FACTORS INFLUENCING INTENTION TO USE MOBILE BANKING IN BANK SIMPANAN NASIONAL USING MODIFIED TECHNOLOGY READINESS ACCEPTANCE MODEL (TRAM)

NURDIANA BINTI ABDUL RANI

UNIVERSITI UTARA MALAYSIA

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BY:

NURDIANA BINTI ABDUL RANI

(MATRIC: 816894)

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ABSTRACT

The aspiration of this research is to study the factors that influence the intention to use mobile banking in Malaysian perspective by using integrated model TRAM. The theoretical framework of this research is the combination of technology readiness (TR) and technology acceptance model (TAM), where perceived usefulness completely mediates the impact of technology readiness towards the intention to use mobile banking. This research employed the full 16-item of technology readiness index (Parasuraman and Colby, 2014) to measure optimism, innovativeness, discomfort, and insecurity; whereas perceived usefulness and intention to use were adapted from Davis (1989) and Wang et al., (2006). Based on the research analysis, optimism and innovativeness have a positive effect on customer's perceived usefulness of mobile banking. Whereas, discomfort and insecurity indicate a weak correlation towards perceived usefulness. On the contrary, perceived usefulness has a strong correlation in influencing the customer's intention to use mobile banking. This research provides a useful understanding of customer's perceived usefulness and their intention to use mobile banking.

Key terms: Mobile Banking, Technology Readiness, Technology Acceptance, TRAM
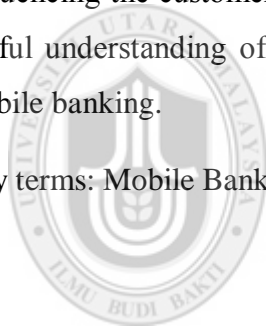
ABSTRAK

Kajian ini adalah untuk mengkaji faktor-faktor yang mempengaruhi niat untuk menggunakan perbankan mudah alih di Malaysia dengan menggunakan model TRAM bersepadu. Rangka kerja teori kajian ini adalah gabungan kesediaan teknologi (TR) dan teknologi model penerimaan (TAM), di mana tanggapan kebergunaan menjadi pemboleh ubah pengantara yang memberi kesan kepada kesediaan teknologi terhadap niat untuk menggunakan perbankan mudah alih. Kajian ini mempunyai 16 soalan yang melibatkan indeks kesediaan teknologi (Parasuraman dan Colby, 2014) untuk mengukur keyakinan, daya inovasi, rasa tidak selesa, dan tidak selamat; manakala soalan bagi tanggapan kebergunaan dan niat untuk menggunakan perbankan mudah alih diadaptasikan daripada kajian Davis (1989) dan Wang et al., (2006). Berdasarkan analisis kajian, keyakinan dan inovasi mempunyai kesan positif ke atas tanggapan kebergunaan pelanggan terhadap perbankan mudah alih. Manakala, rasa tidak selesa dan tidak selamat menunjukkan korelasi yang lemah ke arah perasaan kebergunaan perbankan mudah alih. Sebaliknya, tanggapan kebergunaan mempunyai korelasi yang kuat dalam mempengaruhi niat pelanggan untuk menggunakan perbankan mudah alih. Kajian ini membantu memberikan maklumat yang berguna tentang pandangan pelanggan terhadap tanggapan kebergunaan perbankan mudah alih dan hasrat mereka untuk menggunakannya. .

Kata kunci: Perbankan mudah alih, Kesediaan teknologi, Penerimaan teknologi, TRAM.

ACKNOWLEDGEMENT

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LIST OF ABBREVIATIONS

ANOVA	:	Analysis of Variance
ATM	:	Automated Teller Machine
BAFIA	:	Banking and Financial Institution Act
BSN	:	Bank Simpanan Nasional
CIMB	:	Commerce International Merchant Bankers Berhad
DBS	:	The Development Bank of Singapore Limited
DIS	:	Discomfort
DV	:	Dependent Variable
HSBC	:	Hong Kong and Shanghai Banking Corporation
IBA	:	Islamic Banking Act
INN	:	Innovativeness
INS	:	Insecurity
ITU	:	Intention to Use
IV	:	Independent Variable
MV	:	Mediator Variable
NTRS	:	National Technology Readiness Survey
OPT	:	Optimism
PDA	:	Personal Digital Assistance
PU	:	Perceived Usefulness
SIM	:	Subscriber Identity Module
SPM	:	Sijil Pelajaran Malaysia
SPSS	:	Statistical Package for Social Science
SST	:	Self-Service Technology
STPM	:	Sijil Tinggi Pelajaran Malaysia
TAM	:	Technology Acceptance Model
TR	:	Technology Readiness
TRA	:	Theory of Reasoned Action
TRAM	:	Technology Readiness Acceptance Model
TRI	:	Technology Readiness Index
UK	:	United Kingdom
VIF	:	Variance Inflation Factor

CHAPTER 1

INTRODUCTION

This chapter consists of eight major sections namely; (i) introduction of mobile banking, (ii) background of study, (iii) statement of research problem, (iv) research questions, (v) research objectives, (vi) significance of the study, and (vii) organization of the thesis. The purpose of this chapter is to introduce the context of the research and the structure of the thesis, which explains the contents of the subsequent chapters briefly.

1.0   Introduction

Financial institution have undergone an endless innovation, exclusively in the past decade. The revolution in banking are catalysts to technology advancements, global commerce, competitiveness and customer demands. These financial service providers were required to act fast to develop and to adopt a new method of delivering the services to meet the customer expectations while maintaining competitiveness. The advancement of technology, especially in the mobile phone has provided windows of opportunities for the financial institutions to bring out new financial products and services to meet up the prospect. One of the favourite financial innovations is mobile banking.

Mobile banking viewed as a part of electronic banking with customers connecting to their bank via a mobile device such as cell phone. Drexelius and Herzig (2001) also defines mobile banking as the platform to conduct bank transactions via an electronic device, or more broadly – to carry out financial transactions via a portable terminal. Nowadays, mobile banking services are more accessible via devices such as smartphones and tablets to provide financial

information, communication and transaction to customers (Ensor, Montez and Wannemacher, 2012). As Amin, Supinah, Mohd Aris & Baba (2012) agreed that the clients used handheld mobile phones to conduct banking transactions.

Mobile banking grants customer access to execute banking transaction without even walking to the bank's branch. To enjoy such access the user, first, needs to install the application of mobile banking on the user's SIM card (Hernandez, 2011). This application will create significant value by enabling users to obtain prompt and interactive banking services entirely at their fingertips (Mallat, Rossi, and Tuunainen 2004).

However, different banks provide different ways to access mobile banking. Some banks like Maybank, HSBC bank, and CIMB bank requires customers to register with the respective banks and obtain credentials including username, memorable security question answer, and password as security purposed. Once the customers are registered, then only the customers are able to access the mobile banking service which can be downloaded through Apps Store or Google Play. This innovation allows customers to switch from traditional counter to digital where clients can perform their business transaction twenty-four hours daily by only using their smartphones or tablets.

Mobile banking offers a hustle free and very convenient lifestyle to the consumers because customers are able to conduct the business transaction at their preferred time (Mohd Daud, Mohd Kassim, Wan Mohd Said, & Mohd Noor, 2011). Mobile banking transactions include checking account balances, transferring funds, performing credit card transactions as well as accessing other banking product and services (Ensor, Montez and Wannemacher, 2012). Besides that, Kohli (2004)

claimed that mobile banking not only provides ease for customers to access account information but also cut down one's time and money in perform real-time transaction. In which, according to Devlin and Devlin (2006), customers only need a lesser time to conduct their banking activities.

Moreover, according to Hamzah (2005), mobile banking is not only delivering enhanced value and convenience to the customer but also has a significant impact on bank's operating cost and expediting changes in retail banking (Laukkanen, Sinkkonen, Kivijarvi & Laukkanen, 2007). Therefore, past research has shown clearly that mobile banking does not only offer many advantages to the customers but to the banks as well (Hamzah, 2005; Riivari, 2005; Kohli, 2004).

1.1   Background of the Study

Banking is becoming dominated by tech-savvy mobile technology in use by customers. Banks are finding themselves at different stages of preparedness for a potential new way of interacting with their customers. In the Asian region, Singapore banks are the most prepared for the digital banking phase, followed by Malaysian banks while other neighbouring countries like Indonesia, Thailand, and Philippine banks are still lagging behind (DBS Bank, 2015).

United Kingdom is ranking top in the world, followed by Singapore (House Of Lords, 2015) in term of readiness for digital banking and part of top three ranking concerning banking capabilities which include sophisticated digital offerings, strong financial and digital structure (A.T. Kearney, Inc., 2013). Be as it may, when compared to the western world of banking, digital banking in Asian banks would seem still at the early stages of development.

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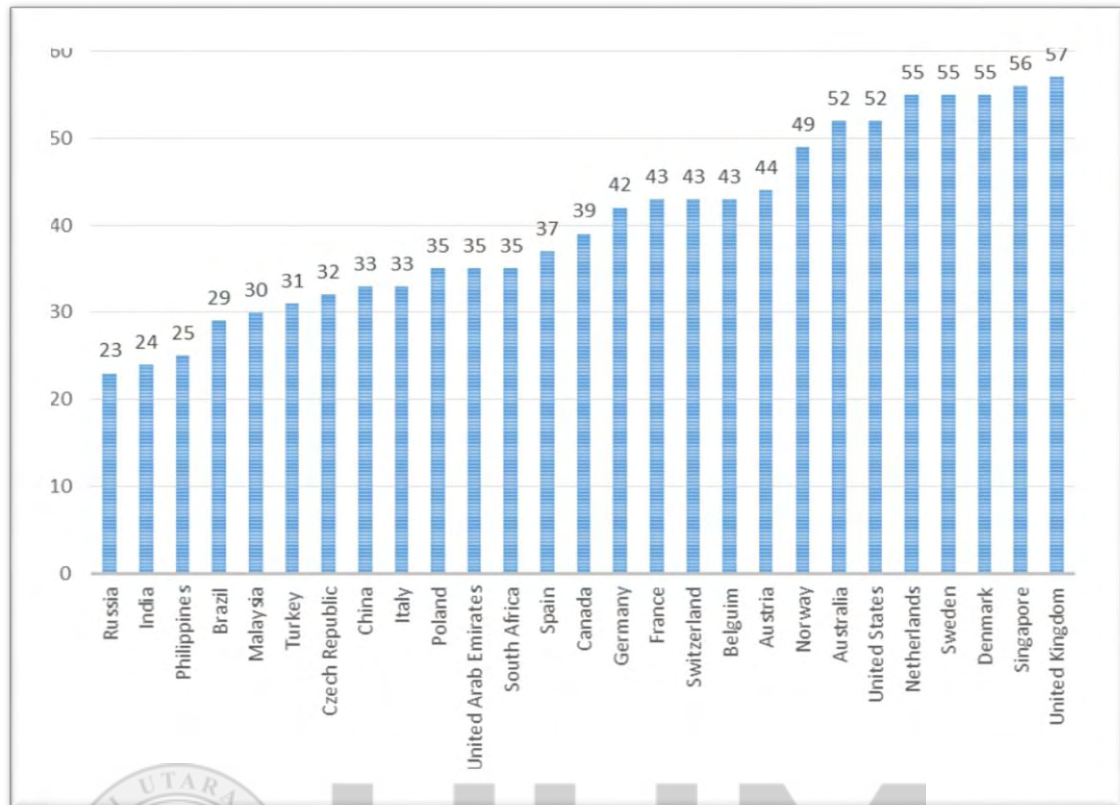
Figure 1.1:
Digital Banking Readiness Index Worldwide
Source: A.T. Kearney, Inc., (2013)

Based on Figure 1.1, A.T. Kearney, Inc., (2013) conclude that United

Kingdom, Singapore, Denmark, Sweden, Netherlands, United States and Australia

are committed to the digital banking and geared up to become digitisation banks

entirely. Whereas, Norway, Austria, Belgium, Switzerland, France, Germany,

Canada and Spain are still in undecided phase whether to remain on the conventional

banking or opt for more contemporary experience in the banking world. Meanwhile,

Malaysia belongs to the third category as according to A.T. Kearney, Inc., (2013)

together with the country like South Africa, United Arab Emirates, Poland, Italy,

China, Czech Republic, Turkey and Brazil where the market for digital banking are

not yet in an attractive environment. On the other hand, Philippines, India, and Russia are still working on the fundamentals of digital banking.

Based on McKinsey (2014), about 40% of upscale customers in the Asia prefer mobile banking or online banking. This indicates the variation of customer's preference in the market when the usage of bank branch services throughout Asia has drop by 27% since 2007. In conjunction with that, McKinsey (2014) predicted that the number of digital banking for ASEAN and Australia will rise up from 60 million in 2012 to 150 million in 2020 (McKinsey, 2014). Based on Figure 1.2, South Korea, Australia and Singapore hold the highest ranking in digital banking penetration in Asia while Malaysia ranked in ninth place with 41% penetration rate compared to China and Vietnam.
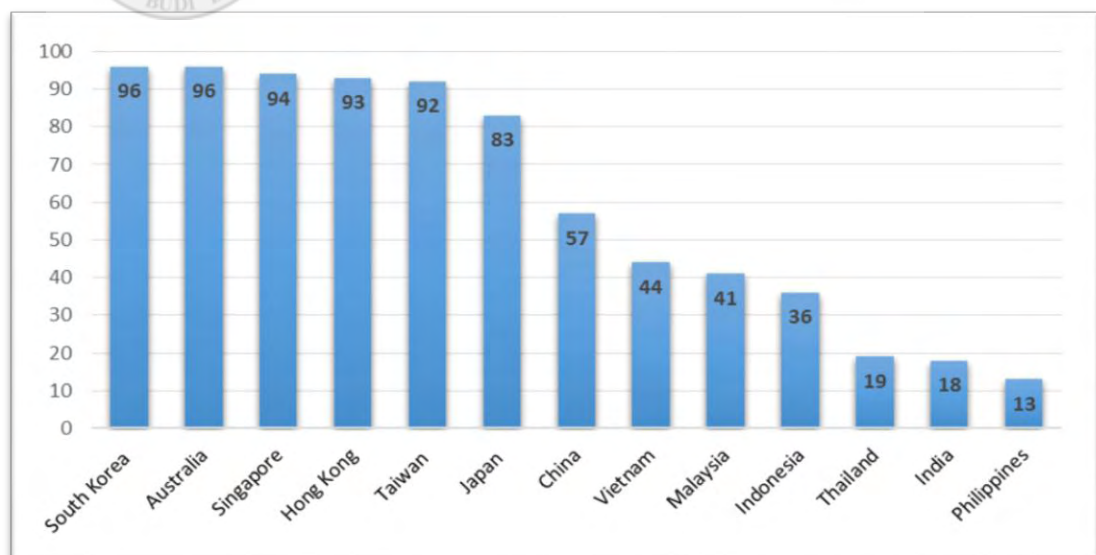
Figure 1.2:
Digital Banking Penetration in Asia
Source: McKinsey (2014)

Over the next few years, digital banking in Malaysia is foreseen to develop more rapidly as strong usage of internet, smartphones and tablets allow banks to offer more service off-the-counter. To date, digitisation within Malaysian financial sector remains the key priority as the government included the creation of an integrated payment ecosystem as one of its Entry Point Projects (EPP). EPPs designed under Malaysia's Economic Transformation Programme (ETP) which strives to achieve the ultimate goal of elevating the country to a developed nation status by the year 2020 (Bank Negara Malaysia, 2016). The EPP targets to reduce dependence on cash transactions from 91% in 2013 to 63% of total transactions by 2020.

To pursue that challenge, almost all Malaysian banks have stated that they will be embarking on digitization going forward (Bank Negara Malaysia, 2016). Digitisation of the banks includes the adoption of mobile banking; nonetheless, the rate of adoption differs across the banks. Table 1.1 shows that the list of segregating leaders and laggards amongst Asian banks in pursuing mobile banking. In Malaysian context, Maybank is taking the clear lead in adopting mobile banking, with Hong Leong Bank and CIMB Bank tagging close behind; while, Ariffin Banks and other banks in Malaysia are still contemplating to join the market.

Table 1.1:

Segregating Leaders and Laggards amongst Asian Banks in Pursuing Mobile Banking

Leaders	Dark Horses	Laggards
Singapore Banks	Indonesian Bank	Smaller Indonesian Banks
Maybank	Hong Leong Bank	Ariffin Banks
Bank Central Asia	CIMB Group	TISCO Financial Group
Kasikornbank	Bank Danamon	
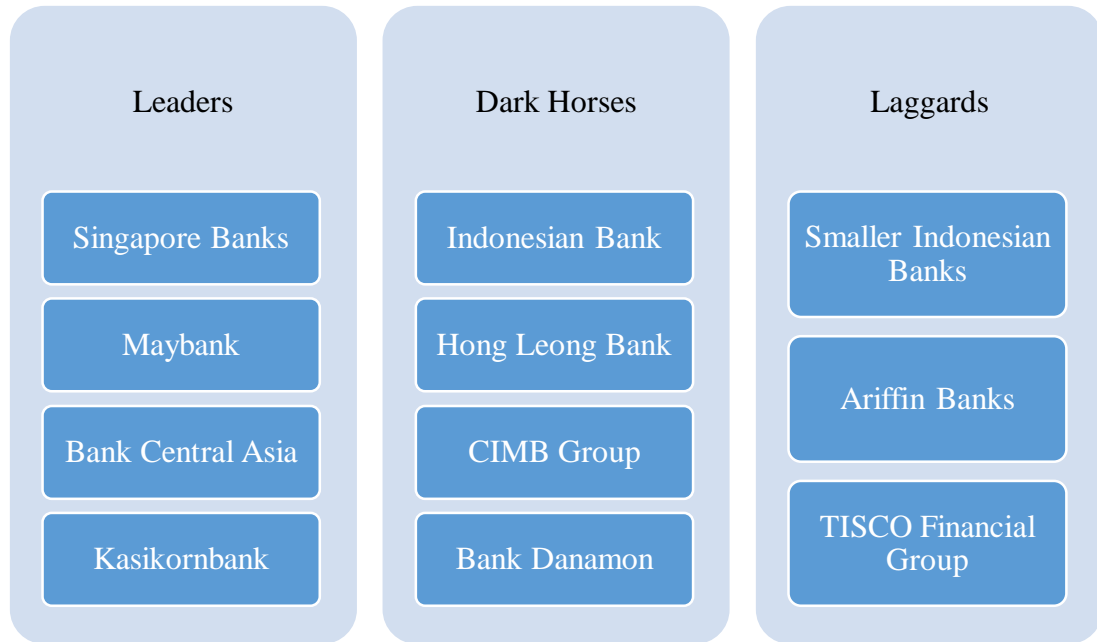
Source: DBS Bank (2015)

Mobile banking in Malaysia is considered relatively new technology which only offers limited services to the consumer; compared to internet banking that has been introduced to the consumer over a decade ago (DBS Bank, 2015). Malaysia's first revolutionary digital banking was initiated by Malayan Bank Berhad, mostly known as Maybank, in June 2000. Maybank was the first bank to launch internet financial portal thenceforth introducing mobile banking to the Malaysian's customers. Mobile banking in Malaysia continues to expand when another twelve (12) banks join the market.

Table 1.2 shows that the list of banks both local and foreign that offered mobile banking services in Malaysia; based on the table below eight (8) out of fourteen (14) local banks in Malaysia offered mobile banking to the consumer. The local banks that do not offer mobile banking include Ariffin Bank Berhad, Alliance Bank Berhad, Bank Muamalat Berhad, Agro Bank Malaysia, Bank Kerjasama

Rakyat Malaysia Berhad (Bank Rakyat) and SME Bank Berhad; whereas only five

(5) foreign bank tap into Malaysia mobile banking services.

Table 1.2:

List of Banks Offering Mobile Banking Services in Malaysia

	Local Banks	**Foreign Banks**
Mobile Banking	1. AmBank (M) Berhad 2. Bank Islam Malaysia Berhad 3. Bank Simpanan Nasional 4. CIMB Bank Berhad 5. Hong Leong Bank Berhad 6. Malayan Banking Berhad 7. Public Bank Berhad 8. RHB Bank Berhad	1. Standard Chartered Bank Malaysia Berhad 2. OCBC Bank (Malaysia) Berhad 3. HSBC Bank Malaysia Berhad 4. Citibank Berhad 5. Al Rajhi Banking & Investment Corporation (Malaysia) Berhad

Source: Bank Negara Malaysia (2016)

After mobile banking service was launch in Malaysia, mobile banking transactions have seen some growth as customers are in the middle of a mobile mind shift (Wise & Parrish, 2016). Table 1.3 shows that both percentages of penetration to population and mobile subscribers have stably increased throughout the years since 2011.

Table 1.3:

Malaysia's Internet Banking and Mobile Banking Subscribers 2011-2015

	Internet Banking					Mobile Banking				
Years	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Total Number of Subscribers (million)	11.9	13.7	15.5	17.6	19.8	1.56	2.45	4.38	5.64	7.28
Penetration to population (%)	40.9	46.4	51.9	58.2	63.7	5.3	8.2	14.6	18.6	23.5
Penetration to mobile subscribers (%)	-	-	-	-	-	4.3	5.9	10.2	12.9	16.5

Source: Bank Negara Malaysia (2016)

As of 2015, Malaysia had only 7.28 million mobile banking subscribers, accounting for just 23.5% penetration to population and 16.5% penetration to mobile subscribers. However, it is unknown as to how many of subscribers remain active customers. As for internet banking, there were 19.8 million subscribers, translating to 63.7% penetration rate of the population. The popularity of mobile banking was believed to continue to catch up with internet banking. Key initiatives highlighted include developing partnerships with telcos, e-commerce players, and retail groups, for example, to broaden reach and offerings to customers.

In favour of Malaysia's Financial Sector Blueprint for 2011-2020, the Bank Negara Malaysia is targeting to boost up the number of e-payment transaction per capita from 56 in 2012 to 200 by the year of 2020, thus, aiding the rise of digital banking Malaysia (Bank Negara Malaysia, 2011). In that direction, Maybank aspires to be the Global Leader in Digital Financial Services in 2020 (DBS, 2015) by developing an integrated digital platform for its corporate customers, offering a full

suite of investment engine and building a digital direct lending platform. Apart from the nation's first internet financial portal, Maybank pioneered many other digitisation initiatives in Malaysia. The efforts made by Maybank include bringing in the first Malaysian bank to introduce comprehensive mobile banking services and card-less withdrawal.

However, mobile banking services in Malaysia still have a long way to go as the majority of customers prefer banking in the conventional ways (Ashta, 2010; Wang, Wang, Lin and Tang, 2003). This is supported by Hugh Harley, the Asia Pacific financial service leader for PricewaterhouseCoopers; Malaysian consumers currently are a bit unwilling to venture to the digital channels for their banking due to several factors (cited in Paul Raj, 2014, p.27.). Therefore, this research intends to provide insight by providing an analysis of bank customers' mobile banking acceptance to the researchers and practitioners.

1.2 Problem Statement

Nowadays, technology is the primary driver in many service sectors for attracting more customers, delivering better services and enhancing transaction execution (Sakun Boon-itt, 2015). Banks are gradually substituting conventional modes of service delivery through the implementation of different kinds of technological innovation which include banking transaction (Lee and Yang, 2013). With the assistance from advanced technology, customers of the financial institution can only browse their account balance on their gadgets without direct personal contact with any bank representatives (Meuter et al., 2005).

Mobile banking is relatively new in Malaysia compared to internet banking, thus leaving lots of room for development (Thakur & Srivastava, 2014). As at 2015,

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Malaysia had only 7.28 million mobile banking subscribers, accounting for just 23.5% penetration to population and 16.5% penetration to mobile subscribers; while the actual numbers that remain active customers is unknown. Therefore, there is a possibility that mobile banking remains unexplored and underutilised by bank customers (Amin, Baba & Muhammad, 2007). Thus, it is important to understand the extent of mobile banking acceptance by customers as well as to examine the factors affecting intentions to use it for financial transactions.

Notwithstanding a significant amount of literature on the technology acceptance model (TAM), the past research has overlooked the role consumers' technology readiness (TR) plays in the adoption of mobile banking technology (Lin & Chang, 2011). Previous studies done in Malaysia have reported e-banking facilities adoption ranging from internet banking up to mobile banking. There have been several studies done that focussed on the adoption and intention to use mobile banking in different regions of Malaysia. For example, in eastern Malaysia, Amin et al. (2007) and Amin (2008) investigated mobile banking acceptance in commercial banks and Bank Islam Malaysia Berhad; whereas, Sulaiman, Lim and Wee (2007) examined mobile banking acceptance in western Malaysia. Given the similarities, except for Sulaiman et al. (2007), the above studies have applied the theory of technology acceptance model (TAM) to identify factors that affect e-banking adoption and intention to use.

More recent research conducted in Malaysia by Krishanan, Khin and Tang (2015), and, Lai and Ahmad (2015) studies the factors that influence the intention to adopt mobile banking services; however, none of these studies draw attention to technology readiness which contributes to the intention to use mobile banking (refer Appendix C). There are very limited studies examining the acceptance of mobile

banking and integrated with the technology readiness, especially in the Malaysian context. This issue is critical as technology readiness impacts on the adoption and use of mobile banking. According to Parasuraman and Colby (2001), the influence of technology readiness is evident and an enabling force in many emerging technologies particularly in the area of e-commerce.

Research done by Lin & Chang (2011), indicates that technology readiness of customers enhances and influences technology acceptance model like perceived usefulness, perceived ease of use, attitude toward adoption and intention to use. Therefore, to achieve better mobile banking services outcome, banks should give detailed attention to customers' technology readiness. Banks should stimulate the use of technological services by strengthening positive technology readiness drivers like the optimism and innovativeness variables to encourage the use of mobile banking services and positive attitudes toward technology while also reducing technology readiness inhibitors (the discomfort and insecurity variables) to lower reluctance to use technology.

Moreover, Sakun Boon-itt (2015) concluded that technology readiness is the driver that can enhance service quality of self-service technology. According to the self-service technology adoption model, some of this technology does not successfully gain adoption with a high level of service quality because service providers do not take into consideration that customer participation through technology readiness is involved (Sakun Boon-itt, 2015).

Thus, the study of technology readiness in the scope of mobile banking is a case worth exploring in more detail. Therefore, this study aims to fill the research gap by adopting and modified the technology readiness acceptance in order to study

the customers' intention to use mobile banking in the context of Bank Simpanan Nasional.

1.3 Research Questions

This study attempts to answer the following issues:

1. Does technology readiness variable (optimism, innovativeness, discomfort, insecurity) correlate with customer's perceived usefulness?

2. Does mediating factor, perceived usefulness, influence the intention to use mobile banking?

1.4 Research Objective

The primary objective of this paper is to adapt and modifies the technology readiness acceptance model by considering individual differences. By taking individual differences into account, this study integrates the construct of technology readiness (Parasuraman, 2000) with technology acceptance model to explain consumers' intentions to better use mobile banking.

The specific objectives of the study are listed below:

1. To examine the correlation between technologies readiness variable (optimism, innovativeness, discomfort, insecurity) and perceived usefulness.

2. To ascertain the mediating factor, perceived usefulness towards the intention to use mobile banking.

1.5   Significance of the Study

The advance of technology will continue to transform the banking industry (Al-Jabri and Sohail, 2016) and the ways they are managing the information and transaction (Aboelmaged & Gebba, 2013). In today's fast-paced world, technology-facilitated transactions have become an integral part of bank service delivery. Thus, mobile banking is becoming one of the new strategies for banks to enhance their latest technology in a dynamic marketing environment. Mobile banking has tremendous potential since it follows on the success of internet banking (Brown, Cajee, Davies and Stroebel, 2003). Mobile banking is not only the evolution of technology, but it is also a better digital alternative to other conventional bank channels such as ATMs, Internet banking and physical branches as according to Püschel, Mazzon, Mauro and Hernandez (2010).

According to McKinsey (2014) analysis, the banks that adopt and implement digital banking systems could see a 30-50% impact on net profits depending on the starting point; however, inaction could result in losing between 29-36% of the bottom line (DBS Group Research, 2015). In the UK, the value of the internet and mobile banking transaction have increased to nearly £1 billion a day with the use of the bank branch declining 30% in the last four years (British Bankers Association, 2015).

Mobile banking enabled banks to lower its expenditure by having the customer to interact with electronic banking facilities rather than with a teller (Mishkin and Eakins, 2008), which indirectly reduce the human resources cost. Not only mobile banking reduces bank's operating cost, but it also offers the banks with analytical data of consumer pattern of purchases, their interest, and habit. In which the banks can turn the data and develop a full view of their customers' preference and

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purchasing habits; hence target the most relevant and accurate promotions to the customers (DBS Group Research, 2015).

Mobile banking not only can provide significant financial benefits like cost reduction and improved efficiency for the banks but also offer the provision of additional value for customers (Hunter and Perreault, 2007; Padget and Mulvey, 2007). Based on the research done by DBS Group Research (2015), competition between banks is not merely about rates, or which bank can pay more interest and which bank can provide better service; it is now more about which bank or more like what platform can give a customer higher returns for their money conveniently, reliably and safely. Therefore, to fulfil customer expectations, banks are pursuing alternative innovation like mobile banking to optimize customer convenience, reduce costs and maintain profitability.

Besides the convenience of 24-hours banking services, mobile banking offers more control in performing various transactions to the customer; for example, according to Amin, Supinah, Mohd Aris, & Baba (2012), Malaysian are involved in various monthly financial commitments such as utility bill payment and others. The traditional mode of payment requires a local person to visit bank or non-bank financial institution to make payment which is relatively time-consuming, therefore mobile banking service is intended to tackle this issues.

Nevertheless, many banks find that implementing and managing an active mobile banking is quite complicated and harder than it looks (Bitner et al., 2002), which originated from a lack of readiness of the banks to adopt and use mobile banking. Therefore, it is crucial for banks to assess whether they have the

mechanisms necessary to be mobile banking ready so that the banks can identify areas of improvements in their operation (Ramaseshan, Kingshott & Stein, 2015).

Mobile banking is proven to offer an advantage to the customers in improving and upgrading their lifestyle, but why are there still consumers that are reluctant to adopt mobile banking. Therefore, the findings presented in this paper can be used by both practitioners and researchers to evaluate the readiness and adoption level of customers in Bank Simpanan Nasional and come up with the right solution to upgrade the services of mobile banking and increase its usage rate (Sharma, 2015). As at the end of the day, pleasing customers would be the critical success factor for digital banking. In conjunction with that, this paper intends to provide insight into the factors that influence customers to adopt and use mobile banking especially in Bank Simpanan Nasional perspective.

1.6   Organization of the Thesis

Chapter one of this thesis provides brief explanations of the thesis. It consists of the introduction, research background, problem statement, research questions, research objectives, the significance of the study, the scope of the research and lastly about the organization of this research report.

Chapter two provides the reflection of the literature relating to the mobile banking, technology readiness and technology acceptance to clarify the arguments facilitating the development of research questions and research objectives. This chapter also provides empirical literature that discusses in detail about the practice of mobile banking and technology readiness.

Chapter three of this paper provides explanations of the methodology and procedures being utilized to collect and process data. Firstly, it describes the research

framework development adopted for this study; followed with the discussion of the research design sub-topic that provides details about the research site and sources of data, the design of questionnaire as the research instrument for this study and about the data collection and sampling method. Furthermore, this chapter also provides the research hypothesis statements, as well as the data analysis procedures being applied to test the hypothesis statements.

Chapter four focuses on the analysis of output based on research objectives in chapter one and presents the empirical results to test the research hypotheses developed in chapter two which include the discussion of the findings in term of correlation analysis, multiple regression analysis, and hierarchical multiple regression analysis. Lastly, chapter five summarizes the study, elaborates on the findings and highlights the contributions of the research to the existing knowledge.
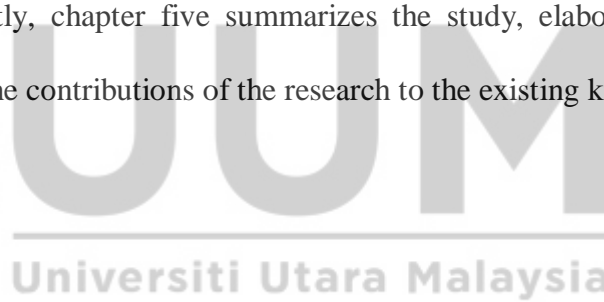
CHAPTER 2

LITERATURE REVIEW

2.0   Introduction

This chapter focuses on the literature review that describes the connection between technology readiness (TR), technology acceptance model (TAM), integration theory of technology readiness and acceptance model (TRAM) towards the intention to use mobile banking. Besides, this chapter attempts to provide a clear insight on the topics by giving the extensive definitions on concepts and further elaboration as quoted from several available literature.

2.1   Technology Readiness (TR)

Consumers' personality plays a vital role in embracing new technology. On account of the advancement of technology today, it is compulsory to comprehend customers' readiness to use technology-based systems such as self-services technologies (Parasuraman, 2000). Thus, technology readiness (TR) concept developed to measure the tendency of individual to embrace and use new technology for accomplishing goals in daily life (Parasuraman, 2000). According to Parasuraman (2000), technology readiness developed multidimensional psychographic constructs in which it offered a way to segment customers based their technology beliefs.

Technology readiness measures on how people would react, adapt, and apply the new technology in their daily life. It is a combination of technology-related beliefs that collectively determine an individual predisposition to interact with technology-based products and services (Parasuraman and Colby, 2001). Başgöze (2015) suggested that during the adoption stage of new technologies, consumers develop positive or negative feelings concerning that product. These feeling

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indirectly acts as an indication of the customer's readiness level in adopting new technology.

According to Parasuraman and Colby (2001), there are few essential components of technology readiness that need to be considered by the researchers and practitioners which include technology readiness that is different from one individual to another and deemed to be multifaceted where various types of beliefs mix to produce one's overall TR. Besides that, technology readiness can also be used to predict and explain consumer behaviour towards new technology. Based on Figure 2.1, Parasuraman and Colby (2001) highlighted the essential components of technology readiness.
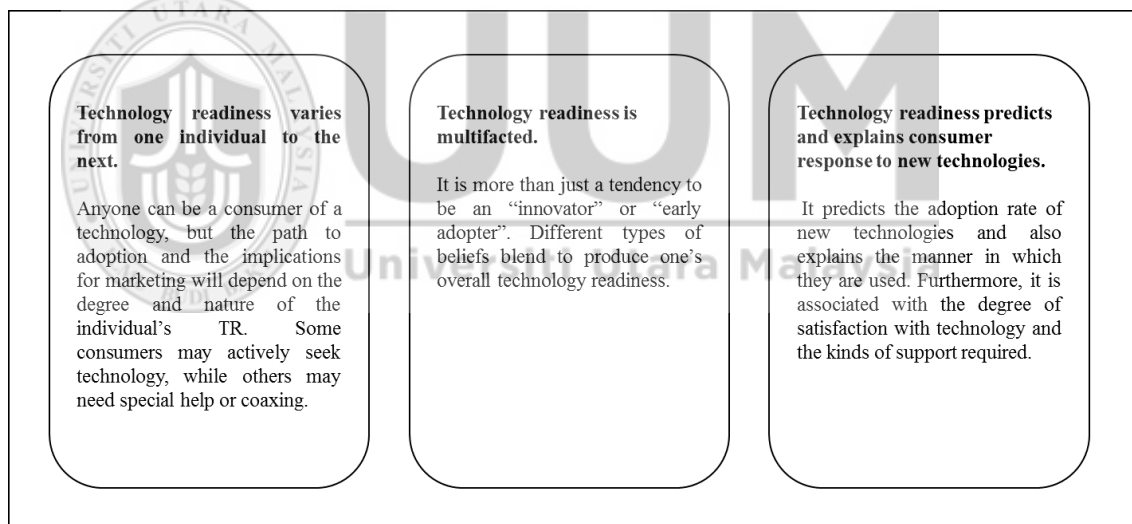
Figure 2.1:
Essential Component of Technology Readiness
Source: Parasuraman and Colby (2001)

2.2   Technology Readiness's Drivers

Technology readiness measures an individual's readiness to use new technology by four personality sub-dimensions traits which are optimism, innovativeness, discomfort, and insecurity. Two of these components –optimism and innovativeness –are "contributors" that increase an individual's technology readiness, while the other two –discomfort and insecurity –are "inhibitors" that suppress technology readiness (Parasuraman and Colby, 2001). Figure 2.2 shows the four drivers of technology readiness.
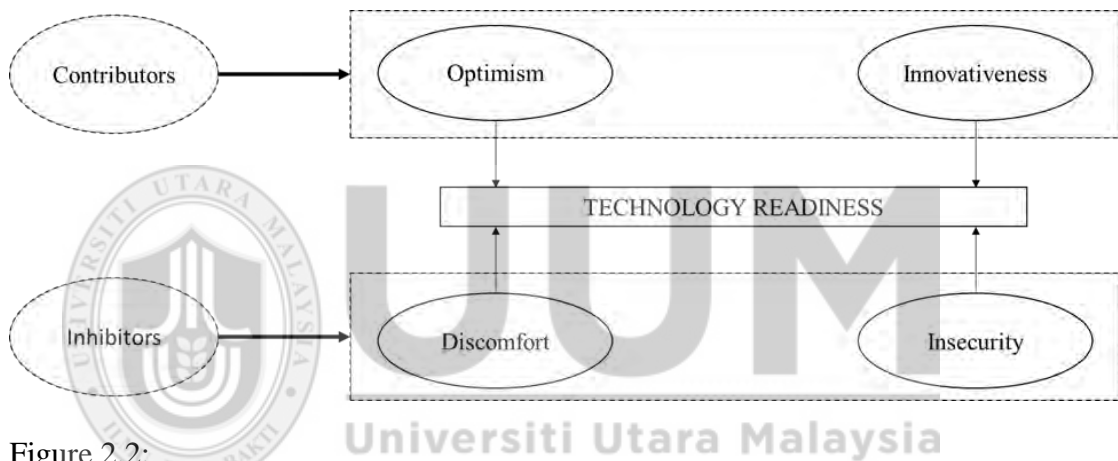
Figure 2.2:
Drivers of Technology Readiness
Source: Parasuraman and Colby (2001)

Based on Figure 2.2, optimism and innovativeness are active drivers of TR, which encourage individuals to use new technological product and services. Optimism and innovativeness influence consumers to hold a positive attitude toward technology. On the other hand, discomfort and insecurity are the negative drivers in the technology readiness construct. According to Yen (2005), these drivers make customers reluctant and lower the intention to opt for new technology. All four drivers in the TR construct are relatively independent of each other with each trait indicative of individual openness towards new technology (Guhr, Loi, Wiegard &

Breitner, 2013). The correlation between people's TR and their propensity to employ technology is empirically confirmed by Parasuraman (2000).

A person's predisposition to use new technologies, as expressed in the technology readiness construct, can be thought of as a state of mind resulting from a gestalt of mental enablers and inhibitors (Parasuraman, 2000). As noted by Yen (2005) that not all consumers are equally ready to embrace new technology. Moreover, Parasuraman and Colby (2001) also agreed that customer with different technology readiness profiles diversify significantly regarding Internet-related behaviours.

Both kinds of research done by Lin and Chang (2011) and Guhr, Loi, Wiegard and Breitner (2013) agreed that technology readiness cannot be ignored in assessing the adoption level of customers especially in the context of self-service technology. Therefore, the role of technology readiness should be integrated into any of technology acceptance model (Lin and Hsieh, 2012; Verhoef et al., 2009).

2.3   Technology Readiness Index (TRI)

Technology Readiness Index (TRI) that was refined by Parasuraman and Rockbridge Associates, Inc in 1999 serves as an understanding of customer's motivations and inhibitions in regards of the adoption of technology. Technology readiness index is a scale to measure individual's level of readiness in using technology. TRI is interested in the tendency of using technology, instead of the proficiency to use it (Parasuraman and Colby, 2001).

However a decade has passed since the technology readiness index was developed and since then, technology has revolutionized service delivery in every service aspect. The magnitude of change is evident in the growth of technologies. As

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of 2013, 2.7 billion people worldwide had Internet access, with global penetration growing from 7% in 2000 to 39% in 2013 (Parasuraman and Colby, 2014). Around 40% of the world population has an internet connection today; in 1995, it was less than 1% (Tim Berners, 2016).

The growth in mobile technology is even more prolific, with mobile cellular subscriptions worldwide growing from 2.3 billion in 2005 to 6.8 billion in 2013 (Parasuraman and Colby, 2014). In addition to that, the pace of technological change has accelerated, with the help of high-speed Internet access, mobile commerce, social media, and cloud computing. Thus, the importance and practical relevance of the Technology Readiness (TR) construct will continue to grow, commensurate with rapidly evolving technologies.

Given the major changes in the technology prospect, Parasuraman and Colby (2014) initiated the development of an upgraded and streamlined technology readiness index known as TRI 2.0. Parasuraman and Colby (2014) distinguish the original technology readiness index from TRI 2.0 by naming it TRI 1.0. According to Parasuraman and Colby (2014), it was important to update the TRI 1.0 scale to improve contexts that were no longer innovative, to examine and incorporate relevant implications of a changing technology environment, and to make the instrument more parsimonious. Besides, new issues were emerging about technology, including uncomfortableness of social dependency and distraction. Hence, these problems were also considered in updating the technology readiness index.

Because online financial services are becoming more common nowadays, the item in the original technology readiness index (TRI 1.0) became less relevant and

contained old words such as "machine," "computer," and "computer program" (Parasuraman and Colby, 2014). Besides that, TR index needed to consider the contemporary technology-related themes for example like smartphones, wireless Internet services, social media, home video conferencing, and cloud applications, to ensure its continued relevance. Parasuraman and Colby (2014) also noted that the wording changes were intended to update questions to reflect how consumers describe technology currently and/or to make items less dependent on a specific type of technology. Table 2.1 shows the examples of item rewordings:

Table 2.1:
Rewording of Technology Readiness Index 1.0

Original (TRI 1.0)	Reworded (TRI 2.0)
Optimism Statement	
"I like computer programs that allow me to tailor things to fit my needs."	"I like technologies that allow me to tailor things to fit my needs."
Discomfort Statement	
There should be caution in replacing important people tasks with technology because new technology can break down or get disconnected."	"There should be caution in replacing important people tasks with technology because new technology is not dependable."
Insecurity Statement	
"I worry that other people will see the information I send over the Internet."	"I worry that others may misuse information I make available over the Internet."

Source: Parasuraman and Colby (2014)

According to Parasuraman and Colby (2014), TRI 1.0 consists of 36-item which often being the concern to other researchers that it is too long. TRI 1.0 consists of 36 belief statements, each with a fully anchored 5-point scale (strongly disagree = 1, to strongly agree = 5). Of the 36 statements, ten measure Optimism, seven measure Innovativeness, ten measure Discomfort, and nine measure Insecurity. Thus, technology readiness index 2.0 was reduced to 16-item without losing its relevancy (Parasuraman and Colby, 2014); the final 16-item TRI 2.0, with four items for each variable. Of the 16 items, 11 were in TRI 1.0, while five are new (2 in the optimism variable and 3 in the insecurity variable).

According to Parasuraman and Colby (2014), the benefit of TRI 1.0 and the revised TRI 2.0 is the ability to measure TR's four variables. A decade of experience with TRI 1.0, and the consistency of factor structures in the various stages of analysis for TRI 2.0, strongly supports TR's four variables structure, making it necessary for the scale to provide measures of each variable.

Besides, Parasuraman and Colby (2014) also noted that TRI 2.0 has two general applications. First, it can be used to assess TR levels within a given population, which can consist of a country, a certain demographic group of special interest, profession, or a market segment. TRI 2.0 facilitates understanding the passage behind the adoption of numerous technologies by providing measures of the four TR variables as well as overall TR. TRI 2.0 is a robust predictor of technology-related behavioural intentions as well as actual behaviours. Second, TR can be an important moderating variable in studies involving multivariate frameworks.

2.3.1 Optimism

The optimism level of technology readiness is defined as "*a positive view of technology and a belief that it offers people increased control, flexibility and efficiency*" in their lives (Parasuraman and Colby, 2001). Walczuch, Lemmink and Streukens (2007) also defined optimism as the customer's tendency to believe that technology will help to achieve success.

In general, optimism variable captures particular feelings implying that "technology is a good thing." Customers with the technology like mobile banking considering their nature that they tend to embrace their issues and are less likely to be escapist (Scheier and Carver, 1987).

Despite that, level of optimism in adopting technology is reflected by the age of consumers. Parasuraman and Colby (2001) mention that older adults in particular those are 65 years old, or more tend to be less positive and less likely to be trying new technologies. Besides that, Parasuraman and Colby (2001) highlighted that older consumers have more scepticism about technology and believe that technology may produce disappointing results.

Overall, considering both positive and negative views about technology optimism, younger consumers are more positive than older consumers. Besides, based on research done by Parasuraman and Colby (2001), both male and female consumers are quite positive about technology; though some consumers are hesitant to leave the human touch completely out of providing high-tech service.

For the sake of measuring individual's optimism level in adopting technology, Parasuraman and Rockbridge Associate, Inc. in 1999 developed Technology

Readiness Index (TRI). TRI consists of 36-item and ten of the statement fall under optimism variable which are shown in Table 2.2 below.

Table 2.2:
Optimism Construct in TRI 1.0

Optimism (OPT)
1. Technology gives people more control over their daily lives
2. Product and services that use the newest technologies are much more convenient to use
3. I like the idea of doing business online because I am not limited to regular business hours
4. I prefer to use the most advanced technology available
5. I like technologies that allow me to tailor things to fit my own needs
6. Technology makes me more efficient in my occupation
7. I find new technologies to be mentally stimulating
8. Technology gives me more freedom of mobility
9. Learning about technology can be as rewarding as the technology itself
10. I feel confident that technology-based systems will follow through with what I instruct them to do

Source: Parasuraman and Colby (2001)

However, Parasuraman and Colby (2014) have made some changes in the construct of Technology Readiness Index. The changes are including reducing the number of the statement in measuring optimism from ten statements to four constructs. Parasuraman and Colby (2014) introduce the new technology readiness index as TRI 2.0. Table 2.3 below shows the optimism construct in TRI 2.0.

Table 2.3:
Optimism Construct in TRI 2.0

Optimism (OPT)
1. New technology contribute to a better quality of life
2. Technology gives me more freedom of mobility
3. Technology gives people more control over their daily lives
4. Technology make me more productive in my personal life

Source: Parasuraman and Colby (2014)

2.3.2 Innovativeness

Innovativeness which is the second contributor in the technology readiness was defined by Parasuraman and Colby (2001) as the tendency of an individuals believe that he or she is to be a technology niche and thought leader. Erdoğmuş and Esen (2011) defined innovativeness as a trend towards being the first in using new technology. Simply put, innovativeness measures individuals' intention to try out new technology before others (Sophonthummapharn and Tesar, 2007).

Innovative consumers tend to learn new technology by themselves which only require minimum assistance (Guhr, Loi, Wiegard & Breitner, 2013). Therefore, individuals that score higher in technology readiness index for innovativeness are usually considered as an opinion leader by others particularly on the issues related to the technology (Parasuraman and Colby, 2001).

On the contrary, consumers who are low on innovative beliefs may require more guidance and assistance in practicing the technology. Guhr, Loi, Wiegard and Breitner (2013) suggested that innovativeness is more closely related to perceived usefulness rather than perceived ease of use as a consumer with high innovativeness level are willing to figure out the technology themselves.

Based on the research done in the United States by NTRS (cited in Parasuraman and Colby, 2001), the level of innovativeness exists uniformly among different age group except consumer age 65 years old and above. Parasuraman and Colby (2001) also concluded that in term of gender; males are somewhat more likely to keep up with the latest developments and enjoy the challenge of tackling new technologies compared to female consumers.

Therefore, to measure the level of innovativeness, 36-item of technology readiness index (TRI) was developed with seven (7) parts of innovativeness. Table 2.4 shows seven (7) innovativeness statements.

Table 2.4:
Innovativeness Construct in TRI 1.0

Innovativeness
1. Other people come to me for advice on new technologies 2. It seems my friends are learning more about the newest technologies than I am 3. In general, I am among the first in my circle of friends to acquire new technology when it appears 4. I can usually figure out new high-tech products and services without help from others 5. I keep up with the latest technological developments in my areas of interest 6. I enjoy the challenge of figuring out high-tech gadgets 7. I find I have fewer problems than other people in making technology work for me

Source: Parasuraman and Colby (2001)

Innovativeness construct in TRI 2.0 has also being reduced from its original number which is left with only four (4) constructs (Parasuraman and Colby, 2014). However, all of the four constructs in TRI 2.0 remain the same from the original TRI as shown in Table 2.5.

Table 2.5:
Innovativeness Construct in TRI 2.0

Innovativeness
1. Other people come to me for advice on new technologies 2. In general, I am among the first in my circle of friends to acquire new technology when it appears 3. I can usually figure out new high-tech products and services without help from others 4. I keep up with the latest technological developments in my areas of interest

Source: Parasuraman and Colby (2014)

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2.3.3   Discomfort

Discomfort is a perception of lack of control over technology and a feeling of being overwhelmed by it (Parasuraman and Colby, 2001). Discomfort is one of the inhibitors of technology readiness. According to Sophonthummapharn and Tesar (2007), discomfort represents consumers' anxieties when facing technology. Guhr, Loi, Wiegard & Breitner (2013) also argues that discomfort represents the extent to which people have a general anxiety when adopting technology-based product or services. This anxiety and uncomfortable feeling when using technology may repel the consumer in adopting the technology.

Furthermore, consumers who highly score on the discomfort scale believe that their knowledge of technology is not sufficient, thus, cause them to feel depressed (Parasuraman, 2000); especially when consumer facing technological product, individual with high level of discomfort may become distressed for not having sufficient expert experiencing on the technology. Thus, they may believe that the tech-product was not designed for them and choose to avoid trying the product. Besides, discomfort can cause the consumer to have a general paranoia towards technology.

Discomfort's level is somewhat more widespread among females and older consumers compared to male and young consumers. According to NTRS (cited in Parasuraman and Colby, 2001), more females (51%) than males (38%) believe that technology is often too complicated to be useful. Whereas, in the context of age, the consumer with the age 65 years and above also find that technology is hard to adopt compared to those less than 30 years of age. Thus, mirroring the age difference and gender, discomfort level scored low among male and young consumers.

Hence, in the technology readiness index (TRI 1.0) 10 statement out of 36 items were used to measure the discomfort level among consumers. Table 2.6 below shows the ten constructs of discomfort.

Table 2.6:

Discomfort Construct in TRI 1.0

Discomfort
1. Technical support lines are not helpful because they don't explain things in terms I understand 2. Sometimes, I think that technology systems are not designed for use by ordinary people 3. There is no such thing as manual for a high-tech product or service that's written in plain language 4. When I get technical support from a provider of a high-tech product or service, I sometimes feel as if I am being taken advantage of by someone who knows more than I do 5. If I buy a high-tech product or service, I prefer to have the basic model over one with a lot extras features 6. It is embarrassing when I have trouble with a high-tech while people are watching 7. There should be caution in replacing important people tasks with technology because new technology is not dependable 8. Many new technology have health or safety risks that are not discovered after people have used them 9. New technology makes it too easy for governments and companies to spy on people 10. Technology always seems to fail at the worst possible time

Source: Parasuraman and Colby (2001)

Parasuraman and Colby (2014) maintain the same original discomfort construct for technology readiness index 2.0. The discomfort items were reduced from ten to four to measure individual's level of discomfort. Table 2.7 shows the four items of discomfort construct.

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Table 2.7:
Discomfort Construct in TRI 2.0

Discomfort
1. When I get technical support from a provider of a high-tech product or service, I sometimes feel as if I am being taken advantage of by someone who knows more than I do
2. Technical support lines are not helpful because they don't explain things in terms I understand
3. Sometimes, I think that technology systems are not designed for use by ordinary people
4. There is no such thing as manual for a high-tech product or service that's written in plain language

Source: Parasuraman and Colby (2014)

2.3.4 Insecurity

Insecurity, another inhibitor of TR, can be defined as distrust of technology and scepticism about its ability to work properly (Parasuraman and Colby, 2001). Insecurity variable covers the cases where the consumer does not trust a technological product and doubts about product's fulfilling its task (Parasuraman, 2000). Though somewhat related to the discomfort variable, this level differs from it in that it focuses on specific aspects of technology-based transactions rather than on a lack of comfort with technology in general (Parasuraman and Colby, 2001).

In contrast to gender and age-related differences observed for the other variable of technology readiness, the views about insecurity vary little across sex and age groups. The apparently universal nature of these beliefs adds to the importance of insecurity as a serious inhibitor of people's technology readiness (Parasuraman and Colby, 2001).

Insecurity feeling may cause doubt, fears, and being sceptical, especially against new technology product or service. Those feelings tend to make consumers to avoid the technology as they cannot be sure how well their privacy and personal

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information are protected. Thus, insecurity construct was developed to measure individuals' level of insecurity and how willing they are to try out the technology. Table 2.8 shows the insecurity construct in technology readiness index.

Table 2.8:
Insecurity Construct in TRI 1.0

Insecurity
1. I do not consider it safe to provide personal information over the internet
2. I do not consider it safe to do business online
3. I worry that information I make available over the internet may be misused by others
4. I do not feel confident doing business with a place that can only be reached online
5. Any business transaction you do electronically should be confirmed later with a separate communication
6. Whenever something gets automated, you need to check carefully that the systems is not making mistakes
7. The human touch is very important when doing business with a company

Source: Parasuraman and Colby (2001)

Moreover, insecurity is also reflected by a high degree of concern with giving out credit card number over computers and dealing with businesses accessible only online. Although people's technology-related insecurities are most pronounced for the online transaction, they are by no means limited to e-commerce. The public also has a certain degree of scepticism concerning technology in general and the ability of nonhuman processes to operate properly where 82% believe that when something gets automated, one must check carefully to see if the machine or computer is making mistakes (Parasuraman and Colby, 2001).

However, due to the changes in today's technology, Parasuraman and Colby (2014) revised and updated the construct that measures the level of insecurity. The changes were made to suit the advancement of technological change and made it

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more relevant to measure the insecurity arising among consumers. Table 2.9 shows the three (3) new statements added to the insecurity construct and one (1) statement remains the same as the original technology readiness index (TRI 1.0).

Table 2.9:
Insecurity Construct in TRI 2.0

Insecurity
1. People are too dependent on technology to do things for them 2. Too much technology distracts people to a point that is harmful 3. Technology lowers the quality of relationships by reducing personal interaction 4. I do not feel confident doing business with a place that can only be reached online

Source: Parasuraman and Colby (2014)

2.4   Technology Acceptance Model

Technology Acceptance Model (TAM) was made known by Davis (1989) as an alternative model adapted from the Theory of Reasoned Action (TRA). TRA was developed back in 1975 by Fishbein and Ajzen (Ajzen, 1991) as a theory that explains individual's attitude towards technology; TRA noted that a person's behaviour can be forecast by his or her behavioural intention. Figure 2.3 shows the model of Theory of Reasoned Action.
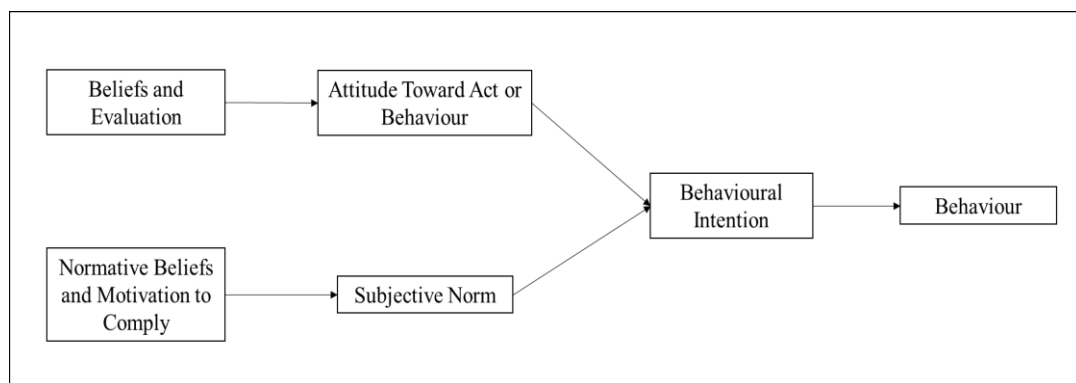
Figure 2.3: *Theory of Reasoned Action*
Source: Davis (1989)

Technology Acceptance Model was composed by Fred Davis in 1985 to explain the individuals' intention to use, and level of acceptance of new technology in organisations (Erdoğmuş & Esen, 2011). Compared to the earlier model to measure intention to adopt technology, TRA, David (1989) noted that the social influence of TRA does not fit into a technological context acceptance and adoption of technology. Thus, instead of using the element of subjective norms, David (1989) applied the concept of two external variables known as perceived usefulness and perceived ease of use.

Perceived usefulness and perceived ease of use were designed to annotate the adoption of technology. Perceived usefulness defined as "*the degree to which individual beliefs that using a particular system would enhance his or her job performance*" (Davis, 1989). While, perceived ease of use was prescribed as "*the degree to which individual's believes that using a particular system would be free of physical or mental effort*" (Davis, 1989).

Besides that, Lin, Shih and Sher (2007) also noted that perceived usefulness as the extent in which an individual assumes that by using a particular technology will increase his or her performance while perceived ease of use refers to the user assumption that using a certain technology will be effortless. Moreover, another key variable in the Technology Acceptance Model is behavioural intention to use. Behavioural intention to use indicates an individual's requests and efforts to perform behaviour (Erdoğmuş & Esen, 2011). Figure 2.4 shows the original model of Technology Acceptance.
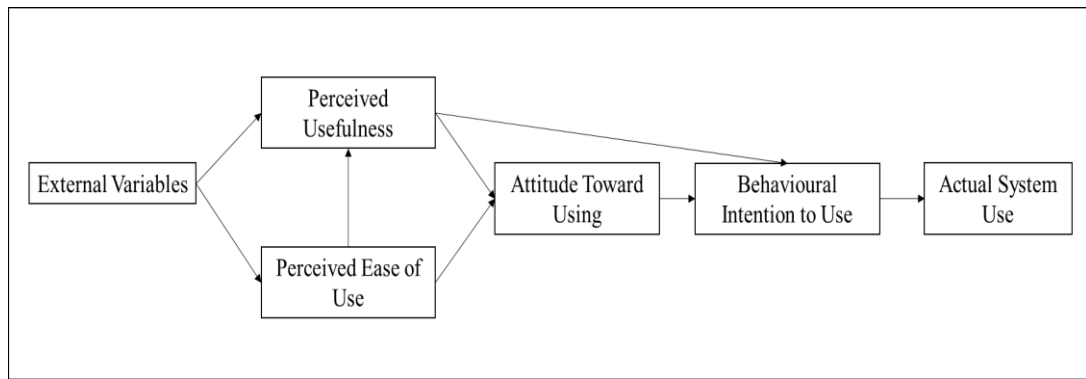
Figure 2.4:
Original Model of Technology Acceptance
Source: David (1989)

Lin, Shih & Sher (2007) postulates that in the technology acceptance model, individual acceptance is determined by the person's intention to use the system, which is influenced by the individuals' beliefs about the system's perceived usefulness and perceived ease of use. Moreover, Lin and Chang (2011) also conclude that a person's faith will determine their attitude toward using the system, which, in turn, leads to intention to use.

Therefore, David (1989) further explained that perceived ease of use has a direct effect on the perceived usefulness; however, perceived usefulness has been proven in previous research as the factor in determining intention to use. Based on the model in Figure 2.4, both perceived usefulness and perceived ease of use relate to the attitude towards using the technology, while perceived usefulness has a direct correlation and is strongest determinant towards the intention to use technology.

On that account, Technology Acceptance Model was selected for this research because this model has been tested empirically and supported via replications, validations and application by various studies (Erdoğmuş & Esen, 2011). Lin, Shih & Sher (2007) agreed that Technology Acceptance Model has been the most widely cited and replicated. Besides, Technology Acceptance Model is also a robust and

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parsimonious model in predicting individual's acceptance towards technology. Venkatesh and David (2000) added that the parsimony nature of the acceptance model makes it easier to apply to various research backgrounds.

In conclusion, the main objective of Technology Acceptance Model is to provide a general explanation on the determinants of technology acceptance in which it is able to explain the individual behaviour across a broad range of technology (Davis, 1989). However, Lin and Chang (2011) noted that there is a need to integrate consumer traits that reflect their readiness to adopt new technology including the positive and negative feelings towards the usage of technology. The technology readiness construct by Parasuraman (2000) fully reflects on the consumer traits and, as extension of TAM, constitutes a more comprehensive construct than existing personality traits. Moreover, Verhoef et al. (2009) also suggested that technology adoption research should incorporated technology readiness to examine how it might influence the usage of self-service technology.

2.5   Technology Readiness Acceptance Model (TRAM)

Technology Readiness Acceptance Model (TRAM) is a combination model between the theory of technology readiness (TR) and technology acceptance model (TAM). According to Lin et al., (2007), TRAM integrates technology readiness into the technology acceptance model in the context of the individual adoption of technology and theorises that the impact of TR on intention to use is mediated by both perceived usefulness and ease of use.

As a recap, technology readiness (TR) was introduced by Parasuraman (2000) to conceptualise individuals' general beliefs about technology. Whereas, technology acceptance model were designed by David (1989) to examine the users' attitude and

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behavioural intentions by using two primary predictors; perceived ease of use and usefulness.

Lin et al. (2007) believe that TR and TAM are interrelated and proposed the TRAM model as shown in Figure 2.5. Lin et al. (2007) have validated the correlation between technology readiness and use intention in their research where perceived ease of use and perceived usefulness as the mediator.
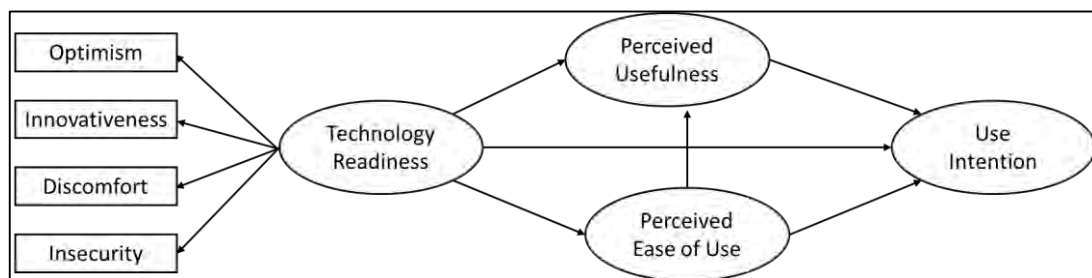
Figure 2.5:
The Model of TRAM
Source: Lin, Shih and Sher (2007).

Thus, Lin et al. (2007) conclude that technology readiness provides a more clear understanding of person technology acceptance behaviour. As a conclusion, no matter how appealing the benefits of mobile banking technology may be, it cannot be realised unless the consumers embrace and adopt the technology. In response to this, several types of research have proposed TRAM, an integrated model of technology readiness and technology acceptance to examine the level of consumer's adoption towards technology.

2.5.1   Technology Readiness and Perceived Usefulness.

Perceived usefulness defined as the prospective user's subjective probability that using a specific application system will increase their job performance (Parasuraman and Colby, 2001); perceived usefulness can also be concluded as element that will boost work performance based on research done by Leclercq (2007).

According to Guhr, Loi, Wiegard & Breitner (2013), perceived usefulness is a second determinant and a crucial motivator toward the intention to use technology. Perceived usefulness is a critical determinant of intention to use technology. According to Lin et al. (2007), the driven factor for a consumer to adopt technology is first because of how they perceive the innovation is useful for them and second is how easy the innovation to be used is.

Besides, research conducted by Lin et al. (2007) and Walczuch et al. (2007) has noted a positive relationship between the optimism of technology readiness and perceived usefulness. Optimism relates to a positive view of technology and a belief that technology offers people increased control, flexibility, and efficiency. Therefore, optimists individual perceive technology as being more useful because they worry less about possible negative outcomes (Scheier and Carver, 1987; Walczuch et al., 2007). Nonetheless, Liljander et al. (2006) suggested that optimism and innovativeness may weaken the effect of perceived usefulness on behavioural intentions. Liljander et al. (2006) also remark that perceived usefulness is expected to influence intentions to use SSTs more strongly for people with low levels of TR than for those with high levels of TR.

In contrast, Chen, Aryee and Lee (2005) concluded that high personal insecurity and discomfort with technology will lead to a low perceived usefulness of

technology. However, since technology readiness contains both positive and negative inhibitors, Lin and Chang (2011) suggest that consumers with higher TR propensities will be more likely to perceive the usefulness of self-service technology.

Based on the previous research mentioned earlier, perceived usefulness is a strong factor to examine the intention to technology. Furthermore, research done by Lin et al. (2007) proved that the mediation effect existed between technology readiness, perceived usefulness and intention to use; with perceived usefulness partially mediates the link between technology readiness and intention to use. Therefore, this research intends to examine the correlation between technology readiness and intention to use mobile banking with perceived usefulness as a mediator.

2.5.2 Technology Readiness and Perceived Ease of Use.

Perceived ease of use refers on how effortless a person perceives using the technology will be. Whereas, Leclercq (2007) suggested that perceived ease of use as the judgement of efforts required being able to use.

Individual with a high level of technology readiness were assumed to be more optimistic and confident in their ability to use technology-based self-service. In such a case, ease of use will not be a significant predictor in assessing the consumer's intention to use technology (Dabholkar and Bagozzi, 2002). Kleijnen, Wetzels and Ruyter (2004) also suggested that individual that scored high in technology readiness are less concerned with ease of use as they enjoy the challenge to figure out the technology. Hence, Lin and Chang (2011) concluded that the relationship between technology readiness and perceived ease of use are weak.

In addition, Kleijnen, Wetzels and Ruyter (2004) suggested that individuals that scored high in technology readiness were less concerned with ease of use as they enjoy the challenge to figure out the mobile banking technology. Whereas, Mallat, Rossi and Tuunainen (2004), find that the relationship between perceived ease of use and intention to use mobile banking is weak. Thus, perceived ease of use only impact on the intention to use mobile banking through perceived usefulness.

Also, Ma and Liu (2004) analyse 26 empirical studies of TAM and find that the relationship between perceived ease of use and technology acceptance is weak and perceived ease of use impact on technology acceptance through perceived usefulness (Shin & Lee, 2014). On that account, this research intends to study the correlation between technology readiness and perceived usefulness towards the intention to use mobile banking in Bank Simpanan Nasional.

2.5.3   Technology Readiness and Behavioural Intentions.

Technology anxiety may be significantly related to key self-service technology (SST) encounter outcomes, such as word of mouth and repeat use (Meuter et al., 2003) while affecting customer trial on the SSTs (Meuter et al., 2005). Research has also shown that consumers with low technology readiness drivers are more likely to have low motivation to use SSTs because they do not expect benefits from it (Yen, 2005). Furthermore, Lin and Hsieh (2012) found that technology readiness is positively related to behavioural intentions toward SSTs. Therefore, this research expects the technology readiness to have a positive effect on customers' behavioural intentions as supported by Lin & Chang (2011).

2.6   Conclusion

As conclusion, this chapter continues the discussion of the previous section one which focussed on the adoption of mobile banking in Malaysian concept as well as on the other nations. Chapter two focusing on a further review of the theory of technology readiness, technology acceptance and the integrated between these models which are technology readiness acceptance model (TRAM); also, how this model improves the adoption rate of mobile banking in Malaysia based on previous researches. The methodology of the research will be further discussed in chapter three. The discussion will include the research design, sampling, and method of data collection. As well as validity, reliability and approaches that will be used to analysis the data.

CHAPTER 3

RESEARCH METHODOLOGY

3.0   Introduction

This chapter primarily outlines the overall research methodology. Detailes development of hypotheses, sampling procedure used for this survey and sources of data will also be described. The method that was used to collect data to run statistical analysis will be discussed further in this chapter.

3.1   Research Design

According to Sekaran and Bougie (2013), a research design is a master plan for the data collection, measurement, and analysis. Research design acts as guidance to ensure that all information collected is appropriate for clarifying the research problem (Sekaran, 2009).

3.1.1   Types of Research

This research is a cross-sectional study which intends to examine the relationship between technology readiness variables like optimism, innovativeness, discomfort and insecurity towards an intention to use mobile banking with perceived usefulness as the mediator. Thus, independent variables are optimism, innovativeness, discomfort and insecurity while dependent variable is an intention to use mobile banking.

3.2   Research Framework

Previously Chapter two discussed the literature review on technology readiness variables including optimism, innovativeness, discomfort and insecurity; as well as perceived usefulness and intention to use mobile banking. The construct of the dependent variable in this research framework is the intention to use mobile banking adopted from (Wang, Lin and Luam, 2006); while the independent variables (optimism, innovativeness, discomfort and insecurity) were adapted from Parasuraman and Colby (2014).

Meanwhile, perceived usefulness as the mediator factor was borrowed from (David, 1989). Due to the weak correlation between perceived ease of use and intention to use mobile banking, this research only intends to study the correlation of perceived usefulness towards the customer's intention to use mobile banking.

Based on the literature review, there is a need to examine the relationship between optimism, innovativeness, discomfort and insecurity towards an intention to use mobile banking with perceived usefulness as the mediator. Figure 3.1 shows the research framework and its hypotheses employed in this study.
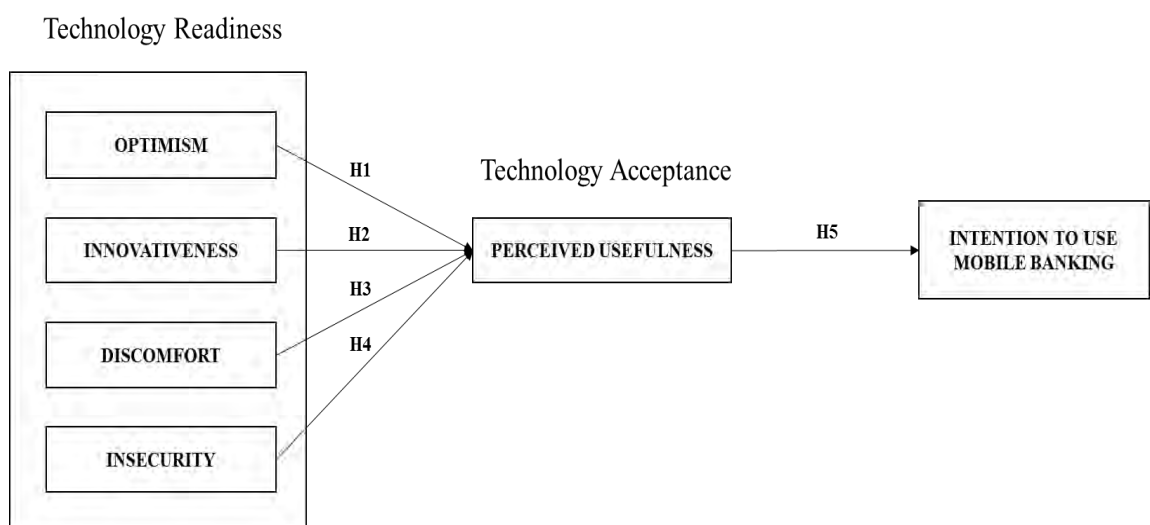
Figure 3.1: *Proposed Research Framework and Hypotheses*

3.3 Hypotheses Development

Based on the theoretical framework in Figure 3.1, the following five (5) hypotheses were constructed. Among the five hypotheses, all of them except H3 are assumed to be having a positive effect.

3.3.1 Optimism and Perceived Usefulness

Optimism and innovativeness are two enablers of technology readiness (Godoe and Johansen, 2012). According to Chen, Chen and Chen (2009), optimism is identified as a significant motivator of satisfaction and behavioural intention towards the continuous use of SST services. The higher optimism of customers possessed, the higher the satisfaction and continuance intentions of SSTs that are generated. According to Parasuraman (2000), a person with optimism and innovativeness and little discomfort and insecurity are more likely to use new technology. The hypothesis H1 is related with optimism.

H1 Optimism has a positive effect on a customer's perceived usefulness of mobile banking.

3.3.2 Innovativeness and Perceived Usefulness

Furthermore, research has reported a positive relationship between technology readiness and perceived usefulness (Lin et al., 2007; Walczuch et al., 2007). Research that was done on internet service by Lam, Chiang, and Parasuraman (2008) found that there is a positive relationship between consumer innovativeness and people's attitudes toward using the services. Researchers have also found that early adopters, who are more innovative individuals, have less complex belief sets about new technology (Karahanna, Straub and Chervany, 1998). The hypothesis H2 is related to innovativeness.

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H2   Innovativeness has a positive effect on a customer's perceived usefulness of mobile banking.

3.3.3   Discomfort and Perceived Usefulness

The two inhibitors of technology readiness are discomfort and insecurity. These inhibitors account for negative attitudes toward new technology (Godoe and Johansen, 2012). Lam et al. (2008) find that discomfort has an adverse effect on the length of time for a consumer to accept the internet and ease of use of the web. Furthermore, the research results of Walczuch et al. (2007) also found that discomfort provides a marginally negative effect on perceived usefulness. The hypothesis H3 is related to discomfort.

H3   Discomfort has a negative effect on a customer's perceived usefulness of mobile banking.

3.3.4   Insecurity and Perceived Usefulness

Security has been one of the crucial issues in online commerce and mobile financial services which make customer perceive that mobile payment process could be a high risk (Parasuraman and Colby, 2014). Lin, Shih and Sher (2007) established that some obvious obstacles of technology acceptance were due to security and privacy concerns. High personal insecurity and discomfort with technology lead to lower perceived usefulness of a specific technology. Thus, hypothesis H4 is related to insecurity

H4   Insecurity has a negative effect on a customer's perceived usefulness of mobile banking.

3.3.5   Perceived Usefulness and Intention to Use Mobile Banking

Consumers are likely to be more satisfied with SSTs if they believe that using the system will increase their performance and productivity (Wang et al., 2008). According to Lin, Shih and Sher (2007), perceived usefulness had a greater effect on use intention compared to perceived ease of use; which the finding was consistent with Davis (1989). Lin, Shih and Sher (2007) emphasize that perceived usefulness is a critical determinant of intention to use due to the reason that consumers are driven to adopt an innovation primarily because of the usefulness of the innovation for them. Hence, hypothesis H5 is related to perceived usefulness.

H5   Perceived usefulness has a positive effect on a customer's intention to use mobile banking.

3.4   Measurement and Instrumentation of Variables

The survey method was chosen for this research considering the fact that it is less time-consuming compared to observation and interviewing (Sekaran, 2009). A self-administered questionnaire was designed for this purpose. The questionnaire consists of 2 parts. Part A is asking about the respondent's demographic data such as their gender, age and education level. Whereas, Part B of the questionnaire consists of the measurement items for optimism, innovativeness, discomfort, insecurity, perceived usefulness and intention to use mobile banking which was borrowed from the existing literature. Table 3.1 provides a list of all questionnaire items.

Table 3.1:
List of Questionnaire Items

No	Statements	Scope	Sources
1	Technology gives people more control over their daily lives.	Optimism (IV)	Parasuraman & Colby (2014)
2	New technologies contribute to a better quality of life.		
3	Technology makes me more productive in my personal life.		
4	Technology gives me more freedom of mobility.		
5	Other people came to me for advice on new technologies.	Innovativeness (IV)	Parasuraman & Colby (2014)
6	In general, I am among the first in my circle of friends to acquire new technology when it appears.		
7	I can usually figure out new high-tech products and services without help from others.		
8	I keep up with the latest technological development in my areas of interest.		
9	Technical support lines are not helpful because they don't explain things in terms I understand.	Discomfort (IV)	Parasuraman & Colby (2014)

Table 3.1 (Continued)

10	Sometimes, I think that technology systems are not designed for use by ordinary people.		
11	There is no such thing as a manual for a high-tech product or service that's written in plain language.		
12	When I get technical support from a provider of a high-tech product or service, I sometimes feel as if I am taken advantage of by someone who knows more than I do.		
13	People are too dependent on technology to do things for them		
14	Too much technology distracts people to a point that is harmful		
15	I do not feel confident doing business with a place that can only be reached online.	Insecurity (IV)	Parasuraman & Colby (2014)
16	Technology lowers the quality of relationships by reducing personal interaction.		
17	I think mobile banking enables me to complete my banking activities conveniently and efficiently.		
18	I think using mobile banking services will improve my performance in conducting transactions.	Perceived Usefulness (MV)	Davis (1989)
19	The use of mobile banking will give the joy of controlling my financial transactions.		
20	Overall, I think mobile banking is advantageous.		
21	I intend to use mobile banking in the future.		
22	I intend to use mobile banking if the cost and times is reasonable for me.	Intention to use (DV)	Wang et al., (2006)
22	I believe it is worth for me to adopt mobile banking.		
24	I intend to adopt mobile banking as soon as possible.		

On the front page of the questionnaire, a short description of mobile banking service is given. Respondents are advised to read the explanation provided before answering the survey. Survey questions were based on five-point Likert scale which ranges from point 1 (strongly disagree) to point 5 (strongly agree) as indicated in Table 3.2.

Table 3.2:
Rating Scales and Measurement

Description	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Level of Agreement	1	2	3	4	5

3.5   Population, Sampling and Sample Size

This study examined the intention to use mobile banking among bank's customers. However, based on Islamic Banking Act (IBA) 1983 and the Banking and Financial Institution Act (BAFIA) 1989 prohibited the acquisition of lists of bank customers and their contact numbers and addresses from banking institutions. Therefore, this research will use Bank Simpanan Nasional's employees as the sample. Bank employees are chosen as the sample due to three reasons.

First, it is because the bank employees are the bank customer itself. As employees of the bank, it is compulsory for them to have an account with the BSN. They use the same facility, products, and services provided by the bank for other customers. Second, as bank employee, they have more knowledge and they are more exposed to the mobile banking services. Lastly, due to the limitation of time, it is easier to obtain and extract data from the bank employees. Hence, in this research, the bank employee will be treated and referred to as the bank customer.

Thus, the sample of this study involves the employees of Bank Simpanan Nasional in Kedah and Perlis regardless of their status; being permanent or contract basis employees. A population is described by Sekaran and Baugie (2013) as the entire group of people, events or things of interest that the researcher wishes to study. Therefore, the number of population in this study is 455 staff (N=455).

Based on Krejcie and Morgan (1970), factor table can be used in determining the number of sample for a given population. Table 3.2 shows the factor table proposed by Krejcie and Morgan (1970). By referring to Krejcie and Morgan (1970) method, this research decided to employ a minimum sample size of 210.

Table 3.3:
Determining Sample Size from a Given Population

N	S	N	S	N	S
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—N is population size.
S is sample size.

Source: Krejcie and Morgan (1970)

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3.6   Method of Data Analysis

A pilot study was performed following the questionnaire design. One professor in related fields and one manager of the bank were invited to examine the questionnaire, and provide an expert assessment of its validity. Several methods for analysing the data were used.

First, data screening and cleaning were done to check for any abnormalities. After the end of the first stage, then the data were analysed using descriptive statistics. Descriptive analysis allows the research data to be summarized, analysed and much easier to be interpreted. In general, the reliability and validity tests were used in this study to reduce measurement errors.

3.6.1   Reliability and Validity Test

The reliability of the questionnaire was tested by using Cronbach Alpha or called Alpha Coefficient to show the internal consistency of the questionnaire; according to Sekaran (2009), the closer the reliability coefficient to 1.00 the better the reliability of the questionnaire. In general, the acceptable alpha coefficient should be more than 0.7. Sekaran (2009) added that the value of Cronbach Alpha of 0.6 is poor, but it is still acceptable. Validity test is to identify whether the variables studied in this research are valid and measurable. Invalidity tests; the researcher, performed face validity and constructed validity. In face validity, the questionnaire was referred to the expert in human resource practices to confirm that the items asked were measuring understudied variables.

3.6.2   Descriptive Analysis

Descriptive statistics involves the transformation of raw data into a form that provides information to describe a set of factors in the situation (Sekaran, 2009).

Besides, this study also uses the descriptive statistics to check the data set of a mistake, to describe the characteristics of the sample, and to check if the variables violate the assumptions underlying the statistical techniques used specifically to address the research questions.

3.7 Summary of the Chapter

As the conclusion, this chapter has discussed the research design, theoretical framework, research instrument, sampling and data collection procedure, reliability and validity test as well as data analysis. In chapter 4, descriptive analyses will be done to describe the demographic information of the respondents as well as inferential analyses which were used for the hypothesis testing.

CHAPTER FOUR

DATA ANALYSIS AND FINDINGS

4.0   Introduction

This chapter analyses the data findings of the study. All data were analysed using Statistical Package for Social Sciences (SPSS) version 21.0 for windows. Frequency and percentage were utilised in analysing the respondent's demographic profile such as age, gender, and education background. In addition, inferential analysis was used to determine the correlation between independent variables, mediator and dependent variables.

4.1   Pilot Study

A pilot study was performed to examine the reliability of the measurement used in the survey. Among the advantages of conducting a pilot test is that it can identify errors, remove mistakes and make corrections to the questionnaire. Meanwhile, to validate the survey, the minimum number of respondents that are appropriate for a pilot test is 20 to 40 respondents (Sekaran, 2009). Thus, in this study 30 respondents were chosen to answer the pilot test questionnaire. The pilot test was conducted in February 2016.

4.1.1   Reliability Analysis of Pilot Test

Reliability of a scale indicates how free it is from random error (Pallant, 2007). Sekaran (2009) mentioned that reliability test is a measure of how stable, reliable, trustworthy and consistent a test is in measuring the same thing each time. According to Pallant (2007), the most commonly used statistic is Cronbach coefficient alpha which provides an indication, (0-1) of the average correlation among the entire items that makes up the scale; the closer the values to one (1), the

greater is the reliability. Pallant (2007) indicated that the value of Cronbach Alpha of 0.7 is acceptable, but value 0.8 is preferable. However, Sekaran (2009) and Hair, Bush and Ortinau (2002) indicated that value 0.6 of Cronbach Alpha is still tolerable. Table 4.1 below shows the indicator for the Cronbach Alpha value.

Table 4.1:
Indicator for the Cronbach Alpha Value

Cronbach Alpha Value	Indicator
<0.6	Acceptable
0.6 to <0.7	Moderate
0.7 to <0.8	Good
0.8 to <0.9	Very Good
> 0.9	Excellent

Source: Hair, Money, Samounel and Page (2007)

In the reliability test, the overall values of Optimism, Innovativeness, Discomfort, Insecurity, Perceived Usefulness and Intention to Use were 0.717, 0.809, 0.638, 0.668, 0.908 and 0.928 respectively. The Cronbach Alpha values for all variables range from 0.638 to 0.928, exceeding the minimum value of 0.6 (Sekaran, 2009; Hair et al., 2007). Table 4.2 below shows the reliability result of each research instrument.

Table 4.2:
The Cronbach Alpha for Pilot Test (n = 30)

Determinants	Number of Items	Reliability Value
Optimism (OPT)	4	0.717
Innovativeness (INN)	4	0.809
Discomfort (DIS)	4	0.638
Insecurity (INS)	4	0.668
Perceived Usefulness (PU)	4	0.908
Intention to Use (ITU)	4	0.928

4.2   Sampling Procedures

A total of 210 questionnaires were distributed to the targeted respondents who were
the Bank Simpanan Nasional's employees via the human resources department. The
210 of respondents were randomly selected based on factor table established by
Krejcie and Morgan (1970). From the total of distributed questionnaires, 150 of them
were received back. Hence, the response rate was 71% as shown in Table 4.3 below.

Table 4.3:
Response Rate

	Total	Percentage
Total Population	455	-
Questionnaires Distributed	210	-
Collected Questionnaires	150	71.43%
Uncollected Questionnaires	60	28.57%

4.3   Data Screening and Cleaning

Before further analysis was carried out, Pallant (2007) suggested that it is essential
that the data collected is screened for errors such as missing values, out of range data
and outliers. Checking for data errors were made based on descriptive statistics by
viewing the maximum and minimum range of the data. The maximum and minimum
data range entered to make sense with the range of possible scores of the respective
variables. Besides that, the descriptive analysis will also indicate if the data entered
has missing values. In this case, two questionnaires were discarded due to more than
one missing values detected. The missing value occurred as the respondents did not
answer the questions on the last page of the survey form.

4.3.1 Outlier Analysis

Moreover, an outlier analysis was performed by inspecting the Boxplot in descriptive statistics. According to Pallant (2007), any scores that appear as little circles with a number attached in SPSS is considered as outliers. In this research, five of the respondents (ID no. 14, 43, 123, 125, and 146) are considered as an outlier due to the extreme points and appeared in many cases in the outlier test. Hence, this data was taken out from further analysis. The outlier analysis was conducted again after the five data had been taken out, no additional outlier were detected.

Table 4.4:
Summary of Data Available After Outlier

	Total
Usable Questionnaires	150
Discard Questionnaires	2
Outlier Data	5
Data Available	143

4.3.2 Normality Test

In statistics, normality tests are used to define whether the data set is well-modelled by a normal distribution. Besides that, normality tests are also used to calculate how likely it is for random variables underlying the data set are normally distributed. In this research, the visual output of histogram is used. According to Pallant (2007), histograms are able to show the actual shape of the distribution for each group.
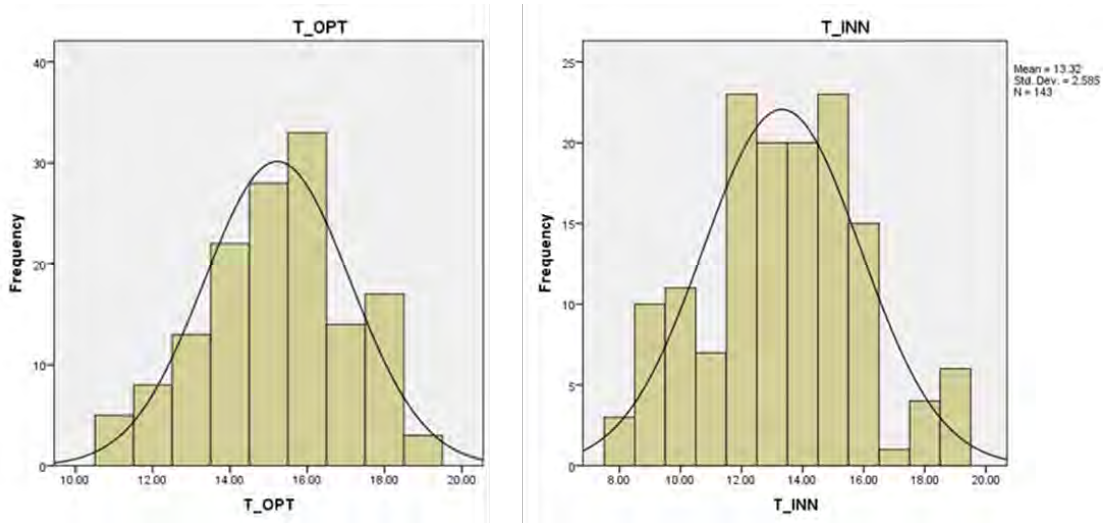
Figure 4.1:
Histogram for Optimism (OPT) and Innovativeness (INN)
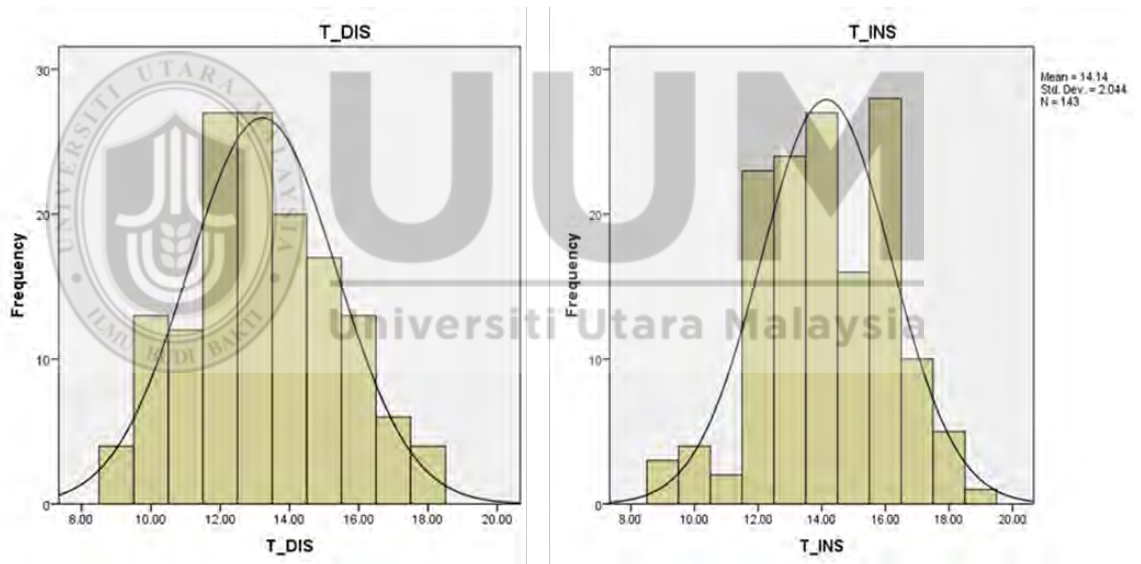
Figure 4.2:
Histogram for Discomfort (DIS) and Insecurity (INS)
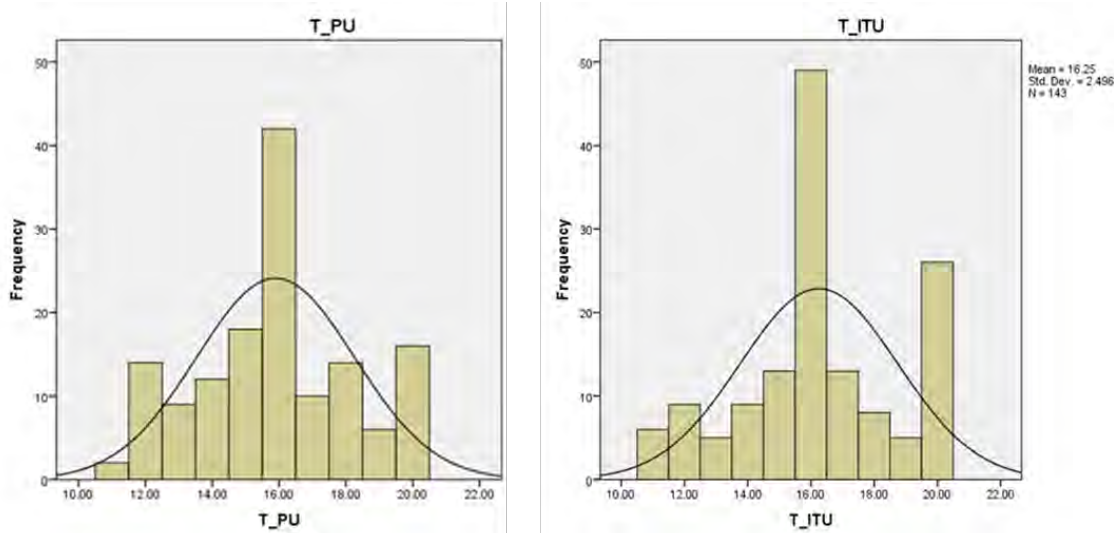
Figure 4.3:
Histogram for Perceived Usefulness (PU) and Intention to Use (ITU)

Other than Histograms, Normality analysis can be done by using skewness and kurtosis. Skewness value provides an indication of the symmetry of the distribution while kurtosis contains information about the 'peakedness' of the distribution (Pallant, 2007). This research used Skewness and Kurtosis with range ±2.58 (Coakes and Steed, 2003) to determine the normality of the data. Table 4.5 shows the value of skewness and kurtosis for all variables.

Table 4.5:
Results of Skewness and Kurtosis for All Variables

Variable	N	Mean	Skewness		Kurtosis	
			Statistic	Std. Error	Statistic	Std. Error
Optimism (OPT)	143	15.22	-0.220	0.203	-0.436	0.403
Innovativeness (INN)	143	13.32	0.065	0.203	-0.302	0.403
Discomfort (DIS)	143	13.22	0.172	0.203	-0.511	0.403
Insecurity (INS)	143	14.14	-0.157	0.203	-0.258	0.403
Perceived Usefulness (PU)	143	15.90	0.030	0.203	-0.592	0.403
Intention to Use (ITU)	143	16.25	-0.156	0.203	-0.450	0.403

Based on Table 4.5, the data distribution is considered a normal distribution when the value of Skewness and Kurtosis is within the range of ±2.58 by referring to Coakes and Steed (2003). From the result above, it can be concluded that from the histogram, skewness and kurtonis the data of these research are normally distributed.

4.4   Reliability of Scale

Pallant (2007) defined reliability as a scale that indicatess how free is the data from random error. One way to test reliability is by assessing through internal consistency. Internal consistency is the degree to which the items that make up the scale are all measuring the same underlying attribute (Pallant, 2007).

The most commonly used statistic to test reliability is Cronbach's coefficient alpha, which provides value range 0 to 1, with the high value indicating greater reliability. Sekaran (2009) mentioned that Cronbach alpha is a reliability coefficient that indicates how well the items are positively correlated to one another. The reliability test must be conducted in this research to see the degree of reliability of each variable. Table 4.6 shows the result of reliability coefficients of all variables which range 0.629 to 0.904.

Table 4.6:
Reliability of Variables

Determinants	Number of Items	Cronbach Alpha	Interpretation
Optimism (OPT)	4	0.722	Good
Innovativeness (INN)	4	0.811	Very Good
Discomfort (DIS)	4	0.629	Acceptable
Insecurity (INS)	4	0.699	Acceptable
Perceived Usefulness (PU)	4	0.870	Very Good
Intention to Use (ITU)	4	0.904	Excellent

Hence, the measures of all variables in this research were acceptable since cronbach alpha is above 0.6.

4.5 Respondents' Profile

4.5.1 Age

In this study, the total respondents for the research are 143 respondents. The Table 4.7 below shows the frequency and percent of the age of the respondents. A total of 2.8% of respondents are below 20 years old, followed by 42% respondents age 21-30, 15.4% respondents age 31-40 while 30.8% of the respondent age 41-50 and 9.1% aged 51 years old and above.

Table 4.7:
Age of The Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 20 years old	4	2.8	2.8	2.8
	21-30 years old	60	42.0	42.0	44.8
	31-40 years old	22	15.4	15.4	60.1
	41-50 years old	44	30.8	30.8	90.9
	51 years old and above	13	9.1	9.1	100.0
	Total	143	100.0	100.0	

4.5.2 Gender of Respondents

Table 4.8, below, shows that in this study; a total of 67 male participants were involved, contributing to 46.9% while, female respondents consist of 76 participants contributing to 53.1% of the total sum of 143 respondents.

Table 4.8:
Gender of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	67	46.9	46.9	46.9
	Female	76	53.1	53.1	100.0
	Total	143	100.0	100.0	

4.5.3   Educational Background of Respondents

Based on Table 4.9, the majority of the respondent, 57.3% came from the educational background of Sijil Pelajaran Malaysia (SPM) and Sijil Tinggi Pelajaran Malaysia (STPM). Besides that, 23.1% and 16.1% respondents graduated with diploma and degree; whereas, only two respondents graduated with master and three respondents with doctorate level.

Table 4.9:

Education Background of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SPM/STPM	82	57.3	57.3	57.3
	Diploma	33	23.1	23.1	80.4
	Degree	23	16.1	16.1	96.5
	Master	2	1.4	1.4	97.9
	PhD	3	2.1	2.1	100.0
	Total	143	100.0	100.0	

4.6   Pearson Correlation Analysis

Pallant (2007) mentioned that the Pearson Correlation coefficient is a statistical measure of the strength of a linear relationship between two metric variables. So, the Correlation coefficients there exists the relationship between two variables that are measured at the same interval or ratio scale. Therefore, Pearson correlation coefficient (r) is applied to analyse the relationship between variables and two-tailed significance level is used to test null hypotheses.

Moreover, the coefficient (r) indicates that the direction of the relationship and also the magnitude of the linear relationship. The coefficient at ranges from +1.0 indicates a perfect positive correlation to -1.0 a perfect negative correlation. A correlation of 0 means there is no linear relationship between the two variables (Hair,

Bush, & Ortinau, 2002). The researcher has shown the measurement scale which is outlined by previous studies. In this research, the researcher refers to the scale rating that was developed by Hair, Money, Samouel, and Page (2007) and this can be used to interpret the relationship between two variables as below:

Table 4.10:
The Coefficient Scale and Relationship Strength of Correlation

Coefficient Scale	Relationship Strength
0.91 – 1.00	Very Strong
0.71 – 0.90	Strong
0.41 – 0.70	Moderate
0.21 – 0.40	Weak
0.01 – 0.20	Very Weak

Source: Hair, Money, Samouel, and Page (2007)

In this research, Pearson Correlation is adapted to examine the strength between the independent variable and mediator variable, independent variable and dependent variable, as well the strength between mediator variable towards dependent variable. Table 4.11 summarizes the correlation between all the variables as below:

Table 4.11:

Pearson Correlation Analysis of Variables

		T_OPT	T_INN	T_DIS	T_INS	T_PU	T_ITU
T_OPT	Pearson Correlation	1	.410**	.111	.079	.436**	.468**
	Sig. (2-tailed)		.000	.185	.347	.000	.000
	N	143	143	143	143	143	143
T_INN	Pearson Correlation		1	.280**	.245**	.451**	.522**
	Sig. (2-tailed)			.001	.003	.000	.000
	N		143	143	143	143	143
T_DIS	Pearson Correlation			1	.400**	.301**	.264**
	Sig. (2-tailed)				.000	.000	.001
	N			143	143	143	143
T_INS	Pearson Correlation				1	.202*	.250**
	Sig. (2-tailed)					.015	.003
	N				143	143	143
T_PU	Pearson Correlation					1	.823**
	Sig. (2-tailed)						.000
	N					143	143
T_ITU	Pearson Correlation						1
	Sig. (2-tailed)						
	N						143

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.12:

Interpretation of Pearson Correlation Analysis

Variables	Mediator		Dependent Variable	
	Perceived Usefulness (PU)	Interpretation	Intention to Use (ITU)	Interpretation
Optimism (OPT)	0.436	Moderate	0.468	Moderate
Innovativeness (INN)	0.451	Moderate	0.522	Moderate
Discomfort (DIS)	0.301	Weak	0.264	Weak
Insecurity (INS)	0.202	Weak	0.250	Weak
Perceived Usefulness (PU)	-	-	0.823	Strong

Table 4.12 above shows the strength between the independent variables

(optimism, innovativeness, discomfort, and insecurity) towards mediator (perceived

usefulness). The strength of correlation between optimism (r = 0.436) and innovativeness (r = 0.451) towards perceived usefulness are moderate, when the Pearson Correlation (r) value is within 0.41 – 0.70 range; while, discomfort and insecurity shows weak correlation towards perceived usefulness, when the Pearson Correlation (r) value fall in the range of 0.21 – 0.40. Among the four independent variables, insecurity is the weakest correlation towards perceived usefulness.

Meanwhile, Pearson Correlation Analysis in Table 4.12 also shows the strength between independent variables and dependent variable. Among the four independent variable (optimism, innovativeness, discomfort and insecurity), insecurity still the weakest correlation. Pearson Correlation (r) value of insecurity is 0.250 indicate weak correlation towards an intention to use mobile banking. Besides, discomfort (r = 0.264) also show a weak correlation to intention to use mobile banking. In contrast, optimism (r = 0.468) and innovativeness (r = 0.522), both signal a moderate correlation toward intention to use mobile banking; also, perceived usefulness show the strongest strength of correlation against the intention to use with Pearson Correlation coefficient (r) at 0.823.

4.7   Hypothesis Testing: Multiple Regression Analysis

Multiple regression analysis is an extension of simple linear regression and were used to predict the value of a variable based on the value of two or more variable. Besides that, Pallant (2007) defined multiple regression analysis as *the statistical tool that is applied to derive and lead-out the value of a criterion from certain other independent, or predictor variables.* It is also the simultaneous combination of multiple factors to evaluate to what extent and how variables influence a certain outcome.

Moreover, multiple regression also explains the overall fit of the model and the relative contribution of each of the predictors to the total variance. This research intends to know how much of the variation in perceived usefulness can be explained by optimism, innovativeness, discomfort and insecurity as a whole; as well as the relative contribution of each independent variable in explaining the perceived usefulness of mobile banking.

Thus, this research used multiple regression analysis to understand whether perceived usefulness (mediator) of mobile banking can be predicted based on optimism, innovativeness, discomfort and insecurity (independent variables). However, to use multiple regression analysis, several assumptions have to be met. Among the assumptions are:

1. Multicollinearity

The data must not show multicollinearity. Multicollinearity occurs when the data have two or more independent variable that is highly correlated with each other. Multicollinearity can be identified from the Tolerance and VIF presented in Coefficients statistics. Tolerance is an indicator of how much of variability of the

specified independent is not explained by the other independent variables (Pallant, 2007). The value that is less than 0.1 indicated that the multiple correlations with other variables are high thus suggesting the possibility of multicollinearity. Multicollinearity is not suitable for multiple regressions. Based on Coefficients statistics in Table 4.13 indicated that these research variables do not have multicollinearity, where all tolerance values are above 0.1; thus fulfilling the first assumption.

Table 4.13:
Collinearity Statistics

Model		Collinearity Statistics	
		Tolerance	VIF
	(Constant)		
	T_OPT	.832	1.202
1	T_INN	.760	1.317
	T_DIS	.804	1.243
	T_INS	.820	1.219

2. There should be no significant of outliers, normality, linearity, homoscedasticity, and independence of residuals.

According to Pallant (2007), one way that these assumptions can be checked is by inspecting the Normal Probability Plot (P-P) of the Regression Standardised Residual. All the points lie in a reasonably straight diagonal line from bottom left to top right. Thus, the second assumption in using multiple-regression is met.

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4.7.1   Determine How Well the Model Fits

First of all, this research intends to identify whether the independent variables (optimism, innovativeness, discomfort, and insecurity) can influence the perceived usefulness.

Table 4.14 below provide the value of R, R², adjusted R and the standard error of the estimate, which can be used to determine how well a regression model fits the data. The 'R' column in Table 4.14 represents the value of multiple correlation coefficients (R) that can be considered to be one measure of the quality of the prediction of perceived usefulness; a value of 0.560 indicates a moderate level of prediction.

Table 4.14:
Model Summary of IV to MV

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.560a	.314	.294	1.98834

a. Predictors: (Constant), T_INS, T_OPT, T_DIS, T_INN
b. Dependent Variable: T_PU

The R Square column in Table 4.14 represents the R² value which also known as the coefficient of determination. R² is the proportion of variance in the perceived usefulness that can be explained by the independent variables (optimism, innovativeness, discomfort and insecurity). From Table 4.14, the R² value is 0.314 which can be interpreted as the independent variables able to explained 31.4% of the variability in perceived usefulness.

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4.7.2 Statistical Significance

Pallant (2007) suggested that to access the statistical significance of the result, it is necessary to look at the ANOVA table. The F-ratio in the ANOVA Table 4.15 tested to determine whether the overall regression model is a good fit for the data. The Table 4.15 below shows that the independent variables (optimism, innovativeness, discomfort, and insecurity) statistically predict the perceived usefulness, $F_{(4,138)} = 15.799$, $p < 0.0005$. Therefore, the result below indicates that the regression model of independent variables and perceived usefulness is a good fit of the data.

Table 4.15:
Summary of ANOVA (IV to MV)

	Model	Sum of Squares	df	Mean Square	F	Sig.
	Regression	249.844	4	62.461	15.799	.000b
1	Residual	545.583	138	3.953		
	Total	795.427	142			

a. Dependent Variable: T_PU
b. Predictors: (Constant), T_INS, T_OPT, T_DIS, T_INN

4.7.3 Estimated model coefficients

According to Pallant (2007), Beta values under standardized coefficient columns explained the contribution of each independent variable toward the perceived usefulness. The highest value of Beta indicated the strong, unique contribution in explaining the mediator variables when the variance explained by all other variables as modelled is controlled for (Pallant, 2007).

Table 4.16:
Summary of Coefficients (IV to MV)

Model		Unstandardized Coefficients		Standardized Coefficients
		B	Std. Error	Beta
1	(Constant)	3.597	1.788	
	T_OPT	.380	.097	.304
	T_INN	.244	.074	.267
	T_DIS	.193	.087	.175
	T_INS	.050	.090	.043

Table 4.16 above shows the summary of coefficients of independent variables (optimism, innovativeness, discomfort, and insecurity) towards perceived usefulness. All hypothesis result was explained based on the Table 4.16.

Hypothesis 1: Optimism (OPT) has a positive effect on a customer's perceived usefulness (PU) of mobile banking.

In optimism, the standardized coefficient Beta value is equal to 0.380. Positive Beta value refers to the positive effect of the correlation. The result also can be interpreted that with the increase in optimism level, the level of perceived usefulness also increases. Therefore, optimism does have a positive effect on a customer's perceived usefulness of mobile banking. Thus, **hypothesis 1 is accepted**

Hypothesis 2: Innovativeness (INN) has a positive effect on a customer's perceived usefulness (PU) of mobile banking.

Based on Table 4.16, the standardized coefficient Beta value for innovativeness is 0.244. A positive value of Beta indicates that innovativeness does have a positive effect on perceived usefulness of the mobile banking. The increase in innovativeness level in customer will also increase the perceived usefulness of mobile banking. Therefore, **hypothesis 2 is accepted.**

Hypothesis 3: Discomfort has a negative effect on a customer's perceived usefulness of mobile banking.

Referring to the Table 4.16, the standardized coefficient Beta value for discomfort is 0.175 with positive Beta value. However, since the hypothesis of this research stated that discomfort has an adverse effect on a customer's perceived usefulness of mobile banking; therefore **hypothesis 3 is rejected.**

Hypothesis 4: Insecurity has a negative effect on a customer's perceived usefulness of mobile banking.

Regarding Table 4.16, the standardized coefficient Beta value for insecurity is 0.043 which indicate a positive effect. Insecurity also shows the weakest correlation towards perceived usefulness compared to other variables. However, since the hypothesis of this research stated that insecurity has a negative effect on a customer's perceived usefulness of mobile banking; hence **hypothesis 4 is rejected.**

4.8 Hypothesis Testing: Simple Linear Regression Analysis

Simple linear regression analysis is a statistical analysis to measure and identify the association relationship between two variables. According to Pallant (2007), linear regression is one of the methods that intend to model the relationship between two variables by fitting a linear equation to the observed data.

Linear regression analysis wishes to examine the relationship between two variables by matching a linear equation to observed data. One variable normally is considered to be the independent variable, and the other one is deemed to be a dependent variable. In this study, the researcher applied the linear regression analysis

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to examine the significant relationship between mediator variable which is perceived usefulness and the dependent variable, intention to use mobile banking.

4.8.1 Determining How Well the Perceived Usefulness and Intention to Use Model Fits

Table 4.17 shows that R-value is 0.823 for the regression of perceived usefulness whereas, R Square 0.678 values shows the regression of intention to use mobile banking. Thus, this indicates that the perceived usefulness influenced 67.8% of variation in the intention to use mobile banking as the mediator. The results also indicated that perceived usefulness as the mediator can affect the dependent variable which is the intention to use mobile banking.

Table 4.17:
Model Summary of MV to DV

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.823a	.678	.676	1.42182

a. Predictors: (Constant), T_PU   b. Dependent Variable: T_ITU

4.8.2 Statistical Significance

The F-ratio in the ANOVA Table 4.18 tested to determine whether the overall regression model is a good fit for the data. The Table 4.18 below shows that the perceived usefulness as a mediator statistically predict the intention to use mobile banking which is the dependent variable, $F (1,141) = 599.894$, $p < 0.0005$. Therefore, the result below indicates that the regression model of perceived usefulness and intention to use mobile banking is a good fit of the data.

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Table 4.18:

Summary of ANOVA (MV to DV)

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	599.894	1	599.894	296.745	.000b
1	Residual	285.043	141	2.022		
	Total	884.937	142			

a. Dependent Variable: T_ITU b. Predictors: (Constant), T_PU

4.8.3 Estimated Model Coefficients

The Beta value in standardized coefficients column in Table 4.19 refers to the contribution of perceived usefulness (Pallant, 2007). Therefore, the Beta value of perceived usefulness is 0.823 which indicates the positive effect towards customer's intention to use mobile banking. This result also can be interpreted as the more customers perceived mobile banking as a useful technology; the higher was the intention to use it. Thus, **hypothesis 5 is accepted**.

Table 4.19:
Summary of Coefficient (MV to DV)

Model		Unstandardized Coefficients		Standardized Coefficients
		B	Std. Error	Beta
1	(Constant)	2.448	.810	
	T_PU	.868	.050	.823

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4.9   Mediating Variable

The mediating variable is one of the variables that is located in between dependent variable and independent variable as a third variable and it attempts to influence both of the variables (Baron & Kenny, 1986). The following Figure 4.4 founded by the Baron and Kenny who indicated that a causal chain between a path of independent variable, mediator variable, and dependent variable as below:
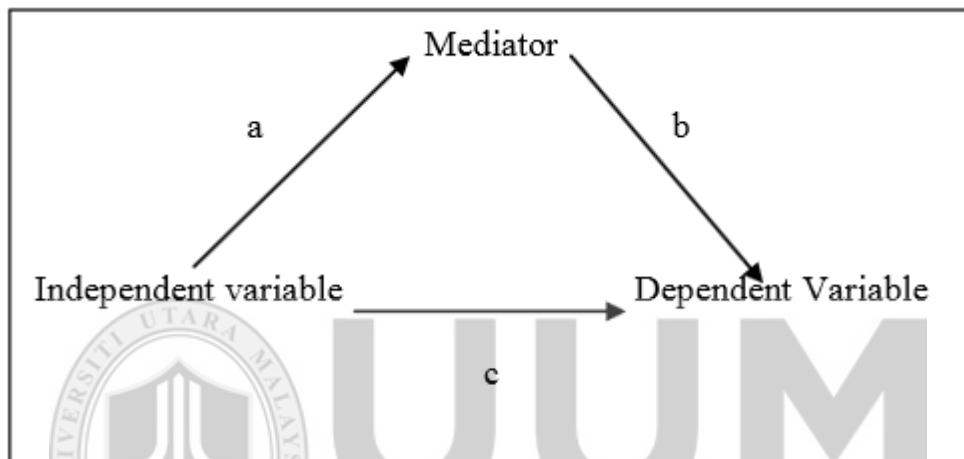
Figure 4.4:
Path Diagram for Mediator
Source: Baron and Kenny (1986)

According to Baron and Kenny (1986), mediation occurs when a variable (IV) affects another variable (DV) wholly or partly via its effect on another variable (MV). The goal of mediation analysis is to decompose a total effect (c) into the parts of direct (c) and indirect (a*b) effect. Mediation is seen as causal; therefore, the IV must precede the MV, and the MV must precede the DV. Mediation is always longitudinal with one-headed arrows indicating causality.

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4.10 Hierarchical Regression Analysis: Test of Mediation

Mediation test as stated by Baron and Kenny (1986) are used in this research to examine whether perceived usefulness is a full mediation or partial mediation between the independent variables and dependent variable. Table 4.20 shows the summary of coefficients between Optimism, Innovativeness, Discomfort, and Insecurity (IVs) toward Intention to Use mobile banking (DV).

Table 4.20:
Summary of Coefficients (IV to DV)

Model		Unstandardized Coefficients		Standardized Coefficients
		B	Std. Error	Beta
1	(Constant)	2.448	.810	
	Perceived Usefulness	.868	.050	.823
2	(Constant)	-.263	1.233	
	Perceived Usefulness	.746	.058	.707
	Optimism	.123	.069	.094
	Innovativeness	.150	.052	.156
	Discomfort	-.038	.060	-.032
	Insecurity	.090	.061	.074

a. Dependent Variable: Intention to Use T_ITU

4.10.1 To test the mediating effect of perceived usefulness on the relationship of optimism and intention to use mobile banking.

The following Table 4.21 presents the regression result for three variable comprising Optimism, Perceived Usefulness, and Intention to Use mobile banking.

Table 4.21:
Regression Results of Optimism, Perceived Usefulness, and Intention to Use Mobile Banking

	Standardized Regression Coefficient (β)
Optimism – Perceived Usefulness (Path a)	0.304
Perceived usefulness – Intention to Use (Path b)	0.823
Optimism – Intention to Use (Path c)	0.094

The path analysis from the Table 4.21 can be visualized as in Figure 4.5. In this analysis, it can be predicted whether the Optimism (OPT) effect directly or indirectly on the Intention to Use (ITU), by influencing Perceived Usefulness (PU) as a mediator.

Figure 4.5:
Path Analysis of Mediation Effect Perceived Usefulness of Optimism and Intention to Use

Therefore, the calculation below indicates the value of indirect effect for this relationship:

C'=a*b
Whereby:
C' is indirect effect or the mediation effect (Baron and Kenny, 1986)
a = β value for path a
b = β value for path b
C'= (0.304) (0.823)
C'= 0.2502

According to the preceding calculation, the value of indirect effect (C') is 0.2502, which is more than a direct effect on the value of c= 0.094. According to Baron and Kenny (1986), if C' = 0 or C' >c, it means that it is a full mediation, and if C' < c, it means that it is a partial mediation. Therefore, it can be identified that perceived usefulness is a **full mediation** of optimism and intention to use mobile banking because of the value of C' > c, which is 0.2502 is greater than 0.094.

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4.10.2 To test the mediating effect of perceived usefulness on the relationship of innovativeness and intention to use mobile banking.

The following Table 4.22 presents the regression result for three variable comprising Innovativeness, Perceived Usefulness, and Intention to Use mobile banking.

Table 4.22:
Regression Results of Innovativeness, Perceived Usefulness, and Intention to Use Mobile Banking

	Standardized Regression Coefficient (β)
Innovativeness – Perceived Usefulness (Path a)	0.267
Perceived usefulness – Intention to Use (Path b)	0.823
Innovativeness – Intention to Use (Path c)	0.156

The path analysis from the Table 4.22 can be visualized as in Figure 4.6; in this analysis, it can be predicted whether the Innovativeness (INN) effects directly or indirectly on the Intention to Use (ITU), by influencing Perceived Usefulness (PU) as a mediator.
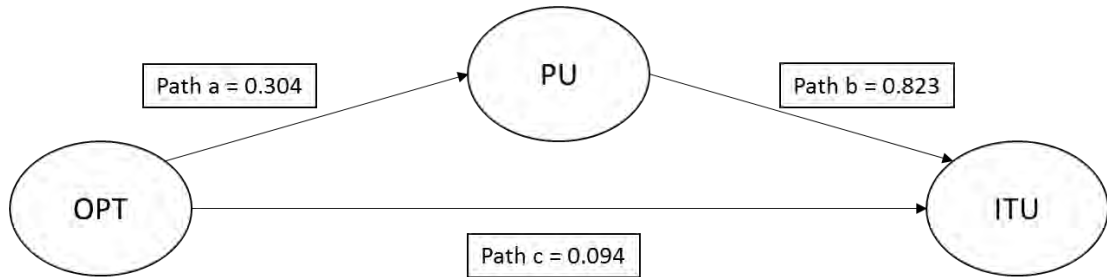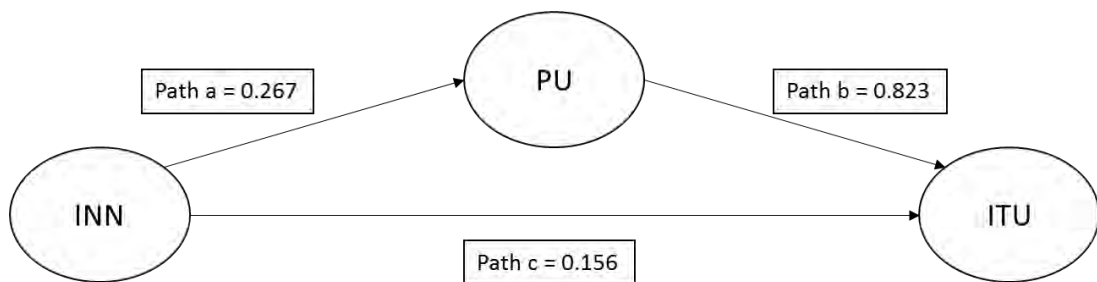

Figure 4.6:
Path Analysis of Mediation Effect Perceived Usefulness of Innovativeness and Intention to Use

Therefore, the calculation below indicates the value of indirect effect for this relationship:

C'=a*b
Whereby:
C' is indirect effect or the mediation effect (Baron and Kenny, 1986)
a = β value for path a
b = β value for path b
C'= (0.267) (0.823)
C'= 0.2197

According to above calculation, the value of indirect effect (C') is 0.2197, which is more than a direct effect on the value of c= 0.156. According to Baron and Kenny (1986), if C' = 0 or C' >c, it means that it is a full mediation, and if C' < c, it means that it is a partial mediation. Therefore, it can be identified that perceived usefulness is a **full mediation** of innovativeness and intention to use mobile banking because of the value of C' > c, which is 0.2197 is greater than 0.156.

4.10.3 To test the mediating effect of perceived usefulness on the relationship of discomfort and intention to use mobile banking.

The following Table 4.23 presents the regression result for three variable comprising Discomfort, Perceived Usefulness, and Intention to Use mobile banking.

Table 4.23:
Regression Results of Discomfort, Perceived Usefulness, and Intention to Use Mobile Banking

	Standardized Regression Coefficient (β)
Discomfort – Perceived Usefulness (Path a)	0.175
Perceived usefulness – Intention to Use (Path b)	0.823
Discomfort – Intention to Use (Path c)	-0.032

The path analysis from the Table 4.23 can be visualized as in Figure 4.7; in this analysis, it can be predicted whether the Discomfort (DIS) effect directly or

indirectly on the Intention to Use (ITU), by influencing Perceived Usefulness (PU) as a mediator.

Figure 4.7:
Path Analysis of Mediation Effect Perceived Usefulness of Discomfort and Intention to Use

Therefore, the calculation below indicates the value of indirect effect for this relationship:

C'=a*b
Whereby:
C' is indirect effect or the mediation effect (Baron and Kenny, 1986)
a = β value for path a
b = β value for path b
C'= (0.175) (0.823)
C'= 0.1440

According to the above calculation, the value of indirect effect (C') is 0.1440, which is more than a direct effect on the value of c= -0.032. According to Baron and Kenny (1986), if C' = 0 or C' >c, it means that it is a full mediation, and if C' < c, it means that it is a partial mediation. Therefore, it can be identified that perceived usefulness is a **full mediation** of discomfort and intention to use mobile banking because of the value of C' > c, which is 0.1440 is greater than -0.032.

4.10.4 To test the mediating effect of perceived usefulness on the relationship of insecurity and intention to use mobile banking.

The following Table 4.24 presents the regression result for three variable comprising Insecurity, Perceived Usefulness, and Intention to Use mobile banking.

Table 4.24:
Regression Results of Insecurity, Perceived Usefulness, and Intention to Use Mobile Banking

	Standardized Regression Coefficient (β)
Insecurity – Perceived Usefulness (Path a)	0.043
Perceived usefulness – Intention to Use (Path b)	0.823
Insecurity – Intention to Use (Path c)	0.074

The path analysis from the Table 4.24 can be visualized as in Figure 4.8; in this analysis, it can be predicted whether the Insecurity (INS) effect directly or indirectly on the Intention to Use (ITU), by influencing Perceived Usefulness (PU) as a mediator.
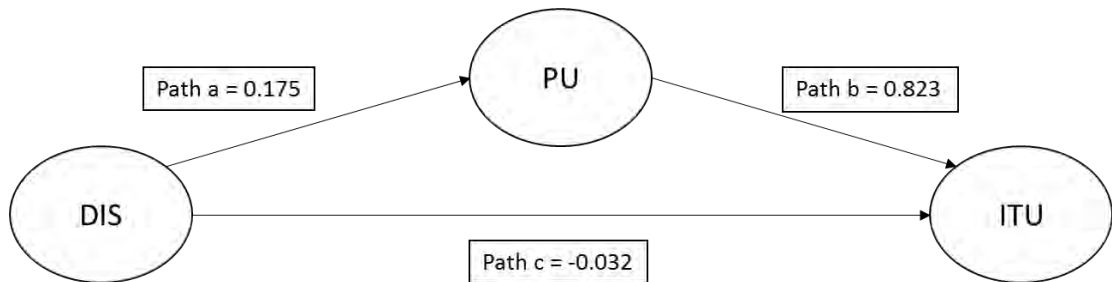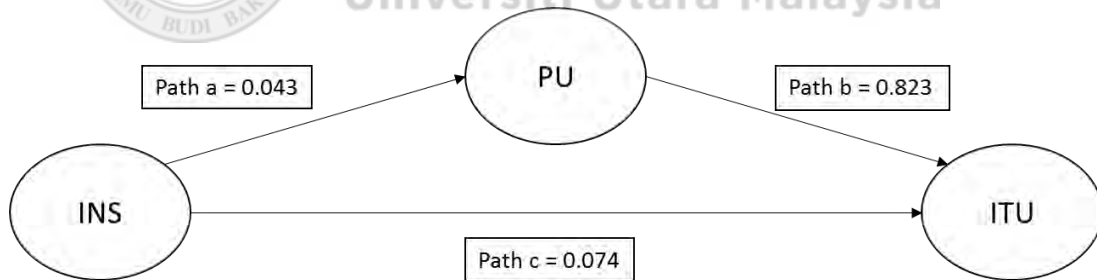

Figure 4.8:
Path Analysis of Mediation Effect Perceived Usefulness of Insecurity and Intention to Use

Therefore, the calculation below indicates the value of indirect effect for this relationship:

C'=a*b
Whereby:

C' is indirect effect or the mediation effect (Baron and Kenny, 1986)

a = β value for path a

b = β value for path b

C'= (0.043) (0.823)

C'= 0.0354

According to the above calculation, the value of indirect effect (C') is 0.0354, which is less than a direct effect on the value of c= 0.074. According to Baron and Kenny (1986), if C' = 0 or C' >c, it means that it is a full mediation, and if C' < c, it means that it is a partial mediation. Therefore, it can be identified that perceived usefulness is a **partial mediation** of insecurity and intention to use mobile banking because of the value of C' < c, which is 0.0354 is less than 0.074.

4.11 Conclusion

This chapter highlighted the result from data analysis process. In the first process, the researcher implemented data screening that tested the linearity and normality. This process is followed by reliability test where the researcher examined the value of Cronbach alpha. Besides, the hypothesis was tested using Pearson Correlation, Standard Multiple Regression, and Hierarchical Multiple Regression.

CHAPTER FIVE

CONCLUSION AND DISCUSSION

5.0 Introduction

This chapter presents the discussion on research findings as presented in the previous chapter. All items that had been analysed in research finding will be introduced in this section to highlight the impact of optimism, innovativeness, discomfort, and insecurity toward the intention to use mobile banking which mediated by perceived usefulness. This chapter also will give a brief overview of the introduction, related literature review, methodology and findings of the study. Furthermore, the inferences from the findings will be discussed in this chapter, and finally recommendations for future research have also been suggested.

5.1 Overview of the Study

Though mobile banking in Malaysia is relatively new, it is still at the advanced stage compared to the Internet banking, which left much room for improvement. Based on the statistic provided by the Bank Negara Malaysia (explained in Chapter 1) show that the mobile banking is slowly catching up to internet banking as lot customers are becoming aware of the product. Therefore, there is a need to understand the extent of acceptance of mobile banking by the customers and to examine the factors affecting the intention to use mobile banking.

However, little effort has so far been made to combine personality-based and cognitive antecedents to technology use in one model (Walczuch, Lemmink, & Streukens, 2007). Thus, this research integrated the construct of technology readiness with the technology acceptance model into one refined framework known as the Technology Readiness and Acceptance Model (TRAM) which were adapted

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from Lin, Shih, and Sher (2007). Optimism, innovativeness, discomfort, and insecurity were the variables of technology readiness that were theorised to be a causal antecedent of perceived usefulness, which subsequently affect consumers' intentions to use mobile banking.

In this research, perceived usefulness serves as a mediator between technology readiness's elements (optimism, innovativeness, discomfort, and insecurity) and the intention to use mobile banking. According to Tsang (2015), a mediating variable explains the relation between the independent variable and the dependent. A mediator can be a potential mechanism by which an independent variable can produce changes on a dependent variable. When the effect of the mediator is removed, the relation between independent and dependent variables may break.

Therefore, this study focused on perceived usefulness as the mediator because the research intended to know whether perceived usefulness can cause a change in the customer's intention to use mobile banking. Another reason is that based on previous research TR is incapable of explaining why high-TR consumers do not always adopt new technologies as argued by Raja, Johns, and Ntalianis (2004) that personality often serves as an antecedent of perception that helps to determine behavioural intentions. Hence, this research adopted the Integrated Technology Readiness and Acceptance Model (TRAM) by adding perceived usefulness as a mediator on the relationship of TR and intention to use mobile banking to see different results.

In regards to that, this research used Bank Simpanan Nasional (BSN) as a sample of the population with 210 questionnaires distributed. The employees of the BSN were treated and viewed as a customer with their intention to use mobile

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banking being the primary intent of this research. As this research focused on the intention to use mobile banking, the previous experiences of the customers in mobile banking were neglected. From 210 questionnaires randomly distributed through the HR department, only 150 were returned duly completed.

Based on the questionnaires returned, descriptive analysis was conducted as a preliminary analysis. From the descriptive analysis, it can be concluded that the respondents who took part in this survey were mostly of age between 21 to 30 years, followed by respondents with the age range between 41-50 years old. Respondents with an age range 21 to 30 years are considered a young generation which is more interested in the gadgets, mobile applications, and new technology. Besides that, female respondents' participation in this survey was slightly more as compared to male participation; female respondent were 53.1% while male respondents were 46.9%.

Discussion on the inferential analysis will be further done with the discussion on research findings in section 5.2. The discussion of findings will focus on; the result of Pearson Correlation Analysis, hypothesis testing in multiple regression analysis and hierarchical multiple regression analysis which is a test of mediation effect.

5.2   Discussion

The primary objective of this research is to study the intention to use mobile banking by using the integrated of technology readiness acceptance model (TRAM). Therefore, this research uses an inferential statistical analysis to infer from the sample data what the population might think and also to make a judgement of the probability that an observed difference between groups is a dependable one or one that might have happened by chance in this study. Thus, the inferential analysis was adopted to better explain the objective of this research as follows. Table 5.1 below shows the summary of all hypothesis and analysis conducted.

Table 5.1:
Overview of all Hypothesis and Analysis

Hypothesis Statement		Method of Analysis	Results
H1	Optimism has a positive effect on a customer's perceived usefulness of mobile banking.	Pearson Correlation	Moderate
		Multiple Regression	Positive effect Hypothesis Accepted
		Hierarchical Regression	Full Mediation
H2	Innovativeness has a positive effect on a customer's perceived usefulness of mobile banking.	Pearson Correlation	Moderate
		Multiple Regression	Positive effect Hypothesis Accepted
		Hierarchical Regression	Full Mediation
H3	Discomfort has a negative effect on a customer's perceived usefulness of mobile banking.	Pearson Correlation	Weak
		Multiple Regression	Positive effect Hypothesis Rejected
		Hierarchical Regression	Full Mediation

Table 5.1: (Continued)

H4	Insecurity has a negative effect on a customer's perceived usefulness of mobile banking.	Pearson Correlation	Weak
		Multiple Regression	Positive effect Hypothesis Rejected
		Hierarchical Regression	Partial Mediation
H5	Perceived usefulness has a positive effect on a customer's intention to use mobile banking.	Pearson Correlation	Strong
		Linear Regression	Positive effect Hypothesis Accepted
		Hierarchical Regression	-

Objective 1: **To examine the correlation between technology readiness variables' (i.e. optimism, innovativeness, discomfort, insecurity) and perceived usefulness.**

In order to examine the correlation between technology readiness variables which include optimism, innovativeness, discomfort and insecurity toward the perceived usefulness; the research adopted the Pearson Correlation Analysis and Multiple Regression Analysis to interpret and provide a better understanding of the issues. Based on Table 5.1, optimism and innovativeness show a moderate strength of relationship towards perceived usefulness. Whereas both variables; discomfort and insecurity, represent a weak correlation towards the perceived usefulness of mobile banking.

Meanwhile by using Multiple Regression Analysis, this research is able to make a decision whether to accept or reject the hypothesis. Multiple Regression Analyses also indicates the positive and negative effect of the relationship. Optimism

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and innovativeness indicate a positive effect toward perceived usefulness of mobile banking. This result can be interpreted as; when the optimism level of customers' increases, their view regarding the usefulness of the mobile banking will favourably increase thus, influencing them to use the technology.

The hypothesis for discomfort and insecurity stated in this research were to have an adverse effect toward the perceived usefulness. However, based on the statistical result from Multiple Regression Analysis both discomfort and insecurity have a positive effect on perceived usefulness; thus constraining this research to reject the hypothesis. The positive effect of discomfort and insecurity on perceived usefulness was due to the unintentional bias of selecting the sample in this research. The respondent of this research were the employees of the Bank Simpanan Nasional, and most of the staff members have the knowledge of using mobile banking and respondents tended to choose neutral as an answer in the questionnaire. For example, for a question like "when I get technical support from a provider of a high-tech product or service, I sometimes feel as if I am being taken advantage of by someone who knows more than I do", 69% of respondents chose neutral as the answer while 39% of respondents agreed. Whereas, 56.6% of the respondents did not feel confident doing business with a place (organisation) that can only be reached online. This indicates that customer still prefers to speak with a representative of the bank while making a bank transaction and feels insecure if the transaction is conducted over a gadget.

Discomfort represents consumers' anxieties when facing technology (Sophonthummapharn and Tesar, 2007). Guhr, Loi, Wiegard & Breitner (2013) also argue that discomfort represents the extent to which people have a general anxiety when adopting technology-based product or service. This anxiety and uncomfortable

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feeling when using technology may repel the consumer in adopting the technology. Therefore, in this research, it is proven that when the customers have a feeling discomfort while using mobile banking, they are reluctant to use the technology.

Whereas insecurity variable covers cases where the consumer does not trust a technological product and doubts that product will fulfil its task (Parasuraman, 2000). Though somewhat related to the discomfort variable, this level differs from it in that it focuses on specific aspects of technology-based transactions rather than on a lack of comfort with technology in general (Parasuraman and Colby, 2001). Therefore, in this research, it can be concluded that when customers do not trust or feel insecure about using new technology, they back away from trying to use the technology. As a conclusion, high personal insecurity and discomfort with technology leads to lower perceived usefulness of mobile banking.

Objective 2:   To ascertain the mediating factor, perceived of usefulness towards the intention to use mobile banking.

Lin, Shih and Sher (2007) mentioned that perceived usefulness as the extent to which an individual assumes that by using a particular technology will increase his or her performance while perceived ease of use refers to the user assumption that using a certain technology will be effortless.

Pearson Correlation Analysis was used to measure the strength of perceived usefulness towards the intention to use mobile banking. Based on the statistical result, perceived usefulness does indicate a strong correlation towards the intention to use mobile banking.

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Linear regression analysis was used to test the hypothesis whether or not the perceived usefulness has a positive effect on the intention to use mobile banking. Based on the statistical result, perceived usefulness provides a strong coefficient (Beta value = 0.868) in influencing the customer's intention to use mobile banking.

Based on the survey conducted, 61.5% of the respondents agree that mobile banking enables them to complete the banking activities conveniently and efficiently while 58.7% of the respondents believe that mobile banking services will improve their performance in conducting bank transactions.

Therefore in this research, perceived usefulness is a robust and close antecedent of intention to use mobile banking. Besides that, perceived usefulness is also a full mediator to all three variables, except for insecurity. The perceived usefulness only has partial mediation on the relationship between insecurity and the intention to use mobile banking.

5.3 Limitations of the Study

This research aims to study the intention to use mobile banking among bank's customers. Unfortunately, due to the Malaysia Islamic Banking Act (IBA) 1983 and the Banking and Financial Institution Act (BAFIA) 1989 that prohibited the acquisition of lists of bank customers and their contact numbers and addresses from any financial institutions due to security and data protection reason. Therefore, this research used Bank Simpanan Nasional's employees as the sample. Hence, this research might not be able to generalize the opinion of all customer base.

Besides that, this research study only focuses on the variables of technology readiness which include; optimism, innovativeness, discomfort and insecurity and one (1) variable of technology acceptance model which is the perceived usefulness;

and neglected perceived ease of use due to low correlation to the intention to use mobile as mentioned in chapter two. Furthermore, there are many other factors such as trust, self-efficacy, and pressure that also can influence the consumer's intention to use mobile banking. Therefore, the future research should look into and consider other variables for better research in mobile banking.

Moreover, this research only limits its population to Kedah and Perlis, and the sample was taken from one organisation due to the time limitation and geographical constraints. Therefore, the results obtained from this study may less be generalizable compared to the large sample used. Even with these limitations, the present study can be used as a pilot study to explore bank customers' behavioural intention to use mobile banking. The study will be able to add to the knowledge available on mobile banking studies in Malaysia.

5.4 Future Research Directions

Suggestions for future research are based on the conclusions of this study and the limitations previously stated. A recommendation is to test the findings of this thesis with a qualitative approach. This would enable collecting data from different target groups while also verifying and examining the correlations between the various factors that influence the acceptance of mobile banking. It would also be interesting to consider this research problem in various cultures to discover any differences in values and opinions, thus eventually to be able to generalize the results of this study. Future research should also consider using different Likert scale, as in this research most of the respondents tended to choose neutral as an answer which caused difficulty in soliciting the real answer from those surveyed.

5.5 Concluding Remarks

As a conclusion, technology readiness variables including; optimism, innovativeness, insecurity and discomfort do contribute in the study of the intention to use mobile banking. The integrated model of technology readiness and technology acceptance does provide a better outcome in understanding the customer's adoption level, especially in the new technology.

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