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**THE MEDIATING EFFECT OF ATTITUDE ON DIRECT AND INDIRECT
DETERMINANTS OF INTERNET BANKING USAGE IN MALAYSIA**

By

AHMAD KAMAL SINDIN



UUM
Universiti Utara Malaysia

**Thesis Submitted to
Othman Yeop Abdullah Graduate School of Business,
Universiti Utara Malaysia,
In Partial Fulfillment of the Requirement for the Doctor of Business Administration**



**OTHMAN YEOP ABDULLAH GRADUATE SCHOOL OF BUSINESS
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Tajuk Tesis / Disertasi
(Title of the Thesis / Dissertation)

: The Mediating Effect of Attitude on Direct and Indirect Determinants
of Internet Banking Usage in Malaysia

Program Pengajian
(Programme of Study)

: Doctor of Business Administration

Nama Penyelia/Penyelia-penyelia
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ABSTRACT

Internet banking in Malaysia has been in existence for more than two decades. However, there is still lack of studies in discovering the aspects of attitude and behavior of the retail banking customers towards the adoption of the internet banking services. Therefore, this study aims to investigate the determinants of the internet banking usage from the angle of attitude and behavior of these customers in the internet banking usage. This study employed the Technology Acceptance Model by Davis as the underpinning theory and further enhanced it to the Extended Technology Acceptance Model by taking into account factors such as trust, internet self-efficacy, and subjective norm as the additional predictors of internet banking usage via the mediating effect of attitude towards usage. The study setting was based on five top commercial banking in Malaysia and systematic random sampling of data collection was done through households via self-administered questionnaire and analysis was done by using the structural equation modelling as the statistical tool. The findings show that perceived ease of use and attitude have a positive significant effect on internet banking usage while perceived usefulness and internet self-efficacy have a positive impact on attitude. The findings further reveal that perceived usefulness and internet self-efficacy mediate through attitude on the internet banking usage while trust, perceived ease of use, and subjective norm do not mediate through attitude on the internet banking usage. These results are immeasurably valuable to practitioners for managing and executing their marketing strategy. Furthermore, it contributes and enriches knowledge pertaining to the predictors of internet banking usage.

Keywords: Internet banking usage, trust, internet self-efficacy, subjective norm, Malaysian retail banking.

ABSTRAK

Perbankan internet di Malaysia telah wujud lebih dua dekad yang lalu. Walau bagaimanapun, masih terdapat kekurangan rangkuman kajian dalam mencari aspek-aspek sikap dan tingkah laku pelanggan perbankan runcit ke arah penggunaan perkhidmatan perbankan internet. Oleh itu, kajian ini menyiasat faktor-faktor penentu penggunaan perbankan internet dari sudut sikap dan tingkah laku pelanggan dalam penggunaan perbankan internet. Kajian ini menggunakan teori *Technology Acceptance Model* oleh Davis sebagai teori asas dan dipertingkatkan kepada *Extended Technology Acceptance Model* dengan mengambil kira faktor kepercayaan, efikasi-kendiri internet dan norma subjektif sebagai peramal tambahan bagi penggunaan perbankan internet melalui kesan pengantara sikap terhadap penggunaan. Kajian ini dijalankan terhadap lima buah bank perdagangan utama di Malaysia dan menggunakan persampelan rawak sistematik bagi pengumpulan data yang dilakukan ke atas isi rumah melalui borang soal selidik tadbir kendiri dan dianalisis dengan menggunakan *structural equation modelling* sebagai alat statistik. Hasil kajian menunjukkan bahawa kemudahan penggunaan dan sikap mempunyai kesan yang positif terhadap penggunaan perbankan internet, manakala kebergunaan dan efikasi-kendiri internet memberikan kesan positif ke atas sikap. Hasil kajian juga mendedahkan bahawa kebergunaan dan efikasi-kendiri internet dapati mempunyai hubungan dengan sikap terhadap penggunaan perbankan internet, manakala kepercayaan, kemudahan penggunaan, dan norma subjektif tidak mempunyai hubungan dengan sikap terhadap penggunaan perbankan internet. Dapatan kajian ini adalah sangat berharga kepada pengamal untuk mengurus dan melaksanakan strategi pemasaran mereka. Tambahan pula, dapatan ini juga dapat menyumbang dan memperkayakan pengetahuan yang berkaitan dengan ramalan penggunaan perbankan internet.

Kata kunci: Penggunaan perbankan internet, kepercayaan, internet efikasi-kendiri, norma subjektif, perbankan runcit Malaysia.

ACKNOWLEDGEMENTS

First and foremost, I would like to thank Allah giving me guidance, good health, strength and protection throughout the working of this thesis and achieving strong determination.

I am most thankful to my supervisor, Professor Dr. Nik Kamariah Binti Nik Mat for her motherly guidance, advice and encouragements, not only during dissertation writing period but also throughout my term of office as a DBA student. Without her full knowledge and sound ideas, the chapters would not have been possible.

My special gratitude is extended to Associate Professor. Dr. Filzah Binti Md Isa and Dr. Barudin Bin Muhamad for valuable inputs and suggestions pertaining to internet banking usage and analysis method. Truly admire your energy which spreads positive auras and uplift students' morale in a time of need. I also like to dedicate this, special thanks to all staff of UUM City campus who have extended their cooperation on administrative matters.

I am likewise indebted to Dr. Mohd Awang Bin Idris from Universiti Malaya and Professor T. Ramayah from Universiti Sains Malaysia, who both, assisted me with unequivocal insights of data collection method and analysis. I truly appreciate their contributions to the successful of this thesis.

Not to forget, my colleague, Aravindan Kalisri Logeswaran, who has always motivated me to further proceed, support and assistance and stood with me ever since our MBA days, 12 years ago and still going strong. Without him, I would not have reached the conclusion of my thesis.

Finally, I would like to thank my wife, family members, parents, for their unwavering support and love.

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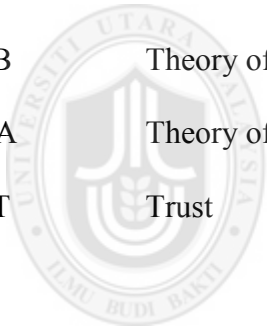
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LIST OF ABBREVIATIONS

AGFI	Adjusted Goodness of Fit Index
AMOS	Analysis of Moment Structures
ATU	Attitude
AVE	Average Variance Extracted
AVR	Automated Voice Response
BIS	Banking Information System
BNM	Bank Negara Malaysia
CDFNorm	Cumulative Distributions Function
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
DOI	Diffusion of Innovation Theory
DTPB	Decomposed Theory of Planned Behaviour
ECT	Expectation Confirmation Theory
ETAM	Extended TAM
GFI	Goodness of Fix Index
IBU	Internet Banking Usage
ICT	Information communication technology
ISE	Internet Self-Efficacy
MCMC	Malaysian Communications and Multimedia Commission
MI	Modification Indices
MOF	Ministry of Finance
NFI	Normed Fit Index
PEMANDU	Performance Management & Delivery Unit (Malaysia)
PEU	Perceived Ease of Use

PU	Perceived Usefulness
PwC	PricewaterhouseCooper's
RMSEA	Root Mean Square Error of Approximation
SD	Standard Deviation
SEM	Structural Equation Modelling
SN	Subjective Norm
SPSS	Statistical Package for Social Science
TAM	Technology Acceptance Model
TAM 2	Technology Acceptance Model 2
TAM 3	Technology Acceptance Model 3
TLI	Tucker Lewis Index
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
TST	Trust



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CHAPTER 1

INTRODUCTION

1.0 Chapter Overview

The first chapter of this research introduces the issue of internet banking in Malaysia from brick and mortar banking to an online banking. Further, it discusses the research background of the study, problem statement, research questions, research objectives, significance and contribution of the study, scope of the study, definitions of terminologies and lastly organization of the thesis.

1.1 Background of the Study

The internet and information communication technology (ICT) has changed landscape of all industries including medical, agricultural, tourism, businesses and banking in Malaysia likewise, all around the world. Internet and ICT have transformed banking industry from a “manual system” of banking operations to full computerisation in all aspects of its operations. The computerisation affects opening and maintenance of an array of services, ranging from savings account, current account, remittances and transfer of funds, fixed deposit, investment account, trade finance and loan processing. This improvement has to certain extent, made the transactions cheaper, easier, efficient, and effective.

On the other hand, internet banking acceptance by customers is still low in Malaysia and other countries such as Hong Kong and Taiwan despite readiness of the system two decades ago. As such, granting further investigation, as being echoed by string of researchers (Alkafagi, Romli, Bahaudin, Alekam & Salameh, 2015; Amin, Supinah, Mohd Aris & Baba, 2012; Bashir & Madhaviah, 2015, Candra, 2013; Fathima & Muthumani, 2015; Juwaheer, Pudaruth & Ramdin, 2012; Nguyen, Nguyen & Singh, 2014). A point to note, is the high internet access at home, at 61.9% which represents a positive indication of internet banking adoption in the future (MCMC report as at 2Q 2015).

The main reason for conducting this research transpired after noticing the shift in use of traditional banking delivery channels toward self-service channels such as internet banking, which was also highlighted by researchers such as Safeena, Date, Hundewale and Kammani (2013). Similarly, Safeena, Date and Kammani (2011) quoted internet banking services which was introduced in late 1990s, apt to replace existing counter services. Therefore, the objective of this study gravitates along investigating and understanding behavioral factors (direct and indirect) of internet banking users in the context of commercial bank in Malaysia.

Despite the overwhelming perception on internet banking, acceptance rate from customers is still low as reported by Hugh Harley (2014), a financial services leader for the Asia Pacific of PricewaterhouseCooper's (PwC). The financial services leader reiterated that nearly 100% Malaysians visited bank branches on a regular basis for their banking needs whereas for Thais, it is less than 80%. This shows that Malaysians prefer

face to face banking experience compared to digital banking (TheEdge Malaysia, August 2014). Similarly, a study has been conducted on Muslim consumers' perception in Malaysia on internet banking services and findings revealed that 32% of respondents indicated that they have used Internet banking service while majority (68%) have not used the services (Anuar, Adam & Mohamad, 2012).

The second reason for conducting this research is that “brick and mortar” banks require a large operational cost to maintain its normal delivery channel (Chavan, 2013). Apparently, cost factor is very important to the bank towards maintaining profit and competitiveness, whereby average cost of internet banking transaction is USD0.010 whereas physical banks' transaction is USD1.07 (Kurtas, 2000). Moreover, Alkafagi *et al.* (2015) and Bashir and Madhavaiah (2015) suggested that the internet banking is an alternative delivery channel where customers may conduct their financial transactions virtually at any place and time without any hindrance. Despite the heavy investment by banks in Malaysia in internet banking, the types of transactions offered by banks to customers and promotions made by commercial banks in Malaysia do not really pay off.

Thirdly, the banks that offer their financial services over the internet banking tend to speed up the adoption process, knowing that the cost of delivering the service over the internet banking is much cheaper than delivering the same service over-the-counter (Munusamy, Annamalah & Chelliah, 2012). The internet banking is an important innovation for banks and it is a very important distribution channel, which could derive a competitive advantage through cost reduction and better satisfaction for customers

(Bashir & Madhavaiah, 2015; Maduku, 2013; Momeni, Kheiry & Dashtipour, 2013 Yasa, Ratnaningrum & Sukaatmadja, 2014).

Lastly, researchers Juwaheer *et al.* (2012), Bashir and Madhavaiah (2015) and Chavan (2013) claimed that factors such as security and risk may impact the level of acceptance on the adoption of a new technology, *i.e.* the internet banking system, where financial transactions are conducted virtually and the concern for security and risk may slow down the acceptance rate even though the internet banking system was first introduced in the late 1990s. This is in line with the research done by Safeena *et al.* (2011) on the element of trust in the context of online banking that will determine the adoption rate of this alternative delivery channel in the future. Juwaheer *et al.* (2012) added that the failure of the internet as a retail distribution channel has been attributed to the lack of trust by customers using the electronic channel.

In addition, Eastin and LaRose (2000) indicated that the complexity of an information system and lack of knowledge may hinder internet adoption. Meanwhile, based on Bandura (1997) definition, self-efficacy is the belief "in one's capabilities to organize and execute the courses of action required to produce given attainments". Therefore, this belief may also cause the adoption of internet banking to be less accepted by bank customers. The bank customers who are weak in self-efficacy have less confidence in using the internet and are not satisfied with their internet skills leading to discomfort in using the internet and not performing this behavior in the future (Bandura, 1982).

In tandem with Bandura's study, Compeau and Higgins (1995) research in information system suggested that computer self-efficacy is not based on an individual skill but on how the skills are applied. Therefore, internet self-efficacy focuses on the belief of an individual to accomplish something online now or in the future, such as finding information or troubleshooting the internet system (Eastin & LaRose, 2000). In conclusion, for internet banking to be adopted by a bank customer, it is important for the customer to have a set of internet self-efficacy capabilities to perform banking transaction over the internet.

1.2 Problem Statement

In this study, there are seven problem statements identified pertaining to the internet banking usage in Malaysia that needs further attention and needs to be addressed accordingly. The problem statements are thoroughly discussed as per the following paragraphs below.

1.2.1 Low Internet Banking Usage

Internet banking usage has also been a concern for countries in Asia region where a study done by McKinsey & Company has uncovered the pattern of low internet banking usage. Their research indicated that in developed Asia (Australia, Hong Kong, Japan, Singapore, South Korea and Taiwan), customer's interactions per month with internet banking was five times while countries belonging to emerging Asia (consists of China,

India, Indonesia, Malaysia, Philippines, Thailand and Vietnam), internet banking activities were recorded at a mere 0.7 times (McKinsey & Company, March 2015). Therefore, developed Asia banking customers have better internet banking usage as compared to emerging Asia by four points three times higher and this proves that Malaysia is relatively far behind in term of low internet usage from countries such as Singapore, Hong Kong and Taiwan. In conclusion Malaysian banking customers still prefer to visit bank branches for their banking transactions and interact with the bank staff.

PwC has also revealed that almost 100% of Malaysian banking customers visited bank branches regularly to conduct banking transactions whereas for Thais it was less than 80%. This shows that Malaysian banking customers prefer face to face banking experience to full fill their banking needs (TheEdge Malaysia, August 2014). Attributable to this, the phenomena need to be addressed and constructive measures should follow for the benefit of the banking industry in Malaysia, likewise to enable its survival in line with globalization and the liberalization of the banking industry in the future.

1.2.2 Low Penetration Rate and Dwindling Usage

In another survey done by BNM in year 2014, it was observed that internet banking subscribers in Malaysia were experiencing declining growth rate from year 2009 until 2014, dropping from 21.12% to 13.32%, respectively. Subsequently, penetration rate reduced as well from year 2009 till 2014 whereby it recorded 19.09% in 2009 and

dwindles to 12.07% in 2014. The percentage change is derived by subtracting the current year's figure from the previous year's figure divided by the previous year's figure.

Despite the fact that banks and financial institutions in Malaysia have been promoting internet banking and have made huge investments, the response from the “brick and mortar” customers has not been encouraging (Table 1.1). The internet banking facility can be a convenient delivery channel for the customer to perform banking transactions at home, in the office or elsewhere, 24 hours a day and 365 days a year. For the banks, it is a great savings as the cost for maintaining a teller is much more expensive at 1% of the total cost of a branch's transaction process (Yuan, Hyung & Sang, 2010).

Table 1.1
Internet Banking Subscribers in Malaysia from 2009 to 2014

As at End of Period	2009	2010	2011	2012	2013	2014	% Change 2009/2010	% Change 2010/2011	% Change 2011/2012	% Change 2012/2013	% Change 2013/2014
No of subscribers (In Million)	8.12	9.85	11.87	13.68	15.52	17.60	21.24	20.57	15.21	13.49	13.37
Individual subscribers (In Million)	7.96	9.64	11.64	13.43	15.22	17.25	21.12	20.73	15.41	13.36	13.32
Penetration to Population* (%)	28.92	34.45	40.85	46.35	51.89	58.16	19.09	18.60	13.46	11.96	12.07

*Based on 2014 Population Figure

Source: Bank Negara Malaysia

1.2.3 Other Reasons for Non-Usage of Internet Banking Facility

A study was done by Rock, Hira and Loibl (2010) in the US to identify the reasons for not using the internet banking and it was found that the majority of the respondents (82.4%) indicated that they did not use the internet because they preferred to work with people. During the survey, a large proportion of the respondents also reported that they did not use the internet due to security concerns at 44.0% while 37.9% of the respondents did not use the websites because of difficulty in understanding or being confused. Similarly, a survey have been conducted by AC Nielsen from 3rd November 2008 to 15th January 2009 in Malaysia was participated by 3,890 respondents who were interviewed between the ages of 18 years to 64 years from semi-urban and rural areas in the country. This study revealed several key barriers to internet banking usage in Malaysia as illustrated in Figure 1.1.

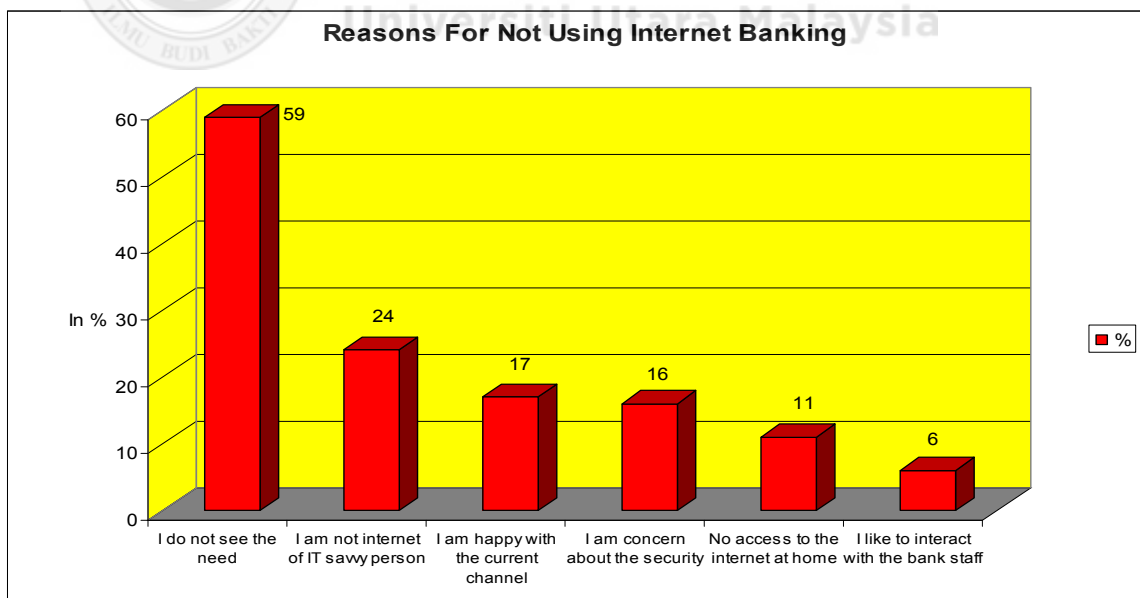


Figure 1.1
Reasons for not using the Internet Banking Services
Source: AC Nielsen (2nd June 2009)

1.2.4 Fragmented Model in Internet Banking Adoption

The empirical research on information system usage via Technology Acceptance Model still requires further study since there are gaps such as fragmented conceptualization, mediating effect not being tested, attitudinal aspect of internet usage, inconsistent results of past studies, trust, perceived usefulness, perceived ease of use, internet self-efficacy, subjective norm and internet banking usage issues in the context of Malaysian banking environment, and being weak in the area of methodology. The following discussion will justify this study.

The fragmented TAM in the information system used in banking and non-banking studies can be observed from previous studies from a simple to a complex research model. For example, a simple model by Porter and Donthu (2006) examined three determinants of attitude towards internet usage (perceived ease of use, perceived usefulness, and access barrier). Similarly, Nasri (2011) examined six determinants that produced hypotheses with direct relationships to internet usage (demographic characteristics, security, channel convenience, information on online banking, perceived risk and prior internet knowledge). Meanwhile, Park (2009) suggested six direct determinants (e-learning self-efficacy, subjective norm, system accessibility, organizational factor, perceived ease of use, perceived usefulness and attitude) of intention to use. Park (2009) also suggested three indirect factors towards intention to use (perceived usefulness, perceived ease of use and attitude). With this complex model, the study produced a total number of 16 hypotheses.

In addition to this, Eze, Yaw, Manyeki and Har (2011) suggested six direct determinants of internet usage (perceived ease of use, perceived usefulness, relative advantage, self-efficacy, perceived credibility, and trialability). Suh and Han (2002) proposed five direct and indirect determinants of internet usage (trust, perceived ease of use, perceived usefulness, attitude towards using, and behavioral intention towards internet). In addition, a complex model (more than seven determinants) by Mansumittrchai and Al-Malkawi (2011) investigates eight determinants of direct relationship towards internet usage (security, trust, difficulty, compatibility, social influence, higher level of PC proficiency, third party concerns, and human contact).

The simple models in all these studies have used the multiple regression analysis method. The complex model by Mansumittrchai and Al-Malkawi (2011) applied the Analysis of Variance method. Besides these, only two studies have direct and indirect determinants towards internet usage by employing Structural Equation Modelling (SEM) as a method of analysis (Reid & Levy, 2008; Suh & Han, 2002). The fragmentation is also observed in two studies in the area of banking and non-banking. For example, different selection of determinants in a banking study by Suh and Han (2002) took into consideration three determinants of attitude towards behavioral intention and in turn to actual usage. This is contrary to the study in a non-banking area by Porter and Donthu (2006) where three determinants of attitude were influenced by demographic factors (age, education, income and race) towards usage.

This fragmentation issue was supported by research done by Safeena *et al.* (2011) who stated that the TAM is not a comprehensive model. Meanwhile, Yaghoubi and Bahmani (2010) also indicated that the Technology Acceptance Model is a fragmented model whereby this model needs to be associated with other external variables so that it will be more comprehensive in predicting the information system usage. The fragmentation of the theoretical framework warrants further research to be conducted.

1.2.5 Inconsistent Findings of Previous Studies

The theoretical bases that have been adopted are the TAM, the TPB, the DOI Theory, and the Expectation Confirmation Theory (ECT) that have been used in many researches in the area of ICT usage. However, the adoption of all these theoretical bases on previous researches conducted showed that there were inconsistent findings in most of the determinants selected as the independent variables (trust, perceived usefulness, perceived ease of use, internet self-efficacy, subjective norm and attitude) towards internet usage.

On the other hand, past studies on establishing the relationships between the determinants and internet usage in banking and non-banking studies, display mixed results with a positive and negative significance; and insignificant relationships (Alhtaybat & Hutaibat, 2011; Alkafagi *et al.*, 2015; Amin, Supinah, Mohd Aris & Baba, 2012; Candra, 2013; Chen & Li, 2010; Lin & Nguyen, 2011; Mamat, Abdullah & Razak, 2015; Mansumittrchai & Al-Malkawi, 2011; Selamat & Jaffar, 2015; Nguyen *et al.*, 2014; Safeena, Abdullah & Date, 2010; Thomas, 2011; Usoro *et al.*, 2010).

Meanwhile, inconsistent results between determinant variables and internet usage were also observed from past researches in the area of banking and non-banking. For example, the linkages between trust, perceived usefulness, perceived ease of use and internet usage also delivers mixed findings. For instance, positive significant relationships were mostly observed in the linkages between trust, perceived usefulness, perceived ease of use and internet usage (Alkafagi *et al.*, 2015; Bashir & Madhavaiah, 2015; Chen *et al.*, 2010; Fathima & Muthumani, 2015; Eriksson *et al.*, 2005; Eze *et al.*, 2011; Juwaheer *et al.*, 2012; Lin & Nguyen, 2011; Lule *et al.*, 2012; Mamat *et al.*, 2015; Mansumittrchai & Al-Malkawi, 2011; Mazhar *et al.*, 2014; Pikkarainen, Pikkarainen, Karjaluoto, & Pahnla 2004; Selamat & Jaffar, 2011; Safeena *et al.*, 2013; Safeena *et al.*, 2011; Trivedi & Kumar, 2014; Wang & Tseng, 2011; Wu & Gao, 2011). In contrary to this, there were also an insignificant linkage between trust, perceived usefulness, perceived ease of use and internet usage (Aboelmaged & Gebba, 2013; Amin *et al.*, 2012; Bashir & Madhavaiah, 2015; Candra, 2013; Eriksson *et al.*, 2005; Mamat *et al.*, 2015; Manzano, Navarre, Mafe, & Blas, 2009; Nguyen *et al.*, 2014; Pikkarainen *et al.*, 2004; Sa´nchez, Hueros & Ordaz, 2013; Selamat & Jaffar, 2011; Usoro *et al.*, 2010).

The association between internet self-efficacy, subjective norm, attitude, and internet usage also shows dissimilarities. Thirteen studies, for example, uncovered a positive significant relationship (Abdulkadir *et al.*, 2013; Aboelmaged & Gebba, 2013; Alkafagi *et al.*, 2015; Al-Ajam & Md Noor, 2013; Amin *et al.*, 2012; Bashir & Madhavaiah, 2015; Elkaseh *et al.*, 2015; Fathima & Muthumani, 2015; Maduku, 2013; Mazhar *et al.*, 2014; Nasri, 2011; Safeena *et al.*, 2013; Trivedi & Kumar, 2014), while eleven studies showed an insignificant linkages (Abdulkadir, Galoji & Razak, 2013; Al-Adwan, Al-

Adwan & Smedley, 2013; Chen *et al.*, 2013; Chen *et al.*, 2010; Juwaheer *et al.*, 2012; Mamat *et al.*, 2015; Mansumittrchai & Al-Malkawi, 2011; Sa´nchez *et al.*, 2013; Selamat & Jaffar, 2011; Trivedi & Kumar, 2014; Wu & Gao, 2011). Moreover, there was one study that indicated a negative significant relationship between these two variables *i.e.* subjective norm and internet usage (Alkafagi *et al.*, 2015).

It was also observed that there are inconsistent results between the determinant variables and attitude in the area of banking and non-banking studies. For example, positive significant results were frequently observed in the linkages between trust, perceived usefulness and attitude (Aboelmaged & Gebba, 2013; Al-Ajam & Md Noor, 2013; Al-Majali, 2011; Adesina & Ayo, 2010; Bashir & Madhavaiah, 2015; Bamoriya & Singh, 2012; Celik & Yilmaz, 2011; Chau & Ngai, 2010; Elkaseh *et al.*, 2015; Kowitlawakul, 2011; Maduku, 2013; Mazhar *et al.*, 2014; Mangin, Bourgault, Guerrero & Egea, 2011; Read, Robertson, & McQuilken, 2011; Reid & Levy, 2008; Thomas, 2011; Wang & Tseng, 2011; Wu & Gao, 2011). Nevertheless, there were also an insignificant relationship between trust, perceived usefulness and attitude (Al-Adwan *et al.*, 2013; Lule *et al.*, 2012; Mazhar *et al.*, 2014; Shroff, Deneen & Ng, 2011; Trivedi & Kumar, 2014), while the linkage between perceived usefulness and attitude mostly displayed a positive significant relationship both in banking and non-banking studies between these two variables.

Lastly, the linkages between perceived ease of use, internet self-efficacy, subjective norm and attitude also display inconsistent results in banking and non-banking studies. For example, there are significant positive relationships between internet self-efficacy

and attitude (Adesina & Ayo, 2010; Al-Ajam & Md Noor, 2013; Bashir & Madhavaiah, 2015; Chau & Ngai, 2010; Elkaseh *et al.*, 2015; Hamari, 2015; Kowitlawakul, 2011; Lule *et al.*, 2012; Maduku, 2013; Mazhar *et al.*, 2014; Park, 2009; Read *et al.*, 2011; Sa'nchez *et al.*, 2013; Shroff *et al.*, 2011; Zendehdel & Paim, 2015; Zhu, Sangwan & Lu, 2010). However, results also indicated that there were also negative significant and insignificant relationship between perceived ease of use, internet self-efficacy, subjective norm and attitude (Aboelmaged & Gebba, 2013; Kulviwat, Bruner & Neelankavil, 2014; Lule *et al.*, 2012; Maduku, 2013; Nguyen *et al.*, 2014; Park, 2009; Trivedi & Kumar, 2014; Wang & Tseng, 2011). Therefore, the above discussions justify the inconclusive findings of the determinant variable of attitude.

1.2.6 Mediation Effect Not Established

The mediating effect of attitude has been suggested in many studies adopting the TAM in their theoretical framework in the area of banking and non-banking. Nevertheless, no mediation test was established by the researchers that causes ambiguity on the intervening variable of attitude towards internet usage. For instance, in a banking study, the mediation test was not established by the researchers (Adesina & Ayo, 2010; Al-Ajam & Md Noor, 2013; Al-Majali, 2011; Lule *et al.*, 2012; Mazhar *et al.*, 2014; Nguyen *et al.*, 2014; Sharma & Gonindaluri, 2015; Widjana & Rachmat, 2011). Similarly, in non-banking studies, the mediation test was also neglected by the researchers (Elkaseh *et al.*, 2015; Lim & Ting, 2012; Park, 2009; Trivedi & Kumar,

2014; Wong & Fung, 2015; Zhu *et al.*, 2010). Therefore, the current study is performed to establish the mediating effect of attitude on the determinants towards internet usage.

1.2.7 Inconclusive Study of Internet Banking Usage

Internet banking adoption studies are inconclusive as they just measure internet usage intention instead of the actual usage behavior. The works of Mazhar *et al.* (2014) and Guriting and Ndubisi (2006) only tested internet banking usage intentions instead of actual use, and they further stated that research on internet banking usage should also measure actual usage behavior instead of just behavior intention. Most banking and non-banking studies measure the internet usage intention. In banking, fourteen studies have been observed on finding out the determinant variables' linkage with internet usage intention (Adesina & Ayo, 2010; Chau & Ngai, 2010; El-Kasheir, Ashour & Yacount, 2009; Mangin *et al.*, 2011; Reid & Levy, 2008; Yaghoubi & Bahmani, 2010; Chong, Ooi, Lin & Tan, 2010; Zhao, Lewis, Hanmer-Lloyd & Ward, 2010).

Meanwhile, twenty-one studies were detected in non-banking measuring factors towards usage intention behavior (Ghorbani & Madani, 2011; Jae *et al.*, 2010; Keng, Wai & Kok, 2010; Kowitlawakul, 2011; Lin & Chang, 2011; Ma & Liu, 2005; Read *et al.*, 2011; Shroff *et al.*, 2011; Tolentino, 2011; Wu & Gao, 2011; Yuliharsi, Islam & Ku Daud, 2011).

In comparison, fewer researches have been conducted in either banking or non-banking studies to measure actual behavior. For example, the determinants of internet usage were displayed in eight studies (Amin *et al.*, 2012; Eriksson *et al.*, 2005; Li, 2013; Lule *et al.*, 2012; Mansumittrchai & Al-Malkawi, 2011; Manzano *et al.*, 2009; Pikkarainen *et al.*, 2004; Safeena *et al.*, 2010) while in the non - banking study, seventeen studies have been located (Alshare, Mesak, Grandon, & Badri, 2011; Chen, Huang, Hsu, Tseng & Lee, 2010; Chen & Li, 2010; Lin & Nguyen, 2011; Porther & Donthu, 2006; Selamat & Jaffar, 2011; Thomas, 2011; Usoro *et al.*, 2010). In aggregate, there are more studies done on measuring internet usage intention compared to the actual internet usage behavior and most of these studies were conducted abroad.

1.3 Research Questions

This study is intended to answer the following research questions:

- 1.3.1 What is the strength of the direct relationship between trust, perceived usefulness, perceived ease of use, internet self-efficacy, subjective norm and attitude to internet usage in banking industry?
- 1.3.2 What is the strength of the direct relationship between trust, perceived usefulness, perceived ease of use, internet self-efficacy, and subjective norm to attitude in banking industry?
- 1.3.3 What is the mediating role of attitude between trust – internet usage, perceived usefulness – internet usage, perceived ease of use – internet usage, internet self-efficacy – internet usage and subjective norm – internet usage in banking industry?

1.4 Research Objectives

The objective of this study is to identify the main determinants and the mediating effect that may affect Malaysian commercial banking customers' usage of internet banking facility provided by Malaysian commercial banks based on the TAM framework (Davis, 1989) as well as to investigate the relationship between the given determinants using the Structural Equation Modelling analysis. The current study hereby lays out the objectives of this study as follows:

- 1.4.1 To examine the direct relationship between trust, perceived usefulness, perceived ease of use, internet self-efficacy, subjective norm and attitude to internet usage in banking industry.
- 1.4.2 To investigate the direct relationship between trust, perceived usefulness, perceived ease of use, internet self-efficacy, and subjective norm to attitude in banking industry.
- 1.4.3 To determine the mediating effect of attitude between trust – internet usage, perceived usefulness – internet usage, perceived ease of use – internet usage, internet self-efficacy – internet usage and subjective norm – internet usage in banking industry.

1.5 Significance and Contributions of the Study

The objective of the study is to examine the direct determinants and indirect determinants of bank customers' internet banking usage by using the conceptual underpinning theory of TAM as suggested by Davis (1989). This study is undertaken to

benefit academic research and the banking industry especially the commercial banks in Malaysia. The following are the contributions of the study:

1.5.1 Contributions to Academia

The proposed extended TAM may enhance the conceptualization of actual usage in the context of internet banking facility in Malaysia whereby previous researchers have illustrated the importance of this research framework with good empirical support in ICT research by many studies worldwide (Guriting & Ndubisi, 2006; Ramayah & Ling, 2002; Venkatesh & Morris, 2000). This study extends the construct of the TAM model in order to have greater positive impact on the usage of internet banking in Malaysia. This study has also included trust, internet self-efficacy and subjective norm as the additional constructs with mediation by attitude, to the original TAM model. The additional constructs, such as internet self-efficacy, trust, subjective norm and mediated by attitude, will shed more lights towards developing a new impetus model for internet banking.

In addition, the outcome of this research especially pertaining to direct and indirect effects of the proposed determinants of internet banking usage may improve the empirical literature in the marketing field and other related disciplines such as social psychology. This results will perhaps assist researchers for future research on how customers behave towards selected determinants to internet usage in banking based on the proposed theoretical framework.

1.5.2 Contributions to Practitioner

Commercial bank managers, especially in Malaysia could gain advantage from outcome of this study, mainly on the revelation of new insights that influences usage of internet banking. As such, it will advocate towards higher number of internet banking subscriber. This is done by strategizing marketing activities, in-line with findings of this study. Furthermore, the findings on perceived ease of use and perceived usefulness will also give a new dimension for improvements in attitude of the customers. Meanwhile, inclusion of trust, internet self-efficacy and subjective norm in this research may also enhance internet banking usage in the multi-racial and multi-cultural society of Malaysia.

1.5.3 The Government and Bank Negara Malaysia

The findings from this study could provide new guidelines for establishing policies for banking industry. Banking industry is important generally, due to being the fourth most important industry in Malaysia, which had contributed RM69.371 million to GDP in 2011. The related agencies that provide guidelines and regulations to the banks are BNM and the Ministry of Finance (MOF). New guidelines and regulatory enforcements by BNM will protect the interest of bank customers especially in the area of security and privacy issues that are related to trust by the bank customers.

The outcome too will be useful to government agencies such as BNM who can regulate security features by introducing maximum security measures to the banks to gain customers trust achievable when financial transactions through internet banking are protected at all time. Similarly, for the ease of use, usefulness and internet self-efficacy of internet banking usage, BNM may introduce a minimum requirement of website layout. BNM may also resort to exempt fees on online transactions which will turn out to motivate and secure new internet banking customers whilst increasing usages.

1.6 Scope of the Study

Firstly, this study is done in the context of the Malaysian banking environment and specifically on the usage of the internet banking facility by Malaysian commercial banking customers.

Secondly, this study deploys the TAM baseline theory with the original independent variables of perceived usefulness and ease of use and the dependent variable is internet banking usage. We further enhance the constructs and try to make it a comprehensive model by employing additional independent variables that are trust, internet self-efficacy, and subjective norm, and mediated by attitude towards internet banking.

Thirdly, the scope of this study focuses on a selected number of commercial banks in the area of Klang Valley. In this study, the researcher includes five largest commercial banks in Malaysia based on market capitalization so that it will represent the whole of

Klang Valley area. Klang Valley consists of ten municipalities consisting of Kuala Lumpur, Klang, Kajang, Subang Jaya, Petaling Jaya, Selayang, Shah Alam, Ampang Jaya, Perbadanan Putrajaya, and Sepang with a total population of 5.773 million (<http://etp.pemandu.gov.my/upload/etp>). In order for the researcher to match the five largest commercial banks with the population of almost six million people in this area, the banks that are being selected for this study will be based on five geographical regions *i.e.* central region, eastern region, western region, northern region and southern region of Klang Valley.

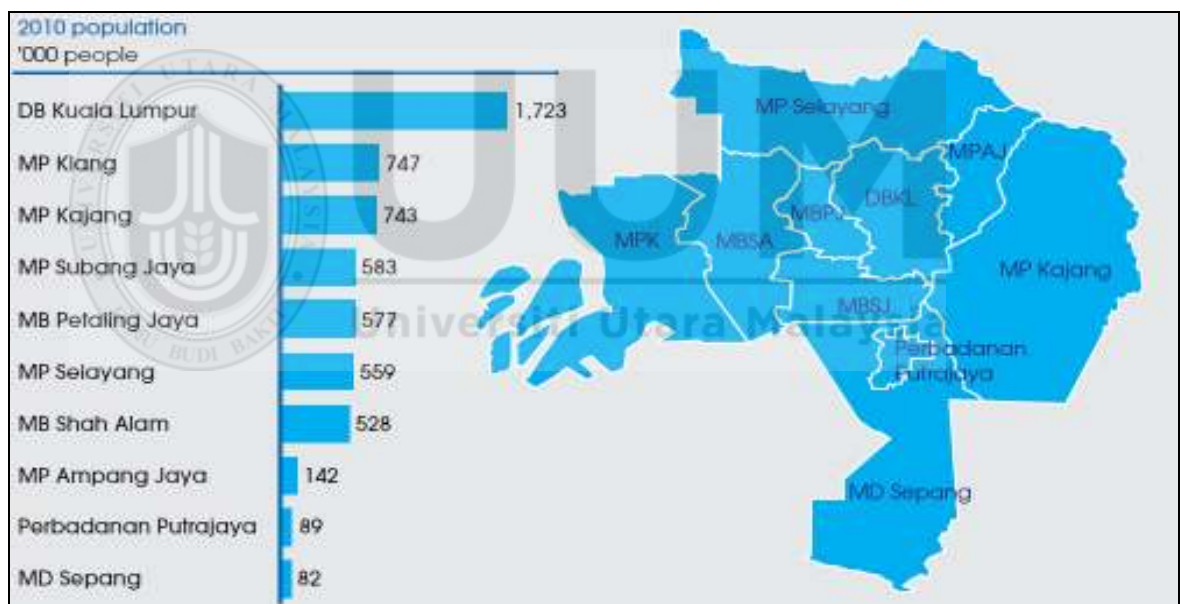


Figure 1.2
Klang Valley Municipalities and Population Breakdown
 Source: <http://etp.pemandu.gov.my/upload/etp>

Fourthly, we are unable to get the name list of customers from the five largest commercial banks due to the Financial Services Act 2013 (FSA 2013) where it is stated that under the FSA 2013 Act, Secrecy Section 133 (1),

“No person who has access to any document or information relating to the affairs or account of any customer of a financial institution, including the financial institution; or any person who is or has been a director, officer or agent of the financial institution, shall disclose to another person any document or information relating to the affairs or account of any customer of the financial institution. Any person who contravenes subsection (1) commits an offence and shall, on conviction, be liable to imprisonment for a term not exceeding five years or to a fine not exceeding ten million ringgit or to both.”

Lastly, due to the above, the researcher did not get internet banking customers' listing from the banks therefore, the researcher and research assistants distributed the self-administered questionnaires to the respondents directly via household sampling (Salim, 2007) of the five largest commercial bank customers from five geographical regions in the Klang Valley.

1.7 Definitions of Terminologies

For the purpose of this study, the researcher list down the key terminologies in this study for easy references (Table 1.2).

Table 1.2

Definition of Key Variables in this study

Variable Name	Definition	Source/Reference
Trust	The belief in a person's competence to perform the Internet banking task or expectancy that promise can be relied on the Internet banking system.	(Chen & Dhillon, 2003; Morgan & Hunt, 1994; Rotter, 1971; Kim & Prabhakar, 2002; Moorman <i>et al.</i> , 1992)
Perceived Usefulness	The degree to which a person believes that using Internet banking system would enhance his or her job	(Bashir & Madhavaiah, 2015; Eze <i>et al.</i> , 2013; Davis, 1998; Davis <i>et al.</i> , 1989; Mazhar <i>et al.</i> , 2014)
Perceived Ease of Use	The degree to which a person believes that using Internet banking system would be free of effort.	(Davis, 1989; Davis <i>et al.</i> , 1989; Guriting & Ndubisi, 2006; Venkatesh & Davis, 2000; Mazhar <i>et al.</i> , 2014)

Table 1.2 (continued)

Definition of Key Variables in this study

Variable Name	Definition	Source/Reference
Internet Self-Efficacy	Is the belief that one can successfully perform a distinct set of behaviours required to establish, maintain and utilize effectively the Internet banking system over and above basic personal computer skills.	(Amin <i>et al.</i> , 2012; Eastin, 2002; Eastin & LaRose, 2000; Park, 2009)
Subjective Norm	A person's perception of the social pressures put on him to perform or not to perform the Internet banking behavior.	(Ajzen & Fishbein, 1980; Amin, 2007; Chiu & Wang, 2008; Elkaseh <i>et al.</i> , 2015; Lule <i>et al.</i> , 2012; Trivedi & Kumar, 2014; Venkatesh & Davis, 2000; Venkatesh & Morris, 2000).
Attitude	The degree of evaluation affect that an individual associates with using the Internet banking system.	(Davis, 1993; Fishbein & Ajzen, 1975; Trivedi & Kumar, 2014)
Internet Banking Usage	Performing transaction through an Internet banking system that enables users to engage in online banking activities.	(Chavan, 2013; Haque, Ismail, & Daraz, 2009; Nelson & Richmond, 2007; Singhal & Padhmanabhan, 2008)
Internet Banking Facility	An Internet banking system that enables a bank's customers to perform the online banking activities.	(Chavan, 2013; Haque, Ismail, & Daraz, 2009; Nelson & Richmond, 2007; Singhal & Padhmanabhan, 2008)

1.8 Organization of the Thesis

The thesis contains five main chapters and the summary of the chapter is discussed as follows:

The study begins with chapter one which outlines the introduction of the research. It consists of the chapter overview, background of the study, problem statement, research questions, research objectives, significance and contribution of the study, scope of the study, definitions of terminologies and organization of the thesis.

Chapter two discusses the literature review as the foundation of study. It starts with a chapter overview, followed by the background of online banking industry in Malaysia, categories of internet usage in Malaysia, internet usage models in the banking industry, internet usage in non-banking industry, determinants of internet usage on direct relationship, indirect relationship of internet usage, determinants of attitude, mediation effects of attitude, the evolution of TAM, the underpinning theory of internet banking usage, trust theory, self-efficacy theory, and lastly the chapter summary.

In Chapter three, the research methodology is discussed. It includes the chapter overview, explanation of the research framework, whereby the methodology, which describes the methods and techniques such as hypotheses/propositions development, research design, operational definition, research instrumentation, measurement of research constructs, data collection, sampling, data collection procedures, techniques of data analysis, justification of using SEM, and lastly chapter summary.

In Chapter four, the research findings will be discussed. The introduction segment in this chapter will give the preview of the findings. The first part of the research findings are the response rate, the demographic analysis of the respondents, followed by the internet banking users' characteristics and descriptive statistics of research constructs. Later, the study discusses the data screening analysis such as missing values, response bias, multivariate outliers and normality assessment. Meanwhile, convergent validity is measured by reliability of the constructs, individual measurement model before fit and after fit, confirmatory factor analysis for the measurement model of individual construct, exogenous and endogenous variables, the structural model before fit and after fit,

analysis of the causal effects for latent constructs, discriminant validity and hypotheses testing. Subsequently, squared multiple correlation for endogenous latent variables, and the chapter summary will be presented.

In Chapter five, the discussion will be based on the objectives of the study in correspondence with the findings of the study and in congruence with the literature. The three objectives of the study will be thoroughly discussed especially the direct determinants of internet banking usage, the direct determinants of attitude, and the mediating effect of attitude towards internet banking usage. This chapter will also discuss the theoretical implications, practitioner implications, limitations of the study and lastly, recommendations for future study and conclusion.



CHAPTER 2

LITERATURE REVIEW

2.0 Chapter Overview

This section will initially discuss the background of online banking industry in Malaysia. This will be followed by categories of internet banking usage. Then, the determinants of internet usage model and theoretical linkages from past studies will be discussed in the area of ICT. Further, non-selected determinants of internet usage from past studies will also be discussed. Next, mediating effects of attitude will be discussed thoroughly based on banking and non-banking studies. Finally, theories, which underpin the model, will be elaborated on accordingly.

2.1 Background of Online Banking Industry in Malaysia

The online banking in Malaysia had started in the 1970s as stated by Pang (1995). The first form of online banking in Malaysia was the introduction of Automated Teller Machines (ATMs) in 1981 where banks' retail customers can perform transactions such as balance inquiry, fund transfer, cash withdrawal and loan payment. Malaysian banks' current practice is to locate ATMs in a large geographical area to better serve the customers. The Malaysian banks have affiliation with other businesses such as AmBank's ATMs are located in 7-Eleven stores and many other banks have placed their ATMs in hypermarkets such as Tesco, Giant, and Carrefour. With this move, retail customers have more accessibility to the ATMs to perform their transactions and this is

more economical for banks as compared to brick and mortar branches. The other form of online banking in Malaysia is telephone banking and it was introduced in the early 1990s as an alternative delivery channel by banks in Malaysia for financial services via telecommunications where devices are connected to an automated system of the bank by utilizing Automated Voice Response (AVR) Technology through the application of a phone keypad response.

For security purposes, the banks will provide the customers with a six-digit password followed by account number or sixteen-digit credit card number that they must key in on the phone keypad from instruction given by AVR. The features of this facility is the same as an automated teller machine such as checking account balance information, electronic bill payments, and funds transfers between a customer's accounts. Thereafter, a more advanced online banking is the introduction of internet banking facility in Malaysia. The BNM (Malaysian Central Bank) gave permission on June 1, 2000 for local commercial banks to offer internet banking facility.

Therefore, on June 15, 2000, Maybank, the largest local bank launched its own website known as www.maybank2U.com and became the first local bank to offer internet banking facility in Malaysia. This service is currently offered to individual customers of the bank and the site uses 128-bit encryption technology for security purposes for the bank's customers. The services provided in this website includes products banking enquiry, bill payment, credit card payment, funds transfer, loan payment, balance enquiry, accounts summary and many other transactions can be performed at maybank2U.com website. Customer support service is provided via e-mails as well as

via telephone and is available seven days a week, 24 hours a day. The second local bank that provided internet banking services is the Hong Leong Bank Berhad which launched its internet banking services on December 2000 known as E-banking which can be accessed by the website at www.hlbb.hongleong.com.my. The services provided by Hong Leong Bank are account enquiry, pay bills, prepaid re-load, fund transfer and interbank fund transfer, loan and credit card payment, standing instruction, cheque management, and many other transactions can be done through their website. The third local bank that took the strategic business step to provide internet banking services was the Southern Bank, which offers its internet banking services via their website at www.sbbdirect.com.my. They currently provide all the services, which are offered by Maybank and Hong Leong Bank.

Due to business competitiveness in the banking industry in Malaysia and as per the directive by BNM to form ten anchor banks in the consolidation exercise of the Malaysian financial institutions, Southern Bank Berhad has merged with CIMB Bank Berhad in October 2006 and the internet banking website has been transferred to the CIMB Bank Berhad website known as www.cimbclicks.com.my. The CIMB Bank Berhad's internet banking website gives more services to customers with a well-organized portal page that can be easily accessed by customers. The Multi-Purpose Bank is the fourth local bank that launched its own internet banking services towards the end of 2001 and the bank provides its internet banking services via its MultiLink account. The Bank's product features are being advertised in their portal at www.mphh.com.my for public acceptability. On 1st January 2001, the Alliance Financial Group (formerly known as Alliance Banking Group) was founded through a consolidation of seven

financial institutions (Multi-Purpose Bank Bhd, International Bank Malaysia Bhd, Bolton Finance Bhd, Bumiputra Merchant Bankers Bhd, Sabah Bank Bhd, Sabah Finance Bhd and Amanah Merchant Bank Bhd), in which the Alliance Financial Group anchored the merger and can now be accessed through the Alliance Financial Group (formerly known as Alliance Banking Group). Their internet banking website can now be accessed through www.alliancebank.com.my/ where services provided include application of new accounts, check real time account balances and interest rates, transfer funds, remit payments, bills payments and many others that can be utilized through their portal.

The merger happened when BNM and the Securities Commission had given their approval on the merger of Hong Leong Bank (HLB) and EON Bank Group (EBG). Therefore, on 6th May 2011, the merger of Hong Leong Bank (HLB) and EON Bank Group (EBG) took place. The merger effectively transformed HLB into a banking group of more than RM140 billion in assets and enabled HLB to offer their customers a stronger, broader range of products, services and solutions through an extensive network of 329 branches and over 1,400 self-service terminals. Leveraging the strengths of both banks, HLB is now well positioned to grow in the fast-changing, liberalizing and competitive banking market. The significant investments in the upfront planning provided the foundation and tools to facilitate changes to stabilize all the businesses and operations during the merger, maintain business-as-usual momentum, and deliver a speedy, systematic integration (www.hlb.com.my/ahlb/images/HLB-EON). The Malaysian local and foreign banks that offer internet banking facility in Malaysia as at January 2012 are listed in Tables 2.1 and 2.2.

Table 2.1

Summary of Internet Banking Services Provided by Malaysian Local Banks

Name of Local Bank	Internet Services Provided
Affin Bank Berhad	Fund transfer, online bill payment and account inquiry.
Alliance Bank Berhad	Application of new accounts, check real time account balances and interest rates, transfer funds, remit payments, bills payments, and request for new cheque books, interbank GIRO fund transfer and online share trading.
AmBank (M) Berhad	Internal fund transfer within account, bill payment, repayment of loan, credit card and hire purchase, interbank transfer, remittance application, prepaid top-up, account application, account inquiry, statement request, cheque book request, cheque status inquiry, stop cheque and update address.
CIMB Bank Berhad	CIMB click application on iPhone, fund transfer, bills payment, accounts inquiry, schedule transactions for fund transfer, payments alert and reminders, prepaid reload, eIPO and online share trading, mobile banking, loan application, remittance application online unit trust, AirAsia Widget, FD placements, track successful and failed transactions, transactions history and risk profiler.
Hong Leong Bank Berhad	Account enquiry on deposit, loan, hire purchase and credit card, enquiry of transaction history, pay bills, prepaid reload, fund transfer and interbank fund transfer, loan and credit card payment and credit card services via Internet banking, standing instruction, cheque management, change of ATM withdrawal limit, report loss of ATM card/debit card and Internet purchase, e-IPO and fixed deposit placement.
Malayan Banking Berhad	Account enquiry, fund transfer, bill payment, credit card services, fixed deposit placement, cheque book request, insurance renewal, online share trading, structure product services, standing instruction, bill and statement request printing.
Public Bank Berhad	Account enquiry, transaction history, statement request, interbank fund transfer, remittance request, loan payment, credit card payment, bill payment, other payment (Zakat, income tax, zakat and EPF), prepaid reload, standing instruction, Public Mutual Trust Fund application, eIPO application, online share trading, Western Union, gold trading, mobile banking, profile maintenance, cheque book request, stop cheque, cheque status enquiry and credit card cancellation.
RHB Bank Berhad	Account enquiry, interbank fund transfer, bill payment, prepaid reload, send money via PayPal and top-up PayPal, fixed deposit placement, remittance request, cheque book request, stop cheque, transaction enquiry, smart notification, eIPO and RHB mobile.

Source: Malaysian Commercial Banks Websites

Table 2.2

Summary of Internet Banking Services Provided by Foreign Local Banks in Malaysia

Name of Foreign Bank	Internet Services Provided
CitiBank	Electronic statement, online bill payment, one bill payment, interbank fund transfer, online reward redemption, online account services, online credit card services, online investment services, Citi mobile bill payment, Citi mobile prepaid reload, Citi alerts and mobile banking.
HSBC Bank Berhad	Balance enquiry, telegraphic transfer, foreign exchange, e-statement, fund transfer, MEPS interbank GIRO, online bill payment, total banking portfolio, networth and account summary, time deposit and cheque book request.
Oversea-Chinese Banking Corporation	Account enquiry on all account, transaction activities, e-statement, fund transfer, fund transfer to third party, bills payments, interbank fund transfer, credit card application enquiry, loan application enquiry, credit card balance transfer application, credit card rewards redemption application and customer service(change mailing address and report lost of ATM card).
The Standard Chartered Bank	Account information services for transaction history, global link until 5 countries, fund transfer locally and globally, credit card fund transfer, bill payment, credit card services, loans services, personalization, foreign exchange enquiry, new account application, online application (EPF statement, loan statement, quick cash, credit application, travel insurance, cheque book request, credit card application and flexi pay application).
United Overseas Bank	Account balance and transaction enquiry, request for e-statement, prepaid reload, interbank fund transfer, bill payment, fixed placement and withdrawal, online account opening, redeem reward point online, UOB Visa money transfer, foreign currency account enquiry and UOB e-store.

Source: Foreign Local Banks Websites

2.2 Categories of Internet Usage in Banking

The usage of internet banking can be categorized into three main categories in the current banking setting in Malaysia. According to Safeena *et al.* (2010), Thulani, Tofara and Langton (2009) and Diniz (1998), there are three functional levels of internet banking that are currently in the banking industry such as informational, communicative, and transactional.

Informational bank websites are the first level of internet banking. For this purpose, the bank has marketing information about the bank's products and services on a standalone server. The risk is very low, as informational systems typically have no path between the server and the bank's internal network.

The second level is communicative or simple transactional bank websites where internet banking users are permitted some interactions with the bank's systems. The bank's customers may have interaction that are limited to e-mails, account inquiry, loan application or information updates of the customers such as name and address of the customers. It does not permit any fund transfers.

The third level is the combination of the two above plus advance financial transactions on the bank's website. This level of internet banking permits bank customers to electronically transfer funds to/from their accounts, fund transfers to other banks, purchase of wealth products such as trust fund, subscription of initial public offering, pay utilities bills, schedule transactions for fund transfer, payments alert and reminders, prepaid reload, fixed deposits placement, online share trading, mobile banking, remittance application, online unit trust, online insurance purchase, and purchase of online air tickets through the bank's website.

For the purpose of this study, internet banking usage is based on third level type of facilities offered by the banks where combination of non-financial and financial transactions are being performed by the customers using commercial banks' internet banking websites.

2.3 The Internet Usage Models in Banking Industry

Internet usage models have been investigated by many researchers and yet the determinants of internet usage models in the area of banking study are still fragmented from simple to complex models. The internet usage models have created attention among researchers who want to find out further about the exact determinants of the internet usage either directly or indirectly. From previous studies, it was also found that very few researches measure the actual usage of internet by inclusion of the intervening variables of attitude especially in the context of the Malaysian retail banking environment.

Furthermore, most of the studies in the banking setting were conducted based on a non-probability method used to gather the data (Eze *et al.*, 2011; Fathima & Muthumani, 2015; Mansumitrachai & Al-Malkawi, 2011; Nasri, 2011). This is being done as most probably the list of population of the banking customers are unattainable due to the privacy and confidentiality of the customers' data and the banks have to uphold the confidentiality at all times as required by the regulatory body, *i.e.* BNM. Due to this, the findings may not be generalized (Sekaran, 2003). The following models discuss a number of determinants; however, there is no consensus among the studies on the direct and indirect determinants of internet banking usage (Abdulkadir *et al.*, 2013; Amin *et al.*, 2012; Eze *et al.*, 2011; Fathima & Muthumani, 2015; Maduku, 2013; Mansumitrachai & Al-Malkawi, 2011; Mazhar *et al.*, 2014; Nasri, 2011; Reid & Levy, 2008; Suh & Han, 2002).

The ten studies under review have also mixed settings according to the respondents' use. For example, the first research under review was conducted by Fathima and Muthumani (2015) using internet banking users as the respondents via convenience sampling. On the other hand, the research conducted by Nasri (2011) used customers of the bank with at least one current account with the bank and between the age of 25 and 45 years. Meanwhile, the research conducted by Eze *et al.* (2011) used young participants from the ages of 18 to 28 years. In another research conducted by Mansumittrchai and Al-Malkawi (2011), working people were used as the respondents. On the other hand, Sefeena *et al.* (2011; 2010) and Pikarainen *et al.* (2004) used students as the respondents. Due to these shortcomings, the following paragraph will discuss further on the related issues.

The first model of internet usage in this study utilized by Fathima and Muthumani (2015) in India that comprises of nine independent variables such as perceived usefulness, perceived ease of use, perceived credibility, trust, facilitating conditions, perceived cost, subjective norm, image, and self-efficacy toward the usage of the internet banking facility (Figure 2.1). However, under this study, the intervening variable of attitude was included to clarify the internet banking usage and the sampling method was defined upfront for generalization while the structural equation modelling was employed to analyze the relationships between the variables in comparison to Fathima and Muthumani (2015) that employed the regression method for their analysis.

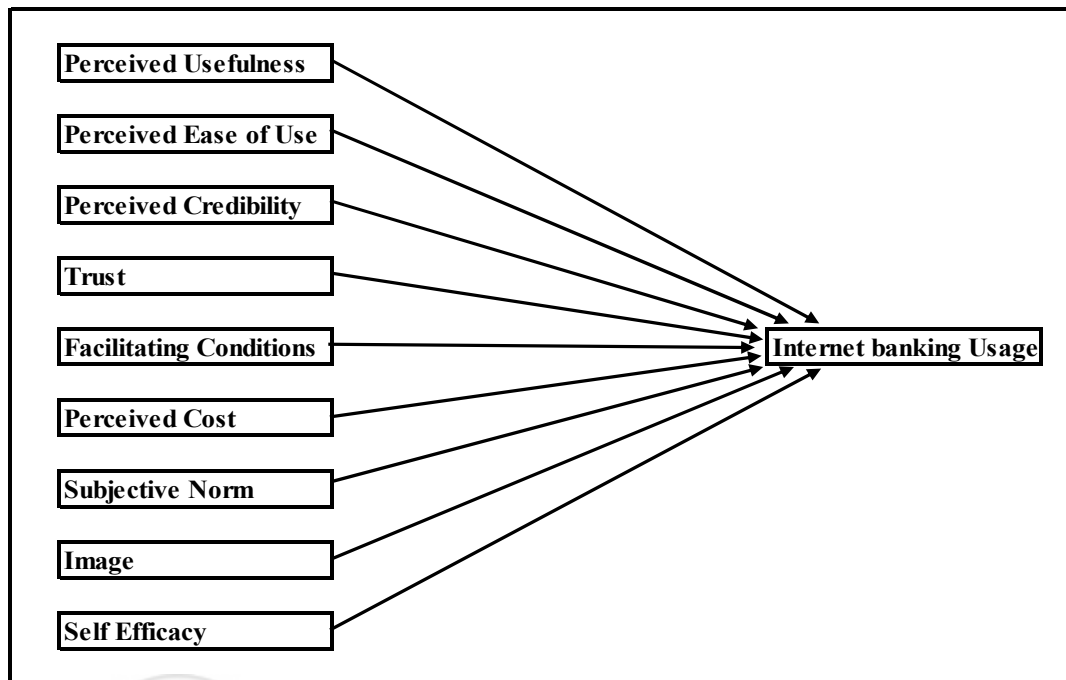


Figure 2.1
 Internet Usage Model 1. “*User acceptance of banking technology with special reference to internet banking.*”
 Source: Fathima and Muthumani (2015), Journal of Theoretical and Applied Information Technology, 73(1).

The second model under review is the model suggested by Mazhar *et al.* (2014) proposing two antecedents for internet banking usage namely perceived usefulness and attitude (Figure 2.2). Attitude acts as an intervening variable for perceived usefulness, perceived ease of use, compatibility, security, and trust. On the other hand, perceived ease of use mediates through perceived usefulness towards attitude and behaviour. In this study, the antecedents skewed towards direct and indirect internet banking usage. Even though this study suggested the intervening variables of perceived usefulness and perceived ease of use towards internet banking usage, the research failed to establish the mediation results.

Contrary to this research, suggests entirely different paths compared to Mazhar *et al.* (2014) whereby the model employed by Mazhar *et al.* (2014) is more influenced by the TAM original model (Davis, 1989). In addition, the indirect path suggested in this study has attitude as the mediator whereas Mazhar *et al.* (2014) used perceived usefulness and attitude as determinants that affect the internet banking usage. Therefore, this study establishes the direct (trust, perceived usefulness, perceived ease of use, internet self-efficacy and subjective norm) and indirect effects via attitude as the antecedent towards internet banking usage. In term of data analysis, Mazhar *et al.* (2014) employed the regression method compared to this study that employs the SEM for data analysis.

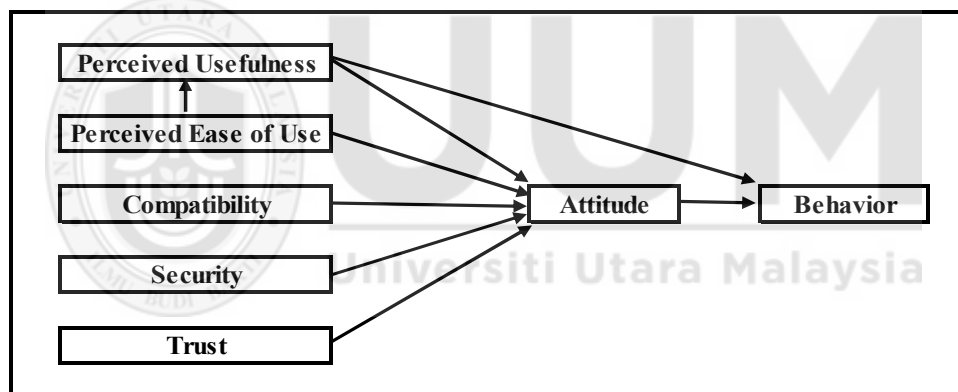


Figure 2.2

Internet Usage Model 2: “An Investigation of Factors Affecting Usage and Adoption of internet & Mobile Banking in Pakistan.”

Source: Mazhar *et al.* (2014), International Journal of Accounting and Financial Reporting, 4(2).

The third model under review is the model proposed by Maduku (2013) who conducted a study in South Africa (Figure 2.3). Under this model, the researcher suggested three factors (demographic variables, trust, and subjective norm) besides the original TAM factors (perceived usefulness and perceived ease of use) as the antecedents of attitude.

Attitude is proposed by the researcher as an intervening variable predicting internet banking usage thereby, emulating past studies on attitude as an intervening variable (Porter & Donthu, 2006; Reid & Levy, 2008; Suh & Han, 2002). In addition, Maduku (2013) employed demographic variables, trust, and subjective norm as a direct effect to attitude contrary to the research done by Nasri (2011) and Mansumittrchai and Al-Malkawi (2011) in which these factors directly affected internet banking usage.

However, in this study, the factors (trust, perceived usefulness, perceived ease of use, internet self-efficacy, and subjective norm) are the predictors of attitude and internet banking usage and likewise attitude is a single mediator compared to Mazhar *et al.* (2014). This study employs SEM as the method for data analysis in contrary to the regression analysis that was done to examine the relationships among the variables under study (Maduku, 2013). Hence, the mediation test for these variables was not established. Therefore, this research emulates that subjective norm mediates through attitude and the adoption of internet banking.

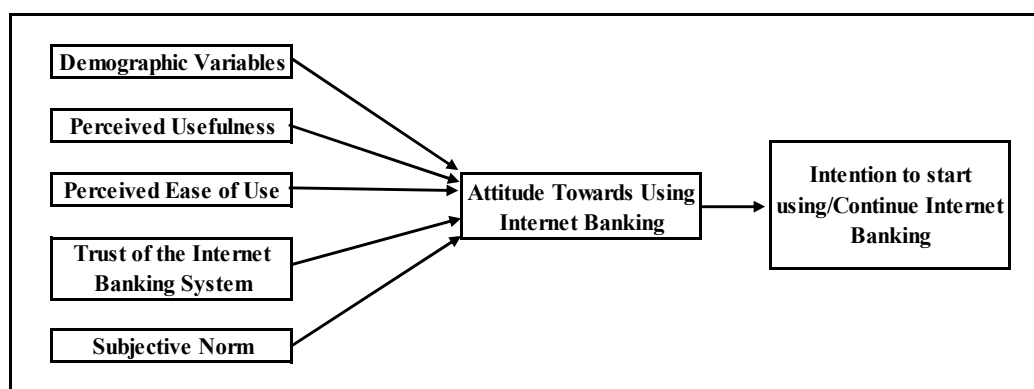


Figure 2.3
Internet Usage Model 3: “Predicting retail banking customers’ attitude towards internet banking services in South Africa.”
Source: Maduku (2013), Southern African Business Review, 17(3).

The fourth model under study is the research done by Abdulkadir *et al.* (2013) in Malaysia that had proposed a seven-factor model (perceived usefulness, perceived ease of use, perceived credibility, perceived image, perceived financial cost, social influence, and computer/internet experience) as the direct antecedents of internet banking usage (Figure 2.4). The respondents in this study were taken from 125 students and staff of a public university that used mobile banking facility; the findings may or may not be generalized.

In addition, it was observed that this study was skewed towards the impact of factors on internet banking usage via mobile phone. The internet banking usage can be conducted through many modes such as the tablet, notebook, desktop computer or smart phone that will meet the same objective. This study investigated the factors (trust, perceived usefulness, and perceived ease of use, internet self-efficacy and subjective norm) towards attitude as the intervening variable and predictor of internet banking usage. On the other hand, this study employed the SEM analysis method compared to regression analysis method to establish the findings (Abdulkadir *et al.*, 2013).

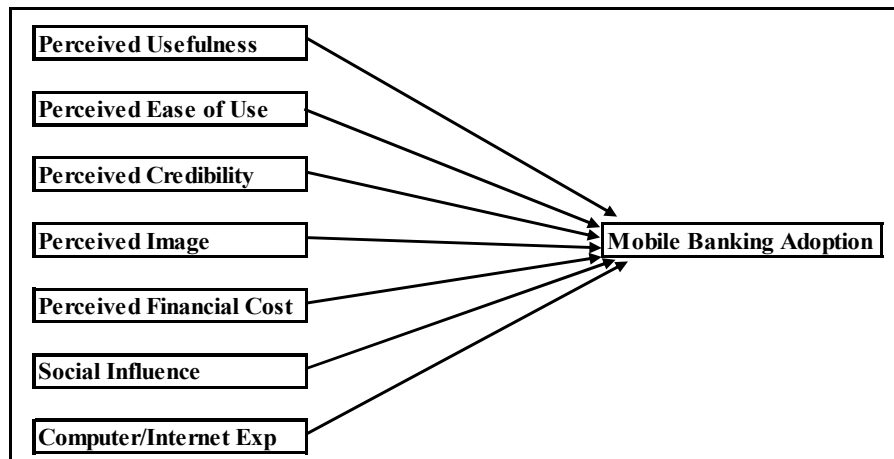


Figure 2.4
 Internet Usage Model 4: “An Investigation into the Adoption of Mobile Banking in Malaysia”
 Source: Abdulkadir *et al.* (2013), American Journal of Economics, 3(3).

The fifth model under review for this research was taken from a study conducted by Amin *et al.* (2012) in Malaysia by using 152 banks customers in Kota Kinabalu, Sabah (Figure 2.5). In their research, they emulated perceived credibility, perceived enjoyment, and perceived self-efficacy besides the original TAM constructs (perceived usefulness and perceived ease of use) for predicting mobile banking usage. However, from this study, it was observed that perceived usefulness and perceived ease of use were not the predictors of mobile banking usage while perceived credibility, perceived enjoyment, and perceived self-efficacy had a significant moderate effect on internet banking usage compared to a study done by Thomas (2011) in which perceived enjoyment had a strong influence on attitude. Likewise, perceived credibility has a strong impact on attitude and perceived self-efficacy has a moderate effect on attitude (Lule *et al.*, 2012). This indicates that those variables are the antecedents of attitude thus affecting internet

banking usage. Therefore, this study emulates perceived ease of use, perceived usefulness, and internet self-efficacy towards internet banking usage via attitude.

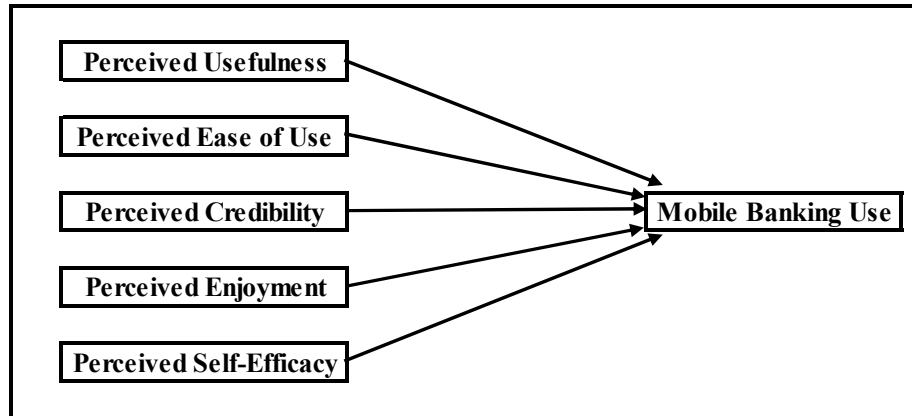


Figure 2.5
Internet Usage Model 5: “*Receptiveness of mobile banking by Malaysian local customers in Sabah: An empirical investigation.*”
Source: Amin *et al.* (2012), Journal of internet Banking and Commerce, 17(1).

The sixth model of internet usage is from a research conducted by Nasri (2011) in Tunisia by using 253 bank customers as their respondents via convenience sampling (Figure 2.6). In this study, six factors were presented namely demographic characteristics, security, channel convenience, information on online banking, perceived risk, and prior internet knowledge in the model and this model hypothesized six direct relationships with internet usage. In this model, Nasri (2011) excluded the main components of TAM *i.e.* perceived ease of use and perceived usefulness, in his study for information system acceptance. In this study, the researcher propose that prior internet knowledge has a direct effect on attitude and an indirect effect on internet banking usage since there is ambiguity in past research findings (Park, 2009; Trivedi & Kumar, 2014).

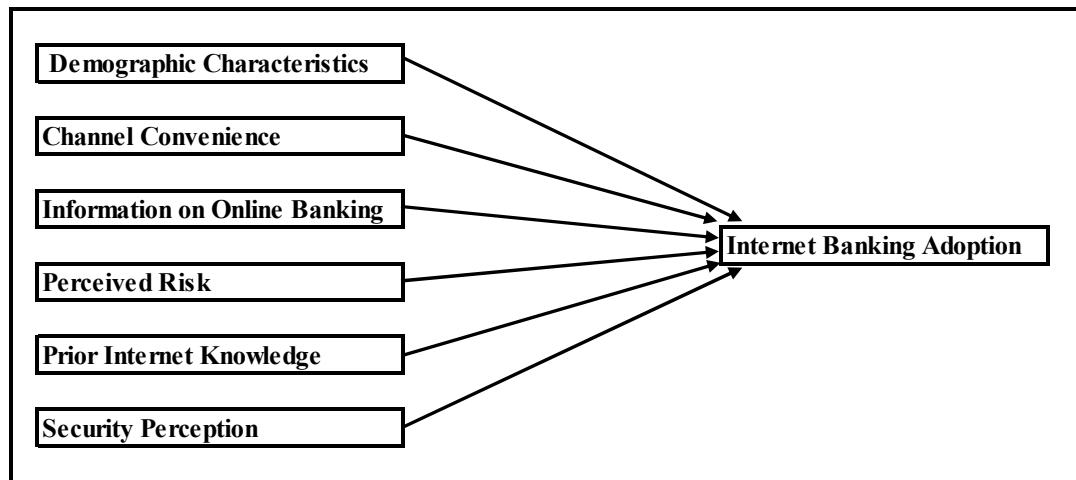


Figure 2.6.

Internet Usage Model 6: *“Factors Influencing the Adoption of internet banking in Tunisia.”*

Source: Nasri (2011), International Journal of Business and Management, 6(8).

The seventh model under review in this study is the model proposed by Mansumittrchai and Al-Malkawi (2011) where a study was conducted in Mexico on the internet usage (Figure 2.7). In this study, eight direct determinants of internet usage are investigated (difficulty, trust, compatibility, third party concerns, human contact, social influence, security and higher level of PC proficiency) and establishing eight direct hypotheses towards internet usage. In addition, Mansumittrchai and Al-Malkawi (2011) employed the analysis of variance (ANOVA) method while in this study, the researcher employ the SEM which enables the testing of the relationships, simultaneously. In this study, the researcher propose that trust and a reference group (subjective norm) are the direct and indirect determinants of attitude and internet banking usage.

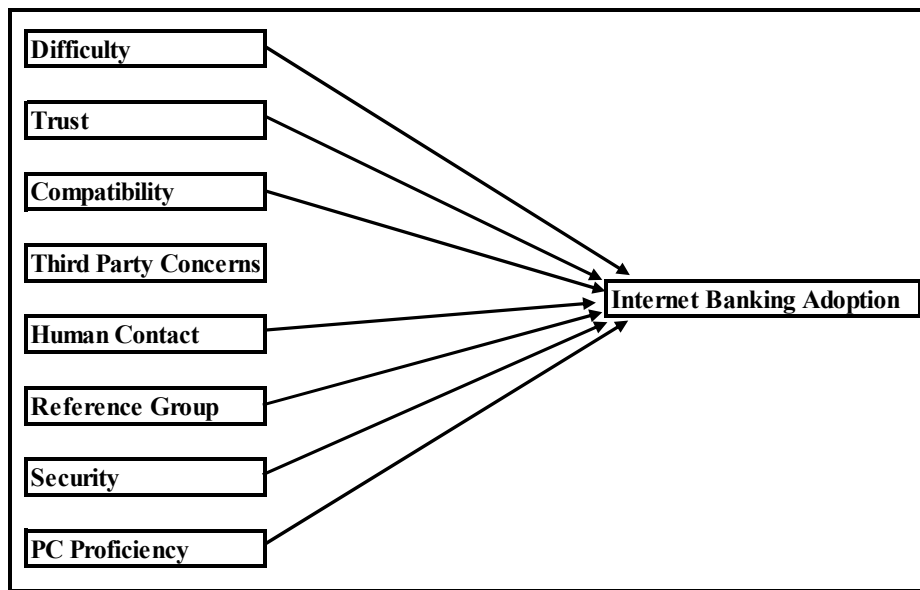


Figure 2.7.

Internet Usage Model 7: “*Factors underlying the adoption of online banking by Mexican consumers.*”

Source: Mansumittrchai and Al-Malkawi (2011), International Journal of Business and Management, 6(9).

The eighth model under review in this research is the study conducted by Eze *et al.* (2011) in Malaysia on internet usage taking into consideration six direct determinants of internet usage namely perceived ease of use, perceived usefulness, relative advantage, self-efficacy, perceived credibility, and trialability. This framework had established six direct hypotheses on internet usage in banking excluded attitude and behavioral intention for information system acceptance by past studies. In addition, Eze *et al.* (2011) employed the regression method to establish the relationships similar to this research, which employs the SEM method for data analysis to confirm the relationships between variables. Therefore, in this study, the researcher emulate further with the inclusion of the main components of TAM, *i.e.* perceived usefulness and perceived ease use, as the direct effect and indirect predictors of attitude and internet banking usage.

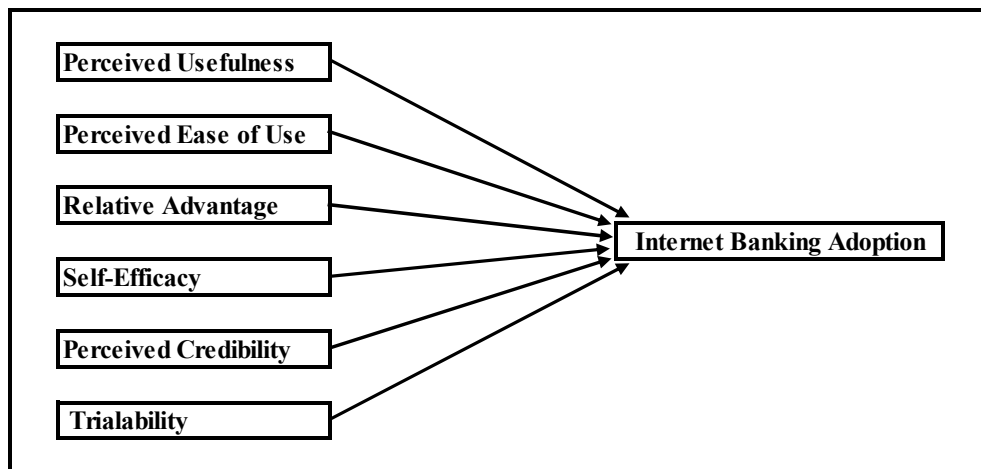


Figure 2.8
 Internet Usage Model 8: “*Factors Affecting internet Banking Adoption among Young Adults: Evidence from Malaysia.*”
 Source: Eze *et al.* (2011), 2011 International Conference on Social Science and Humanity Vol. 5(2011).

The ninth model under study in this research is from the empirical research conducted by Reid and Levy (2008), (Figure 2.9). In their study, the researchers presented a five-factor model (trust, computer self-efficacy, perceived usefulness, perceived ease of use and attitude) by engaging direct relationships and multi-group analysis on internet banking usage. In addition, trust was positioned as a mediating role between computer self-efficacy towards perceived ease of use and perceived usefulness while trust mediated through perceived usefulness and perceived ease of use on attitude. Similarly, perceived usefulness also acted as an intervening variable between trust and intention to use BIS. On the other hand, computer self-efficacy mediates through perceived usefulness and perceived ease of use in affecting attitude. Likewise, perceived usefulness stood as a mediator between perceived ease of use and attitude. Lastly, perceived usefulness and perceived ease of use mediated through attitude predicting internet banking usage. The results of this study clearly indicated that the individual

paths have direct relationships except for computer self-efficacy on trust and perceived ease of use. However, Reid and Levy (2008) failed to establish the mediating effect on this study. Therefore, this study emulates trust, computer self-efficacy, perceived usefulness, and perceived ease of use intervened by attitude towards internet banking usage.

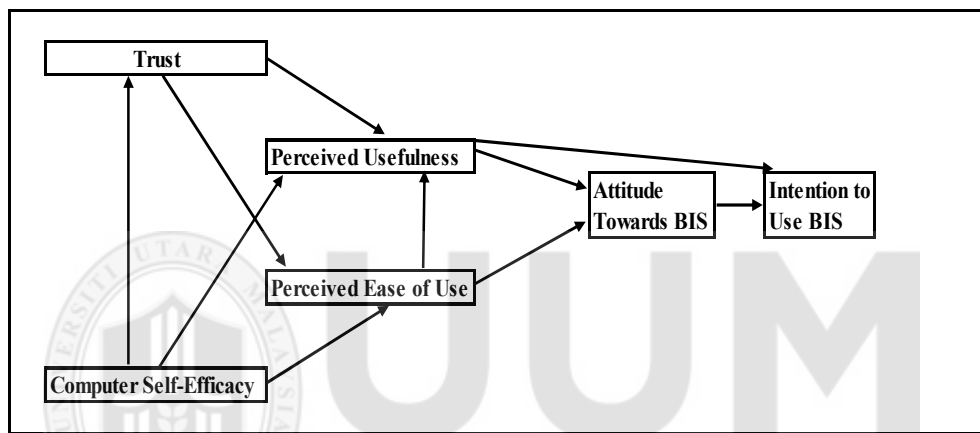


Figure 2.9
Internet Usage Model 9: “Integrating trust and computer self-efficacy with tam: An empirical assessment of customers’ acceptance of banking information systems (bis) in Jamaica.”

Source: Reid & Levy (2008), Journal of internet Banking and Commerce, 12(3).

The final model under review in this study is from the research conducted by Suh and Han (2002) in South Korea, five direct and indirect determinants of internet usage was investigated including trust, perceived ease of use, perceived usefulness, attitude towards behavior, and intention towards internet usage. Meanwhile, Fishbein and Ajzen (1975) pointed out that behavior intention of information system usage is only a person’s readiness to perform a particular behavior. This model is quite similar to the model suggested by Reid and Levy (2008); however, Reid and Levy (2008) included computer

self-efficacy in their study. Computer self-efficacy mediated through trust on perceived usefulness and computer self-efficacy mediated through perceived usefulness and perceived ease of use on attitude. On the contrary, Suh and Han (2002) used perceived ease of use to mediate through perceived usefulness on trust and trust, perceived usefulness and perceived ease of use was used to mediate through attitude on behavioral intention towards actual internet banking usage.

The model suggested by Suh and Han (2002) also proposed a direct relationship between trust and perceived usefulness on behavioral intention of internet banking usage and the adoption of internet banking. Therefore, this study incorporates trust, perceived usefulness, and ease of use as a direct and indirect determinant towards attitude and internet banking adoption.

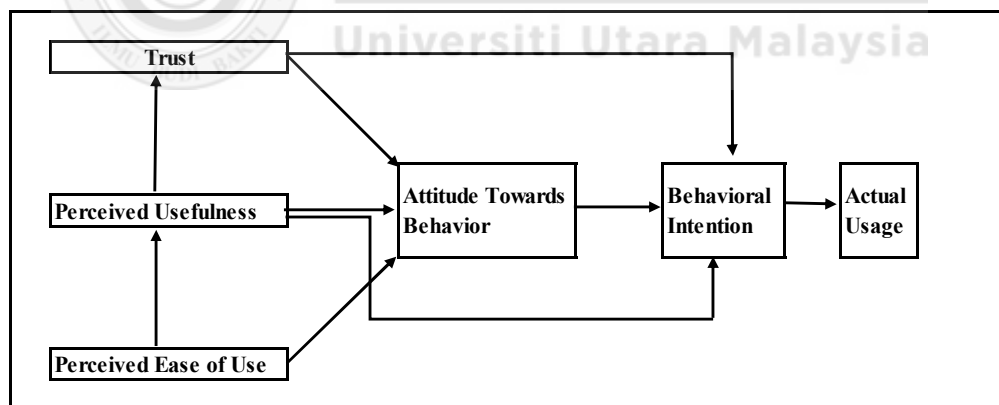


Figure 2.10
Internet Usage Model 10: “*Effect of trust on customer acceptance of internet banking.*”
Source: Suh & Han (2002), *Electronic Commerce Research and Applications*, 1.

In view of the ten models discussed on internet banking usage, it was found that there was no consensus among the past studies on types and numbers of determinants on internet banking usage. This causes the ten models to be fragmented and inconclusive. The review also indicates that the common variables in the models are perceived ease of use and perceived usefulness whereby these variables are the main components of TAM that predicts the internet banking usage but certain studies have left out these important variables from their studies.

Even though past researchers have suggested the intervening variable of attitude in their models of study, the indirect relationships between the variables are not established accordingly. For example, the mediating effect of attitude mediated trust and internet banking usage (Maduku, 2013; Mazhar *et al.*, 2014; Reid & Levy, 2008). Therefore, this study investigates the direct and indirect effect of attitude predicting internet banking usage as proposed in the framework.

2.4 The Determinants of Internet Usage in Banking Industry

The determinants of internet usage in the past studies of the banking industry mainly concentrated on trust, perceived usefulness, perceived ease of use, internet self- efficacy, subjective norm, and attitude (Table 2.3). However, the relationship with internet usage apparently displays ambiguity. This ambiguity could most likely have happened due to the unit of study and the respondents in the research. Therefore, a homogenous sample could possibly strengthen the differences while the method of data collection and scale

provided should also be taken into consideration. Among the other determinants being investigated in the banking industry are facilitating conditions, perceived cost, image, compatibility, difficulty, security, demographic variables, perceived credibility, perceived financial cost, perceived enjoyment, channel convenience, information on online banking, perceived risk, security perception, thirds party concern, human contact, relative advantage, and trialability. However, these determinants are not directly included in this study as these determinants are part of other grounded theories or excluded due to other TAM determinants that are not specified (Davis, 1989).

Table 2.3

Antecedents of Internet usage in banking industry

Antecedents	Authors	Country	Analysis Method/ Scale	Respondent	Underpinning
a) Perceived usefulness (direct) d) Perceived ease of use (direct) c) Perceived credibility (direct) d) Trust (direct) e) Facilitating conditions (direct) f) Perceived cost (direct) g) Subjective norm (direct) h) Image (direct) e) Self-efficacy (direct)	Fathima & Muthumani (2015)	India	Regression/5 Point likert	Internet banking customers	TAM (Davis, 1989)
a) Perceived usefulness (direct & indirect) b) Perceived ease of use (indirect) c) Compatibility (indirect) d) Security (indirect) e) Trust (indirect) f) Attitude (direct)	Mazhar <i>et al.</i> (2014)	Pakistan	Regression/5 Point likert	Mobile/Internet banking customers	TAM (Davis, 1989)
a) Demographic variables (indirect) b) Perceived usefulness (indirect) c) Perceived ease of use (indirect) d) Trust (indirect) e) Subjective norm (indirect) f) Attitude (direct)	Maduku (2013)	South Africa	Regression/5 Point likert	Retail banking customers	TAM (Davis, 1989)

Table 2.3 (continued)

Antecedents	Authors	Country	Analysis Method/ Scale	Respondent	Underpinning
a) Perceived usefulness (indirect) b) Perceived ease of use (indirect) c) Perceived credibility (direct) d) Perceived Image (direct) e) Perceived financial cost (direct) f) Social influence (direct) g) Computer/Internet experience (direct)	Abdulkadir, Galoji & Razak (2013)	Malaysia	Regression/5 Point likert	University Students & Lecturers	TAM (1989) & TPB (Ajzen, 1985 & 1987)
a) Perceived usefulness (direct) b) Perceived ease of use (direct) c) Perceived credibility (direct) d) Perceived enjoyment (direct) e) Perceived self-efficacy (direct)	Amin <i>et al.</i> (2012)	Malaysia	Regression/5 Point likert	Banks customers	TAM (Davis, 1989)
a) Demographic Characteristics (direct) b) Channel Convenience (direct) c) Information on online banking (direct) d) Perceived risk (direct) e) Prior Internet knowledge (direct) f) Security perception (direct)	Nasri (2011)	Tunisia	Regression/5 Point likert	Bank customers	CT (Bandura, 1997), DOI (Rogers, 1995) & TAM (Davis, 1989)
a) Security (direct) b) Trust (direct) c) Difficulty (direct) d) Compatibility (direct) e) Social influence (direct) f) Higher level of PC proficiency (direct) g) Thirds party concern (direct) i) Human contact (direct)	Mansumittrchai & Al-Malkawi (2011)	Mexico	ANOVA/5 Point likert	Employed individuals	Diffusion Innovation Theory (Roger, 1962)
a) Perceived ease of use (direct) b) Perceived usefulness (direct) c) Relative advantage (direct) d) Self-efficacy (direct) e) Perceived credibility (direct) f) Trialability (direct)	Eze <i>et al.</i> (2011)	Malaysia	Regression/5 Point likert	Young Malaysian (age 18-28 years)	TAM (Davis, 1989)
a) Trust (indirect) b) Computer self-efficacy (indirect) c) Perceived usefulness (direct & indirect) d) Perceived ease of use (indirect) e) Attitude (direct)	Reid & Levy (2008)	Jamaica	SEM (AMOS)/5 Point likert	Banks customers	TAM (Davis, 1989)

Table 2.3 (continued)

Antecedents	Authors	Country	Analysis Method/ Scale	Respondent	Underpinning
a) Trust (indirect)	Suh & Han (2002)	Korea	SEM (LISREL)/ 7 Point likert	Internet banking customers	TAM (Davis, 1989)
b) Perceived usefulness (indirect)					
c) Perceived ease of use (indirect)					
d) Attitude (indirect)					
e) Behavioral intention (direct & mediator)					

2.5 Internet Usage Model in Non-Banking Industry

Internet usage models in the non-banking industry have undergone comprehensive research in the past and are vital in the internet usage. Among past study settings that were taken into consideration were e-learning (Al-Adwan *et al.*, 2013; Alharbi & Drew, 2014; Chen *et al.*, 2013; Elkaseh *et al.*, 2015; Mamat *et al.*, 2015; Park, 2009; Shroff *et al.*, 2011; Sa'nchez *et al.*, 2013; Sharma & Chandel, 2013; Wu & Gao, 2011), online shopping (Chen *et al.*, 2010; Lim & Ting, 2012; Tong, 2010; Trivedi & Kumar, 2014; Wang & Tseng, 2011), health care (Ma & Liu, 2005), internet usage (Porter & Donthu, 2006), social media usage (Rauniar, Rawski, Yang, & Johnson 2014), tourism (Usono *et al.*, 2010), IT usage (Selamat & Jaffar, 2011), e-payment (Lin & Nguyen, 2011), internet financial reporting (Al-Htaybat *et al.*, 2011), and e-filing (Chen & Li, 2010). Hence, ten models were studied in the non-banking industry, refer internet usage Model 11 to 20, *Appendix I* (Figure 2.11 to 2.20).

The outcomes discovered a similar trend of prevalent fragmentation in the non-banking industry context (Table 2.4). For example, Rauniar *et al.* (2014) analysed internet usage in social media utilization in USA by having perceived ease of use, critical mass, capability, perceived playfulness, and an indirect path to usage intention while perceived usefulness stood as an indirect path to actual internet usage. Moreover, the grounded TAM theory (Davis, 1989) states that external variables mediate through perceived usefulness and perceived ease of use towards attitude and internet usage. In addition, the fragmentation is accentuated as the researchers used the five-point Likert scale to measure perceived usefulness and perceived ease of use. On the other hand, Sa'nchez *et al.* (2013) employed the seven-point Likert scale to measure perceived usefulness and perceived ease of use in studying e-learning in Spain. The presence of inconsistencies, diversity, and model fragmentation can be clearly visible on the direct and indirect relationship impacting internet usage.

Table 2.4

Antecedents of Internet usage in non-banking industry

Antecedents	Authors	Country	Industry	Analysis Method/ Scale	Respondent	Underpinning
a) Perceived ease of use (direct)	Mamat,	Malaysia	Virtual	SEM (PLS)/	76 Pre-school	TAM (1989)
b) Perceived usefulness (direct)	Yusoff,		learning	5 Point likert	teachers	& UTAUT
c) Compatibility (direct)	Abdullah &					(Venkatesh
d) Facilitating condition (direct)	Razak (2015)					et al., 2003)
e) Social influence (direct)						
a) Job relevance (indirect)	Alharbi &	Saudi	E-learning	Correlation	Academic &	TAM
b) Learning management system	Drew (2014)	Arabia	management	analysis/	administrative	(Davis, 1989)
unavailability (indirect)			system	7 Point likert	staff of	
c) Learning management system					university	
usage experience (direct & Indirect)						
d) Perceived ease of use (direct						
& indirect)						
e) Perceived usefulness (direct						
& indirect)						
f) Attitude (direct)						

Table 2.4 (continued)

Antecedents	Authors	Country	Industry	Analysis Method/ Scale	Respondent	Underpinning
a) Perceived ease of use (indirect)	Rauniar, Rawski, Yang & Johnson (2014)	USA	Social media using Facebook	SEM (AMOS)/ 5 Point likert	Full time students one public and one private university	TRA (Ajzen, 1980), TAM (Davis, 1989) & TPB (Ajzen, 1985 & 1987)
b) Perceived usefulness (indirect)						
c) Critical mass (indirect)						
d) Capability (indirect)						
e) Perceived playfulness (indirect)						
f) Trustworthiness (indirect)						
g) Intention to use (direct)						
a) Technical support (indirect)	Sa'ñchez, Hueros & Ordaz (2013)	Spain	Web Course Tool virtual learning	SEM (LISREL)/ 7 Point likert	University Students	TAM (Davis, 1989)
b) Computer self-efficacy (indirect)						
c) Perceived ease of use (direct & indirect)						
d) Perceived usefulness (direct & indirect)						
e) Attitude (direct)						
b) Perceived usefulness (direct)	Sharma & Chandel (2013)	Oman	E-learning	Regression/ 5 Point likert	University students	TAM (Davis, 1989)
a) Perceived ease of use (direct)						
c) Perceived website quality (direct)						
d) Computer self-efficacy (direct)						
e) Attitude (direct)						
a) Perceived ease of use (indirect)	Lim & Ting (2012)	Malaysia	Online shopping	Regression/ 5 Point likert	Consumers at shopping malls at Klang Valley	TAM (Davis, 1989)
b) Perceived usefulness (indirect)						
c) Attitude (direct)						
a) Prior online shopping experience (indirect)	Tong (2010)	USA	Online shopping	SEM (AMOS)/ 5 Point likert	University Students in USA & China	TAM (Davis, 1989)
b) Perceived usefulness (direct)						
c) Perceived ease of use (indirect)						
d) Perceived enjoyment (direct)						
e) Perceived risk (direct)						
a) Internet self-efficacy (direct)	Park (2009)	Korea	University e-learning	SEM (LISREL)/ 7 Point likert	University students	TAM (Davis, 1989)
b) Subjective norm (direct)						
c) System accessibility organizational factor (direct)						
d) Perceived usefulness (direct & indirect)						
e) Perceived ease of use (direct & indirect)						
f) Attitude (direct & mediator)						

Table 2.4 (continued)

Antecedents	Authors	Country	Industry	Analysis Method/ Scale	Respondent	Underpinning
a) Age (indirect)	Porther & Donthu (2006)	USA	Internet usage	SEM (LISREL)/ 5 Point likert	Consumers	TAM (Davis, 1989)
b) Income (indirect)						
c) Education (indirect)						
d) Race (indirect)						
e) Perceived ease of use (indirect)						
f) Perceived usefulness (indirect)						
g) Access barrier (indirect)						
i) Attitude (mediator)						
a) Internet self-efficacy (direct & indirect)	Ma & Liu (2005)	USA	Web based medical records (Health care)	Hierarchical regressions/ 5 Point likert	Health care trainees & staff	TAM (Davis, 1989)
b) Perceived usefulness (mediator)						
c) Perceived ease of use (mediator)						

2.6 Determinants of Internet Usage: Direct Relationship

In a nutshell, the relationships in the internet usage model of banking and non-banking setting display a very distinctive manner. For example, the direct relationship itself (*Appendix 2*, Table 2.5) is derived from various sources and the fragmentation of the determinants such as trust, perceived usefulness, perceived ease of use, internet self-efficacy, subjective norm, attitude, behavioural intention, anxiety, awareness, compatibility, channel convenience, difficulty, facilitating conditions, human contact, online banking information, image, perceived enjoyment, perceived credibility, perceived financial cost, perceived behavioral control, relative advantage, resistance, risk, and security produces ambiguity and inconsistent results in these studies.

2.6.1 Study on Trust and Internet Usage

Trust has been found to be an important determinant of internet usage in past studies (Table 2.6). For example, a research was conducted by Mansumittrchai and Al-Malkawi (2011) on usage of internet banking facility in United Arab Emirates by adopters and non-adopters of internet banking facility and it was found that trust had a positive significant relationship towards internet usage. Likewise, a study conducted by Alkafagi *et al.* (2015) in Malaysia displayed that trust had a significant effect on internet banking usage. On the other hand, two studies that were conducted in India presented trust as a predictor of internet banking usage (Bashir & Madhavaiah, 2015; Fathima & Muthumani, 2015) and the results indicated that there are significant relationships between these variables.

Meanwhile, Juwaheer *et al.* (2012) conducted a study on e-banking in Mauritius having 384 bank customers as the respondents, all of which above 18 years old. The findings showed that there was a positive significant relationship between trust and internet adoption towards online banking which includes searches for banking products on the banks' websites. This shows that trust is able to reduce perceived risk and advocate internet banking usage as long as the society is matured in embracing internet banking (Alkafagi *et al.*, 2015; Bashir & Madhavaiah, 2015). Equivalently, Suh and Han (2002) conducted a study in Korea to discover the behavior of bank customers from five major banks in Korea on trust towards internet banking adoption. They found that trust influenced the internet banking usage.

On the contrary, results from the research done in Vietnam by Nguyen *et al.* (2014) on the relationship of trust and internet banking usage revealed that there was no significant impact by trust on internet banking usage. However, this study's outcome is highly questionable since it produced ambiguous result, reporting p value of more than 0.05 as significant. On the other hand, a study was conducted by Manzano *et al.* (2009) in Spain in the area of virtual banking and findings showed that there was no relationship between trust and internet usage. In Indonesia, a study was conducted by Candra (2013) on 100 internet banking users to find out the influence of trust on internet banking adoption. Surprisingly, the results did not support the relationship between trust and internet banking usage.

In the area of non-banking, a study was conducted by Usoro *et al.* (2010) in Finland focusing e-tourism industry. The researchers investigated relationship between trust and internet usage and it was proven that there was no significant relationship between trust and internet usage. On the other hand, Trivedi and Kumar (2014) conducted a research in India on online shopping and found that trust influenced internet usage. From the above discussion, it can be observed that most of the past studies that examined the relationship between the trust factor and customer's internet usage found a positive significant relationship in banking and non-banking studies (Alkafagi *et al.*, 2015; Bashir & Madhavaiah, 2015; Mansumittrchai & Al-Malkawi, 2011; Trivedi & Kumar, 2014). On the contrary, other past studies show that the trust factor and customer's internet usage towards the adoption of the facility had an insignificant effect on customers to adopt the services (Manzano *et al.*, 2009 Nguyen *et al.*, 2014; Usoro *et al.*,

2010). It can be concluded that the results of the impact of customers' trust on internet usage are still ambiguous.

Table 2.6

Summary of Trust and Usage

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Alkafagi, Romli, Bahaudin, Alekam & Salameh (2015)/Iraq	Banking	SEM	7 Point likert Trust: 6 items Usage: 4 items	535 internet banking users in Iraq	Sig positive: $\beta=0.221$, $t= 6.087$, $p=0.000$
Bashir & Madhavaiah (2015)/India	Banking	SEM	5 Point likert Trust: 5 items Usage: 5 items	697 internet banking users via online survey	Sig positive: $\beta=0.127$, $CR= 4.679$, $p<0.001$
Fathima & Muthumani (2015)/India	Banking	Regression	5 Point likert Trust: NA Usage: NA	319 internet banking users	Sig positive: $\beta=0.201$, $t= 21.763$, $p<0.05$
Nguyen, Nguyen & Singh (2014)/Vietnam	Banking	SEM	7 Point likert Trust: 5 items Usage: 4 items	464 banks customers	Not Sig: $\beta=0.09$, $p=0.051$
Trivedi & Kumar (2014)/India	Online shopping	Regression	5 Point likert Trust: 4 items Usage: 2 items	110 students	Sig positive: $\beta=0.289$, $t= 3.133$, $p<0.05$
Candra (2013)/Indonesia	Banking	SEM	Scale type: NA Trust: NA Usage: NA	100 internet banking users	Not Sig: $\beta=0.16$, $p=0.17$
Juwaheer,Pudaruth & Ramdin (2012)/Mauritius	Banking	ANOVA	5 Point likert Trust: NA Usage: NA	384 bank customer above 18 years	Sig positive: $\alpha=0.688$, $\alpha> 0.06$
Mansumitrchai & Al-Malkawi (2011)/Mexico	Banking	ANOVA	5 Point likert Trust: 3 items Usage: 4 items	395 working people	Sig positive: $F=47.77$, $p= 0.000$
Usono <i>et al.</i> (2010)/Finland	Tourism	Correlations and regression	5 Point likert Trust: NA Usage: NA	159 e-tourism customers	Not Sig: $r= 0.141$, R $square=0.038$

Table 2.6 (continued)

Summary of Trust and Usage

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Manzano <i>et al.</i> (2009)/Spain	Banking	SEM	7 Point likert Trust: 5 items Usage: 1 item	511 internet banking customers via online survey	Not Sig: $\beta = -0.01$, $p = 0.09$
Suh & Han (2002)/Korea	Banking	SEM	7 Point likert Trust: 6 items Usage: 4 items	Internet banking users of 5 major banks in Korea	Sig positive: $\beta = 0.152$, $t = 4.717$, $p < 0.01$

2.6.2 Study on Perceived Usefulness and Internet Usage

Perceived usefulness is defined as “the extent to which a person finds that using the system will increase his or her job performance” (Davis, 1998; Davis *et al.*, 1989). Therefore, perceived usefulness is the ability to provide the ways and means or a rationale upon which to make decisions. Due to the importance of this construct, extensive research has been done by the information system community that provides evidence of the positive significant effect of perceived usefulness towards usage of ICT (Alkafagi *et al.*, 2015; Al-Adwan *et al.*, 2013; Al-Ajam & Md Noor, 2013; Bashir & Madhavaiah, 2015; Davis *et al.*, 1989; Elkaseh *et al.*, 2015; Venkatesh, 1999, 2000; Venkatesh & Davis, 1996, 2000; Venkatesh & Morris, 2000). The following paragraphs will elaborate further on the relationship between perceived usefulness and internet usage in the area of banking and non-banking studies (Table 2.7).

Researches have been conducted and the results indicated that there were a positive significant relationship between perceived usefulness and internet banking usage. For example, Fathima and Muthumani (2015) conducted a study in India to verify the relationship between perceived usefulness and internet banking usage. Results indicate that there is a positive relationship between these two variables. Likewise, Mazhar *et al.* (2014) employed a research in Pakistan by using 150 mobile banking users as their respondents. Results proved that there was a significant impact by perceived usefulness towards internet banking adoption. Another study was conducted in India by Safeena *et al.* (2013) by engaging 549 online banking users to find the relationship of these variables. Results proved that there was a significant impact of perceived usefulness towards internet banking usage. On the other hand, Juwaheer *et al.* (2012) conducted a study in Mauritius to find the influence of perceived usefulness and internet banking usage. Results displayed the influence of perceived usefulness and internet banking usage.

Moreover, Lule *et al.* (2012) conducted a research in Kenya to confirm the relationship between perceived usefulness and internet banking usage. Results proved that there was a significant impact by perceived usefulness on internet banking usage. Correspondingly, in Malaysia, a research was conducted by Eze *et al.* (2011) by using respondents between the ages of 18 and 28 years old. Results indicated that there was an influence by perceived usefulness on internet banking usage. Pikkarainen *et al.* (2004) conducted an internet usage research in Finland by using college students as the respondents and found that there was a positive significant relationship between perceived usefulness and internet usage. Alternatively, Eriksson *et al.* (2005) conducted

a research in Estonia to investigate the relationship between perceived usefulness and internet usage. Results showed that perceived usefulness and internet usage had a positive significant relationship among Estonian banking customers.

Moreover, in Spain, Manzano *et al.* (2009) conducted a study in virtual banking to find out the link between perceived usefulness and internet usage. Results also indicated that there was a positive significant link between perceived usefulness and internet usage. In India, a research was conducted by Safeena *et al.* (2011) by using college students as the respondents to investigate association of perceived usefulness on internet usage by online banking customers and results proved that there was a positive significant association on internet usage by perceived usefulness. Meanwhile, another study on banking has concluded that there is a positive significant impact by perceived usefulness on internet banking usage (Reid & Levy, 2008).

On the contrary, Amin *et al.* (2012) conducted a research in the area of mobile banking in Malaysia and the result from this study indicated an insignificant link between perceived usefulness and internet usage. Likewise, a study was conducted in India by Bashir and Madhavaiah (2015) in the area of banking to verify the relationship between perceived usefulness and internet banking adoption. Results suggested that there was an insignificant impact by perceived usefulness on internet banking adoption. A study was conducted in Malaysia by Mamat *et al.* (2015) to find the relationship between perceived usefulness and internet banking usage. Results indicated that there was no significant relationship between these two variables. Aboelmaged and Gebba (2013) performed a study in UAE to verify the linkage between perceived usefulness and internet banking

adoption by using 119 undergraduate and postgraduate students as the respondents. Results confirmed absence of relationship between perceived usefulness and internet banking usage. In the area of non-banking studies, Park (2009) tried to establish the relationship between perceived usefulness and e-learning in Korea. Results indicated that there was no linkage between perceived usefulness and e-learning. Other study on e-learning was performed by Wu and Gao (2011) in USA, to check the relationship between perceived usefulness and internet usage. Their research proved that there was an impact of perceived usefulness on internet usage.

In addition, Lin and Nguyen (2011) conducted a research in Vietnam and Taiwan pertaining to e-payment and discover that perceived usefulness had a positive significant impact on information system usage. Meanwhile, Selamat and Jaffar (2011) conducted a research in Malaysia in the area of bankers' computing acceptance of information system usage and the result indicated that perceived usefulness had a positive significant linkage towards information system usage. Al-Htaybat *et al.* (2011), on the other hand, developed a theoretical model based on TAM to investigate determinants of internet usage in Jordan in focusing on internet financial reporting. The study concluded perceived usefulness had no significant relationship with information system usage.

On the other hand, Wu and Gao (2011) conducted a research in e-learning in the USA by using 105 students as the respondents in their study. Results indicated there was an impact on internet usage by perceived usefulness. Meanwhile, Chen *et al.* (2010) and Wang and Tseng (2011) conducted a study in Taiwan pertaining to the usage of online shopping. Results proved that there was a significant linkage between these two

variables. From these past studies, the discussion displays that there are equivocal findings on determining the relationship between perceived usefulness and internet system usage. This shows that customers' perceived usefulness of internet usage is inconclusive. Therefore, this linkage is still unclear and warrants further research.

Table 2.7

Summary of Perceived usefulness and Usage

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Bashir & Madhavaiah (2015)/India	Banking	SEM	5 Point likert PU: 6 items Usage: 5 items	697 internet banking users via online	Not sig: $\beta = 0.008$, CR= -0.496, $p > 0.01$
Fathima & Muthumani (2015)/India	Banking	Regression	5 Point likert PU: NA Usage: NA	319 Internet banking users	Sig positive: $\beta = 0.275$, $t = 25.041$, $p < 0.05$
Mamat, Yusoff, Abdullah & Razak (2015)/Malaysia	Banking	SEM	5 Point likert PU: NA Usage: NA	76 Pre-school teachers	Not Sig: $\beta = 0.18$
Mazhar <i>et al.</i> (2014)/Pakistan	Banking	Regression	5 Point likert PU: 7 items Usage: 4 items	150 customers of mobile/Int	Sig positive: $\beta = 0.559$, CR=8.211, $p = 0.000$
Aboelmaged & Gebba (2013)/UAE	Banking	Regression	5 point Likert PU: 3 items Usage: 3 items	119 undergrad and postgrad students	Not sig: $\beta = 0.072$, $t = 0.743$, $p > 0.01$
Safeena, Date, Hundewale & Kammani (2013)/India	Banking	Regression	5 point Likert PU: 3 items Usage: NA	549 online banking users	Sig positive: $\beta = 0.36$, $t = 3.087$, $p < 0.01$
Amin <i>et al.</i> (2012)/Malaysia	Banking	Regression	5 Point likert PU: NA Usage: NA	152 Mobile banking customers	Not Sig: $\beta = 0.088$, $t = 1.005$, $p > 0.05$
Juwaheer, Pudaruth & Ramdin (2012)/Mauritius	Banking	ANOVA	5 Point likert PU: NA Usage: NA	384 bank customer above 18 years	Sig positive: $f = 22.588$, $p < 0.05$

Table 2.7 (continued)

Summary of Perceived usefulness and Usage

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Lule <i>et al.</i> (2012)/Kenya	Banking	SEM	7 Point likert PU: 3 items Usage: 2 items	395 M-kesho users	Sig positive: $\beta=0.244$, $p<0.001$
Al-Htaybat <i>et al.</i> (2011)/Jordan	Internet Financial reporting	Kruskal Wallis Test	5 Point likert PU: 11 items Usage: NA	114 academicians, bank officers & auditors	Mean score: 4.67 - 2.22
Eze <i>et al.</i> (2011)/Malaysia	Banking	Regression	5 Point likert PU: 6 items Usage: 6 items	229 Malaysian (age 18-28 years)	Sig positive: $\beta=0.157$, $t=2.271$, $p<0.05$
Wu & Gao (2011)/USA	E-learning	SEM	7 Point likert PU: 4 items Usage: 3 items	105 Students macroeconomic classes	Sig positive: $\beta=0.678$, $p<0.01$
Safeena <i>et al.</i> (2011)/India	Banking	Regression	5 Point likert PU: 9 items Usage: NA	116 Students of internet banking users	Sig positive: $\beta=0.260$, $t=3.087$, $p=0.003$
Lin & Nguyen (2011)/Taiwan	E-payment	Regression	7 Point likert PU: 5 items Usage: 3 items	676 e-payments users (Vietnam & Taiwan)	Sig positive: $\beta=0.309$ (0.390), $p<0.01$
Selamat & Jaffar (2011)/Malaysia	Banking (IT usage)	Regression	5 Point likert PU: 6 items Usage: 3 items	69 Bankers	Sig positive: $\beta=0.561$, $p<0.05$
Wang & Tseng (2011)/Taiwan	Online shopping	SEM	Scale (NA) PU: 4 items Usage: 3 items	206 Online shopping customers	Sig positive: $\beta=0.25$, $p<0.01$
Chen <i>et al.</i> (2010)/Taiwan	Online shopping	SEM	7 Point likert PU: NA Usage: NA	342 online shopping users via online survey	Sig positive: $\beta=0.64$, $t=6.84$, $p=0.001$
Manzano <i>et al.</i> (2009)/Spain	Banking	SEM	7 Point likert PU: 4 items Usage: 1 item	511 internet banking customers via online survey	Sig positive: $\beta=0.28$, $t=3.00$, $p<0.01$
Park (2009)/Korea	E-learning	SEM	7 Point likert PU: 3 items Usage: 2 items	628 students	Not sig: $\beta= -0.04$, $t=-.60$, $p>0.05$

Table 2.7 (continued)

Summary of Perceived usefulness and Usage

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Reid & Levy (2008)/Jamaica	Banking	SEM	5 point Likert PU: 4 items Usage: 3 items	374 banks customers	Sig positive: $\beta=0.23$, CR=2.247, $p<0.05$
Eriksson <i>et al.</i> (2005)/Estonia	Banking	SEM	Scale type: NA PU: 2 items Usage: 2 items	1831 Internet banking users	Sig positive: $\beta=0.55$, $t=7.82$, $p<0.05$
Pikkarainen <i>et al.</i> (2004)/Finland	Banking	Regression	5 point Likert PU: 4 items Usage: 6 items	268 Students & barber customers	Sig positive: $\beta=0.247$, $t=3.151$, $p<0.05$

2.6.3 Study on Perceived Ease of Use and Internet Usage

The Technology Acceptance Model (TAM) has a second factor *i.e.* perceived ease of use, which defines how clear and understandable the information system is in getting the system to do what is required to interact with the system (Guriting & Ndubisi, 2006). Therefore, the following paragraphs will elaborate further the relationship between perceived ease of use and internet usage (Table 2.8).

In the area of banking studies, a research was conducted by Fathima and Muthumani (2015) in India to find the impact of perceived ease of use on internet banking usage. Results indicated that there was a positive significant relationship between perceived ease of use and internet banking adoption. On the other hand, Safeena *et al.* (2013) conducted a study in India by using 549 online banking users as the respondents. Results proved that there was an impact by perceived ease of use on internet banking usage.

Juwaheer *et al.* (2012) conducted a study in Mauritius and found out that there was positive linkage between perceived ease of use and internet banking adoption. Another research was conducted by Amin *et al.* (2012) in Malaysia to study the impact of perceived ease of use and internet usage among customers of a bank in the city of Kota Kinabalu, Sabah. From this research, results indicated that there was no significant relationship between perceived ease of use and internet usage on mobile banking. Eze *et al.* (2011) conducted a research in Malaysia and concluded that perceived ease of use was the predictor for internet banking usage.

In addition, another research was conducted by Safeena *et al.* (2011) in India by using college students as the respondents in their study and it was found that there was a positive significant relationship between perceived ease of use and internet banking usage. On the contrary, the research conducted by Bashir and Madhavaiah (2015) in India failed to conclude the impact of perceived ease of use on internet banking usage. While, Candra (2013) employed a study in Indonesia and received the same outcome as Bashir and Madhavaiah (2015).

Meanwhile, some other studies in the area of banking failed to prove the significant effect of perceived ease of use on internet banking adoption. For example, Eriksson *et al.* (2005) examined the area of internet banking usage in Estonia by engaging internet banking customers as the respondents and the results indicated that there was no significant relationship between perceived ease of use and internet banking usage. In addition to this, a research was also conducted by Pikkarainen *et al.* (2004) in the scope of internet banking. The researchers resort to using students and barber shop customers

as the respondents in Finland; result revealed that there was no significant relationship between perceived ease of use and internet banking usage. On the other hand, studies on the non-banking industry also experienced mixed results and ambiguity. For instance, a research in e-learning was conducted by Mamat *et al.* (2015) in Malaysia using 76 pre-school teachers as their respondents. Results indicated that perceived ease of use was a strong predictor of internet usage. In contrast, a study performed by Park (2009) in Korea proved that perceived ease of use failed to predict internet usage. Meanwhile, Bashir and Madhavaiah (2015) conducted a study in India on the usage of e-banking and the results were similar to the outcome of Park (2009).

On the hand, Sa'nchez *et al.* (2013) performed a study of e-learning in Spain and the results showed that perceived ease of use was unable to predict internet usage. Meanwhile, Alhtaybat and Hutaibat (2011) study revealed different outcome compared Sa'nchez *et al.* (2013). It was notice that perceived ease of use is a positive significant determinant of actual information system usage when it is tested among Jordanian pertaining to internet financial reporting. Subsequent research by Lin and Nguyen (2011) done in the area of e-payment able to show perceived ease of use ability to predict information system usage among Vietnamese and Taiwanese. These results were contradictory to the research done by Selamat and Jaffar (2011) where perceived ease of use had no significant relationship with actual information system usage. It can be concluded that the results of the impact of customers' perceived ease of use on internet usage is unclear, henceforth dissimilarities exist among past studies. Therefore, it warrants further research to examine this linkage.

Table 2.8

Summary of Perceived ease of use and usage

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Bashir & Madhavaiah (2015)/India	Banking	SEM	5 Point likert PEU: 5 items Usage: 5 items	697 internet banking users via online survey	Not sig: $\beta = 0.058$, CR= 0.167, $p > 0.01$
Fathima & Muthumani (2015)/India	Banking	Regression	5 Point likert PEU: NA Usage: NA	319 internet banking users	Sig positive: $\beta = 0.173$, $t = 17.081$, $p < 0.05$
Mamat, Yusoff, Abdullah & Razak (2015)/Malaysia	Virtual learning	SEM	5 Point likert PEU: NA Usage: NA	76 Pre-school teachers	Sig positive: $\beta = 0.42$, $p < 0.05$
Candra (2013)/Indonesia	Banking	SEM	Scale type: NA PEU: NA Usage: NA	100 internet banking users	Not Sig: $\beta = 0.13$, $p = 0.06$
Safeena, Date, Hundewale & Kammani (2013)/India	Banking	Regression	5 point Likert PEU: 3 items Usage: NA	549 online banking users	Sig positive: $\beta = 0.34$, $t = 2.041$, $p < 0.05$
Sa'nchez, Hueros & Ordaz (2013)/Spain	WebCT learning system	SEM	7 Point likert PEU: 4 items Usage: 2 items	226 undergrad students	Not Sig: $\beta = 0.09$, $t = 0.69$, $p > 0.05$
Amin <i>et al.</i> (2012)/Malaysia	Banking	Regression	5 Point likert PEU: NA Usage: NA	152 Mobile banking customers	Not Sig: $\beta = 0.097$, $t = 1.319$, $p > 0.05$
Juwaheer, Pudaruth & Ramdin (2012)/Mauritius	Banking	ANOVA	5 Point likert PEU: NA Usage: NA	384 bank customer above 18 years	Sig positive: $f = 8.166$, $p < 0.05$
Al-Htaybat <i>et al.</i> (2011)/Jordan	Internet Financial reporting	Kruskal Wallis Test	5 Point likert PEU: 11 items Usage: NA	114 academicians, bank officers & auditors	Average Mean score: 3.5
Eze <i>et al.</i> (2011)/Malaysia	Banking	Regression	5 Point likert PEU: 8 items Usage: 6 items	229 Malaysian (age 18-28 years)	Sig positive: $\beta = 0.131$, $t = 2.305$, $p < 0.05$

Table 2.8 (continued)

Summary of Perceived ease of use and usage

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Selamat & Jaffar (2011)/Malaysia	Banking (IT usage)	Regression	5 Point likert PEU: 4 items Usage: 3 items	69 Bankers	Not Sig: $\beta=-0.086$, $p>0.05$
Lin & Nguyen (2011)/Taiwan	E-payment	Regression	7 Point likert PEU: 6 items Usage: 3 items	676 e-payments users (Vietnam & Taiwan)	Sig positive: $\beta=0.242$ (0.493),
Safeena <i>et al.</i> (2011)/India	Banking	Regression	5 Point likert PEU: 5 items Usage: 2 items	116 Students of internet banking users	Sig positive: $\beta=0.172$, $t=2.041$, $p=0.044$
Manzano <i>et al.</i> (2009)/Spain	Banking	SEM	7 Point likert PEU: 4 items Usage: 1 item	511 internet banking customers	Not Sig: $\beta=0.06$, $t=0.58$, $p>0.05$
Park (2009)/South Korea	E-learning	SEM	7 Point likert PEU: 3 items Usage: 2 items	628 students	Not sig: $\beta=0.002$, $t=0.10$, $p>0.05$
Eriksson <i>et al.</i> (2005)/Estonia	Banking	SEM	Scale type: NA PEU: 2 items Usage: 2 items	1831 Internet banking users	Not Sig: $\beta=0.07$, $t=1.14$, $p>0.05$
Pikkarainen <i>et al.</i> (2004)/Finland	Banking	Regression	5 Point likert PEU: 6 items Usage: 6 items	268 Students & barber customers	Not Sig: $\beta=0.074$, $t=0.940$, $p>0.05$

2.6.4 Study on Internet Self-Efficacy and Internet Usage

According to Nelson and Richmond (2007), internet usage can be defined as “a transaction oriented by system that enables customers to engage in online activities”. The impact of internet self-efficacy on internet usage has been studied by a few academic researches using different competing models such as the TAM, TPB, DTPB,

DOI and ECT. Web self-efficacy is an important determinant of attitudes towards computer usage that might lead to users' acceptance of the information system (Park, 2009; Sa'nchez *et al.*, 2013) while internet self-efficacy is a positively significant determinant of internet usage (Eastin & LaRose, 2000).

Therefore, many researchers have tried to prove that internet self-efficacy predict internet usage but unfortunately these studies' outcomes have produced a mixed result with positive significant and insignificant effects towards internet usage which in turn has created ambiguity in this area (Table 2.9), (Abdulkadir *et al.*, 2013; Alkafagi *et al.*, 2015; Amin *et al.*, 2012; Chen *et al.*, 2010; Fathima & Muthumani, 2015; Ma & Liu, 2005; Mansumittrchai & Al-Malkawi, 2011; Nasri, 2011; Park, 2009; Sa'nchez *et al.*, 2013; Trivedi & Kumar, 2014).

Alkafagi *et al.* (2015) studied the linkage between internet self-efficacy and internet banking adoption in Iraq and this linkage was supported. Moreover, studies conducted by Fathima and Muthumani (2015) in India to verify the relationship between internet self-efficacy and internet banking adoption also produced similar results to that of AlKafagi *et al.* (2015). Amin *et al.* (2012) investigated the usage of internet banking via mobile phones in Malaysia and linkage was supported in their study. On the contrary, a study done by Abdulkadir *et al.* (2013) in Malaysia did not show any significant link between internet self-efficacy and internet usage. Meanwhile, Mansumittrchai and Al-Malkawi (2011) applied the theory of Diffusion of Innovation by Rogers (1995) to investigate the determinants that may influence adoption of internet banking usage in Mexico among 395 working adults consisting of adopters and non-adopters.

In their study, it was found that higher level of PC proficiency, which is equivalent to internet self-efficacy, had no significant effect on internet usage. Therefore, internet self-efficacy does not affect customer decision on usage of internet banking. On the other hand, Nasri (2011) performed a study in Tunisia by engaging 253 internet banking adopters and non-adopters to confirm the impact of internet self-efficacy on internet banking usage. While, online shopping is also one of the vital interests by researchers on consumers' reaction towards virtually purchase.

Accordingly, Trivedi and Kumar (2014) performed a research in India by using students as the respondents in their research. However, the findings of Trivedi and Kumar (2014) contradicted the research done by Chen *et al.* (2010) in Taiwan among 342 consumers of the 7-11 on-line virtual stores as respondents. In this study, Chen *et al.* (2010) investigated repurchase intention on internet shopping by using Expectation-Confirmation Theory (ECT) baseline model, which was originated by Oliver (1980), and found an insignificant relationship between these variables.

Moreover, Park (2009) conducted a study in Korea to examine students' internet self-efficacy towards e-learning among higher education students. Results proved that students with competency of internet self-efficacy would intend to use the e-learning system. On the contrary, in area of non-banking industry, there is also research that has been conducted did not support internet self-efficacy as determinant of internet usage. For instance, study conducted by Sa'nchez *et al.* (2013) in Spain on usage of e-learning, results proved that internet self-efficacy did not support internet usage.

Meanwhile, Ma and Liu (2005) conducted a research in USA on health care by employing 86 health care trainees and clinic staff as respondents and results revealed that internet self-efficacy strongly predicted internet usage. It can be concluded that results on impact of customers' internet self-efficacy and internet usage are inconclusive. In addition, past studies on associating customers' internet self-efficacy and customers' internet usage were examined in diverse ways and in a fragmented context.

Table 2.9

Summary of Internet self-efficacy and usage

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Alkafagi, Romli, Bahaudin, Alekam & Salameh (2015)/Iraq	Banking	SEM	7 Point likert ISE: 5 items Usage: 4 items	535 internet banking users in Iraq	Sig positive: $\beta=0.466$, $t= 5.672$, $p=0.000$
Fathima & Muthumani (2015)/India	Banking	Regression	5 Point likert ISE: NA Usage: NA	319 Internet banking users	Sig positive: $\beta=0.147$, $t=14.228$, $p<0.05$
Trivedi & Kumar (2014)/India	Online shopping	Regression	5 Point likert ISE: 4 items Usage: 2 items	110 students	Sig positive: $\beta=0.324$, $t= 3.509$, $p<0.05$
Abdulkadir, Galoji & Razak (2013)/Malaysia	Banking	Regression	5 Point likert ISE: 3 items Usage: NA	125 students	Not Sig: $r=0.000$, $p=0.998$
Sa´nchez, Hueros & Ordaz (2013)/Spain	WebCT learning	SEM	7 Point likert ISE: NA Usage: 2 items	226 undergrad students	Not sig: Eliminated loaded with PEU
Amin <i>et al.</i> (2012)/Malaysia	Banking	Regression	5 Point likert ISE: NA Usage: NA	152 Mobile banking customers	Sig positive: $\beta=0.277$, $t=4.150$, $p<0.01$

Table 2.9 (continued)

Summary of Internet self-efficacy and usage

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Mansumitichai & Al-Malkawi (2011)/UAE	Banking	ANOVA	5 Point likert ISE: 2 items Usage: 4 items	395 working people	Not Sig: $F=0.282$, $p=0.282$
Nasri (2011)/Tunisia	Banking	Regression	5 Point likert ISE: 3 items Usage: 4 items	253 internet banking users/non users	Sig positive: $\beta=0.125$, $t=2.206$, $p<0.01$
Chen <i>et al.</i> (2010)/Taiwan	Online shopping	SEM	7 Point likert ISE: NA Usage: NA	342 online shopping users via online survey	Not Sig: $\beta=0.06$, $t=1.73$, $p>0.05$
Park (2009)/Korea	E-learning	SEM	7 Point likert ISE: 2 items Usage: 2 items	628 students	Sig positive: $\beta=0.579$, $t=7.08$, $p<0.01$
Ma & Liu (2005)/USA	Health care	Regression	5 Point likert ISE: 6 items Usage: 5 items	86 health care trainees & clinics staff	Sig positive: $\beta=0.741$, $t=10.10$,

2.6.5 Study on Subjective Norm and Internet Usage

Subjective norm is an individual's normative structure that leads to a belief about what important others think about a particular behaviour in question. This will further cause social pressure to comply with expectations to engage or not to engage in a particular behaviour (Abdulkadir *et al.*, 2013). Furthermore, Ajzen (1991) states, subjective norm can be defined as "perceived social pressure to perform or not to perform a particular behaviour". In this scenario, internet is seen as a socially desirable behaviour; based on what others think about internet, an individual is more likely to perform an internet usage through World Wide Web. Therefore, the following paragraphs will discuss

further the relationship between subjective norm and internet usage (Table 2.10). Past studies have been conducted to find the impact of subjective norm towards internet usage. For instance, in banking industry, Alkafagi *et al.* (2015) tried to find the impact of social influence on internet banking adoption in Iraq by surveying 535 internet banking users. The research concluded that there was no significant difference between subjective norm and internet banking adoption due to negative significant relationship. Bashir and Madhavaiah (2015) conducted a research in India to validate this relationship by using 697 internet banking users via an online survey. Results confirmed that subjective norms might influence internet banking usage.

Similarly, Fathima and Muthumani (2015) investigated this relationship in India by engaging 319 internet banking adopters their study. However, results indicated the influence of subjective norm towards internet banking usage. Thereafter, Abdulkadir *et al.* (2013) performed a research in Malaysia to find out the relationship between subjective norm and internet banking adoption, and results revealed that there was a positive significant relationship between these variables. Meanwhile, Aboelmaged and Gebba (2013) performed a study in UAE employing 119 undergraduate and postgraduate students their survey. Results posted a similar outcome as prior study by Abdulkadir *et al.* (2013).

On the other hand, Safeena *et al.* (2013) conducted a study in India to investigate this relationship and found that there was an impact by subjective norm on internet banking usage. On the contrary, Juwaheer *et al.* (2012) conducted a research in Mauritius among 384 bank customers above 18 years their study. Results posted that there was no

significant impact by subjective norm towards internet banking usage. Likewise, Mansumittrchai and Al-Malkawi (2011) conducted a survey in Mexico on internet banking usage by adopters and non-adopters. From this survey, results showed that there was an insignificant effect between subjective norm and internet usage. In the area of non-banking industry, researchers have also paid a greater attention on investigating this relationship. For example, Trivedi and Kumar (2014) in India performed a study on online shopping behaviour by Indian consumers. Results posted no significant relationship between subjective norm and online shopping behaviour. Likewise, Mamat *et al.* (2015) tried to validate the usage of e-learning by pre-school teachers in Malaysia. Results affirmed that similar outcome as Trivedi and Kumar (2014). Chen *et al.* (2013) conducted a study in Taiwan to verify e-learning behavior by students on web-based instruction. Results displayed that there was an insignificant effect by subjective norm on internet web-based e- learning instruction.

In addition, Park (2009) performed a study in Korea to investigate the usage of e-learning by university students. This study outcome displays a significant relationship between these variables. On the other hand, a study was conducted by Selamat and Jaffar (2011) in Malaysia in the area of bankers' computing acceptance. The researchers found out that subjective norm is not a predictor of internet usage. Further, a study was conducted by Chen and Li (2010) in Taiwan in e-service usage by undergraduate students, as results indicated there was a positive significant association between subjective norm and internet usage. The above discussion shows that there are ambiguous findings on determining the relationship between subjective norm and internet usage. These may lead to an indication subjective norm may or may not be a

determinant for internet usage by customers resulting in inconclusive findings. Due to this, the linkage between subjective norm and internet usage warrants further examination.

Table 2.10

Summary of subjective norm and Usage

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Alkafagi, Romli, Bahaudin, Alekam & Salameh (2015)/Iraq	Banking	SEM	7 Point likert SN: 5 items Usage: 4 items	535 internet banking users in Iraq	Sig neg: $\beta = -0.151$, $t = 3.736$, $p = 0.000$
Bashir & Madhavaiah (2015)/India	Banking	SEM	5 Point likert SN: 5 items Usage: 5 items	697 internet banking users via online survey	Sig positive: $\beta = 0.081$, $CR = 4.014$, $p < 0.001$
Fathima & Muthumani (2015)/India	Banking	Regression	5 Point Likert SN: NA Usage: NA	319 Internet banking users	Sig positive: $\beta = 0.170$, $t = 17.013$, $p < 0.05$
Mamat, Yusoff, Abdullah & Razak (2015)/Malaysia	Virtual learning	SEM	5 Point Likert SN: NA Usage: NA	76 Pre-school teachers	Not Sig: $\beta = 0.06$, $p > 0.05$
Trivedi & Kumar (2014)/India	Online shopping	Regression	5 Point likert SN: 2 items Usage: 2 items	110 students	Not sig: $\beta = 0.122$, $t = 1.511$, $p > 0.05$
Abdulkadir, Galoji & Razak (2013)/Malaysia	Banking	Regression	5 Point likert SN: NA Usage: NA	125 students	Sig positive: $\beta = 0.345$, $t = 3.762$, $p = 0.000$
Aboelmaged & Gebba (2013)/UAE	Banking	Regression	5 point Likert SN: 3 items Usage: 3 items	119 undergrad and postgrad students	Sig positive: $\beta = 0.268$, $t = 3.137$, $p = 0.002$
Chen, Lin, Yeh & Lou (2013)/Taiwan	E-learning	SEM	7 Point likert SN: 4 items Usage: 3 items	258 students web based instruction users	Not Sig: $\beta = 0.08$, $p > 0.05$
Safeena, Date, Hundewale & Kammani (2013)/India	Banking	Regression	5 point Likert SN: 3 items Usage: NA	549 online banking users	Sig positive: $\beta = 0.24$, $t = 1.43$, $p < 0.01$

Table 2.10 (continued)

Summary of subjective norm and Usage

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Juwaheer, Pudaruth & Ramdin (2012)/Mauritius	Banking	ANOVA	5 Point likert SN: NA Usage: NA	384 bank customer above 18 years	Not sig: $r=1.000$, $p>0.05$
Selamat & Jaffar (2011)/Malaysia	Banking (IT usage)	Regression	5 Point Likert SN: 2 items Usage: 3 items	69 Bankers	Not Sig: $\beta=-0.37$, $p>0.05$
Mansumittrchai & Al-Malkawi (2011)/UAE	Banking	ANOVA	5 Point Likert SN: 3 items Usage: 4 items	395 working people	Not Sig: $F=0.032$, $p=0.857$
Chen & Li (2010)/Taiwan	E-service	SEM	7 Point likert SN: 3 items Usage: NA	405 undergrad students	Not Sig: $\beta=0.04$, $p>0.05$
Park (2009)/Korea	E-learning	SEM	7 Point likert SN: 2 items Usage: 2 items	628 students	Sig positive: $\beta=0.184$, $t=3.44$, $p<0.01$

2.6.6 Study on Attitude and Internet Usage

According to attitude theory, the more favourable attitude a person has towards product or service, the more likely that the person will buy or use that product or service (Chen & Li, 2010). This notion was reiterated by a study done by Alkafagi *et al.* (2015) in Iraq. Eventhough the researchers employed TPB underpinning theory while analysing university staff using Smart PLS, the supporting nature of attitude towards intention is further strengthened. Davis *et al.* (1989) stated that attitude towards a specific information system is conceptualized as a potential user's assessment of the desirability of using a particular technology. Therefore, the followings paragraphs will discuss

further the relationship between attitude and internet usage in banking and non-banking studies (Table 2.11). There are quite a number of previous studies representing the relationship of attitude and internet banking usage. For example, Alkafagi *et al.* (2015) conducted a study to assess attitude towards internet banking adoption by engaging 535 internet banking users in Iraq. Results reflected that attitude had a strong influence towards internet banking adoption. Meanwhile, Bashir and Madhavaiah (2015) conducted a research in India to find out the impact of this linkage via an online survey on 697 internet banking users and results were similar to that of Alkafagi *et al.*, 's (2015) study.

Likewise, Mazhar *et al.* (2014) investigated usage of internet banking in India by engaging 150 mobile banking customers. Results indicated there was a strong significant impact of attitude towards internet banking adoption. On the other hand, Aboelmaged and Gebba (2013) conducted a study in UAE to verify the usage of internet banking among undergraduate students and results proved that there was a significant influence by attitude on internet banking usage. Moreover, Al-Ajam and Md Noor (2013) examined the relationship between attitude and internet banking usage in Yemen by employing 1286 non-adopters of internet banking. Results stated that attitude was a strong predictor of internet banking usage even though they were non-adopters of internet banking facility. Furthermore, Maduku (2013) conducted a study in South Africa to examine the impact of attitude on internet banking usage by retail banking customers. Results revealed that there was a high correlation of attitude towards internet banking usage.

Meanwhile, Safeena *et al.* (2013) tried to evaluate the behaviour of online banking users in India on the importance of attitudinal belief towards internet banking usage. Results indicated there was significant pressure by attitude on internet banking usage. Likewise, Juwaheer *et al.* (2012) investigated the relationship between attitude and internet banking usage by retail banking customers in Mauritius, and study outcome as per Safeena *et al.* (2013). On the other hand, Lule *et al.* (2012) conducted a study in Kenya to find the influence of attitude towards internet banking usage by M-kesho users. This study proved that attitude was a strong predictor of internet banking usage.

Researches in banking might concluded that there was a strong impact by attitude towards internet banking usage (Al-Ajam & Md Noor, 2013; Alkafagi *et al.*, 2015; Bashir & Madhavaiah, 2015; Mazhar *et al.*, 2014). Studies have been also taken place in non-banking industry such as e-learning, online shopping, IT usage, social media usage, e-service and e-readers. In the area of e-learning, several researches have been conducted to examine the relationship between attitude and internet usage. For instance, Elkaseh *et al.* (2015) conducted a study to investigate factors that affect e-learning implementation in Libyan higher education among 499 students and lecturers, results proved that attitude was a strong predictor of e-learning usage.

In contrary, research was done by Al-Adwan *et al.* (2013) in Jordan whereby this study focused on students' usage of e-learning system in their universities. This study found that attitude did not have a significant impact on usage of e-learning system among Jordanian students. Meanwhile, Sa'nchez *et al.* (2013) conducted a study in Spain to determine students' attitude on WebCT learning system towards e-learning usage,

results posted that as the same outcome of Al-Adwan *et al.* (2013). While, Wu and Gao (2011) examined USA students' attitude on response system (Clikers) predicting e-learning by engaging 105 students from macroeconomic classes, study revealed that there was no significant linkage between attitude and e-learning system usage.

Similarly, study was conducted by Shroff *et al.* (2011) to find the relationship between attitude on electronic portfolio system and e-learning usage in Hong Kong higher education. Results stated that there was no significant impact by attitude on electronic portfolio system and e-learning usage. In contrary, Park (2009) conducted a study to examine the influence of attitude on e-learning usage by higher education students in South Korea, and study revealed that attitude might predict e-learning usage by Korean. Another area of study focused on the acceptance of online shopping, for instance, Wang and Tseng (2011) investigated relationship between attitude of shoppers and online shopping adoption in Taiwan among 206 online shopping customers; results of this study contradicting with Park (2009). Meanwhile, Thomas (2011) discussed the influence of attitude towards internet chatting adoption in India, this research indicated that there was a positive significant impact by attitude on internet usage by chatters in India.

Likewise, Chen and Li (2010) completed a research in Taiwan by examining students' attitude on e-service adoption, results posted that attitude significantly impacted adoption of internet usage. In addition to this, Alshare *et al.* (2011) conducted a survey in the USA, Chile and UAE to find out the effect of attitude towards internet usage on national culture by students from these three countries. It was observed that there was a

significant linkage between these variables. Meanwhile, Porter and Donthu (2006) examined the link between attitude and internet usage by American students, results indicated that there was a positive significant correlation by attitude and internet usage by these students. While, study was conducted by Read *et al.* (2011) in Australia to find the behavior of e-readers' attitude on internet usage by engaging 451 e-reader users. Nevertheless, results of this study showed that there was a significant impact of attitude on e-readers adoption. Previous studies examining the influence of attitude towards internet usage appears to have inconsistent findings, while, study predicting actual usage is still under research in Malaysian banking context. Therefore, it warrants further research to examine this linkage.

Table 2.11
Summary of attitude and usage

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Alkafagi, Romli, Bahaudin, Alekam & Salameh (2015)/Iraq	Banking	SEM	7 Point likert Att: 6 items Usage: 4 items	535 internet banking users in Iraq	Sig positive: $\beta=0.617$, $t=12.93$, $p=0.000$
Bashir & Madhavaiah (2015)/India	Banking	SEM	5 Point likert Att: 5 items Usage: 5 items	697 internet banking users via online survey	Sig positive: $\beta=0.553$, $CR=15.297$, $p<0.001$
Elkaseh, Wong & Fung (2015)/Australia	E-learning	SEM	Scale: NA Att: 3 items Usage: 3 items	499 students & lecturers in Libya	Sig positive: $\beta=0.503$ & 0.799 , $p<0.001$
Mazhar <i>et al.</i> (2014)/India	Banking	Regression	5 point Likert Att: 4 items Usage: 4 items	150 customers of mobile/Int	Sig positive: $\beta=0.696$, $CR=11.779$, $p=0.000$

Table 2.11 (continued)

Summary of attitude and usage

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Aboelmaged & Gebba (2013)/UAE	Banking	Regression	5 point Likert Att: 4 items Usage: 3 items	119 undergrad and postgrad students	Sig positive: $\beta=0.351$, $t=3.754$, $p=0.000$
Al-Adwan, Al-Adwan & Smedley (2013)/Jordan	E-learning	Regression	4 point Likert Att: 4 items Usage: 4 items	107 students	Not Sig: $\beta=0.325$, $t= 6.063$, $p>0.01$
Al-Ajam & Md Noor (2013)/Yemen	Banking	SEM	7 point Likert Att: 4 items Usage: 5 items	1286 non users of internet banking	Sig positive: $\beta=0.706$, $CR=30.88$, $p<0.001$
Maduku (2013)/South Africa	Banking	Regression	5 point Likert Att: 5 items Usage: 2 items	394 retail banking customers	Sig positive: Pearson $corr=0.799$, $p=0.000$
Safeena, Date, Hundewale & Kammani (2013)/India	Banking	Regression	5 point Likert Att: 5 items Usage: NA	549 online banking users	Sig positive: $\beta=0.21$, $t=1.098$, $p<0.01$
Sa´nchez, Hueros & Ordaz (2013)/Spain	WebCT learning system	SEM	7 Point likert Att: 4 items Usage: 2 items	226 undergrad students	Not sig: $\beta=0.14$, $t= 0.76$, $p>0.05$
Juwaheer,Pudaruth & Ramdin (2012)/Mauritius	Banking	ANOVA	5 Point likert Att: NA Usage: NA	384 bank customer above 18 years	Sig positive: $r=0.271$, $p<0.05$
Lule <i>et al.</i> (2012)/Kenya	Banking	SEM	7 Point likert Att: 5 items Usage: 2 items	395 M-kesho users	Sig positive: $\beta=0.730$, $p<0.001$
Wu & Gao (2011)/USA	E-learning	SEM	7 Point likert Att: 3 items Usage: 3 items	105 Students macroeconomic classes	Not sig: $\beta=0.174$, $p<0.05$
Read <i>et al.</i> (2011)/Australia	E-readers	SEM	7 Point likert Att: 4 items Usage: 4 items	451 e-reader users	Sig positive: $\beta=0.76$, $p<0.001$

Table 2.11 (continued)

Summary of attitude and usage

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Shroff <i>et al.</i> (2011)/Hong Kong	E-learning	SEM	7 Point likert Att: 5 items Usage: 5 items	72 students	Not sig: $\beta=0.93$, $t=1.41$, $p>0.05$
Thomas (2011)/India	Social media (chatting)	SEM	5 Point likert Att: 4 items Usage: 8 items	345 Under graduate and post graduate	Sig positive: $\beta=0.35$
Wang & Tseng (2011)/Taiwan	Online shopping	SEM	Scale (NA) Att: 4 items Usage: 3 items	206 Online shopping	Not sig: $\beta=0.13$, $p>0.01$
Chen & Li (2010)/Taiwan	E-service	SEM	7 Point likert Att: 4 items Usage: 3 items	405 undergrad students	Sig positive: $\beta=0.58$, $p<0.05$
Park (2009)/South Korea	E-learning	SEM	7 Point likert Att: 3 items Usage: 2 items	628 students	Sig positive: $\beta=0.225$, $t=3.31$, $p<0.01$
Reid & Levy (2008)/Jamaica	Banking	SEM	5 point Likert Att: 3 items Usage: 3 items	374 banks customers	Sig positive: $\beta=0.67$, $CR=6.156$, $p<0.001$
Porter & Donthu (2006)/USA	IT usage	SEM	5 point Likert Att: 3 items Usage: 3 items	539 internet users/and non users	Sig positive: $B=0.63$, $t=14.68$, $p<0.05$
Suh & Han (2002)/Korea	Banking	SEM	5 point Likert Att: 5 items Usage: 4 items	Internet banking users of 5 major banks in Korea	Sig positive: $B=0.484$, $t=12.193$, $p<0.01$

2.6.7 Non-selected Determinants

In this study, the non-selected determinants of internet usage especially in banking will also be discussed. Among other variables not included in this study are perceived security and privacy, perceived risk, behavioural intention, internet experience, computer self-efficacy, complexity, convenience, and credibility. All these variables are excluded from this study due to its insignificance under the present context or it might have been part of another main variable or other grounded theories. For example, perceived security and privacy have been adopted by the banks to ensure that the security and privacy of the customers are protected at all times.

This is because the bank is the custodian of public fund. Empirical evidence shows that security and privacy concerns are determinant in influencing internet banking usage (Pikkarainen *et al.*, 2004; Zahid, Mujtaba & Riaz, 2010). Perceived risk factor has been dropped from this study as this factor has been mitigated and regulated by the banking industry. For instance, ID, password, and Transaction Activation Code (TAC) have been provided by the banks. Meanwhile, Candra (2013) mentioned that risk is not an impacting factor in internet banking usage. Computer self-efficacy and internet experience have also been excluded in this research since this study included internet self-efficacy as one of the factors predicting internet banking usage. Moreover, internet self-efficacy is the ability to execute a course of action over and above personal computer skills (Eastin & LaRose, 2000). Therefore, the factors discussed above have been excluded in this study.

2.7 The Determinants of Attitude

There have been a handful of determinants predicting attitude (refer *Appendix 3*, Table 2.12); for example, trust (Al-Ajam & Md Noor, 2013; Al-Majali, 2011; Bashir & Madhavaiah, 2015; Mazhar *et al.*, 2014; Maduku, 2013; Suh & Han, 2002), perceived usefulness (Aboelmaged & Gebba, 2013; Adesina & Ayo, 2010; Bashir & Madhavaiah, 2015; Chau & Ngai, 2010; Maduku, 2013; Mangin *et al.*, 2011; Mazhar *et al.*, 2014; Reid & Levy, 2008; Suh & Han, 2002), perceived ease of use (Aboelmaged & Gebba, 2013; Adesina & Ayo, 2010; Al-Ajam & Md Noor, 2013; Bashir & Madhavaiah, 2015; Chau & Ngai, 2010; Lule *et al.*, 2012; Maduku, 2013; Mazhar *et al.*, 2014; Nguyen *et al.*, 2014; Reid & Levy, 2008; Suh & Han, 2002), internet self-efficacy (Adesina & Ayo, 2010; Lule *et al.*, 2012), and subjective norm (Lule *et al.*, 2012; Maduku, 2013).

2.7.1 Study on Trust and Attitude

Trust has been defined in many different ways and no specific definition has been wholly accepted (Rousseau, Sitkin, Burt & Camerer, 1998; Tyler & Stanley, 2007). For the purpose of this study, the researcher define trust from the work of Doney and Cannon (1997) whereby “trust is the perceived credibility and benevolence of the target of trust.” According to Ganesan (1994), trust comes with a first dimension where credibility of a partner is anticipated and that the other partner has the required expertise in performing a task effectively and reliably (Ganesan, 1994). The second dimension of trust is benevolence where one partner is genuinely interested in the other partner’s

welfare, intentions and motives of the other party when new conditions arise, where these conditions lead to an unattended commitment (Ring & Van de Ven, 1992; Zaheer, McEvily & Perrone, 1998). Trust is also defined as a “belief in a person's competence to perform a specific task where the promise of an individual can be relied on” (Morgan & Hunt, 1994; Rotter, 1971) or as a “willingness to rely or depend on an exchange partner” (Moorman, Zaltman & Deshpande, 1992; Nguyen *et al.*, 2014). Trust development and maintenance of successful relationships is significant in the financial services industry and this is due to the complexity of the financial products (Nguyen *et al.*, 2014; Juwaheer *et al.*, 2012). Furthermore, the degree of customer trust on the internet usage will be negatively influenced by the belief of the customer operating at a high level of risk even though the risk is relatively low (Momeni *et al.*, 2013).

Attitude performs an important role in the acceptance of information system and computer technology usage (Davis *et al.*, 1989; Mazhar *et al.*, 2014) and it will lead to actual usage of an information system (Davis, 1989; Ives, Olson, & Baroudi, 1983). While, attitude can be categorized into two types. The first one is attitude towards objects, which is a person's affective evaluation of a specific object while the second is attitude to behaviour, which is a person's affective evaluation of a specific behaviour involving the object (Ajzen & Fishben, 1980). For the purpose of this study, the researcher employ attitude towards action. According to Davis (1993), attitude can be defined as “the degree of evaluation affect that an individual associates with using the target system in his or her job”. These factors will permit the user of the information system to adopt the system if they have trust on the information system and create a positive attitude towards the system (Davis, 1993).

Studies have been conducted to discuss trust factor that may impact attitude on internet usage in banking and non-banking industries (Table 2.13). For example, Bashir and Madhavaiah (2015) conducted a study in India to find out the impact of trust and attitude towards usage by employing 697 internet banking users via an online survey, results stated that trust was a predictor of attitude towards internet banking usage. In contrary, research was done by Mazhar *et al.* (2014) in India to confirm the relationship between these two variables by engaging 150 mobile banking customers, results did not support the relationship of trust and attitude. Similarly, Al-Ajam and Md Noor (2013) performed a study in Yemen to assess the influence of trust towards attitude of internet usage among 1286 non-adopters of internet banking. Results revealed that trust might influence attitude on internet banking adoption. Likewise, Maduku (2013) initiated a study to check out the relationship of trust and attitude by South African retail banking customers, and results showed that trust might predict attitude towards internet banking usage. On the other hand, Al-Majali (2011) conducted a research in Jordan to find out if trust had an impact on attitude by taking 532 employees of four universities in Jordan, and findings was similar to research conducted by Maduku (2013). Another study done by Suh and Han (2002) in Taiwan on internet banking usage also showed a positive significant relationship between these variables.

In non-banking setting, researches have explored many broad areas such as study conducted on online shopping, social media usage and SMS advertising. For example, Trivedi and Kumar (2014) performed a study in India to examine the relationship between online trust and attitude towards online shopping among 110 university students, and results revealed that students trust on online shopping did not influence the

attitude towards online shopping. Similarly, Wang and Tseng (2011) performed a research in Taiwan to validate trust and attitude towards online shopping by using 206 online shopping customers, and results confirmed that online trust is a strong predictor of attitude towards online shopping behaviour. Likewise, further study was conducted by Celik and Yilmaz (2011) in the area of e-shopping in Turkey by internet users, and results also indicated there was positive significant impact between trust and attitude.

In addition, Bamoriya and Singh (2012) conducted a research in India on SMS advertising by India mobile users and found that trust had a positive significant relationship with attitude towards internet usage. Hence, previous studies have produced an outcome of mixed results causing the studies to be inconclusive. Therefore, it warrants further investigation to address this issue by the current study.

Table 2.13

Summary of trust and attitude

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Bashir & Madhavaiah (2015)/India	Banking	SEM	5 Point likert Trust: 5 items Att: 5 items	697 internet banking users via online survey	Sig positive: $\beta=0.309$, CR=11.497, $p<0.001$
Mazhar <i>et al.</i> (2014)/India	Banking	Regression	5 point Likert Trust: 8 items Att: 4 items	150 customers of mobile/Int	Not sig: $\beta=-0.055$, $p=0.498$
Trivedi & Kumar (2014)/India	Online shopping	Regression	5 Point likert Trust: 4 items Att: 3 items	110 students	Not sig: $\beta=0.023$, $t=0.274$, $p>0.05$
Al-Ajam & Md Noor (2013)/Yemen	Banking	SEM	7 point Likert Trust: 4 items Att: 4 items	1286 non users of internet banking	Sig positive: $\beta=0.243$, CR=10,817,

Table 2.13 (continued)

Summary of trust and attitude

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Maduku (2013)/ South Africa	Banking	Regression	5 point Likert Trust: 4 items Att: 5 items	394 retail banking customers	Sig positive: B=0.489, t=10.424, p<.05
Bamoriya & Singh (2012)/India	SMS advertising	SEM	5 point Likert Trust: 3 items Att: 2 items	237 Indian mobile users	Sig positive: $\beta=0.116$, p<0.05
Al-Majali (2011)/Jordan	Banking	SEM	7 point Likert Trust: 6 items Att: 5 items	532 employees of 4 universities in Jordan	Sig positive: $\beta=NA$, CR=2.102, p=0.036
Wang & Tseng (2011)/Taiwan	Online shopping	SEM	Scale (NA) Trust: 3 items Att: 4 items	206 Online shopping	Sig positive: $\beta=0.62$, p<0.01
Celik & Yilmaz (2011)/Turkey	Online shopping	SEM	5 Point likert Trust: 2 items Att: 4 items	606 forum users via e-survey	Sig positive: $\beta=0.17$, t=3.73, p<0.01
Suh & Han (2002)/Korea	Banking	SEM	5 Point likert Trust: 6 items Att: 5 items	Internet banking users of 5 major banks in Korea	Sig positive: $\beta=0.352$, t=9.972, p<0.01

2.7.2 Study on Perceived Usefulness and Attitude

Previous researches provide evidences that attitude has a significant impact on readiness to perform a particular behaviour in the context of information system adoption (Rauniar *et al.*, 2014). Moreover, attitude can predict a behaviour that will deliver a particular outcome but it depends on social-economic motivational factors (Oliver & Shapiro, 1993). According to the motivation theories, a social economic factor can be categorized

into two *i.e.* the extrinsic motivation and the intrinsic motivation. The extrinsic motivation is the performance of an activity because it is perceived to be instrumental in achieving the value of the outcomes while intrinsic motivation is the performance of an activity and requires no reinforcement except the process of performing it (Deci, 1975).

In relation to this, perceived usefulness is an extrinsic motivational factor concerning positive and negative effects of using the information system (Cornell, Eining, & Jen-Hwa, 2011; Davis, 1989). Due to this, many researchers have included this factor into their research models as it is significant in explaining the usage of information system (Table 2.14). For instance, Bashir and Madhavaiah (2015) conducted a study in India to verify the relationship between perceived usefulness and attitude on internet banking adoption by Indian retail banking customers. Research concluded that perceived usefulness produced a significant positive outcome on attitude towards adoption of internet banking. Similarly, Mazhar *et al.* (2014) also conducted a study in India to validate the impact of perceived usefulness on attitude towards internet banking adoption, and results indicated that perceived usefulness acted as a strong predictor of attitude towards usage.

In addition, research was conducted by Aboelmaged and Gebba (2013) to confirm the linkage of perceived usefulness and attitude towards internet banking usage by undergraduate and postgraduate students in UAE. This research supported with positive significant relationship of perceived usefulness and attitude towards adoption of internet banking. Meanwhile, Maduku (2013) examined the impact of perceived usefulness on attitude towards internet banking usage by retail banking customers in South Africa, and results was similar to that of Aboelmaged and Gebba's (2013).

In contrary, research was done by Lule *et al.* (2012) to investigate the relationship between perceived usefulness and attitude towards adoption of internet banking among 395 M-kesho users in Kenya, and results concluded that there was an insignificant linkage between these variables. Besides that, research was conducted in Canada by Mangin *et al.* (2011) to find out the behaviour of 225 university students on their perceived usefulness in relation to attitude of internet banking usage, and results affirmed that perceived usefulness had a strong impact on attitude by the Canadian students. Furthermore, research was conducted by Adesina and Ayo (2010) in Nigeria to confirm the relationship between perceived usefulness and attitude of internet banking among 292 electronic banking users, and results outcome was similar to Mangin *et al.* (2011). Meanwhile, Chau and Ngai (2010) investigated the relationship between perceived usefulness and attitude towards usage of internet banking in United Kingdom by taking 164 internet banking adopters and non-adopters, and results supported this linkage.

On the other hand, Reid and Levy (2008) conducted a research in Jamaica by using samples from three banks' customers, and results showed that there was a significant positive affiliation between perceived usefulness and attitude towards internet banking usage. Likewise, Suh and Han (2002) in Korea tried to establish the relationship of perceived usefulness and attitude towards internet banking usage, and findings showed positive significant outcomes. In the area of non-banking study, researchers have paid a greater attention to investigate relationship between perceived usefulness and attitude towards internet usage. As an example, Elkaseh *et al.* (2015) conducted a study in Libya on usage of e-learning by students and lecturers from Libyan University, and outcome were similar to that of Suh and Han's (2002). Meanwhile, Al-Adwan *et al.* (2013) tried

to verify the impact of these variables by engaging students as the respondents in their study in Jordan, and outcome were in contrary to Elkaseh *et al*'s. (2015) findings whereby this study produced an insignificant effect between perceived usefulness and attitude on e-learning. In fact, Sa'nchez *et al.* (2013) conducted a study in Spain to validate the usage of e-learning by 226 undergraduate students on perceived usefulness and attitude towards e-learning, results indicated that perceived usefulness was a strong predictor of attitude towards e-learning usage. Alternatively, Shroff *et al.* (2011) tried to establish the effect of perceived usefulness and attitude towards e-learning by students in Hong Kong; however, the results failed to establish this relationship. In addition, study was also conducted in e-learning by Wu and Gao (2011) in USA pertaining to the influence of perceived usefulness towards attitude; while, results showed that there was a positive significant influence on attitude by perceived usefulness.

Meanwhile, Park (2009) conducted a study in Korea to investigate the impact of perceived usefulness and attitude on e-learning usage by university students, and results concluded that there was a positive linkage between these variables. On the other hand, there were also researches conducted to validate this relationship in online shopping. For example, Celik and Yilmaz (2011) conducted a research in Turkey to verify the said relationship on online shopping among 606 forum users via an e-survey, and results indicated that perceived usefulness strongly predicted attitude towards usage. Wang and Tseng (2011) tried to find out the influence of perceived usefulness on attitude of online shopping by Taiwanese retail consumers, and concluded that there was a positive significant impact by perceived usefulness on online shopping attitude. In addition to this, Kowitlawakul (2011) proved that perceived usefulness had a positive significant

impact towards attitude of internet usage in the area of healthcare telemedicine technology in Thailand. Read *et al.* (2011) conducted a research in Australia to investigate the relationship between perceived usefulness and attitude towards e-reading usage, and results indicated that there was a positive significant relationship between perceived usefulness and attitude towards internet usage. Furthermore, Thomas (2011) conducted a study in India to confirm the linkage between perceived usefulness and attitude towards adoption of social media by undergraduate and postgraduate students, and confirmed there was a significant relationship between these constructs.

Alternatively, Porter and Donthu (2006) conducted a research in USA to find out the influence of perceived usefulness and attitude by adopters and non-adopters on WWW usage, and results posted that this relation exist. From the above discussion, results display that there were equivocal findings on determining the relationship between perceived usefulness and attitude towards internet usage in banking and non-banking, and therefore, the current research aims to address this setback and proposes to investigate this relationship.

Table 2.14
Summary of perceived usefulness and attitude

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Bashir & Madhavaiah (2015)/India	Banking	SEM	5 Point likert PU: 6 items Att: 5 items	697 internet banking users via online survey	Sig positive: $\beta=0.223$, CR=3.990, $p<0.001$
Elkaseh, Wong & Fung (2015)/Australia	E-learning	SEM	Scale: NA PU: 3 items Att: 3 items	499 students & lecturers in Libya	Sig positive: $\beta=0.463$ & 0.661 , $p<0.001$

Table 2.14 (continued)

Summary of perceived usefulness and attitude

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Mazhar <i>et al.</i> (2014)/India	Banking	Regression	5 point Likert PU: 7 items Att: 4 items	150 customers of mobile/Int	Sig positive: $\beta=0.559$, $p<0.05$
Aboelmaged & Gebba (2013)/UAE	Banking	Regression	5 point Likert PU: 3 items Att: 4 items	119 undergrad and postgrad students	Sig positive: $\beta=0.581$, $t=6.279$, $p=0.000$
Al-Adwan, Al-Adwan & Smedley (2013)/Jordan	E-learning	Regression	4 point Likert PU: 4 items Att: 4 items	107 students	Not Sig: $\beta=0.185$, $t=2.499$, $p>0.05$
Maduku (2013)/South Africa	Banking	Regression	5 point Likert PU: 5 items Att: 5 items	394 retail banking customers	Sig positive: $B=0.216$, $t=4.073$, $p<.05$
Sa'nchez, Hueros & Ordaz (2013)/Spain	WebCT learning system	SEM	7 Point likert PU: 6 items Att: 4 items	226 undergrad students	Sig positive: $\beta=0.55$, $t=6.17$ $p<0.01$
Lule <i>et al.</i> (2012)/Kenya	Banking	SEM	7 Point likert PU: 3 items Att: 5 items	395 M-kesho users	Not Sig: $\beta=0.030$, $p>0.05$
Celik & Yilmaz (2011)/Turkey	Online shopping	SEM	5 Point likert PU: 3 items Att: 4 items	606 forum users via e-survey	Sig positive: $\beta=0.65$, $t=9.41$, $p<0.01$
Mangin <i>et al.</i> (2011)/Canada	Banking	SEM	5 Point likert PU: 4 items Att: 2 items	225 university students	Sig positive: $\beta=0.825$, $p<0.05$
Kowitlawakul (2011)/USA	Health Care	Regression	5 Point likert PU: 7 items Att: 21 items	117 Nurses from the ICU	Sig positive: $\beta=0.297$, $p<0.01$
Read <i>et al.</i> (2011)/Australia	E-readers	SEM	7 Point likert PU: 4 items Att: 4 items	451 e-reader users	Sig positive: $\beta=0.28$, $p<0.001$

Table 2.14 (continued)

Summary of perceived usefulness and attitude

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Shroff <i>et al.</i> (2011)/Hong Kong	E-learning	SEM	7 Point likert PU: 5 items Att: 5 items	72 students	Not Sig: $\beta=0.67$, $t=1.10$, $p>0.05$
Thomas (2011)/India	Social media (chatting)	SEM	5 Point likert PU: 5 items Att: 4 items	345 Under graduate and post graduate	Sig positive: $\beta=0.26$
Wang & Tseng (2011)/Taiwan	Online shopping	SEM	Scale (NA) PU: 4 items Att: 4 items	206 Online shopping	Sig positive: $\beta=0.31$, $p<0.01$
Wu & Gao (2011)/USA	E-learning	SEM	7 Point likert PU: 4 items Att: 3 items	105 Students macroeconomic classes	Sig positive: $\beta=0.675$, $p<0.01$
Adesina & Ayo (2010)/Nigeria	Banking	Regression	5 Point likert PU: 5 items Att: 3 items	292 electronic banking users	Sig positive: $\beta=0.327$, $t=5.135$, $p=0.000$
Chau & Ngai (2010)/UK	Banking	Regression	7 Point likert PU: 4 items Att: 4 items	164 internet banking users & non users	Sig positive: $\beta=0.179$, $p<0.05$
Park (2009)/Korea	E-learning	SEM	7 Point likert PU: 3 items Att: 3 items	628 students	Sig positive: $\beta=0.526$, $t=11.36$, $p<0.01$
Reid & Levy (2008)/Jamaica	Banking	SEM	5 point Likert PU: 4 items Att: 3 items	374 banks customer	Sig positive: $\beta=0.55$, $CR=6.788$ $p<0.001$
Porter & Donthu (2006)/USA	IT usage	SEM	5 point Likert PU: 3 items Att: 3 items	539 internet users/and non users	Sig positive: $\beta=0.57$, $t=10.42$, $p>0.05$
Suh & Han (2002)/Korea	Banking	SEM	5 Point likert PU: 6 items Att: 5 items	Internet banking users of 5 major banks in Korea	Sig positive: $\beta=0.376$, $t=8.831$, $p<0.01$

2.7.3 Study on Perceived Ease of Use and Attitude

Perceived ease of use can be possibly influenced by external determinants where external stimuli may influence a person's attitude towards a behavior indirectly by influencing salient beliefs of the person about the consequences on performing the particular behavior (Fishbein & Ajzen, 1975). On the other hand, Davis (1989) defined perceived ease of use as "the degree to which a person believes that using a particular system would be free from effort". Therefore, the following paragraphs will discuss further this relationship (Table 2.15).

In the area of banking, studies have been conducted by past researchers to validate the relationship of perceived ease of use and attitude towards internet banking usage. For instance, Bashir and Madhavaiah (2015) conducted a study in India to verify the relationship between perceived ease of use and attitude on internet banking usage among 697 online banking users via an online survey, and results indicated that perceived ease of use predicted attitude towards internet banking usage.

On the other hand, Mazhar *et al.* (2014) examined the impact of perceived ease of use and attitude of internet banking adoption by 150 mobile phone customers in India, which led to the result that perceived ease of use was a strong predictor of attitude towards internet banking usage. In contrary, research was conducted by Nguyen *et al.* (2014) in Vietnam to investigate the relationship between perceived ease of use and attitude on internet banking adoption, and result stated that there was insignificant impact of

perceived ease of use and attitude towards adoption of internet banking facility. Similarly, Aboelmaged and Gebba (2013) conducted a study to find out the influence of perceived ease of use on attitude towards internet banking usage in UAE among 119 undergraduate and postgraduate students, and results outcome were similar to Nguyen *et al.* (2014).

In addition, Al-Ajam and Md Noor (2013) conducted a research Yemen to check out the relationship between perceived ease of use and attitude of internet banking adoption. Results posted that perceived ease of use may predict attitude on internet banking usage. Alternatively, Maduku (2013) examined the linkage between perceived ease of use and attitude on internet banking usage in South Africa by engaging 394 retail banking customers, and result supported the linkage between these variables. Likewise, study was conducted to find the effect of perceived ease of use on attitude by Lule *et al.* (2012) on mobile banking in Kenya among 395 M-Kesho users, and results produce the same outcome as Maduku (2013) study.

In fact, Adesina and Ayo (2010) performed a study in Nigeria to find out the relationship between perceived ease of use and attitude towards internet banking usage of 292 electronic banking users, and find out that there was a positive significant relationship between these constructs. Furthermore, Chau and Ngai (2010) conducted a study in UK to examine the impact of perceived usefulness on attitude of internet banking usage by 164 internet banking users and non-users, and results revealed that perceived ease of use strongly predict attitude towards internet banking usage.

Moreover, Reid and Levy (2008) performed a study in Jamaica to establish the effect of perceived ease of use on attitude of internet banking adoption among 374 retail banking customers, and results confirmed that there was a significant linkage between these variables. In addition, Suh and Han (2002) investigated the influence of perceived ease of use and attitude of internet banking usage in Korea by using internet banking users of five major banks, and results established the significant relationship of perceived ease of use and attitude towards internet banking usage.

In the area of non-banking industry, researchers also tend to pay attention on the importance of perceived ease of use and attitude of internet usage. For instance, Elkaseh *et al.* (2015) investigated the relationship between perceived ease of use and attitude towards e-learning in Iraq by employing 499 students and lecturers in Libyan universities. Results concluded that there was a positive significant impact between perceived ease of use and attitude to use e-learning. Likewise, Sa'nchez *et al.* (2013) examined the effect of perceived ease of use and attitude towards adoption of e-learning system in Spain by undergraduate students, and results were similar to that of Elkaseh *et al.*'s. (2015) study. In addition to this, Shroff *et al.* (2011) conducted a study in Hong Kong to find out the impact of perceived ease of use and attitude on e-learning by students from Hong Kong Institute of Education, and outcome contradict with Shroff *et al.* (2011) study.

Furthermore, Park (2009) conducted a study to find the impact of perceived ease of use towards attitude on the internet usage in South Korea on e-learning by university students. Results stated that there was a positive significant impact by perceived ease of

use and attitude towards e-learning usage. Moreover, Wang and Tseng (2011) conducted a research in Taiwan to verify the influence of perceived ease of use on attitude of online shopping. Results stated that there was no significant impact by perceived ease of use on attitude to use e-shopping. Meanwhile, Bamoriya and Singh (2012) conducted a study in India to find out the relationship of perceived ease of use and attitude towards SMS advertising among 237 Indian mobile users, and results concluded that perceived ease of use may predict attitude towards usage of SMS advertising. Alternatively, Kowitlawakul (2011) investigated the effect of perceived ease of use and attitude on usage of telemedicine technology in USA by engaging 117 nurses from ICU. Results stated that there was a linkage between these constructs.

In fact, Read *et al.* (2011) conducted a study in Australia to examine the relationship between perceived ease of use and attitude towards e-readers by Australian consumers, and result posted that perceived ease of use predict attitude on e-readers usage. Furthermore, research was conducted by Thomas (2011) to investigate the relationship between perceived ease of use and attitude in India on internet addiction by 345 undergraduate college, and results indicated as that there was an insignificant effect by perceived ease of use on attitude towards internet addition.

In addition to this, Porter and Donthu (2006) examined the relationship of perceived ease of use and attitude on IT usage by internet adopters and non-adopters in USA. And results concluded that there was a significant relationship between perceived ease of use and attitude towards IT usage. The results from past studies displayed mixed findings on

ease of use and attitude relationship, therefore, these indicate that there were equivocal findings that warrant further research.

Table 2.15

Summary of perceived ease of use and attitude

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Bashir & Madhavaiah (2015)/India	Banking	SEM	5 Point likert PEU: 5 items Att: 5 items	697 internet banking users via online survey	Sig positive: $\beta=0.165$, CR=3.298, $p<0.001$
Elkaseh, Wong & Fung (2015)/Australia	E-learning	SEM	Scale: NA PEU: 4 items Att: 3 items	499 students & lecturers in Libya	Sig positive: $\beta=0.365$ & 0.284, $p<0.001$
Mazhar <i>et al.</i> (2014)/India	Banking	Regression	5 point Likert PEU: 7 items Att: 4 items	150 customers of mobile/Int	Sig positive: $\beta=0.559$, $p<0.05$
Nguyen, Nguyen & Singh (2014)/Vietnam	Banking	SEM	7 Point likert PEU: 6 items Att: 4 items	464 bank customers via web survey & customers meeting	Not Sig: $\beta=-0.047$, $p=0.523$
Aboelmaged & Gebba (2013)/UAE	Banking	Regression	5 point Likert PEU: 3 items Att: 4 items	119 undergrad and postgrad students	Not Sig: $\beta=0.014$, $t=0.151$, $p>0.05$
Al-Ajam & Md Noor (2013)/Yemen	Banking	SEM	7 point Likert PEU: 4 items Att: 4 items	1286 non users of internet banking	Sig positive: $\beta=0.236$, CR=9.723, $p<0.001$
Maduku (2013)/South Africa	Banking	Regression	5 point Likert PEU: 4 items Att: 5 items	394 retail banking customers	Sig positive: $B=0.145$, $t=2.558$, $p<0.05$
Sa'nchez, Hueros & Ordaz (2013)/Spain	WebCT learning system	SEM	7 Point likert PEU: 4 items Att: 4 items	226 undergrad students	Sig positive: $\beta=0.38$, $t=4.85$ $p<0.01$
Bamoriya & Singh (2012)/India	SMS advertising	SEM	5 point Likert PEU: 3 items Att: 2 items	237 Indian mobile users	Sig positive: $\beta=0.137$, $p<0.05$

Table 2.15 (continued)

Summary of perceived ease of use and attitude

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Lule <i>et al.</i> (2012)/Kenya	Banking	SEM	7 Point likert PEU: 4 items Att: 5 items	395 M-kesho users	Sig positive: $\beta=0.230$, $p<0.001$
Kowitlawakul (2011)/USA	Health Care	Regression	5 Point likert PEU: 6 items Att: 21 items	117 Nurses from the ICU	Sig positive: $\beta=0.466$, $p<0.01$
Read <i>et al.</i> (2011)/Australia	E-readers	SEM	7 Point likert PEU: 3 items Att: 4 items	451 e-reader users	Sig positive: $\beta=0.40$, $p<0.001$
Shroff <i>et al.</i> (2011)/Hong Kong	E-learning	SEM	7 Point likert PEU: 5 items Att: 5 items	72 students	Sig positive: $\beta=0.30$, $t=3.20$, $p<0.05$
Thomas (2011)/India	Social media (chatting)	SEM	5 Point likert PEU: 4 items Att: 4 items	345 Under graduate and post graduate	Not sig: details not provided.
Wang & Tseng (2011)/Taiwan	Online shopping	SEM	Scale (NA) PEU: 4 items Att: 4 items	206 Online shopping customers	Not Sig: $\beta=0.03$, $p>0.01$
Adesina & Ayo (2010)/Nigeria	Banking	Regression	5 Point likert PEU: 5 items Att: 3 items	292 electronic banking users	Sig positive: $\beta=0.180$, $t=2.953$, $p=0.003$
Chau & Ngai (2010)/UK	Banking	Regression	7 Point likert PEU: 4 items Att: 4 items	164 internet banking users & non users	Sig positive: $\beta=0.616$, $p<0.001$
Park (2009) /Korea	E-learning	SEM	7 Point likert PEU: 3 items Att: 3 items	628 students	Sig positive: $\beta=0.199$, $t=5.57$, $p<0.01$
Reid & Levy (2008)/Jamaica	Banking	SEM	5 point Likert PEU: 4 items Att: 3 items	374 banks customers	Sig positive: $\beta=0.38$, $CR= 5.261$ $p<0.001$

Table 2.15 (continued)

Summary of perceived ease of use and attitude

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Porter & Donthu (2006)/USA	IT usage	SEM	5 point Likert PEU: 4 items Att: 3 items	539 internet users/and non users	Sig positive: $\beta=0.27$, $t=6.71$, $p>0.05$
Suh & Han (2002)/Korea	Banking	SEM	5 Point likert PEU: 5 items Att: 5 items	Internet banking users of 5 major banks in Korea	Sig positive: $\beta=0.186$, $t=5.440$, $p<0.01$

2.7.4 Study on Internet Self-Efficacy and Attitude

From the previous studies, it was indicated that self-efficacy significantly impacts end user competence of an information system usage (Park, 2009). The competence in knowledge will assist users in using a technology that will contribute to the perception of ease of use of technology, logic and objective of the technology will further contribute to perceived usefulness of the technology (Ma & Liu, 2005). According to Eastin and LaRose (2000), internet self-efficacy is defined as “internet self-efficacy requires development of a further set of skills that include establishing and maintaining a stable internet connection, learning how to browse on the internet and searching it for relevant information”.

Therefore, internet self-efficacy is distinguished from computer self-efficacy as the belief that one can successfully perform a distinct set of behaviours required to establish, maintain, and utilize effectively over the internet and above the basic personal computer skills (Eastin & LaRose, 2000). While Marakas, Yi and Johnson (1998) made a further

statement there are dissimilarities between computer self-efficacy and task-specific self-efficacy. Therefore, internet self-efficacy can be defined as one's capability to perform internet tasks by the internet user. Further, stated by Eastin and LaRose (2000), the relationship between self-efficacy and personal computer usage is very noticeable. Personal computers perceived by users as a difficult technology, required substantial skill and training to operate successfully. Furthermore, self-efficacy is important to overcome fear for beginner experience (Eastin & LaRose, 2000). Compeau and Higgins (1995) empirically proved that there was a positive relationship between computer self-efficacy and computer use. Moreover, research done by Staples, Hulland, and Higgins (1998) found out that users with high levels of self-efficacy in remote computing would be more productive, satisfied and able to work remotely. Researchers such as Compeau and Higgins (1995) proposed the concept of computer self-efficacy in reference to judgment of one's capability using the computer.

From their research, it was also stated that internet self-efficacy has a relationship with prior internet usage. People who are weak in self-efficacy beliefs have less confidence in their ability to use the internet or are uncomfortable in using the internet (Eastin & LaRose, 2000). Meanwhile, Davis (1993) defined attitude as a person's degree of estimation on an affect using a system in his or her job.

The following paragraphs will discuss further the relationship between internet self-efficacy and attitude towards internet usage (Table 2.16). Lule *et al.* (2012) performed a study to find the effect of internet self-efficacy on attitude in Kenya among 395 M-Kesho users, and results indicated that there was an insignificant effect by internet self-

efficacy on attitude towards mobile banking. On the other hand, Adesina and Ayo (2010) investigated the impact of internet self-efficacy on attitude in Nigeria by engaging 292 e-banking customers. Results concluded internet self-efficacy may impact attitude to use e-banking. Likewise, Kulviwat *et al.* (2014) performed a study in USA to verify IT usage by 230 undergraduate students' at Midwestern University (internet self-efficacy towards attitude), and results stated that the relationship between internet self-efficacy and attitude of IT usage was not supported. Meanwhile, Trivedi and Kumar (2014) conducted a research in India to validate the usage of mobile commerce by students on their internet self-efficacy and attitude towards adoption, and results showed similar outcome as Kulviwat *et al.* (2014) study.

In addition to this, Zhu *et al.* (2010) examined the impact of internet self-efficacy and attitude towards mobile auction in China by taking 487 samples via web based survey. Results posted that internet self-efficacy may impact attitude on mobile auction usage. In contrary, research was conducted by Park (2009) to establish the impact of e-learning self-efficacy on attitude by 628 undergraduate students' in South Korea, and results indicated that there was an insignificant linkage between these variables. Hence, it can be concluded that there were inconsistent findings from the previous studies and warrants further research to confirm this linkage.

Table 2.16

Summary of Internet self-efficacy and attitude

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Kulviwat, Bruner & Neelankavil (2014)/USA	IT usage	SEM	7 Point likert ISE: 4 items Att: 1 items	230 under grad students	Not sig: $\beta=0.07$, $p>0.05$
Trivedi & Kumar (2014)/India	Online shopping	Regression	5 Point likert ISE: 4 items Att: 3 items	110 students	Not sig: $\beta=0.081$, $t=0.850$, $p>0.05$
Lule <i>et al.</i> (2012)/Kenya	Banking	SEM	7 Point likert ISE: 4 items Att: 4 items	395 M-kesho users	Sig positive: $\beta=0.116$, $p<0.05$
Adesina & Ayo (2010)/Nigeria	Banking	Regression	5 Point likert ISE: 7 items Att: 3 items	292 electronic banking users	Sig positive: $\beta=0.104$, $t=2.046$, $p=0.042$
Zhu <i>et al.</i> (2010)/China	Mobile auction	SEM	7 Point likert ISE: 6 items Att: 2 items	487 respondents from China via web based survey	Sig positive: $\beta=0.32$, $p<0.001$
Park (2009) /South Korea	E-learning	SEM	7 Point likert ISE: 2 items Att: 3 items	628 students	Not sig: $\beta=0.049$, $t=1.11$, $p>0.01$

2.7.5 Study on Subjective Norm and Attitude

Al-Somali, Gholami and Clegg (2009) proved that the impact by social factors and forces are strong determinants of consumer behaviour. Taylor (1991) confirms that most people try to surround themselves with others and carry the same value and belief that are consistent with their own identities. Therefore, the following discussion elaborates further the impact of subjective norm on attitude towards behaviour (Table 2.17).

Research was conducted by to investigate the linkage of subjective norm and attitude towards internet banking usage among 394 retail banking customers in South Africa, while, results demonstrated that this linkage was not supported. Similarly, Lule *et al.* (2012) examined the impact between subjective norm and attitude by mobile banking customers in Kenya, and results were similar to that of Maduku's (2013) study.

In the area non-banking studies, a few researches have validated this relationship. For example, Hamari (2015) in Finland conducted a research to verify this relationship pertaining to online shopping by engaging 2791 social games users. Results concluded that there was a significant impact by subjective norm towards attitude of online shopping. Similarly, Zendehdel and Paim (2015) investigated the influence of subjective norm and attitude concerning online shopping in Malaysia by deploying 375 university students, and results showed that subjective norm was a strong predictor of attitude on online shopping.

Alternatively, Liao and Chou (2012) conducted a research on usage of social media in Taiwan by examining the linkage of subjective norm and attitude towards social media by engaging 318 social media users. Results concluded that there was a significant relationship between these constructs. Meanwhile, Shittu, Basha, AbdulRahman and Ahmad (2011) investigated the influence of subjective norm and attitude on usage of social media among 151 university students in Malaysia, and results was similar to Liao and Chou (2012) study. On the other hand, Park (2009) conducted a research to examine the impact of subjective norm on attitude by undergraduate students on their e-learning at Konuk University in South Korea, and result showed that there was a positive

significant relationship between subjective norm and attitude on e-learning usage by Korean students. From the discussion, it shows that there are dissimilarities in findings from the previous studies pertaining to the relationship between subjective norm and attitude towards internet usage. Therefore, further research warranted to confirm this linkage.

Table 2.17

Summary of subjective norm and attitude

Author/Country	Industry	Analysis Method	Scale	Respondents	Findings
Hamari (2015)/Finland	Online shopping	SEM	7 Point likert SN: NA Att: NA	2791 social games users	Sig positive: $\beta=0.748$, $p<0.001$
Zendeheel & Paim (2015)/Malaysia	Online shopping	SEM	5 point Likert SN: 9 items Att: 11 items	375 university students	Sig positive: $\beta=0.44$, $p=0.01$
Maduku (2013)/South Africa	Banking	Regression	5 point Likert SN: 4 items Att: 5 items	394 retail banking customers	Not sig: $\beta=0.051$, $t=1.253$, $p>.05$
Liao & Chou (2012)/Taiwan	Social media	SEM	7 Point likert SN: 3 items Att: 3 items	318 social media users	Sig positive: $\beta=0.18$, $p<0.01$
Lule <i>et al.</i> (2012)/Kenya	Banking	SEM	7 Point likert SN: 5 items Att: 5 items	395 M-kesho users	Not sig: $\beta=0.030$, $p>0.05$
Shittu, Basha, AbdulRahman & Ahmad (2011)/Malaysia	Social media	SEM	Scale type: NA SN: 5 items Att: 4 items	151 university students	Sig positive: $\beta=0.23$, $p<0.05$
Park (2009) /South Korea	E-learning	SEM	7 Point likert SN: 3 items Att: 3 items	628 students	Not sig: $\beta=0.265$, $t=6.4911$, $p>0.01$

2.8 Indirect Relationship of Internet Usage

The indirect relationship of internet usage also displays diversity and fragmentation towards the internet banking usage (refer *Appendix 4*, Table 2.18). Besides, there are various determinants of internet banking usage for instance trust, perceived usefulness, perceived ease of use, internet self-efficacy, subjective norm, attitude, behavioral intention, perceived usefulness, behavioral intention, and subjective norm. However, some of the determinants have a double role on the direct and indirect effect on internet banking usage. For example, it is quite obvious that a predictor that has a mediating function in one study, can also have an intervening function in another study thus causing further fragmentation. For instance, in past studies, attitude has been operationalized as a direct determinant of the internet banking usage (Aboelmaged & Gebba, 2013; Alkafagi *et al.*, 2015; Safeena *et al.*, 2013) while attitude also performs as an intervening variable in other studies (Bashir & Madhavaiah, 2015; Nguyen *et al.*, 2014; Sharma & Gonindaluri, 2015). In addition, this produces an equivalent result with a positive significance (Aboelmaged & Gebba, 2013; Alkafagi *et al.*, 2015; Safeena *et al.*, 2013) but not a significant result (Al-Adwan *et al.*, 2013).

On the other hand, perceived usefulness has been operationalized as a determinant of internet banking usage (Bashir & Madhavaiah, 2015; Fathima & Muthumani, 2015; Mamat *et al.*, 2015) while perceived usefulness also stands as an intervening variable (Rauniar *et al.*, 2014; Sheng & Zolfagharian, 2014). There are also many researchers that propose the intervening variable of attitude in their studies but the intervening

results are not established (Al-Ajam & Md Noor, 2013; Al-Majali, 2011; Elkaseh *et al.*, 2015; Mazhar *et al.*, 2014; Nguyen *et al.*, 2014; Raida & Neji, 2013; Sharma & Gonindaluri, 2015). From the perspective of the grounded TAM theory (Davis, 1989), attitude is an intervening variable of information system usage.

However, findings from previous studies have produced mixed results; for example, trust mediates through attitude on internet usage and supports the mediation (Bashir & Madhavaiah, 2015; Suh & Han, 2002) whereas there are also mediations that are not supported (Liao & Chou, 2012; Trivedi & Kumar, 2014).

A handful of studies suggest attitude as an intervening variable of internet banking usage whereby trust, perceived usefulness, perceived ease of use, internet self-efficacy, and subjective norm predict internet banking usage via attitude. Therefore, this study employs attitude as an intervening variable (Bashir & Madhavaiah, 2015; Park, 2009; Sa'nchez *et al.*, 2013).

2.9 Mediation Effects of Attitude

Attitude has been analysed in many studies in the past as a predominant factor of intervening however diversification between variables exists and causes fragmentation to happen, and this can be seen in banking or non-banking studies. Besides that, many past studies have proposed attitude as an intervening variable however researchers have failed to establish the mediation tests (Al-Ajam & Md Noor, 2013; Al-Majali & Nik

Mat, 2010; Lule *et al.*, 2012; Maduku, 2013; Mazhar *et al.*, 2014; Nguyen *et al.*, 2014; Raida & Neji, 2013; Reid & Levy, 2008; Sharma & Gonindaluri, 2015). On the other hand, equivocal findings exist from past studies on the mediation effect of attitude influencing internet usage (Bashir & Madhavaiah, 2015; Liao & Chou, 2012; Park, 2009). Therefore, academic justification for adopting attitude as the mediator in this study is discussed below.

2.9.1 Indirect Effect of Trust

In this present study, mediating effects of attitude on trust and internet usage is included based on the arguments that there are limited past studies investigating this relationship (refer *Appendix 4*, Table 2.18). In addition, most of past studies propose attitude as intervening variable in their research however, researchers did not establish the mediation effect of attitude. There are also mixed results that cause equivocal findings that warrant further research. In addition, past studies have investigate this relationship based on internet usage intention but very few on actual internet usage via the mediation effect of attitude. Therefore, this current study aims to investigate this relationship in banking and non-banking studies on the mediating effect of attitude. For instance, Bashir and Madhavaiah (2015) conducted a study in India to examine the intervening variable of attitude on trust and internet banking usage among 697 internet banking users via an online survey, and results concluded that the mediation was supported via attitude. Similarly, Suh and Han (2002) investigated the mediation variable of attitude on trust and internet banking usage in Korea by internet banking users of five major banks in Korea, and results were similar to that of Bashir and Madhavaiah's (2015) study.

Likewise, Trivedi and Kumar (2014) conducted a study to validate the intervening variable of attitude on trust and internet usage by students' in India on their online shopping behaviour, and results showed that the mediation of attitude was not supported. Meanwhile, Liao and Chou (2012) performed a study on the usage of social media by 318 virtual community members in Taiwan via an online survey considering the intervening variable of attitude on trust and internet usage. Result posted that the mediation effect was not supported.

There are also past studies suggesting the intervening variable of attitude on trust and internet usage. However, the mediation test of these linkages did not performed by the researchers. For example, in banking and non-banking studies, a few studies have suggested the intervening variable of attitude but the mediation test was not established (Al-Ajam & Md Noor, 2013; Al-Majali, 2011; Mazhar *et al.*, 2014; Nguyen *et al.*, 2014). Therefore, this setback warrants further research.

2.9.2 Indirect Effect of Perceived Usefulness

Perceived usefulness is one of the important determinants of the acceptance and adoption of information system from the TAM baseline theory. In lieu of this, attitude may mediate between perceived usefulness and internet usage. Therefore, the current study investigates the mediating effect of attitude on perceived usefulness and internet usage (refer *Appendix 4*, Table 2.18).

In banking studies, mediating effect of attitude on perceived usefulness and internet usage has been suggested by Bashir and Madhavaiah (2015) in India by engaging 697 internet banking users via an online survey, and results concluded that the mediation effect is supported. Similarly to this, research have been conducted by Yaghoubi and Bahmani (2010), attitude became a full intervening variable of perceived usefulness and internet banking usage. On the other hand, Suh and Han (2002) examined the intervening effect of attitude on perceived usefulness and internet banking usage by Korean, and results outcome is similar to Bashir and Madhavaiah (2015) study.

Likewise, Sa'nchez *et al.* (2013) investigated the intervening variable of attitude on perceived usefulness and internet banking usage among 226 undergrad students in Spain on their WebCT e-learning, and results showed that mediation was supported. Moreover, Liao and Chou (2012) conducted a research to verify the mediation effect of attitude on perceived usefulness and social media usage in Taiwan. Results proved that the mediation effect of attitude was supported. In contrary to this, a study was conducted by Park (2009) in Korea to find out the intervening effect of attitude by perceived usefulness towards e-learning, and results indicated that intervening effect was insignificant.

In addition, there are a handful of previous studies in banking and non-banking that suggesting the intervening variable of attitude on perceived usefulness on internet usage. However, these studies fail to establish the mediation effect (Elkaseh *et al.*, 2015; Lim & Ting, 2012; Lule *et al.*, 2012; Mazhar *et al.*, 2014; Nguyen *et al.*, 2014; Raida & Neji, 2013; Sharma & Gonindaluri, 2015; Shittu *et al.*, 2011; Widjana & Rachmat, 2011).

Whereas, previous studies have produced mixed results and with equivocal findings, couple with a handful of studies suggesting intervening variables of attitude but mediation test did not perform by the researchers. Due to this, present study needs to investigate this relationship.

2.9.3 Indirect Effect of Perceived Ease of Use

Attitude formation is derived from a belief of positive or negative feeling of an individual towards the subject. Therefore, positive belief of an individual will lead to a positive attitude towards a behaviour. Likewise, attitude may mediate the relationship of perceived ease of use towards ICT usage. For instance, study was conducted by Bashir & Madhavaiah (2015) in India to investigate the mediation effect of attitude on perceived ease of use and internet banking adoption by retail banking customers, and results concluded that the mediation effect of attitude was supported. Similarly, Suh and Han (2002) conducted a research to examine the intervening effect of attitude on perceived ease of use and internet banking usage in Korea by internet banking users of five major banks. Results showed that similar outcome as Bashir & Madhavaiah's (2015) study.

Likewise, Sa'nchez *et al.* (2013) conducted a research in Spain to verify the mediation effect of attitude by perceived ease of use and e-learning usage among students, and results indicated that the mediation effect of attitude is supported. In contrary to this, Liao and Chou (2012) performed a study in Taiwan to find out the mediation effect of attitude on perceived usefulness and social media usage. Result revealed that there was

no mediation effect of attitude exist between these linkages. A few studies have suggested the intervening variable of attitude on perceived ease of use towards internet usage in the area of banking studies but from these studies no mediating empirical tests were conducted by the researchers (refer *Appendix 4*, Table 2.18), (Lule *et al.*, 2012; Mazhar *et al.*, 2014; Nguyen *et al.*, 2014; Sharma & Gonindaluri, 2015).

In non-banking study, three studies have been observed suggesting intervening variable of attitude on perceived ease of use towards internet usage in their research models. However, one study shows that there was no mediation effect of attitude on perceived ease of use and internet usage (Park, 2009) while the other two studies did not perform the mediation test on attitude towards the usage of internet (Elkaseh *et al.*, 2015; Lim & Ting, 2012). This gives an opportunity for the current study to investigate the mediating effect of attitude on perceived ease of use and internet usage.

2.9.4 Indirect Effect of Internet Self- Efficacy

Internet self-efficacy is an individual's confidence in her/his ability and capability to use the internet system. However, attitude formation from this belief may affect the behaviour of the individual acceptance of information system. Therefore, internet self-efficacy may have an important function to influence the attitude towards the internet usage. Few previous studies that have embarked on this include attitude as the intervening variable on internet self-efficacy and internet usage by many researchers as this is one of the important determinants of ICT usage (refer *Appendix 4*, Table 2.18).

For instance, Park (2009) investigated this relationship by conducting a study on e-learning usage among university students in Korea. Results concluded that there was a mediation effect by attitude on internet self-efficacy and e-learning.

In contrary to this, Trivedi and Kumar (2014) had examined this relationship by conducting a research among students on their online shopping behaviour of India, the findings were however contradicts with outcome. The non-mediating effect could most probably prevail due to nature of Gen Y who has techy mind hence impacting internet usage directly as also mentioned by Park (2009). In addition, there were also three other studies done, *e.g.* banking, mobile auction and e-service, nevertheless no mediation test were conducted in spite of suggestive models (Lule *et al.*, 2012; Zhu *et al.*, 2010). Therefore, the mixed results cause equivocal findings and mediation effect were not tested on the intervening variable of attitude on internet self-efficacy and internet usage. Due to this, current study aims to investigate this mediating effect empirically.

2.9.5 Indirect Effect of Subjective Norm

The mediating effects of attitude on subjective norm and internet usage has been rarely discussed in past empirical researches in banking studies, however, a few studies have managed to test the mediation effect. (Bashir & Madhavaiah, 2015; Lule *et al.*, 2012; Maduku, 2013), (refer *Appendix 4*, Table 2.18). Likewise, few past studies have embarked on investigating this relationship especially in banking, for example, study was conducted by Bashir and Madhavaiah (2015) in India to examine the intervening

variable of attitude on subjective norm and internet banking adoption among 697 internet banking users via an online survey, and results posted that mediation effect was not supported.

In contrary, research was done by Park (2009) in Korea to verify the mediating effect of attitude on subjective norm and e-learning usage by deploying 628 university students. Results concluded that the mediation effect of attitude was supported. Similarly, Liao and Chou (2012) conducted a research in Taiwan to validate this relationship in the area of social media usage by engaging 318 social media users, and results were similar to that of Park's (2009) study. Even though, previous studies in the area of banking and non-banking have suggested the intervening variable of attitude on subjective norm and internet usage in their researches unfortunately the researchers did not test the mediation effect of attitude (Hamari, 2015; Lule *et al.*, 2012; Maduku, 2013; Shittu *et al.*, 2011). From the review, previous studies still display mixed results that cause equivocal findings couple with mediation test were not establish by the reserachers eventhough they have suggested attitude as an intervening variable their studies. Therefore, current study addresses this issue to establish this linkage.

2.10 The Evolution of Technology Acceptance Model (TAM)

The TAM baseline theory has been widely used as a base model to identify individual decision to use information system (Davis, 1989; Legris, Ingham & Colletette, 2003) while research done by Legris *et al.* (2003) found that this model only explained 40% variance on the behavioral intentions. As such, this is basic model that may explain the

users' acceptance of information technology, therefore, to understand better the acceptance of ICT, TAM has been replicated and extended for more than two decades by ICT researchers and they have proven that this extended model is a robust and parsimonious model that able to predict users' acceptance of ICT usage (Abdulkadir *et al.*, 2013; Al-Fahim, 2012; Legris *et al.*, 2003; Turan, 2012; Vankatesh & Davis, 2000).

The extended TAM is by inclusion of factors such as trust and computer self-efficacy have been proven to be the determinants of information system acceptance (Amin *et al.*, 2012; Compeau *et al.*, 1999; Gefen, Karahanna & Straub, 2003; Mazhar *et al.*, 2014). Nevertheless, trust is also important because it involves divulging personal information and financial information through the "online open environment" (Juwaheer *et al.*, 2012). On the other hand, computer self-efficacy is also another important determinant that enables a user's intention to use information system currently or in the future (Compeau & Higgins, 1995). Meanwhile, demographic variables such as gender, education level, and income may influence trust and computer self-efficacy on the acceptance of ICT usage (Chau & Ngai, 2010; Juwaheer *et al.*, 2012).

Many authors have found that trust is related to customers' perception towards security and privacy of internet banking (Eriksson *et al.*, 2005) and trust is also one of the main concerns that may hinder customers from using the internet banking based on their level of perception towards security and privacy (Chavan, 2013). Therefore, this is an indication that security may have a great impact on usage of internet banking coupled with other factors.

A study was done by Bax and McGill (2003) stating that factors such as perceived usefulness, computer self-efficacy, internet self-efficacy, and computer anxiety are the most important determinants that may influence the usage of mobile commerce. This has directly proven internet self-efficacy is one of the important factors that may influence the usage of ICT.

2.11 The Underpinning Theory of Internet Banking Usage

In this study, underpinning theory is based on famous predominant theory that may explain internet banking usage by TAM (Davis, 1989) that is considered a parsimonious model (Turan, 2012); therefore, this could explain internet banking usage in the context of Malaysian retail banking environment. The purpose of using this theoretical model is to further investigate customers' behavior on internet banking usage that has been thoroughly discussed throughout this chapter. Henceforth, the researcher suggest employing TAM to support and explain the role of information technology system that affects actual behavior of internet banking usage.

2.11.1 Technology Acceptance Model (TAM)

From the work of Rogers (1962), Davis (1989) sought to understand the drivers of technology acceptance by studying primarily potential users of hardware and software technologies within organizational context. Based on well-known TRA (Fishbein &

Ajzen, 1975), Davis (1989) proposed TAM, which incorporates attitude towards intention and intention predict behaviour relationship as depicted in TRA.

TAM is the theory that predicts information system acceptance, adoption and usage where it suggests how users' come to accept or not to accept, and use ICT. This theory was originated by Davis (1989) and Davis *et al.* (1989) by prediction of relationship between external variables that may affect belief, and belief may cause the effect on attitude and behavioral intention towards usage of ICT (Davis & Davis *et al.*, 1989). Therefore, this theory is an extension of TRA by Ajzen and Fishbein (1977; 1980) where it predicts a person's behavior intention and usage by two main determinants namely attitude and subjective norm.

TAM theory is based on two main beliefs namely perceived usefulness and perceived ease of use (Venkatesh & Morris, 2000). Perceived usefulness is defined as “the degree to which a person believes that using a particular system would enhance his or her job performance” (Davis, 1989) and perceived ease of use indicates, “The degree to which a person believes that using a particular system would be free of effort” (Davis, 1989). According to TAM, perceived ease of use has a positive impact on perceived usefulness, and both factors positively affect intention (Venkatesh & Davis, 2000), whereby, both of these determinants are predictors for attitude and ICT usage (Davis, 1993). The basic TAM is illustrated in figure 2.21.

The extension of TAM in this research is the inclusion of external variables such as trust as a determinant of perceived usefulness and perceived ease of use (Alnsour & Al-Hyari, 2011; Eriksson *et al.*, 2005; Reid & Levy, 2008); internet self-efficacy (Chung, Park, Wang, Fulk & McLaughlin, 2010; Estin & LaRose, 2000; Ma & Liu, 2005; Trivedi & Kumar, 2014), and moreover, subjective norm is also one of predictor for internet usage (Chen & Li, 2010; Park, 2009).

Perceived security and privacy have been used by many authors and determinants of trust that leads to usage (Alnsour & Al-Hyari, 2011; Lallmahamood, 2007; Pikkarainen *et al.*, 2004; Tandrayen-Ragoobur & Ayriga, 2011; Yulihassri *et al.*, 2011). In addition, research was conducted by Trivedi and Kumar (2014) in India pertaining to online shopping where internet self-efficacy was found to be a determinant of online shopping use. The findings also indicate that people who have a higher internet self-efficacy tend to use e-services. Demographic variables, such as gender may also influence internet self-efficacy, and may also differ from male and female students' according to research done by Eachus, Cassidy, Norgate, Marrow and Greene (2008) on students in U.K in the area of e- learning.

Davis (1989) suggested that future research on technology acceptance needs to be addressed by including other external determinants that may affect perceived usefulness and perceived ease of use towards intention or usage of ICT, and therefore, it will increase the validity of TAM (Abbasi, Chandio, Soomro & Shah, 2011). While, Lallmahamood (2007) stated that TAM is a basic model that may predict usage of ICT but it should be incorporated with an extensive model such as human and social change

processes to predict TAM better. Furthermore, TAM is a fragmented model that may be influenced by external variables to give better impact on ICT usage (Amin *et al.*, 2012). In total, perceived usefulness and perceived ease of use do not really support intention or usage of internet banking therefore ironically there are other factors that may give a combination to better predict the adoption of internet banking (Legris *et al.*, 2003). Therefore, to create a user's belief on internet banking usage, this study employs TAM as a baseline theory in this research framework.

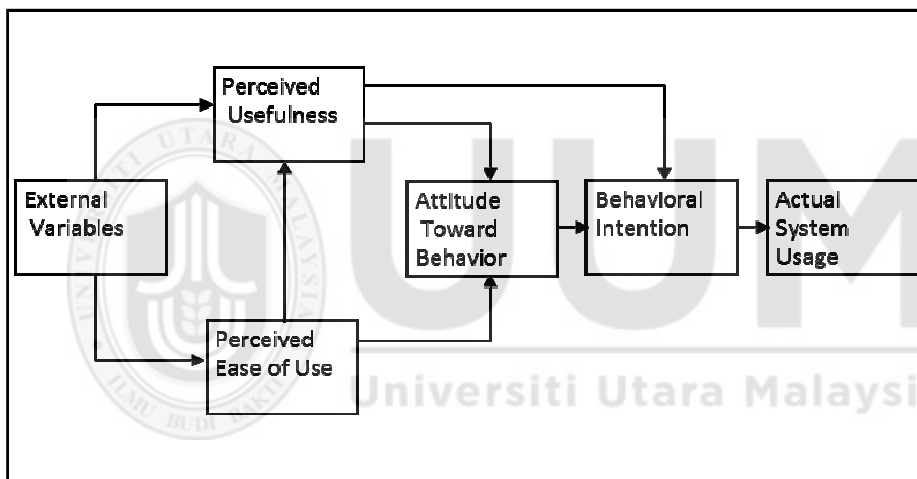


Figure 2.21
The Original TAM. “*Perceived usefulness, perceived ease of use, and user acceptance Of information technology*”.
Source: Davis (1989), MIS Quarterly, 13(3).

2.11.2 Technology Acceptance Model 2 (TAM 2)

The TAM 2 is a theoretical extension of TAM baseline theory by Davis (1989). This new model was proposed by Venkatesh and Davis (2000) that contributes as a foundation to improve the understanding of user adoption behaviour in ICT.

Furthermore, TAM 2 incorporates social influence multi-dimension constructs such as subjective norm, voluntariness and image, and also incorporates the cognitive instrumental multi-dimension constructs such as job relevance, output quality, result demonstrability and perceived ease of use. In this model, experience and voluntariness are the moderators for subjective norm towards intention to use ICT. The TAM 2 is illustrated as per figure 2.22.

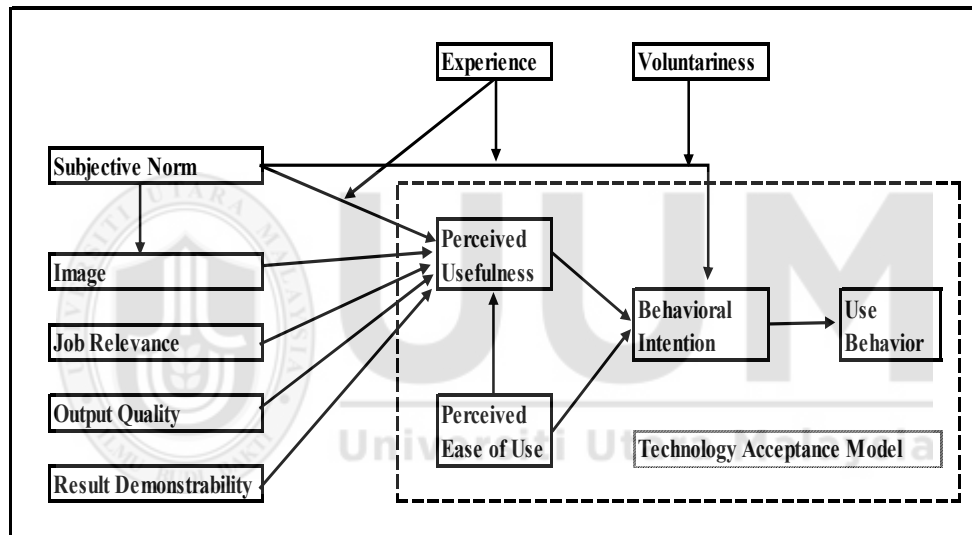


Figure 2.22
Technology Acceptance Model 2. *“A theoretical extension of the technology acceptance model: four longitudinal field studies”*.
Source: Venkatesh and Davis (2000), Management Science, 46(2).

The determinants for TAM 2: Definitions of the determinants (Table 2.19).

Table 2.19

The Determinants of TAM 2

Determinants	Definitions
Perceived Ease of Use	The degree to which a person believes using an information system will be free of effort (Davis et al., 1989).
Subjective Norm	The degree to which a person perceives that most people who are important to him think he should or should not use the information system (Feishbein & Ajzen, 1975; Venkatesh & Davis, 2000).
Image	The degree to which a person perceives that using an innovation will enhance his or her status in a social system (Moore & Benbasat, 1991).
Job Relevance	The degree to which a person believes that the target system is applicable to his or her job (Venkatesh & Davis, 2000).
Output Quality	The degree to which a person believes that the system performs his or her job well (Venkatesh & Davis, 2000).
Result Demonstrability	The degree to which a person believes the results of using a system are tangible, observable and communicable (Moore & Benbasat, 1991).

In their study, it was found that all the hypotheses are supported and it explains 37% to 52% of the variance in usage intentions. Meanwhile, correlations coefficients between intention and usage behaviour found in this study are from 0.44 to 0.57. In TAM 2, the key factor of underlying decision of perceived usefulness explains 60% variance of ICT usage intentions.

2.11.3 Technology Acceptance Model 3 (TAM 3)

The TAM 3 is a theoretical extension of TAM 2. This new model is suggested by Venkatesh and Bala (2008) that contributes to the understanding on how managers can make an effective decision that can lead to a greater acceptance and adoption of ICT. These various interventions may enhance the influence of the known determinants of information system adoption and use by employees. The extension to this model is by the inclusion of factors such as anchor and adjustment. The factor for anchor carries multi-dimension factors such as computer self-efficacy, perceptions of external control, computer anxiety, and computer playfulness, while the factor for adjustment consists of perceived enjoyment and objective usability. Both of these main factors are the determinants of perceived ease of use.

In TAM 3, experience is the moderator for subjective norm, perceived ease of use and perceived usefulness towards behavioural intention; similarly it moderate computer anxiety, computer playfulness, perceived enjoyment and objective usability towards perceived ease of use; and likewise, it become a moderator for subjective norm towards perceived usefulness. On the other hand, voluntariness become a single moderator between subjective norm and behavioural intention. The TAM 3 is illustrated as per figure 2.23.

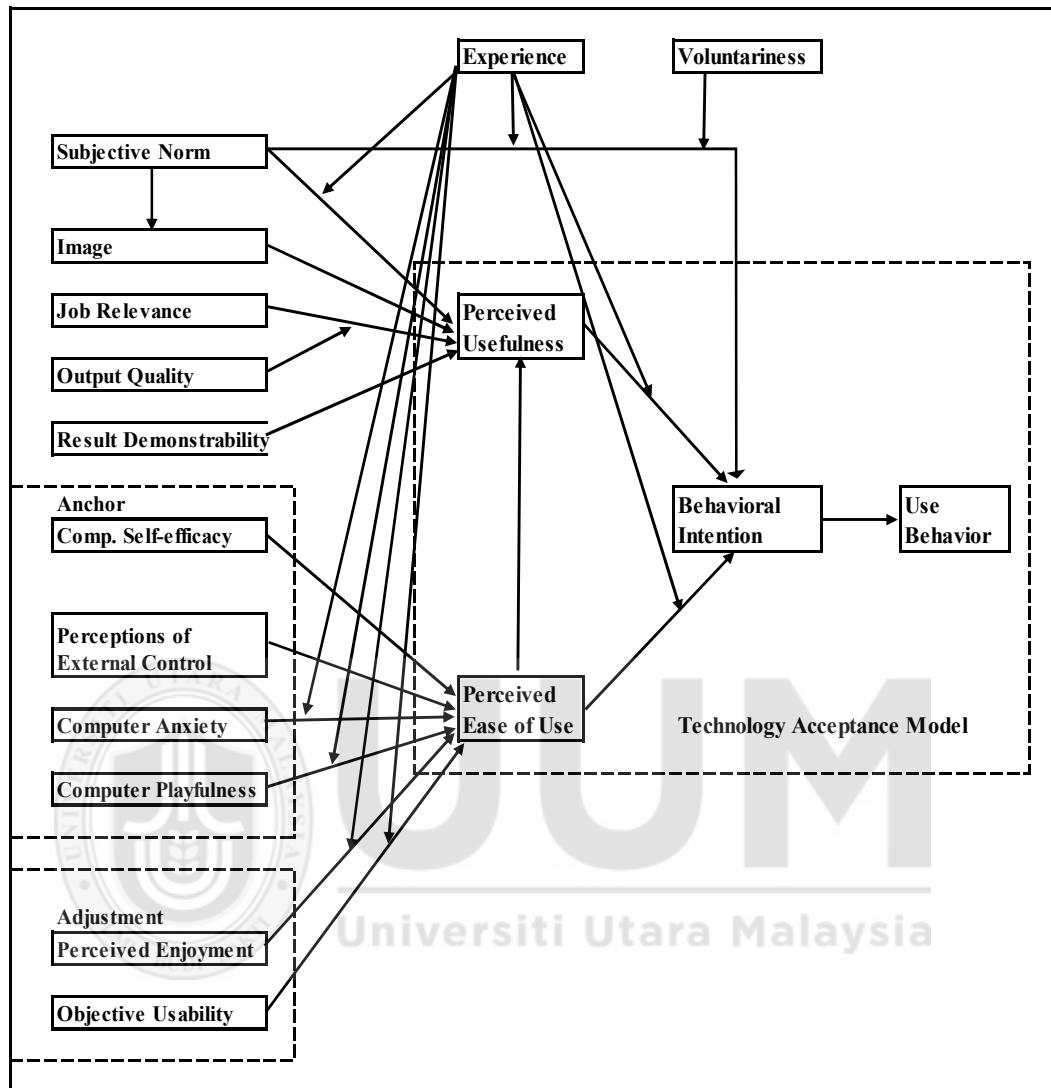


Figure 2.23
 Technology Acceptance Model 3. “*Technology Acceptance Model 3 and a Research Agenda on Interventions*”.
 Source: Venkatesh and Bala (2008), *Decision Sciences*, 39(2).

The determinants of perceived ease of use (PEU): Definitions of determinants for PEU (TAM 3).

Table 2.20

The Determinants of Perceived Ease of Use

Determinants	Definitions
Computer Self-Efficacy	The degree a person believes that he or she has the ability to perform a specific task/job using the Computer (Compeau & Higgins, 1995a, 1995b).
Perception of External Control	The degree a person believes that organizational and technical resources exist to support the use of the system (Venkatesh et al., 2003).
Computer Anxiety	The degree of a person worry or even fear, when she/he is faced with the possibility of using computers” (Venkatesh, 2000).
Computer Playfulness	The degree of cognitive spontaneity in microcomputer interactions” (Webster & Martocchio, 1992).
Perceived Enjoyment	The extent of an “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).
Objective Usability	A “comparison of systems based on the actual level of effort required to completed specific job” (Venkatesh, 2000).

In this study, it was found that TAM 3 is able to explain 67% of the variance in perceived usefulness towards behavioural intention while perceived ease of use has a 52% variance towards behavioural intention. Behavioural intention has a 53% variance towards use of ICT.

2.11.4 Theory of Reasoned Action (TRA)

TRA was developed by Izek Ajzen and Martin Fishbein (1980). The development of this theory looks into the psychological processes that mediate relationships between attitudes and behaviour of a person. While, this theory consists of attitudinal, subjective norm, and behavioural intention to predict actual behaviour of a person. In fact, this theory also suggests that a particular behaviour of a person in performing the behaviour is influenced by an individual's attitude and subjective norm possessed by the individual.

According to Ajzen and Fishbein (1975), attitude is the positive or negative feeling of a person related to performing a particular behaviour. Mykytyn and Harrison (1993) suggest that a person will hold a favourable attitude toward a given behaviour that will lead to positive outcomes while if the person holds unfavourable attitude, it is believed that it will lead to a negative outcome as a result from the behaviour. While, Alkafagi *et al.* (2015) defined subjective norm as “normative beliefs, and the person's motivation to comply with different referents”. Intention is the likelihood of performing a behaviour and it is influenced by attitude and subjective norms. Further, as explained by Fishbein and Ajzen (1975; 1980), variables such as demography, attitudes toward target, and personality traits are not explicitly included in TRA. These variables may affect intention and behaviour only if they influence attitudinal or normative belief.

Such behaviour in the future may or may not be affected by intention such as prior experience (Bagozzi, Baumgartner & Yi 1992). Further, as explained by Bagozzi *et al.* (1992), attitude and subjective norm may influence individuals on the intention to

predict behaviour based on a condition or situation; the importance of attitude and subjective norm of an individual to predict behaviour varies by situation. According to Bagozzi *et al.* (1992), state as opposed to action orientation, affects the relative importance of attitude and subjective norm in the formation of intention. Specifically, as an individual becomes more action oriented, attitude is more important than subjective norm as a basis of intention. If the individual becomes more state oriented, relative importance of subjective norm in formation of intention will increase.

Ajzen and Fishbein (1980) categorized their TRA, giving three circumstances in which behaviour can be predicted accurately by the individual intention. The first condition is action, target, context, and time that may influence the intention and behaviour of an individual. The second condition is intention and behaviour that does not change during the gap of the evaluation of intention and behaviour. The last circumstance is a particular behaviour that is under the full control of an individual whether to perform or not to perform the behaviour. The TRA is compelled by these three conditions, where it does not consider other factors such as internal and external factors and it might deter the full control of a behaviour and it is a poor predictor of this kind of behaviour. External factors such as financial capacity and opportunity, and internal factors such as technological skills, knowledge, and self-control may influence a behaviour (Jeong & Yoon, 2013; Netemeyer, Burton & Johnston, 1991). The TRA model is illustrated as per figure 2.24.

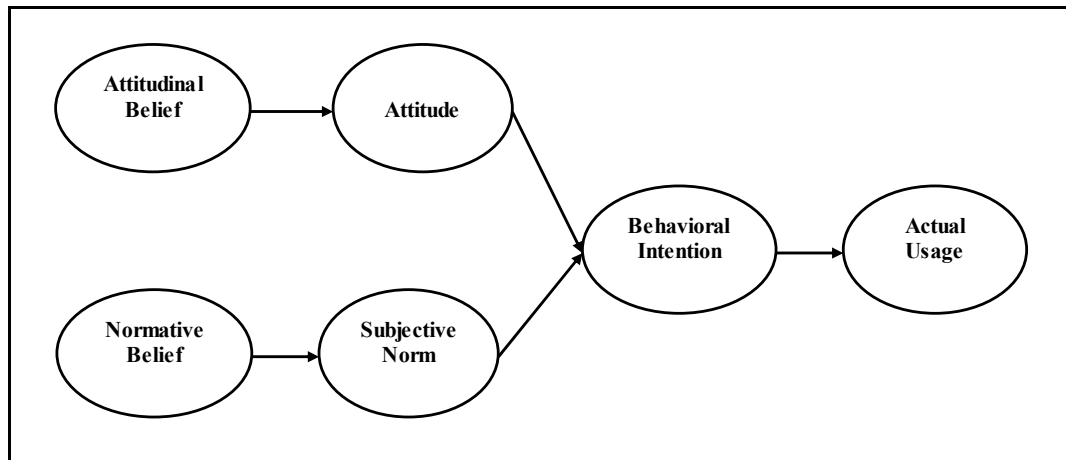


Figure 2.24

The TRA Original Model. *“The use of a decomposed theory of planned behavior to study internet banking in Taiwan”*.

Source: Shih and Fang (2004), internet Research, 14(3).

2.12 Trust Theory

Many researchers have defined trust in many ways in the previous literature. According to Moorman, Deshpande, and Zaltman (1993), trust is “willingness of a person to rely on an exchange partner as the person who has confidence on him”. Further, Morgan and Hunt (1994) describe that trust exists when the trustee has the element of reliability and integrity.

Meanwhile, Deutsch (1960) mentions that trust should have the ability to create confidence and intention to trust. In addition, Ganesan (1994) defines trust as perceived credibility and benevolence of target of trust while Lindsfold, (1978) states that trust has two dimensions *i.e.* trust credibility of an exchange partner on their words and also trust benevolence on the partner’s welfare. Recent studies conducted on internet banking

usage indicated that trust is one of the determinants of internet banking usage (Alkagafi *et al.*, 2015; Bashir & Madhavaiah, 2015; Mansumittrchai & Al-Malkawi, 2011). Therefore, from the bank's perspective, customer may perform banking transactions using internet banking system by a secured bank website and create a customer's belief that he/she can perform a transaction effectively and with reliability and the bank shall protect customer's interest at all time by the security features provided by the bank.

Many researchers have proven that trust or perceived risk may influence customers in decision making either to use or not to use internet for purchase of goods and services or in the case of online banking to subscribe to the services and conduct transactions online (Alkafagi *et al.*, 2015; Fathima & Muthumani, 2015; Juwaheer *et al.*, 2012; Trivedi & Kumar, 2014). According to Humphery and Schmitz (1998), business transaction that is conducted online will anticipate risk and therefore the element of trust arises. In internet banking environment, the bank and its customers are at a different platform where contingencies are difficult to foresee and term and conditions are not well stated.

Meanwhile, Ba (2001) states that the levels of trust by customers are at stake in internet banking system when customers who do not have knowledge, skills and experience will anticipating the level of risk is high compared to customers who have the experience. Therefore, trust will be jeopardized if internet banking system is incompetent and customers of the banks have a bad experience with performance of the system when conducting their transactions online (Mansumittrchai & Al-Malkawi, 2011). Besides performance, lack of reliability by internet banking system can cause the transactions over the internet be intercepted by unauthorized persons such as hackers that lead to

financial and personal information loss (Redelinghuis & Rensleigh, 2010; Khare, Mishra & Singh, 2012).

2.12.1 Trust Development

From the economic literature by Dasgupta (1988) and Williamson (1985), it is indicated that trust fundamentally involves the process of calculating individual or organizational cost or reward due to dishonesty of the party involved in exchange process. This was proven by Rao and Mark (1992) where buyers pay more to suppliers to get a high quality of goods and services.

During trust development, information on the other party is required to enable one party to predict behavior of the other party based on his/her credibility and benevolence, and during exchange process, the confidence is developed from the organization that provides the good and services (Doyle & Roth 1992; Swan & Nolan 1985). According to Shapiro, Sheppard and Cheraskin (1992), frequency of interactions and courtship shall be the source of trust, while, courtship is relationship development and a learning process of the other party involved. Therefore, trust development requires time to understand each other and this improves the level of trust between parties.

In fact, process of determining the other party's ability to perform his/her obligation with credibility as determinant of trust. Therefore, performing obligations may involve two parties in the exchange process whereby seller shall deliver the goods and services in time with specification given and on the other hand, buyer will need to pay the seller as promised (Lindskold, 1978). Trust is also developed by motive of a party through

assessment of a behavior and interpretation of the behavior (Lindsfold, 1978). The behavior can be driven by element of benevolent intentions that shall result in two parties in the exchange process by sharing values and norms, therefore this will make the parties involved to understand their objectives better (Macneil, 1980). Besides that, trust may also develop by reference of one party to another on trustee based on the first party experience of his/her exchange process (Milliman & Fugate, 1988; Strub & Priest, 1976).

2.12.2 E-Commerce on Trust

Trust has been defined in many ways by different authors. Trust is one party accepting the action of the other party although the first party knows that he/she is not protected on the course of the exchange process (Mayer, Davis & Shoorman, 1995). Trust is further defined as a “cognitive process with positive expectation of the other person” (Rousseau *et al.*, 1998) and from this, it will form a belief that the first party will be sincere to the second party without the element of opportunistic behavior during the exchange process (Gefen, 2002b; Hosmer, 1995; Moorman *et al.*, 1992).

2.12.3 Trust in Online Environment

In the online environment, buyers and sellers are not known to each other and information provided is crucially important in the exchange process. Normally, transactions done are based on payment made by a credit card, cheque payment, or cash payment deposited to the seller's account. If the transactions are done by a credit card, there is a possibility that the cardholder's information and financial data may be known to others. On the other hand, buyer may be facing the risk of product delivered that is not according to specification during ordering (Flavian & Guinaliu, 2006; Monsuwe, Dellaert & Ruyter, 2004).

Besides that, buyer in the online business environment will feel that his/her interest is not really protected during exchange process (Monsuwe, *et al.*, 2004). Hence, to reduce the element of uncertainty, online trust plays an important role in reducing the risk faced by the online shoppers (Kim, Ferrin & Rao, 2008). Trust will create customer loyalty with the company if level of trust is high (Nguyen *et al.*, 2014; Zhao *et al.*, 2010). Furthermore, customer's behavior is the reflection of the amount of trust that is based on information provided on the website by the seller or service provider (Wang, 2003). The reason customers do not use online commerce on products and services and reject online transactions is due to the customer not believing the seller or service provider (Kim *et al.*, 2008; Mansumittrchai & Al-Malkawi, 2011; Nasri, 2011; Trivedi & Kumar, 2014; Urban, Sultan & Qualls, 2000). Therefore, trust is a determinant of success for online

website (Juwaheer *et al.*, 2012; Limbu, Wolf & Lunsford, 2012; Yaghoubi, Beiglo & Zare, 2011).

2.12.4 The Important of Trust in Online Banking

Trust is an important element in many transactional, buyer and seller relationships where the elements of risk persist including interacting with an e-vendor (Reichheld & Schefter, 2000). Therefore, it is one's belief that the offering party will be dependable (Nguyen *et al.*, 2014). To a further extend, trust is considered a belief that the trusted party will fulfil its commitments (Luhman, 1979; Rotter, 1971).

Finally, trust is important in many business relationships (Dasgupta, 1988 and Moorman *et al.*, 1992). Meanwhile, confidence is the integral part of the belief that the trustworthy party is reliable with high integrity (Morgan & Hunt, 1994) and further more according to Morgan and Hunt (1994) customer to company relationship requires trust to be effective. Hence, for an organization, the relationship is crucial in managing trust whereby customers must buy a service before experiencing the service offered by the organization. When trust is conceptualized as a dimension in TAM, it may have a great influence on the user's willingness to engage in online transaction (Juwaheer *et al.*, 2012; Trivedi & Kumar, 2014; Wang, Wang, Lin, & Tang, 2003).

2.13 Self-Efficacy Theory (SE)

Self-efficacy refers to individuals' beliefs in their ability to perform certain actions (Bandura, 1977, 1982). Studies on the effects of self-efficacy point to its crucial role in determining individual behaviour towards using information technologies (Compeau & Higgins, 1995; Taylor & Todd, 1995). Venkatesh and Davis (1996) support the role of an individual's self-efficacy as a determinant of ease-of-use of new technology. In other words, users with higher self-efficacy are more willing to learn a new technology (Chau & Ngai, 2010). The importance of perceived ease of use is supported by Bandura's (1982) extensive research on self-efficacy, defined *as* "judgments of how well one can execute courses of action required to deal with prospective situations". Self-efficacy is similar to perceived ease of use as defined above.

However, self-efficacy is a belief that theorized to function as a proximal determinant of behaviour. Furthermore, Bandura's theory also distinguishes self-efficacy judgments from outcome judgments; the latter being concerned with the extent to which a behaviour, once successfully executed, is believed to be linked to valued outcomes. Bandura's "outcome judgment" variable is similar to perceived usefulness. Therefore, behavior would be best predicted by considering both self-efficacy and outcome beliefs. Therefore, the above theoretical foundation, self-efficacy may be also referred to as an individual's perceived ability through his/her belief to use internet banking system.

2.13.1 Computer Self-efficacy (CSE) Theory

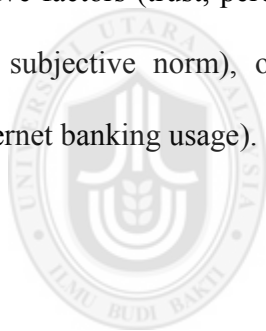
Previous research has suggested a positive relationship between experience with computing technology and a variety of outcomes such as an effect towards computers and computer usage (Alkagafi *et al.*, 2015; Fathima & Muthumani, 2015; Trivedi & Kumar, 2014; Nasri, 2011). Therefore, a related construct, called computer self-efficacy, has been examined in information system literature (*e.g.* Compeau & Higgins, 1995; Compeau *et al.*, 1999; Abdulkadir *et al.*, 2013). While, computer self-efficacy can be defined as judgment of one's ability to use a computer (Compeau & Higgins, 1995), and continuous research efforts on computer self-efficacy can be observed in recent information system studies (Al-kafagi *et al.*, 2015; Agarwal, Sambamurthy & Stair, 2000; Hong, Thong, Wong & Tam, 2001), which confirm the critical role that computer self-efficacy plays in understanding individual responses to information technology.

In addition to this, the proposed relationship between computer self-efficacy and perceived ease of use is based on theoretical argument by Davis (1989) and Mathieson (1991). There are also empirical evidence of a causal link between computer self-efficacy and perceived ease of use (*e.g.* Agarwal *et al.*, 2000; Igbaria & Iivari, 1995; Venkatesh & Davis, 1996; Venkatesh, 2000). This is based on theory of social cognitive developed by Bandura (1986), Igbaria and Iivari (1995) postulated that computer self-efficacy affects an individual's computer anxiety, which in turn, influences perceived ease of use, perceived usefulness and system usage. However, computer experience might be positively related to the existence of concerns regarding privacy and security of

online exchanges, implying that computer self-efficacy will have a negative effect on perceived security and privacy and internet banking usage.

2.14 Chapter Summary

In this chapter, a thorough and rigorous review was done on literature pertaining to theories subjected to the scope of this study. From the literature, underpinning theory of TAM was identified and selected. Therefore, gap of the study was determined and the study was pursued. Due to this, theoretical model was formed based on the gap inclusion of five factors (trust, perceived usefulness, perceived ease of use, internet self-efficacy, and subjective norm), one mediating effect (attitude), and one dependent variable (internet banking usage).



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CHAPTER 3

METHODOLOGY

3.0 Chapter Overview

This chapter discusses the research framework, development of hypotheses based on the research framework, detailed description of the research design, operational definition that caters to this study, and research instrument used to measure the constructs. This chapter also discusses the details of population and sampling method, data collection method and technique of data analysis and the Structural Equation Modelling (SEM) technique deployed in this study.

3.1 Explanation of the Research Framework

A framework is referred to as “a research conceptual model on how one theorizes or makes logical sense of the relationship among several factors that have been identified earlier as important to the problems” (Sekaran, 2003). Therefore, in this research framework, trust, perceived usefulness, perceived ease of use, internet self-efficacy, subjective norm and attitude are theorized to have influence on the internet banking usage. This is derived with the propositions presented from various past studies as reviewed in Chapter 2. It is further hypothesized that perceived usefulness, perceived ease of use, and attitude mediate the effects of internet banking usage.

Apart from perceived usefulness and perceived ease of use, additional factors are used to explain attitude toward internet banking usage, which includes trust, internet self-efficacy and subjective norm towards internet banking usage as illustrated in figure 3.1.

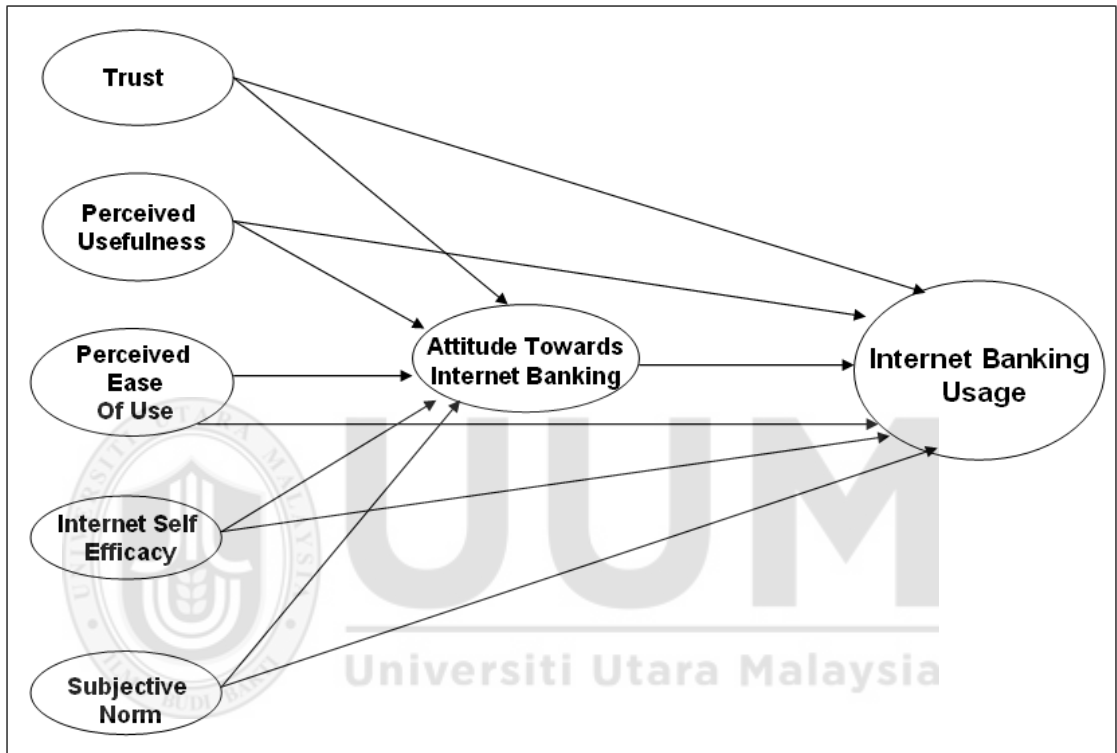


Figure 3.1
The Research Framework

3.2 Hypotheses/Propositions Development

From the above research framework, this study has derived two direct impacts namely *i.e.* the direct determinants of internet banking usage and the direct determinants of attitude towards internet banking usage. The research framework has also produced one indirect impact *i.e.* the mediating effect of attitude towards internet banking usage

(Table 3.1). The hypotheses development is based on the propositions presented and discussed from various past studies as reviewed in Chapter 2. For easy reference of the hypotheses, a list is presented below:

H1: Direct Determinants of internet Banking Usage.

H1a= Trust will have a positive significant relationship on usage the internet banking systems.

H1b= Perceived usefulness will have a positive significant relationship on usage of internet banking systems.

H1c= Perceived ease of use will have a positive significant relationship on usage of internet banking systems.

H1d= internet self-efficacy will have a positive significant relationship on usage of internet banking systems.

H1e= Subjective norm will have a positive significant relationship on usage of internet banking systems.

H1f= Attitude towards internet banking will have a positive significant relationship on usage the internet banking systems.

H2: Direct Determinants of Attitude towards internet Banking Usage

H2a= Trust will have a positive significant relationship on attitude towards internet banking.

H2b= Perceived usefulness will have a positive significant relationship on attitude towards internet banking.

H_{2c}= Perceived ease of use will have a positive significant relationship on attitude towards internet banking.

H_{2d}= internet self-efficacy will have a positive significant relationship on attitude towards internet banking.

H_{2e}= Subjective norm will have a positive significant relationship on attitude towards internet banking.

H₃: Mediating Effect of Attitude towards internet Banking Usage

H_{3a}= Attitude towards internet Banking mediates the relationship between trust and internet banking usage.

H_{3b}= Attitude towards internet Banking mediates the relationship between perceived usefulness and internet banking usage.

H_{3c}= Attitude towards internet Banking mediates the relationship between perceived ease of use and internet banking usage.

H_{3d}= Attitude towards internet Banking mediates the relationship between internet self-efficacy and internet banking usage.

H_{3e}= Attitude towards internet Banking mediates the relationship between subjective norm and internet banking usage.

Table 3.1

Summary of the Research Framework

Number of Direct Determinant	Number of Mediating Effect	Number of Hypotheses on Direct Determinant	Number of Hypotheses on Mediating Effect	Name Independent Variables	Name of Dependent Variable
2	1	11	5	Trust, Perceived usefulness, Perceived ease of use , Internet self-efficacy, subjective norm and attitude towards Internet banking	Internet Banking Usage

3.3 Research Design

The research is based on a descriptive study where data is collected and analysed to determine the factors that influence the usage of internet banking in Malaysia and to identify which factors that most contribute to the usage of internet banking in the Malaysian environment. A cross-sectional study is conducted to get insights or a description of the business elements on the population via self-administered questionnaires consisting of demographic data and data measuring the exogenous and endogenous variables.

At the point of study, the research was done based on the existing internet banking customers and taking into consideration the impact of the respondents on the adoption of the internet banking facility.

The research strategy is based on a quantitative approach which is also known as a positivist paradigm of exploring social reality emphasized by observation and reason as means of understanding human behavior (Denscombe, 2003). Positivism paradigm, which emphasizes objectivist approach to studying social phenomena, gives importance to research methods focusing on quantitative analysis and surveys (Perry & Gummesson, 2003). The research framework is based on previous literatures and this study intends to adopt the extended Technology Acceptance Model in the Malaysian banking environment.

3.4 Operational Definition

For the purpose of this study, the researcher list down the terminologies and acronyms for easy references as per table 3.2.

Table 3.2

Operational Definition of Key Variables in this study

Variable Name	Definition	Source/Reference
Trust	The extent to which an individual believes that using online banking is secured and has no privacy threats.	(Yee <i>et al.</i> , 2010; Manzano <i>et al.</i> , 2009)
Perceived Usefulness	The degree to which a person believes that using a particular system would enhance his or her job performance.	(El-Kasheir <i>et al.</i> , 2009; Manzano <i>et al.</i> , 2009 cited in Davis, 1989).
Perceived Ease of Use	The degree to which the prospective adopter expects the new technology adopted to be a free effort regarding its transfer and utilization.	(Pikkarainen <i>et al.</i> , 2004; Yee <i>et al.</i> , 2010 cited in Davis, 1989)
Internet Self-Efficacy	The estimate of one's capability to perform internet tasks.	(Ma & Liu, 2005; O'Cass & Fenech, 2003).

Table 3.2 (continued)

Operational Definition of Key Variables in this study

Variable Name	Definition	Source/Reference
Subjective Norm	The person's perception that most people who are important to her or him should or should not perform the behavior in question.	(El-Kasheir <i>et al.</i> , 2009; Amin, 2009 cited in Nysveen <i>et al.</i> , 2005)
Attitude	The reflects feelings of favourableness or unfavourableness towards using the technology.	(Porter & Donthu, 2006; Taylor & Todd, 1995).
Internet Banking Usage	The customers' usage behaviour for the internet banking.	(Eriksson <i>et al.</i> , 2005; Pikkarainen <i>et al.</i> , 2004)

3.5 Research Instrumentation

The measurements of the variables in this study were based on the structured questionnaires adopted and adapted from past studies for the purpose of obtaining the responses from the internet banking customers on the view on various research variables. The questionnaires of this research consists of six independent variables *i.e.* trust (9 items), perceived usefulness (6 items), perceived ease of use (6 items), internet self-efficacy (10 items), subjective norm (6 items), mediated by attitude towards internet banking (11 items) and one dependent variable *i.e.* internet banking usage (9 items).

3.5.1 Trust

The trust questions in the questionnaire contain nine items. Three items were adapted from Chong *et al.* (2010) and six items were adopted from Manzano *et al.* (2009) towards the internet banking usage where minor modifications were done to the

questionnaire. All items are measured by the seven-point Likert scale ranging from 1-strongly disagree to 7-strongly agree. The trust questionnaire items are depicted in Table 3.4.

3.5.2 Perceived Usefulness

A total of six items were used to measure perceived usefulness and four items were adapted from El-Kasheir *et al.* (2009) and two items were adopted from Manzano *et al.* (2009). These items needed some modifications and it was done on the questionnaire to suit measuring this construct on the usage of internet banking facility. All items are measured by the seven-point Likert scale ranging from 1-strongly disagree to 7-strongly agree. The perceived usefulness questionnaire items are presented in Table 3.5.

3.5.3 Perceived Ease of Use

On measuring perceived ease of use, six questions were used to measure this construct towards internet banking usage based on the research done by Pikkarainen *et al.* (2004) and Chong *et al.* (2010). Four items were adopted and two items were adapted from Pikkarainen *et al.* (2004). Some of these items needed further modifications so that it is suitable to measure this variable. All items are measured by the seven-point Likert scale ranging from 1-strongly disagree to 7-strongly agree. The perceived ease of use questionnaire items are depicted in Table 3.6.

3.5.4 Internet Self-Efficacy

To measure respondents' view on internet self-efficacy, this study adapted ten questions and all items were adapted from the research done by Ma and Liu (2005) and O'Cass and Fenech (2003). All items are measured by the seven-point Likert scale ranging from 1-strongly disagree to 7-strongly agree. The internet self-efficacy questionnaire are exhibited in Table 3.7.

3.5.5 Subjective Norm

On measuring subjective norm, five questions were adpted to measure this construct towards internet banking usage. All items were adapted from previous studies (El-Kasheir *et al.*, 2009; Amin, 2009). Items are measured by the seven-point Likert scale ranging from 1-strongly disagree to 7-strongly agree. The subjective norm questionnaire items are exhibited in Table 3.8.

3.5.6 Attitude towards internet Banking

The attitude towards internet banking is measured by seven items. All these items were adapted from Porter and Donthu (2006) and Taylor and Todd (1995). Some modifications have been done to suit these items to measure the construct. All items are measured by the seven-point Likert scale ranging from 1-strongly disagree to 7-strongly agree. The items for Attitude towards internet Banking are depicted in Table 3.9.

3.5.7 Internet Banking Usage

Internet banking usage is measured by four items. Three items were adapted from Porter and Donthu (2006) and are measured by the seven-point Likert scale ranging from 1-strongly disagree to 7-strongly agree; two items were adapted from Eriksson *et al.* (2005); and one of the item is measured by a categorical scale and one item is measured by the seven-point Likert scale ranging from 1-strongly disagree to 7-strongly agree. Four items were adopted from Pikkarainen *et al.* (2004). Items from Pikkarainen *et al.* (2004) has two ratio scaled questions, one categorical scales and one item (number 9) was measured by the seven-point Likert scale ranging from 1 – never to 7 – every time. The internet banking usage items are exhibited in Table 3.10.

3.6 Measurement for Research Constructs

The measurements of the research constructs are based on the five exogenous variables namely trust, perceived usefulness, perceived ease of use, internet self-efficacy, and subjective norm with two endogenous variables namely attitude and internet banking usage. In this study, 47 items are being used to measure the constructs and the concept as depicted from Table 3.4 to 3.10. This section also includes two screening items to enable this study to focus on internet banking users only and measurement items for respondent profile have six items and are depicted in Tables 3.11 and 3.12. On the measurement, the seven-point Likert scale was used for measuring the latent variables and ratio, and category scales were used to measure the concept. The summary for the measurement of constructs is depicted in Table 3.3.

Table 3.3
Summary for Measurement of Constructs

Summary of Measurement of Constructs					
Construct	Dimension	Total No Item	Adopted/ Adapted from Authors	Reliability	Industry
Trust		3	Adopted from Yee et al. (2010)	0.78	Banking
	Honesty	2	Adopted from Manzano et al. (2009)	0.93	
	Benevolence	2			
	Competence	2			
Perceived Usefulness	Belief	4	Adopted from El- Kasheir et al.(2009)	0.92	Banking
		2	Adapted from Manzano et al. (2009)	0.94	

Table 3.3 (continued)

Summary for Measurement of Constructs

Construct	Dimension	Total No Item	Adopted/ Adapted from Authors	Reliability	Industry
Perceived Ease of Use	Belief	4	Adopted from Pikkarainen et.al.(2004) and Yee et al. (2010)	0.86 0.89	Banking
		2	Adapted from Pikkarainen et.al.(2004)	0.86	
Internet Self- Efficacy	Belief	6	Adapted from Ma & Liu (2005)	0.93	Health Care
		4	Adapted from O'Cass & Fenech (2003)	0.90	
Subjective Norm	Cognitive	2	Adapted from El- Kasheir et al.(2009)	0.70	Banking
		3	Adapted from Amin (2009)	0.84	
Attitude Towards Internet Banking	Attitude	3	Adapted from Porter & Donthu (2006)	0.90	Internet Usage
		4	Taylor & Todd (1995)	0.85	Computer Usage
Internet Banking Usage	Usage	3	Adapted from Porter & Donthu (2006)	0.93	Internet Usage
		2	Adapted from Eriksson et al. (2005)	NA	Banking
		4	Adopted from Pikkarainen et.al.(2004)	NA	Banking

Table 3.4

Measurement Item for Trust (TST)

Item	Statement	Source
1	I trust that transaction conducted through my Internet banking website is secure and private.	Yee et al.(2010)
2	I trust payments made through my Internet banking channel will be processed securely.	Yee et al. (2010)
3	I trust that my personal information on my Internet banking will be kept confidential.	Yee et al.(2010)
4	My Internet banking website is characterized by the frankness and clarity of the services that is offered to the customer.	Manzano et al. (2009)

Table 3.4 (continued)

Measurement Item for Trust (TST)

Item	Statement	Source
5	I can have the confidence in the promises that my Internet banking websites makes.	Manzano et al. (2009)
6	I think that the design and commercial offerings of my Internet banking websites take into account the desires and needs of its	Manzano et al. (2009)
7	I think that my Internet banking websites takes into account the repercussions that their actions could have on the customer.	Manzano et al. (2009)
8	I think that my Internet banking websites has the necessary resources to successfully carry out its activities.	Manzano et al. (2009)
9	I think that my Internet banking websites knows its customers well enough to offer them products and services adapted to their needs.	Manzano et al. (2009)

Table 3.5

Measurement Item for Perceived Usefulness (PU)

Item	Statement	Source
1	Using Internet banking services saves my time.	El-Kasheir et al. (2009)
2	I find Internet banking service is useful.	El-Kasheir et al. (2009)
3	I find Internet banking a convenient service.	El-Kasheir et al. (2009)
4	Using Internet banking services enable me to accomplish my banking activities more quickly.	El-Kasheir et al. (2009)
5	I find that using Internet banking service makes it easier to do my banking activities.	Manzano et al. (2009)
6	I find using Internet banking services useful for my banking activities	Manzano et al. (2009)

Table 3.6

Measurement Item for Perceived Ease of Use (PEU)

Item	Statement	Source
1	It is easy to get Internet banking to do what I want it to do.	Pikkarainen et.al. (2004) & Yee et al. (2010)
2	I find Internet banking easy to use.	Pikkarainen et.al. (2004) & Yee et al. (2010)
3	My interaction with Internet banking is clear and understandable.	Pikkarainen et.al. (2004) & Yee et al. (2010)
4	Learning to use Internet banking is easy for me.	Pikkarainen et.al. (2004) & Yee et al. (2010)
5	It is easy for me to become skilful at using Internet banking.	Pikkarainen et al. (2004)
6	I find an Internet banking to be flexible to interact with.	Pikkarainen et al. (2004)

Table 3.7

Measurement Item for Internet Self-Efficacy (ISE)

Item	Statement	Source
1	I feel confident to use search engines like Google, Bing, Yahoo and Ask.	Ma & Liu (2005)
2	I feel confident to download necessary material from Internet.	Ma & Liu (2005)
3	I feel confident to search for information on the Internet for banking products and services.	Ma & Liu (2005)
4	I feel confident to visit my Internet banking websites to perform my banking transactions.	Ma & Liu (2005)
5	I feel confident to log in to my Internet banking websites if I have the user ID and password.	Ma & Liu (2005)
6	Overall, I feel comfortable when I am using the Internet banking facility.	Ma & Liu (2005)
7	I could easily use the websites to find banking products and services.	O'Cass & Fenech (2003)
8	I can get to a specific websites with an Internet browser.	O'Cass & Fenech (2003)
9	I feel comfortable searching the World Wide Web on my own.	O'Cass & Fenech (2003)
10	I would be able to use Internet on my own to locate my Internet banking websites.	O'Cass & Fenech (2003)

Table 3.8

Measurement Item for Subjective Norm (SN)

Item	Statement	Source
1	My friends, family members, colleagues, bosses etc influence my decision to use Internet banking.	El-Kasheir et al. (2009)
2	I completely agree with them that I should use Internet banking services continuously.	El-Kasheir et al. (2009)
3	If I use Internet banking most of the people who are important to me will regard me as clever.	Amin (2009)
4	If I use Internet banking most of the people who are important to me will regard it as useful.	Amin (2009)
5	If I use Internet banking most of the people who are important to me will regard it as valuable.	Amin (2009)

Table 3.9

Measurement Item for Attitude towards Internet Banking (ATU)

Item	Statement	Source
1	I am positive towards the Internet banking.	Porter & Donthu (2006)
2	It makes sense to use the Internet banking.	Porter & Donthu (2006)
3	People should adopt the Internet banking facility.	Porter & Donthu (2006)
4	Using the Internet banking facility is a good idea.	Taylor & Todd (1995)
5	Using the Internet banking facility is a wise idea.	Taylor & Todd (1995)
6	I like the idea of using the Internet banking facility.	Taylor & Todd (1995)
7	Using the Internet banking facility would be pleasant.	Taylor & Todd (1995)

Table 3.10

Measurement Item for Internet Banking Usage (IBU)

Item	Statement	Source
1	I use the Internet banking facility quite often for my banking needs.	Porter & Donthu (2006)
2	I spend a lot of time on the Internet banking for my personal use.	Porter & Donthu (2006)
3	I have been using the Internet banking for my personal use for a very long time ago.	Porter & Donthu (2006)
4	How long have you been using Internet banking facility?	Eriksson et al. (2005)
	a) Less than 1 year	
	b) 1 to 2 years	
	c) 3 to 4 years	
	d) 5 to 6 years	
	e) 7 to 8 years	
	f) 9 to 10 years	
	g) More than 10 years	
5	I often you use the Internet banking facility?.	Eriksson et al. (2005)
6	I use Internet banking mainly:	Pikkarainen et al. (2004)
	a) At Home	
	b) At Work	
	c) At School	
	d) In a Bank	
	e) In a Library	
	f) In a friend's place	
	g) In a cyber café	
	h) Others _____ (Please specify)	
7	On average I use Internet banking _____ times in a month.	Pikkarainen et al. (2004)
8	On average I do _____ transactions at a time.	Pikkarainen et al. (2004)
9	How often you use the following Internet banking services?	Pikkarainen et al. (2004)
	a)View account (Current/Savings, Fixed Deposits, Credit Cards, and Loan/Financing etc.	
	b)Fund transfer.	
	c)Pay Bills.	
	d)Top up services (reloads services).	
	e)Credit/Loan/Financing based services.	
	f)Investment based services	
	g)Insurance/Takaful based services	
	h)Account opening (Savings, Current, Fixed Deposits Investment, Loan/Financing, ASB and Unit Trust)	

Table 3.11

Measurement Item for Screening Questions

Item	Statement	Source
1	Are you the account holder of Maybank Berhad, CIMB Bank Berhad, Public Bank Berhad, Hong Leong Bank Berhad and AmBank Berhad? a. Yes b. No Important Note: [If you maintain your account(s) with any of the above bank(s) please proceed to the next questions].	Self
2	Are you an Internet banking customer? a. Yes b. No Important Note: [If you are an Internet banking customer please proceed to answers all questions].	Self



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Table 3.12

Measurement Item for Respondent Profile

Item	Statement	Source
1	Please state your gender. a. Male b. Female	Lallmahamood (2007)
2	Please state your race. a. Malay b. Chinese c. Indian d. Others (Please specify) _____	Lallmahamood (2007)
3	Please state your education level. a. Primary School. b. Secondary School/SPM/STPM c. Diploma d. First degree e. Master degree f. Phd/DBA/Doctoral Degree g. Other (Please specify) _____	Lallmahamood (2007)
4	Please state your age _____	Lallmahamood (2007)
5	Please state your monthly income per month (in RM). a. Less than 1,000 b. 1001 – 3,000 c. 3001 – 5,000 d. 5,001 – 10,000 e. More than 10,000	Lallmahamood (2007)
6	Please state your current profession in your organization that you work: a. Clerical/Non-Clerical b. Executive c. Assistant Manager d. Manager/Head of Department e. Head of Division f. CEO/President/Director/Managing Director g. Consultant h. Professional i. Self employed j. Technician k. Others (Please specify) _____	Tan & Teo (2000)

3.6.1 Pre-Testing of Structured Questionnaire

It is important to pre-test the instruments to ensure that all the questionnaires are understood by the respondents and there is no error in the wording and structure of the sentences of the measurement (Sekaran, 2003). The pre-testing involved the verification of the draft questionnaire by 12 internet banking staff to ensure the clarity and comprehensiveness of the questionnaire. Feedback from the 12 internet banking staff helped to rectify any inadequacy in the questionnaire prior to administering the instrument to the respondents and therefore reducing biases.

3.6.2 Pilot Study

This pilot study was a second layer check on the comprehensiveness of the items, to detect any ambiguity on the questionnaire and to make the respondents understand the format and layout of the questionnaire. According to Cooper and Schindler (1998), the sample size for a pilot study is 25 to 100 respondents but in this research, the pilot study was conducted with a sample size of 100 internet banking users from Jalan Raja Laut branch in Kuala Lumpur for the duration of three weeks. This pilot study is important to avoid invalid responses from the respondents. The data from the pilot study are analysed by SPSS for reliability and exploratory factor analysis for construct and convergent validity using Principal Component Analysis with Varimax Rotation. Results from the pilot study show that the Bartlett test of Sphericity was significant while Kaiser-Meyer-Olkin measure of sampling adequacy was at 0.867 which was above the threshold of

0.60 and on the other hand, the eigenvalues were more than one; the total variance explained was at 71.46% on the internet banking usage (Table 3.13). There were no changes made before the final questionnaire is distributed to the respondents.

Table 3.13

Pilot study Result

Kaiser-Meyer-Olkin Measure of Sampling Adequacy	Bartlett's Test of Sphericity	df	Total Variance Explained
0.867	2392.724	630	71.455

3.6.3 Final Questionnaire

There are no changes to the final questionnaire in this study. However, the researcher have prepared the questionnaire with dual languages, Bahasa Melayu and English, to cater for a better understanding for the respondents. Back to back translation has been done to ensure the absolute quality and accuracy of the final questionnaire. To achieve this, English and Bahasa Melayu school teachers were engaged for the translation purposes. After which, contents and layout of the questionnaires were checked thoroughly by researcher to ensure crystal clear questions before releasing to the respondents. Questionnaire was prepared in booklet form so that respondents could easily participate in the survey likewise enabling researcher to input data accordingly. The questionnaire starts with greeting the respondents and introduces the researcher and the title of the thesis. Thereafter, it explained the purpose of study and the importance of doing it in Malaysian banking context. Furthermore, it invites respondents to share their thoughts by completing the questionnaire. Lastly, it states three main section of the questionnaire. (*Appendix 5*).

3.7 Data Collection

This section discusses the population, population frame, sampling size, and sampling method, unit of analysis, and data collection procedures in this study. The data in this study was gathered through primary and secondary sources. The secondary data were obtained from journals, periodicals, books, government publications, and databases whereas the primary data were gathered through questionnaires provided to the respondents.

3.7.1 Population

Population in this study is the total internet banking users in Malaysia however, it focuses on the Klang Valley area because of urbanization and major economic activities done here with a population of 5.773 million people according to data gathered from pemandu (<http://etp.pemandu.gov.my/upload/etp>) which may justify this research in terms of generalization of this study. It was quite difficult to determine the exact number of bank customers in the Klang Valley area therefore for the purpose of this study, it took the total number of those employed in this area as the basis of calculation. Therefore, the population in this study was calculated based on the Klang Valley population and 43.31% of the population were employed (pemandu). Further assumption is that those who are employed will usually have a bank account, either a savings account or a current account, in order for the employers to pay their monthly salary and other perks (Table 3.14).

3.7.2 Population Frame

The population frame (the population frame is a listing of all the elements in the population from which the sample is drawn) in this study is the retail banking customers having the internet banking facility in Malaysia. They are governed under the Financial Services Act 2013 (FSA 2013) whereby under this Act, the banks' customers' data are protected under the Secrecy Section 133 (1). It is estimated that the number of internet Banking Users is 11.7 million subscribers as per the BNM report in 2012. Nevertheless, it was not a major barrier to reach the respondents since 43.31% of the population in Klang Valley were employed which represents almost half of the employment in Malaysia as stated by pemandu (Table 3.14).

3.8 Sampling

Under this section of the study it discuss the unit of analysis, sample size and sampling method as the followings paragraph.

3.8.1 Unit of Analysis

The unit of analysis in this study is the internet banking users based on the five regions of the selected municipalities and further focused on selected housing areas in each of the municipalities. The internet banking users are located in most populous, urbanized, and industrialized areas of Klang Valley. Klang Valley is sub-divided into five regions of municipalities consisting of the central regions (Dewan bandaraya Kuala Lumpur and Majlis Perbandaran Petaling Jaya), eastern region (Majlis Perbandaran Kajang and

Majlis Perbandaran Ampang Jaya), western region (Majlis Bandaran Shah Alam and Majlis Perbandaran Klang), northern region (Majlis Perbandaran Selayang), and southern region (Majlis Bandaran Subang Jaya, Perbadanan Putrajaya and Majlis Daerah Sepang) with a total population of 5.773 million according to Pemandu. However, in this study, the selection will be based on each region with one municipality with a total population of almost 2.5 million people. Out of this, 1,078,250 (based on employment rate of 43.13%) are employed. The internet banking users in this study will be the bank customers between the ages of 18 and 60 since some have started to work after leaving secondary school and 60 is the retirement age in Malaysia.

Table 3.14
Population and Employment of Klang Valley Area in 2010

Region	Name Of Region	Population	Region Population	Percentage	Total Employment
Central Region	DB Kuala Lumpur	1,723,000	2,300,000	39.84%	996,000
	MB Petaling Jaya	577,000			
Eastern Region	MP Kajang	743,000	885,000	15.33%	383,250
	MP Ampang Jaya	142,000			
Western Region	MP Klang	747,000	1,275,000	22.09%	552,250
	MB Shah Alam	528,000			
Northern Region	MP Selayang	559,000	559,000	9.68%	242,000
Southern Region	MB Subang Jaya	583,000	754,000	13.06%	326,500
	Perbadanan Putrajaya	89,000			
	MD Sepang	82,000			
Total		5,773,000	5,773,000	100%	2,500,000

Source: <http://etp.pemandu.gov.my/upload/etp>

On the other hand, the selection of internet banking customers of five major commercial banks in Malaysia is based on market capitalization (Table 3.15).

Table 3.15

Largest Malaysian Local Banks Ranked by Market Capitalization as of end 2009

Rank	Bank	Market Capitalization (RM, in Billion)	% of Market Capitalization
1	MayBank	47.99	25.73%
2	CIMB Group	46.64	25.00%
3	Public Bank	38.71	20.75%
4	Hong Leong Bank	17.67	9.47%
5	AMMB Holding	14.79	7.93%
6	RHB Capital	11.46	6.14%
7	Alliance Financial Group	4.19	2.25%
8	Affin Holdings	3.79	2.04%
9	Bank Islam	1.29	0.69%
Total		186.53	100%

Source: www.relbanks.com/asia/malaysia.

3.8.2 Sample Size

It is very important to select an adequate sample size for a study. The sample size must be large enough to provide sufficient representation of the group within population of a study (Hair, Black, Babin, Anderson & Tatham, 2006). An adequate sample size will improve representation towards generalizing.

Schreiber, Nora, Stage, Barlow, and King (2006) suggested a minimum of 10 participants for every free parameter estimated while Bentler and Chou (1987) suggested that a ratio of ten responses per free parameter is required to obtain trustworthy estimates. Others suggest a rule of thumb of ten subjects per item in the scale development is prudent (Flynn & Percy, 2001). However, there is little agreement on

the suggested sample size for SEM by many researchers (Sivo, Fan, Witta & Willse, 2007). Meanwhile, Garver and Mentzer (1999), and Hoelter (1983) proposed a minimum sample size of 200 for SEM and any sample size of above 200 is understood to provide sufficient statistical power for SEM data analysis. This study's sample size that is derived from the Klang Valley (Selangor and Kuala Lumpur) was selected as the majority (43.14%) of them have bank accounts. However, in this study, the sample size is 384 according to the sample size from a given population (Krejcie & Morgan, 1970) where the population is above one million (Table 3.16). Nevertheless, this research was design to achieve 479 respondents as this response rate for household sampling is 60% (Salim, 2007) and to avoid invalid or non-response by the potential respondents. The sample is gathered from households as per past studies that have contributed to market research. For instance, Salim (2007) who conducted a study in Indonesia in retail marketing and government agencies, deployed this method in his population survey. On the other hand, a household study is less complicated and cost saving in reaching the end users.

Table 3.16

Random Sample Size from a Determined Population

Random		Random	
Given population	sample size	Given population	sample size
3,500	346	10,000	370
4,000	351	15,000	375
4,500	354	20,000	377
5,000	357	30,000	379
6,000	361	40,000	380
7,000	364	50,000	381
8,000	367	75,000	382
9,000	368	1,000,000	384

Source: Krejcie and Morgan (1970)

3.8.3 Sampling Method

Systematic random sampling has been operationalised by researchers in the banking fraternity (Alnsour & Al-Hyari, 2011; Yaghoubi & Bahmani, 2010), therefore this study will engage a similar sampling method. In a nutshell, there will be four stages involved. Firstly, the administrative district in Klang Valley is categorized into five regions based on pemandu's guideline. Secondly, one administrative district/municipality was randomly selected from each region. The third step involved references being made to the selected municipalities to ascertain the number of residential areas in view of the sampling frame (Salim, 2007) within five kilometers radius from the banks' premises. The fourth step is to select one residential area (Taman) among various residential areas residing in the randomly selected municipality followed by a systematic random sampling to reach the respondents.

The first stage is to draw lots on each region to select one administrative district. The Central Region consists of Dewan Bandaraya and MB Petaling Jaya and MB Petaling Jaya was selected from the draw. The second region is the Eastern Region consisting of MP Kajang and MP Ampang Jaya and from the draw, MP Kajang was chosen. The third region is the Western Region consisting of MP Klang and MB Shah Alam and from the draw, MB Shah Alam was identified. The Northern Region's MB Selayang was selected accordingly. Lastly, the Southern Region consists of MB Subang Jaya, Perbadanan Putrajaya and MD Sepang and from the draw, Perbadanan Putrajaya was selected (Table 3.17).

Table 3.17

Population and Percentage of Sample Size by Region

Region	Total Municipalities	Randomly Selected Municipality	Population	Percentage
Central	2	MB Petaling Jaya	577,000	23
Eastern	2	MP Kajang	743,000	30
Western	2	MB Shah Alam	528,000	21
Northern	1	MP Selayang	559,000	22
Southern	3	Perbadanan Putrajaya	89,000	4
Total	10		2,496,000	100

(Source: <http://etp.pemandu.gov.my/upload/etp>)

Reference was made at Majlis Perbandaran Petaling Jaya, Majlis Perbandaran Kajang, Majlis Bandaran Shah Alam, Majlis Perbandaran Selayang and Perbadanan Putrajaya to get the details of the residences. However, this study excluded high-rise residences such as condominiums and apartments due to the security barrier whereas houses in the village were excluded too as it may not be in proper array. Meanwhile, based on the study done by Salim (2007) where a six-kilometer radius was sized up for data collection, this study undertook a five-kilometer radius for data collection. As such, references were made through Google Map (<https://www.google.com.my/maps>). Majlis Bandaran Petaling Jaya consists of 12 sections between the five-kilometer radius from the banks' premises (Section 1, Section 4, Section 5, Section 6, Section 7, Section 8, Section 11, Section 12, Section 13, Section 14, Section Section 19 and 20 Section). Upon drawing lots, Section 14 was randomly selected in this study. A total number of 2330 households consisting of bungalows, double storey and single storey were present. In addition, Majlis Perbandaran Kajang has 18 housing areas within the five kilometers radius from the banks' premises (Taman Melor, Taman Melati, Taman Desa Ros, Taman

Angkasa Indah, Taman Berlian, Taman Kajang Baru, Taman Zamrud, Taman Damai Mewah, Taman Jasmin, Taman Bukit Mewah, Taman Bukit Kajang Baru, Taman Kajang Jaya, Taman Kajang Utama, Taman Sri Langat, Taman Kajang Mewah, Taman Kajang Putra, Taman Sri Saga and Taman Muhibbah). Taman Kajang Putra was randomly selected in this study. Taman Kajang Putra has a total of 2240 households consisting of bungalows, double storey and single storey houses. Likewise, Majlis Perbandaran Shah Alam consists of 17 housing areas within the five kilometers radius from the banks' premises (Section 1, Section 2, Section 4, Section 6, Section 7, Section 8, Section 10, Section 12, Section 13, Section 15, Section 16, Section 17, Section 18, Section 19, Section 20, Section 23 and Section 24). Section 20 was randomly selected in this study and there were a total number of 1198 houses consisting of bungalows, double storey and single storey houses.

Similarly, Majlis Perbandaran Selayang has 32 housing areas within the five kilometers radius from the banks' premises (Taman Selayang Baru, Taman Selayang, Taman Desa Bakti, Taman Wilayah Selayang, Taman Sri Murni, Taman Jasa, Taman Selayang Mutiara, Bandar Baru Selayang fasa 2A, Bandar Baru Selayang Fasa 2B, Taman Jasa Utama, Taman Bukit Permata, Taman Pinggiran Batu Caves, Taman Sri Gombak, Taman GreenWood Indah, Taman Industri Bolton, Taman Samudra, Taman Sri Batu Caves, Taman Gombak, Taman Batu Muda, Taman Harmonis, Taman Rowther, Taman Amaniah, Taman Melewar, Taman Selaseh, Taman Koperasi Polis Phase 1, Taman Desa Minang, Taman Sahabat, Taman Berlian, Taman Kenangan, Taman Kamariah, Taman Gombak Jaya and Taman Karak Utama). Taman Samudra was selected randomly in this study and has a total number of 450 houses consisting of bungalows, double storey and

single storey houses. Lastly, the last housing area is Perbadanan Putra Jaya, which consists of 20 precincts based on the five kilometers radius from the banks' premises. The housing area was from Precinct 1 to Precinct 20. Precinct 9 was selected randomly in this study and has a total number of 1196 houses consisting of bungalows, double storey and single storey houses. As such, the residential areas would reflect a composition of ethnic groups and a homogenous sample was able to be gathered (Table 3.18).

Table 3.18

Total houses by residential area

Region	Municipalities	Total Residential Area (5 Km Radius)	Selected Residential Area	Total Houses
Central	Petaling Jaya	12	Sect 14	2330
Eastern	Kajang	18	Tmn Kjpg Putra	2240
Western	Shah Alam	17	Sect 20	1198
Northern	Selayang	32	Tmn Samudra	757
Southern	Putrajaya	20	Presint 9	1969
Total		99		8494

Source: Respective local municipalities

This study will proceed with the systematic random sampling, employed to identify the number of houses based on an interval calculated and derived from the formula of $(k = N/n)$ whereby k is the interval, N is the total number of houses and n is the number of sample required (Awang, 2013). Petaling Jaya Section 14, 2330/184 producing the outcome of 12.66 and the number is non-integral as it will be rounded up to every 12th houses. The next step is to select one random number between 1 and 12. Number five was selected randomly which will be the first house approached for data collection activity henceforth, subsequent houses for data collection will be $12+5=17$, $k+(k+5) =$

$12+12+5=29$ and so on until 184 houses are selected. In addition, for Majlis Perbandaran Kajang, $2240/240$ generated a number of 9.33. Since the number is non-integral, it will be rounded to every 9th houses. The next step is to select one random number between 1 and 10. Number six was selected randomly and that is the first house chosen from the sampling frame. The following houses to be selected will be $k+6=15$, $k+(k+6) = 9+9+6=24$ and so on until 240 houses are selected. Similarly, for Majlis Bandaran Shah Alam, $1198/168$ therefore generating a number of 7.13. Since the number is non-integral, it will be rounded to the 7th houses. The next process is to select one random number between 1 and 8. Number five was selected randomly and that is the first house chosen from the sampling frame. The following houses to be selected will be $k+5=12$, $k+(k+5) = 7+7+5=19$ and so on until 168 houses selected.

On the other hand, Majlis Perbandaran Selayang, $757/176$ generated a number of 4.30. Since the number is non-integral, it will be rounded to the 4th houses. The next process is to select one random number between one and four. Number three was selected randomly and that is the first house chosen from the sampling frame. The following houses to be selected will be $k+3=7$, $k+(k+3) = 4+4+3=11$ and so on until 176 houses selected. Lastly, Perbandaran Putra Jaya, $1969/32$ generated a number of 61.53. Since the number is non-integral, it will be rounded to 61th houses. The next process is to select one random number between 1 and 61. Number eight was selected randomly and that is the first house chosen from the sampling frame. The following houses to be selected will be $k+8=69$, $k+(k+8) = 69+69+8=146$ and so on until 32 houses are selected (Table 3.19).

Table 3.19

Total houses by residential area & expected response

Region	Municipalities	Total Residential Area (5 Km Radius)	Selected Residential Area	Total Houses	Data Collection (Every k)	Total House Expected	Response rate @ 60%
Central	Petaling Jaya	12	Sect 14	2330	12	184	110
Eastern	Kajang	18	Tmn K'jg Putra	2240	9	240	143
Western	Shah Alam	17	Sect 20	1198	7	168	101
Northern	Selayang	32	Tmn Samudra	757	4	176	106
Southern	Putrajaya	20	Presint 9	1969	61	32	19
Total		99		8494		800	479

Source: Respective local municipalities

Past studies indicate that household response is about 60% (Salim, 2007) therefore a total number of 800 self-administered questionnaires were sent by the researcher and assisted by research assistants to the respondents dispersed at the five selected regions of the municipalities' households in Klang Valley. This method is employed to anticipate the respondents who are not reachable or the respondents who are not internet banking customers. The number of respondents from the household representing the banks customers in this study was derived based on the percentage of each population from each region of the locations (Table 3.17).

3.9 Data Collection Procedures

The data collection activities started with the 12th house in Section 14 Petaling Jaya, surveying 184 houses considering 21 balance houses (2209 to 2230) due to taking the interval less of the integral number. Taman Kajang Putra, Kajang data collection commenced with the 9th house giving 79 balance of houses (2161 to 2240). Meanwhile,

Section 20, Shah Alam data collection started with the 7th house producing a balance of 21 houses (1177 to 1198); likewise, Taman Samudra, Selayang data was obtained with the 4th houses considering a balance of 52 houses (705 to 757) and lastly, Precinct 9 data collection started with 61th houses giving a balance of 16 houses (1953 to 1969).

The researcher with the support from the research assistants distributed the questionnaires to the respondents of five selected residential areas in the Klang Valley. The questionnaires were personally administered and it took approximately 10 to 15 minutes to complete and collected immediately after it has been completed. This will assist the respondents on any of the items that they do not understand and need further clarification from the researcher and research assistants on the spot. This also may assist the reduction in numbers of non- responses to the questionnaires by the respondents (Yusoff, Muhammad, Zahari, Pasah & Robert, 2009). The duration of data collected was 97 days and this is due to the respondents being dispersed throughout the five regions in the Klang Valley area.

3.10 Techniques of Data Analysis

The data from the research was collected through questionnaires and analysed and interpreted with the use of the Statistical Package for Social Science (SPSS) software program and the Analysis of Moment Structures (AMOS) 20.0 program.

3.10.1 Data Files Preparation

On the data files preparation, the researcher will assign appropriate alphanumeric code on all the variables for variable labels and value labels on the variables' names. On the missing values if there are any, a system is used to indicate the missing value.

3.10.2 Response Bias

Response bias is to ascertain should there be any changes in response due to different conditions during data collection time frame. This biasness is most rampant in the types of studies and research that involve self-reporting participants (Furnham, 1986). Due to this, response bias is conducted to identify if the sample data collected between these two groups of respondents indicating differences by an independent sample *t-test*.

3.10.3 Pre-Data Screening and Transformation

The data screening is done to make sure that the data has been correctly entered and that the distribution of variables to be used in this analysis is normal. For assessing the normality test, we may use the inferential statistic technique graphically such as the histogram, stem and leaf plot or boxplot. For the normality test, the researcher used the statistics test for normality such as Kolmogorov-Smirnov statistics where the Lilliefors significance level must be greater than 0.05 for the data to be normal and the Shapiro Wilk statistics calculated if the sample size is less than 100 respondents (Coakes, Steed

& Dzidic, 2006). The skewness and kurtosis is also tested for normality and the reading of the skewness must be ± 2.00 to be acceptable and for the kurtosis with a critical values plus minus 1.96 for 95% confident level (Hair, Black, Babin & Anderson, 2010). In order to normalise a set of data, cumulative distribution function (cdfnorm) in SPSS was used for the data transformation by labelling with T in front of the data involved.

3.10.4 Treatment for Outliers by Mahalanobis distance

Outliers' analysis will be done through mahalanobis distance to ensure that there is no multivariate outliers among the variables. According to Coakes, Steed and Dzidic (2006), the value should not be greater than or equal to the critical chi-square value of 13.8 at an alpha level of 0.001.

3.10.5 Test of AMOS Multicollinearity

Using the AMOS correlations, the researcher can ensure that the reading of all the five independent variables and one mediating variable is below 0.80 from the model to treat any multicollinearity problem (Bryman & Cramer, 2011). If there is any reading higher than 0.80, then the treatment of multicollinearity will be done and this shows that there is no significant violation to the non-multicollinearity assumptions. This indicates that the items hang together as a set in the model.

3.10.6 Confirmatory Factor Analysis (CFA) and Construct Validity

Confirmatory factor analysis will be used in this study as the researcher has some knowledge of the underlying factors items of the instruments used to assess a certain construct based on the theory and from previous empirical studies done (Byrne, 2001). Therefore, the researcher attempted to confirm these factors by using the Structural Equation Modelling.

3.10.7 Convergent Validity and Discriminant Validity

When using confirmatory factor analysis, the latent variables are assigned to specific factors that are the observed variables. Therefore, it is essential that variables with high factor loading are assigned to describe the respective factors in explaining the concept in the study (Wei & Nair, 2006). Hair *et al.* (2006) indicate that high convergent validity and high factor loading represent factor convergence on some common points. In the condition that if the variables have a low factor loading, the respective factors are constrained to zero (Hair *et al.*, 1998).

From a previous study done by Carmines and Zeller (1979), it indicated that the acceptance threshold for factor loading should be at 0.70 and above. For any reading on variables below the threshold of 0.70, the value shall be constrained to zero.

With CFA, the *Variance Extracted* value is calculated based on the standardized factor loadings. This is computed on the basis of total of all squared standardized factor loading (squared multiple correlations) and divided by the number of items. The rule of thumb for variance extracted is 0.5 or higher and it indicates the items have adequate convergence (Hair *et al.*, 2006). The variance extracted can be derived as per the following equation:

$$\text{Variance Extracted} = \frac{\sum SMC}{\sum SMC + \sum s_e^2}$$

The next item will be the reliability whereby construct reliability is measured by coefficient alpha and by composite reliability. The construct reliability and composite reliability are conducted to make sure that there is internal consistency within the items (Ku, 2011) or reliability coefficients between the five independent variables *i.e.* trust, perceived usefulness, perceived ease of use, internet self-efficacy, subjective norm, and the mediating variable of attitude towards internet banking usage while the dependent variable *i.e.* internet banking usage by using the Cronbach's alpha reliability coefficients from the value of 0 to 1.

In general, reliabilities of less than 0.60 are considered to be poor; those in the 0.70 range are acceptable and those over 0.80 are considered good (Sekaran, 2003). Others indicate that reliability between 0.6 and 0.7 is acceptable provided that other indicators of a model's construct validity are good (Hair *et al.*, 2006). To indicate that the items in each factor hang together as a set in measuring the concept are much stronger, 0.70 and above shall be considered (Sekaran, 2003; Hair *et al.*, 2006). From the result of the

testing, some items may be deleted to increase the alpha coefficients value. The composite reliability can be derived from the following equation:

$$\text{Composite Reliability} = \frac{(\sum fL)^2}{(\sum fL)^2 + \sum \epsilon}$$

Lastly, the discriminant validity is the measurement of which construct is totally distinct from other constructs. The high value of discriminant validity provides evidence that the construct is exclusive and captures some wonders which other measures do not display (Hair *et al.*, 2006). Discriminant validity can be measured by the Average Variance Extracted (AVE) against the correlation square. The absence of multicollinearity occurs when AVE values are greater than the correlation square (Fornell & Larcker, 1981; Hair *et al.*, 2006). However, it must be observed that when there is a cross loading between items, it is an indication that there is a problem of discriminant validity (Hair *et al.*, 2006). Therefore, fitting the model can be done by modification indices in the CFA (Hair *et al.*, 2006).

The average variance extracted can be derived from the equation below:

$$\text{Average Variance Extracted} = \frac{\sum_{i=1}^n R^2_i}{n}$$

3.10.8 Goodness of Fit Indices

In SEM, goodness of fit indices play an important role whereby this indices will confirm the model is fit to the data and it is based on three categories. The first category is the absolute fit with index such as chi square, root mean square error of approximation

(RMSEA), goodness of fit index (GFI) and adjusted goodness of fit index (AGFI). The second category is the incremental fit which consists of comparative fit index (CFI), Tucker Lewis index (TLI) and normed fit index (NFI). The last category is the parsimonious fit measured by Chi square/df. The goodness of fit indices acceptance level is demonstrated as per table 3.20.

Table 3.20
Goodness of Fit Indices Acceptance Level

Category	Name of Index	Acceptance Level
Absolute Fit	Chi Square	>0.05
	RMSEA	<0.08
	GFI	>0.90
	AGFI	>0.90
Incremental Fit	CFI	>0.90
	TLI	>0.90
	NFI	>0.90
Parsimonious Fit	Chi Square/df	<5.0

The goodness of fit indices indicates how well a data fits a model in a study and it reproduces the observed covariance matrix of the variables (Hair *et al.*, 2010). However, if the model does not produce the fit indices, steps need to be taken to fit the model by the confirmatory factor analysis. The confirmatory factor analysis is a multivariate technique to confirm a pre-specified relationship between the variables in the study (Hair *et al.*, 2010). The technique used to correct the fit indices is by Modification Indices (MI) where high values of cross loading of regression weight and covariance between items need to be deleted. This process will continue until the data is fit to the specified model in the study.

The absolute fit is the undeviating measure of how good the model specified reproduces the observed data by the researcher; by going further, how well the theory fits the sample data collected (Hair *et al.*, 2006). This is measured by the chi square statistic where it indicates a cross classification to examine the relationship that exists between two non-metric measures. The threshold for the chi square must be above 0.05 to be acceptable (Awang, 2013).

The RMSEA is the test of how good a model fits into the given population and it is not just for sample estimation in a study. The acceptable value for RMSEA is below 0.08 (Awang, 2013; Hair *et al.*, 2006). The GFI in fact is the effort to produce a fit statistic based on the criteria of being less sensitive to a given sample size (Hair *et al.*, 2006). For the GFI the bench mark value should be above 0.90 indicating a good fit (Awang 2013; Hair *et al.*, 2006). On the other hand, the AGFI takes into consideration the differing degrees of model complexity by adjusting the degree of freedom in the specified model against the total of the degree of freedom available. The AGFI threshold is above 0.90 indicating a good fit (Awang, 2013; Hair *et al.*, 2006).

The incremental fit indices is the assessment on how a specified model fits in comparison to an alternative model which is usually referred to the null model in the assumption that all the observed variables are uncorrelated (Hair *et al.*, 2006). However, in this study, two indices will be observed that is the CFI and TLI. The CFI is an incremental fit index that improvises the normed fit index which has desirable properties but not subtle to model complexity. The acceptable value of the CFI is above 0.90 to indicate model fit. The TLI is also a test of comparison between the theoretical

measurement model and the baseline model in a study. For a good fit model, the acceptable value should be more than 0.90 (Awang, 2013; Hair *et al.*, 2006).

The last category of goodness of fit indices is the parsimony fit indices that focuses on fitting of the model compared to the complexity of a model. Therefore, the indices provide information about the best competing model in a fitting process (Hair *et al.*, 2006). The Chi square/df value is acceptable when it is below 5.0 for the model to be considered fit (Awang, 2013; Marsh & Hocevar, 1985).

3.10.9 Structural Equation Modelling (SEM)

Structural Equation Modelling is a technique to test the hypothesized models describing the relationships between various variables whereby it is a hybrid of two statistical analyses *i.e.* the Factor Analysis and Simultaneous Equation Modelling (Bentler, 1995; Joreskog & Sorbom, 1993). It is also a method that encompasses the covariance structure analysis, latent variable analysis, confirmatory factor analysis, path analysis and linear regression analysis by estimating multiple and interrelated relationship between variables and the ability of the SEM to account for error of measurement in the model (Hair *et al.*, 1998).

The fitting of the model is done via the CFA of the measurement model of the individual latent variables. This process is performed until the goodness of fit indices is achieved. Thereafter, the second process is to fit the exogenous latent construct and the endogenous latent construct by observing the optimum acceptable values of the

goodness of fit indices. In final process, the hypotheses measurement model is fitted accordingly and it produces the final generated model for hypotheses testing (Awang, 2013). All of the above processes are done by looking into the highest cross factor loading and covariance values in the MI of the items and deletion is done repeatedly until the fit generated model is produced.

3.10.10 Hypotheses Testing

The hypotheses are tested via the final generated model in which the fit results are derived from the CFA. While the significance or non-significance of a hypothesis is based on where α and $p < 0.05$ indicates the hypothesis is supported and rejects the null hypothesis. In this study, 95% confidence interval and error of 5% is taken into consideration.

During the analysis using SEM, the standard coefficients and unstandardized will appear in the output whereby the standardized estimate is produced by items of the exogenous variables to a common scale (Hair *et al.*, 2010). It is preferable that the standardized coefficient is closer to 1 to show there is a strong relationship between the observed variables and latent variables (Hair *et al.*, 2010). The researcher reports based on the standardized estimate value. Likewise, the unstandardized estimate is not considered in the common scale of the exogenous variables.

The critical ratio is also reported in this study. Critical ratio is the value taken from the unstandardized estimates where variance estimate is divided with the standard error producing the variance estimate. The standard error represents the expected range of the coefficient through manifold samples of the data. It is useful in a statistical test of significance to see whether the coefficient is significantly different from zero at a certain percentage of confident interval. For example, 95% confidence interval where the p value should be < 0.05 in order to support the hypotheses (Hair *et al.*, 2010; Sekaran, 2003).

The mediating effect of an intervening variable is also examined in this study, whereby the SEM provides the platform for the analysis to be carried out. The mediating effect occurs when a third variable intervenes between two constructs. In this study, attitude is the intervening variable and it is analyzed by the method of bootstrapping in the SEM. Studies have shown that the bootstrapping method is powerful in testing the mediation and it has the advantage to control the type 1 error (probability of rejecting the null hypothesis), (Hair *et al.*, 2010; Hayes, 2009). It is also a preferred method of mediating test due to not taking the assumption of normality and distribution of sample in a study (Preacher & Hayes, 2008; 2004) compared to the mediations test of Baron and Kenny (1986) and Sobel mediation's test (Sobel, 1986) that needs the assumption of normality and sample distribution. Bootstrapping is a method of generating an empirical representation of the sampling distribution of the indirect effect by resampling of the sample for k times at least 1,000 times and preferably 5,000 at the produced path coefficient of the indirect effect (Hayes, 2009; Preacher & Hayes, 2008; 2004).

3.11 Justification for Using SEM

There are a few reasons that SEM is being used in this study. The first reason is in this research, multiple latent variables are being used to investigate and understand the area of inquiry. SEM is able to analyse with multiple latent variables, indirect effect and path analysis while other basic statistical methods are unable to deal with multiple latent variables and development of a complex model (Schumacker & Lomax, 2004). The use of an older generation of multivariate procedures is unable to examine a complex model (Schumacker & Lomax, 2004).

The second reason is that the SEM techniques can consider measurement error when statistically analysing data on latent and observed variables while the older generation of multivariate procedures has become a major issue and treatment on the error has to be taken separately when analysing the data (Schumacker & Lomax, 2004).

The third reason is SEM can analyse more advance theoretical models such as it can analyse group differences such as gender, age, socioeconomic status as examples of external variables that may impact the exogenous latent variables by assessing multiple group SEM models (Byrne, 2001; Schumacker & Lomax, 2004). These SEM models and techniques have enabled many researchers to analyse a complex observable facts that are not provided under the older generation of multivariate procedures (Schumacker & Lomax, 2004).

The forth reason, the SEM has the capability of alternative methods for modelling multivariate relations for estimating point or interval indirect effects that is the important feature available in the SEM methodology compared to the older version of multivariate procedures (Byrne, 2001).

The fifth reason, the SEM also has the capability of incorporating both the unobserved (Latent variables) and observed variables (Endogenous variables) in the analyses while the older generation of multivariate analysis is only capable of measuring the observed variable (Byrne, 2001).

The sixth reason, according to Kelloway (1998), the Structural Equation Modelling (SEM) is a powerful method to examine the structurally causal relationships among constructs or variables (Kelloway, 1998) and SEM is appropriate for simultaneous assessment of the relationships between multiple dependent and independent latent constructs (Hair *et al.*, 1998).

Lastly, SEM allows not only for the specifications and testing of complex path models (Kelloway, 1998), but also for more flexible assumptions while allowing interpretations such as the problem on multicollinearity (Kline, 1998).

3.12 Chapter Summary

This chapter explained the methodology of research framework followed by development of hypotheses based on the study. Subsequently, research instruments and measurement of research instruments were presented on exogenous and endogenous variables. Thereafter, pre testing of questionnaire and pilot study was explained. The data collection, population, and population frame of the study were thoroughly discussed. Further, it explained the sample size and sampling method. In addition, data collection procedures and techniques of data analysis were elaborated accordingly. Lastly, it explained the purpose of using the SEM method in this study.



CHAPTER 4

FINDINGS

4.0 Introduction

This chapter will exhibit the statistical results of this study. The chapter will be subdivided into seven sections. The first section presents the demographic analysis of the respondents of this study while, the second and third sections will provide the data screening analysis and data analysis. Henceforth, the fourth and fifth sections of this chapter will provide the measurement and structural models. The sixth section of this chapter will present the hypotheses testing. Finally, the chapter concludes with the summary of the findings.

4.1 Response Rate

A total of 509 questionnaires were collected, recording a response rate of 63.63%. However, only 479 questionnaires were usable after 30 questionnaires were discarded due to incomplete responses especially on the screening items such as maintaining a bank account and being an internet banking customer. According to Kelloway (1998), 200 samples are the minimum requirement for the SEM analysis however, in this study, the number of 479 questionnaires were usable and more than sufficient to analyse using the SEM.

4.2 Demographic Analysis

This section will present the Malaysian internet banking customers' characteristics from a sample size of 479 respondents that is summarized in Table 4.1. Among the five major banks undertaken in this study, the highest respondents are customers of CIMB Bank, recorded at 39.7% while the second largest respondent group is from Maybank which stood at 37.6%. The three remaining banks in descending orders are Public Bank (14%), AmBank (6.1%), and Hong Leong (2.7%). Subsequently, from the sample size of 479 respondents, 42.8% were male and 57.2% were female with 77.5% Malays followed by 13.8% Chinese, 5.0% Indians and remaining 3.8% representing other ethnic groups.

The respondents were also asked to indicate that their age and since it was reflected through the ratio data, age was further ranged into six categories. The mean respondents' age is 34.51 years at the standard deviation (SD) of 8.829 where the age spreads from a young age of 19 to 58 years old. Majority respondents (39.5%) belong to the age group of 26 to 33 years old whereas 24.6% of respondents fall into the categories of 34 to 41 years old, which happens to be the second largest group. The third largest age category (14%) falls between 18 to 25 years old followed by 42 to 49 (13.4%), 50 to 57 years old (8.4%) and the smallest percentage of respondent (0.2%) falls in the range of 58 to 63 years old.

The education levels of 479 respondents were gathered through seven categories. Apparently, most of the respondents hold a first degree (36.5%). Diploma holders represent the second largest respondent group (30.1%) followed by 22.1% having

secondary school qualification. 10.4% respondents have a master degree whereas PHD/DBA and other qualifications recorded 0.4%, respectively. In addition, information on income was also gathered in response to the scope of this research, which was designed to analyse the working class group hence respondents were categorized into five income groups. The largest percentage of respondents (42.6%) earned an income of between RM1, 001.00 to RM3, 000.00 monthly whereas 29.9% of respondents earned RM3, 001.00 to RM5, 000.00 monthly. This was followed by 21.1% of respondents netting income from RM5, 001.00 to RM10,000.00 per month while 4.4% raked in more than RM10, 000.00 monthly in contrary to 2.1% respondents earning less than RM1, 000.00 monthly.

This study has also taken into consideration the profession of the respondents as an element in the demographic analysis. Majority of the respondents were executives (29.4%) followed by clerical at 21.3% while heads of departments and managers made up 13.4% as compared to assistant managers who consist of 12.5% of the total respondents. Subsequently, professionals and consultants are at 8.8% and 5.8%, respectively. Other profession reflected only 4.2% of the respondents, however it was noted that a minority of the respondents' were technicians, heads of division, self-employed and CEO/President/Director/Managing Director at 1.9%, 1.7%, 0.8%, and 0.2%, accordingly.

Table 4.1

Demographic Characteristics

Characteristics	Frequency	Percentage
Bank Account		
Maybank Berhad	180	37.6
CIMB Bank Berhad	190	39.7
Public Bank Berhad	67	14
Hong Leong Bank Berhad	13	2.7
AmBank Berhad	29	6.1
Gender		
Male	205	42.8
Female	274	57.2
Race		
Malay	371	77.5
Chinese	66	13.8
Indian	24	5
Others	18	3.8
Education Level		
Primary School	Nil	Nil
Secondary School/SPM/STPM	106	22.1
Diploma	144	30.1
First Degree	175	36.5
Master Degree	50	10.4
Phd/DBA	2	0.4
Others	2	0.4
Age Group		
18-25	67	14
26-33	189	39.5
34-41	118	24.6
42-49	64	13.4
50-57	40	8.4
58-63	1	0.2
Monthly Income Level		
Less than RM1,000	10	2.1
RM1,001 - RM3,000	204	42.6
RM3,001 - RM5,000	143	29.9
RM5,001 – RM10,000	101	21.1
More than RM10,000	21	4.4

Table 4.1 (continued)

Demographic Characteristics

Characteristics	Frequency	Percentage
Profession		
Clerical	102	21.3
Executive	141	29.4
Assistant Manager	60	12.5
Manager/Head of Department	64	13.4
Head of Division	8	1.7
CEO/President/Director/ Managing Director	1	0.2
Consultant	28	5.8
Professional	42	8.8
Self Employed	4	0.8
Technician	9	1.9
Others	20	4.2

4.3 Internet Banking Users Characteristics

This research has been designed to capture users' characteristics, therefore 12 internet banking users' elements were analysed (Table 4.2). The login frequency per month by internet banking users were mainly (91.9%) gravitating between 1 to 16 times per month followed by a dip of 7.3% users login between 17 to 32 times per month. Others login display a meagre percentage of between 0.2% (33 to 48 and 65 to 80 logins) and 0.4% (49 to 64 logins).

The frequency of transactions for each login was also gathered and revealed that 62.4% of the internet banking users performed one to three transactions every time they login as compared to 24.8% who engage four to six transactions per login. Other number of transactions per login displays a meagre percentage such as 7% to 9% transactions at 4.8%, 10 to 12 transactions at 6.1%. The smallest number of percentage was 1% and

0.8% belonging to the groups of 13 to 15 and 19 to 21 transactions per login respectively; meanwhile, there were no respondents for 16 to 18 transactions per login.

In this study, element of customers' experience using the internet banking facility were included thereby a majority of the customers have three to four years of internet banking experience (26.1%) followed closely by the customers who have five to six years internet banking experience which stood at 25.3%. Customers who have experience between one and two years also contributed 16.7% of the respondents while other intervals of internet banking experience constitute less than one year, seven to eight years, nine to ten years and more than 10 years have 10.4%, 10.2%, 4.8% and 6.5%, respectively.

On the other hand, location of internet banking usage was also included in this study. Most of the internet banking customers performed their transactions at their home reflecting a 48.0% followed by at work (41.30%). However, other usage locations display non-favourable places to conduct internet banking such as at school, in the bank and other locations which contributed 0.4%, 9.4% and 0.8% respectively while in the library, at a friend's place and in a cyber café none of the respondents conducted their transaction.

This study also collected important data on the types of transactions performed by the respondents such as view account, fund transfer, bills payment, top up services, loan based services, investment based services, and insurance based services. Majority of the respondents would usually viewed their account (25.7%) followed closely by the

category of every time would viewed their account at 25.5%. The respondents that frequently viewed their account reflected 22.8% compared to sometimes, occasionally, rarely and never at 15%, 6.1%, 3.5%, and 1.5%, respectively.

On the other hand, the frequency of usually performed a fund transfer stood at 25.3% and the second largest of every time performed a fund transfer reflected 16.9% followed closely by sometimes at 16.7%. However, the frequency of occasionally, rarely and never were at 8.1%, 5.8%, and 5.6% accordingly. In the aspect of bills payment by the respondents, the category of usually indicates majority of the respondents performing their transactions (26.1%) followed by every time stood at 25.1% whereas respondents are also frequently performing their bills payment reflected at 23.4%. Other categories such as sometimes, occasionally, rarely and never are not favourable to the respondents with the percentage of 9.0%, 4.6%, 5.8% and 6.1%, respectively.

This study also included top up services as one of the characteristics' performed by the respondents. Majority of the respondents never use the top up services (32.8%) and most of them rarely use the services (12.7%). However, other categories such as occasionally, sometimes, frequently, usually and every time display with a lower support from the respondents at 8.6%, 12.3%, 11.5%, 10.2% and 11.9%, accordingly. Henceforth, the study considers the respondents' response toward usage of loan-based services of the internet banking. From the data gathered, a majority of the respondents did not use this services (23.8%) followed by frequently indicates 19.4%.

Other behaviour spread out with small differences in percentage *e.g.* rarely, occasionally, sometimes, usually and every time reflecting at 10.0%, 7.5%, 12.1%, 16.7% and 11.5%, respectively. On the other hand, the investment based services did not get support from the respondent (44.9%) whereas sometimes were at 15.2% followed by rarely at 13.6% compared to occasionally, frequently, usually and every time were at 6.5%, 10.0%, 6.1% and 2.1%, respectively.

In addition to this, the insurance or takaful based product through the internet banking did not get support from the internet banking customers (47%); this was followed by rarely used by the customers at 14.2%. There are customers who occasionally use, sometimes use and frequently use at 7.9%, 13.4% and 9.2%, respectively. In contrary, there are internet banking customers that usually and every time use the insurance or takaful product at 10.2% and 11.9%, respectively.

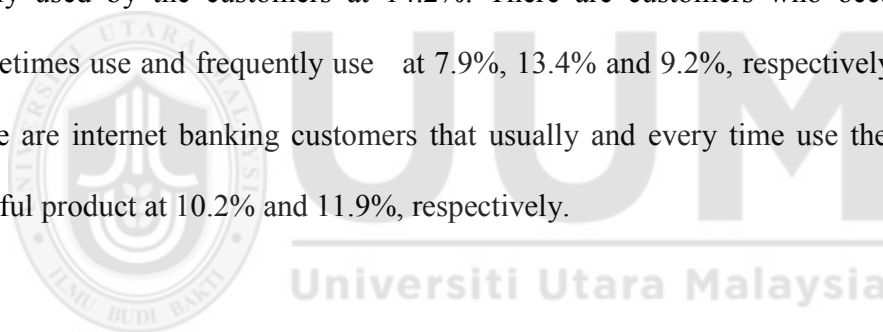


Table 4.2

Internet Banking Users Characteristics

Characteristics	Frequency	Percentage
Login Frequency Per Month		
1 to 16		
17 to 32	35	7.30
33 to 48	1	0.20
49 to 64	2	0.40
65 to 80	1	0.20
Number of Transactions Per Login		
1 to 3	299	62.40
4 to 6	119	24.80
7 to 9	23	4.80
10 to 12	29	6.10
13 to 15	5	1.00
16 to 18	0	0.00
19 to 21	4	0.80
Customers Experience		
Less than 1 year	50	10.40
1 to 2 years	80	16.70
3 to 4 years	125	26.10
5 to 6 years	121	25.30
7 to 8 years	49	10.20
9 to 10 years	23	4.80
More than 10 years	31	6.50
Usage Location		
At home	230	48.00
At work	198	41.30
At school	2	0.40
In a bank	45	9.40
In the library	0	0.00
At a friend's place	0	0.00
In a cyber cafe	0	0.00
Others	4	0.80

Table 4.2 (continued)

Internet Banking Users Characteristics

Characteristics	Frequency	Percentage
View Account		
Never	7	1.50
Rarely	17	3.50
Occasionally	29	6.10
Sometimes	72	15.00
Frequency	109	22.80
Usually	123	25.70
Every time	122	25.50
Fund Transfer		
Never	27	5.60
Rarely	28	5.80
Occasionally	39	8.10
Sometimes	80	16.70
Frequency	103	21.50
Usually	121	25.30
Every time	81	16.90
Bills Payment		
Never	29	6.10
Rarely	28	5.80
Occasionally	22	4.60
Sometimes	43	9.00
Frequency	112	23.40
Usually	125	26.10
Every time	120	25.10
Top up services		
Never	157	32.80
Rarely	61	12.70
Occasionally	41	8.60
Sometimes	59	12.3
Frequency	55	11.5
Usually	49	10.2
Every time	57	11.9

Table 4.2 (continued)

Internet Banking Users Characteristics

Characteristics	Frequency	Percentage
Credit/Loan/Financing Based Services		
Never	114	23.80
Rarely	48	10.00
Occasionally	31	6.50
Sometimes	58	12.10
Frequency	93	19.40
Usually	80	16.70
Every time	55	11.50
Investment Based Services		
Never	215	44.90
Rarely	65	13.60
Occasionally	36	7.50
Sometimes	73	15.20
Frequency	48	10.00
Usually	29	6.10
Every time	13	2.70
Insurance/Takaful Based Services		
Never	225	47.00
Rarely	68	14.20
Occasionally	38	7.90
Sometimes	64	13.40
Frequency	44	9.20
Usually	29	6.10
Every time	11	2.30
Account Opening(Savings, Current, Fixed Deposits, Investment, Loan/Financing & others)		
Never	214	44.70
Rarely	69	14.40
Occasionally	29	6.10
Sometimes	52	10.90
Frequency	55	11.50
Usually	39	8.10
Every time	21	4.40

4.4 Measure of Descriptive Statistics of Constructs

The descriptive analysis of mean and standard deviations of constructs are displayed in Table 4.3. It was observed that Perceived Usefulness has the highest mean value ($M=5.970$, $SD=0.787$), followed by Attitude ($M=5.830$, $SD= 0.870$), Perceived Ease of Use ($M=5.660$, $SD= 0.865$), internet Banking Usage ($M=5.400$, $SD=1.104$), internet Self Efficacy ($M=5.390$, $SD=0.811$), while the two lowest means are Subjective Norm ($M=5.170$, $SD= 0.922$) followed by Trust ($M=5.040$, $SD=0.830$). Likewise, internet Banking usage has the highest standard deviation (Mean= 5.40, $SD=1.104$) and the lowest was Perceived Usefulness (Mean= 5.970, $SD=0.787$). The highest minimum score was by Perceived Usefulness (Minimum =4) while the lowest minimum score was Subjective Norm (Minimum=1) and internet banking usage. All items are measured by the 7-point Likert scale.

Table 4.3

Descriptive Statistics for Overall Latent Variables (N=479)

Construct	Coding	Number of Items	Minimum	Maximum	Mean	Standard Deviation
Trust	TST	9	2	7	5.040	0.830
Perceived usefulness	PU	6	4	7	5.970	0.787
Perceived Ease of Use	PEU	6	2	7	5.660	0.865
Internet Self Efficacy	ISE	10	2	7	5.390	0.811
Subjective Norm	SN	5	1	7	5.170	0.922
Attitude	ATU	7	2	7	5.830	0.870
Internet Banking Usage	IBU	4	1	7	5.400	1.104

4.5 Data Screening Analysis

The data was further analysed using the statistical software of SPSS version 20 and AMOS version 20. The data cleaning was conducted namely recode, missing values, multivariate outliers, normality, and linearity. This is done in order to achieve optimum accuracy of the research results.

4.5.1 Missing Data

In this research, there are no missing values as the questionnaires were immediately checked by the administrator upon receiving from the respondents. If there were questions which were not answered by the respondent, the administrator would immediately request the respondents to complete the questionnaires. However, 30 questionnaires were discarded by the researcher due to the respondents not being an internet banking customer.

4.5.2 Response Bias

The response bias analysis was done by dividing the respondents into two groups based on the data collection time frame. The first group's data collected is from respondents 1 to 239 and the second group is from 240 to 479. An independent sample *t-test* was conducted to determine the differences between these two groups. Results indicated that five variables (perceived usefulness, internet self-efficacy, subjective norm, attitude and

internet banking usage) were not significant differences between group one and group two while two variables (trust and perceived ease of use) were significant between group one and group two. However, according to Clancy and Gove (1974), there are no significant steps to be taken to alleviate response bias and it does not contribute a significant effect on the study. Furthermore, a study affected by response bias still often contributes a high reliability (Gove & Geerken, 1977).

Table 4.4
Respond bias of Group 1 and Group 2

Construct	df	t-value	p value	Mean (Group 1 /Group 2)	Std Deviation (Group 1/Group 2)	Result
Trust	477	-0.664	0.034	5.01/5.06	0.791/0.868	sig
Perceived usefulness	477	-0.185	0.899	5.97/5.98	0.787/0.789	Not sig
Perceived Ease of Use	477	1.303	0.037	5.71/5.60	0.800/0.925	sig
Internet Self-Efficacy	477	0.208	0.128	5.40/5.39	0.776/0.846	Not sig
Subjective Norm	477	0.563	0.820	5.20/5.15	0.924/0.921	Not sig
Attitude	477	-0.181	0.059	5.82/5.83	0.810/0.928	Not sig
Internet Banking Usage	477	0.347	0.469	5.41/5.38	1.069/1.140	Not sig

4.5.3 Multivariate Outliers

Mahalanobis Distance measure was performed to determine the multivariate outliers in this research. Based on 47 observed variables in this study, the recommended chi square critical value is 86.66 at $p=0.001$ whereby all the variables were within acceptable threshold. The results of mahalanobis distance (Mah-1 in SPSS) were attached as *Appendix 6*.

4.5.4 Normality Assessment

To normalize the data in this study the technique of data transformation based on cumulative distributions function (CDFNorm) was deployed. The transformations was done to a maximum of two times as there were some items that do not bear the benchmark of aspiring critical ratio value of ± 2 . After the transformations, these items were relabeled with “T” in front of each item for single transformations and “TT” is labelled for double transformations.

The transformed items accomplished normality’s assumption except for perceived usefulness (Table 4.5), one item [TTPU4 (-4.344)], perceived ease of use, two items [TTPEU2 (-3.339) and TTPEU5 (-3.691)], internet self-efficacy, one item [TTISE4 (-3.135)], attitude, two items [TTATU4 (-3.212) and TTATU7 (-3.560)], and internet banking usage, one item [TTIBU4 (3.113)]. However, for sample size of more than 200, non-normal data would have negligible impact (Hair *et al.*, 2010). As such, this study would included all the items captured under the watchful items for structural model confirmatory factor analysis. Related comparison between multivariate normality indices, before and after transformation are presented in *Appendix 7*.

Table: 4.5

Multivariate Normality For All Items (AMOS output)

Construct	Item Coding	Skew	Critical Ratio	Kurtosis	Critical Ratio
Trust	TTTST1	-0.230	-2.054	-1.525	-6.811
	TTTST2	-0.234	-2.089	-1.605	-7.173
	TTTST3	-0.215	-1.920	-1.499	-6.699
	TTST4	-0.167	-1.492	-1.303	-5.819
	TTST5	-0.071	-0.635	-1.447	-6.463
	TTST6	-0.218	-1.945	-1.230	-5.494
	TTST7	-0.150	-1.338	-1.243	-5.555
	TTST8	-0.139	-1.239	-1.396	-6.237
	TTST9	-0.155	-1.388	-1.249	-5.578
Perceived Usefulness	TTPU1	-0.209	-1.868	-1.676	-7.489
	TTPU2	-0.331	-2.954	-1.318	-5.888
	TPU3	-0.203	-1.818	-1.164	-5.201
	TTPU4	-0.486	-4.344	-1.346	-6.012
	TTPU5	-0.025	-0.226	-1.379	-6.162
	TPU6	-0.210	-1.874	-1.080	-4.826
Perceived Ease of Use	TTPEU1	-0.178	-1.588	-1.217	-5.437
	TTPEU2	-0.374	-3.339	-1.310	-5.852
	TTPEU3	-0.289	-2.586	-1.392	-6.220
	TTPEU4	-0.244	-2.181	-1.436	-6.414
	TTPEU5	-0.413	-3.691	-1.402	-6.262
	TPEU6	-0.209	-1.866	-1.180	-5.274
Internet Self Efficacy	TTISE1	-0.283	-2.524	-1.403	-6.269
	TISE2	-0.011	-0.095	-1.401	-6.259
	TTISE3	-0.256	-2.285	-1.538	-6.871
	TTISE4	-0.351	-3.135	-1.458	-6.516
	TTISE5	-0.287	-2.565	-1.357	-6.061
	TTISE6	-0.271	-2.421	-1.298	-5.799
	TTISE7	-0.219	-1.960	-1.504	-6.717
	TTISE8	-0.242	-2.165	-1.483	-6.627
	TTISE9	-0.198	-1.769	-1.596	-7.131
	TTISE10	-0.309	-2.760	-1.407	-6.284

Table: 4.5 (continued)

Multivariate Normality For All Items (AMOS output)

Construct	Item Coding	Skew	Critical Ratio	Kurtosis	Critical Ratio
Subjective Norm	TSN1	0.060	0.535	-1.279	-5.715
	TSN2	-0.092	-0.822	-1.409	-6.297
	TSN3	0.138	1.232	-1.367	-6.109
	TSN4	-0.117	-1.043	-1.380	-6.167
	TTSN5	-0.226	-2.016	-1.545	-6.902
Attitude	TTATU1	-0.239	-2.134	-1.302	-5.818
	TTATU2	-0.219	-1.953	-1.223	-5.464
	TATU3	-0.208	-1.859	-1.139	-5.087
	TTATU4	-0.359	-3.212	-1.249	-5.579
	TTATU5	-0.193	-1.727	-1.328	-5.932
	TTATU6	-0.183	-1.634	-1.218	-5.439
	TTATU7	-0.398	-3.560	-1.233	-5.509
Internet Banking Usage	TTIBU1	-0.310	-2.768	-1.264	-5.647
	TTIBU2	-0.157	-1.401	-1.555	-6.947
	TTIBU3	-0.262	-2.338	-1.467	-6.555
	TTIBU4	-0.348	-3.113	-1.319	-5.891

4.6 Convergent and Discriminant Validity

The measure of construct reliability and validity of the data would be discussed through the followings sub topics.

4.6.1 Measure of Reliability of the Constructs

The reliability of the data is analyzed through coefficient Cronbach Alpha and Composite Reliability. The Cronbach Alpha for all constructs in this study range from 0.760 to 0.897. A Cronbach Alpha value of 0.70 and above demonstrates a high level of homogeneity of the scale (Nunnally, 1978). Therefore, the measures in this study are reliable and consistent with the data. The measure of reliability of the constructs is

provided in Table 4.6. The Composite Reliability in this study is between 0.984 and 0.939. The Composite Reliability of the value of 0.70 and above is considered an accepted norm (Nunnally, 1978).

Table: 4.6
Measure of Reliability of Constructs

Construct	No of Items	Cronbach Alpha	Composite Reliability
Trust	9	0.809	0.980
Perceived Usefulness	6	0.760	0.939
Perceived Ease of Use	6	0.798	0.978
Internet Self Efficacy	10	0.839	0.976
Subjective Norm	5	0.826	0.964
Attitude	7	0.897	0.980
Internet Banking Usage	4	0.860	0.984
Total Items	47		

4.6.2 Factor Loadings of Individual Construct

The factor loading measurement model (individual construct) indicates that all the items in the individual construct do not fall above the recommended accepted value (Table 4.7). The initial factor loadings value in this study did achieve the value above 0.5 for 42 items therefore supporting convergent validity except for five items. After the confirmatory factor analysis, a total of 17 items were deleted which included four items from the initial low factor loading value (TTST2, TTST8, TTPU4 and TTISE9) and the balance of three items (TTST5, TTPEU5 and TISE2) still reported with low factor loading values of 0.420, 0.348 and 0.304 respectively were retained in this study and captured under the watchful items for structural model (confirmatory factor analysis).

Meanwhile, it was observed that after the deletion of 17 items, the overall indices for individual construct achieved the fit values. According to Hair *et al.* (2006), a good factor loading must be above 0.50. In this study, a low factor loading of below than 0.50 will be discarded accordingly during the analysis of the structural model.

Table: 4.7

Factor Loadings of measurement model (Before and after fit)

Variable Name	Coding	Statement	Factor Loading Before Fit	Factor Loading After Fit
Trust	TTTST1	I trust that transaction conducted through my Internet banking website is secure and private.	0.720	0.746
	TTTST2	I trust payments made through my Internet banking channel will be processed securely.	0.460	
	TTTST3	I trust that my personal information on my Internet banking will be kept confidential.	0.738	0.784
	TTST4	My Internet banking website is characterized by the frankness and clarity of the services that is offers to the customers.	0.760	0.792
	TTST5	I think I can have confidence in the promises that my Internet banking websites makes.	0.460	0.420
	TTST6	I think that the design and commercial offerings of my Internet banking websites take into account the desires and needs of its customer.	0.664	0.573
	TTST7	I think that my Internet banking websites takes into account the repercussions that their actions could have on the customer.	0.597	
	TTST8	I think that my Internet banking websites has the necessary resources to successfully carry out its activities.	0.358	
	TTST9	I think that my Internet banking websites knows its customers well enough to offer them products and services adapted to their needs.	0.639	

Table 4.7 (continued)

Factor Loadings of measurement model (Before and after fit)

Variable Name	Coding	Statement	Factor Loading Before Fit	Factor Loading After Fit
Perceived Usefulness	TTPU1	Using Internet banking services saves my time.	0.733	
	TTPU2	I find Internet banking service is useful.	0.631	0.608
	TPU3	I find Internet banking a convenient service.	0.841	0.811
	TTPU4	Using Internet banking services able me to accomplish my banking activities more quickly.	0.408	
	TTPU5	I find that using Internet banking service makes it easier to do my banking activities.	0.885	0.909
	TPU6	I find using Internet banking services useful for my banking activities.	0.851	0.862
Perceived Ease of	TTPEU1	It is easy to get Internet banking to do what I want it to do.	0.802	0.834
	TTPEU2	I find Internet banking easy to use.	0.584	
	TTPEU3	My interaction with Internet banking is clear and understandable.	0.824	0.845
	TTPEU4	Learning to use Internet banking is easy for me.	0.797	
	TTPEU5	It is easy for me to become skillful at using Internet banking.	0.408	0.348
	TPEU6	I find an Internet banking to be flexible to interact with.	0.775	0.738
Internet Self	TTISE1	I feel confident to use search engines like Google, Bing, Yahoo and Ask.	0.567	
	TISE2	I feel confident to download necessary material from Internet.	0.328	0.304
	TTISE3	I feel confident to search for information on the Internet for banking products and services.	0.688	0.686
	TTISE4	I feel confident to visit my Internet banking websites to perform my banking transactions.	0.507	
	TTISE5	I feel confident to log in to my Internet banking websites if I have the user ID and password.	0.810	0.764
	TTISE6	Overall, I feel comfortable when I am using the Internet banking facility.	0.851	
	TTISE7	I could easily use the websites to find banking products and services.	0.780	
	TTISE8	I can get to a specific websites with an Internet browser.	0.801	0.804
	TTISE9	I feel comfortable searching the World Wide Web on my own.	0.374	
	TTISE10	I would be able to use Internet on my own to locate my Internet banking websites.	0.756	0.785

Table 4.7 (continued)

Factor Loadings of measurement model (Before and after fit)

Variable Name	Coding	Statement	Factor Loading Before Fit	Factor Loading After Fit
Subjective Norm	TSN1	My friends, family members, colleagues, bosses etc influence my decision to use Internet	0.512	0.457
	TSN2	I completely agree with them that I should use Internet banking services continuously.	0.511	
	TSN3	If I use Internet banking most of the people who are important to me will regard me as clever.	0.690	0.729
	TSN4	If I use Internet banking most of the people who are important to me will regard it as useful.	0.783	0.832
	TTSN5	If I use Internet banking most of the people who are important to me will regard it as valuable.	0.660	0.576
Attitude	TTATU1	I am positive towards the Internet banking.	0.855	
	TTATU2	It makes sense to use the Internet banking.	0.895	
	TATU3	People should adopt the Internet banking facility.	0.900	0.875
	TTATU4	Using the Internet banking facility is a good idea.	0.626	
	TTATU5	Using the Internet banking facility is a wise idea.	0.901	0.936
	TTATU6	I like the idea of using the Internet banking facility.	0.905	0.917
	TTATU7	Using the Internet banking facility would be pleasant.	0.605	0.588
Internet Banking Usage	TTIBU1	I use the Internet banking facility quite often for my banking needs.	0.849	0.849
	TTIBU2	I spend a lot of time on the Internet banking for my personal use.	0.597	0.597
	TTIBU3	I have been using the Internet banking for my personal use for a very long time ago.	0.831	0.831
	TTIBU4	I often use the Internet banking facility.	0.929	0.929

4.6.3 Measurement Model of Individual Construct

The construct validity is measured by the confirmatory factor analysis whereby the SEM program will compute the factor scores of each respondent and the relationship between constructs will be automatically corrected for the error in variance of the construct measures. Therefore, the construct validity provides confidence of measurement from

the sample taken representing the actual score that exists in the population (Hair *et al.*, 2006).

The confirmatory factor analysis for the initial and generated graphical of each exogenous and endogenous variable is presented in *Appendix 8*. The generated measurement model for goodness of fit indices of each construct is shown in Table 4.8. The value for absolute fit index *i.e.* the RMSEA is between 0.000 and 0.036 below the value of acceptance of 0.08 and GFI is between 0.993 and 1.000 above the value of acceptance of 0.90.

The Incremental fit index AGFI, CFI and TLI are all above 0.90 *i.e.* AGFI is between 0.994 and 0.999, CFI is between 0.996 and 1.00; and TLI is between 0.992 and 1.011. Henceforth, the parsimonious fit index of Chi square/df is below the level of acceptance value of 5.0. The reading for this index ranges from 0.131 to 1.608.

Table: 4.8

Goodness of Fit Indices for measurement model (Individual Construct)

Construct	χ^2	χ^2/df	p	GFI	AGFI	TLI	CFI	RMSEA
Trust	2.461	0.492	0.782	0.998	0.994	1.007	1.000	0.000
Perceived Usefulness	0.454	0.227	0.797	1.000	0.998	1.004	1.000	0.000
Perceived Ease of Use	2.686	1.343	0.261	0.997	0.986	0.997	0.999	0.027
Internet Self-Efficacy	8.038	1.608	0.154	0.993	0.980	0.992	0.996	0.036
Subjective Norm	0.131	0.131	0.717	1.000	0.999	1.011	1.000	0.000
Attitude	0.887	0.443	0.642	0.999	0.995	1.002	1.000	0.000
Internet Banking Usage	0.934	0.467	0.627	0.999	0.995	1.003	1.000	0.000

4.6.4 Measurement Model of Exogenous Variables

The initial five constructs of exogenous variables (Trust, perceived usefulness, perceived ease of use, subjective norm and internet self-efficacy) produce a good result of goodness of fit indices (Table 4.9). The initial results of estimation on the measurement model produced mix results. The value for absolute fit index of RMSEA is at 0.079 below the value of acceptance of 0.08, while the GFI is at 0.708 and did not meet the recommended value of below 0.09. On the other hand, the incremental fit index AGFI, CFI and TLI did not meet the standard value of above 0.90. *i.e.* AGFI at 0.667, CFI at 0.813 and TLI at 0.798. However, the parsimonious fit index of Chi²/df is at 3.984 below the acceptance value of 5.00. The p value did not meet the recommended value of above 0.05 *i.e.* at 0.000.

Table: 4.9
Goodness of Fit Indices for CFA for Exogenous

Construct	χ^2	χ^2/df	p	GFI	AGFI	TLI	CFI	RMSEA
Initial	2326.370	3.984	0.000	0.708	0.667	0.798	0.813	0.079
Revised	38.741	1.139	0.264	0.986	0.972	0.996	0.998	0.017

The generated measurement model is analysed based on the modification indices and regression weight that are indicated in the AMOS analysis. During the AMOS analysis, 25 items from the five constructs were deleted mostly with high M.I indices of the covariance. Therefore, it produces a model fit as stated in Table 4.10. The generated measurement model produces results within the recommended value as suggested. The value for absolute fit indices for RMSEA is at 0.079 while GFI is at 0.986 indicates a

good fit model. Hence, the incremental fit indices of AGFI (0.972), CFI (0.998) and TLI (0.996) also show a good fit. For the parsimonious fit index of Chi²/df is at 1.139 displays fit indices. Lastly, the p value is within the recommended value as suggested at 0.264. The model for initial and generated is shown in *Appendix 9a* and *Appendix 9b*.

4.6.5 Measurement Model for Endogenous Variables

The initial two constructs for measurement model for endogenous variables (attitude and internet banking usage) produce good results of goodness of fit indices (Table 4.10). The results of the initial measurement model did not meet the recommended value for the model fit. The RMSEA (0.160) and GFI (0.846) fail to meet the standard value while AGFI (0.846), TLI (0.860) and CFI (0.890) are almost close to the recommended values. On the other hand, chi square/df (13.293) and p value (0.000) also failed to meet the suggested values.

Table: 4.10
Goodness of Fit Indices for CFA for Endogenous

Construct	χ^2	χ^2/df	p	GFI	AGFI	TLI	CFI	RMSEA
Initial	571.595	13.293	0.000	0.846	0.764	0.860	0.890	0.160
Revised	8.860	1.108	0.354	0.994	0.984	0.999	0.999	0.015

The generated measurement model is analysed based on the modification indices of covariances and regression weights of the AMOS analysis. During the AMOS analysis, five items were deleted due to high values of modification indices of covariances and the results of the model fit are presented in Table 4.11. The generated measurement model indicates a goodness of fit indices values as suggested. The value for absolute fit indices

of RMSEA (0.015) and GFI (0.994) show a good fit while the incremental fit index of AGFI (0.984), TLI (0.999) and CFI (0.999) also show a good fit. Other indices such as parsimonious fit index of chi square/df have a good fit at 1.108. Lastly, the p value is at 0.354 within the recommended value suggested. The initial and generated model of endogenous variables is presented in *Appendix 10*.

4.6.6 Discriminant Validity

The correlation estimates of the hypothesized constructs for exogenous and endogenous variables are presented in Table 4.11. The correlations estimate of the hypothesized constructs of exogenous and endogenous variables falls between 0.450 and 0.838. A value less than 0.90 indicates the non-multicollinearity existence (Hair, Black, Babin and Anderson, 2010). Therefore, it can be concluded that each of the variables are distinct from others.

Table: 4.11
Correlation & Correlation Square Matrix among Exogenous and Endogenous Variables

Variable Name	1	2	3	4	5	6	7
Trust (1)	1	0.348	0.403	0.465	0.242	0.372	0.342
Perceived Usefulness (2)	0.590***	1	0.692	0.531	0.231	0.613	0.517
Perceived Ease of Use (3)	0.635***	0.832***	1	0.623	0.214	0.599	0.557
Internet Self Efficacy (4)	0.682***	0.729***	0.789***	1	0.346	0.702	0.558
Subjective Norm (5)	0.492***	0.481***	0.463***	0.588***	1	0.286	0.203
Attitude (6)	0.610***	0.783***	0.774***	0.838***	0.535***	1	0.666
Internet Banking Usage (7)	0.585***	0.719***	0.746***	0.747***	0.450***	0.816***	1

Significance Level: *** = .001

Note: Values below the diagonal are correlation estimates among constructs, diagonal elements are construct variances, and values above the diagonal are squared correlation. Since all correlations are significant, mediation is plausible

Discriminant validity can also be measured by Average Variance Extracted (AVE) against correlation square. The discriminant validity for the hypothesized constructs is between 0.990 and 0.996 while the reading for correlation square is between 0.203 and 0.702 (Table 4.12). This result indicates that there is absence of multicollinearity when AVE values are greater than the correlation square (Fornell and Larcker, 1981). Therefore, the constructs are independent by itself and further analysis for this study should proceed.

Table: 4.12

Average Variance Extracted (AVE) Matrix of Exogenous Variables and Endogenous Variables

Variable Name	1	2	3	4	5	6	7
Trust (1)	1						
Perceived Usefulness (2)	0.992	1					
Perceived Ease of Use (3)	0.991	0.994	1				
Internet Self Efficacy (4)	0.990	0.993	0.992	1			
Subjective Norm (5)	0.990	0.992	0.992	0.991	1		
Attitude (6)	0.993	0.995	0.995	0.994	0.993	1	
Internet Banking Usage (7)	0.993	0.995	0.994	0.994	0.993	0.996	1

4.7 The Structural Model

This section will discuss the hypothesized structural model and will proceed with the hypotheses testing based on the generated structural model. This is done in tandem with addressing the research objectives a, b, and c (Table 4.13).

The initial indices derived from the hypothesized structural model did not meet the threshold value except for RMSEA, which is 0.074. Even though GFI, AGFI, TLI, CFI and p value fall short from the recommended value, it is expected to improve by

necessary treatment of the confirmatory factor analysis. However, during this analysis, it was found that there are no new linkages proposed by the system and therefore this study will be confined to the hypothesized model. The confirmatory factor analysis was undertaken whereby 32 items were deleted based on modification indices method.

Eventually, a fit model (generated) was achieved, recording the absolute fit of GFI (0.977), incremental fit of AGFI (0.960), TLI (0.994) and CFI (0.996), with a parsimonious fit of chi square/df at 0.102. The p value stood at 0.102 within the recommended value of above 0.05. It was also observed that the RMSEA value improved further at 0.022. The hypothesized structural model and generated structural model for internet banking usage is displayed in Figures 4.3a and 4.3b.

Table: 4.13
Goodness of Fit Indices for Structural Model

Construct	χ^2	χ^2/df	p	GFI	AGFI	TLI	CFI	RMSEA
Initial	3670.903	3.624	0.000	0.663	0.625	0.813	0.825	0.074
Revised	84.267	1.221	0.102	0.977	0.960	0.994	0.996	0.022

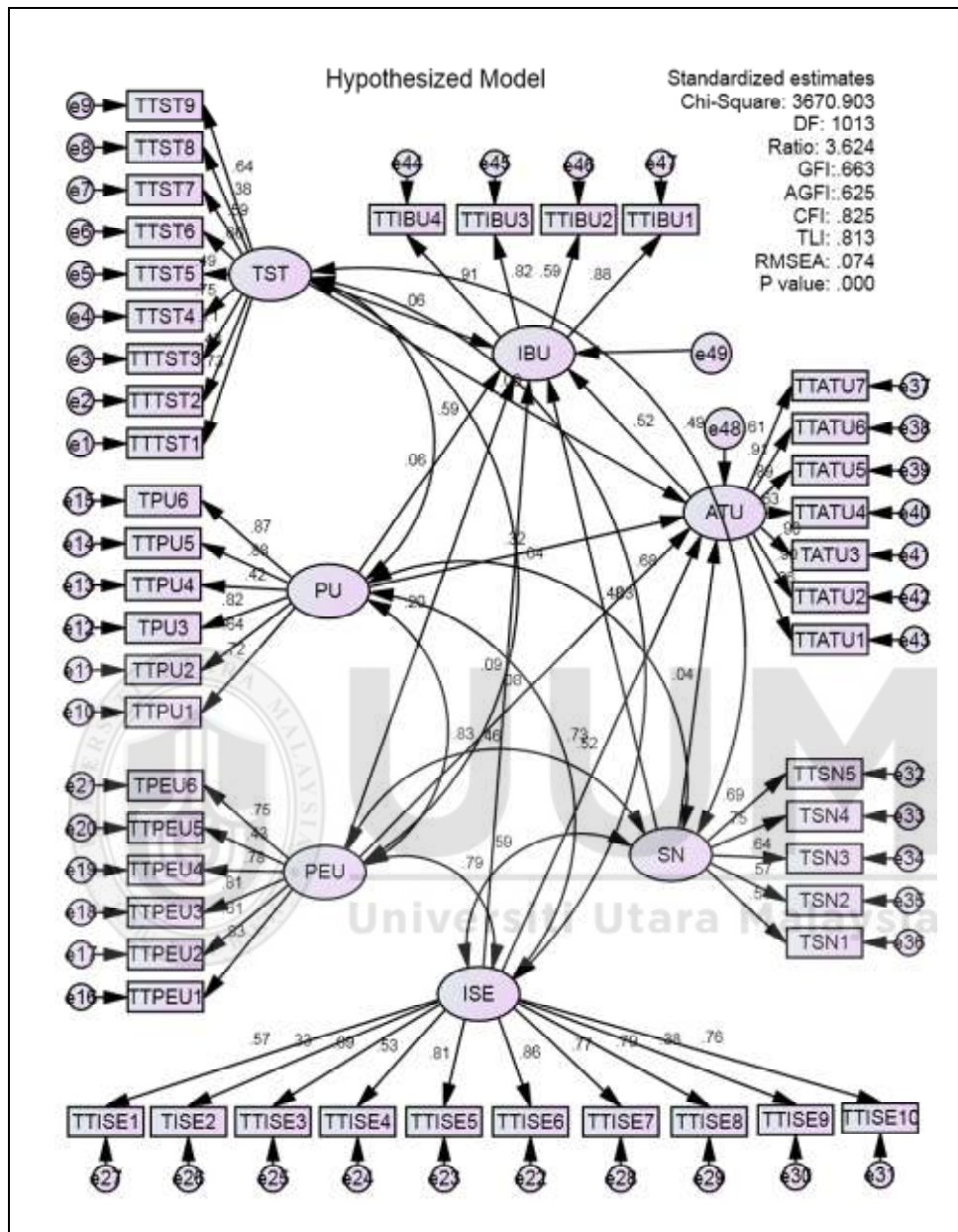


Figure: 4.3a
 Hypothesized Structural Model for Internet Banking Usage

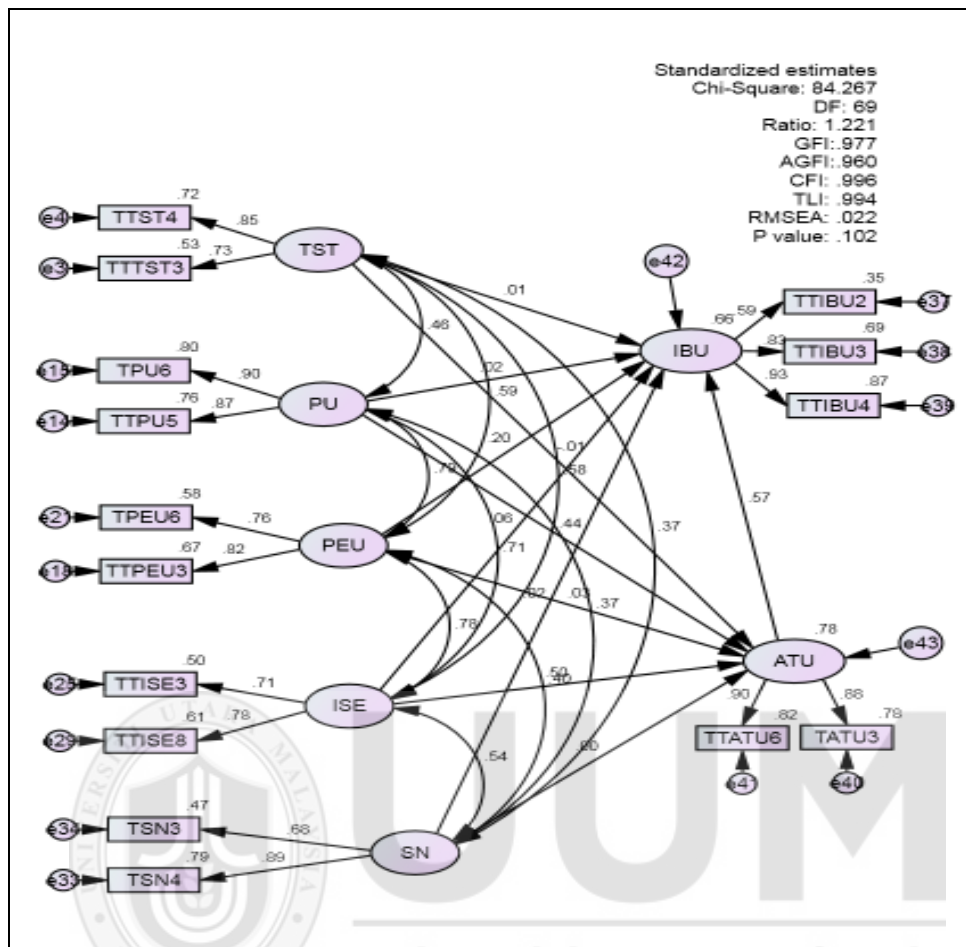


Figure: 4.3b
Generated Structural Model for Internet Banking Usage

4.8 Hypotheses Testing for Causal Effects (Latent Constructs)

The hypotheses testing were conducted based on the final generated model presented as per Figure 4.3b. This hypotheses testing will be categorized into two sections namely the direct causal effect and indirect causal effect (see Table 4.14).

4.8.1 Direct Causal Effect

The direct causal effect will be based on the standardized regression weight for each causal relationship that is related to the hypotheses. The results from this analysis are shown in Table: 4.14 while the full AMOS text output will be displayed as per *Appendix II*.

Table: 4.14

Direct Causal Effect of Generated Model

Hypotheses	Causal Relationship	Beta Coefficient	Critical Ratio	P Value	Status
Direct Determinants of Internet Banking Usage (H1)					
H1a	Trust → Internet Banking Usage	0.013	0.242	0.809	Not Significant
H1b	Perceived Usefulness → Internet Banking Usage	0.017	0.201	0.840	Not Significant
H1c	Perceived Ease of Use → Internet Banking Usage	0.200	1.971	0.049	significant (+ive)
H1d	Internet Self-Efficacy → Internet Banking Usage	0.056	0.464	0.643	Not Significant
H1e	Subjective Norm → Internet Banking Usage	0.023	0.475	0.635	Not Significant
H1f	Attitude → Internet banking Usage	0.567	5.197	***	significant (+ive)
Direct Determinants of Attitude towards Internet Banking Usage (H2)					
H2a	Trust → Attitude	-0.014	-0.270	0.787	Not Significant
H2b	Perceived Usefulness → Attitude	0.437	6.030	***	significant (+ive)
H2c	Perceived Ease of Use → Attitude	0.026	0.265	0.791	Not Significant
H2d	Internet Self-Efficacy → Attitude	0.501	4.689	***	significant (+ive)
H2e	Subjective Norm → Attitude	-0.002	-0.050	0.960	Not Significant

4.8.2 Direct Determinants of Internet Banking Usage

The first part of this analysis is to determine the direct determinants of internet banking usage that have six hypotheses in this study as shown in Table: 4.14. The first hypothesis (H1a) specified, is trust has a positive significant relationship on internet banking usage. This hypothesis is not supported ($\beta=0.013$, $CR=0.242$ and $p=0.809$), while, the second

hypothesis (H1b) predicted perceived usefulness has a positive significant relationship on internet banking usage. This hypothesis is also not supported in this study ($\beta=0.017$, $CR=0.201$ and $p=0.840$). On the other hand, the third hypothesis (H1c); perceived ease of use has a positive significant relationship towards internet banking usage, is supported ($\beta=0.200$, $CR= 1.971$ and $p=0.049$). The fourth hypothesis (H1d), internet self-efficacy has a positive significant relationship on internet banking usage, is not supported ($\beta=0.056$, $CR=0.464$ and $p=0.643$). Likewise, the fifth hypothesis (H1e) forecast subjective norm has a positive significant impact on internet banking usage, is also not supported ($\beta=0.023$, $CR=0.475$ and $p=0.635$). Lastly, the sixth hypothesis (H1f) is attitude towards internet banking will have a positive significant relationship on usage of internet banking. The results indicate that there is a positive significant relation between attitude and internet banking usage ($\beta=0.567$, $CR=5.197$ and $p=0.001$)

4.8.3 Direct Determinants of Attitude towards Internet Banking usage

The second part of this analysis is to determine direct determinants of attitude towards internet banking usage that have five hypotheses and the results are shown in Table: 4.14. The first hypothesis (H2a), trust has a positive significant relationship towards attitude of internet banking usage. Result indicates that this hypothesis is not supported ($\beta= -0.014$, $CR= -0.270$ and $p= 0.787$). Henceforth, the second hypothesis (H2b); is perceived usefulness has a positive significant relationship towards attitude of internet banking usage. Result shows that this hypothesis is supported ($\beta=0.437$, $CR=6.030$ and $p=0.001$), while, the third hypothesis (H2c); stated perceived ease of use has a positive

significant relationship towards attitude of internet banking usage, is not supported ($\beta=0.026$, $CR=0.265$ and $p=0.791$). The fourth hypothesis (H2d) in this study, there is a positive significant relationship between internet self-efficacy and attitude of internet banking usage, is positively significant ($\beta= 0.501$, $CR= 4.689$ and $p= 0.001$). Lastly, the fifth hypothesis (H2e) stated is subjective norm has a positive significant relationship towards attitude of internet banking usage and it is not supported ($\beta=-0.002$, $CR=-0.050$ and $p=0.960$).

4.8.4 Mediating Effect of Attitude towards Internet Banking Usage

The third part of this analysis is to determine the mediating effect of attitude towards internet banking usage that has five hypotheses and the results are shown in Table: 4.15. The first hypothesis (H3a), attitude towards internet Banking mediates the relationship between trust and internet banking usage. The results show that the indirect effect $\beta=0.008$ with Boot confidence interval of 95%, lower bounds at -0.087 and upper bound at 0.062 and it is straddle at zero in between the lower and upper bound. Therefore, indicating that there is no mediation effect and this hypothesis is not supported.

Henceforth, the second hypothesis (H3b), perceived usefulness would have a positive significant relationship on attitude towards internet banking usage. The results indicate the indirect effect $\beta=0.248$ with Boot confidence interval of 95%, lower bound at 0.113 and upper bound at 0.433 and it does not straddle at zero in between the lower and upper bound. Therefore, it can be concluded that there is a mediation effect and this hypothesis is supported.

The third hypothesis (H3c), attitude towards internet banking mediates the relationship between perceived ease of use and internet banking usage. Results proof the indirect effect $\beta=0.015$ with Boot confidence interval of 95%, lower bound at -0.153 and upper bound at 0.152 and it straddles at zero in between the lower and upper bound. Therefore, indicating that there is no mediation and this hypothesis is not supported.

The fourth hypothesis (H3d), attitude towards internet banking mediates the relationship between internet self-efficacy and internet banking usage. Result indicates the direct effect $\beta=0.284$ with Boot confidence interval of 95%, lower bound at 0.138 and upper bound at 0.560 and it does not straddle at zero in between lower and upper bound. Therefore, there is indication that there is a mediation effect and this hypothesis is supported.

Lastly, the fifth hypothesis (H3e), attitude towards internet banking mediates the relationship between subjective norm and internet banking usage. It was proven the direct effect $\beta=-0.001$ with Boot confidence interval of 95%, lower bound at -0.068 and upper bound at 0.064 and it straddles at zero in between lower and upper bound. Therefore, it indicates that there is no mediation effect and this hypothesis is not supported.

Table: 4.15

Mediation Effect of Attitude on Internet Banking Usage

Constructs	Point Estimate	Product of Coefficients		Bootstrapping				Result
				Percentile 95% CI		BC 95% CI		
		SE	Z	Lower	Upper	Lower	Upper	
Indirect Effects								
Trust	0.008	0.037	0.216216	-0.086	0.063	-0.087	0.062	No Mediation
Perceived Usefulness	0.248	0.081	3.061728	0.112	0.429	0.113	0.433	Mediation
Perceived Ease of Use	0.015	0.080	0.187500	-0.177	0.141	-0.153	0.152	No Mediation
Internet Self-Efficacy	0.284	0.111	2.558559	0.139	0.564	0.138	0.560	Mediation
Subjective Norm	-0.001	0.033	-0.030303	-0.070	0.062	-0.068	0.064	No Mediation

4.9 Squared Multiple Correlation for Endogenous Latent Variables

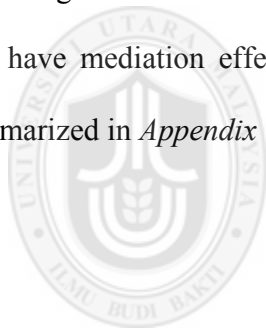
In this study, there are two squared multiple correlation (R^2) for endogenous variables namely attitude and internet banking usage. The squared multiple correlation for attitude stood at 0.776 and internet banking usage at 0.656 and this represents that attitude has contributed 77.60% of variance being explained by trust, perceived usefulness, perceived ease of use, internet self-efficacy and subjective norm while internet banking usage contributed 65.60% of variance being explained by attitude with trust, perceived usefulness, perceived ease of use, internet self-efficacy and subjective norm.

4.10 Summary

In this chapter, this research has addressed the research objectives by several analyses based on data collected in this study. Further, the generated conceptual model in this study maintained the original constructs and respective items of each individual

constructs with their factor loading are summarized in *Appendix 12a*, Table: 4.16. All retained items are above the threshold of above 0.50 ranging between 0.59 and 0.93 (Hair *et al.*, 2006).

The previous chapter, this research presented sixteen hypotheses, which were divided, into three parts. The first part is the direct determinants of internet banking usage consisting of six hypotheses; two are supported and four are not supported while the second part is the direct determinants of attitude towards internet banking usage consisting of five hypotheses; two are supported and three are not supported. Lastly, the mediating effect of attitude towards internet banking usage consists of five hypotheses; two have mediation effects and three do not have mediation effects. The results are summarized in *Appendix 12b*, Table 4.17.



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CHAPTER 5

DISCUSSION AND CONCLUSION

5.0 Introduction

This chapter discusses the research outcomes by corresponding the research findings against the literature and research objectives of this study. The first section displays the discussion on the research findings and its relevant literature while, the second and third sections discuss the theoretical and practitioner implications. Next, the fourth section deliberates the limitations of this study. Thereafter, the fifth section highlights the recommendations for future research. Lastly, the sixth section delivers the conclusion of this study.

5.1 Discussion of Research Findings

The deliberations of the research findings focuses on the 16 hypotheses of which four are supported and two have a mediations effect. This will also answer the non-usage of internet banking services by the retail banking customers in Malaysia. Next, the discussion is also focused on the usage of the extended TAM as the underpinning theory applicability in this study. This discussion is pinned towards the research findings aligned with the research objectives of this study.

5.1.1 Direct Impact of Internet Banking Usage

The research objective one is the hypothesis that the trust, perceived usefulness, perceived ease of use, internet self-efficacy, subjective norm and attitude have a positive significant effect on internet banking usage (H1a to H1f). The results show that two hypotheses are supported, namely perceived ease of use and attitude towards internet banking usage (H1c & H1f), while trust, perceived usefulness, internet self-efficacy and subjective norm are not significant (H1a and H1b, H1d and H1e). This study may conclude that perceived ease of use and attitude are the drivers of the internet banking usage. The attitude is the positive evaluation of the internet banking usage while the perceived ease of use is the thought that using the system is easy. The results indicate that the more positive the attitude of the customers, the more usage of the internet banking.

The result of ease of use towards the usage of internet banking is positively significant in this study therefore giving the meaning of the ease of use of the internet banking system will have a positive impact on the customers' usage (Lin & Nguyen, 2011; Safeena *et al.*, 2010). Previous study also indicates that internet banking users have a positive opinion of usage of the internet banking via the ease of use compared to non-adopters of the internet banking facility (Munusamy *et al.*, 2012). Other study also confirmed that perceived ease of use is a strong predictor of internet banking usage (Kasheir *et al.*, 2009). The ease of use of the internet banking facility is based on how the layout of the internet banking web page design is easy for the customer to understand and easy to

navigate and this may cause continued usage of the system hence customers satisfaction due to good service quality of internet banking provided by the bank (Ghost & Gnanadhas, 2011; Momeni *et al.*, 2013; Ravichandran, Bhargavi, & Arun, 2010). Other possible reasons could be customers interaction with internet banking system is very clear and easily understood without much mental effort, thus enabling usage of the system. Customers also experienced that learning the system which is user friendly, is in actual fact easy, hence elevating their skills. Therefore, the internet banking system is flexible to interact and engaging in banking transactions. Due to this, ICT researchers should take into consideration the role ease of use in the prediction of ICT usage in other field of studies.

The attitude towards internet usage in this study is consistent with previous studies (Alkafagi *et al.*, 2015; Alshare *et al.*, 2011; Porter & Donthu, 2006; Thomas, 2011) where the casual path is strongly significantly positive between attitude and internet usage. For example, in a banking study by Alkafagi *et al.* (2015), it was found that attitude is a strong predictor of internet banking usage and this is due to customers who have a better understanding of the internet banking system. On the other hand, in the other areas such as e-shopping, e-learning and general internet usage itself, support is shown (Al-Adwan *et al.*, 2013; Elkaseh, *et al.*, 2015; Read *et al.*, 2011; Thomas, 2011).

Therefore, the outcome of attitude and internet banking usage relationship of this study is an evident that strong correlation exist between them and play vital role on the prediction of internet banking usage. This shows that the positive attitudinal belief by the Malaysian banking customers reflecting the attitude as an important element prior to

internet banking usage concurred by many studies abroad (Chinho & Conghoang, 2011). This glaring results should benefit ICT researchers in their quest to investigate further in other study setting, uncovering how attitudinal belief could assist usage in the future.

On the other hand, the possibility of attitude to have an impact on the internet banking usage is due to the customers relying on the attitude that may influence them to perform the internet banking usage based on the wise and pleasant ideas that give them a belief that online banking is a convenience way of doing banking transactions (Maduku, 2013; Mazhar *et al.*, 2014; Suh & Han, 2002). Likewise, previous empirical research also suggests that the individual's capability of using an information system successfully to complete a task impacts his or her attitude and usage of the information system (Compeau & Higgins, 1995; Compeau *et al.*, 1999; Reid & Levy, 2008).

Banking industry especially in the area of retail banking must provide a pleasant attitude to the customers to use the internet banking facility. For instance, at the branch operation in many commercial banks in Malaysia, the positive evaluation of attitude towards the usage of internet banking is done in many ways; for example, when during opening of account either current account or savings account, the frontline staff plays an important role in encouraging and educating the customers on how important it is to have an internet banking facility for performing their banking transaction via the web. This must be planted to customers that online banking is vital in helping customers in managing their finance effectively and efficiently (Maduku, 2013).

It is also important for the commercial banks to promote the usage by non-adopters on internet banking in many ways as study indicated strong factors that influence the respondents' decision to use Internet banking are one self and promotions by banks (Adam *et al.*, 2012). This can be done by ways of training in the banking website, teaching the customers on how to operate the internet banking. Dialogues with customers can be done by the call centres of every commercial bank to give confidence to these customers on the usage of the internet banking facility. Lastly, a marketing campaign need to be done to promote internet banking usage for this group of customers (Munusamy *et al.*, 2012). Contrary to the results, trust is not a predictor of usage in this study. This result is consistent with the past studies done by Manzano *et al.* (2009). In addition, Nguyen *et al.* (2014) conducted a study in Vietnam to find the impact of trust and internet banking usage however trust did not support usage of internet banking and the likelihood is because customers did not rely on trust as their online information is not protected by the banks.

Similarly, recent research also conducted by Al-Fahim (2012) in Malaysia indicates that the trust did not appear as a predictor of internet banking usage. However, most of the previous studies produced a positive significant relationship between trust and internet banking usage (Foon & Fah, 2011; Mansumittrchai & Al-Malkawi, 2011; Manzano *et al.*, 2009; Usoro *et al.*, 2010). It may be concluded that the usage of internet banking facility by the adopters did not support the trust as a factor of internet banking usage due to trust is related to the security and privacy concern provided by the banks (Mansumittrchai & Al-Malkawi, 2011).

In conclusion, this study also reveals that trust is not a predictor of internet banking usage. Perhaps, this is due to the respondents of this study who resides mainly in Gen Y group. Gen Y is a well educated group of respondents (39.5% consists of the age group of 26 to 33 years and 66.6% with diploma and first degree). However, there is a possibility that this relationship may be significance if majority respondents in future study do not belong to this age group. Hence, for computer and internet illiterate customers may support trust towards internet banking usage. This is because of this group of customers with full knowledge and technological skills have trust and awareness about security and privacy issues therefore they tend to adopt the internet banking (Jeong & Yoon, 2013). While, the ICT researchers may explore further how trust can increase usage of internet.

On the other hand, the perceived usefulness is also not a predictor of internet banking usage in this study. This is consistent with the research done by Bashir & Madhavaiah (2015) in India that shows perceived usefulness did not support usage of internet banking as the customers perceived the internet banking system is complicated to use. This is consistent with the study done by Amin *et al.* (2012) in mobile banking in Malaysia in view of the customers in Sabah who have a little awareness of the usefulness of internet banking as a channel of delivery.

However, most of the previous studies done on online banking environment supported perceived usefulness as one of the predictors of internet banking usage (Eriksson *et al.*, 2005; Lin & Nguyen, 2011; Lule *et al.*, 2012; Manzano *et al.*, 2009; Pikkarainen *et al.*, 2004; Safeena *et al.*, 2010; Safeena *et al.*, 2011). Thus, the non-supported result in this

study may be caused by the individual belief that the internet banking facility does not enhance the capability of their banking transactions need (Amin *et al.*, 2012).

Furthermore, customers did not believe the internet banking is useful for their banking transactions or the internet banking able to accomplish their banking activities faster compare to conventional banking. This belief causes the relationship between perceived usefulness and internet banking usage unsupported in relation to little awareness of usefulness on internet banking system for their daily banking needs. Moreover, lack of information about a service and its benefit is a major barrier of internet banking adoption (Sripalawat, Thongmak & Ngramyarn, 2011). Therefore, to address this shortcomings banks should create awareness campaign to improve acceptance and usage rate. Notwithstanding, ICT researchers can investigate this predictor to close the gap in other field of studies on how useful a system that can assist their daily life.

The internet self-efficacy does not have an influence towards the usage of internet banking in this study. This is corresponding with a previous research done Abdulkadir *et al.* (2013) to find the impact of internet self-efficacy on internet banking usage via mobile banking in Malaysia. The non-support nature may be due to lack of internet self-efficacy among mobile banking customers, who believe that the system is not easy to use. In fact another study done in Mexico by researchers, Mansumittrchai and Al-Malkawi (2011) showed that internet self-efficacy does not promote internet banking usage. This could probably prevail as web page is not perceived being user friendly and therefore posing difficulties in completing online banking.

Similarly, Chen *et al.* (2010) displayed the same results indicating that there is no support for internet proficiency towards usage of online shopping as the skills of internet self-efficacy is not important for online purchase. On the other hand, another study but on non-banking industry contradicts to this findings (Trivedi & Kumar, 2014). In the area of banking study compared to non-banking studies, it was observed that internet self-efficacy plays an important role for the bank customers to use internet banking. This may prove that lack of internet self-efficacy may hinder banks customers' to adopt internet banking (Mansumittrchai & Al-Malkawi, 2011).

Some studies have indicated that lack of skills and knowledge on internet self-efficacy may cause financial loss to the customers (Mansumittrchai and Al-Malkawi (2011). This may be contributed by the belief that transactions conducted via internet banking website is vulnerable, not secure and private. In addition, customers may feel that their personal information post internet banking activities will not be kept confidential by the bank hence, customers may feel less confident to visit their internet banking website. Likewise, findings showed that older people with low income category reported themselves were lack of awareness towards internet banking and its advantage, lack of internet access and internet confidence, inadequate knowledge and support to use were among the reasons of not using internet banking services (Fah & Foon, 2011). Therefore, customers shying away of using the internet banking. However, ICT researchers could investigate further on the issue of internet self-efficacy by older people employing different set of methodology to find out how older people can adopt the internet banking facility.

On the latent factor of subjective norm, there is no relationship between the subjective norms towards the usage of internet banking in this study. This result is similar to the study done by Mansumitrchai and Al-Malkawi (2011) in a banking study in Mexico on adopters and non-adopters of internet banking. Similarly, Juwaheer *et al.* (2012) performed a research in Mauritius and the result was not supported. In India, a study was done by Bashir and Madhavaiah (2015) in banking giving the same result. Contrary to all these studies, there are studies in banking that show subjective norm as a predictor of internet banking usage (Abdulkadir *et al.*, 2013; Aboelmaged & Gebba, 2013; Bashir & Madhavaiah, 2015; Fathima & Muthumani, 2015; Foon & Fah, 2011). In the non-banking environment such as e-learning and e-shopping, the same effects are displayed where there is no relationship between subjective norm and internet usage (Chen *et al.*, 2013; Mamat *et al.*, 2015; Trivedi & Kumar, 2014). On the other hand, other previous studies also indicate that there is a positive or negative significant relationship between subjective norm and internet usage (Alkafagi *et al.*, 2015; Chen & Li, 2010).

The empirical results in the banking study did not support that subjective norm being the important predictors of internet banking usage compared to non-banking study. This probably indicates that the influence of important persons around the individual's does not impact the belief and decision making of the individual's on the usage of ICT. Moreover, most of the users are Gen Y, being very familiar with ICT environment besides being the well- educated lot, thus able to decide on usage without having the influential role of peers group. Hence the banks promoting internet banking usage should focus on Gen Y. The advertisement by banks should highlight the comfort of using internet banking and its usefulness. The advertisement can highlight various

situations when a young generation member needs to carry out urgent transactions with underlying constraint of tight schedules. Therefore, necessary tasks would be accomplished easily and in a timely manner with ICT usage especially among Gen Y who is well versed with ICT and used information communication technology (Anuar *et al.*, 2012; Chen *et al.*, 2010; Selamat & Jaffar, 2011).

Besides that, ICT researchers should authenticate this findings that may useful in other field of studies, gravitating ICT environment whereby previous literatures concluded that subjective norm was an important predictor to internet usage (Alkafagi *et al.*, 2015; Bashir & Madhavaiah, 2015; Fathima & Muthumani, 2015; Abdulkadir *et al.*, 2013). Future research in this area can also be cascaded down based on urban and sub-urban settlers. Researchers can also conduct their researches, having gender and profession as the background for preference on ICT usage, which was not included in this study.

5.1.2 Direct Impact of Attitude

Research objective two hypothesizes the direct effect of trust, perceived usefulness, perceived ease of use, internet self-efficacy and subjective norm on attitude towards internet banking (H2a to H2e). The findings indicate that two hypotheses are supported out of five hypotheses drawn up. The hypotheses supported are perceived usefulness towards attitude of internet banking (H2b) and internet self-efficacy towards attitude of internet banking (H2d), while, trust, perceived ease of use and subjective norm towards attitude of internet banking are not supported (H2a, H2c and H2e respectively).

This indicate that perceived usefulness affects the positive evaluation of attitude to use the internet banking in this study. This result is consistent with the research done abroad in banking that shows there is a positive significant relationship between perceived usefulness and attitude (Aboelmaged & Gebba, 2013; Adesina & Ayo, 2010; Bashir & Madhavaiah, 2015; Chau & Ngai, 2010; Maduku 2013; Mangin *et al.*, 2011; Mazhar *et al.*, 2014; Reid & Levy, 2008).

On the other hand, there were also researches that did not support the relationship of perceived usefulness and attitude of usage (Al-Adwan *et al.*, 2013; Lule *et al.*, 2012; Shroff *et al.*, 2011). Perceived usefulness of internet banking have the tendency to enhance capability of bank customers in performing financial or non-financial transaction. Apparently, positive evaluation of attitude is important, as outcome of their behaviour (Maduku, 2013; Mazhar *et al.*, 2014; Reid & Levy, 2008). In addition, the perceived usefulness of internet banking enable customers to check daily balance, paying utility bills, interbank transfer, opening of account, applying of loan can be done through the internet banking facility (Bashir & Madhavaiah, 2015; Juwaheer et al., 2012) instead of going to the bank branch to do transactions. Attitude will generate belief towards the behaviour and perceptions of usefulness of using the internet banking facility for conducting their transactions (Triandis, 1979). This belief will garner adoption and continue usage of internet banking facility (Mazher *et al.*, 2014).

Theory pertaining to internet banking can further be enhanced with the inclusion of perceived usefulness and attitude (Mazhar *et al.*, 2014). Past literatures have had many predictors such as trust, subjective norm, compatibility, credibility, image, financial cost,

computer experience, and channel convenience, risk and; security perception *etc.*, directly predicting internet usage (AbdulKadir *et al.*, 2013; Amin *et al.*, 2012; Fathima & Muthumani, 2015; Mazhar *et al.*, 2015; Nasri, 2011), however, limited studies have been observed pertaining to attitude as a predictor of internet usage. Outcome of this study concurred to this notion, explained by strong variance (78%) of internet banking usage by attitudinal belief.

The results of internet self-efficacy and attitude relationship in this study displays a major factor of formation of positive attitude towards the usage of the internet banking facility. This result is consistent with previous research done in banking and non-banking studies (Adesina & Ayo, 2010; Lule *et al.*, 2012; Zhu *et al.*, 2010). Furthermore, a study conducted by Park (2009) indicated that students with less confidence and low internet skills are hindered from using e-learning. The internet self-efficacy of internet banking not only involves the ability to perform the financial or non-financial transactions over the internet but also the ability of a customer to know the safety precautions and to avoid financial losses due to the usage of internet banking facility. For example, the safety precautions has been laid out by CIMB Clicks through the new letters to remind the internet banking customers how to stay safe while online such as do not disclose the login ID and password or any banking information to any parties (www.cimbclicks.com.my). Other safety precautions inform the customers to ensure that there is a padlock icon on the browser's status bar. This padlock indicates it has a Verisign certificate giving the meaning the website can be trusted and safe to use. Other important safety precaution for internet banking customers are a secure word upon logging in to the system. The secure word must be the intended one before proceeding to

login with the password. Lastly, the new letter reminds the internet banking users should have the latest version of anti-virus and anti-malware software (www.cimbclicks.com.my). It can be concluded that the bank customers with high internet self-efficacy will use the internet banking facility due to their ability and knowledge compared to low internet self-efficacy bank customers (Alkafagi *et al.*, 2015; Park, 2009).

ICT researchers especially in internet banking have the opportunity to enhance body of knowledge by applying internet self-efficacy and attitude. It was observed that ICT researches in banking and non-banking industry were able to predict the direct effect of internet self-efficacy and internet usage (Amin *et al.*, 2012; Eze *et al.*, 2011; Nasri, 2011; Sharma & Chandel, 2013), whereby this study indicated that there is a strong relationship between internet self-efficacy and attitude. Therefore, future ICT and internet banking researchers may include self-efficacy to predict attitude instead of directly predicting internet usage.

On the other hand, element of trust among Malaysian banking customers did not display significant relationship towards attitude on internet banking usage similar to studies done in multiple industries (Mazhar *et al.*, 2014; Trivedi & Kumar, 2014). In fact, Mazhar *et al.* (2014) tested this relationship among Indian banking customers, only to find that trust insignificance towards attitude. Similarly, Trivedi and Kumar (2014), found that trust has an insignificant impact on attitude among online shoppers of India. However, there are also other studies in banking and non-banking, indicated trust as an important factor towards attitude in online shopping, internet banking usage and SMS

advertising (Al-Ajam & Md Noor, 2013; Bamoriya & Singh, 2012; Bashir & Madhavaiah, 2015; Celik & Yilmaz, 2011; Suh & Han, 2002; Wang & Tseng, 2011).

Subsequently, this study concluded that trust is impacted due to security and privacy issue hence the negative evaluation of attitude towards internet banking. In contrary, if security and privacy issue is in place, it will support trust towards forming positive attitude of internet usage (Bashir & Madhavaiah, 2015). Therefore, lack of trust towards online banking can be the hurdle to market penetration of internet banking, reiterated by Nguyen *et al.* (2014). As such, ICT researchers should take advantage and validate current study result as previous researches proven that trust is a strong predictor of attitude (Al-Ajam & Md Noor, 2013; Bamoriya & Singh, 2012; Maduku, 2013; Mazhar *et al.*, 2015). Future studies on ICT may also focus on different methodology as compared to this study which may improve and enhance theory of ICT usage.

The perceived ease of use in this study did not displayed support towards attitude on positive evaluation of internet banking. This is consistence with previous empirical findings on banking and non-banking industry (Aboelmaged & Gebba, 2013; Nguyen *et al.*, 2014; Thomas, 2011). Contrary to this, previous researches indicate that there are significant relationship between perceived ease of use and attitude of internet banking usage (Al-Ajam & Md Noor, 2013; Bashir & Madhavaiah, 2015; Elkaseh *et al.*, 2015; Lule *et al.*, 2012; Maduku, 2013). Thus, the role of ease of use to advocate attitude is not supported among internet banking users in Malaysia.

Moreover, it may be concluded that the internet banking webpage might be clumsy for the customers and the stability of the internet connection in certain areas is not stable. The other reason that may arise is that the perceived ease of use did not form the attitude for the Malaysian banking customers is the language barrier. Most of the internet banking webpages are in the English language; therefore, for better interaction, dual languages (BM and English) should be considered as the customers can choose the language that they prefer.

In addition, ICT researchers should take opportunity that may intensify theory in TAM by validating the result of this study. Previous studies have indicated that perceived ease of use may predict attitudinal belief in ICT usage (Al-Ajam & Md Noor, 2013; Bashir & Madhavaiah, 2015; Elkaseh *et al.*, 2015; Maduku, 2013; Mazhar *et al.*, 2014). Whereby these studies have used TAM as the baseline theory and have been conducted abroad with multiple differential in scales and items including analysis method were based on SEM or Regression. However, these findings have contradicted with the current study. Therefore, future ICT researches should take advantage to improvise the knowledge by focusing on longitudinal study either in banking of non-banking industry.

Lastly, subjective norm did not have a significant impact on attitude towards usage in internet banking. This result is supported by previous researches done by Lule *et al.* (2012) in mobile banking and Maduku (2013) on internet banking. However, most of the previous studies showed contradicting findings, *i.e.* there is a significant relationship between subjective norm and attitude (Hamari, 2015; Liao & Chou, 2012; Park, 2009; Shittu *et al.*, 2011; Zendehdel & Paim, 2015). In this study, social influence of a bank

customer did not play an important role towards usage of internet banking. The adoption of internet banking may have exerted from other sources such as advertisement activities, monthly account statement or through counter staff upon interacting with prospects. Meanwhile, older people may be unfamiliar with the usage of internet banking therefore, family members support can be vital to increases the perceived needs perhaps by educating them about the benefits and conveniences of internet banking (Al-Omoush & Shaqrah, 2010).

ICT researchers may also enhance TAM theory in the current study's context or may use other related theories related to ICT usage such as TRA, TPB, UTAUT and DTPB in inclusion of subjective norm to predict attitude or usage in their studies. Previous studies have indicated that mix theories have been employed where also subjective norm too can causes negative attitudinal belief on ICT usage (Lule *et al.*, 2012; Maduku, 2013). Moreover, TRA, TPB and DTPB baseline theories were directly predicting usage intention whereas extended TAM in the theoretical framework of this study, subjective norm predict attitude and internet usage. Therefore, this study have a robust framework that may assist ICT researchers in predicting attitude and internet usage by subjective norm.

5.1.3 Mediating Role of Attitude

The research objective three articulates the mediating effect of attitude towards internet banking usage in Malaysia. This is done to determine whether attitude has a mediating role with exogenous and endogenous variables in this study. It further postulated five exogenous variables *i.e.* trust, perceived usefulness, perceived ease of use, internet self-efficacy and subjective norm. Perceived usefulness and internet self-efficacy were mediated by attitude towards the usage of internet banking facility.

The direct effect of perceived usefulness towards internet banking usage did not display a significant relationship however through the mediation test it was observed that there is a mediation effect that occurred with the existence of attitude. Therefore, attitude as a mediator of perceived usefulness impacts internet banking usage. This result confirms with other previous studies (Bashir & Madhavaiah, 2015; Yaghoubi & Bahmani, 2010). Mazhar *et al.* (2014) found that there was partial mediation of perceived usefulness through attitude on the internet banking usage while other previous studies done did not test the mediation of attitude between perceived usefulness and internet usage (Elkaseh *et al.*, 2015; Maduku, 2013; Nguyen *et al.*, 2014; Sharma & Gonindaluri, 2015). On top of that, many researchers suggested that consumer attitude has a strong direct effect on usage of an information system (Eriksson *et al.*, 2005; Read *et al.*, 2011). Hence, this study has also closed the gap on the non-mediation test and the mixed results therefore it should shed some light for future ICT researches that may also enhance the theory especially on the TAM baseline model. Moreover, this study will also provide impetus

for future research that need to be established pertaining to the mediation effect of attitude especially in the Malaysian retail banking context based on different methodology approach that might be resorting to different findings. It is important to find out whether attitude plays an important role before usage of internet banking facility. In addition, Aboelmaged and Gebba (2013) stated that attitude performs a very important role as an intervening variable between perceived usefulness and internet banking adaption. This is critical for the banking industry in developing a usable internet banking system by creating the usefulness and the positive attitudinal belief that the system would help them on performing their banking transactions (Mazhar *et al.*, 2014).

This study managed to empirically establish the mediating effect of attitude between perceived usefulness and internet banking usage. As such, it has contributed to augmentation of ICT in extended TAM baseline model. It was noted that many previous studies have neglected this relationship on ICT usage, be it in banking or non-banking environment. Likewise, ICT researchers may use other base line theories such as TRA (Ajzen & Fishbein, 1980), TPB (Ajzen, 1985; 1991) and DTPB (Taylor & Todd, 1995) to verify this relationship that may lead to ICT usage, thus enriching the existing body of knowledge on this relationship.

This study also found that internet self-efficacy displays an important factor of moulding attitude towards usage of internet banking. Therefore attitude has a great effect as an intervening predictor of the usage of the internet banking facility in the context of Malaysian banking environment. This is coherent with the previous research conducted on non-banking industry. For example, research conducted in the area of e-learning by

Park (2009) found that attitude is the intervening variable of internet self-efficacy towards internet intention. On the other hand there was also a research conducted showing indirect effect of internet self-efficacy is not supported (Trivedi & Kumar, 2014). However, in the previous empirical research reviewed for the purpose of this study the mediation of attitude between internet self-efficacy and internet banking usage was not established accordingly (Lule *et al.*, 2012; Zhu *et al.*, 2010). This will shed more lights on mixed results and mediation studies of attitude as an intervening variable towards internet banking usage.

This study reflects that internet self-efficacy plays an indirect role through attitude towards increasing usage of internet banking. Thus, this could probably prevail due to the factors of users' demographic profile of which majority are the Y generation (54%). Y Gen is educated, young, vibrant, and is born with technology (Rahman & Azhar, 2011; Weyland, 2011). Similarly, individuals with high confidence and ability to learn computer related technologies are likely to view internet as easy to use (Soh, Wong & Chan, 2010).

On the other hand, ICT researchers may intensify the TAM theory by including element of internet self-efficacy, mediated by attitude on internet usage. This is due to the fact that it has been more than a decade since ICT researchers have focus on this or to establish the mediating effect of attitude in their studies, either using TAM as a base line theory of other ICT theories such as TRA & TPB. Moreover, there are a few studies that had suggested intervening variable of attitude, however, these studies failed to establish the mediating effect of attitude (Lule *et al.*, 2012; Zhu *et al.*, 2010). Therefore, it is

important for ICT researchers to include internet self-efficacy mediated by attitude on internet usage as these elements can stimulate ICT usage (Park, 2009).

There is no mediating effect of attitude on trust and internet banking usage relationship in this study, where trust seems not an important direct predictor to attitude likewise giving a direct impact on internet banking usage. This study is consistent with previous research conducted by Bashir and Madhavaiah (2015) in the area of banking and Liao and Chou (2012) in the area of social media usage. In contrary to this, study was done by Su and Han (2002) that indicates mediation occurred between the linkages. There are also other studies which had suggested attitude as an intervening variable for trust, however researchers did not conduct mediation test (Al-Ajam & Md Noor, 2013; Al-Majali, 2011; Mazhar *et al.*, 2014; Nguyen *et al.*, 2014).

Therefore, absence of trust among commercial bank customers may lead to being significant barrier towards market penetration of internet banking (Nguyen *et al.*, 2014), reflecting the importance of trust which had a study concluding it as the strongest predictor of attitude formation towards internet banking usage (Maduku, 2013). Nevertheless, this study discovers that trust is not a crucial factor, hence commercial banks in Malaysia may want to channel resources to other important elements when planning marketing strategy. Trust may be viewed as insignificant, perhaps due to the fact that financial system security and privacy issue have been regulated by law and regulations such as the FSA (2013), fulfilling the need for security. Regulator such as BNM plays an important role to maintain this through their enforcement.

As such, Y generation tend to look for other factors of usage such as ease of use of internet banking facility in conducting their daily banking transaction likewise the usefulness of the internet banking facility that can save time, cost and can be done anywhere, and at any time during the year (Suki, 2010).

On the other hand, from the perspective of ICT researches this study have contributed a significance theoretical framework that may enhance the theory and research by the extended TAM model suggested. Moreover, previous studies have proven that trust is a significance predictor to attitude and internet usage (Bashir & Mahavaiah, 2015). Therefore, ICT researchers may intensify their studies based on the theoretical framework suggested by inclusion of multi dimension of trust factor such as honesty, benevolence and competence (Manzano *et al.*, 2009). Furthermore, by including multi-dimension of trust in the extended TAM model, the theoretical framework would be more robust in predicting ICT usage.

In this study, perceived ease of use fail to mediate through attitude towards the usage of internet banking. This is consistent with research done by Liao and Chou (2012) in the area of social media usage whereas in banking, perceived ease of use does not mediate through attitude towards usage of internet (Park, 2009). This result is contrary to researches done by many authors who found the mediation of attitude (Bashir & Madhavaiah, 2015; Sa'nchez *et al.* 2013; Suh & Han, 2002). Nevertheless, there are handful of studies suggesting intervening variable of attitude but unfortunately, mediation test was not established (Al-Ajam & Md Noor, 2013; Elkaseh *et al.*, 2015; Lule *et al.*, 2012; Nguyen *et al.*, 2014; Porter & Donthu, 2006; Reid & Levy, 2008;

Sharma & Gonindaluri, 2015; Suh & Han, 2002). Therefore, this study will close the gap of mixed results and non-established intervening variables.

Even though the perceived ease of use did not mediate through attitude in this study, the usage of internet banking is based on direct relationship of this construct. However, overseeing this mediator may cause detrimental effects on usage of internet banking. Thus, it is necessary for managers and web developers of internet banking web page to create a web page that is easy to navigate, correctly formatted and easy to read so that it will create a positive perception towards their attitude of using the internet banking facility.

The ICT researchers may enhance the theory and research where perceived ease of use may mediate attitude on internet banking usage. Many previous studies have suggested that perceived ease of use mediate through attitude on usage, however they have neglected to establish this relationship that may causes unfavorable effects non-mediation tested coupled with a few studies have established this relationship with mix results. Therefore, ICT researchers are encourage to use TAM baseline model in this study or TRA, TPB and DTPB in their studies to justify this relationship that might revitalize the findings. Moreover, it may robust these theories in order to predict ICT usage in the future due to ICT proliferation.

Finally, this study also generates findings that subjective norm did not display an effect through intervening variable of attitude on usage of internet banking facilities even though the mean for subjective norm stood at 5.18. However, many studies have shown

mediation effect of attitude on subjective norm and internet usage relationship (Liao & Chou, 2012; Park, 2009). In addition to this, many other studies in banking or non-banking did not establish mediation test on intervening variable of attitude on the effect of subjective norm (Hamari, 2015; Lule *et al.*, 2012; Maduku, 2013; Shittu *et al.*, 2011).

The ICT researches may benefit from current study that have established an extended TAM framework to predict ICT usage. Moreover, current study have attempted testing indirect effect of subjective norm through attitude towards internet usage. This is done after observing various literatures and research that had suggested intervening variable of attitude but somehow overlooked testing this relationship (Hamari, 2015; Lule *et al.*, 2012; Maduku, 2013; Shittu *et al.*, 2011). This study has gone one step ahead and tested the relationship, only to find out absence of attitude's mediating effect between subjective norm and internet usage. Based on this findings, ICT researches could intensify their studies further by including subjective norm's multi-dimension construct (Taylor & Todd, 1995).

In conclusion, this study have illustrated usage of Extended TAM (ETAM) by testing direct and indirect effect of the latent variables internet banking usage. It is noted that ETAM's usage pertaining to banking context is relatively modest. As such, this study is part of the founding effort to employ ETAM in the dynamic banking industry of Malaysia. It is also believed that it may gain considerable attention from banking fraternity and industry players. Therefore, outcome of this study will be a guiding principle in order to formulate marketing strategy. In addition, employment of ETAM in this study have created robust findings which altogether helps on improving its

predictive abilities. Along the same line, this model has included testing indirect effect of additional predictors such as trust, internet self-efficacy, and subjective, through attitude towards internet banking usage.

The findings also revealed that there is an irrepressible support of the appropriateness of employing the ETAM that may explain the attitudinal and behavioural aspects of the retail banking customers towards the adoption of internet banking. The major findings of ETAM are the predictor of attitude has the strongest influence on the internet banking usage while perceived ease of use has a moderate effect on the internet banking usage. Other glaring findings are that internet self-efficacy has a very strong prediction on attitude; however, perceived usefulness has less influence towards the attitude.

Likewise, perceived usefulness and internet self-efficacy does not have a direct impact on internet banking usage, but these predictors mediate through attitude forming a prediction on the internet banking usage. On the other hand, attitude has a strong variance explained by the five predictors of usage; however, the variance that explains usage has become slightly lower (from 0.78 to 0.66), indicating that attitude does not really transform to actual usage by the retail banking customers similar to the study done by Suh and Han (2002). Therefore, this study may conclude that the ETAM is applicable in explaining the attitudinal factor and usage behaviour of internet banking customers based on the existing predictors of the original TAM (perceived usefulness, perceived ease of use and attitude) while the additional predictor of internet self-efficacy is the dominant external factor that influences the attitude and internet banking usage by the retail banking customers in Malaysia.

5.2 Theoretical Implications

First, the outcome of this research will contribute to the current body of knowledge in the banking study in the Malaysian context on the perceived ease of use, perceived usefulness, and internet self-efficacy towards the usage of internet banking facility as the contributing factor and imperative driver of attitude and internet banking usage. It is obvious that the contributions of internet self-efficacy in the forming of attitude towards usage of internet banking are very significant. This was proven by the result displayed that this is the most important predictor of attitude formation towards the usage of internet banking. Similarly, the indirect effect of attitude by internet self-efficacy consistently contributed to the usage of internet banking facility.

On the other hand, there is another point to note where there is no significant direct effect by perceived usefulness towards internet banking usage except through attitude as an intervening variable mediation occurred in this study (Tables 4.13 and 4.14). In comparison to other previous studies, it is very rare that the mediation test is conducted even though the researchers have suggested the model with attitude as a mediator in their studies (Maduku, 2013; Mazhar *et al.*, 2014). Therefore, this study would contribute attitude as a mediator and predict the powerful future framework of TAM.

Second, in addition to this, positive attitude is the strongest direct predictor of internet banking usage whereas perceived ease of use has a moderate contribution of internet banking usage. Thus, perceived usefulness has formed attitude towards usage of internet

banking facility (Table 4.13). This direct predictor also supports the TAM's original framework, which has a strong predicting supremacy of usage information and communication technology (Davis, 1989; Davis *et al.*, 1989).

Third, this study contributes to the body of knowledge by providing a more comprehensive TAM framework with the inclusion of additional variables to enlighten the model to be more robust. It is evidenced on the strong variances explained by attitude that contributed 78% while the variances explained by the internet banking usage contributed 66%. This shows that by inclusion of additional variables, it has improved the predicting power of TAM; furthermore, it is more important for the banking industry in Malaysia to review their strategy tools both in their marketing effort and web page building based on this findings.

5.3 Practitioners Implication

The conceptual model of the advance TAM in this study is developed for the banking industry in Malaysia particularly for the retail banking that allows them to review the TAM framework that may provide an advantage for the banks to benefit from the usage of this framework. This framework can assist the bank in setting their marketing strategy and gaining a competitive advantage of utilizing this framework. The banks should take further steps to understand the customers and bank relationship pertaining to the usage of internet banking. This can be done by identifying the correct predictors of internet banking usage and operationalize these drivers in order for the bank to get the benefits

and customers satisfaction and loyalty in the long run and measure the effectiveness and efficiency of these drivers.

5.3.1 Solicitation for Bank Manager

The commercial bank managers in Malaysia should ensure that formation of banks customers' attitude is the major primacy in setting their marketing strategy on the market penetration to non-adopters even though these customers have savings account or current account on the usage of internet banking facility. Whereas, for the existing customer, the bank managers must also ensure they retain these customers and continue the usage of the internet banking facility. On the market penetration, the banks managers must adopt a strategy to penetrate the market by studying the profile of their customers based on the database that they have. They can segment the customer by adopters and non-adopters.

Further, they can study this profile of non-adopters by looking at the demographic profile elements such as age, gender, race, education level, profession, and income. From here, the bank managers can identify further in which segments the non-adopters belong. They may also cross segment this demographic profile segment in order for the analysis to be more meaningful. The next step the bank managers should undertake is to recommend to the higher management the next course of action. Further to this, the next course of action is to reposition their marketing strategy to reach this target segment of non-adopters. The marketing strategy to this target group is by providing monthly

statements and to save cost by e-mailing these statements to these customers. In the statement, the content may have marketing materials such as leaflets that include the monthly statement. This marketing material should be done in an interval basis in order for the customer to form the attitudinal belief that the internet banking facility is important for their banking transaction. Besides that, the banks managers also need to build an internet banking manual for the non-adopters.

This manual is important for new users of the internet banking facility in order for them to use the internet banking. However, the bank managers must bear in mind that the content of this manual must be complete. The content may include the introduction of thanking the customers for using the internet banking. It should also emphasize on how important the internet banking facility is to their daily life that saves cost, time and convenience with a minimum cost to pay.

Other items that have to be included in the manual are how to get an ID and password to login into the internet banking system. Information such as how to navigate should be done step by step in order for the new users to understand to navigate easily on the internet banking website. On the aspects of security and privacy, the new users should be reminded not to give the ID and password to anybody. The ID and password should be remembered and should not be written or stored anywhere. The new users should also be reminded to go to the correct and secured URL (with https and locked symbol) of the internet banking website.

Moreover, the managers should also provide critical information in the manual such as do not open the link that they are not sure or person impersonating as bank officers or BNM officers requesting for confidential information pertaining to the internet users or the bank account such as account number, ID and password. Hence, this internet banking manual should be published in the general website of the banks for easy reference and also should be published in the internet banking website for easy reference of the users while conducting their banking transactions.

On the part of the bank managers and internet banking website builders of the bank, the internet banking website must be easy to use or to navigate and is useful in the perception of the internet banking customers (Kesharwani & Bisht, 2011). The navigation from one page to another should not be difficult for the internet banking users. Some internet banking websites are difficult to navigate looking for information of bank products or current offerings. In addition to this, the website should not be clumsy in terms of the content per page. The font and colour or pictures, diagram, figures play a part so that the website page is neat and tidy. The perception of the internet banking users is on the first perception of about the internet banking website that may form attitudinal belief (Kesharwani & Bisht, 2011). The content should be updated soonest possible if there are any changes in terms of charges, rates or any regulatory requirements by BNM that shall affect the customers. For example, there is a new interbank transfer charges or the current regulatory by the government is on the GST of 6% on the transfer fee.

On the other hand, the banks managers should also review their campaign to attract new internet banking users. This campaign should include the pricing items strategy of the internet banking. The bank may give some discounts on charges that they imposed to the customers. For example, the charges for the internet banking transfer are RM0.11 inclusive of GST. Based on the conduct of account of how many transfers done by a customers for the previous three months the banks may not impose the charges at all or based on an average monthly deposit balance of RM2,000.00 charges are waived by the banks accordingly.

Other item to note is that the managers must look into “one stop centre” for internet banking users. The “one stop centre” is not only for conducting financial or non-financial transaction for the banks customers but it is more than that. For example, the retail banking sector should create more alliances with others organisations such as with Lembaga Tabung Haji. As we are aware that 60% of the Malaysian is Malay and Muslim therefore it creates a need for them to transfer from the Tabung Haji account can be done online through internet banking for the Pilgrimage savings and vice versa.

Finally, to warp up, it is very important for the managers and the retail banking sector to understand and acknowledge the facts they need to know the factors that form the customers’ attitude and other related factors such as ease of use and usefulness towards usage of internet banking. By knowing this, they can set up their strategy on focusing their need of the customers and providing them with value added services and in the long run customers will continue the usage of internet banking facility. The managers and banks will get benefits on cost reduction, efficiency and effectiveness by internet

banking compared brick and mortar infrastructure of conventional banking (Mazhar, 2014). The new edge of banking is heading towards the cyber banking and most of the banks have invested millions of dollars to install hardware and software of banking peripheral such as cheque deposit machines, cash deposit machines, coin deposit machines, foreign currency cash machines, upgrading of ATM machines and upgrading of the internet banking facility. On the customers' side, this cyber banking will benefit the customers in terms of cost savings and time savings by not travelling to the physical branch therefore it will create convenience to the customers and high customer satisfaction that leads to long term beneficial relationship between the banks and the customers (Mazhar, 2014).

5.3.2 Solicitation for Government and Bank Negara Malaysia

The financial system in Malaysia plays an important role in the Malaysian economy where the banks are intermediaries, which facilitate the movement of funds between depositors and borrowers, therefore safeguarding the financial resources towards upholding economic growth and development. Financial stability is the financial intermediary process that goes smoothly and creates confidence by the financial institutions and financial markets within the economy. The Government through BNM plays an important role in promoting and maintaining monetary policy and financial stability that contributes to a healthy economy and sustainable growth. This is done by discharging their responsibility for sound and efficient financial withstand robustness financial infrastructure to ensure adverse economic cycles and shocks and maintaining confident in the financial system.

On top of that is introducing regulations and supervision on the licensed financial institutions. However, many regulations have been introduced for example the Personal Data Protection Act 2013 (PDPA 2013) that protects customers and consumers sharing of data by financial institutions. Therefore, BNM comes up with the Guidelines of Product Transparency and Disclosure as a guiding principle to the commercial banks to protect the customers' interest on data sharing.

However, BNM as the regulatory body for the commercial bank in Malaysia (local and foreign banks) does not have the guidelines on internet banking facility provided by the commercial bank in Malaysia. The guiding principle is very important to protect the customers' interest and to maintain a standard of the internet banking facility provided by the commercial banks. This standard includes the minimum content of the internet banking website, dispute handling by customers and any other related matters to the internet banking. For example, the standard of security to access the internet banking login is different from one bank to another.

5.4 Limitation of the Study

There are a few limitations in this study even though prudence and due diligence has been exercised to produce the best output. The first limitation is the customers' internet banking usage as a wide and complex based on the information communication technology acceptance and it varies depending on the models and theory used in a study. This acceptance and adoption of internet banking usage may produce different

results even though it uses the same predictors. It varies based on the time and data collection method.

The second limitation is based on the method of data collection. In this study, the data collection is based on cross sectional whereby data is collected once in a time frame. If the data collection is based on longitudinal study, the approach will give some advantages that allow changes in response by the respondents over time that may lead to different results in a study. This may assist the factors affect the attitude and internet banking usage.

The third limitation is on the nature of the study setting whereby it focused on the top five commercial banks respondents and the data collection area within Klang Valley based on the population provided by Pemandu. However, Klang Valley is an urban area where the population comes from various states in Malaysia. Therefore, the actual behaviour of the respondents on the usage of internet banking may differ if they are in the rural area that may lead to different results. The other point to note is this study excludes foreign banks in Malaysia where the foreign banks' customers may have a different perception and behaviour towards the usage of internet banking and therefore it may not be demonstrative of all the commercial banks customers in Malaysia.

5.5 Recommendation for Future Study

This study has provided the comprehension of retail banking customers' on their internet banking usage however this study can be expanded further in future research. The future researches may explore several areas as follows:

This study has focused on adopters of the internet banking facility that investigate the usage of internet banking in Klang Valley however this may not reflective of the actual behaviour. Therefore, this study suggests to make a comparison between adopters and non-adopters on the usage of internet banking facility. Hence, the comparison between these two groups may gauge and reflect the actual attitudinal belief and behaviour of the respondents in the study.

The study setting may also have some impacts on the results of this research. This study concentrated on the respondents in the area of Klang Valley that may not display the actual behaviour of the respondents. Therefore, future research is suggested to include other geographical areas such as other cities in Malaysia in meeting the generalization of the findings. In addition to this, cross sectional approach of data collection may have some impediment due to one off data collection method therefore unable to meet representation. Hence, this study suggests for future research to implement a longitudinal study where recurring measurement on respondents are done, thereby understanding the behaviour of the internet banking usage over time.

In this study, trust does not have a direct relationship between attitude and internet banking usage. However, future research should also investigate the multi dimension of trust to be incorporated in the TAM to validate the impact of trust towards the attitude and internet banking usage. Therefore, by adding the multi dimension of trust to firm up the current suggested model and this will make the model more meaningful. Besides that, the demographic profile may impact the attitude and internet usage and in many studies demographic factors may have a strong predictor towards attitude and internet usage. In addition to this, future research should be included in the model for generalization of the study and to enrich the literatures.

5.6 Conclusion

This is the first theoretical model of internet banking study in Malaysia that has adopted the TAM with additional predictors of trust, internet self-efficacy and subjective norm while attitude as the mediator towards internet banking usage and maintaining perceived ease of use and perceived usefulness. However, only internet self-efficacy has a direct relationship on attitude and not towards internet banking usage. In addition to this, perceived ease of use has a positive significant relationship on the internet usage and not on attitude. Perceived usefulness does not predict internet banking usage however it predicts attitude. On the other hand, perceived usefulness and internet self-efficacy have a mediating effect on internet banking usage.

The findings from this study are important for the managers of consumer banking in Malaysia to digest the results of this study when embarking on their marketing strategy and market penetration. For the regulatory body such as BNM, this study is a point for them to formalise a standard of practice such as format and webpage content to be followed by the commercial banks to protect the consumer bank customers. Lastly, it is one of the valuable researches for academicians that may enrich the body of knowledge.



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APPENDICES

Universiti Utara Malaysia

Appendix 1: Model in Non-Banking Industry

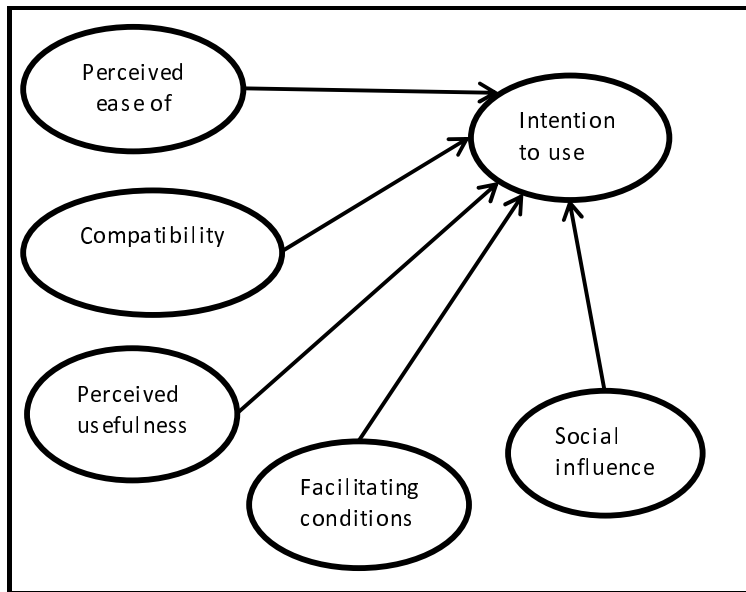


Figure 2.11

Model 11: *"Factors contributing pre-school trainees teachers adoption of virtual learning environment: Malaysian evidence."*

Source: Mamat et al. (2015). The Turkish online Journal of Education Technology, 14(2).

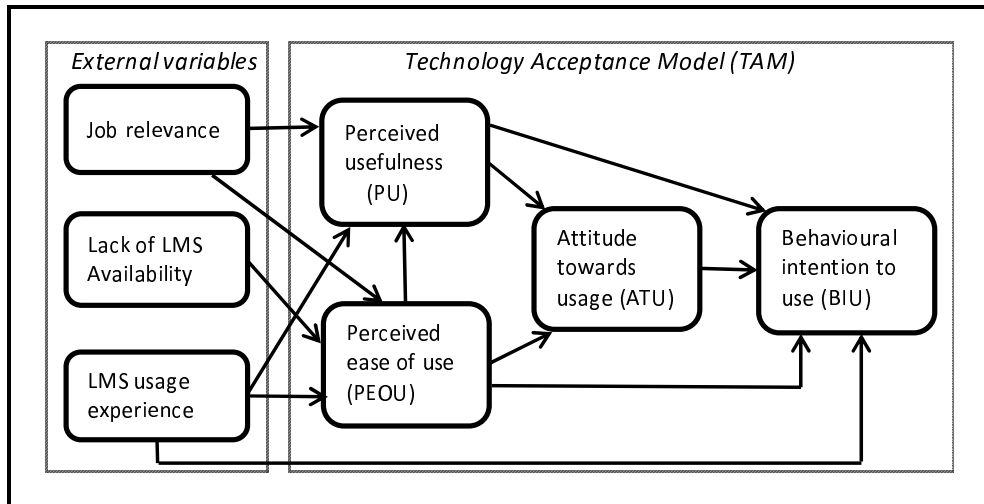


Figure 2.12

Model 12: "Using the Technology Acceptance Model in understanding academics behavioural intention to use learning management system."

Source: Alharbi & Drew (2014). International journal of Advanced Computer Science and Application, 5(1).

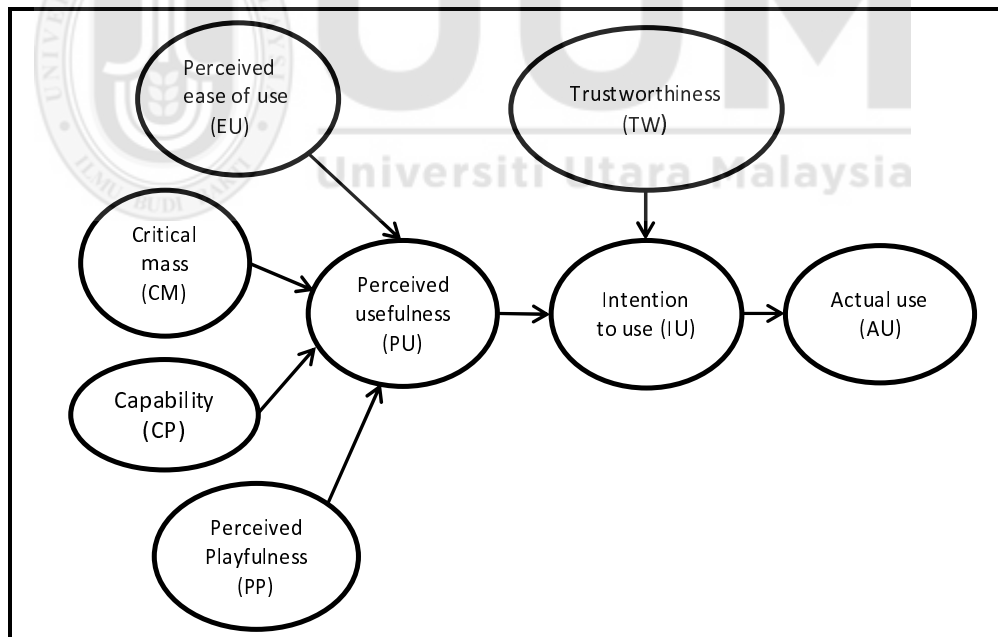


Figure 2.13

Model 13: "Technology acceptance model (TAM) and sosial media usage: an empirical study on facebook."

Source: Rauniar et al. (2014). Journal of Enterprise Information Management, 27(1).

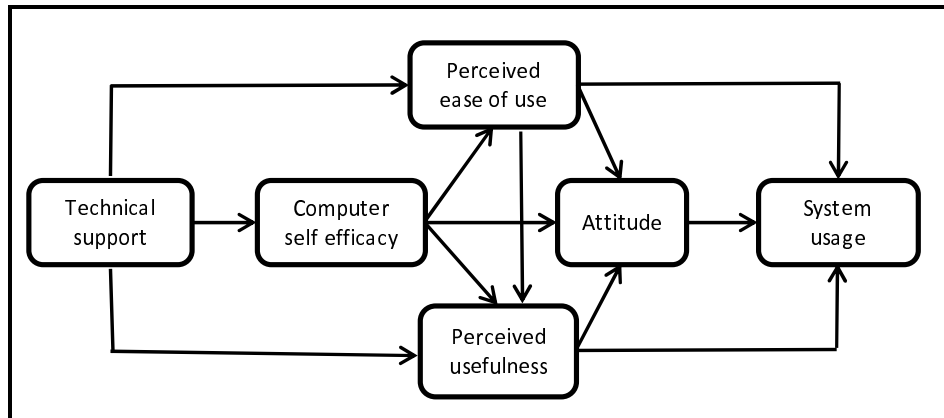


Figure 2.14
 Model 14: " *E-learning and the University of Huelva: A study of WebCT and the technological acceptance model.*"
 Source: Sanchez et al. (2013). Campus-wide Information Systems, 30(2).

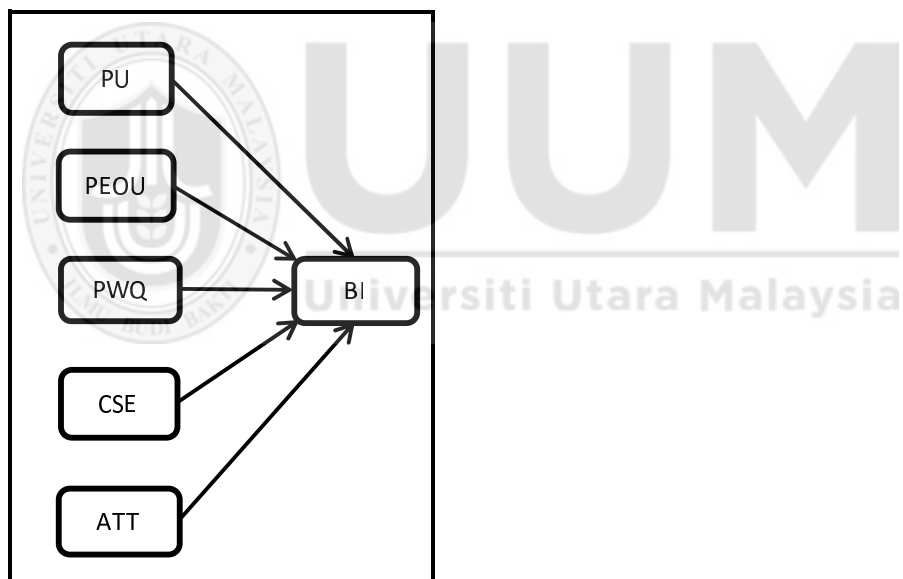


Figure 2.15
 Model 15: " *Technology Acceptance Model for the use of learning through websites among students in Oman.*"
 Source: Sharma & Chandel (2013). International Arab Journal of e-Technology, 3(1).

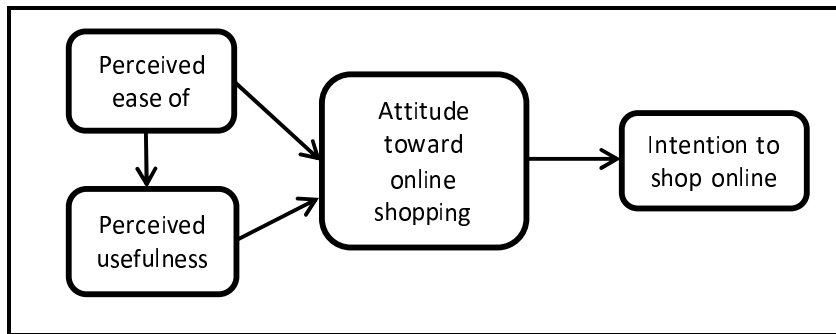


Figure 2.16

Model 16: " *E-shopping: an Analysis of the Technology Acceptance Model.* "

Source: Lim & Ting (2012). *Modern Applied Science*, 6(4).

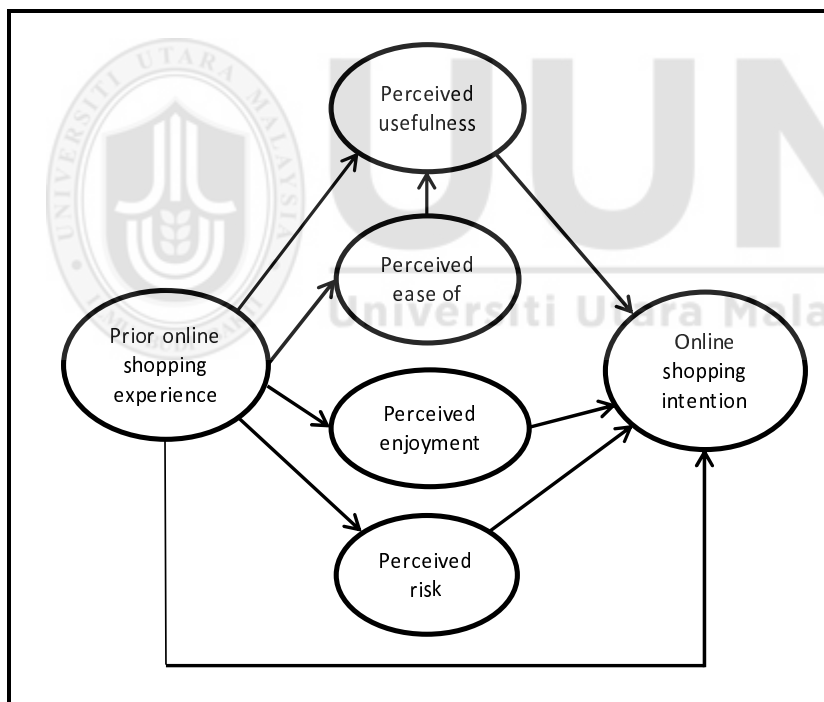


Figure 2.17

Model 17: " *A cross-national investigation of an extended technology acceptance model in the online shopping context.* "

Source: Tong (2010). *International Journal of Retail & Distribution Management*, 38(10).

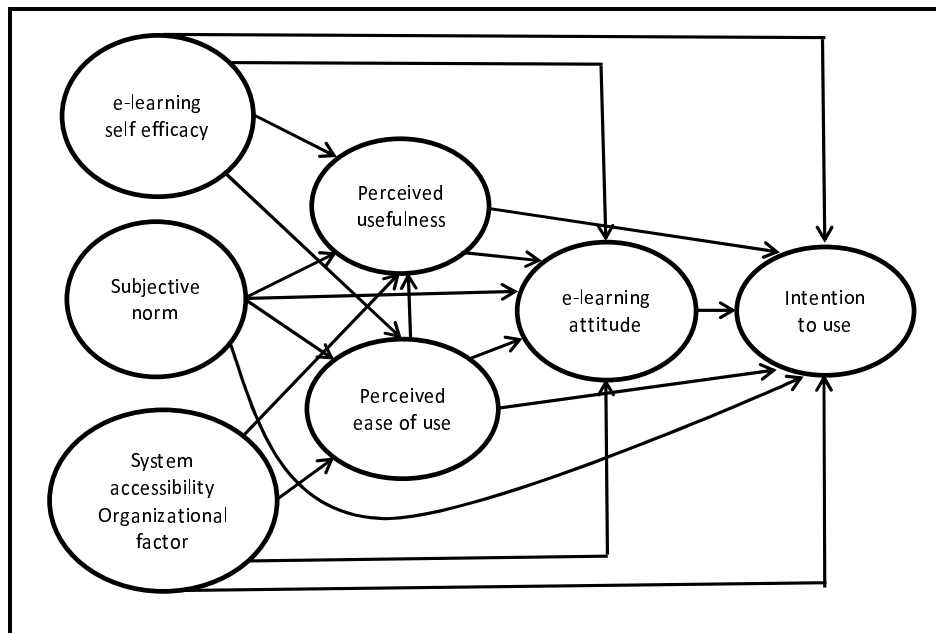


Figure 2.18

Model 18: "An analysis of the Technology Acceptance Model in Understanding University Students' Behavioural Intention to use e-learning."

Source: Park (2009). Educational Technology & Society, 12(3).

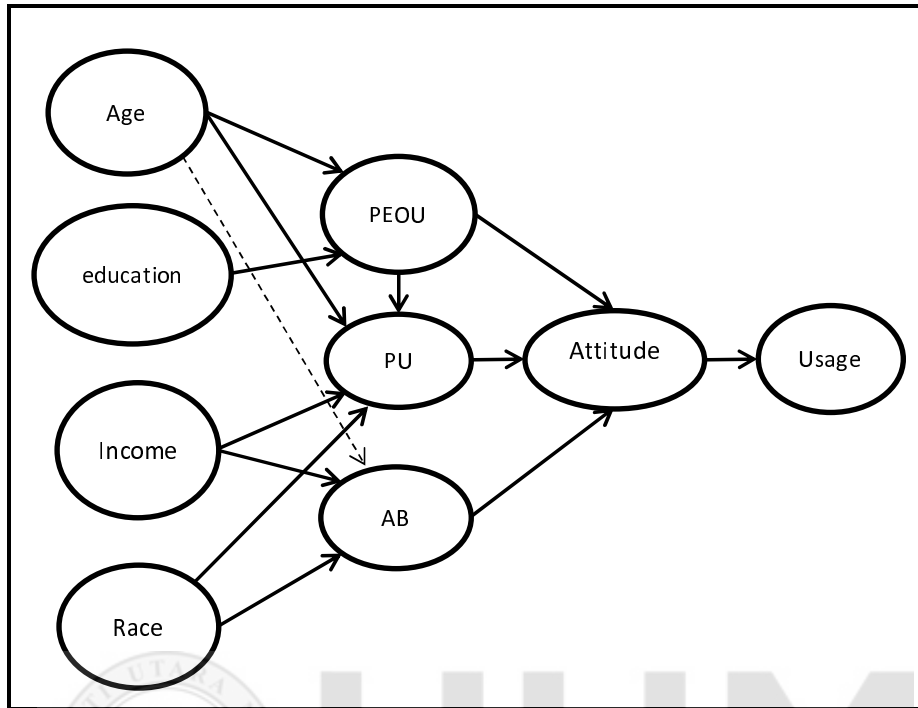


Figure 2.19

Model 19: *"Using the technology acceptance model to explain how attitudes determine internet usage: The role of perceived access barriers and demographics."*

Source: Porter & Donthu (2006). *Journal of Business Research*, 59.

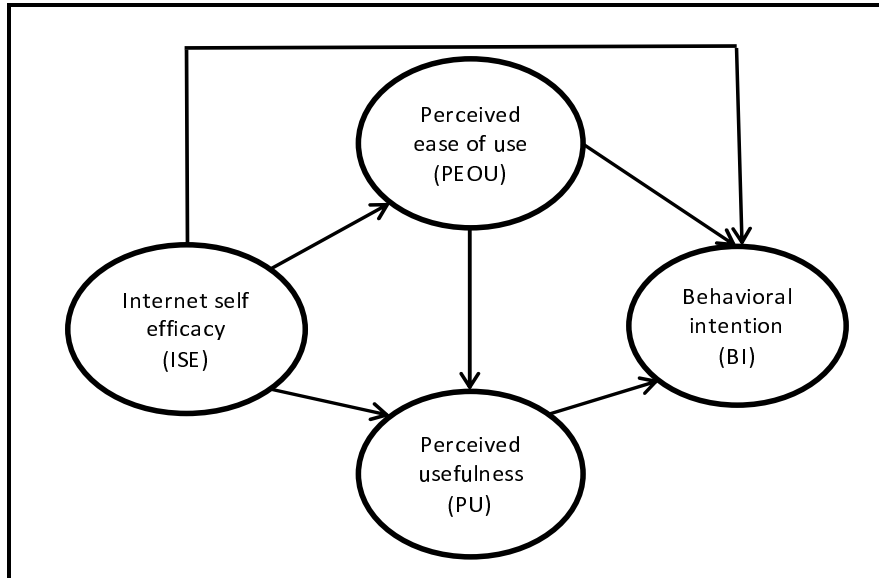
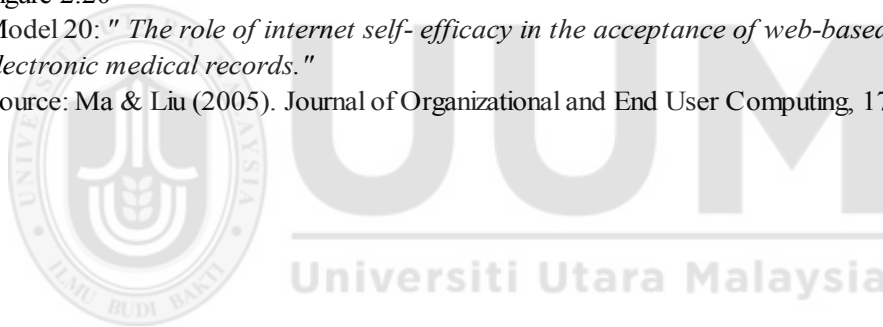


Figure 2.20

Model 20: " *The role of internet self- efficacy in the acceptance of web-based electronic medical records.* "

Source: Ma & Liu (2005). *Journal of Organizational and End User Computing*, 17(1)



Appendix 2: Table 2.5

Summary of direct antecedents of Internet Usage

Antecedents	Author	Industry	Findings
Trust	Alkafagi <i>et al.</i> (2015)	Banking	Sig positive: $\beta=0.221$, $t= 6.087$, $p=0.000$
	Bashir & Madhavaiah (2015)	Banking	Sig positive: $\beta=0.127$, CR= 4.679, $p<0.001$
	Fathima & Muthumani (2015)	Banking	Sig positive: $\beta=0.201$, $t= 21.763$, $p<0.05$
	Nguyen, Nguyen & Singh (2014)	Banking	Not Sig: $\beta=0.09$, $p=0.051$
	Trivedi & Kumar (2014)	Online shopping	Sig positive: $\beta=0.289$, $t= 3.133$, $p<0.05$
	Candra (2013)	Banking	Not Sig: $\beta=0.16$, $p=0.17$
	Juwaheer <i>et al.</i> (2012)	Banking	Sig positive: $\alpha=0.688$, $\alpha> 0.06$
	Mansumittrchai & Al-Malkawi (2011)	Banking	Sig positive: $F=47.77$, $p= 0.000$
	Usoro <i>et al.</i> (2010)	E-tourism	Not Sig: $r= 0.141$, R square=0.038
	Manzano <i>et al.</i> (2009)	Banking	Not Sig: $\beta=-0.01$, $p=0.09$
	Suh & Han (2002)	Banking	Sig positive: $\beta=0.152$, $t= 4.717$, $p<0.01$
	Bashir & Madhavaiah (2015)	Banking	Not sig: $\beta= 0.008$, CR= -0.496, $p>0.01$
	Fathima & Muthumani (2015)	Banking	Sig positive: $\beta=0.275$, $t=25.041$, $p<0.05$
	Mamat, Yusoff, Abdullah & Razak (2015)	Virtual learning	Not Sig: $\beta=0.18$
Perceived Usefulness	Mazhar <i>et al.</i> (2014)	Banking	Sig positive: $\beta=0.559$, CR=8.211, $p=0.000$
	Aboelmaged & Gebba (2013)	Banking	Not sig: $\beta= 0.072$, $t=0.743$, $p>0.01$
	Safeena <i>et al.</i> (2013)	Banking	Sig positive: $\beta=0.36$, $t=3.087$, $p < 0.01$
	Amin <i>et al.</i> (2012)	Banking	Not Sig: $\beta=0.088$, $t=1.005$, $p>0.05$
	Juwaheer <i>et al.</i> (2012)	Banking	Sig positive: $f=22.588$, $p<0.05$
	Lule <i>et al.</i> (2012)	Banking	Sig positive: $\beta=0.244$, $p<0.001$
	Al-Htaybat <i>et al.</i> (2011)	Internet Fin. reporting	Mean score: 4.67 -2.22
	Eze <i>et al.</i> (2011)	Banking	Sig positive: $\beta=0.157$, $t=2.271$, $p<0.05$

Table 2.5 (continued)

Summary of direct antecedents of Internet Usage

Antecedents	Author	Industry	Findings
	Wu & Gao (2011)	E-learning	Sig positive: $\beta=0.678$, $p<0.01$
	Safeena <i>et al.</i> (2011)	Banking	Sig positive: $\beta=0.260$, $t=3.087$, $p=0.003$
	Lin & Nguyen (2011)	E-payment	Sig positive: $\beta=0.309$ (0.390), $p<0.01$
	Selamat & Jaffar (2011)	IT usage	Sig positive: $\beta=0.561$, $p<0.05$
	Wang & Tseng (2011)	Online shopping	Sig positive: $\beta=0.25$, $p<0.01$
	Chen <i>et al.</i> (2010)	Online shopping	Sig positive: $\beta=0.64$, $t=6.84$, $p=0.001$
Perceived Usefulness	Manzano <i>et al.</i> (2009)	Banking	Sig positive: $\beta=0.28$, $p<0.01$
	Park (2009)	E-learning	Not sig: $\beta=-0.04$, $t=-.60$, $p>0.05$
	Reid & Levy (2008)	Banking	Sig positive: $\beta=0.23$, $CR=2.247$, $p<0.05$
	Eriksson <i>et al.</i> (2005)	Banking	Sig positive: $\beta=0.55$, $t=7.82$, $p<0.05$
	Pikkarainen <i>et al.</i> (2004)	Banking	Sig positive: $\beta=0.247$, $t=3.151$, $p<0.05$
Perceived ease of use	Bashir & Madhavaiah (2015)	Banking	Not sig: $\beta=0.058$, $CR=0.167$, $p>0.01$
	Fathima & Muthumani (2015)	Banking	Sig positive: $\beta=0.173$, $t=17.081$, $p<0.05$
	Mamat, Yusoff, Abdullah & Razak (2015)	Virtual learning	Sig positive: $\beta=0.42$, $p<0.05$
	Candra (2013)	Banking	Not Sig: $\beta=0.13$, $p=0.06$
	Safeena <i>et al.</i> (2013)	Banking	Sig positive: $\beta=0.34$, $t=2.041$, $p<0.05$
Perceived ease of use	Sa'nchez, Hueros & Ordaz (2013)	E-learning	Not Sig: $\beta=0.09$, $t=0.69$, $p>0.05$
	Amin <i>et al.</i> (2012)	Banking	Not Sig: $\beta=0.097$, $t=1.319$, $p>0.05$
	Juwaheer <i>et al.</i> (2012)	Banking	Sig positive: $f=8.166$, $p<0.05$
	Al-Htaybat <i>et al.</i> (2011)	Financial reporting	Average Mean score: 3.5
	Eze <i>et al.</i> (2011)	Banking	Sig positive: $\beta=0.131$, $t=2.305$, $p<0.05$
	Selamat & Jaffar (2011)	Bankers IT usage	Not Sig: $\beta=-0.086$, $p>0.05$
	Lin & Nguyen (2011)	E-payment	Sig positive: $\beta=0.242$ (0.493), $p<0.05$

Table 2.5 (continued)

Summary of direct antecedents of Internet Usage

Antecedents	Author	Industry	Findings
Internet Self-efficacy	Safeena <i>et al.</i> (2011)	Banking	Sig positive: $\beta=0.172$, $t=2.041$, $p=0.044$
	Manzano <i>et al.</i> (2009)	Banking	Not Sig: $\beta=0.06$, $p>0.05$
	Park (2009)	E-learning	Not sig: $\beta=0.002$, $t=0.10$, $p>0.05$
	Eriksson <i>et al.</i> (2005)	Banking	Not Sig: $\beta=0.07$, $t=1.14$, $p>0.05$
	Pikkarainen <i>et al.</i> (2004)	Banking	Not Sig: $\beta=0.074$, $t=0.940$, $p>0.05$
	Alkagafi <i>et al.</i> (2015)	Banking	Sig positive: $\beta=0.466$, $t=5.672$, $p=0.000$
	Fathima & Muthumani (2015)	Banking	Sig positive: $\beta=0.147$, $t=14.228$, $p<0.05$
	Trivedi & Kumar (2014)	Online shopping	Sig positive: $\beta=0.324$, $t=3.509$, $p<0.05$
	Abdulkadir, Galoji & Razak (2013)	Banking	Not Sig: $r=0.000$, $p=0.998$
	Sa'ñchez, Hueros & Ordaz (2013)	WebCT learning system	Eliminated due to comm variance with PEU
	Amin <i>et al.</i> (2012)	Banking	Sig positive: $\beta=0.277$, $t=4.150$, $p<0.01$
	Mansumittrchai & Al-Malkawi (2011)	Banking	Not Sig: $F=0.282$, $p=0.282$
	Nasri (2011)	Banking	Sig positive: $\beta=0.125$, $t=2.206$, $p<0.01$
	Chen <i>et al.</i> (2010)	Online shopping	Not Sig: $\beta=0.06$, $t=1.73$, $p>0.05$
Subjective Norm	Park (2009)	E-learning	Sig positive: $\beta=0.579$, $t=7.08$, $p<0.01$
	Ma & Liu (2005)	Health care	Sig positive: $\beta=0.741$, $t=10.10$, $p<0.01$
	Alkagafi <i>et al.</i> (2015)	Banking	Sig negative: $\beta=-0.151$, $t=3.736$, $p=0.000$
	Bashir & Madhavaiah (2015)	Banking	Sig positive: $\beta=0.081$, $CR=4.014$, $p<0.001$
	Fathima & Muthumani (2015)	Banking	Sig positive: $\beta=0.170$, $t=17.013$, $p<0.05$
	Mamat, Yusoff, Abdullah & Razak (2015)	Virtual learning	Not Sig: $\beta=0.06$, $p>0.05$
	Trivedi & Kumar (2014)	Online shopping	Not sig: $\beta=0.122$, $t=1.511$, $p>0.05$
	Abdulkadir, Galoji & Razak (2013)	Banking	Sig positive: $\beta=0.345$, $t=3.762$, $p=0.000$
	Aboelmaged & Gebba (2013)	Banking	Sig positive: $\beta=0.268$, $t=3.137$, $p=0.002$
	Chen, Lin, Yeh & Lou (2013)	E-learning	Not Sig: $\beta=0.08$, $p>0.05$

Table 2.5 (continued)

Summary of direct antecedents of Internet Usage

Antecedents	Author	Industry	Findings
Attitude	Juwaheer <i>et al.</i> (2012)	Banking	Not sig: $r=1.000$, $p>0.05$
	Safeena <i>et al.</i> (2011)	Banking	Sig positive: $\beta=0.24$, $t=1.43$, $p<0.01$
	Selamat & Jaffar (2011)	Banking	Not Sig: $\beta=-0.37$, $p>0.05$
	Mansumittrchai & Al-Malkawi (2011)	Banking	Not Sig: $F=0.032$, $p=0.857$
	Chen & Li (2010)	E-service	Not Sig: $\beta=0.04$, $p>0.05$
	Park (2009)	E-learning	Sig positive: $\beta=0.184$, $t=3.44$, $p<0.01$
	Alkafagi <i>et al.</i> (2015)	Banking	Sig positive: $\beta=0.617$, $t=12.93$, $p=0.000$
	Bashir & Madhavaiah (2015)	Banking	Sig positive: $\beta=0.553$, $CR=15.297$, $p<0.001$
	Elkaseh, Wong & Fung (2015)	E-learning	Sig positive: $\beta=0.799$, $p<0.001$
	Mazhar <i>et al.</i> (2014)	Banking	Sig positive: $\beta=0.696$, $CR=11.779$
	Aboelmaged & Gebba (2013)	Banking	Sig positive: $\beta=0.351$, $t=3.754$, $p=0.000$
	Al-Adwan, Al-Adwan & Smedley (2013)	E-learning	Not Sig: $\beta=0.325$, $t=6.063$, $p>0.01$
	Al-Ajam & Md Noor (2013)	Banking	Sig positive: $\beta=0.706$, $CR=30.88$, $p<0.001$
	Maduku (2013)	Banking	Sig positive: Pearson $corr=0.799$, $p=0.000$
	Juwaheer <i>et al.</i> (2012)	Banking	Sig positive: $r=0.271$, $p<0.05$
	Safeena <i>et al.</i> (2011)	Banking	Sig positive: $\beta=0.21$, $t=1.098$, $p<0.01$
	Sa'nchez, Hueros & Ordaz (2013)	E-learning	Not sig: $\beta=0.14$, $t=0.76$, $p>0.05$
	Lule <i>et al.</i> (2012)	Banking	Sig positive: $\beta=0.730$, $p<0.001$
	Wu & Gao (2011)	E-learning	Not sig: $\beta=0.174$, $p<0.05$
	Read <i>et al.</i> (2011)	E-readers	Sig positive: $\beta=0.76$, $p<0.001$
	Shroff <i>et al.</i> (2011)	E-learning	Not sig: $\beta=0.93$, $t=1.41$, $p>0.05$
	Thomas (2011)	Social media	Sig positive: $\beta=0.35$
	Wang & Tseng (2011)	Online shopping	Not sig: $\beta=0.13$, $p>0.01$
	Chen & Li (2010)	E-service	Sig positive: $\beta=0.58$, $p<0.05$

Table 2.5 (continued)

Summary of direct antecedents of Internet Usage

Antecedents	Author	Industry	Findings
Attitude	Park (2009)	E-learning	Sig positive: $B=0.225$, $t=3.31$, $p<.01$
	Reid & Levy (2008)	Banking	Sig positive: $\beta=0.67$, $p<0.001$
	Porter & Donthu (2006)	IT usage	Sig positive: $B=0.63$, $t=14.68$, $p<.05$
	Suh & Han (2002)	Banking	Sig positive: $B=0.484$, $t=12.193$, $p<.01$
Intention to use	Rauniar, Rawski, Yang & Johnson (2014)	Social media usage	Sig positive: $B=0.50$, $p<.001$
	Suh & Han (2002)	Banking	Sig positive: $\beta=0.174$, $p<0.01$
Anxiety	Alkafagi <i>et al.</i> (2015)	Banking	Sig positive: $\beta = -0.172$, $t = 4.821$, $p < 0.01$
Awareness	Juwaheer, Pudaruth & Ramdin (2012)	Banking	Sig positive: $f = 5.619$, $p < 0.05$
Compatibility	Mamat <i>et al.</i> (2015)	E-learning	Sig positive: $\beta=0.31$, $p<0.05$
	Mansumitrchai & Al-Malkawi (2011)	Banking	Sig positive: $f=41.555$, $p < 0.01$
Channel Convenience	Nasri (2011)	Banking	Sig positive: $\beta=0.264$, $t=3.979$, $p=0.000$
Difficulty	Mansumitrchai & Al-Malkawi (2011)	Banking	Sig positive: $f=19.017$, $p < 0.01$
Facilitating Conditions	Fathima & Muthumani (2015)	Banking	Sig positive: $\beta=0.121$, $t=12.173$, $p<0.05$
	Mamat <i>et al.</i> (2015)	E-learning	Not sig: $\beta=0.014$, $p>0.05$
Human Contact	Mansumitrchai & Al-Malkawi (2011)	Banking	Sig positive: $f=21.029$, $p < 0.01$
Online Banking Info	Nasri (2011)	Banking	Not sig: $\beta=0.071$, $t=1.347$, $p=0.179$
Perceived Enjoyment	Bashir & Madhavaiah (2015)	Banking	Sig positive: $\beta = 0.114$, $CR=3.260$, $p<0.001$
	Hamari (2015)	Online shopping	Sig positive: $\beta = -0.053$, $p<0.05$
Perceived Credibility	Abdulkadir <i>et al.</i> (2013)	Banking	Not sig: result details not available
	Fathima & Muthumani (2015)	Banking	Sig positive: $\beta=0.195$, $t=19.923$, $p<0.05$
	Jeong & Yoon (2013)	Banking	Not sig: $r=0.1755$, $t=1.5468$, $p=0.1254$
Perceived Image	Fathima & Muthumani (2015)	Banking	Sig positive: $\beta=0.083$, $t=9.357$, $p<0.05$
	Abdulkadir <i>et al.</i> (2013)	Banking	Not sig: result details not available

Table 2.5 (continued)

Summary of direct antecedents of Internet Usage

Antecedents	Author	Industry	Findings
Perceived Financial Cost	Abdulkadir <i>et al.</i> (2013)	Banking	Not sig: result details not available
	Fathima & Muthumani (2015)	Banking	Sig positive: $\beta=0.063$, $t=6.992$, $p<0.05$
	Jeong & Yoon (2013)	Banking	Not sig: $r=0.0598$, $t=0.6948$, $p=0.4889$
Perceived behavioral control	Aboelmaged & Gebba (2013)	Banking	Not sig: $\beta=0.12$, $p>0.001$
	Safeena <i>et al.</i> (2013)	Banking	Sig positive: $\beta=0.35$, $t=3.04$, $p<0.01$
Relative Advantage	Eze <i>et al.</i> (2011)	Banking	Sig positive: $\beta=0.162$, $t=2.382$, $p=0.018$
Resistance	Alkafagi <i>et al.</i> (2015)	Banking	Sig positive: $\beta=-0.118$, $t=2.262$, $p<0.01$
Risk	Alkafagi <i>et al.</i> (2015)	Banking	Sig positive: $\beta = -0.125$, $t = 3.818$, $p < 0.01$
	Bashir & Madhavaiah (2015)	Banking	Sig positive: $\beta = 0.026$, $CR = 2.770$, $p < 0.01$
	Candra (2013)	Banking	Not sig: $\beta=0.04$, $P=0.32$
	Nasri (2011)	Banking	Sig positive: $\beta=0.188$, $t=3.362$, $p=0.001$
Security	Juwaheer, Pudaruth & Ramdin (2012)	Banking	Sig positive: $\alpha=0.880$, $\alpha > 0.06$
	Mansumittrchai & Al-Malkawi (2011)	Banking	Not sig: $f=0.026$, $p=0.873$
	Nasri (2011)	Banking	Sig positive: $\beta=0.205$, $t=3.197$, $p=0.002$
Triability	Eze <i>et al.</i> (2011)	Banking	Sig positive: $\beta=0.251$, $t=4.219$, $p=0.000$
Third Party Concerns	Mansumittrchai & Al-Malkawi (2011)	Banking	Not sig: $f=0.856$, $p=0.356$

Appendix 3: Table 2.12

Antecedents of Attitude

Antecedents	Authors	Industry	Analysis Method/ Scale	Respondent	Findings
Trust	Bashir & Madhavaiah (2015)	Banking	SEM/5 Point likert Trust: 5 items Att: 5 items	697 internet banking users via online survey	Sig positive: $\beta=0.309$, CR=11.497, $p<0.001$
Trust	Mazhar <i>et al.</i> (2014)	Banking	Regression/5 Point likert Trust: 8 items Att: 4 items	150 customers of mobile/Int	Not sig: $\beta=-0.055$, $p=0.498$
Trust	Trivedi & Kumar (2014)	Online shopping	Regression/5 Point likert Trust: 4 items Att: 3 items	110 students	Not sig: $\beta=0.023$, $t=0.274$, $p>0.05$
Trust	Al-Ajam & Md Noor (2013)	Banking	SEM/7 point Likert Trust: 4 items Att: 4 items	1286 non users of internet banking	Sig positive: $\beta=0.243$, CR=10,817,
Trust	Maduku (2013)	Banking	Regression/5 Point likert Trust: 4 items Att: 5 items	394 retail banking customers	Sig positive: $\beta=0.489$, $p=0.000$
Trust	Bamoriya & Singh (2012)	SMS advertising	SEM/5 point Likert Trust: 3 items Att: 2 items	242 Indian mobile users	Sig positive: $\beta=0.116$, $p<0.05$
Trust	Al-Majali (2011)	Banking	SEM/7 point Likert Trust: 6 items Att: 5 items	532 employees of 4 universities in Jordan	Sig positive: $\beta=NA$, CR=2.102, $p=0.036$
Trust	Wang & Tseng (2011)	Online shopping	SEM/Scale (NA) Trust: 3 items Att: 4 items	206 online shopping customers	Sig positive: $\beta=0.62$, $p<0.01$
Trust	Celik & Yilmaz (2011)	E-shopping	SEM/5 Point likert Trust: 2 items Att: 4 items	606 forum users via e-survey	Sig positive: $\beta=0.17$, $t=3.73$, $p<0.01$

Table 2.12 (continued)

Antecedents of Attitude

Antecedents	Authors	Industry	Analysis Method/ Scale	Respondent	Findings
Trust	Suh & Han (2002)	Banking	SEM/5 Point likert Trust: 6 items Att: 5 items	Internet banking users of 5 major	Sig positive: $\beta=0.352$, $t=9.972$,
Perceived usefulness	Bashir & Madhavaiah (2015)	Banking	SEM/5 Point likert PU: 6 items Att: 5 items	697 internet banking users via online survey	Sig positive: $\beta=0.223$, CR=3.990, $p<0.001$
Perceived usefulness	Elkaseh, Wong & Fung (2015)	E-learning	SEM/Scale: NA PU: 3 items Att: 3 items	499 students & lecturers in Libya	Sig positive: $\beta=0.463$ & 0.661 ,
Perceived usefulness	Mazhar <i>et al.</i> (2014)	Banking	Regression/5 Point likert PU: 7 items Att: 4 items	150 customers of mobile/Int	Sig positive: $\beta=0.523$, $p=0.00$
Perceived usefulness	Aboelmaged & Gebba (2013)	Banking	Regression/5 point Likert PU: 3 items Att: 4 items	119 undergrad and postgrad	Sig positive: $\beta=0.581$, $t=6.279$, $p=0.000$
Perceived usefulness	Al-Adwan, Al-Adwan & Smedley (2013)	E-learning	Regression/4 point Likert PU: 4 items Att: 4 items	107 students	Not Sig: $\beta=0.185$, $t=2.499$, $p>0.05$
Perceived usefulness	Maduku (2013)	Banking	Regression/5 Point likert PU: 5 items Att: 5 items	394 retail banking customers	Sig positive: $\beta=0.216$, $p=0.000$
Perceived usefulness	Sa'ñchez, Hueros & Ordaz (2013)	WebCT learning system	SEM/7 Point likert PU: 6 items Attitude: 4 items	226 undergrad students	Sig positive: $\beta=0.55$, $t=6.17$
Perceived usefulness	Lule <i>et al.</i> (2012)/Kenya	Banking	SEM/7 Point likert PU: 3 items Att: 5 items	395 M-kesho users	Not Sig: $\beta=0.030$, $p>0.05$

Table 2.12 (continued)

Antecedents of Attitude

Antecedents	Authors	Industry	Analysis Method/ Scale	Respondent	Findings
Perceived usefulness	Celik & Yilmaz (2011)	Online shopping	SEM/5 Point likert PU: 3 items Att: 4 items	606 forum users via e-survey	Sig positive: $\beta=0.65$, $t=9.41$, $p<0.01$
Perceived usefulness	Mangin <i>et al.</i> (2011)	Banking	SEM/5 Point likert PU: 4 items Att: 2 items	225 university students	Sig positive: $\beta=0.825$, $p<0.05$
Perceived usefulness	Kowitlawakul (2011)	Health Care	Regression/5 Point likert PU: 7 items Att: 21 items	117 Nurses from the ICU	Sig positive: $\beta=0.297$, $p<0.01$
Perceived usefulness	Read <i>et al.</i> (2011)	E-readers	SEM/7 Point likert PU: 4 items Att: 4 items	451 e-reader users	Sig positive: $\beta=0.28$, $p<0.001$
Perceived usefulness	Shroff <i>et al.</i> (2011)	E-learning	SEM/7 Point likert PU: 5 items Att: 5 items	72 students	Not Sig: $\beta=0.67$, $p>0.05$
Perceived usefulness	Thomas (2011)	Social media (Internet)	SEM/5 Point likert PU: 5 items Att: 4 items	345 Under graduate and post	Sig positive: $\beta=0.26$
Perceived usefulness	Wang & Tseng (2011)	Online shopping	SEM/Scale type (NA) PU: 4 items Att: 4 items	206 online shopping customers	Sig positive: $\beta=0.31$, $p<0.01$
Perceived usefulness	Wu & Gao (2011)	E-learning	SEM/7 Point likert PU: 4 items Att: 3 items	105 Students macroeconomic classes	Sig positive: $\beta=0.675$, $p<0.01$
Perceived usefulness	Adesina & Ayo (2010)	Banking	Regression/5 Point likert PU: 5 items Att: 3 items	292 electronic banking users	Sig positive: $\beta=0.327$, $t=5.135$, $p=0.000$

Table 2.12 (continued)

Antecedents of Attitude

Antecedents	Authors	Industry	Analysis Method/ Scale	Respondent	Findings
Perceived usefulness	Chau & Ngai (2010)	Banking	Regression/7 Point likert PU: 4 items ATT: NA	164 internet banking users &	Sig positive: $\beta=0.179$, $p<0.05$
Perceived usefulness	Park (2009)	E-learning	SEM/7 Point likert PU: 3 items Usage: 2 items	628 students	Not sig: $\beta= -0.04$, $t=-.60$, $p>0.05$
Perceived usefulness	Reid & Levy (2008)	Banking	SEM/ 5 point Likert PU: 4 items Att: 3 items	374 banks customers	Sig positive: $\beta=0.55$, CR=6.788,
Perceived usefulness	Porter & Donthu (2006)	IT usage	SEM/5 point Likert PU: 3 items Att: 3 items	539 internet users/and non users	Sig positive: $\beta=0.57$,
Perceived usefulness	Suh & Han (2002)	Banking	SEM/5 Point likert PU: 6 items Att: 5 items	Internet banking users of 5 major banks in Korea	Sig positive: $\beta=0.376$, $t=8.831$, $p<0.01$
Perceived Ease of Use	Bashir & Madhavaiah (2015)	Banking	SEM/5 Point likert PEU: 5 items Att: 5 items	697 internet banking users via online survey	Sig positive: $\beta=0.165$, CR= 3.298, $p<0.001$
Perceived Ease of Use	Elkaseh, Wong & Fung (2015)	E-learning	SEM/Scale: NA PEU: 4 items Att: 3 items	499 students & lecturers in Libya	Sig positive: $\beta=0.365$ & 0.284 ,
Perceived Ease of Use	Mazhar <i>et al.</i> (2014)	Banking	Regression/5 Point likert PEOU: 7 items Att: 4 items	150 customers of mobile/Int	Not sig: $\beta=0.129$, $p>0.05$
Perceived Ease of Use	Nguyen, Nguyen & Singh (2014)	Banking	SEM/7 Point likert PEU: 6 items Att: 4 items	464 bank customers via web survey & customers	Not Sig: $\beta=-0.047$, $p=0.523$

Table 2.12 (continued)

Antecedents of Attitude

Antecedents	Authors	Industry	Analysis Method/ Scale	Respondent	Findings
Perceived Ease of Use	Aboelmaged & Gebba (2013)	Banking	Regression/5 point Likert PEU: 3 items Att: 4 items	119 undergrad and postgrad students	Not Sig: $\beta=0.014$, $t=0.151$, $p>0.05$
Perceived Ease of Use	Al-Ajam & Md Noor (2013)	Banking	SEM/7 point Likert PEU: 4 items Att: 4 items	1286 non users of internet banking	Sig positive: $\beta=0.236$, $CR=9.723$, $p<0.001$
Perceived Ease of Use	Maduku (2013)	Banking	Regression/5 Point likert PEU: 4 items Att: 5 items	394 retail banking customers	Sig positive: $\beta=0.145$, $p=0.011$
Perceived Ease of Use	Sánchez, Hueros & Ordaz (2013)	WebCT learning	SEM/7 Point likert PEU: 4 items Attitude: 4 items	226 undergrad students	Sig positive: $\beta=0.38$, $t=4.85$
Perceived Ease of Use	Bamoriya & Singh (2012)	SMS advertising	SEM/5 point Likert PEU: 3 items Att: 2 items	237 Indian mobile users	Sig positive: $\beta=0.137$, $p<0.05$
Perceived Ease of Use	Lule <i>et al.</i> (2012)	Banking	SEM/7 Point likert PEU: 4 items Att: 5 items	395 M-kesho users	Sig positive: $\beta=0.230$, $p<0.001$
Perceived Ease of Use	Kowitlawakul (2011)	Health Care	Regression/5 Point likert PEU: 6 items Att: 21 items	117 Nurses from the ICU	Sig positive: $\beta=0.466$, $p<0.01$
Perceived Ease of Use	Read <i>et al.</i> (2011)	E-readers	SEM/7 Point likert PEU: 3 items Att: 4 items	451 e-reader users	Sig positive: $\beta=0.40$, $p<0.001$
Perceived Ease of Use	Shroff <i>et al.</i> (2011)	E-learning	SEM/7 Point likert PEU: 5 items Att: 5 items	72 students	Sig positive: $\beta=0.30$, $t=3.20$,

Table 2.12 (continued)

Antecedents of Attitude

Antecedents	Authors	Industry	Analysis Method/ Scale	Respondent	Findings
Perceived Ease of Use	Thomas (2011)	Social media (chatting)	SEM/5 Point likert PEU: 4 items Att: 4 items	345 Under graduate and post	Not sig: details not provided
Perceived Ease of Use	Wang & Tseng (2011)	Online	SEM/Scale type(NA) PEU: 4 items Att: 4 items	206 online shopping customers	Not Sig: $\beta=0.03$, $p>0.01$
Perceived Ease of Use	Adesina & Ayo (2010)	Banking	Regression/5 Point likert PEU: 5 items Att: 3 items	292 electronic banking users	Sig positive: $\beta=0.180$, $t=2.953$, $p=0.003$
Perceived Ease of Use	Chau & Ngai (2010)	Banking	Regression/7 Point likert PEU: 4 items ATT: NA	164 internet banking users & non users	Sig positive: $\beta=0.616$, $p<0.01$
Perceived Ease of Use	Park (2009)	E-learning	SEM/7 Point likert PEU: 3 items Att: 3 items	628 students	Sig positive: $\beta=0.199$, $t=5.57$, $p<0.01$
Perceived Ease of Use	Reid & Levy (2008)	Banking	SEM/5 point Likert PEU: 4 items Att: 3 items	374 banks customers	Sig positive: $\beta=0.38$, $CR=5.261$,
Perceived Ease of Use	Porter & Donthu (2006)	IT usage	SEM/5 point Likert PEU: 4 items Att: 3 items	539 internet users/and non users	Sig positive: $\beta=0.27$, $t=6.71$,
Perceived Ease of Use	Suh & Han (2002)	Banking	SEM/5 Point likert PEU: 5 items Att: 5 items	Internet banking users of 5 major banks in Korea	Sig positive: $\beta=0.186$, $t=5.440$,
Internet Self-Efficacy	Kulviwat, Bruner & Neelankavil (2014)	IT usage	SEM/7 Point likert ISE: 4 items Att: 1 items	230 under grad students	Not sig: $\beta=0.07$, $p>0.05$

Table 2.12 (continued)

Antecedents of Attitude

Antecedents	Authors	Industry	Analysis Method/ Scale	Respondent	Findings
Internet Self-Efficacy	Trivedi & Kumar (2014)	Online shopping	Regression/5 Point likert ISE: 4 items Att: 3 items	110 students	Not sig: $\beta=0.081$, $t=0.850$, $p>0.05$
Internet Self-Efficacy	Lule <i>et al.</i> (2012)	Banking	SEM/7 Point likert ISE: 4 items Att: 4 items	395 M-kesho users	Sig positive: $\beta=0.116$, $p<0.05$
Internet Self-Efficacy	Adesina & Ayo (2010)	Banking	Regression/5 Point likert ISE: 7 items Att: 3 items	292 electronic banking users	Sig positive: $\beta=0.104$, $t=2.046$, $p=0.042$
Internet Self-Efficacy	Zhu <i>et al.</i> (2010)	Mobile auction	SEM/7 Point likert ISE: 6 items Att: 2 items	487 respondents from China via	Sig positive: $\beta=0.32$, $p<0.001$
Internet Self-Efficacy	Park (2009)	E-learning	SEM/7 Point likert ISE: 2 items ATT: 3 items	629 undergraduate	Not sig: $\beta=0.049$, $t=1.11$, $p>0.01$
Subjective Norm	Hamari (2015)	Online shopping	SEM/7 Point likert SN: NA Att: NA	2791 social games users	Sig positive: $\beta=0.748$, $p<0.001$
Subjective Norm	Zendehdel & Paim (2015)	Online shopping	SEM/5 point Likert SN: 9 items Att: 11 items	375 university students	Sig positive: $\beta=0.44$, $p=0.01$
Subjective Norm	Maduku (2013)	Banking	Regression/5 Point likert SN: 4 items Att: 5 items	394 retail banking customers	Not sig: $\beta=0.051$, $p=0.211$
Subjective Norm	Liao & Chou (2012)	Social media	SEM/7 Point likert SN: 3 items Att: 3 items	318 social media users	Sig positive: $\beta=0.18$, $p<0.01$

Table 2.12 (continued)

Antecedents of Attitude

Antecedents	Authors	Industry	Analysis Method/ Scale	Respondent	Findings
Subjective Norm	Lule <i>et al.</i> (2012)	Banking	SEM/7 Point likert SN: 5 items Att: 5 items	395 M-kesho users	Not sig: $\beta=0.030$, $p>0.05$
Subjective Norm	Shittu, Basha, AbdulRahman & Ahmad (2011)	Social media	SEM/Scale type: NA SN: 5 items Att: 4 items	151 university students	Sig positive: $\beta=0.23$, $p<0.05$
Subjective Norm	Park (2009)	E-learning	SEM/7 Point likert SN: 3 items ATT: 3 items	628 students	Not sig: $\beta=0.265$, $t=6.4911$, $p>0.01$
Awareness	Al-Majali (2011)/Jordan	Banking	SEM/7 point Likert Awa: 4 items Att: 5 items	532 employees of 4 universities in Jordan	Sig positive: $\beta=NA$, $CR=2.028$, $p=0.043$
Compatibility	Mazhar <i>et al.</i> (2014)	Banking	Regression/5 Point likert Com: 6 items Att: 4 items	150 customers of mobile/Int	Not sig: $\beta=0.092$, $p=0.123$
Security	Mazhar <i>et al.</i> (2014)	Banking	Regression/5 Point likert Sec: 7 items Att: 4 items	150 customers of mobile/Int	Sig positive: $\beta=0.137$, $p=0.049$
Credibility	Lule <i>et al.</i> (2012)	Banking	SEM/7 Point likert CRE: 5 items Att: 5 items	395 M-kesho users	Sig positive: $\beta=0.525$, $p<0.001$
Transaction cost	Lule <i>et al.</i> (2012)	Banking	SEM/7 Point likert TC: 3 items Att: 5 items	395 M-kesho users	Sig positive: $\beta=0.138$, $p<0.05$
Perceived self-efficacy	Lule <i>et al.</i> (2012)	Banking	SEM/7 Point likert SE: 4 items Att: 5 items	395 M-kesho users	Sig positive: $\beta=0.116$, $p<0.05$

Table 2.12 (continued)

Antecedents of Attitude

Antecedents	Authors	Industry	Analysis Method/ Scale	Respondent	Findings
System accessibility organizational	Park (2009)	E-learning	SEM/7 Point likert SAO: 1 items Att: 3 items	628 students	Not sig: $\beta=-0.01$, $t=-0.30$, $p>0.01$
Access barriers	Porter & Donthu (2006)	IT usage	SEM/5 point Likert AB: 2 items Att: 3 items	539 internet users/and non users	Sig negative: $\beta=-0.12$, $t=-3.61$, $p>0.05$
Perceived risk	Al-Majali (2011)/Jordan	Banking	SEM/7 point Likert Risk: 4 items Att: 5 items	532 employees of 4 universities in Jordan	Sig positive: $\beta=NA$, $CR=-1.976$, $p=0.048$
Perceived risk	Thomas (2011)	Social media (chatting)	SEM/5 Point likert Risk: 8 items Att: 4 items	345 Under graduate and post graduate	Sig negative: $\beta=-0.23$
Perceived enjoyment	Celik & Yilmaz (2011)	Online shopping	SEM/5 Point likert Pjoy: 3 items Att: 4 items	606 forum users via e-survey	Sig positive: $\beta=0.23$, $t=4.14$, $p<0.01$
Perceived enjoyment	Thomas (2011)	Social media (chatting)	SEM/5 Point likert Pjoy: 6 items Att: 4 items	345 Under graduate and post graduate	Sig positive: $\beta=0.44$
Emotional attachment	Read <i>et al.</i> (2011)	E-readers	SEM/7 Point likert Emo: 9 items Att: 4 items	451 e-reader users	Neg Sig: $\beta=-0.05$, $p<0.01$
Relative Advantage	Al-Ajam & Md Noor (2013)	Banking	SEM/7 point Likert RA: 4 items Att: 4 items	1286 non users of internet banking	Sig positive: $\beta=0.174$, $CR=3.974$, $p<0.001$

Appendix 4: Table 2.18

Summary of indirect antecedents of Internet usage

Antecedents	Author	Industry	Findings
Trust-Attitude (Att)- Internet usage (IU)	Bashir & Madhavaiah (2015)	Banking	Mediation supported: $\beta=0.202$, $p<0.01$
Trust-Att-IU	Mazhar <i>et al.</i> (2014)	Banking	Mediation result not established
Trust-Att-IU	Trivedi & Kumar (2014)	Online shopping	Mediation not supported
Trust-Att-IU	Nguyen, Nguyen & Singh (2014)	Banking	Mediation result not established
Trust-Att-IU	Al-Ajam & Md Noor (2013)	Banking	Mediation result not established
Trust-Att-IU	Liao & Chou (2012)	Social media	Mediation not supported: $\beta=0.0068$
Trust-Att-IU	Al-Majali (2011)	Banking	Mediation result not established
Trust-Att-IU	Suh & Han (2002)	Banking	Mediation supported: $\beta=0.171$, $t= 8.158$,
Perceived usefulness (PU)-Att-IU	Bashir & Madhavaiah (2015)	Banking	Mediation supported: $\beta=0.124$, $p<0.01$
PU-Att-IU	Elkaseh, Wong & Fung (2015)	E-learning	Mediation result not established
PU-Att-IU	Sharma & Gonindaluri (2015)	Banking	Mediation result not established
PU-Att-IU	Nguyen, Nguyen & Singh (2014)	Banking	Mediation result not established
PU-Att-IU	Mazhar <i>et al.</i> (2014)	Banking	Partial Mediation: $\beta=0.364$, $p<0.05$
PU-Att-IU	Raida & Neji (2013)	Banking	Mediation result not established
PU-Att-IU	Sa'nchez <i>et al.</i> (2013)	E-learning	Mediation supported: $\beta=0.07$
PU-Att-IU	Liao & Chou (2012)	Social media	Mediation supported: $\beta=0.163$
PU-Att-IU	Lim & Ting (2012)	Online shopping	Mediation result not established
PU-Att-IU	Lule <i>et al.</i> (2012)	Banking	Mediation result not established
PU-Att-IU	Widjana & Rachmat (2011)	Banking	Mediation result not established
PU-Att-IU	Shittu <i>et al.</i> (2011)	Social media	Mediation result not established
PU-Att-IU	Yaghoubi & Bahmani (2010).	Banking	Mediation supported: $\beta=0.19$

Table 2.18 (continued)

Summary of indirect antecedents of Internet usage

Antecedents	Author	Industry	Findings
PU-Att-IU	Suh & Han (2002)	Banking	Mediation supported: $\beta=0.403$, $t= 11.902$, $p<0.01$
PU-Att-IU	Park (2009)	E-learning	Mediation not supported: $\beta=0.118$, $t= -0.60$, $p>0.05$
Perceived ease of use (PEU)-Att-IU	Bashir & Madhavaiah (2015)	Banking	Mediation supported: $\beta=0.185$, $p<0.01$
PEU-Att-IU	Elkaseh, Wong & Fung (2015)	E-learning	Mediation result not established
PEU-Att-IU	Sharma & Gonindaluri (2015)	Banking	Mediation result not established
PEU-Att-IU	Nguyen, Nguyen & Singh (2014)	Banking	Mediation result not established
PEU-Att-IU	Mazhar <i>et al.</i> (2014)	Banking	Mediation result not established
PEU-Att-IU	Al-Ajam & Md Noor (2013)	Banking	Mediation result not established
PEU-Att-IU	Raida & Neji (2013)	Banking	Mediation result not established
PEU-Att-IU	Sa'nchez <i>et al.</i> (2013)	E-learning	Mediation supported: $\beta=0.28$, $p<0.05$
PEU-Att-IU	Liao & Chou (2012)	Social media	Mediation not supported: $\beta=0.04$
PEU-Att-IU	Lim & Ting (2012)	Online shopping	Mediation result not established
PEU-Att-IU	Lule <i>et al.</i> (2012)	Banking	Mediation result not established
PEU-Att-IU	Shittu <i>et al.</i> (2011)	Social media	Mediation result not established
PEU-Att-IU	Park (2009)	E-learning	Mediation not supported: $\beta=0.052$,
PEU-Att-IU	Reid & Levy (2008)	Banking	Mediation result not established
PEU-Att-IU	Porther & Donthu (2006)	Multiple	Mediation result not established
PEU-Att-IU	Suh & Han (2002)	Banking	Mediation supported: $\beta=0.596$, $t= 17.014$,
Internet self-efficacy (ISE)-Att-IU	Trivedi & Kumar (2014)	Online shopping	Mediation not supported
ISE-Att-IU	Lule <i>et al.</i> (2012)	Banking	Mediation result not established

Table 2.18 (continued)

Summary of indirect antecedents of Internet usage

Antecedents	Author	Industry	Findings
ISE-Att-IU	Zhu <i>et al.</i> (2010)	Mobile auction	Mediation result not established
ISE-Att-IU	Park (2009)	E-learning	Mediation supported: $\beta=0.054$, $t= 7.08$, $p<0.05$
Subjective norm (SN)-Att-IU	Bashir & Madhavaiah (2015)	Banking	Mediation not supported: $\beta=-0.004$, $p>0.05$
SN-Att-IU	Hamari (2015)	Online shopping	Mediation result not established
SN-Att-IU	Maduku (2013)	Banking	Mediation result not established
SN-Att-IU	Liao & Chou (2012)	Social media	Mediation supported: $\beta=0.122$
SN-Att-IU	Lule <i>et al.</i> (2012)	Banking	Mediation result not established
SN-Att-IU	Shittu <i>et al.</i> (2011)	Social media	Mediation result not established
SN-Att-IU	Park (2009)	E-learning	Mediation supported: $\beta=0.096$, $t= 3.44$, $p<0.05$
Perceived enjoyment (PE)-Att-IU	Bashir & Madhavaiah (2015)	Banking	Mediation supported: $\beta=0.139$, $p<0.01$
PE-PU-IU	Sheng & Zolfagharian (2014)	E-products agent	Mediation supported.
Compatibility (com)-Att-IU	Mazhar <i>et al.</i> (2014)	Banking	Mediation result not established
Security (sec)-Att-IU	Mazhar <i>et al.</i> (2014)	Banking	Mediation result not established
Risk (RK)-Att-IU	Li (2013)	Banking	Mediation supported
Risk (RK)-Att-IU	Al-Majali (2011)	Banking	Mediation result not established
Awareness (AW)-Att-IU	Al-Majali (2011)	Banking	Mediation result not established
Family influence(FM)-SN-IU	Al-Majali (2011)	Banking	Mediation result not established
Relative Advantage(RA)-Att-IU	Al-Ajam & Md Noor (2013)	Banking	Mediation result not established
Mass media(MM)-SN-IU	Al-Majali (2011)	Banking	Mediation result not established

Table 2.18 (continued)

Summary of indirect antecedents of Internet usage

Antecedents	Author	Industry	Findings
Network ties(NT)-Att-IU	Liao & Chou (2012)	Social media	Mediation supported
Norm of reciprocity(NR)-Att-IU	Liao & Chou (2012)	Social media	Mediation not supported
Shared language(SL0-Att-IU	Liao & Chou (2012)	Social media	Mediation supported
Shared vision(SV)-Att-IU	Liao & Chou (2012)	Social media	Mediation supported
PEU-PU-IU	Rauniar <i>et al.</i> (2014)	Social media	Mediation result not established
Critical Mass (CM)-PU-IU	Rauniar <i>et al.</i> (2014)	Social media	Mediation result not established
Capability (CP)-PU-IU	Rauniar <i>et al.</i> (2014)	Social media	Mediation result not established
Perceived Playfulness (PPL)-PU-IU	Rauniar <i>et al.</i> (2014)	Social media	Mediation result not established
Technical support (TS)-Att-IU	Sa'nchez <i>et al.</i> (2013)	E-learning	Mediation supported: $\beta=0.20$, $p<0.01$

Appendix 5: Questionnaire booklet

QUESTIONNAIRE

Dear Valued Respondents,

I am a doctoral candidate of Business Administration at Universiti Utara Malaysia, Sintok, Kedah who is collecting the final data for my thesis entitled "An Empirical Investigation on Direct and Indirect Determinants of Internet Banking Usage: the Mediating Effect of Attitude" .

The purpose of this study is to investigate the factors that may impact the usage of Internet banking in the context of the Malaysian banking environment. The results from this study is important and may assist the commercial banks and the banking industry particularly in Malaysia to strategize their Internet banking facility as one of the most important alternate delivery channels.

I would appreciate if you could spare your time and thought for about 15 minutes to complete this questionnaire based on your opinion on factors that may influence the usage of Internet banking in Malaysia. All information provided by you will be kept in strictest confidence and for the purpose of academic research only. There are no right and wrong answers to your response.

This questionnaire booklet consists of three main sections. Section one will be the screening questions related to your bank(s) and to determine you as one of the Internet banking customer. While section two will be your background information and section three will be your perceptions of the factors that may contribute towards Internet banking usage.

Lastly, thank you very much for your participation in this important study.

Yours sincerely,



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SOAL SELIDIK

Responden Yang Dihargai,

Saya merupakan seorang calon doktor falsafah dalam Pentadbiran Perniagaan di Universiti Utara Malaysia, Sintok, Kedah yang mengumpul data terakhir bagi tesis yang bertajuk "Satu Penyiasatan Empirikal Terhadap Faktor Penentu Langsung dan Tidak Langsung Penggunaan Perbankan Internet: Kesan Pengantara Sikap".

Tujuan kajian ini adalah untuk menyelidik faktor-faktor yang boleh memberi kesan kepada penggunaan perbankan Internet dalam kontek persekitaran perbankan Malaysia. Hasil daripada kajian ini adalah penting dan boleh membantu bank perdagangan dan industri perbankan terutamanya di Malaysia untuk menyusun strategi kemudahan perbankan Internet mereka sebagai salah satu cabang yang paling penting dalam perbankan alternatif.

Saya sangat menghargai jika anda boleh meluangkan masa kira-kira 15 minit untuk melengkapkan soal selidik ini berdasarkan pendapat anda tentang faktor-faktor yang boleh mempengaruhi penggunaan perbankan Internet di Malaysia. Semua maklumat yang diberikan oleh anda akan dirahsiakan dan hanya untuk tujuan penyelidikan akademik sahaja. Tiada jawapan yang betul atau salah di atas respon yang anda berikan.

Kertas soal selidik ini terdiri daripada tiga bahagian utama. Seksyen satu merupakan soalan saringan yang berkaitan dengan bank anda dan untuk menentukan anda sebagai salah satu daripada pelanggan perbankan Internet. Sementara seksyen kedua pula merupakan soalan yang berkaitan maklumat latar belakang anda dan seterusnya seksyen ketiga merupakan persepsi anda terhadap faktor-faktor yang boleh menyumbang ke arah penggunaan perbankan Internet.

Akhir sekali, terima kasih saya ucapkan di atas penyertaan anda dalam kajian yang penting ini.

Yang ikhlas,



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SECTION 1

Please complete Part A by placing check marks (✓) in the appropriate boxes and filling in the blanks for written answers.

Sila lengkapkan Bahagian A dengan meletakkan tanda cek (✓) dalam kotak berkenaan dan mengisi ruang kosong bagi jawapan bertulis

Part A: Screening Items

Maklumat Saringan

The purpose of this section is to gather some information about the bank(s) that you maintain your account(s) with and also to find out whether/if you are an Internet banking customer.

Tujuan seksyen ini adalah untuk mengumpul beberapa maklumat mengenai bank dan di mana akaun anda dikekalkan dan juga untuk mengetahui samaada anda adalah pelanggan perbankan Internet.

Code	Statement/Pernyataan
SI1	<p>Please indicates the bank(s) that you maintain your account with: <i>Sila tandakan bank anda dan di mana akaun anda dikekalkan:</i></p> <p><input type="checkbox"/> a. Maybank Berhad</p> <p><input type="checkbox"/> b. CIMB Bank Berhad</p> <p><input type="checkbox"/> c. Public Bank Berhad</p> <p><input type="checkbox"/> d. Hong Leong Bank Berhad</p> <p><input type="checkbox"/> e. AmBank Berhad</p> <p>Important Note: [If you maintain your account(s) with any of the above bank(s) please proceed to the next questions] <i>Nota Penting:</i> <i>[Jika anda mengekalkan akaun anda dengan mana-mana bank di atas sila terus menjawab soalan berikut]</i></p>

SI2	<p>Are you an Internet banking customer? <i>Adakah anda pelanggan perbankan Internet?</i></p> <p><input type="checkbox"/> a. Yes/Ya</p> <p><input type="checkbox"/> b. No/Tidak</p> <p>Important Note: [If you are an Internet banking customer please proceed to answer all questions]. <i>Nota Penting:</i> <i>[Jika anda adalah pelanggan perbankan Internet, sila teruskan untuk menjawab semua soalan berikut].</i></p>
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SECTION 2

Please complete Part B by placing check marks (✓) in the appropriate boxes and filling in the blanks for written answers.

Sila lengkapkan Bahagian B dengan meletakkan tanda cek (✓) dalam kotak yang sesuai dan mengisi tempat kosong bagi jawapan bertulis.

Part B: Background

Maklumat Latarbelakang

The purpose of this part is to collect some basic information about your background.

Tujuan bahagian ini adalah untuk mengumpul beberapa maklumat asas mengenai latar belakang anda.

Code	Statement/Pernyataan
BG1	<p>Please state your gender. <i>Sila nyatakan jantina anda.</i></p> <p><input type="checkbox"/> a. Male/Lelaki</p> <p><input type="checkbox"/> b. Female/Perempuan</p>
BG2	<p>Please state your race. <i>Sila nyatakan bangsa anda.</i></p> <p><input type="checkbox"/> a. Malay</p> <p><input type="checkbox"/> b. Chinese</p> <p><input type="checkbox"/> c. Indian</p> <p><input type="checkbox"/> d. Others (Please specify) _____ <i>Lain-lain (Sila nyatakan)</i></p>

BG3	<p>Please state your education level. <i>Sila nyatakan tahap pendidikan anda.</i></p> <p><input type="checkbox"/> a. Primary School <i>Sekolah Rendah</i></p> <p><input type="checkbox"/> b. Secondary School/SPM/STPM <i>Sekolah Menengah /SPM/STPM</i></p> <p><input type="checkbox"/> c. Diploma <i>Diploma</i></p> <p><input type="checkbox"/> d. First (Bachelor's) degree <i>Ijazah Pertama (Sarjana Muda)</i></p> <p><input type="checkbox"/> e. Master degree <i>Ijazah Sarjana</i></p> <p><input type="checkbox"/> f. PhD/DBA/Doctoral Degree <i>PhD/DBA/Ijazah Kedoktoran</i></p> <p><input type="checkbox"/> g. Other (Please specify) _____ <i>Lain-lain (Sila nyatakan)</i></p>
BG4	<p>Please state your age _____ <i>Sila nyatakan umur anda</i></p>
BG5	<p>Please state your monthly income (in RM). <i>Sila nyatakan pendapatan bulanan anda (dalam RM).</i></p> <p><input type="checkbox"/> a. Less than 1,000/<i>Kurang daripada 1,000</i></p> <p><input type="checkbox"/> b. 1,001 – 3,000/<i>1,001 hingga 3,000</i></p> <p><input type="checkbox"/> c. 3,001 – 5,000/<i>3,001 hingga 5,000</i></p> <p><input type="checkbox"/> d. 5,001 – 10,000/<i>5,001 hingga 10,000</i></p> <p><input type="checkbox"/> e. More than 10,000/<i>Lebih daripada 10,000</i></p>

BG6	Please state your current profession in your organization that you work: <i>Sila nyatakan profesion semasa anda dalam organisasi yang anda berkerja:</i>	
	<input type="checkbox"/>	a. Clerical/Non-Clerical <i>Kerani/Bukan Kerani</i>
	<input type="checkbox"/>	b. Executive <i>Eksekutif</i>
	<input type="checkbox"/>	c. Assistant Manager <i>Penolong Pengurus</i>
	<input type="checkbox"/>	d. Manager/Head of Department <i>Pengurus/Ketua Jabatan</i>
	<input type="checkbox"/>	e. Head of Division <i>Ketua Bahagian</i>
	<input type="checkbox"/>	f. CEO/President/Director/Managing Director <i>Ketua Pegawai Eksekutif/Presiden/Pengarah/Pengarah Urusan</i>
	<input type="checkbox"/>	g. Consultant <i>Konsultan</i>
	<input type="checkbox"/>	h. Professional <i>Profesional</i>
	<input type="checkbox"/>	i. Self employed <i>Bekerja Sendiri</i>
	<input type="checkbox"/>	j. Technician <i>Juruteknik</i>
<input type="checkbox"/>	k. Others (Please specify) _____ <i>Lain-lain (Sila nyatakan)</i>	

SECTION 3

Please complete Part C to I by placing check marks (✓) in the appropriate boxes and filling in the blanks for written answers.

Sila lengkapkan Bahagian C hingga I dengan meletakkan tanda cek (✓) dalam kotak yang sesuai dan mengisi tempat kosong bagi jawapan bertulis.

Part C: Trust on Internet Banking Usage

Kepercayaan Terhadap Penggunaan Perbankan Internet

The purpose of this Part C is to determine your level of trust on the Internet banking usage by using a 7 point scale.

Tujuan Bahagian C ini adalah untuk menentukan tahap kepercayaan anda terhadap penggunaan perbankan Internet dengan menggunakan skala 7 titik.

Legend:

- 1= Strongly disagree/*Sangat Tidak Bersetuju*
- 2= Disagree/*Tidak Bersetuju*
- 3= Slightly Disagree/*Agak Tidak Bersetuju*
- 4= Neutral
- 5= Slightly Agree/*Agak Bersetuju*
- 6= Agree/*Setuju*
- 7= Strongly Agree/*Sangat Bersetuju*

Code	Statement/Pernyataan	Level/Tahap						
TST1	I trust that the transaction conducted through my Internet banking website is secure and private. <i>Saya percaya bahawa transaksi yang dijalankan melalui laman web perbankan Internet saya adalah selamat dan sulit.</i>	①	②	③	④	⑤	⑥	⑦
TST2	I do not trust payments made through my Internet banking channel will be processed securely (-). <i>Saya tidak mempercayai pembayaran yang dibuat melalui saluran perbankan Internet saya akan diproses dalam dengan selamat (-).</i>	①	②	③	④	⑤	⑥	⑦
TST3	I trust that my personal information on my Internet banking will be kept confidential. <i>Saya percaya bahawa maklumat peribadi saya mengenai perbankan Internet saya adalah sulit.</i>	①	②	③	④	⑤	⑥	⑦

TST4	My Internet banking website is characterized by the frankness and clarity of the services that is offered to the customer. <i>Laman web perbankan Internet saya adalah bercirikan atas dasar kejujuran dan perkhidmatan yang jelas yang ditawarkan kepada pelanggan.</i>	①	②	③	④	⑤	⑥	⑦
TST5	I do not think I can have confidence in the promises that my Internet banking website makes (-). <i>Saya tidak mempunyai keyakinan terhadap janji-janji yang dibuat oleh laman web perbankan Internet Saya (-).</i>	①	②	③	④	⑤	⑥	⑦
TST6	I think that the design and commercial offerings of my Internet banking website takes into account the desires and needs of its customers. <i>Saya berpendapat bahawa reka bentuk dan persembahan komersil laman web perbankan Internet saya mengambil kira kehendak dan keperluan pelanggan.</i>	①	②	③	④	⑤	⑥	⑦
TST7	I think that my Internet banking website takes into account the effect that their actions could have on the customer. <i>Saya berpendapat bahawa laman web perbankan Internet saya mengambil kira kesan di atas tindakan mereka boleh mempengaruhi pelanggan.</i>	①	②	③	④	⑤	⑥	⑦
TST8	I do not think that my Internet banking website has the necessary resources to successfully carry out its activities (-). <i>Saya berpendapat bahawa laman web perbankan Internet saya tidak mempunyai sumber yang diperlukan untuk berjaya menjalankan aktivitinya (-).</i>	①	②	③	④	⑤	⑥	⑦

TST9	I think that my Internet banking website knows its customers well enough to offer them products and services adapted to their needs. <i>Saya berpendapat bahawa laman web perbankan Internet saya tahu dengan kehendak pelanggan dengan cukup baik bagi menawarkan produk dan perkhidmatan yang disesuaikan dengan keperluan mereka.</i>	①	②	③	④	⑤	⑥	⑦
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Part D: Perceived Usefulness on Internet Banking Usage.

Persepsi Kebergunaan Terhadap Penggunaan Perbankan Internet

The purpose of this Part D is to determine your perceived usefulness on the Internet banking usage by using a 7 point scale.

Tujuan Bahagian D ini adalah untuk menentukan kebergunaan anda terhadap penggunaan perbankan Internet dengan menggunakan skala 7 titik.

Legend:

- 1= Strongly disagree/Sangat Tidak Bersetuju
- 2= Disagree/Tidak Bersetuju
- 3= Slightly Disagree/Agak Tidak Bersetuju
- 4= Neutral
- 5= Slightly Agree/Agak Bersetuju
- 6= Agree/Setuju
- 7= Strongly Agree/Sangat Bersetuju

Code	Statement/Pernyataan	Level/Tahap						
PU1	Using Internet banking service saves my time. <i>Dengan menggunakan perkhidmatan perbankan Internet dapat menjimatkan masa saya.</i>	①	②	③	④	⑤	⑥	⑦
PU2	I find the Internet banking service is not useful (-). <i>Saya dapati perkhidmatan perbankan Internet tidak berguna (-).</i>	①	②	③	④	⑤	⑥	⑦
PU3	I find the Internet banking is a convenient service. <i>Saya dapati perbankan Internet adalah satu perkhidmatan yang mudah.</i>	①	②	③	④	⑤	⑥	⑦

PU4	Using the Internet banking service unable me to accomplish my banking activities more quickly (-). <i>Dengan menggunakan perkhidmatan perbankan Internet saya tidak mampu untuk mencapai aktiviti perbankan saya dengan lebih pantas.</i>	①	②	③	④	⑤	⑥	⑦
PU5	I find that using the Internet banking service makes my banking activities more easier to do. <i>Saya mendapati bahawa menggunakan perkhidmatan perbankan Internet menjadikan aktiviti perbankan saya lebih mudah untuk dilakukan.</i>	①	②	③	④	⑤	⑥	⑦
PU6	I find using Internet banking service is useful for my Banking activities. <i>Saya mendapati bahawa menggunakan perkhidmatan perbankan Internet sangat berguna untuk aktiviti Perbankan saya.</i>	①	②	③	④	⑤	⑥	⑦

Part E: Perceived Ease of Use on Internet Banking Usage.

Persepsi Kemudahan penggunaan Terhadap Penggunaan Perbankan Internet

The purpose of this Part E is to determine your perceived ease of use on the Internet banking usage by using a 7 point scale.

Tujuan Bahagian E ini adalah untuk menentukan kemudahan penggunaan anda terhadap penggunaan perbankan Internet dengan menggunakan skala 7 titik.

Legend:

- 1= Strongly disagree/*Sangat Tidak Bersetuju*
- 2= Disagree/*Tidak Bersetuju*
- 3= Slightly Disagree/*Agak Tidak Bersetuju*
- 4= Neutral
- 5= Slightly Agree/*Agak Bersetuju*
- 6= Agree/*Setuju*
- 7= Strongly Agree/*Sangat Bersetuju*

Code	Statement/Pernyataan	Level/Tahap						
PEU1	It is easy to get the Internet banking to do my banking transactions. <i>Ia adalah mudah dengan menggunakan perbankan Internet untuk melakukan transaksi perbankan saya.</i>	①	②	③	④	⑤	⑥	⑦

PEU2	I find the Internet banking not easy to use (-). <i>Saya dapati perbankan Internet tidak mudah untuk digunakan (-).</i>	①	②	③	④	⑤	⑥	⑦
PEU3	My interaction with the Internet banking is clear and understandable. <i>Interaksi saya dengan perbankan Internet adalah jelas dan mudah difahami.</i>	①	②	③	④	⑤	⑥	⑦
PEU4	Learning to use the Internet banking is easy for me. <i>Belajar untuk menggunakan perbankan Internet adalah mudah bagi saya.</i>	①	②	③	④	⑤	⑥	⑦
PEU5	It is not easy for me to become skillful at using the Internet banking (-). <i>la tidak mudah bagi saya untuk menjadi mahir menggunakan perbankan Internet (-).</i>	①	②	③	④	⑤	⑥	⑦
PEU6	I find the Internet banking is flexible to interact with. <i>Saya mendapati perbankan Internet adalah fleksibel untuk saya berinteraksi dengannya.</i>	①	②	③	④	⑤	⑥	⑦

Part F: Internet Self-Efficacy on Internet Banking Usage.

Kecekapan Kendiri Internet Terhadap Penggunaan Perbankan Internet

The purpose of this Part F is to determine your Internet self-efficacy on the Internet banking usage by using a 7 point scale.

Tujuan Bahagian F ini adalah untuk menentukan keberkesanan Kecekapan kendiri Internet anda terhadap penggunaan perbankan Internet dengan menggunakan skala 7 titik.

Legend:

- 1= Strongly disagree/*Sangat Tidak Bersetuju*
- 2= Disagree/*Tidak Bersetuju*
- 3= Slightly Disagree/*Agak Tidak Bersetuju*
- 4= Neutral
- 5= Slightly Agree/*Agak Bersetuju*
- 6= Agree/*Setuju*
- 7= Strongly Agree/*Sangat Bersetuju*

Code	Statement/Pernyataan	Level/Tahap						
ISE1	I feel confident to use search engines like Google, Bing, Yahoo and Ask. <i>Saya berasa yakin untuk menggunakan enjin carian seperti Google, Bing, Yahoo dan Ask.</i>	①	②	③	④	⑤	⑥	⑦
ISE2	I do not feel confident to download necessary material from the Internet (-). <i>Saya tidak berasa yakin untuk memuat turun bahan-bahan yang diperlukan dari Internet (-).</i>	①	②	③	④	⑤	⑥	⑦
ISE3	I feel confident to search for information on the Internet for banking products and services. <i>Saya berasa yakin untuk mencari maklumat di Internet bagi produk dan perkhidmatan perbankan.</i>	①	②	③	④	⑤	⑥	⑦
ISE4	I do not feel confident to visit my Internet banking websites to perform my banking transactions (-). <i>Saya tidak berasa yakin untuk melawat laman web perbankan Internet saya untuk melakukan transaksi perbankan saya (-).</i>	①	②	③	④	⑤	⑥	⑦
ISE5	I feel confident to log in to my Internet banking websites if I have the user ID and password. <i>Saya berasa yakin untuk log masuk ke laman web perbankan Internet saya jika saya mempunyai ID pengguna dan kata laluan.</i>	①	②	③	④	⑤	⑥	⑦
ISE6	Overall, I feel comfortable when I am using the Internet banking facility. <i>Secara keseluruhan, saya berasa selesa apabila saya menggunakan kemudahan perbankan Internet.</i>	①	②	③	④	⑤	⑥	⑦
ISE7	I could easily use the websites to find banking products and services. <i>Saya dengan mudah boleh menggunakan laman web untuk mencari produk dan perkhidmatan perbankan.</i>	①	②	③	④	⑤	⑥	⑦
ISE8	I can get to a specific website with an Internet browser. <i>Saya boleh masuk ke laman web tertentu dengan pelayar Internet.</i>	①	②	③	④	⑤	⑥	⑦

ISE9	I feel uncomfortable searching the World Wide Web on my own (-). <i>Saya berasa tidak selesa mencari World Wide Web secara bersendirian (-).</i>	①	②	③	④	⑤	⑥	⑦
ISE10	I would be able to use the Internet on my own to locate my Internet banking websites. <i>Saya mampu menggunakan Internet secara bersendirian untuk mencari laman web perbankan Internet saya.</i>	①	②	③	④	⑤	⑥	⑦

Part G: Subjective Norm on Internet Banking Usage.

Norma Subjektif Terhadap Penggunaan Perbankan Internet

The purpose of this Part G is to determine the influence of your family, friends, colleague, bosses etc. on the Internet banking usage by using a 7 point scale.

Tujuan Bahagian G ini adalah untuk menentukan pengaruh keluarga anda, kawan-kawan, rakan sekerja, majikan dan lain-lain pada penggunaan perbankan Internet dengan menggunakan skala 7 titik.

Legend:

- 1= Strongly disagree/Sangat Tidak Bersetuju
2= Disagree/Tidak Bersetuju
3= Slightly Disagree/Agak Tidak Bersetuju
4= Neutral
5= Slightly Agree/Agak Bersetuju
6= Agree/Setuju
7= Strongly Agree/Sangat Bersetuju

Code	Statement/Pernyataan	Level/Tahap						
SN1	My friends, family members, colleagues, bosses etc. Influence my decision to use the Internet banking. <i>Kawan-kawan saya, ahli keluarga, rakan sekerja, bos dan sebagainya mempengaruhi keputusan saya untuk menggunakan perbankan Internet.</i>	①	②	③	④	⑤	⑥	⑦
SN2	I completely disagree with them that I should use the Internet banking services continuously (-). <i>Saya benar-benar tidak bersetuju dengan mereka bahawa saya perlu meneruskan menggunakan perkhidmatan perbankan Internet (-).</i>	①	②	③	④	⑤	⑥	⑦

SN3	If I use the Internet banking most of the people who are important to me will regard me as clever. <i>Jika saya menggunakan perbankan Internet kebanyakan orang-orang yang penting kepada saya akan menganggap saya sebagai bijak.</i>	①	②	③	④	⑤	⑥	⑦
SN4	If I use the Internet banking most of the people who are important to me will regard it as useful. <i>Jika saya menggunakan perbankan Internet kebanyakan orang-orang yang penting kepada saya akan menganggap ia sebagai berguna.</i>	①	②	③	④	⑤	⑥	⑦
SN5	If I use the Internet banking most of the people who are important to me will regard it as not valuable (-). <i>Jika saya menggunakan perbankan Internet kebanyakan orang-orang yang penting kepada saya akan menganggap ia sebagai tidak berharga (-).</i>	①	②	③	④	⑤	⑥	⑦

Part H: Attitude towards Internet Banking Usage.

Sikap Terhadap Penggunaan Perbankan Internet

The purpose of this Part H is to determine your attitude towards Internet banking usage by using a 7 point scale.

Tujuan Bahagian H ini adalah untuk menentukan sikap anda terhadap penggunaan perbankan Internet dengan menggunakan skala 7 titik.

Legend:

- 1= Strongly disagree/*Sangat Tidak Bersetuju*
- 2= Disagree/*Tidak Bersetuju*
- 3= Slightly Disagree/*Agak Tidak Bersetuju*
- 4= Neutral
- 5= Slightly Agree/*Agak Bersetuju*
- 6= Agree/*Setuju*
- 7= Strongly Agree/*Sangat Bersetuju*

Code	Statement/Pernyataan	Level/Tahap						
ATU1	I am positive towards Internet banking. <i>Saya bersikap positif terhadap perbankan Internet.</i>	①	②	③	④	⑤	⑥	⑦

ATU2	It makes sense to use Internet banking. <i>Ia masuk akal untuk menggunakan perbankan Internet.</i>	①	②	③	④	⑤	⑥	⑦
ATU3	People should adopt the Internet banking facility. <i>Orang ramai seharusnya menggunakan kemudahan perbankan Internet.</i>	①	②	③	④	⑤	⑥	⑦
ATU4	Using the Internet banking facility is a bad idea (-). <i>Menggunakan kemudahan perbankan Internet adalah idea yang tidak baik (-).</i>	①	②	③	④	⑤	⑥	⑦
ATU5	Using the Internet banking facility is a wise idea. <i>Menggunakan kemudahan perbankan Internet adalah idea yang bijak.</i>	①	②	③	④	⑤	⑥	⑦
ATU6	I like the idea of using the Internet banking facility. <i>Saya suka dengan idea untuk menggunakan kemudahan perbankan Internet.</i>	①	②	③	④	⑤	⑥	⑦
ATU7	Using the Internet banking facility would be unpleasant (-). <i>Dengan menggunakan kemudahan perbankan Internet akan tidak menyenangkan (-).</i>	①	②	③	④	⑤	⑥	⑦

Part I: Internet Banking Usage

Penggunaan Perbankan Internet

Please complete Part I by placing check marks (✓) in the appropriate boxes and filling in the blanks for written answers.

Sila lengkapkan Bahagian I dengan meletakkan tanda cek (✓) dalam kotak yang sesuai dan mengisi tempat kosong untuk jawapan bertulis.

The purpose of this part is to determine your Internet banking usage by using a 7 point scale.

Tujuan bahagian ini adalah untuk menentukan penggunaan perbankan Internet anda dengan menggunakan skala 7 titik.

Legend:

- 1= Strongly disagree/*Sangat Tidak Bersetuju*
- 2= Disagree/*Tidak Bersetuju*
- 3= Slightly Disagree/*Agak Tidak Bersetuju*
- 4= Neutral
- 5= Slightly Agree/*Agak Bersetuju*
- 6= Agree/*Setuju*
- 7= Strongly Agree/*Sangat Bersetuju*

Code	Statement/Pernyataan	Level/Tahap						
IBU1	I use the Internet banking facility quite often for my banking needs. <i>Saya menggunakan kemudahan perbankan Internet agak kerap untuk keperluan perbankan saya.</i>	①	②	③	④	⑤	⑥	⑦
IBU2	I spend a lot of time on Internet banking for my personal use. <i>Saya menghabiskan banyak masa pada perbankan Internet untuk kegunaan peribadi saya.</i>	①	②	③	④	⑤	⑥	⑦
IBU3	I have been using the Internet banking for my personal use for a very long time. <i>Saya telah menggunakan perbankan Internet untuk kegunaan peribadi saya untuk sekian lama.</i>	①	②	③	④	⑤	⑥	⑦
IBU4	I often use the Internet banking facility. <i>Saya sering menggunakan kemudahan perbankan Internet.</i>	①	②	③	④	⑤	⑥	⑦
IBU5	On average I use Internet banking _____ times in a month. <i>Secara purata saya menggunakan perbankan Internet _____ kali dalam sebulan.</i>							
IBU6	On average I do _____ transactions at a time (state the number). <i>Secara purata saya melakukan _____ transaksi pada satu masa (nyatakan bilangan).</i>							
IBU7	<p>How long have you been using the Internet banking facility? <i>Berapa lama anda telah menggunakan kemudahan perbankan Internet?</i></p> <p><input type="checkbox"/> a. Less than 1 year/<i>Kurang daripada 1 tahun</i></p> <p><input type="checkbox"/> b. 1 to 2 years/<i>1 hingga 2 tahun</i></p> <p><input type="checkbox"/> c. 3 to 4 years/<i>3 hingga 4 tahun</i></p> <p><input type="checkbox"/> d. 5 to 6 years/<i>5 hingga 6 tahun</i></p> <p><input type="checkbox"/> e. 7 to 8 years/<i>7 hingga 8 tahun</i></p> <p><input type="checkbox"/> f. 9 to 10 years/<i>9 hingga 10 tahun</i></p> <p><input type="checkbox"/> g. More than 10 years/<i>Lebih daripada 10 tahun</i></p>							

IBU8	I use Internet banking mainly: <i>Saya menggunakan perbankan Internet terutamanya:</i>	
	<input type="checkbox"/>	a. At Home/ <i>Di Rumah</i>
	<input type="checkbox"/>	b. At Work/ <i>Di Tempat Kerja</i>
	<input type="checkbox"/>	c. At School/ <i>Di Sekolah</i>
	<input type="checkbox"/>	d. In a Bank/ <i>Di Bank</i>
	<input type="checkbox"/>	e. In a Library/ <i>Di dalam Perpustakaan</i>
	<input type="checkbox"/>	f. At a friend's place/ <i>Di Rumah Rakan</i>
	<input type="checkbox"/>	g. In a cyber café/ <i>Di Kafe Siber</i>
	<input type="checkbox"/>	h. Others _____ (Please specify) <i>Lain-lain (Sila nyatakan)</i>

Please complete questions number 9 below by placing check marks (✓) in the appropriate boxes for your answers.

Sila jawab soalan nombor 9 di bawah dengan meletakkan tanda cek (✓) pada kotak yang sesuai untuk jawapan anda.

The purpose of this question number 9 is to determine your frequency of Internet banking usage by using a 7 point scale.

Tujuan soalan nombor 9 ini adalah untuk menentukan kekerapan penggunaan perbankan Internet dengan menggunakan skala 7 titik.

Legend:

- 1 = Never
Tiada langsung
- 2 = Rarely (less than 10% of the usage)
Jarang (kurang daripada 10% daripada penggunaan)
- 3 = Occasionally (about 30% of the usage)
Kadang-kala (kira-kira 30% daripada penggunaan)
- 4 = Sometimes (about 50% of the usage)
Kadang-kadang (kira-kira 50% daripada penggunaan)
- 5 = Frequently (about 70% of the usage)
Lazim (kira-kira 70% daripada penggunaan)
- 6 = Usually (about 90% of the usage)
Biasanya (kira-kira 90% daripada penggunaan)
- 7 = Every time
Setiap kali

Code	Statement/Pernyataan	Level/Tahap						
IBU9	How often you use the following Internet banking services? <i>Berapa kerapkah anda menggunakan perkhidmatan perbankan Internet yang berikut?</i>							
IBU9.a	View account (Current/Savings, Fixed Deposits, Credit Cards, and Loan/Financing etc.) <i>Melihat akaun (Semasa / Simpanan, Simpanan Tetap, Kad Kredit dan Pinjaman / Pembiayaan dan lain-lain)</i>	①	②	③	④	⑤	⑥	⑦
IBU9.b	Fund transfer. <i>Pemindahan dana.</i>	①	②	③	④	⑤	⑥	⑦
IBU9.c	Pay Bills. <i>Pembayaran Bil.</i>	①	②	③	④	⑤	⑥	⑦
IBU9.d	Top up services (reload services). <i>Perkhidmatan Top up (perkhidmatan tambah nilai).</i>	①	②	③	④	⑤	⑥	⑦
IBU9.e	Credit/Loan/Financing based services. <i>Kredit / Pinjaman / Perkhidmatan berasaskan Pembiayaan.</i>	①	②	③	④	⑤	⑥	⑦
IBU9.f	Investment based services. <i>Perkhidmatan berasaskan pelaburan.</i>	①	②	③	④	⑤	⑥	⑦
IBU9.g	Insurance/Takaful based services. <i>Perkhidmatan berasaskan Insurans/Takaful.</i>	①	②	③	④	⑤	⑥	⑦
IBU9.h	Account opening (Savings, Current, Fixed Deposits, investment, Loan/Financing, ASB and Unit Trust). <i>Pembukaan akaun (Simpanan, Semasa, Simpanan Tetap, pelaburan, Pinjaman / Pembiayaan, ASB dan Unit Amanah)</i>	①	②	③	④	⑤	⑥	⑦

End of Survey
Akhir Kajian

Thank you very much for your time and support.
Your participation in this study is truly appreciated.
Terima kasih untuk masa yang diluangkan dan sokongan yang anda berikan .
Penyertaan anda dalam kajian ini amat-amat dihargai.

Appendix 6: Outlier (Mahalanobis Distance)

Respondent	Mahalanobis	Respondent	Mahalanobis	Respondent	Mahalanobis
1	7.51277	26	2.45322	51	3.95666
2	5.93846	27	8.63907	52	7.89083
3	6.08287	28	3.17867	53	3.58806
4	15.85257	29	2.08068	54	2.77855
5	8.08473	30	3.47998	55	1.62231
6	2.29824	31	3.4453	56	3.33016
7	6.6921	32	6.42639	57	16.94845
8	1.70681	33	4.49931	58	1.50445
9	3.14047	34	4.49097	59	2.31005
10	0.36135	35	5.38164	60	6.0117
11	8.49969	36	8.16978	61	4.49417
12	2.04814	37	3.74603	62	4.46254
13	7.63078	38	38.01268	63	7.28741
14	7.47824	39	38.01268	64	15.23781
15	3.3955	40	1.83491	65	15.0169
16	9.1908	41	13.56403	66	4.04215
17	6.83149	42	9.48468	67	2.43086
18	5.61041	43	12.47013	68	3.82553
19	12.19377	44	5.0872	69	13.57601
20	0.73875	45	6.18908	70	4.67636
21	3.07959	46	3.49975	71	6.85735
22	6.53703	47	3.97731	72	16.6331
23	4.89972	48	8.60744	73	0.98021
24	3.52769	49	10.04951	74	6.46545
25	2.07575	50	4.90761	75	6.0101

Respondent	Mahalanobis	Respondent	Mahalanobis	Respondent	Mahalanobis
76	8.55154	101	5.66916	126	4.04911
77	1.81566	102	2.81937	127	4.70419
78	3.38562	103	3.74535	128	4.38212
79	3.1777	104	4.0026	129	16.17011
80	7.01445	105	5.5723	130	5.28738
81	5.59452	106	3.64825	131	2.34584
82	3.56516	107	3.95923	132	7.72303
83	5.93637	108	6.73316	133	2.61553
84	14.45423	109	26.69045	134	3.49877
85	6.73135	110	6.16654	135	4.06103
86	3.0979	111	3.17471	136	1.88319
87	1.44208	112	9.08212	137	12.34587
88	5.35602	113	0.25969	138	5.48478
89	4.96614	114	2.16696	139	7.50968
90	5.81607	115	4.91277	140	39.15123
91	2.8707	116	5.91361	141	3.08976
92	13.51212	117	1.99724	142	4.49732
93	1.56824	118	5.05395	143	1.23509
94	11.89463	119	6.72393	144	1.9796
95	3.5028	120	4.38936	145	6.52243
96	1.08616	121	9.91145	146	5.09343
97	1.38968	122	3.38477	147	5.55696
98	11.15928	123	4.76619	148	1.73216
99	7.40057	124	5.20315	149	2.278
100	0.93566	125	4.49061	150	4.3112

Respondent	Mahalanobis	Respondent	Mahalanobis	Respondent	Mahalanobis
151	5.30949	176	5.82862	201	2.4534
152	5.1283	177	0.43789	202	0.32212
153	8.68992	178	2.61951	203	6.73377
154	9.39791	179	7.85046	204	2.00143
155	10.60686	180	0.40383	205	4.05465
156	9.73001	181	6.13811	206	3.72251
157	1.71897	182	3.94658	207	5.66482
158	6.97948	183	1.85153	208	3.46868
159	2.5463	184	2.68347	209	1.86283
160	11.53917	185	3.70712	210	7.68534
161	10.47867	186	2.4139	211	8.90281
162	6.17272	187	1.42117	212	13.24233
163	6.40493	188	1.9831	213	5.76793
164	2.71363	189	6.71814	214	7.14977
165	3.01109	190	2.84735	215	1.03847
166	4.31228	191	5.46498	216	3.09606
167	5.55018	192	1.86972	217	0.63614
168	6.29002	193	4.2648	218	0.9794
169	3.14273	194	2.47959	219	2.03049
170	9.19661	195	2.23503	220	1.92248
171	2.65463	196	4.6226	221	4.00278
172	4.17279	197	0.3401	222	1.90495
173	1.36069	198	4.06284	223	2.0826
174	5.17394	199	4.63006	224	15.75964
175	4.5024	200	4.27177	225	5.99974

Respondent	Mahalanobis	Respondent	Mahalanobis	Respondent	Mahalanobis
226	1.47414	251	2.40406	276	1.96287
227	4.2827	252	9.6297	277	3.137
228	4.61357	253	6.92784	278	2.28713
229	4.1404	254	4.20465	279	5.47314
230	5.81174	255	17.54503	280	6.57985
231	6.58177	256	5.42346	281	6.75018
232	21.41786	257	9.12771	282	4.37983
233	3.73229	258	6.79961	283	3.53462
234	4.81392	259	5.82402	284	1.757
235	8.43947	260	20.14977	285	4.45164
236	4.06618	261	5.0608	286	3.83906
237	1.84403	262	12.21598	287	11.36483
238	2.8292	263	6.79961	288	17.33173
239	4.41817	264	1.8691	289	3.6887
240	5.2138	265	7.00595	290	5.63425
241	2.0753	266	7.44462	291	4.04218
242	5.48112	267	5.11857	292	6.69851
243	2.89838	268	12.81848	293	22.91793
244	11.33076	269	7.16617	294	10.68698
245	10.79123	270	3.36056	295	2.56312
246	2.50066	271	7.88719	296	4.82589
247	4.96096	272	12.62166	297	4.72298
248	6.19875	273	16.1834	298	3.15421
249	8.4485	274	7.56583	299	3.39135
250	5.56024	275	9.34531	300	1.88871

Respondent Mahalanobis		Respondent Mahalanobis		Respondent Mahalanobis	
301	3.10341	326	1.64199	351	8.06232
302	2.85423	327	13.267	352	9.86017
303	36.1138	328	17.91713	353	2.50694
304	2.40776	329	6.30156	354	6.58585
305	7.31372	330	4.12205	355	8.74706
306	3.17164	331	3.04928	356	4.45076
307	1.49231	332	3.01907	357	8.51492
308	3.66643	333	1.71467	358	10.06195
309	10.42667	334	2.75394	359	9.17838
310	3.53007	335	5.87619	360	4.7725
311	1.0519	336	5.37799	361	5.32527
312	9.55608	337	1.9252	362	3.76953
313	6.959	338	3.50369	363	0.6077
314	1.79798	339	8.95125	364	3.60923
315	4.10307	340	4.82902	365	15.47511
316	5.59223	341	2.57549	366	1.1807
317	5.76956	342	5.00837	367	6.34299
318	8.77884	343	1.558	368	1.62042
319	6.2608	344	1.88707	369	1.67947
320	3.97487	345	7.67474	370	4.75249
321	6.15719	346	5.17288	371	8.37733
322	4.03867	347	7.8091	372	3.62229
323	1.4314	348	14.4036	373	3.51352
324	12.33891	349	4.79335	374	2.67164
325	1.47543	350	15.45381	375	2.57933

Respondent	Mahalanobis	Respondent	Mahalanobis	Respondent	Mahalanobis
376	1.59658	401	3.26323	426	4.69882
377	5.97638	402	2.37357	427	18.431
378	3.29775	403	6.6118	428	1.51466
379	8.06634	404	11.75217	429	12.86215
380	7.17674	405	1.23152	430	3.84314
381	9.46265	406	3.60481	431	8.35381
382	9.24614	407	2.90267	432	5.03306
383	8.4912	408	10.23801	433	5.49465
384	6.80202	409	3.33212	434	5.9182
385	3.98266	410	1.92144	435	12.19955
386	6.46224	411	5.56421	436	9.0434
387	6.78013	412	6.00638	437	1.79166
388	6.30494	413	11.68733	438	4.26242
389	4.61007	414	9.13144	439	2.83409
390	3.83612	415	21.54785	440	20.07412
391	4.09483	416	4.35508	441	1.15503
392	3.92824	417	2.20452	442	21.19433
393	7.65207	418	32.48271	443	16.49919
394	2.68419	419	22.88626	444	3.55637
395	8.86459	420	6.29876	445	1.83178
396	4.48238	421	4.15233	446	1.79146
397	1.37151	422	3.4695	447	10.00558
398	3.67301	423	11.3652	448	3.41935
399	9.63454	424	3.66788	449	5.79581
400	3.73118	425	5.01877	450	2.44135

Respondent Mahalanobis		Respondent Mahalanobis	
451	0.89546	476	2.61879
452	7.1464	477	1.43744
453	1.08213	478	4.55202
454	2.15032	479	3.67374
455	1.27375		
456	2.54306		
457	5.28584		
458	6.40478		
459	0.87122		
460	0.51081		
461	9.28808		
462	8.12683		
463	1.54541		
464	2.52445		
465	3.78391		
466	4.52183		
467	4.23261		
468	2.65338		
469	5.36772		
470	1.57576		
471	3.31467		
472	1.98653		
473	2.25867		
474	6.01715		
475	10.16255		

Appendix 7: Assessment of Normality (Initial & Transformed)

Trust: Initial							Trust: Transformed				
Item	min	max	skew	c.r.	kurtosis	c.r	Item	skew	c.r.	kurtosis	c.r
TST1	1	7	-0.754	-6.739	0.397	1.776	TTST1	-0.230	-2.054	-1.525	-6.811
RTST2	1	7	-0.500	-4.464	-0.796	-3.554	TTST2	-0.234	-2.089	-1.605	-7.173
TST3	1	7	-0.725	-6.482	0.094	0.418	TTST3	-0.215	-1.920	-1.499	-6.699
TST4	2	7	-0.494	-4.418	0.047	0.208	TTST4	-0.167	-1.492	-1.303	-5.819
RTST5	1	7	-0.222	-1.981	-0.907	-4.053	TTST5	-0.071	-0.635	-1.447	-6.463
TST6	1	7	-0.671	-5.995	0.411	1.834	TTST6	-0.218	-1.945	-1.230	-5.494
TST7	1	7	-0.496	-4.430	0.184	0.822	TTST7	-0.150	-1.338	-1.243	-5.555
RTST8	1	7	-0.336	-3.002	-0.726	-3.243	TTST8	-0.139	-1.239	-1.396	-6.237
TST9	1	7	-0.615	-5.496	0.495	2.212	TTST9	-0.155	-1.388	-1.249	-5.578

Perceived Usefulness: Initial							Perceived Usefulness: Transformed				
Item	min	max	skew	c.r.	kurtosis	c.r	Item	skew	c.r.	kurtosis	c.r
PU1	1	7	-1.759	-15.713	5.154	23.024	TTPU1	-0.209	-1.868	-1.676	-7.489
RPU2	1	7	-1.639	-14.646	3.022	13.501	TTPU2	-0.331	-2.954	-1.318	-5.888
PU3	3	7	-0.713	-6.371	0.002	0.011	TTPU3	-0.203	-1.818	-1.164	-5.201
RPU4	1	7	-0.887	-7.926	-0.455	-2.034	TTPU4	-0.486	-4.344	-1.346	-6.012
PU5	2	7	-0.958	-8.559	0.896	4.003	TTPU5	-0.025	-0.226	-1.379	-6.162
PU6	3	7	-0.860	-7.687	0.587	2.621	TTPU6	-0.210	-1.874	-1.080	-4.826

Perceived Ease of Use: Initial							Perceived Ease of Use: Transformed				
Item	min	max	skew	c.r.	kurtosis	c.r	Item	skew	c.r.	kurtosis	c.r
PEU1	1	7	-1.063	-9.494	1.823	8.144	TTPEU1	-0.178	-1.588	-1.217	-5.437
RPEU2	1	7	-1.156	-10.330	0.933	4.169	TTPEU2	-0.374	-3.339	-1.310	-5.852
PEU3	1	7	-0.855	-7.637	0.847	3.786	TTPEU3	-0.289	-2.586	-1.392	-6.220
PEU4	1	7	-0.937	-8.375	1.341	5.990	TTPEU4	-0.244	-2.181	-1.436	-6.414
RPEU5	1	7	-0.931	-8.319	-0.016	-0.070	TTPEU5	-0.413	-3.691	-1.402	-6.262
PEU6	1	7	-0.718	-6.415	0.671	3.000	TPEU6	-0.209	-1.866	-1.180	-5.274

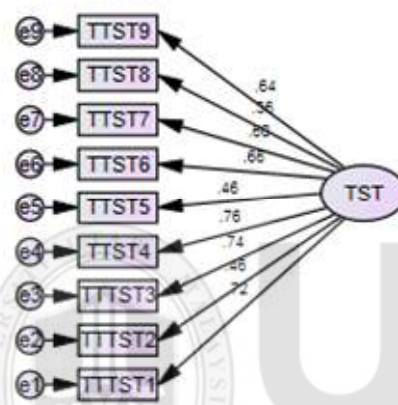
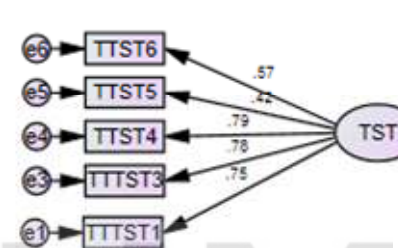
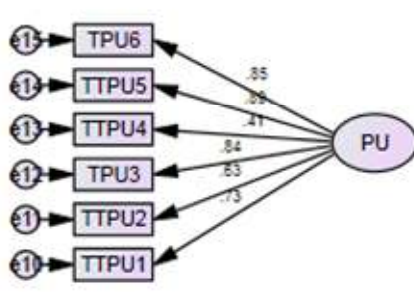
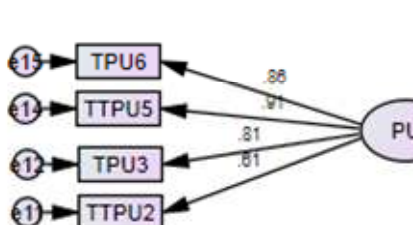
Internet Self-Efficacy: Initial							Internet Self-Efficacy: Transformed				
Item	min	max	skew	c.r.	kurtosis	c.r	Item	skew	c.r.	kurtosis	c.r
ISE1	1	7	-0.885	-7.905	0.681	3.041	TTISE1	-0.283	-2.524	-1.403	-6.269
RISE2	1	7	-0.154	-1.380	-0.866	-3.870	TTISE2	-0.011	-0.095	-1.401	-6.259
ISE3	1	7	-0.664	-5.932	0.254	1.136	TTISE3	-0.256	-2.285	-1.538	-6.871
RISE4	1	7	-0.851	-7.604	0.011	0.048	TTISE4	-0.351	-3.135	-1.458	-6.516
ISE5	2	7	-0.795	-7.103	0.303	1.354	TTISE5	-0.287	-2.565	-1.357	-6.061
ISE6	1	7	-1.037	-9.264	1.736	7.756	TTISE6	-0.271	-2.421	-1.298	-5.799
ISE7	1	7	-0.864	-7.720	1.152	5.146	TTISE7	-0.219	-1.960	-1.504	-6.717
ISE8	1	7	-0.879	-7.858	1.217	5.437	TTISE8	-0.242	-2.165	-1.483	-6.627
RISE9	1	7	-0.594	-5.305	-0.512	-2.287	TTISE9	-0.198	-1.769	-1.596	-7.131
ISE10	1	7	-0.861	-7.690	0.447	1.999	TTISE10	-0.309	-2.760	-1.407	-6.284

Subjective Norm: Initial							Subjective Norm: Transformed				
Item	min	max	skew	c.r.	kurtosis	c.r	Item	skew	c.r.	kurtosis	c.r
SN1	1	7	-0.362	-3.231	0.509	2.272	TSN1	0.060	0.535	-1.279	-5.715
SN2R	1	7	-0.356	-3.179	-0.316	-1.412	TSN2	-0.092	-0.822	-1.409	-6.297
SN3	1	7	-0.231	-2.068	0.324	1.449	TSN3	0.138	1.232	-1.367	-6.109
SN4	1	7	-0.597	-5.339	0.515	2.299	TSN4	-0.117	-1.043	-1.380	-6.167
SN5R	1	7	-0.813	-7.265	0.661	2.953	TTSN5	-0.226	-2.016	-1.545	-6.902

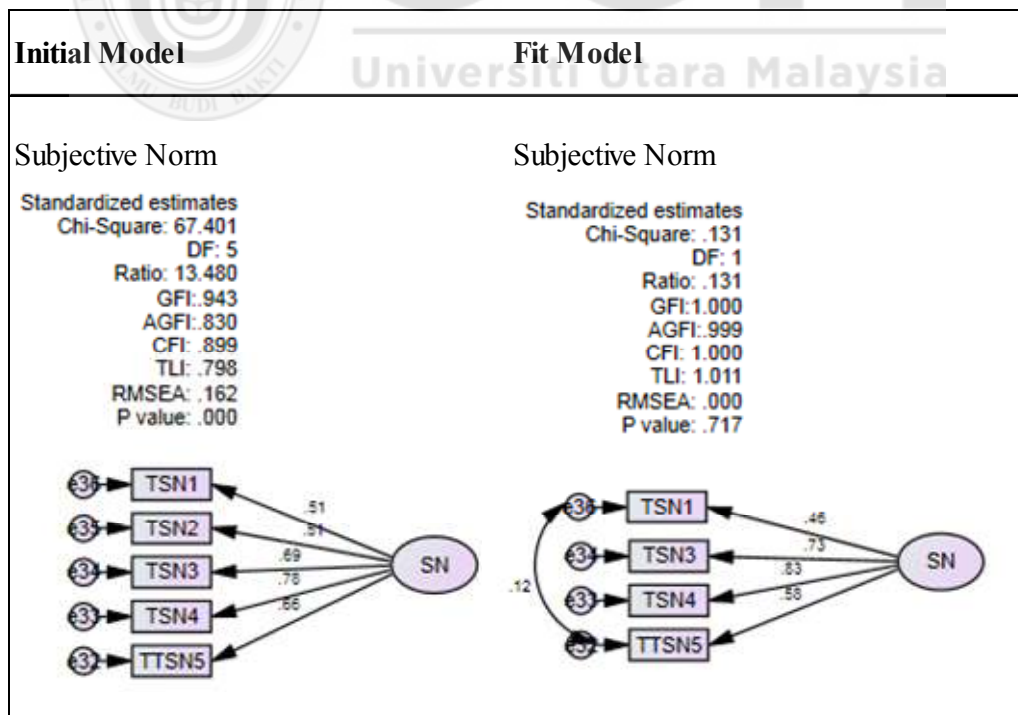
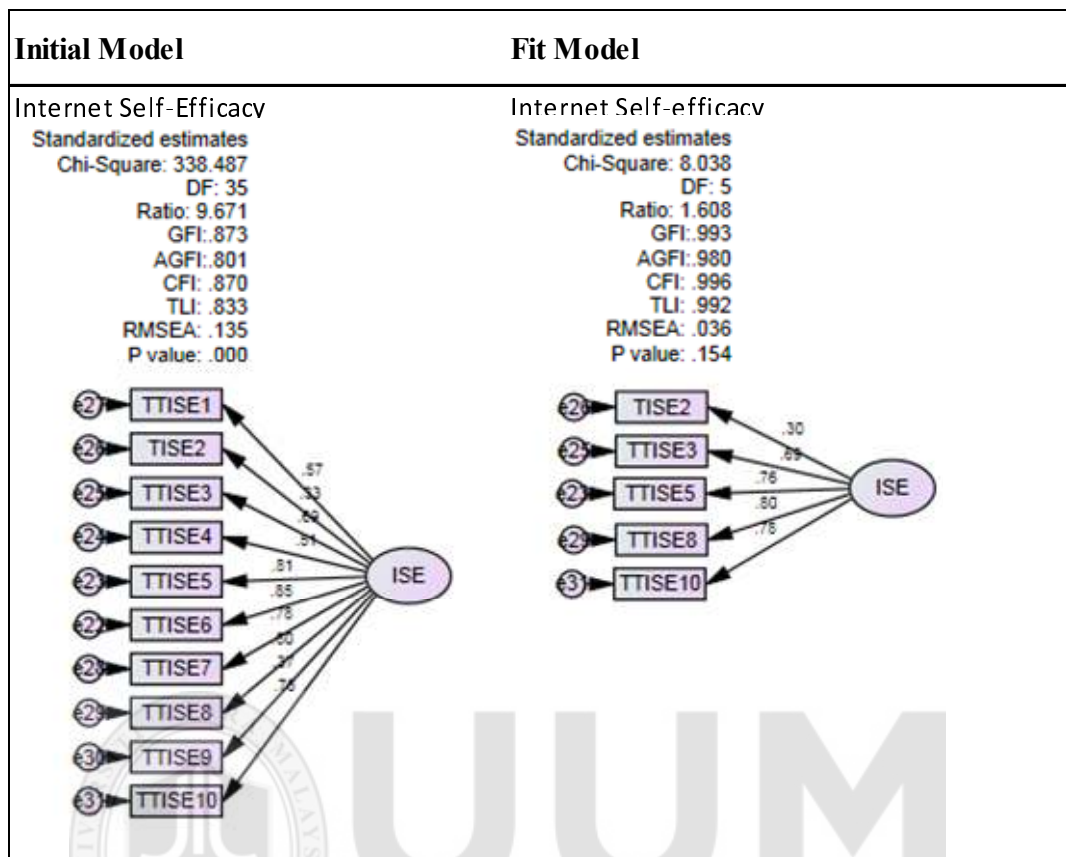
Attitude: Initial							Attitude: Transformed				
Item	min	max	skew	c.r.	kurtosis	c.r	Item	skew	c.r.	kurtosis	c.r
ATU1	2	7	-0.796	-7.111	0.373	1.668	TTATU1	-0.239	-2.134	-1.302	-5.818
ATU2	1	7	-1.227	-10.962	2.845	12.708	TTATU2	-0.219	-1.953	-1.223	-5.464
ATU3	2	7	-0.778	-6.949	0.729	3.255	TATU3	-0.208	-1.859	-1.139	-5.087
RATU4	1	7	-1.467	-13.108	2.096	9.365	TTATU4	-0.359	-3.212	-1.249	-5.579
ATU5	1	7	-1.110	-9.916	1.976	8.829	TTATU5	-0.193	-1.727	-1.328	-5.932
ATU6	2	7	-0.752	-6.721	0.392	1.750	TTATU6	-0.183	-1.634	-1.218	-5.439
RATU7	1	7	-1.372	-12.259	1.676	7.486	TTATU7	-0.398	-3.560	-1.233	-5.509

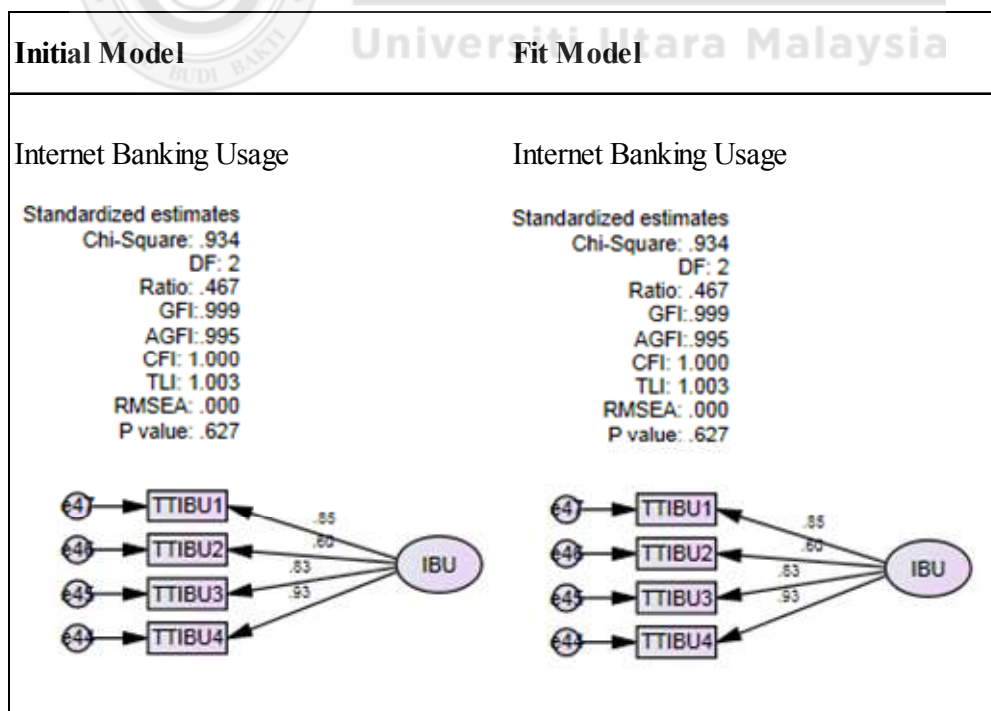
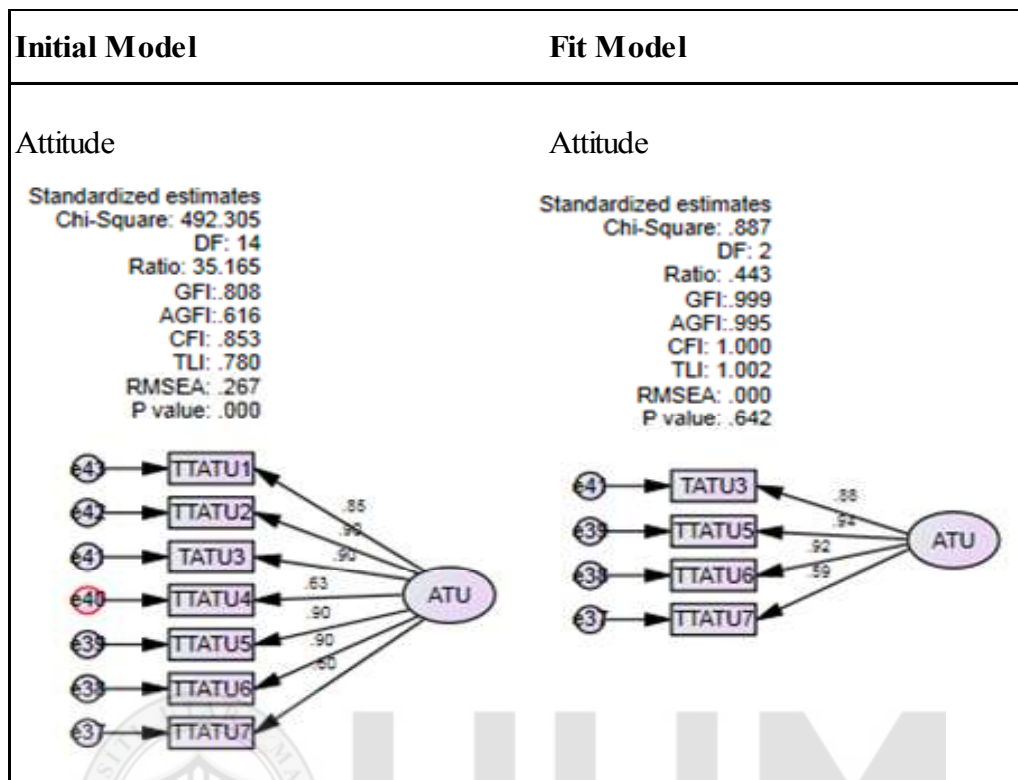
Internet Banking Usage: Initial							Internet Banking Usage: Transformed				
Item	min	max	skew	c.r.	kurtosis	c.r	Item	skew	c.r.	kurtosis	c.r
IBU1	1	7	-1.145	-10.232	1.606	7.174	TTIBU1	-0.310	-2.768	-1.264	-5.647
IBU2	1	7	-0.522	-4.660	-0.463	-2.069	TTIBU2	-0.157	-1.401	-1.555	-6.947
IBU3	1	7	-0.906	-8.091	0.506	2.261	TTIBU3	-0.262	-2.338	-1.467	-6.555
IBU4	1	7	-1.185	-10.591	1.564	6.986	TTIBU4	-0.348	-3.113	-1.319	-5.891

Appendix 8: Confirmatory Factor Analysis for Individual Construct

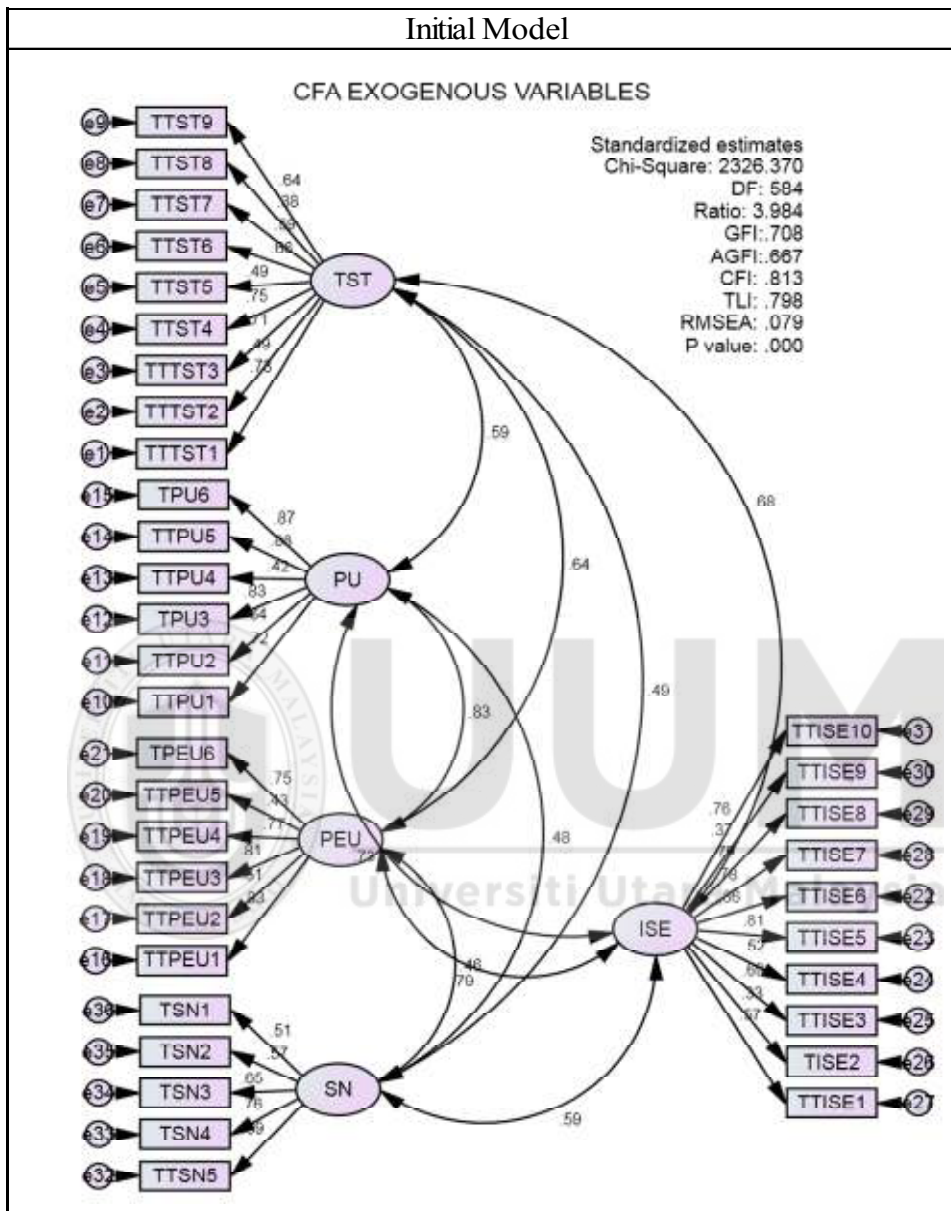
Initial Model	Fit Model
<p>Trust</p> <p>Standardized estimates Chi-Square: 359.310 DF: 27 Ratio: 13.308 GFI: .843 AGFI: .738 CFI: .784 TLI: .712 RMSEA: .160 P value: .000</p> 	<p>Trust</p> <p>Standardized estimates Chi-Square: 2.461 DF: 5 Ratio: .492 GFI: .998 AGFI: .994 CFI: 1.000 TLI: 1.007 RMSEA: .000 P value: .782</p> 
<p>Perceived Usefulness</p> <p>Standardized estimates Chi-Square: 130.988 DF: 9 Ratio: 14.554 GFI: .918 AGFI: .809 CFI: .922 TLI: .871 RMSEA: .168 P value: .000</p> 	<p>Perceived Usefulness</p> <p>Standardized estimates Chi-Square: .454 DF: 2 Ratio: .227 GFI: 1.000 AGFI: .998 CFI: 1.000 TLI: 1.004 RMSEA: .000 P value: .797</p> 

Initial Model	Fit Model
<p>Perceived Ease of Use</p> <p>Standardized estimates</p> <p>Chi-Square: 141.084</p> <p>DF: 9</p> <p>Ratio: 15.676</p> <p>GFI: .915</p> <p>AGFI: .801</p> <p>CFI: .900</p> <p>TLI: .834</p> <p>RMSEA: .175</p> <p>P value: .000</p>	<p>Perceived Ease of Use</p> <p>Standardized estimates</p> <p>Chi-Square: 2.686</p> <p>DF: 2</p> <p>Ratio: 1.343</p> <p>GFI: .997</p> <p>AGFI: .986</p> <p>CFI: .999</p> <p>TLI: .997</p> <p>RMSEA: .027</p> <p>P value: .261</p>

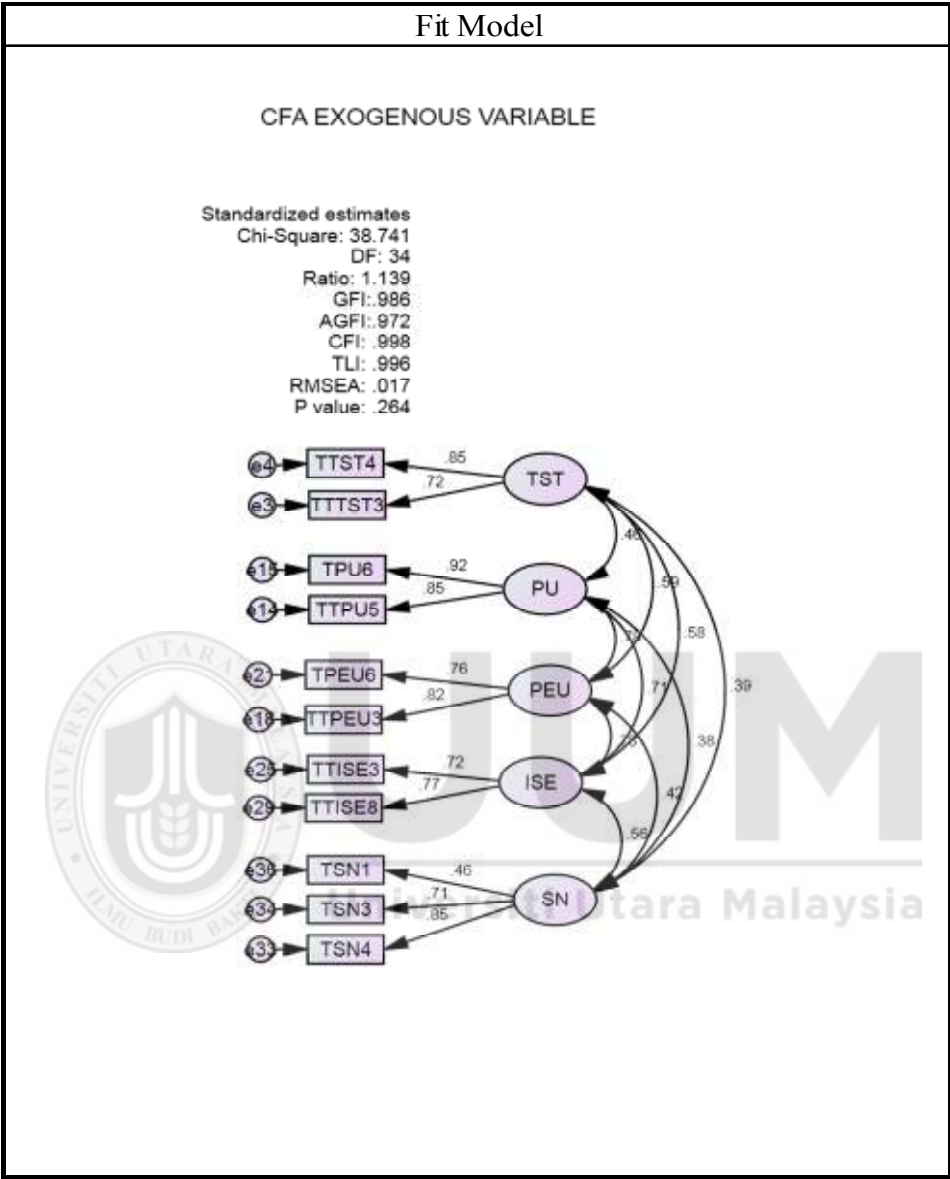




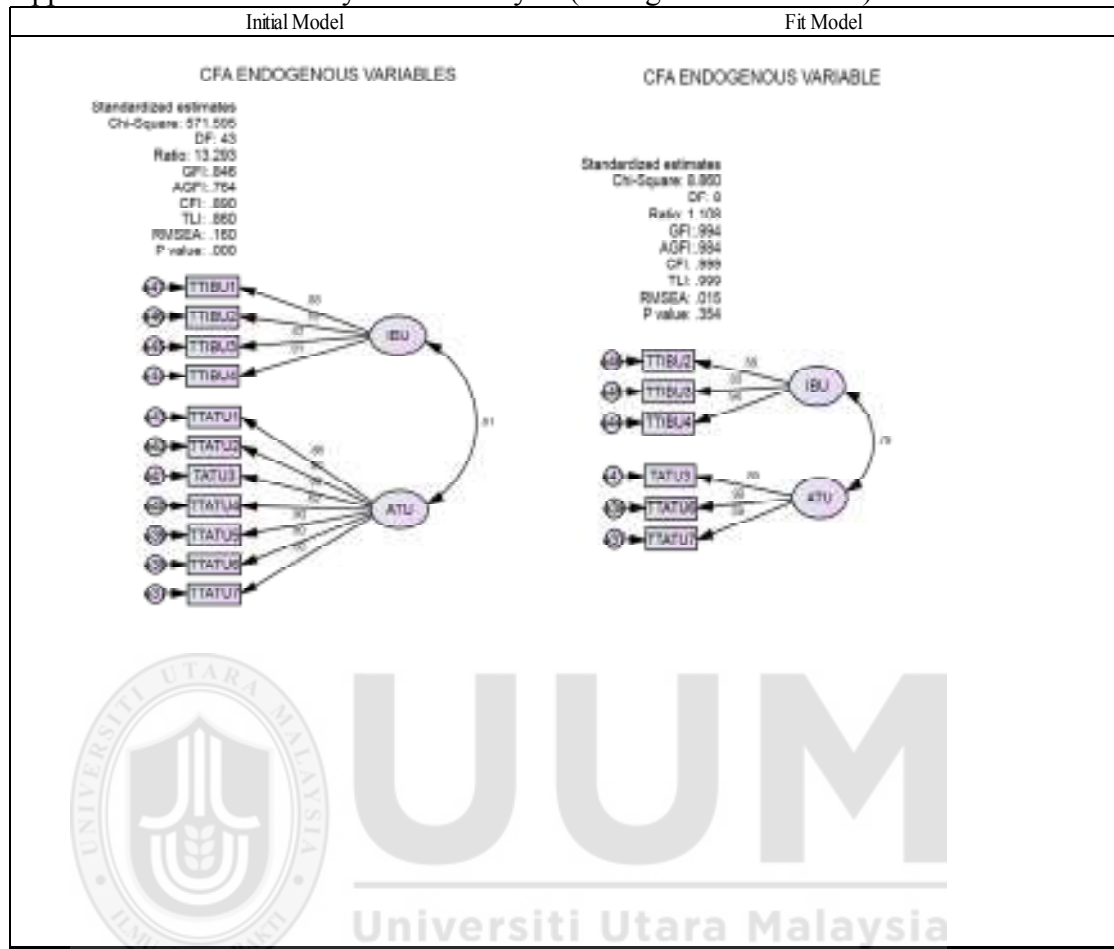
Appendix 9a: Confirmatory Factor Analysis (Exogenous Construct)



Appendix 9b: Confirmatory Factor Analysis (Exogenous Construct)



Appendix 10: Confirmatory Factor Analysis (Endogenous Construct)



Appendix 11: Generated Model of AMOS Output

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
ATU	<---	TST	-0.014	0.052	-0.27	0.787	par_19
ATU	<---	PU	0.414	0.069	6.03	***	par_20
ATU	<---	PEU	0.031	0.117	0.265	0.791	par_21
ATU	<---	ISE	0.575	0.123	4.689	***	par_22
ATU	<---	SN	-0.003	0.061	-0.05	0.96	par_23
IBU	<---	ATU	0.415	0.08	5.197	***	par_24
IBU	<---	TST	0.01	0.039	0.242	0.809	par_25
IBU	<---	PU	0.012	0.06	0.201	0.84	par_26
IBU	<---	PEU	0.172	0.087	1.971	0.049	par_27
IBU	<---	ISE	0.047	0.101	0.464	0.643	par_28
IBU	<---	SN	0.021	0.044	0.475	0.635	par_29
TTTST3	<---	TST	0.912	0.081	11.283	***	par_1
TTST4	<---	TST	1				
TTPU5	<---	PU	1				
TPU6	<---	PU	0.953	0.04	23.866	***	par_2
TTPEU3	<---	PEU	1.165	0.071	16.499	***	par_3
TPEU6	<---	PEU	1				
TTISE3	<---	ISE	1				
TTISE8	<---	ISE	1.093	0.075	14.606	***	par_4
TSN4	<---	SN	1.306	0.142	9.198	***	par_5
TSN3	<---	SN	1				
TTIBU2	<---	IBU	1				
TTIBU3	<---	IBU	1.384	0.102	13.62	***	par_6
TTIBU4	<---	IBU	1.518	0.107	14.214	***	par_7
TATU3	<---	ATU	1				
TTATU6	<---	ATU	1.084	0.04	26.943	***	par_8

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

			Estimate
ATU	<---	TST	-0.014
ATU	<---	PU	0.437
ATU	<---	PEU	0.026
ATU	<---	ISE	0.501
ATU	<---	SN	-0.002
IBU	<---	ATU	0.567
IBU	<---	TST	0.013
IBU	<---	PU	0.017
IBU	<---	PEU	0.2
IBU	<---	ISE	0.056
IBU	<---	SN	0.023
TTTST3	<---	TST	0.725
TTST4	<---	TST	0.849
TTPU5	<---	PU	0.872
TPU6	<---	PU	0.897
TTPEU3	<---	PEU	0.821
TPEU6	<---	PEU	0.759
TTISE3	<---	ISE	0.708
TTISE8	<---	ISE	0.781
TSN4	<---	SN	0.889
TSN3	<---	SN	0.683
TTIBU2	<---	IBU	0.59
TTIBU3	<---	IBU	0.831
TTIBU4	<---	IBU	0.931
TATU3	<---	ATU	0.885
TTATU6	<---	ATU	0.904

Covariances: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
TST	<-->	PU	0.03	0.004	7.494	***	par_9
TST	<-->	PEU	0.032	0.004	8.428	***	par_10
TST	<-->	ISE	0.032	0.004	7.999	***	par_11
TST	<-->	SN	0.018	0.003	5.451	***	par_12
PU	<-->	PEU	0.046	0.004	10.553	***	par_13
PU	<-->	ISE	0.042	0.004	9.558	***	par_14
PU	<-->	SN	0.02	0.004	5.651	***	par_15
PEU	<-->	ISE	0.037	0.004	9.387	***	par_16
PEU	<-->	SN	0.017	0.003	5.618	***	par_17
ISE	<-->	SN	0.024	0.004	6.493	***	par_18

Correlations: (Group number 1 - Default model)

			Estimate
TST	<-->	PU	0.458
TST	<-->	PEU	0.588
TST	<-->	ISE	0.577
TST	<-->	SN	0.374
PU	<-->	PEU	0.785
PU	<-->	ISE	0.71
PU	<-->	SN	0.372
PEU	<-->	ISE	0.779
PEU	<-->	SN	0.401
ISE	<-->	SN	0.54

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
TST	0.061	0.007	8.663	***	par_30
PU	0.072	0.006	11.492	***	par_31
PEU	0.047	0.005	9.048	***	par_32
ISE	0.049	0.006	8.139	***	par_33
SN	0.039	0.006	6.555	***	par_34
e43	0.014	0.002	6.708	***	par_35
e42	0.012	0.002	6.261	***	par_36
e3	0.046	0.005	9.342	***	par_37
e4	0.024	0.005	4.809	***	par_38
e14	0.023	0.002	9.245	***	par_39
e15	0.016	0.002	7.7	***	par_40
e18	0.031	0.003	9.047	***	par_41
e21	0.034	0.003	11.453	***	par_42
e25	0.049	0.004	12.109	***	par_43
e29	0.037	0.004	9.72	***	par_44
e33	0.018	0.007	2.675	0.007	par_45
e34	0.045	0.005	9.356	***	par_46
e37	0.065	0.004	14.654	***	par_47
e38	0.03	0.003	11.314	***	par_48
e39	0.012	0.002	5.491	***	par_49
e40	0.018	0.002	9.899	***	par_50
e41	0.017	0.002	8.603	***	par_51

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

	Estimate
ATU	0.776
IBU	0.656
TTATU6	0.818
TATU3	0.783
TTIBU4	0.868
TTIBU3	0.691
TTIBU2	0.349
TSN3	0.466
TSN4	0.791
TTISE8	0.611
TTISE3	0.502
TPEU6	0.576
TTPEU3	0.675
TPU6	0.805
TTPU5	0.76
TTST4	0.72
TTTST3	0.526

Total Effects (Group number 1 - Default model)

	SN	ISE	PEU	PU	TST	ATU	IBU
ATU	-0.003	0.575	0.031	0.414	-0.014	0	0
IBU	0.02	0.286	0.185	0.184	0.004	0.415	0
TTATU6	-0.003	0.623	0.034	0.448	-0.015	1.084	0
TATU3	-0.003	0.575	0.031	0.414	-0.014	1	0
TTIBU4	0.03	0.434	0.28	0.279	0.006	0.631	1.518
TTIBU3	0.027	0.396	0.256	0.255	0.005	0.575	1.384
TTIBU2	0.02	0.286	0.185	0.184	0.004	0.415	1
TSN3	1	0	0	0	0	0	0
TSN4	1.306	0	0	0	0	0	0
TTISE8	0	1.093	0	0	0	0	0
TTISE3	0	1	0	0	0	0	0
TPEU6	0	0	1	0	0	0	0
TTPEU3	0	0	1.165	0	0	0	0
TPU6	0	0	0	0.953	0	0	0
TTPU5	0	0	0	1	0	0	0
TTST4	0	0	0	0	1	0	0
TTTST3	0	0	0	0	0.912	0	0

Standardized Total Effects (Group number 1 - Default model)

	SN	ISE	PEU	PU	TST	ATU	IBU
ATU	-0.002	0.501	0.026	0.437	-0.014	0	0
IBU	0.021	0.34	0.215	0.265	0.005	0.567	0
TTATU6	-0.002	0.453	0.024	0.395	-0.012	0.904	0
TATU3	-0.002	0.443	0.023	0.387	-0.012	0.885	0
TTIBU4	0.02	0.316	0.2	0.247	0.005	0.528	0.931
TTIBU3	0.018	0.282	0.179	0.22	0.004	0.472	0.831
TTIBU2	0.012	0.201	0.127	0.157	0.003	0.335	0.59
TSN3	0.683	0	0	0	0	0	0
TSN4	0.889	0	0	0	0	0	0
TTISE8	0	0.781	0	0	0	0	0
TTISE3	0	0.708	0	0	0	0	0
TPEU6	0	0	0.759	0	0	0	0
TTPEU3	0	0	0.821	0	0	0	0
TPU6	0	0	0	0.897	0	0	0
TTPU5	0	0	0	0.872	0	0	0
TTST4	0	0	0	0	0.849	0	0
TTTST3	0	0	0	0	0.725	0	0

Direct Effects (Group number 1 - Default model)

	SN	ISE	PEU	PU	TST	ATU	IBU
ATU	-0.003	0.575	0.031	0.414	-0.014	0	0
IBU	0.021	0.047	0.172	0.012	0.01	0.415	0
TTATU6	0	0	0	0	0	1.084	0
TATU3	0	0	0	0	0	1	0
TTIBU4	0	0	0	0	0	0	1.518
TTIBU3	0	0	0	0	0	0	1.384
TTIBU2	0	0	0	0	0	0	1
TSN3	1	0	0	0	0	0	0
TSN4	1.306	0	0	0	0	0	0
TTISE8	0	1.093	0	0	0	0	0
TTISE3	0	1	0	0	0	0	0
TPEU6	0	0	1	0	0	0	0
TTPEU3	0	0	1.165	0	0	0	0
TPU6	0	0	0	0.953	0	0	0
TTPU5	0	0	0	1	0	0	0
TTST4	0	0	0	0	1	0	0
TTTST3	0	0	0	0	0.912	0	0

Standardized Direct Effects (Group number 1 - Default model)

	SN	ISE	PEU	PU	TST	ATU	IBU
ATU	-0.002	0.501	0.026	0.437	-0.014	0	0
IBU	0.023	0.056	0.2	0.017	0.013	0.567	0
TTATU6	0	0	0	0	0	0.904	0
TATU3	0	0	0	0	0	0.885	0
TTIBU4	0	0	0	0	0	0	0.931
TTIBU3	0	0	0	0	0	0	0.831
TTIBU2	0	0	0	0	0	0	0.59
TSN3	0.683	0	0	0	0	0	0
TSN4	0.889	0	0	0	0	0	0
TTISE8	0	0.781	0	0	0	0	0
TTISE3	0	0.708	0	0	0	0	0
TPEU6	0	0	0.759	0	0	0	0
TTPEU3	0	0	0.821	0	0	0	0
TPU6	0	0	0	0.897	0	0	0
TTPU5	0	0	0	0.872	0	0	0
TTST4	0	0	0	0	0.849	0	0
TTTST3	0	0	0	0	0.725	0	0

Indirect Effects (Group number 1 - Default model)

	SN	ISE	PEU	PU	TST	ATU	IBU
ATU	0	0	0	0	0	0	0
IBU	-0.001	0.239	0.013	0.172	-0.006	0	0
TTATU6	-0.003	0.623	0.034	0.448	-0.015	0	0
TATU3	-0.003	0.575	0.031	0.414	-0.014	0	0
TTIBU4	0.03	0.434	0.28	0.279	0.006	0.631	0
TTIBU3	0.027	0.396	0.256	0.255	0.005	0.575	0
TTIBU2	0.02	0.286	0.185	0.184	0.004	0.415	0
TSN3	0	0	0	0	0	0	0
TSN4	0	0	0	0	0	0	0
TTISE8	0	0	0	0	0	0	0
TTISE3	0	0	0	0	0	0	0
TPEU6	0	0	0	0	0	0	0
TTPEU3	0	0	0	0	0	0	0
TPU6	0	0	0	0	0	0	0
TTPU5	0	0	0	0	0	0	0
TTST4	0	0	0	0	0	0	0
TTTST3	0	0	0	0	0	0	0

Bootstrapping

Standardized Indirect Effects (Group number 1 - Default model)

	SN	ISE	PEU	PU	TST	ATU	IBU
ATU	0	0	0	0	0	0	0
IBU	-0.001	0.284	0.015	0.248	-0.008	0	0
TTATU6	-0.002	0.453	0.024	0.395	-0.012	0	0
TATU3	-0.002	0.443	0.023	0.387	-0.012	0	0
TTIBU4	0.02	0.316	0.2	0.247	0.005	0.528	0
TTIBU3	0.018	0.282	0.179	0.22	0.004	0.472	0
TTIBU2	0.012	0.201	0.127	0.157	0.003	0.335	0
TSN3	0	0	0	0	0	0	0
TSN4	0	0	0	0	0	0	0
TTISE8	0	0	0	0	0	0	0
TTISE3	0	0	0	0	0	0	0
TPEU6	0	0	0	0	0	0	0
TTPEU3	0	0	0	0	0	0	0
TPU6	0	0	0	0	0	0	0
TTPU5	0	0	0	0	0	0	0
TTST4	0	0	0	0	0	0	0
TTTST3	0	0	0	0	0	0	0

Bootstrapping

Standardized Indirect Effects - Standard Errors (Group number 1 - Default model)

	SN	ISE	PEU	PU	TST	ATU	IBU
ATU	0	0	0	0	0	0	0
IBU	0.033	0.111	0.08	0.081	0.037	0	0
TTATU6	0.051	0.125	0.119	0.074	0.058	0	0
TATU3	0.05	0.124	0.116	0.073	0.056	0	0
TTIBU4	0.052	0.124	0.134	0.089	0.061	0.126	0
TTIBU3	0.047	0.111	0.12	0.079	0.055	0.111	0
TTIBU2	0.033	0.079	0.086	0.056	0.039	0.08	0
TSN3	0	0	0	0	0	0	0
TSN4	0	0	0	0	0	0	0
TTISE8	0	0	0	0	0	0	0
TTISE3	0	0	0	0	0	0	0
TPEU6	0	0	0	0	0	0	0
TTPEU3	0	0	0	0	0	0	0
TPU6	0	0	0	0	0	0	0
TTPU5	0	0	0	0	0	0	0
TTST4	0	0	0	0	0	0	0
TTTST3	0	0	0	0	0	0	0

Bootstrapping:

Standardized Indirect Effects - Lower Bounds (BC) (Group number 1 - Default model)

	SN	ISE	PEU	PU	TST	ATU	IBU
ATU	0	0	0	0	0	0	0
IBU	-0.068	0.138	-0.153	0.113	-0.087	0	0
TTATU6	-0.108	0.248	-0.227	0.243	-0.131	0	0
TATU3	-0.107	0.241	-0.227	0.241	-0.128	0	0
TTIBU4	-0.081	0.082	-0.08	0.063	-0.117	0.269	0
TTIBU3	-0.07	0.074	-0.073	0.058	-0.104	0.244	0
TTIBU2	-0.05	0.056	-0.049	0.042	-0.074	0.178	0
TSN3	0	0	0	0	0	0	0
TSN4	0	0	0	0	0	0	0
TTISE8	0	0	0	0	0	0	0
TTISE3	0	0	0	0	0	0	0
TPEU6	0	0	0	0	0	0	0
TTPEU3	0	0	0	0	0	0	0
TPU6	0	0	0	0	0	0	0
TTPU5	0	0	0	0	0	0	0
TTST4	0	0	0	0	0	0	0
TTTST3	0	0	0	0	0	0	0

Bootstrapping:

Standardized Indirect Effects - Upper Bounds (BC) (Group number 1 - Default model)

	SN	ISE	PEU	PU	TST	ATU	IBU
ATU	0	0	0	0	0	0	0
IBU	0.064	0.56	0.152	0.433	0.062	0	0
TTATU6	0.09	0.725	0.235	0.537	0.095	0	0
TATU3	0.089	0.715	0.228	0.527	0.094	0	0
TTIBU4	0.123	0.566	0.459	0.42	0.123	0.764	0
TTIBU3	0.112	0.504	0.411	0.37	0.109	0.68	0
TTIBU2	0.081	0.366	0.301	0.267	0.077	0.494	0
TSN3	0	0	0	0	0	0	0
TSN4	0	0	0	0	0	0	0
TTISE8	0	0	0	0	0	0	0
TTISE3	0	0	0	0	0	0	0
TPEU6	0	0	0	0	0	0	0
TTPEU3	0	0	0	0	0	0	0
TPU6	0	0	0	0	0	0	0
TTPU5	0	0	0	0	0	0	0
TTST4	0	0	0	0	0	0	0
TTTST3	0	0	0	0	0	0	0

Bootstrapping:

Standardized Indirect Effects - Two Tailed Significance (BC) (Group number 1 - Default model)

	SN	ISE	PEU	PU	TST	ATU	IBU
ATU	...	...	...	...	...	...	...
IBU	0.982	0.002	0.756	0.002	0.812	...	...
TTATU6	0.987	0.001	0.766	0	0.82	...	...
TATU3	0.985	0.001	0.769	0	0.822	...	...
TTIBU4	0.684	0.011	0.128	0.012	0.905	0.003	...
TTIBU3	0.683	0.011	0.13	0.011	0.908	0.003	...
TTIBU2	0.681	0.01	0.125	0.011	0.905	0.002	...
TSN3	...	...	...	...	...	...	...
TSN4	...	...	...	...	...	...	...
TTISE8	...	...	...	...	...	...	...
TTISE3	...	...	...	...	...	...	...
TPEU6	...	...	...	...	...	...	...
TTPEU3	...	...	...	...	...	...	...
TPU6	...	...	...	...	...	...	...
TTPU5	...	...	...	...	...	...	...
TTST4	...	...	...	...	...	...	...
TTTST3	...	...	...	...	...	...	...

Bootstrapping:

Standardized Indirect Effects - Lower Bounds (PC) (Group number 1 - Default model)

	SN	ISE	PEU	PU	TST	ATU	IBU
ATU	0	0	0	0	0	0	0
IBU	-0.07	0.139	-0.177	0.112	-0.086	0	0
TTATU6	-0.113	0.267	-0.254	0.243	-0.13	0	0
TATU3	-0.11	0.259	-0.251	0.239	-0.128	0	0
TTIBU4	-0.087	0.102	-0.089	0.06	-0.125	0.291	0
TTIBU3	-0.076	0.092	-0.079	0.054	-0.111	0.263	0
TTIBU2	-0.054	0.066	-0.053	0.038	-0.08	0.187	0
TSN3	0	0	0	0	0	0	0
TSN4	0	0	0	0	0	0	0
TTISE8	0	0	0	0	0	0	0
TTISE3	0	0	0	0	0	0	0
TPEU6	0	0	0	0	0	0	0
TTPEU3	0	0	0	0	0	0	0
TPU6	0	0	0	0	0	0	0
TTPU5	0	0	0	0	0	0	0
TTST4	0	0	0	0	0	0	0
TTTST3	0	0	0	0	0	0	0

Bootstrapping:

Standardized Indirect Effects - Upper Bounds (PC) (Group number 1 - Default model)

	SN	ISE	PEU	PU	TST	ATU	IBU
ATU	0	0	0	0	0	0	0
IBU	0.062	0.564	0.141	0.429	0.063	0	0
TTATU6	0.089	0.753	0.218	0.537	0.096	0	0
TATU3	0.086	0.744	0.212	0.526	0.095	0	0
TTIBU4	0.119	0.601	0.453	0.415	0.116	0.787	0
TTIBU3	0.108	0.537	0.407	0.366	0.104	0.701	0
TTIBU2	0.077	0.382	0.296	0.262	0.073	0.502	0
TSN3	0	0	0	0	0	0	0
TSN4	0	0	0	0	0	0	0
TTISE8	0	0	0	0	0	0	0
TTISE3	0	0	0	0	0	0	0
TPEU6	0	0	0	0	0	0	0
TTPEU3	0	0	0	0	0	0	0
TPU6	0	0	0	0	0	0	0
TTPU5	0	0	0	0	0	0	0
TTST4	0	0	0	0	0	0	0
TTTST3	0	0	0	0	0	0	0

Bootstrapping:

Standardized Indirect Effects - Two Tailed Significance (PC) (Group number 1 - Default model)

	SN	ISE	PEU	PU	TST	ATU	IBU
ATU	...	...	...	...	...	...	...
IBU	0.94	0.002	0.878	0.002	0.825	...	...
TTATU6	0.939	0	0.879	0	0.826	...	...
TATU3	0.939	0	0.879	0	0.826	...	...
TTIBU4	0.76	0.007	0.138	0.014	0.975	0.002	...
TTIBU3	0.76	0.007	0.138	0.014	0.975	0.002	...
TTIBU2	0.76	0.007	0.138	0.014	0.975	0.002	...
TSN3	...	...	...	...	...	...	...
TSN4	...	...	...	...	...	...	...
TTISE8	...	...	...	...	...	...	...
TTISE3	...	...	...	...	...	...	...
TPEU6	...	...	...	...	...	...	...
TTPEU3	...	...	...	...	...	...	...
TPU6	...	...	...	...	...	...	...
TTPU5	...	...	...	...	...	...	...
TTST4	...	...	...	...	...	...	...
TTTST3	...	...	...	...	...	...	...

Appendix 12a: Table 4.16 (Retained Items & Factor Loading for Generated Model)

Construct	Code	Item	Factor Loading
Trust	TTTST3	I trust that my personal information on my Internet banking will be kept confidential.	0.73
	TTST4	My Internet banking website is characterized by the frankness and clarity of the services that is offered to the customer.	0.85
Perceived Usefulness	TTPU5	I find that using the Internet banking service makes my banking activities more easier to do.	0.87
	TPU6	I find using Internet banking service is useful for my Banking activities.	0.90
Perceived Ease of Use	TTPEU3	My interaction with the Internet banking is clear and understandable.	0.82
	TPEU6	I find the Internet banking is flexible to interact with.	0.76
Internet Self-Efficacy	TTISE3	I feel confident to search for information on the Internet for banking products and services.	0.71
	TTISE8	I can get to a specific website with an Internet browser.	0.78
Subjective Norm	TSN3	If I use the Internet banking most of the people who are important to me will regard me as clever.	0.68
	TSN4	If I use the Internet banking most of the people who are important to me will regard it as useful.	0.89
Attitude	TATU3	People should adopt the Internet banking facility.	0.88
	TTATU6	I like the idea of using the Internet banking facility.	0.90
Internet Banking Usage	TTIBU2	I spend a lot of time on Internet banking for my personal use.	0.59
	TTIBU3	I have been using the Internet banking for my personal use for a very long time.	0.83
	TTIBU4	I often use the Internet banking facility.	0.93

Appendix 12b: Table 4.17 (Research Objective, Hypotheses and Research Results)

Research Objective	Hypotheses	Result
To examine the direct effect of the determinants trust, perceived usefulness, perceived ease of use, internet self-efficacy, subjective norm and attitude on Internet banking usage in Malaysia.	H1a= Trust will have a positive significant relationship on usage the Internet banking systems.	Not supported
	H1b= Perceived usefulness will have a positive significant relationship on Internet banking usage.	Not supported
	H1c= Perceived ease of use will have a positive significant relationship on Internet banking usage.	Supported
	H1d= Internet self-efficacy will have a positive significant relationship on Internet banking usage.	Not supported
	H1e= Subjective norm will have a positive significant relationship on Internet banking usage.	Not supported
	H1f= Attitude will have a positive significant relationship on the Internet banking usage.	Supported
To examine the direct effect of the determinants trust, perceived usefulness, perceived ease of use, internet self-efficacy, subjective norm on attitude towards Internet banking.	H2a= Trust will have a positive significant relationship on attitude towards Internet banking usage.	Not supported
	H2b= Perceived usefulness will have a positive significant relationship on attitude towards Internet banking usage.	Supported
	H2c= Perceived ease of use will have a positive significant relationship on attitude towards Internet	Not supported
	H2d= Internet self-efficacy will have a positive significant relationship on attitude towards Internet banking usage.	Supported
	H2e= Subjective norm will have a positive significant relationship on attitude towards Internet banking usage.	Not supported
To examine the indirect effect of the determinant attitude towards Internet banking on specific linkages to Internet banking usage as in the theoretical model.	H3a= Attitude mediates the relationship between trust and Internet banking usage.	No mediation
	H3b= Attitude mediates the relationship between perceived usefulness and Internet banking usage.	Mediation
	H3c= Attitude mediates the relationship between perceived ease of use and Internet banking usage.	No mediation
	H3d= Attitude mediates the relationship between Internet self-efficacy and Internet banking usage.	Mediation
	H3e= Attitude mediates the relationship between subjective norm and Internet banking usage.	No mediation