160	399			
Perceived Ease of Use	Between Groups	1.560	5	.312	.925	.465
	Within Groups	132.972	394	.337		
	Total	134.532	399			
Trust	Between Groups	8.965	5	1.793	1.147	.335
	Within Groups	615.697	394	1.563		
	Total	624.662	399			
Attitude	Between Groups	2.231	5	.446	1.294	.266
	Within Groups	135.894	394	.345		
	Total	138.124	399			
Technology Anxiety	Between Groups	68.659	5	13.732	10.378	.000
	Within Groups	521.313	394	1.323		
	Total	589.972	399			
Social Norm	Between Groups	6.268	5	1.254	2.529	.029
	Within Groups	195.254	394	.496		
	Total	201.522	399			
Behavioral Intention to Use	Between Groups	8.659	5	1.732	2.675	.022
	Within Groups	255.118	394	.648		
	Total	263.778	399			

Smart card usage familiarity

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Perceived Usefulness	Equal variances assumed	.230	.632	-.739	398	.460	-.026	.035	-.095	.043
	Equal variances not assumed			-.741	206.436	.459	-.026	.035	-.095	.043
Perceived Entertainment Value	Equal variances assumed	.035	.852	.307	398	.759	.014	.045	-.075	.103
	Equal variances not assumed			.302	197.891	.763	.014	.046	-.077	.105
Perceived Ease of Use	Equal variances assumed	.734	.392	2.099	398	.036	.135	.064	.009	.261
	Equal variances not assumed			1.996	185.862	.047	.135	.068	.002	.268
Trust	Equal variances assumed	.009	.926	2.452	398	.015	.339	.138	.067	.610
	Equal variances not assumed			2.848	290.230	.005	.339	.119	.105	.573
Attitude	Equal variances assumed	.182	.670	-.227	398	.821	-.015	.065	-.143	.114
	Equal variances not assumed			-.217	188.197	.828	-.015	.068	-.150	.120
Technology Anxiety	Equal variances assumed	1.196	.275	-1.175	398	.241	-.159	.135	-.424	.107
	Equal variances not assumed			-1.165	201.511	.245	-.159	.136	-.427	.110
Social Norm	Equal variances assumed	.820	.366	-.072	398	.942	-.006	.079	-.161	.150
	Equal variances not assumed			-.071	198.459	.943	-.006	.080	-.164	.153
Behavioral Intention to Use	Equal variances assumed	.013	.909	1.981	398	.048	.178	.090	.001	.355
	Equal variances not assumed			1.870	183.317	.063	.178	.095	-.010	.366

Reliability

Overall

Reliability Statistics

Cronbach's Alpha	N of Items
.821	21

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Perceived Usefulness_1	78.53	69.223	.521	.811
Perceived Usefulness_2	78.37	71.757	.352	.818
Perceived Usefulness_3	78.53	71.844	.233	.820
Perceived Entertainment Value_1	79.10	69.679	.334	.816
Perceived Entertainment Value_2	79.07	69.651	.353	.816
Perceived Entertainment Value_3	78.77	69.702	.372	.815
Perceived Ease of Use_1	78.90	68.369	.527	.810
Perceived Ease of Use_2	79.00	69.448	.415	.814
Perceived Ease of Use_3	79.33	66.230	.582	.805
Trust_1	79.63	65.068	.584	.804
Trust_2	79.37	66.654	.394	.814
Trust_3	79.57	65.426	.561	.805
Attitude_1	78.83	69.316	.418	.813
Attitude_2	78.87	70.120	.388	.815
Behavioral Intention to Use	78.97	65.482	.595	.804
reversed_Technology_Anxiety_1	79.73	67.237	.325	.818
reversed_Technology_anxiety_2	79.70	65.941	.348	.818
reversed_Technology_anxiety_3	79.77	67.426	.292	.821
Socail Norm_1	79.53	68.326	.244	.824
Socail Norm_2	80.13	67.361	.257	.825
Socail Norm_3	79.63	64.585	.481	.809

Perceived Usefulness

Reliability Statistics

Cronbach's Alpha	N of Items
.757	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Perceived Usefulness_1	9.43	.668	.665	.578
Perceived Usefulness_2	9.27	.892	.682	.613
Perceived Usefulness_3	9.43	.806	.467	.822

Perceived Ease of Use

Reliability Statistics

Cronbach's Alpha	N of Items
.811	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Perceived Ease of Use_1	8.00	1.586	.728	.681
Perceived Ease of Use_2	8.10	1.610	.692	.714
Perceived Ease of Use_3	8.43	1.426	.590	.838

Perceived Entertainment Value

Reliability Statistics

Cronbach's Alpha	N of Items
.749	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Perceived Entertainment Value_1	8.50	1.155	.824	.334
Perceived Entertainment Value_2	8.47	1.706	.430	.825
Perceived Entertainment Value_3	8.17	1.661	.516	.731

Perceived Trust

Reliability Statistics

Cronbach's Alpha	N of Items
.894	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Trust_1	7.40	3.145	.834	.816
Trust_2	7.13	2.878	.765	.882
Trust_3	7.33	3.264	.790	.854

Attitudes

Reliability Statistics

Cronbach's Alpha	N of Items
.821	2

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Attitude_1	4.30	.355	.700	.
Attitude_2	4.33	.437	.700	.

Technology Anxiety

Reliability Statistics

Cronbach's Alpha	N of Items
.937	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
reversed_Technology_Anxiety_1	6.87	5.154	.890	.894
reversed_Technology_anxiety_2	6.83	4.695	.875	.905
reversed_Technology_anxiety_3	6.90	5.059	.847	.925

Social Norms

Reliability Statistics

Cronbach's Alpha	N of Items
.807	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Social Norm_1	6.57	4.530	.646	.745
Social Norm_2	7.17	3.799	.734	.649
Social Norm_3	6.67	4.920	.595	.795