FACTORS INFLUENCING INTERNET BASED ICT ADOPTIONS INTENTION AMONG SMES IN MALAYSIA

By

MOHD NOR ABD MUHAIMIN BIN MOHD YUSOF

Thesis submitted to
Othman Yeop Abdullah Graduate School of Business,
Universiti Utara Malaysia,
in Fulfillment of the Requirement for the Degree of Master of Science
(Management)

March, 2013

PERMISSION TO USE

In presenting this dissertation/project paper in partial fulfillment of the requirements for a postgraduate degree from Universiti Utara Malaysia, I agree that the University Library make a freely available for inspection. I further agree that permission for copying of this dissertation/project paper in any manner, in whole or in part, for scholarly purpose may be granted by my supervisor(s) or, in their absence by the Dean of Othman Yeop Abdullah Graduate School of Business. It is understood that any copying or publication or use of this dissertation/project paper or parts thereof for financial gain shall not be given to me and to Universiti Utara Malaysia for any scholarly use which may be made of any material from my thesis/dissertation/project paper.

Request for permission to copy or make other use of materials in this dissertation/project paper, in whole or in part should be addressed to:

Dean of Othman Yeop Abdullah Graduate School of Business
Universiti Utara Malaysia
06010 UUM Sintok
Kedah Darul Aman

ABSTRACT

In Malaysia, SMEs play a vital role and important in Malaysian economy. It is considered to be the backbone of industrial development in the country. SMEs plays important role in generating employment, enhancing the quality of human resources, nurturing a culture of entrepreneurship, supporting the large scale industries and opening up new business opportunities. Currently Malaysian SMEs account for 59% of employments and their contribution to exports is at 19% , and this is expected to grow to 62% of employments with 25% exports contribution by 2020 (Borneo Post, 2012)

The emergence of information and communications technologies (ICTs) has affected many industries and organizations. It is undeniable that ICT are transforming the industries and fueling the growth of the global economy. In its effort to transform Malaysia economy from a commodity-based producing nation to being a manufacturer of industrial products and more recently knowledge based economy, the government is putting greater emphasis on ICT. Notwithstanding the many efforts undertaken by Malaysian governments to promote ICT adoption among SMEs across different types of industries, many of them failed to reap this benefit evenly. This problem is prevalent among the SMEs in the Asia Pacific region and Malaysia is no exception.

Realizing the prominence of SMEs as a main contributor to the country's GDP and employment as well as the ICT as an enabler to leapfrog Malaysia to achieve Vision 2020, this study sought to understand and identify the factor that influences the SMEs towards Internet-based ICT adoption in Malaysia. Therefore this study presents extended Technology Acceptance Model (TAM) that integrates Theory of Planned Behavior (TPB) into the research model to examine what determines Internet-based ICT adoption among Malaysian SMEs. The proposed model was empirically tested using data collected from a survey conducted. The study involved 103 SME businesses throughout the state in Malaysia using questionnaire survey instrument. The result of this study supports the theoretical framework as well as clarifies and extend it. The findings also includes some suggestion and recommendation to further promote Internet-based ICT adoption among the SMEs

Keywords: Information Communications and Technology (ICT), small and medium enterprises (SME), Malaysia.

ABSTRAK

Industri Kecil dan Sederhana (IKS) memainkan peranan yang penting dalam ekonomi Malaysia. Ianya dianggap sebagai tunjang pembangunan sektor perindustrian di negara ini. Selain itu, IKS juga memainkan peranan yang penting dalam menjana peluang pekerjaan, meningkatkan kualiti sumber manusia, memupuk budaya keusahawanan dan menyokong industri berskala besar. Berdasarkan statistik semasa, industri IKS di Malaysia telah menyediakan 59% peluang perkerjaan dan menjana sumber eksport negara pada kadar 19%, dan statistik ini dijangka meningkat kepada 62% peluang pekerjaan dan sumbangan hasil eksport sebanyak 25% menjelang tahun 2020 (Borneo Post, 2012).

Evolusi teknologi maklumat dan komunikasi *(ICT*) telah memberi impak kepada industri dan organisasi. Tidak dapat dinafikan bahawa ICT telah memperbaiki industri dan pertumbuhan ekonomi global. Dalam usaha memajukan ekonomi Malaysia daripada sebuah negara yang berasaskan penghasilan komoditi ke arah menjadi sebuah negara pengeluar produk industri dan juga ekonomi berasaskan pengetahuan, kerajaan telah meletakkan penekanan yang lebih pada ICT. Walaupun telah banyak usaha yang diambil oleh kerajaan Malaysia untuk menggalakkan penggunaan ICT di kalangan IKS dalam pelbagai industri, masih ada di kalangan IKS yang masih gagal meraih manfaat dari inisiatif tersebut. Masalah ini adalah lazim di kalangan IKS di rantau Asia Pasifik dan Malaysia adalah tidak terkecuali.

Menyedari kepentingan IKS sebagai penyumbang utama kepada Keluaran Dalam Negara Kasar (KDNK) dan juga sumber pekerjaan serta Teknologi Maklumat and Komunikasi (*ICT*) sebagai pemangkin bagi melonjakkan Malaysia ke arah Wawasan 2020, kajian ini membentangkan *Technology Acceptance Model* (TAM) yang diintegrasikan bersama *Theory of Planned Behavior* (TPB) sebagai model penyelidikan untuk mengkaji secara mendalam faktor-faktor yang mempengaruhi penggunaan Teknologi Maklumamt and Komunikasi yang berasaskan Internet di kalangan Industri Kecil dan Sederhana (IKS) di seluruh Malaysia. Model kajian ini dianalisa menggunakan data yang dikumpul melalui proses kaji selidik melibatkan 103 perniagaan IKS di seluruh Malaysia. Hasil kajian ini didapati telah menyokong teori rangka kerja kajian ini. Kajian ini juga disertakan bersama cadangan dan syor dalam usaha penggalakan pengunaan ICT berasaskan internet di kalang IKS di negara ini.

Kata Kunci: Teknologi Maklumat dan Komunikasi (ICT), Industri Kecil dan Sederhana (IKS), Malaysia.

ACKNOWLEDGEMENTS

First and foremost, I would like express my highest gratitude to Allah subhanahu wa ta'ala for the blessing, love, opportunity, health and mercy for me to complete this thesis. Shalawat is also sent to Prophet Muhammad (pbuh) who had delivered the truth to human beings in general and Muslim in particular.

In this valuable chance, I personally would like to express my gratitude and appreciation to all people who have provided motivation, advice, support, and even remark that had contribute towards the completion of my project paper. My special appreciation and heartily thankful to my research supervisor, Mdm Nor Pujawati Binti Md Said, for her support, insightful suggestions, and endless patience from the beginning of my project paper towards the end.

My deepest appreciation goes to my beloved parents, my mother Hjh Rasidah Binti Mat Nor for the endless love, pray, and support, and my father, Hj Mohd Yusof Bin Ibrahim (the late) who has become one of my inspiration. My appreciation also goes to my lovely wife who keeps on supporting me, Siti Nur Atikah Binti Amiruddin , my daughter Nur Zara Sofea. My sincere thanks also go to my lovely and caring siblings, Siti Norziyana, Dr. Siti Norwardatul Aina, Mohd Nor Shukriya and Mohd Nor Shukran who always motivate and inspire my study.

Lastly, I offer my regards and appreciation to all of those who supported me in any respect during the completion of the project.

May Allah always bless us, Amiin.

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Small and medium enterprises (SMEs) are considered to be the backbone of industrial development in the country (Saleh & Ndubisi, 2006) and it plays a vital role in the Malaysian economy development.

There appears to be a general consensus that Internet-based Information and Communication Technology (ICT) practices and adoption can bring significant values to the current and future development and growth of the small and medium enterprise (SMEs). ICT is no longer considered merely a tool in the organization, but as an enabler for any organization to be competitive and effective. The advantages not limited but includes supporting business transformation, enhance efficiency and productivity, closer relationship among value chain partners and customers, greater and wider access to the market and knowledge information and more importantly the ability to reach new clients from either locally, regionally or globally.

Based on statistical information collected by SME Corporation Malaysia (www.smecorp.gov.my), census 2011 indicated that there are 645,136 of SMEs in five main key economic sectors in Malaysia which are services, manufacturing, agriculture, construction, mining and quarrying. Currently Malaysian SMEs account for 59% of employments and their contribution to exports is at 19% , and this is

expected to grow to 62% of employments with 25% exports contribution by 2020 Their contribution to the total GDP is currently at 32% is aiming to increase to 41% by 2020 (Borneo Post, 2012)

1.2 **Malaysian SMEs**

There was no standard definition as to what Small and Medium Enterprises (SMEs) were in Malaysia before. Moreover, in Malaysia small companies are referred to as small and medium industry (SMI) rather than SME. Various agencies and banking institutions define SMEs according to their own standards. Small and Medium Industries Development Corporation (SMIDEC) defined SMIs as those companies with annual sales turnover not exceeding RM25 million or not exceeding 150 full-time employees. Table 1.1 shows the early definition of SMIs in the country before 2005. Dato' Seri Abdullah bin Haji Ahmad Badawi as fifth Malaysian Prime Minister formed National SME Development Council (NSDC) in June 2004 as part of the strategy to assist and oversee the growth and development of SMEs in the country. The establishment of the NSDC is a clear indication of the government's systematic approach in building up a strong SME sector.

Table 1.1 SMI Definition Before 2005 (Source SMIDEC)

Category	Annual Sales Turnover	Full-time Employees
SMI	< RM25 mil	< 150 employees

In 2005, the National SME Development Council (NSDC) has set two main criteria which are annual sales turnover and number of employees, although some banks also list the amount of shareholder's funds present as another criteria. These

criteria were to be adopted by all government ministries and agencies and apply to all SMEs of various sectors such as manufacturing, services and agriculture.

Malaysia adopted a common definition of SMEs to facilitate identification of SMEs in the various sectors and subsectors. This has facilitated the Government to formulate effective development policies, support programs as well as provision of technical and financial assistance. In general, an enterprise is considered an SME in each of the respective sectors based on the annual sales turnover or number of full-time employees. Malaysia‘s Ministry of Internal Trade and Industry defines an SME as a company with ; i) an annual sales turnover of not more than RM25 million, and ii) the company do not more than 150 full-time employees.

Table 1.2 SME Definition Based on Annual Turnover (Source: NSDC, 2005)

Size	Primary Agriculture	Manufacturing (including Agro-Based) & Manufacturing-Related Services	Services Sector (including ICT)
Micro	< RM 200k	< RM 250k	< RM 200k
Small	RM 200k - < RM1m	RM 250k - < RM 10m	RM 200k - < RM 1m
Medium	RM 1m - RM 5m	RM 10m - RM 25m	RM 1m - RM 5m
SME	< RM 5m	< RM 25m	< RM 5m

Table 1.3 SME Definition Based on Number of Employees (Source: NSDC, 2005)

Size	Primary Agriculture	Manufacturing (including Agro-Based) & Manufacturing-Related Services	Services Sector (including ICT)
Micro	< 5 employees	< 5 employees	< 5 employees
Small	5-19 employees	5- 50 employees	5-19 employees
Medium	20-50 employees	51-150 employees	20-50 employees
SME	< 50 employees	< 150 employees	< 50 employees

SME Corporation (SME Corp) Malaysia categorizes Primary Agriculture, Service Sectors and Information and Communication Technology (ICT) into same category as the annual sales turnover and number of full time employees is similar to each other. However the same definition of annual turnover and number of full time employee is in accordance to criteria definition set by NSDC. Table 1.4 and Table 1.5 show the categorization and definition of SME by SME Corp Malaysia.

Table 1.4 SME Definition Based on Annual Turnover (Source: SME Corp Malaysia, 2013)

Size	Manufacturing (including Agro-Based) & Manufacturing-Related Services	Services, Primary Agriculture and Information & Communication Technology (ICT)
Micro	< RM 250k	< RM 200k
Small	RM 250k - < RM 10m	RM 200k - < RM 1m
Medium	RM 10m - RM 25m	RM 1m - RM 5m

Table 1.5 SME Definition Based on Number of Employees (Source: SME Corp Malaysia, 2013)

Size	Manufacturing (including Agro-Based) & Manufacturing-Related Services	Services, Primary Agriculture and Information & Communication Technology (ICT)
Micro	< 5 employees	< 5 employees
Small	5- 50 employees	5-19 employees
Medium	51-150 employees	20-50 employees

Presently, 80% of total manufacturing establishments in Malaysia are from SME category. SMEs account for about 35% of the total workforce in the manufacturing sector (Fong, 2002) . The majority are in the traditional sectors of food and beverages (20%), fabricated metal products (18%), wood and wood products (17%, and basic metals (4%). The majority of the SMEs in Malaysia are in

in the textile and apparel, food and beverages, metals and metals products and wood and wood products sectors. The majority of manufacturing companies are located in the central parts of Malaysia and around the country's major industrial regions.

1.3 **Malaysian ICT Development**

Malaysia has long recognized the transformational ability of ICT that would propel the country from production-based economy (P-economy) to knowledge-based economy (K-economy) (Hassan, 2010). National ICT Council (NITC) was formed in under the 6th Malaysian Plan (1990-1995). National ICT Agenda (NITA) was formulated in the 7th Malaysia plan (1996-2000) as part of NITC agenda. It was during this period that the Multimedia Super Corridor (MSC) was launched. NITC is expected to be as a catalyst to transform Malaysian economy into value-based economy with development human capital, infrastructure and applications. In pursuance of moving towards a knowledge-based economic nation, an effective utilization and adoption of ICT as tools as well as enabling access to all levels of the population to ICT are the vital fundamentals. Importantly, vision 2020 sees Malaysia as a fully developed nation and Malaysia is modeled to be a world-class hub for development and nurturing of the Nation's ICT industry.

Malaysia government has been intensively emphasizing the use of ICT in business operations to improve productivity, efficiency and quality of the services to people and investors. In 1994, the Prime Minister's Department appointed a team of consultants to determine the necessary steps and strategies for Malaysia to achieve developed country status by the year 2020 (vision 2020). Several recommendations

were made regarding ICT development. Based on this input, one of the government's first moves was to form an advisory group to drive the use of ICT as a strategic technology for national development — the National Information Technology Council (NITC) .The NITC, chaired by the Prime Minister, hosted by the Malaysian Institute of Microelectronic Systems (MIMOS) and composed of members from the public, private and community sectors, launched the National IT Agenda (NITA) in December 1996. NITA with its framework for the use ICT to convert Malaysia into a Knowledge-based society (K-society) views the ICT development from three perspectives people, info-structure and applications. It is premised on the concept that with the necessary skills, appropriate hard and soft infrastructure and applications, people will be able to use ICT to transform society. NITA's motto is "Turning Ripples into Waves." The idea is that the government can help push ICT by creating ripple-like initiatives that will trigger a tidal wave of change.

Realizing that Malaysia has time constraint and it is imperative to develop a plan to leapfrog Malaysia from industrial society to advanced industrial society bypassing the stage of a developed society. In this regard, Malaysian government envisions ICT as an enabler that can transform Malaysian faster pace from information based industrial society to knowledge-based advanced industrial society. Hence, NITC takes the lead to devise plans and formulate strategies to ensure a successful transformation of the nation.

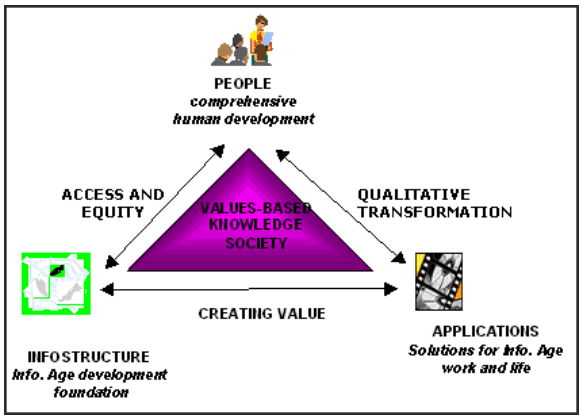

Figure 1.1 National IT Agenda (the NITA Triangle) (Source:NITA)

Malaysia Multimedia Super Corridor (MSC) was established in 1996 which aiming to help Malaysia to accelerate the objectives of Vision 2020 and to transform Malaysia into a modern state by the year 2020, with the adoption of a knowledge-based society framework (Jeong, 2007). This project was announced by fourth Malaysian Prime Minister Datuk Seri Dr Mahathir at the Multimedia Asia Conference on 1 August 1996. The Multimedia Development Corporation (MDeC, formerly MDC) was formed to oversee development of the MSC. There are seven flagships which have been identified by Malaysian government as the key success to achieve vision 2020; e-government, national multipurpose card, smart school, telemedicine, R&D cluster, world-wide manufacturing webs and borderless marketing centers. Internet is the main services in delivering these applications. The Multimedia Super Corridor (MSC), managed by the Multimedia Development Corporation (MDeC), is a major project designed to act as a catalyst for ICT industries and products by attracting and nurturing hi-tech companies. Thus it is important to ensure the effectiveness of flagship or internet platform by willingness of Malaysian, including the SMEs to adopt and embrace the seven flagships.

Between 2010–2011, 434 companies were awarded MSC Malaysia status. 218 of these were awarded in 2010, while the remaining was awarded in 2011. The number of companies awarded the MSC Malaysia status has increased at a Compounded Annual Growth Rate (CAGR) of 11.31% from 2006 to 2011 and has grown more than six times since 2000. (MSC Malaysia Annual Industry Report, 2012).

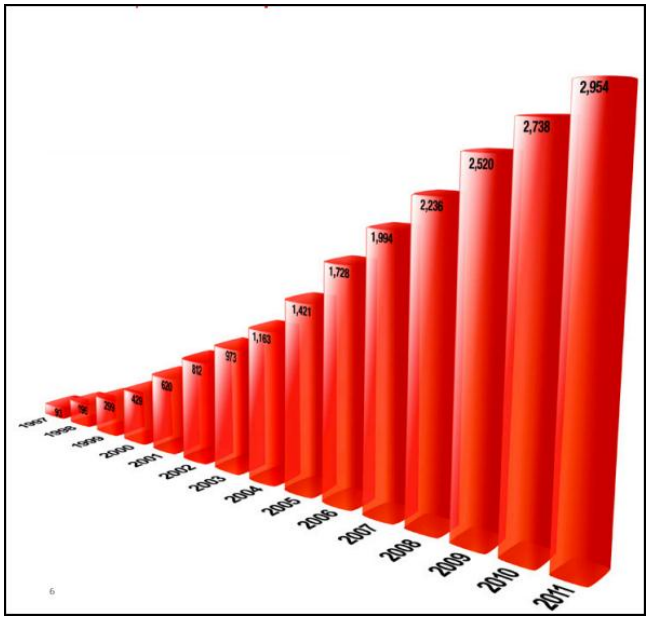

Figure 1.2 Total MSC Malaysia Status Awarded
(Source: MSC Malaysia)

1.4 Problem Statement

SMEs have been allocated various ICT funds and grants by the Malaysian government in line with the government initiatives in encouraging ICT adoption among SMEs. ICT is seen as enabler in bringing up the SMEs competitive level in business arena. Despite these efforts, however SMEs in Malaysia remain on the wrong side of a digital divide (Karkoviata, 2001). Malaysian businesses, small and

medium-sized enterprises (SMEs) have been relatively slow in web adoption. There are about 30 per cent of SMEs in Malaysia have a web presence and use IT extensively in their daily operations (Alam, Khatibi, Ismail , Ismail, Hishamuddin, & Ahmad, Perceived Benefits of E-Commerce Adoption in the Electronic Manufacturing Companies in Malaysia., 2005) . This reflects a poor rate of IT adoption among the estimated 600,000 local SMEs. Most SMEs perceived the barriers of implementing IT into their business operations as expensive, risky, complex procedure, lack of technical expatriate, and customer services (Yeung, Shim, & Lai, 2003). In this context, the adoption and use of information and communications technology (ICT) is widely seen as critical for the competitiveness of SMEs in the emerging global market.

Malaysian SMEs indicated slowness in web adoption. According to Lee (2005), there are only 30 per cent of Malaysian SMEs have web presence and adopted ICT extensively in their daily operations. This finding reflected a poor rate of ICT adoption among the local SMEs. Some of factor which found to be a challenges towards the adoption are most of the SMEs perceived the barriers of implementing ICT into their business operations as expensive, risky, complex procedure, lack of technical expertise, and customer services (Yeung, Shim, & Lai, 2003) (Chong, Pervan, & Bauer, 2001) (Pires & Aisbett, 2001). Numerous awareness campaigns have been conducted in encouraging the use of technology by SMEs. Various incentives, soft loan, and grant scheme have been offered by Malaysian government in facilitating and encouraging SMEs to embrace ICT. However, down the road, not much seemed to have been achieved beyond increased awareness.

Issue of ICT adoption among Malaysian SMEs need further attention as SMEs play vital role towards nation's growth as they represent the largest portion of the established business in the country. Apart from that, ICT is becomes the main enabler in facilitating business operations. Consequently, it is become an appropriate time for SMEs to consider internet-based ICT adoption. Deploying ICT enables the company to quickly respond to the environmental pressure, fulfill customers' demand, and further going to business globalization (Bernadas & Verville, 2005).

There were quite limited studies done in the past pertaining ICT and SMEs in Malaysia. Even SMEs and ICT are vital elements in Malaysia economic landscape, it seems not many studies conducted to investigate Internet-based activities among SMEs. Hussin and Noor (2005) and Alam et. al. (2005) investigated the SMEs ICT adoption based on industries. Alam et. al. (2005) studied about the same regardless of annual sales or employee size with the responded sampled using Federation of Malaysian Manufacturers (FMM). He also studied ICT usage among SMEs in service sector. Finding revealed that the ICT investment in Malaysia is fairly low. According to the researchers, Malaysian government seems to be the most important factor to influence ICT adoption in the organizations.

According to Lim (2006), there are still many Malaysian family-based SMEs are still operating the business in a conventional way. He also stressed that most of the Malaysian SMEs realize the importance of the ICT towards the performance and productivity of their companies, but the implementation of these ICT systems is restricted due to inability to handle, owing to high staff turnover and lack of ICT expertise. In another report produced by MDEC (2012) shows that, Malaysian SMEs

constitutes 99.2 per cent (548,267) of total business establishments in Malaysia. Out of this figure, there are only 20 per cent of SMEs are using IT extensively in their daily business operations and only 100,000 of them are having website (Digital Malaysia, 2012). According to Sharif (2004), Malaysia has slipped in global ICT ranking. From 100 countries evaluated worldwide, Malaysia ranked at 26th in 2003 and dropped to 27th in 2004. Global Information Technology Report (GITR) , in one of its key reports called Networked Readiness Index (NRI) for 2012, indicated that Malaysia is ranked 29th out of 142 countries, 8th out of 22 Asia-Pacific economies and 2nd in the Asian region. This index shows where Malaysia does stand in the IT arena (The Star Online, 2012). This low ICT adoption rate among SMEs as identified in previous studies and reports deserves further and more detail investigation in order to close the gap of ICT adoption among the SMEs.

In summary, this study intends to fill the research gaps and further analyze the factors of internet-based ICT adoption among SMEs based on Malaysia context. Furthermore, this study would definitely add to the existing literatures on Internet-based ICT adoption among the SMEs by expanding the works of previous researchers by covering all categories of SMEs rather than focusing on specific sectors of the SMEs based on Malaysia context.

1.5 **Research Questions**

The purpose of this study is to discover and to identify the factor that influences Internet-based ICT adoption among the Malaysian SMEs. While lack of adoption by SMEs in other part of the world could be well-documented, little is

known about SMEs in Malaysia. Specifically, this study sought to examine the extent of adoption of the internet-based ICT for business among the Malaysian SMEs and the key factor which affected the adoption. The study is motivated by the following research questions:

1. What are the current Internet-based ICT adoptions and practices among SMEs in Malaysia?
2. What are the factors that refrained the Internet-based ICT adoption for the business among the Malaysian SMEs?
3. What is the extent the use of internet as business tool by the Malaysian SMEs?
4. What influences Malaysian SMEs in adoption decision of Internet-based ICT towards their business operations?

1.6 **Research Objectives**

The general objective of this study is to determine the factors that can predict the intention to use Internet-based ICT among Malaysian SMEs and to extend the TAM while retaining its parsimony and IS focus in the context of Internet-based ICT. Specific objectives break down the general objectives into pieces, which can be addressed as follow:

1. To access the current Internet-based ICT usages among Malaysian SMEs.
2. To identify the acceptance level of Internet-based ICT among Malaysian SMEs.

3. To identify the hindrance factor which prevent Malaysian SMEs from adopting and using Internet-based ICT to support their business.
4. To determine the Internet-based ICT adoption factors.

This study sought to examine the current rate of the Internet adoption for the business by SMEs through execution of random sample of 382 SMEs companies in Malaysia obtained from SMEinfo Business Directory and Federation of Malaysian Manufacturers directory.

1.7 **Significance of the Study**

The contribution of the study provides a good basis to analyze the current ICT usages and practices among the Malaysian SMEs, the success factors benefits and barriers that possibly encourage or hinder the ICT adoption among SMEs in Malaysia. This study also aims to obtain the insights into the factors that can influence the adoption of internet-based ICT to support Malaysian SMEs in running the business. It is hoped that the outcome of this study will be able to extend the current knowledge and understandings about current knowledge on technology acceptance in Internet-based ICT adoption. With the accelerated business competition and popularity of internet nowadays, there is an urgent need to understand the factor that would encourage Internet-based ICT adoption to ensure Malaysian SMEs are not left behind while competing in this digital era.

If SMEs in Malaysia are to successfully compete in an increasingly competitive and global market, it is imperative that they embrace the full benefits

that are available through optimized use of the internet. The outcome and result of this study may help governmental, academic and other institutions in Malaysia or elsewhere in analyzing and further develop programs or services in boosting up Internet-based ICT practices among the SMEs. Outside of Malaysia, a great deal of attention is being paid to the adoption of the internet-based ICT for business solution by SMEs because the importance of small medium sized enterprise to national economies. Many governments are seeking to encourage, facilitate, and increase the adoption of e-business strategies through funded projects that focus on Internet commerce adoption, technology diffusion, virtual business networks, societal issues and other conventional internet-based applications due to their awareness that internet-based ICT potential to increase gross domestic product (GDP) and to address globalization challenges (Poon & Swatman, 1999)

Since this study is conducted in Malaysia, the results of this study also may assist all relevant parties to understand the landscape of local internet-based ICT adoption and development among local SMEs. In analyzing the reports of this study may give a better insight into the demographics of SMEs against the benefits, barriers and internet-based ICT adoption and implementation. This study uses the new definition of the SMEs compared to before it was. Hence, future researchers who conduct the related study may benefit out of this study as this study has more recent, accurate and relevant to be used as their guides and references.

1.8 **Scope and Limitations of the Study**

As in all empirical research, the characteristic of this study also has certain limitation in the applicability of the finding. Even though this empirical study has achieved its research objective, nevertheless, due to time and costs constraints, as other studies, there is also some unavoidable limitations in which future researchers may need to consider overcoming these limitations.

Firstly, the sample was not representative from population and the scope cover the whole state in Malaysia using convenience sampling technique. The sample used for this study is mainly taken from SME Corp One Stop Information Portal and Federation of Malaysian Manufacturers (FMM) 2012 43rd edition. This has its advantage in fact as the study can observe the Malaysian SMEs community as a whole, not limiting to specific group of SMEs in any particular state or region. However the sample that consists of 103 respondents may limit the generalizability of results. Thus, the sample of 103 SMEs, while accurate, cannot be construed to be representative of all SMEs in the Malaysia.

This study generalized the demographic analysis as the research concentrates more on the acceptance of internet-based ICT among Malaysian SMEs as a whole. Thus, future researcher might want to study in depth of the demographic variables but not limited to education background, states, owners, and type of ventured industry in specific. For example, the organizational characteristic such as location, management characteristic such as age and academic background as well as environmental characteristic such as local or state government policies may also effect Internet-based ICT adoption.

Therefore, although the measures and the model used in the present study perform well with the selected sample, further studies are necessary to confirm the causal relationship between constructs by using specific sample in order to identify if there is any variance of Internet-based ICT adoption behavior among the Malaysian SMEs

1.9 **Organization of the Thesis**

This project paper study organized into five chapters, which are:

Chapter 1 presents introduction to the project paper study. This chapter explains the background of the study. The problem statements and study objectives are clearly spelled out. Significance and contribution of this study also described. This chapter is quite important to provide an overview of this study.

Chapter 2 is dedicated to review the literature pertaining to the technology acceptance model that led to the theoretical framework adoption used of this study. This chapter also provides an extensive review about Malaysian SMEs and ICT landscape in Malaysia. The research literature addressing the theories used by researchers on ICT related studies as well as various prominent theories for innovation related research. This chapter is important to provide the understanding of Malaysian SMEs and ICT as well as underpinning theories which support the technology acceptance study.

Chapter 3 details the research methodology of the study. This chapter provides the research framework, hypothesis adapted from the literature and theories which eventually led to this study's objective. The purposes of this study are explained and research design is discussed. The operationalization of the variables is further explained in this chapter with justification and discussion of the sampling procedures and data collection methods. Other than that, questionnaire structure and data collections are further explained and elaborated. The importance of this chapter is to provide the readers thorough understandings of the whole scientific research design and approach which eventually leads to the data analysis phase.

Chapter 4 covers the analyses of data and findings of the research whereas it presents the complete results and analyses of this study. This chapter discusses in details about but not limited to the outcome of research design, the research setting and research participants involved in the survey. It presents the analyses of the research questions that provided the framework of this study using the input of the survey and questionnaire. It also presents the empirical result of the hypotheses testing. Data is analyzed using factorial analysis, correlation and multiple regression analysis with the discussion of the results.

Chapter 5 summarizes the key findings according to the research objectives. This chapter also highlights the findings of the theoretical framework, practical and policy implications with the recommendation for potential future research.

1.10 **ICT Terminologies**

This study uses few aspects of ICT which are Internet, ICT and Internet-based ICT. Thus it is important to have a clear and unambiguous understanding of these terminologies before discussing it further in further.

1.10.1 Internet

In this study, internet refers to borderless and global computer networking that link Malaysian SMEs to other organization either locally or globally. It network the networks that consist of millions of private, public, academic, businesses, and government network of local to global scope. The internet is particularly appealing for SMEs, removing or reducing some of the traditional barriers they faced in globalization such as communication costs, distances and market entry risks. Perhaps using internet, allows Malaysian SMEs to access and exchange information with other SMEs, organizations, individuals either locally or globally.

1.10.2 Internet-based ICT

ICT encompassed the combination of terminologies of information and communication technology. This term generally refers to "Technology and tools that people use to share, distribute, and gather information and to communicate with one another, one on one, or in groups." (Association for Progressive Communications , 2012). Within this study the term refers to the combination of computer-based and

information-based technologies use to support SMEs business operation with a narrowed down scope on one of the ICT services; the internet.

Realizing internet importance either nationally or globally together with its impact on the current and future business landscape, this research adopts the internet-based ICT as the key research body rather than generalizing on the global context of ICT. In addition to that, Internet-based ICT is not a new terminology. Previous researchers have been using Internet-based ICT terminology in their studies (Chapman, James-Moore, Szczygiel , & Thompson, 2000) , (Lucchetti & Sterlacchini, 2004), (Lettieri & Masella, 2006).

1.10.3 E-Commerce

Electronic commerce refers to the process of buying, selling, transferring or exchanging products, services or information via computer networks including the Internet (Khodadadi, Keivani, & Jouzbarkand, 2011). E-commerce refers primarily to the buying and selling activities over the Internet, which includes transactions such as placing orders, making payments, and tracking delivery of orders on the Internet (Rodgers, Yen, & Chou, 2002) . According to Laudon and Laudon (2006), e-commerce is "subset to e-business". E-commerce is related to "buying and selling of goods and services by using computerized business transactions like the Internet, networks and other digital technologies". E-commerce includes "activities such as advertising, marketing, customer support, delivery and payment". In other words, E-business refers to a broader definition of e-commerce, not just the buying and selling of goods and services, but also servicing customers, collaborating with business partners, conducting e-learning, and processing electronic transactions.

1.11 **Definition of SME**

The terms small and medium enterprise (SME) and small and medium scale industry (SMI) appear to have been used interchangeably especially in our local newspaper and medias to connote almost the same meaning. This study uses the new definition of SMEs in Malaysia as what illustrated in Table 1.4 and Table 1.5, instead of using SMI. Enterprises are considered SMEs if they meet the criteria of annual sales turnover or number of full-time employees.

Not only are Malaysian SMEs being categorized into different types based on annual sales and employee size, but they are also categorized based on sectors as well. This study uses the simplified categorization which provided by SMECORP

There are three sectors which are manufacturing, services and agriculture (If SME falls between the two different size categories, the smaller size will apply. For example, if one SME is categorized as small-scaled in annual sales but micro-scaled in employee size, the SME will be categorized as micro-sized SME.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter presents the literature review. This chapter is quite crucial part of the research, since it allows a researcher to get familiar with the subject's background. Within this chapter, selection of articles and papers related to the subject of this study also were reviewed and discussed. This chapter also presents a comprehensive discussion on the various theories used by previous researchers in some innovation and technology acceptance and adoption researches. The five main theories reviewed are chronologically are: Theory of Reasoned Action (Fishbein & Ajzen, 1975), Technology Acceptance Model (Davis et al., 1989), Theory of Planned Behavior (Ajzen, 1991), and Unified Theory of Acceptance and Use of Technology (Venkatesh et. al., 2003).

Small and medium-sized enterprises (SMEs) are widely known as an important sector for national and international economic growth and development. The growth oriented small business contributes to a major contribution towards economic development and employment generation within local communities and national economies as a whole (Smallbone & Wyer, 2000). SMEs have been considered as the backbone of economic growth of an economy in driving industrial development (Normah, 2006).

In order to sustain the competitive edge and business globalization era and to cope the increased quality requirements from their customer, SMEs are facing pressures to increase their productivity and competitiveness in order to survive and prosper (St Pierre & Raymond, 2004). In Malaysia, the SMEs are under increasing pressure to improve their performance level (Normah, 2006). Companies used to compete based on price and quality, but now they have to compete across all competitive aspect including flexibility and responsiveness in the current economic environment.

Even though SMEs form a small constituent out of global economy landscape, there is limited knowledge available hovering the ICT adoption by SMEs and it is only recently that interest in the relationship between SMEs and ICT has begun to be explored in a great depth (Shiels, 2003). While ICT adoption studies among SMEs has become popular due to the fact that information system keeps on its relentless march into almost all aspect of organizational life (Hamel, 1998), the literature still suggests the need for advancing understanding of the key factors experienced mainly those involving different contexts, technologies and user populations. Furthermore since the user's perception and intention can change over time, it is important to measure these quantities at several point of time.

The literature reviewed here covers several thematic areas including the development and progress of worldwide and Malaysian internet evolution. Secondly, it explores the progress and importance of SMEs in other country including Malaysia. The literature was design such a way to help in building up strong fundamental concepts on SMEs and ICT within Malaysia context. At the end of the

literature, this paper presents a comprehensive discussion on underpinning theories used by previous researchers in some innovation adoption researches. These theories and models developed in different disciplines and used in predicting, explaining, and understanding individuals' acceptance and adoption of new products or technologies. The five main theories discussed are Technology Acceptance Model (Davis, 1989), Theory of Reasoned Action (Fishbein & Ajzen, 1975), Theory of Diffusion of Innovation (Rogers, 1983), Theory of Planned Behavior (Ajzen, 1991) and Unified Theory of Acceptance and Use of Technology (Venkatesh et. al., Toward A Unified View, 2003). These models and theories have evolved over the years and came as result of persistent efforts of models' validation and extension that took over the place during the period each was presented. An example was psychology which contributed the Theory of Reasoned Action, TRA (Fishbein & Ajzen, 1975), which was extended to Theory of Planned Behavior, TPB (Ajzen, 1991).

2.2 **Internet Development**

Asian internet users has dominated 44.8% of the worldwide internet users, ranking the first highest internet users, followed by Europe (21.5%), North America (11.4%), Latin America (10.6%), Africa (7.0%), Middle East (3.7%) and Australia (1.0%) (www.internetworldstats.com, 2012). From Asian internet users' domination, Malaysian contributed 1.6% from the total of Asian internet users with 17.7 million internet users.

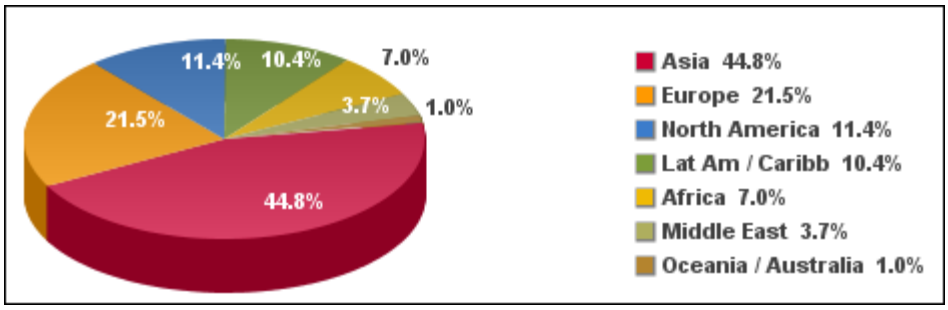

Figure 2.1 Internet Users in the World Distribution by World Regions - 2012 Q2
(Source: www.interworldstats.com)

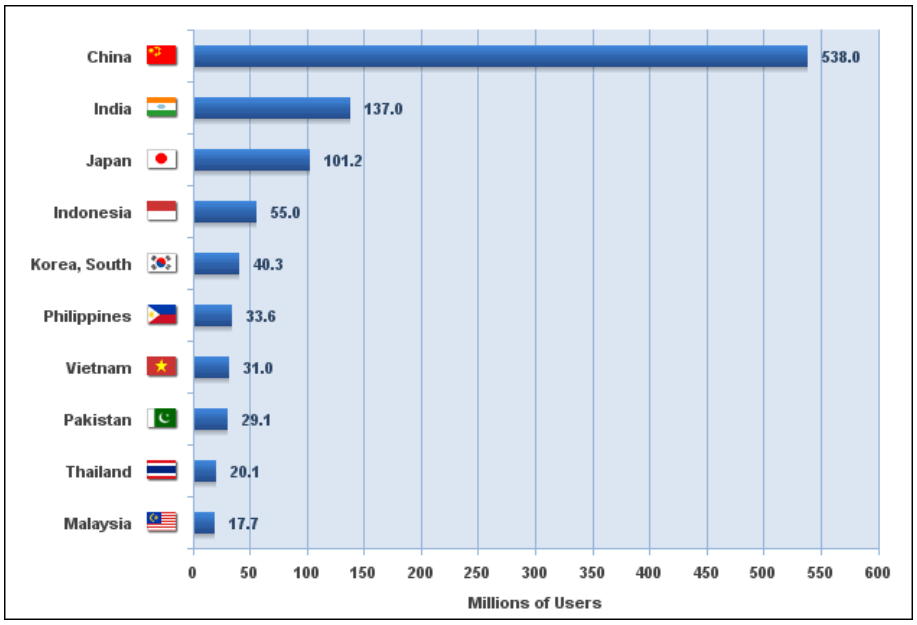

Figure 2.2 Asian Top Internet Countries – June 30, 2012
(Source: www.interworldstats.com)

Figure 2.2 indicates that there are 17.7 million internet users in Malaysia compared to other Asian countries as of June 30, 2012. Compared to other neighboring countries like Thailand and Indonesia, Malaysia has less internet users. However, Malaysia has higher number of Internet users compared to Singapore. This figure shows that there is still opportunity for Internet to expand and grow in Malaysia.

The internet has clearly transformed the industries and government through innovative approaches and changed how users engage the world. The web has made possible new waves of business models and entrepreneurship, but has also led to radical innovations for accessing, using, and delivering goods and services for everyone. The internet has shown a significant contributor to the economies.

2.3 **Small and Medium Enterprises (SMEs)**

SMEs play a pivotal role in sustaining employment and creating income and prosperity (Lange et al., 2000) . Governments around all the countries in the world are recognizing the importance upon the success of small business entrepreneurs and provide support this emphasis (Burgess & Ed, 2001). SMEs in another metaphor, pretty much like bricks to a modern house. It is also seeding ground for potential conglomerates of the future.

Based on statistical information collected by SME Corp Malaysia, (www.smecorp.gov.my) , census 2011 indicated that there are 645,136 of SMEs in five main key economic sectors in Malaysia which are services, manufacturing, agriculture, construction, mining and quarrying. Currently Malaysian SMEs account for 59% of employments and their contribution to exports is at 19% , and this is expected to grow to 62% of employments with 25% exports contribution by 2020 (Borneo Post, 2012). Their contribution to the total GDP is currently at 32% is aiming to increase to 41% by 2020 (Borneo Post, 2012).

2.4 **Malaysian SMEs and Internet Usage.**

Small and medium enterprise (SMEs) is considered to be the backbone of the Malaysian economy (Mahalingam, 2012). The importance of internet in internationalizing SMEs has been recognized and it was stressed that, lacking of internet adoption would result declining in the competitive position (Hamill & Gregory, 1997). Most of SMEs in Malaysia realized that ICT is crucial and importance towards productivity and performance of their companies (Lim, 2006). However, the adoption and implementation of the ICT system is not widely used due to some reason such as inability to handle, lack of ICT project management and owing to high staff turnover. According to him, many of the Malaysian family-based SMES still operating the business according to traditional method. Consequently SMEs which have invested in ICT systems fail to implement and maintain these systems successfully. Adoption and implementation of new technology such as internet-based ICT to run the business is essential towards the survival and growth of the small business sector (Martin & Matlay, 2001). The fact is supported by Chaston, who investigate the factors affecting the IT acceptance by 188 small businesses in the United Kingdom. The result proved that small businesses that readily adopt new technology and innovation are willing to exploit new knowledge will have a competitive edge over their competition (Chaston et. al, 2001). The main incentives behind the adoption of ICTs by SMEs such as reduced transaction costs, lower risk involved, information gathering and dissemination, increased inventory control and quality control, improved relationships with customers and suppliers and

the increased control over distribution and marketing of products (Ramsey et. al, 2003).

According to New Straits Times, Malaysia has come in amongst the top three in a study conducted by McKinsey & Company on the economic impact of the Internet on the Gross Domestic Product (GDP) of nine aspiring countries – Taiwan, Malaysia, Hungary, Argentina, Mexico, Morocco, Turkey, Vietnam and Nigeria. According to the McKinsey report, Malaysia has also surpassed other developed and developing economies such as France, Germany, China, India and even the United States on McKinsey's internal index. The McKinsey report was released on 27 January 2012 on the sidelines of the World Economic Forum in Davos, Switzerland (Bernama, 2012). This was a positive outcome resulted from the continuous support from Malaysian government and clearly shows the shows the benefits of the Internet on the economy and makes a case for prioritizing this aspiration even further.

Despites the usage of internet seems to be pervasive in this 21st century, some studies (Mehling, 1998) (Poon & Swatman, A Combined-method Study of Small Business Internet Commerce, 1998) found that SMEs are described as slowest sector to embrace e-commerce. E-commerce seems to be a confusing nightmare. They are not able to cope with the rapid change brought by this emerging technology. On the other hand, they are scared to be left behind. Therefore they are eager to adopt the technology (Hobson, 2000).

The use of internet and communication technologies has found to improve business competitiveness, with the Internet providing the opportunities to SMEs to

become more competitive and able to compete on equal terms with larger organization (Chapman et al., 2000)

2.5 **Malaysian ICT & SMEs**

Malaysia is now moving towards becoming a high-income and innovation-driven nation. In the past, the country thrived mainly as a factor-driven economy. Land, labor and capital were the main drivers of the preceding agro-industry economy thrust (Refer Figure 5). During this era, the Gross National Income (GNI) at fixed prices registered a spectacular growth of ten-fold increase from RM1, 820 per capita in 1980 to RM17,747 in 2007. During the same period, the average household income only grew five-fold from RM692 to RM3,686. With the ICT and Knowledge Economy thrust, the New Economy Model (NEM) projects that the nation will achieve a GNI level of RM58,413 by 2020 from its current level of RM17,747 (NEAC, 2010)

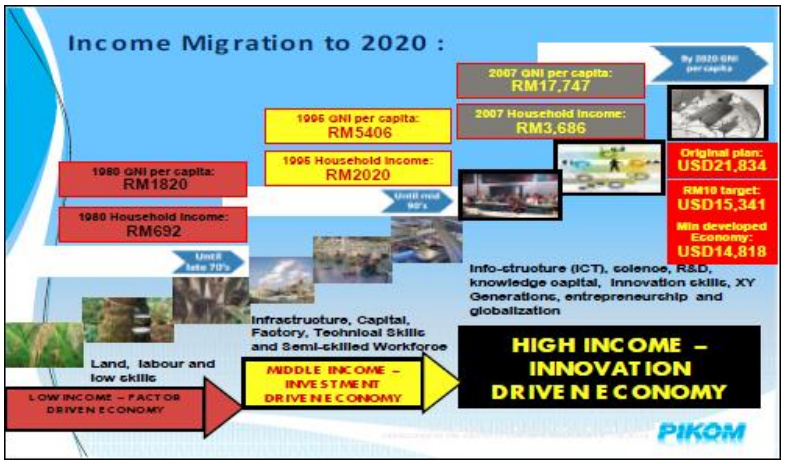

Figure 2.3 Malaysian Income Migration Towards 2020 (Source: Pikom)

Malaysia government has to capitalize on creativity and innovation to steer Malaysian economy to its next phase of development in order to be competitive in parallel of evolving its agro-industry economy. As such, new drivers emerge such as info-structure, R&D, science and technology, and knowledge capital. ICT has been identified as one of the key development area in the creation of the new age economy (EPU, 2000)

2.6 Grants and Incentives

The need for cash flow during the difficult economic period and enhanced awareness on government grants have led to surge in applications for grants by SMEs . This has clearly indicated the full support and courage by Malaysian government towards SMEs developments. In 2009, a total of 174 SMEs programs with RM3.04 billion allocation from the government have been implemented by 14 ministries with 60 agencies (Hamid, 2009).

2.7 Local and International Studies about Internet-based ICT Adoption

Alam (2009) conducted an empirical study about e-commerce adoption specifically for service sectors from Malaysian SMEs which examines the relationship between ICT adoption and its five factors which are perceived benefits, perceived cost, ICT knowledge, external pressure and government support. The results of this study show that three factors examined are significantly important to the adoption of ICT whereas perceived cost and external pressure are found to be

insignificant in determining its adoption. This study provides a greater understanding of SME's perception about ICT adoption in their service business.

Ramayah et. al. (2002) conducted research which outlined the importance of demographical and motivational variables with the use of technology. This study use SMIs instead of SMEs. This study was conducted in the northern region covers Penang, Kedah, Perak and Perlis. Based on the study outcome, the researchers found out that gender and educational level are positively related to technology usage. Moreover, age is positively related to the network related usage.

Apart from that, there are also overseas and international studies on ICT adoption and SMEs. In Namibia, Chiware and Dick (2008) conducted a research to study the use of ICT among Namibia's SMEs to access business information services. They use ICT as mean of communication tools such as telephones, faxes, cell phones, computers and post boxes. Based on the study, the researchers found out that Namibia's SMEs faced some barriers in using Internet-based services. The low level of ICT adoption among Namibia SMEs was because of investment, import and maintenance costs. They discovered that if the level of ICT usage needs to be improved, local government, business service providers and enterprises must play important role.

2.8 **Theoretical Foundation**

2.8.1 Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA) was developed by Martin Fishbein and Icek Ajzen as an improvement over Information Integration Theory (Ajzen & Fishbein, 1980) (Ajzen & Fishbein, 1975) . Theory of Reasoned Action says that the two important construct attitude towards the outcome of the behavior and opinions that a person has on the social environment determines a person's behavior. In turn, behavioral intention is determined by an individual's attitude towards that behavior (positive or negative) and subjective norms (social perceptions on engaging in that behavior) (Fu, Richards, D, & Jones, 2010). According to Fishbein and Ajzen (1975), the core construct, "attitude towards behavior " is defined as "one's positive or negative feelings about performing the target behavior ". Another construct, "subjective norm" is defined as "one's perception that most people think of one should or should not perform the behavior in question". In 1980, Ajzen and Fishbein proposed "a person's behavior is determined by his intention and this intention is a function of his attitude towards the behavior and his subjective norm". External variables encompass all variables not explicitly represented in the model, which include demographic of personality characteristics of the behavioral target, and other variables that can influence the formation of the beliefs.

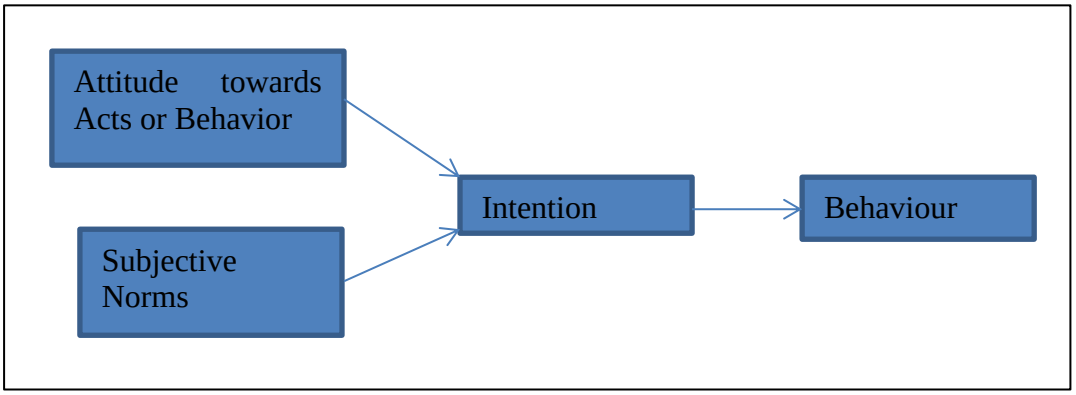

Figure 2.4 Theory of Reasoned Action (TRA)

TRA has been widely used to study human behavior and appropriate interventions. TRA is a widely studied model from social psychology, which concerned with the determinants of consciously intended behaviors (Ajzen & Fishbein, 1975) (Ajzen & Fishbein, 1980). The TRA model has been used in several research studies, for instances user acceptance of Information Technology, consumer behavior, Enterprise Resource Planning (ERP) user involvement, and online behavioral purchase intention (Alexander, A study of environmental, organizational and information technology issues in e-business adoption and assimilation in small firms (Doctoral Dissertation), 2006).

Yu and Wu (2007) used TRA to study Internet shopping behavior among 693 college students in Taiwan. They included many additional determinants of "attitude toward the behavior" and "subjective norm". Nevertheless, they found that the findings from college students were not generalizable because they had limited disposable income.

In 2012, Alan, Wendy and Patricia have adapted this theory to study Social Networking Behavior. Specifically, findings reveal that both attitude toward social networking and "subjective norm" are positively associated with intention to use SN. In addition, intention influences use of social networking. The TRA model provides a strong fit with the overall data and can be used to predict and understand the usage of social networking in the target population (Peslak, Cecucci, & Sendall, 2012).

2.8.2 Technology Acceptance Model (TAM)

Originally, TAM was developed to understand the causal link between external variables and user acceptance of PC-based applications. Technology Acceptance Model (TAM) (Davis et al., 1989) derived from the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975) offers a powerful explanation for user acceptance and usage behavior of information technology. While TRA is a general theory to explain general human behavior, TAM is specific to information system usage. Davis et al. (1989) stated that "the goal of the TAM is to [be] … capable of explaining user behavior across a broad range of end-user computing technologies" (p. 985).

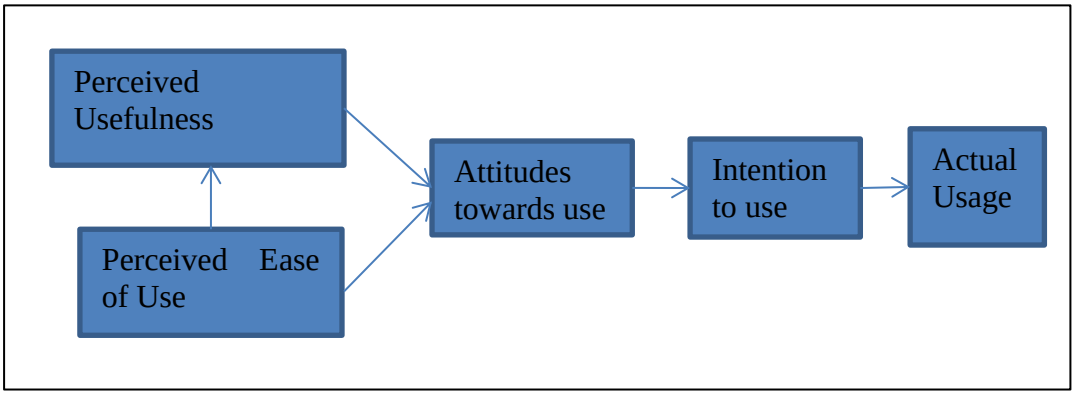

Figure 2.5 Technology Acceptance Model (TAM)

This theory is quite influential model and has been used in many research studies in determining IT/IS acceptance. TAM explained that an individual's behavioral intention to adopt a system is determined by two beliefs, perceived usefulness and perceived ease of use. Perceived usefulness is defined as "the degree to which an individual believes that using a particular system would enhance his or her productivity" while perceived ease of use is defined as "the degree an individual believes that using a particular system would be free of effort" (Davis, 1989)

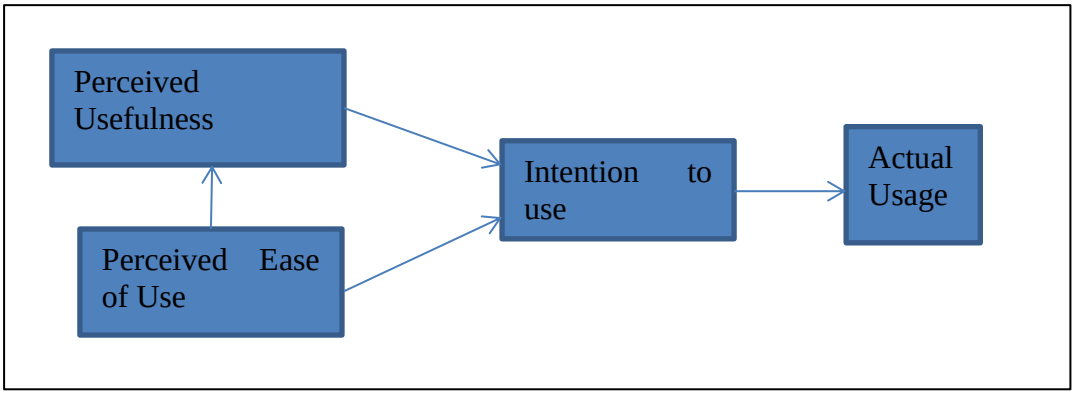

Figure 2.6 Refined Technology Acceptance Model (Refined TAM)

Subsequent research by Venkatesh (1996) then refined this theory suggesting that the mediating element of attitude possibly excluded as empirical evidence found that the attitude element did not fully mediate the effect of perceived usefulness on intention to use.

Jantan, Ramayah and Chin (Jantan, Ramayah, & Chin, Personal Computer Acceptance By Small and Medium Sized Companies Evidence From Malaysia, 2001) has used refined TAM to study various factors influencing personal computer acceptance by small and medium sized company in the scope of Malaysia. Basyir (Basyir, 2000) has adopted TAM to study the various factors associated with acceptance of internet shopping behavior. Fok (2001) investigated self-efficacy and its determinants as factors that affect perceived ease of use, perceived usefulness and the use of the Internet using TAM model (Fok , 2001). Wong (2001) proposed a model to study impact of extrinsic and intrinsic motivational factors in influencing individual's acceptance of Internet job search using TAM theory (Wong, 2001). On the other hand, Lu et. al, (Lu et. al., 2003) suggested a model to study wireless Internet with TAM as groundwork. The researchers had researched many papers and decided to adopt five anchors; technology complexity, individual differences, facilitating conditions, social influences and wireless trust environment.

In nutshell, the TAM approach has been the model that is the most generally tested and applied (Pearson & Grandon, 2005). It has been applied in numerous studies in evaluating user acceptance of Information Technology.

2.8.3 Theory of Planned Behavior (TPB)

Theory of Planned Behavior is a theory about the linkage between belief and behavior. This theory is basically an extension of Theory Reasoned Action. There is additional element which constructs the model "perceived behavioral control". Perceived Behavioral Control is defined as "the perceived ease of difficulty of performing the behavior" (Ajzen, 1991).

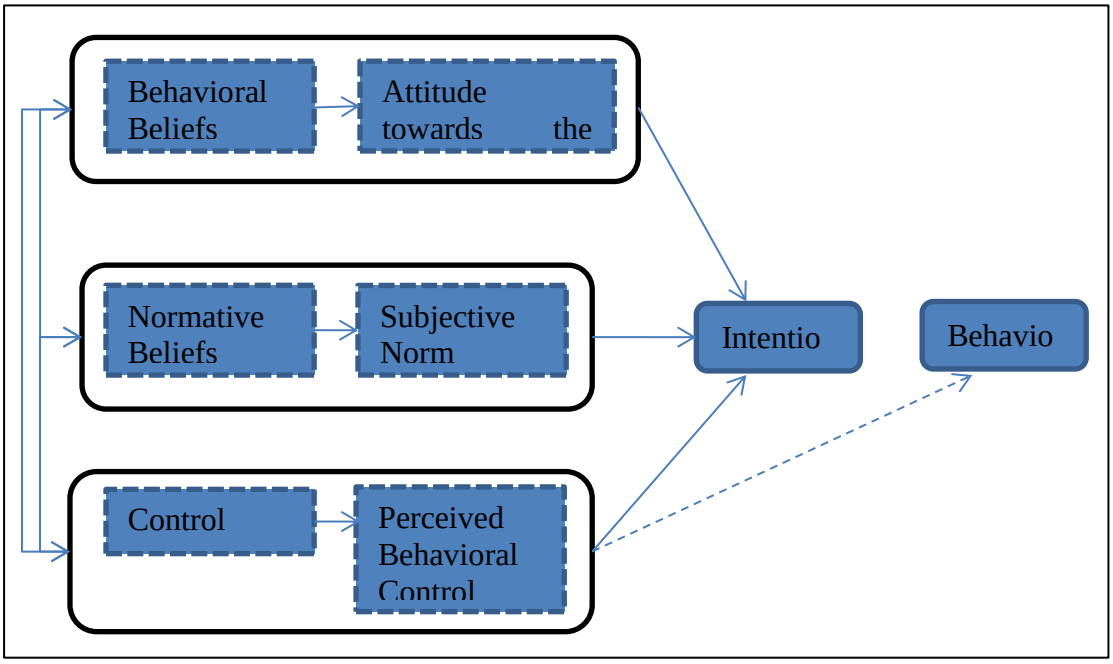

Figure 2.7 Theory of Planned Behavior (TPB)

Ajzen (Ajzen, 1991) pointed out that the main goal of TPB is to explain human behavior in different contextual settings. A person's action is determined by

behavioral intentions, which in turn are influenced by an attitude towards the behavior and subjective norms. In addition to attitude towards the behavior and the subjective norm in the theory of planned behavior, perceived behavioral control can influence intention as well. Perceived behavioral control influences the individual's decision through behavioral intention. In the TPB, behavioral intention is the most influential predictor of behavior. Behavioral intentions are factors that describe how hard people are willing to try to perform a behavior (Ajzen, 1991) Attitudes toward use (ATU) guide behavior and are defined as the way individuals respond to, and are disposed towards, an object. This disposition may be negative or positive. Subjective norm (SN) is defined as one's perception of whether people important to the individual think the behavior should be performed.

Many researchers claimed that TPB has better prediction power of behavior compared to TRA (Cheung et. al., 1999) (Madden et. al., 1992). Chang (1998) conducted a research to identify the different of TPB and TRA application in predicting the unethical behavior in making illegal copy of the software among the university students. He found out that TPB yielded better result in predicting the intention to perform the unethical behavior. He found out that TPB is more successful than TRA which did not take the resources and opportunity variables into account in predicting unethical behavior. Moreover, he found that there is relationship existed between subjective norm and attitude.

2.8.4 Unified Theory of Acceptance and Use of Technology (UTAT)

The Unified Theory of Acceptance and Use of Technology (UTAT) proposed to explain people intention to use information system and subsequent usage behavior.

This theory formulated by Venkatesh and others (2003). UTAT postulates that four core constructs – performance expectancy, effort expectancy, social influence, and facilitating conditions are directly related to the determinants factors of IS/IT behavioral intention and ultimately behavior (Venkatesh et. al., 2003). "Gender", "age"," experience" and "voluntariness of use" is posited to moderate the four key constructs (Venkatesh et. al., 2003)

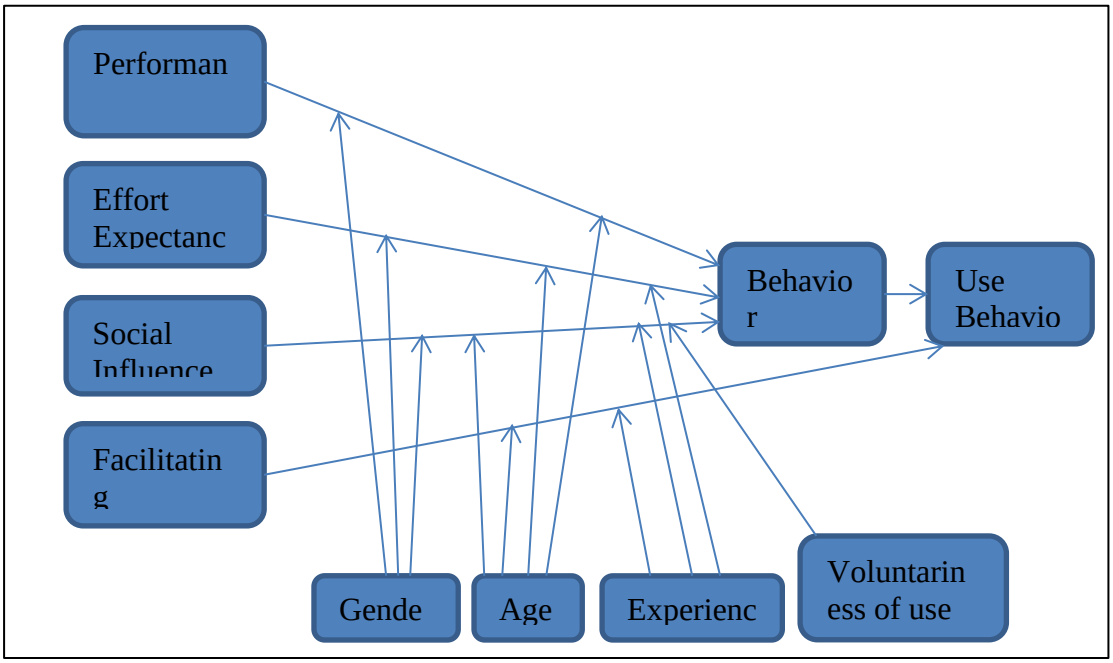

Figure 2.8 Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAT is a combination of eight models that earlier researchers have employed to explain IS/IT usage and behavior. The eight theories are TRA, TPB, TAM, Motivation Model, combined theories of TAM/TPB, DIT, model of personal computer utilization, and social cognitive theory. These eight theories and models have been successfully adapted into a quite number of previous research studies in the area of technology or innovation adoption and diffusion within both the

information systems field and other disciplines including marketing, social psychology, and management.

2.9 **Research Model Justification**

After thorough reviews on the different innovation models and various studies done by previous researchers, this study adapted and combined two models as research framework. The two models are Technology Acceptance Model (TAM) (Davis, 1989) and Theory of Planned Behavior (TPB) (Ajzen, 1991). The technological products and services adoption is often explained by the TAM (Davis, 1989). TAM is presently a present a leading theory of technology acceptance in Information System (IS) research. The theory of planned behavior extends the TRA model by incorporating an additional construct, namely perceived behavior control as the third model, to account for situation in which and individual lacks substantial control over the targeted behavior (Ajzen, 1991). Ajzen, (1991) suggested that the attitudes towards behavior, subjective norms and perception of behavioral control are generally found to be able to accurately predict individual behavioral intentions. Hence this study adapted both model, TAM and TPB in looking into factors influencing Internet-based ICT adoptions among SMEs in Malaysia. The complete research framework for this study is presented in the next chapter.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter illustrates the research framework. From the research framework, few hypotheses are generated to answer all research objectives. These hypotheses described the relationship between the proposed variables and the Internet Based ICT adoption intention among Malaysian SMEs. A set of questionnaire is prepared with all variables have been carefully operationalized.

3.2 Hypotheses

The section discusses the relationship existing between perceived ease of use, perceived usefulness, behavior control and subjective norms on internet based ICT adoption intention. Figure 3.1 illustrates the research framework of this study. There are four independent variables and one dependent variable. The research model was built based on integration of the refined Technology Acceptance Model (TAM) and Theory of Planned Behavior (TPB). Subjective norms and behavioral control constructs are recruited from TPB to study the effect of normative beliefs in social system and personal psychology state respectively.

Even though attitudes have been identified as core focus in social psychology (Eagly & Chaiken, 1993) in IS study, however the relationship between the attitudes and behavioral intentions was found to be insignificant, therefore excluded from later version of TAM resulted from subsequent research (Venkatesh, Determinants of Perceived Ease of Use: Integrating Control, Intrinsic Motivation, and Emotion into the Technology Acceptance Model, 2000) (Venkatesh & Davis, 2000). In Malaysia, the refined TAM has been used to study the various factors which influence the personal computer acceptance by small and medium sized companies (Jantan, Ramayah, & Chin, 2001). Wong (2001) replicated the refined TAM into examining the impact of extrinsic and intrinsic motivational factors in influencing individual's acceptance of Internet job search. Koay (2002) adopted TAM model to measure the receptiveness of E-Banking by Malaysian consumers.

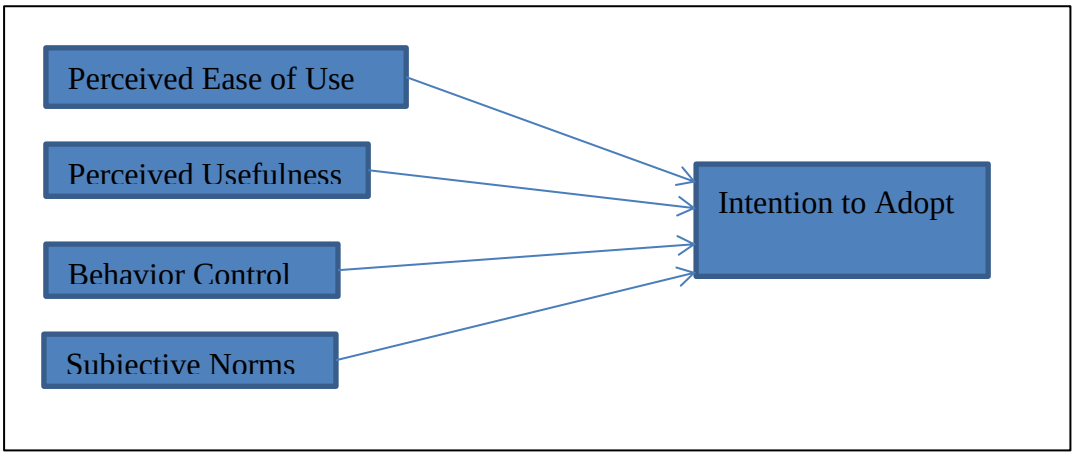

Figure 3.1 Research Framework

3.2.1 Perceived Ease of Use and Intention to Adopt

Davis (1989) defined perceived ease of use as "the degree to which a person believes that using a particular system would be free from effort" (Davis, 1989) . Perceived ease of use relates to assessments of the intrinsic characteristics of IT, such

as the ease of use, ease of learning, flexibility, and clarity of its interface. The effects derived from perceived ease of use has been widely studied over the past decades and the evidence was it has a significant effect on attitude towards usage (Karahanna et. al., 1999) (Taylor & Todd, 1995) (Lau, 2002) (Davis, 1989). Since behavioral intent to adopt depends on the cognitive choice, the SMEs can either respond favorably or unfavorably towards engaging and adoption internet based ICT in their businesses. In the study of Karahanna and others (1999) about software adoption among potential adopters, they found that there is significant positive effect on perceived ease of use attitude towards adopting the software. Individual's belief determines the attitude towards using the system, in other words the attitude develops the intention to use which eventually influence the decision of the actual technology usage. As TAM has been adopted for online business, perceived east of use has been found to be significant antecedent of attitudes towards online store (Moon et. al., 2001) (O' Cass & Fenench, 2003).

H_1: Perceived Ease of Use has relationship with Intention to Adopt

3.2.2 Perceived Usefulness and Intention to Adopt

Perceived usefulness directly influences intention to use. Perceived usefulness is one of the fundamental elements of TAM. It is defined “the degree to which a person believes that using a particular system would enhance his or her job performance (Davis et al., 1989). This element directly The TAM has been evaluated to be not only a powerful and parsimonious model for representing the determinants of system usage but also a valuable tool for system planning, since the system designers have some degree of control over easiness and usefulness. In this

study, perceived usefulness is defined as the degree in which SMEs believes that use of Internet-based ICT will improve their business performance. Therefore the hypothesis derived is:

H_2: Perceived Usefulness has relationship with the Intention to Adopt

3.2.3 Behavior Control and Intention to Adopt.

Perceived behavior control refers to "people's perception of east or difficulty in performing the behavior of interest". The perceived behavior control reflects a person perception of the ease or difficulty of implementing the behavior in question. It concerns beliefs about the presence of control factors that may facilitate or hinder their performing the behavior. This element plays important role in the theory of planned behavior. There were a lot of studies has been carried out in demonstrating the applicability of TPB to various content domains (Ajzen, 2001). The ability of TPB in providing a very useful theoretical framework for understanding and predicting the acceptance of new information technology is demonstrated. In nutshell, perceived control is consisted of elements of individual constraint which related to individual user's economy, experiences and skill in using service. If the SMEs has resources or ability to use Internet-based ICT, they will experience better control, and probability of using the services will be higher, eventually will determine the intention to use Internet-based ICT for their business. Therefore the hypothesis posited is:

H_3: Behavioral Control has relationship with the Intention to Adopt

3.2.4 Subjective Norms and Intention to Adopt

TPB posits that individual behavior is driven by behavioral intentions where behavioral intentions are a function of an individual's attitude toward the behavior, the subjective norms surrounding the performance of the behavior, and the individual's perception of the ease with which the behavior can be performed (behavioral control). In general, a subjective norm is defined as "the social pressure to perform or not to perform the behavior" (Ajzen, 1991). It is related to normative belief about the expectation from other people either through interpersonal and external influences. A person may perform a behavior in order to comply with his or her important referents regardless his own perceived and attitudes towards the behavior. The referent mentioned could be from his or her peers, friends, top management, organization surrounds, and his or her community in general. In other words, if social expectation is that people should engage the behavior, then it is more likely that the person will perform the behavior. In this study, the following hypothesis is proposed:

H_4: Subjective Norms has relationship with the Intention to Adopt

3.3 **Research Design**

Following to the research framework and hypothesis development of the study, the next step is to develop research design. The research design derived from the logic that links the data to be collected (and the conclusion to be drawn) to the initial questions of a study (Yin, 1994). In other words, research design is a plan by

which the strategy is to be carried out. It specifies the procedures and methods for the collection, measurement and data analysis. For example, before a builder or architect can develop a work plan or order materials they must first establish the type of building required, its uses and the needs of occupants. The work plan flows from this. Similarly, in social research the issues of sampling, method of data collection (i.e. questionnaire, observation, and document analysis), and design of questions are all subsidiary to the matter of 'What evidence do I need to collect?' In summary, research design is not related to any particular method of collecting data or any particular type of data. Any research design can, in principle use any type of data collection method and can use either quantitative or qualitative data.

This study employs survey instrument using self-administered questionnaire. The methods being used are combination of postal mail and web based survey. There are several factors which have been considered in designing the research survey for this study. For example, population, characteristic of the sample, types of question, question topic, response rate, cost and time. Survey is a one of the common type of quantitative, social science research. In this study, the sample of respondents was selected from a population with administered question. This quantitative study employed survey instrument via postal mail and web based survey to collect and test the research framework. The aim of the survey was to generate sufficient data to piece them together a picture of SMEs perception towards the Internet-based ICT adoption. Gathering the response from as many respondents was considered advantageous and surveys were regarded as the most appropriate method to achieve this since they can generate amounts of quantitative data from large number of respondents (Denscombe, 1998). In relation to the aims and objectives of the study,

questionnaire can also be useful in discovering both facts and opinions such as attitudes (Denscombe, 1998). Furthermore a self-administrated questionnaire is cost effective method of questioning a large number of people, being "relatively east to administer. They are flexible in that they can be used to collect a wide variety of data in a variety of different circumstances. And they are relatively cheap" (Moore, 2000). Survey research is often used to assess thoughts, opinion and feelings (Shaughnessy, Zechmeister, & Jeanne, 2011).

The survey questionnaire is comprised of two parts. The first part used nominal scales to collect basic information characteristics pertaining the respondents. The second part was comprised of the theoretical construct of the research model to record the respondents' perception of each variable regarding the intention to use of Internet-based ICT. The measure of theoretical construct consisted of multiple statements utilizing a 5-point Likert scale ranging from one (strongly disagree) to five (strongly agree). The model consists of four constructs which are perceived ease of usefulness (PEOU), perceived usefulness (PU), behavioral control (BC) and subjective norms (SN).

3.4 **Operational Definition**

Operationalization is defined as "the development of specific research procedures (operations) that will result in empirical observations representing those concepts in the real world" (Babbie, 1990). In the other words, operationalizing or operationally defining a concept is to "render the concept measurable and to look at the behavioral dimensions, facets, or properties denoted by the concept. These are

then translated into observable and measurable elements to develop an index of measurement of the concept" (Sekaran, 2003; Sekaran, 2003).

In order to assess the research hypotheses, all constructs in the survey questionnaire are defined operationally. Table 3.1 demonstrates the summary of variable operationalization in this study.

Table 3.1 Operationalization of Variables

Constructs	Item	Operationalization of Variables	Measurement Scales
Demographic Variables (Appendix A, Section A)		1. Type of Company 2. Type of industry 3. Number of Full-Time Employees 4. Annual Sales Turnover 5. Type if Company Ownership 6. Years of Business Start-Up 7. Reason company using Internet 8. Reasons company does not use Internet	Nominal, Multiple Choice
Perceived Ease of Use (IV)	PEOU1 PEOU2 PEOU3 PEOU4 PEOU5	Internet-based ICT system is easy to use It is easy to get ICT internet-based system to do what we want it to do E-commerce does not requires a lot of my mental efforts It is easy to recover from errors encountered while using internet-based ICT system Internet-based ICT system is easy for me to understand.	Five-point scale with anchors from Strongly Disagree (1) to Strongly Agree (5)
Perceived Usefulness (IV)	PU1 PU2 PU3	Using internet-based ICT improves the quality of work. Internet-based ICT gives me greater control over my work. Internet-based ICT	Five-point scale with anchors from

		supports critical aspects of my job.	Strongly Disagree (1) to Strongly Agree (5)
	PU4	Using internet-based ICT allows the organization to accomplish more work than would otherwise be possible.	
	PU5	Internet-based ICT increases productivity.	
Behavior Control (IV)	BC1	Using internet-based ICT is entirely within my organization control	Five-point scale with anchors from Strongly Disagree (1) to Strongly Agree (5)
	BC2	My organization has the necessary means and resources to use internet-based ICT system for business.	
	BC3	My organization would be able to operate Internet-based ICT system.	
	BC4	My organization has the ability to use Internet-based ICT system.	
	BC5	The employee within my organization has knowledge to use internet-based ICT system	
Subjective Norms (IV)	SN1	Others who influence my organization behavior would think that I should use Internet-based ICT	Five-point scale with anchors from Strongly Disagree (1) to Strongly Agree (5)
	SN2	Others who important to my organization think I should use Internet-based ICT.	
	SN3	Most of the people who are important to my organization think that using internet-based ICT is a wise idea	
	SN4	It is expected that by others that my organization use internet-based ICT	
	SN5	Others who my organization look up to , expect my organization to use Internet- based ICT	
	ADOPT1	My organization is currently adopting	

Intention to Adopt (DV)	ADOPT2 ADOPT3 ADOPT4	Internet-based ICT for the business My organization is planning to adopt internet-based ICT I would strongly recommend others to use Internet-based ICT system for their business My organization will enhance the ICT infrastructure to continuously embrace Internet-based ICT in future.	Five-point scale with anchors from Strongly Disagree (1) to Strongly Agree (5)

The questionnaire format and structure has been designed in such careful manner with thought and objective in mind to reduce as much possible potential biased answers from the respondents. Moreover, the instrument use is basically by adapting the original question design made by the previous researchers who used it for their research to study technology acceptance behavior. The format of the instrument is made simpler, short and comprehensible and adaptable to statistical analysis (Burns & Bush, 2000) (Luck & Rubin, 1987).

3.5 **Instrumentation**

The items which is used in this study to operationalize the constructs of each investigated variable were mostly adopted from relevant previous studies and modified for adaptation to Internet-based ICT adoption context with necessary wording changes being made (Sendecka, 2006) (Nysveen, Lexhagen, & Hem , 2005) (Wang , Shun Wang, Min Lin , & Hsin & Tang , 2003) (Davis et al., 1989) (Hung , Ku, & Chang , 2003). The measures also have been adapted and modified to fit the purpose of the purpose of the present study which is also concentrates on technology

acceptance behavior. The measurement items were common to TAM, TRA, and TPB. Specifically for items measuring TAM – perceived ease of use and perceived of usefulness, were adapted from the original item of Davis (1989) in the theory of technology acceptance model. The measure of items measuring subjective norms, perceived behavioral control, and intention behavioral were adapted from various studies related to the scale developed by Fishbein and Ajzen (1975) in the theory of reasoned action and theory of planned behavior (Ajzen, 1991). Similar items also have been used by Nyseveen et. al. (2005), Taylor and Todd (1995), Teo and Pok (2003) and Hung et. al. (2003). Lastly the measure of intention to adopt was adapted from the study of Ok et. al (2006), Nyseveen et. al (2005) and Mathieson (1991).

Refer to Table 3.2 for a summary of the instrument gathered information about the research constructs, namely perceived ease of use, perceived usefulness, behavioral control, subjective norms and intention to adopt

Table 3.2 Questionnaire Sources

Variables	Definition	Source
Perceived Ease of Use (PEOU)	The degree to which a person believes that using a particular system will be free of effort.	Davis (1989)
Perceived Usefulness (PU)	The degree to which a person believes that using a particular system will enhance his or her job performance	Davis (1989); Nysveen et. al . (2005)
Behavioral Control (BC)	People's perception of ease or difficulty in performing the behavior of interest	Nysveen et. al. (2005); Teo et. al. (2003); Taylor et. al (1995); Seok-Jae, Ok (2006)
Subjective Norms (SN)	The perceived social pressure to perform or not to perform the behavior	Nysveen et. al (2005); Teo et. al. (2003); Hung et. al. (2003) Taylor et. al (1995); Seok-Jae, Ok (2006)

Intention to Adopt (ADOPT)	The strength of one's intention to perform a specific behavior	Seok-Jae, Ok (2006); Nysveen et. al . (2005)

.**Data Collection**

Data collection refers to how the researcher obtains the empirical data to be used to answer his or her research questions. The focus is on methods of data collection, not methods of research. There are six major methods of data collection which includes tests, questionnaires, interviews, focus groups, observations and secondary or existing data.

The research instrument was designed for cross-sectional survey methodology using self-administered questionnaire. This method and technique suit the purpose of study to identify the behavior of Internet-based ICT adoption behavior and its factor among Malaysian SMEs. Moreover, a survey is an appropriate instrument because the information gathered was related to perceptual experience that should be examined directly from the participants' own responses (Fink, 2009). In addition to that, survey is also cost effective since many questions could be asked to a large population in a short timeframe (Fink, 2009). Surveys are also defined as systematic attempts of collecting data through standardized questions that provide uniform definitions to and receive similar responses from the participants. Thus, the measurements can be more precise and aligned to the research questions. Using a survey helps ensure that comparable data will be collected and interpreted.

Survey instrument was employed for this study. Individual self-administered survey is used as the data gathering technique. The questions were carefully design

in such a way to ensure that the survey was a useful measurement for the intended constructs of the study. Thus, the researcher adapted a combination of existing surveys to develop the question set for this study (Croxall, 2002). Using the existing validated surveys from previous research to develop the survey questions helped ensure that the desired constructs were adequately measured.

The population of this study comprises of SMEs from all sectors which selected randomly. These are registered under Small and Medium Industries Development Corporation (SMIDEC).

3.6 **Subjects**

In order to determine Malaysian SMEs intention to adopt Internet- based ICT in their business operations, a survey was conducted in early February 2013. This study employed a convenience sampling technique and directly administered to the respondents. The focus of this study is all SMEs in Malaysia, the population of this study is to all SMEs in Malaysia. Obviously, it is difficult to obtain the list of all SMEs in Malaysia. Thus, this study depends to the Official SME Business Directory which available via online SME Corp Malaysia One Stop Information Portal (www.smeinfo.com.my) as the population frame. There are 17,082 companies listed in the SME business directory, consists of all business sectors which fall under Malaysian SME segment. In addition to SME Corp One Stop Information Portal, the sample also obtained from Federation of Malaysian Manufacturers (FMM) 2012 43rd edition of Malaysian business directory.

In this study, convenience sampling used to select the elements from the population frame. From FMM business directory, those company which classified as SMEs were carefully selected based on the company turnover value, number of employees and nature of the business. However, all listing in SME Corp Malaysia One Stop Information Portal are from SME category. The selection was made randomly from the listing with the consideration of the fair numbers of companies identified from each of the states in Malaysia factoring mixed of SMEs categories from the manufacturing and services segment. In total, there are 300 respondents were identified and contacted equivalently via postal mail and online survey with same set of questionnaire. Only one respondent will answer the questionnaire as representative of the organization regardless his or her position.

A total of 103 responses managed to be collected during four weeks data collection period. In overall, the response rate is 34.33% (103/300) which higher than the acceptable range (30 per cent) as proposed by Sekaran (Sekaran, 2000).

3.7 **Sampling**

In order determine the internet-based ICT adoption among the Malaysian SMEs, a survey was conducted in Feb 2013. This study used convenience sampling method which directly administered the instrument to the respondents. Online and postal surveys were distributed randomly across Malaysia. This study conducted with intention to see the pattern of all SMEs in Malaysia rather than performing cluster sampling which only scoping at a specific group of respondents. A convenience sample of respondent (N=300) was targeted. A total of 103 questionnaires were

successfully collected within three weeks of data collection period. In overall, the response rate was at 34.33% (103/300).

3.8 **Data Collection Procedures**

The data were gathered based on online survey and personal administered questionnaire. A packet of 150 survey questionnaire, together with a return envelope were sent randomly selected from all SMEs sector such as manufacturing, services sectors and agro-based. There is no specific target of respondents as this study is aiming to get overall perception of employees within the SMEs organization towards Internet-based ICT practices.

In this study, questionnaire surveys were collected by postal mail and online survey. To insure a high response rate, a personalized mailing printed with UUM logo was sent via stamped post to 150 SMEs across Malaysia, with an introduction and announcement about the survey, promise of confidentiality of the data provided, detailed instruction together with the statement that indicated the purposes and significance of the survey responses to the researchers and to the database. An online survey with the same set of questionnaires and format also sent to additional 150 SMEs The self-stamped envelope with self-address is enclosed in all posted mail to ease respondent. On the other hand, the online survey will directly link all response to the online survey repository. “Survey Monkey” an online tool, is used to create and host the Web-based or online survey to monitor responses and to monitor view the summary results. At the first opening page of the web based survey, contained the necessary information about the survey, the background of the survey and

information about the researchers and his institution. There is an option available in the web based page which can be selected by the respondent if he or she would like to opt out from receiving the notification and for not to proceed with the participation of the survey .An automated reminder notification is sent to the distribution list in a week time after the first online email distribution sent in attempt to remind the respondent. Telephone inquiries also conducted as the last resort for some SMEs that had not responded. The questionnaire is ended with appreciation and acknowledgement to appreciate the respondent who contributed to the survey.

Out of 103 respondents, 19 respondents submitted their response via postal mail while 84 respondents submitted their feedback through online survey.

3.9 **Technique of Data Analysis**

Data analysis means that the researcher is deciding what and which meaning can the attribute to the (collected) data; and what are the implications to that effect; and how does it relate to the topic being investigated (Descombe, 2000). Data analysis is the process of bringing order, structure and interpretation to the mass of collected data (Marshall & Rossman, 1999).

In this study, the analysis evolved through distribution of survey with the SMEs in Malaysia. Based on this information collected, the discussion was established in this paper. The analysis of data began after the completion of responses compilation of the distributed survey via snail mail and online survey. SPSS statistical software is used in performing the scientific analysis. Statistical

analysis such as descriptive statistics, t-test and multiple regressions were also performed. In order to answer the research questions and define the specific research objectives, analyses were made on the sample characteristics. Characteristics of the dependent and independent variables, as well as the hypotheses were developed and various statistical techniques were employed.

The following is a summary of statistical analyses which derived from this study (Table 3.3). This are tabulated approach employed for statistical analyses. The purpose has been distilled briefly and the different tests used to achieve it are enumerated.

Table 3.3 Analysis Technique Summary

Purpose	Technique
Examination of sample characteristics	Descriptive statistics
Examination of characteristics of independent and dependent variables	Reliability analysis Correlation analysis
Hypothesis testing	Multiple regression analysis

CHAPTER 4

RESULT AND DISCUSSION

4.1 Introduction

This chapter provides in detail of the data analysis and the findings of this research. It presents a complete results and analyses of the study. Statistical Package for Social Sciences (SPSS) software is used to present the descriptive analyses on the demographic data, Internet-based ICT usage among the SMEs, four perceived characteristic of TAM and TPB elements and Internet-based ICT adoption based on research and hypotheses. A theoretical grounded questionnaire survey was used then administered to call for responses from Malaysian SMEs about their perception of Internet-based ICT. This section divided into two sections. Section one, includes the sample, instruments, sample development and survey procedures, the reliability and validation processes are described in section two of this chapter.

4.2 Respondents' Profile

The summary of characteristic of the subject is presented in tables below. This subsection discusses the statistics. Table 4.1 shows that most of the respondent are male respondents. From age perspective which described in Table 4.2, most of the respondents' ages are in the range of 31 – 40 years old.

Further assessing the population of gender respondents by the industry sector (Table 4.3), it is found that majority of the respondents from Manufacturing, manufacturing-related services or agro-based industries are female, while majority of respondents from services, primary agriculture or information & communication technology (ICT) are male respondents.

Table 4.4 shows cross relation of the respondents' position in the organization with the gender. This report shows that majority of the respondents are from the category of Chief Executive Officer (CEO) or director level.

The respondent are varies from 21 years old to above 51 years old with majority are male respondents (76.7%) from the age ranging 31-40 years old. The statistic also shows that majority of the respondents are mostly male and from Chief Executive Officer (CEO) or director level of position.

Table 4.1 Respondents'' Gender

Gender	Per cent (%)
Male	76.7
Female	23.3

Table 4.2 Respondents' Age

Age Range	Per cent %
21-30	15.5
31-40	38.8
41-50	32
51-above	13.6

Table 4.3 Respondents' Gender & Industry Type

Industry Type	Gender (%)	
	Male	Female
Manufacturing, Manufacturing-Related Services or Agro-Based Industries	53%	67%
Services, Primary Agriculture or Information & Communication Technology (ICT)	47%	33%

Table 4.4 Respondents' position in the organization and gender

Position in the Organization	Number of Male	Number of Female
Officer / Senior Officer	6	5
Executive / Senior Executive	18	4
Manager / Senior Manager	6	4
CEO / Director	36	2
Company Owner	13	9

4.2.1 Type of Industry

Collected primary data can be divided into two different industries. There are 57 SMEs (55 per cent) from Manufacturing, Manufacturing-Related Services or Agro-Based industry such as industry related to foods, textile, chemical and petroleum while another 46 (45 per cent) of SMEs are from services, Primary Agriculture or Information & Communication Technology (ICT) industry, for example consultancies services, tourism and advertising. Each type of industries is subdivided into number of full time employees and annual sales turnover in subsequent analysis.

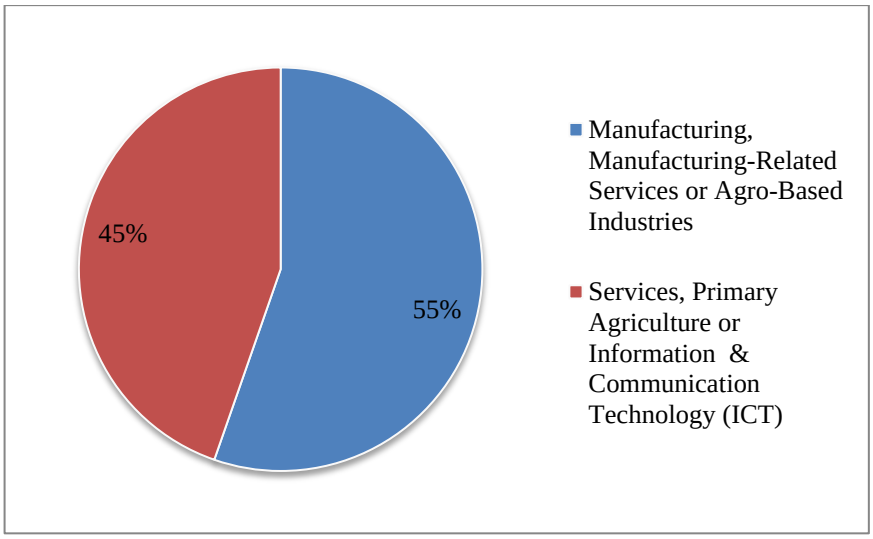

Figure 4.1 Industry Type

4.2.2 Type of Company Ownership

Local entrepreneurs constitute 94 per cent or 97 enterprises out of 10 enterprises. Joint Venture type of SME contributes to 5 per cent or 5 out of 130 and foreign type of enterprise is at the lowest number which is at 1 per cent or 1 out of 103 enterprises. In the other words, local or domestic entrepreneur is at the majority of all the other type of SME ownership in Malaysia.

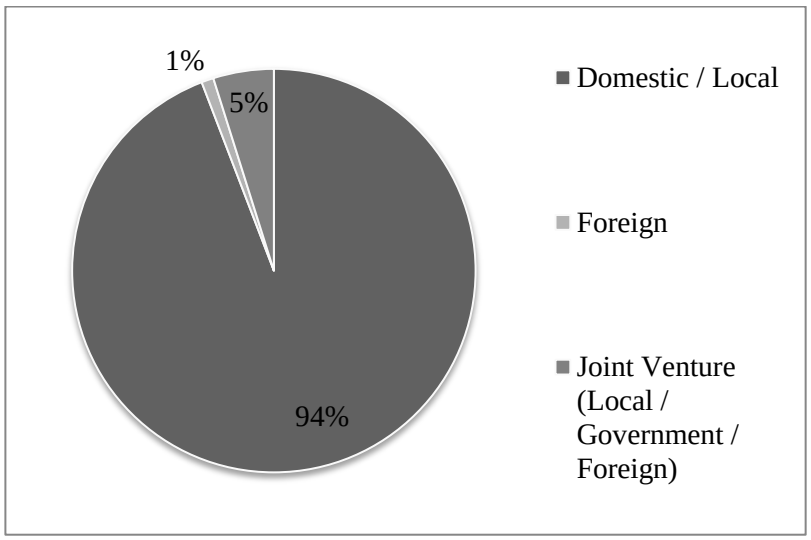

Figure 4.2 Type of Respondents' Company Ownership

Table 4.5 Type of Company Ownership and Company Type

Company Type	Type of Industry (%)	
	Manufacturing, Manufacturing-Related Services or Agro-Based Industries	Services, Primary Agriculture or Information & Communication Technology (ICT)
Domestic / Local	91 %	98 %
Foreign	0 %	2 %
Joint Venture (Local / Government / Foreign)	9 %	0 %

4.2.3 Company Annual Turnover Sale

In the category of manufacturing industry (Figure 4.3), there are 26 or 45.61 per cent of small-sized SMEs and 24 or 42.11 per cent micro sized SMEs. In other words, 87.72 per cent of manufacturing companies are small-sized or medium-sized with annual sale turnover less than RM10 million.

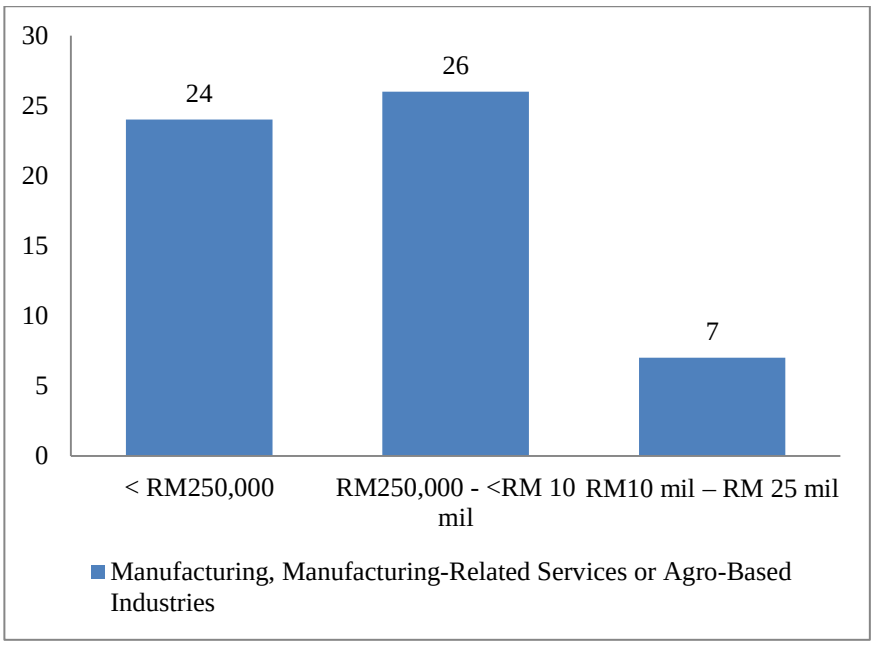

Figure 4.3 Company Annual Turnover Sale - Manufacturing, Manufacturing-Related Services or Agro-Based Industries

In the category of services industry, there are 41.30 per cent or 19 companies are from micro-sized SMEs, and 45.62 per cent or 21 companies are from medium-sized SMEs. In other words, there are 86.96 per cent of the companies within the services industry are micro-scaled and medium-scaled type with the annual sale turnover less than RM1 million.

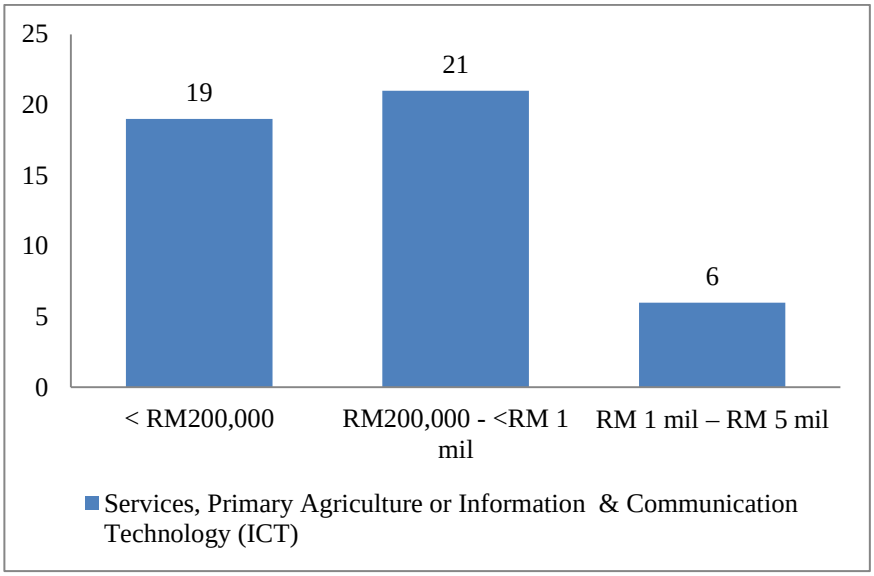

Figure 4.4 Company Annual Turnover Sale - Services, Primary Agriculture or Information & Communication Technology (ICT)

4.2.4 Number of Employees

In the category of manufacturing industry, majority of the respondents are from small sized SMEs (67 per cent), while 21 per cent are from micro sized SMEs and the least proportion is from medium sized SME which is at 21 per cent.

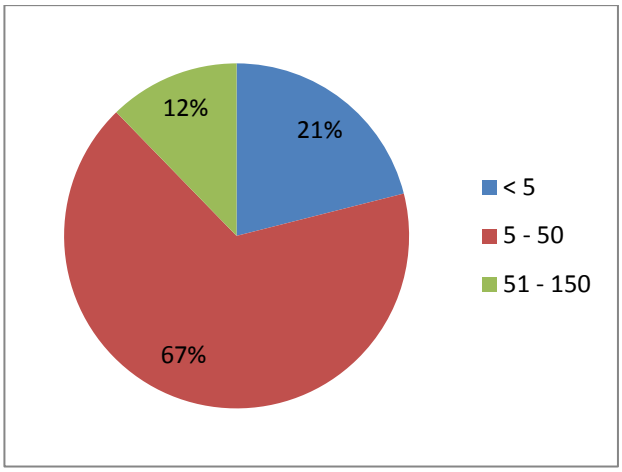

Figure 4.5 Number of Full Time Employee - Manufacturing, Manufacturing-Related Services or Agro-Based Industries

In the category of services industry, majority of the respondents are from small sized SMEs (44 per cent), while 39 per cent are from micro sized SMEs and the least proportion is from medium sized SME which is at 17 per cent.

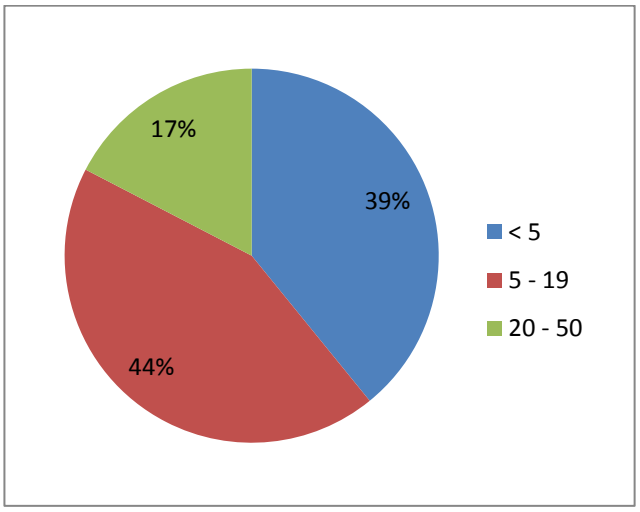

Figure 4.6 Number of Full Time Employee - Services, Primary Agriculture or Information & Communication Technology (ICT)

4.2.5 Years of the Business Start-Up

Eighty-seven companies (84.4 per cent) were established before January 1997 while, sixteen companies (15.5 per cent) were established after January 1997. Hence,

in this study, more SMEs started their businesses before Malaysia officially launched MSC in 1997. Table 4.6 shows the year of the business start-up among both manufacturing and services SMEs. Refer Table 4.6

Table 4.6 Year of the Business Start-Up

Year of the Business Start-Up	Manufacturing, Manufacturing-Related Services or Agro-Based Industries	Services, Primary Agriculture or Information & Communication Technology (ICT)
Before January, 1997	44	43
After January, 1997	13	3

4.2.6 Years of Using Internet for Business Purposes

Forty-three companies (41.7 per cent) have been using Internet for their business between 5 – 10 years which obviously shows that more SMEs have been using internet after Malaysia officially launched MSC in 1997. This statistic also positively shows that majority of the SMEs have been adopting internet, except small number of companies. There are only five companies out of 103 companies (4.9 per cent) which have never been use internet for their business. Refer Figure 4.7.

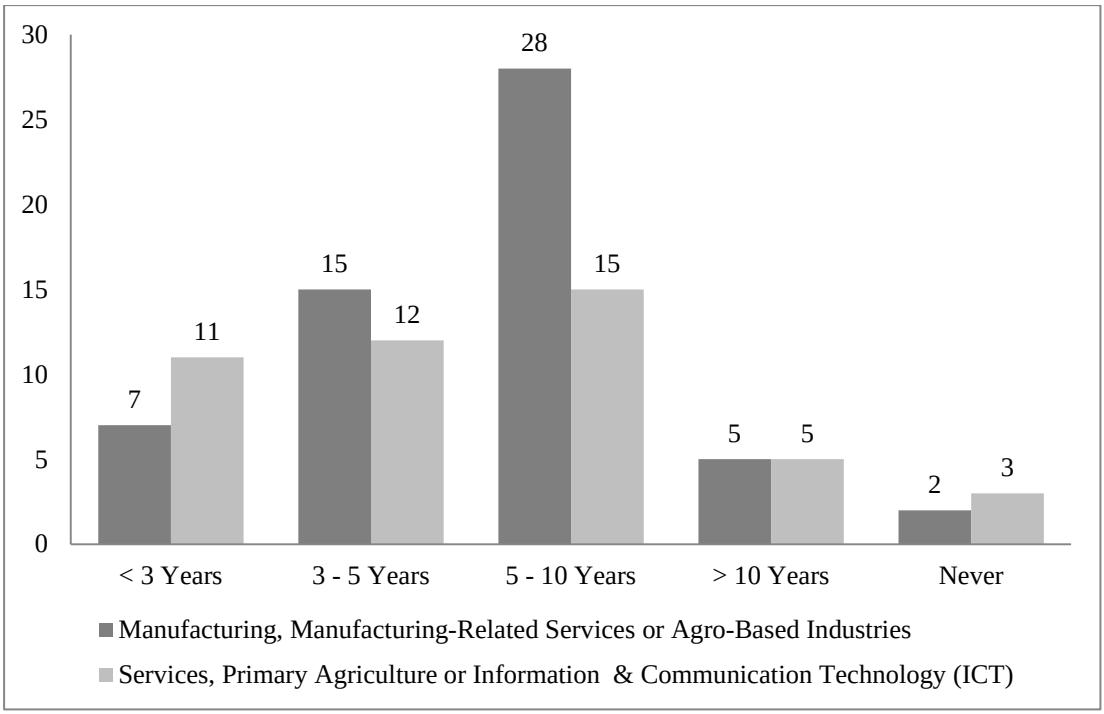

Figure 4.7 Years of using internet for business purposes

4.2.7 Reason for using Internet

Figure 4.8 summarizes the internet usage reason among Malaysian SMEs. The figure indicates that internet usage for emailing ranking at the top which shows that most of the SMEs are using email as communication channel for their business. This finding is substantiates previous research that email is the most widely adopted e-commerce (Tanburn & Singh, 2001). Payne (2002) discovered that email is the most cost effective and easy e-commerce activity. The next most popular usage of internet among is the Malaysian SMEs is for information search. Nowadays, the digital divide is borderless where the information is just at fingertips. SMEs would be able to look out for any kind of information needed for their information gathering and research to support the business. The statistics also shows that 78 out of 103 companies use internet for their company corporate website. Corporate website is not just a medium for representation of the company, but it is a form of media from

which everybody can acquire information about the company, services or products offered, and business contacts.

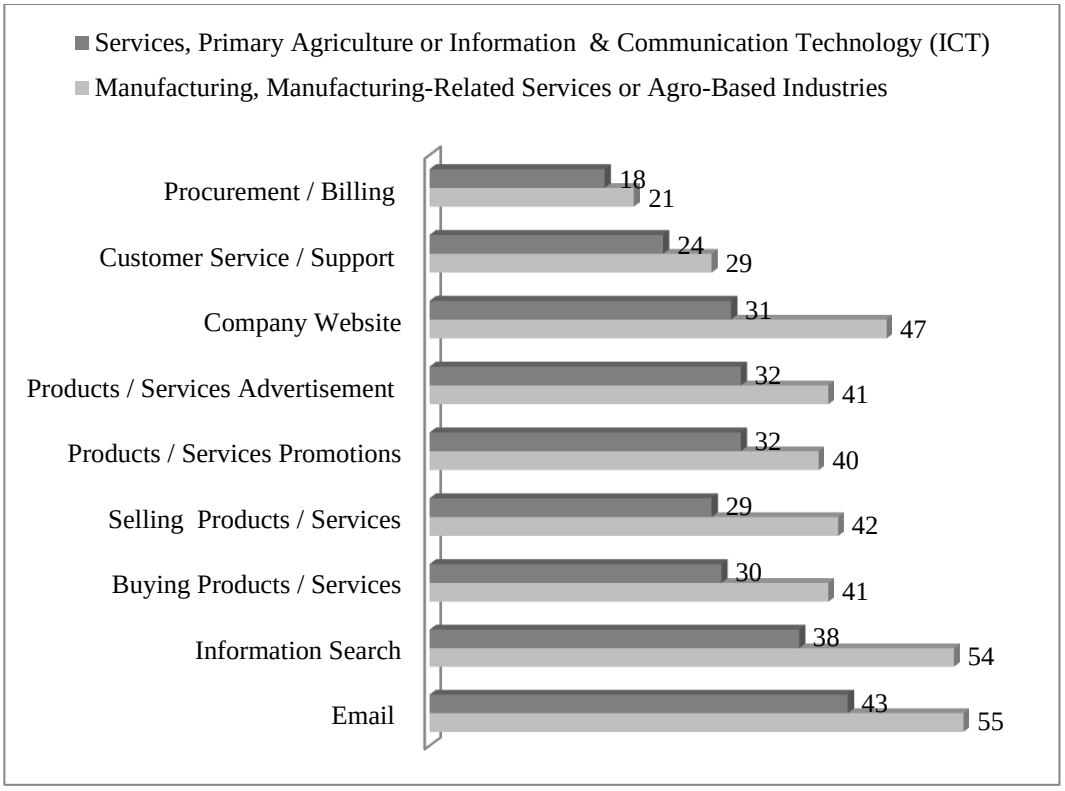

Figure 4.8 Reason for using internet

4.2.8 Reason for Not Using Internet

From this study, it shows that only five companies had never used Internet (Figure 4.9) for their business. According to the responses, looks like the norms of the companies which did not embrace internet in their business doesn't require internet to operate their business and three out five respondents indicate financial constraint as the factor not to use internet.

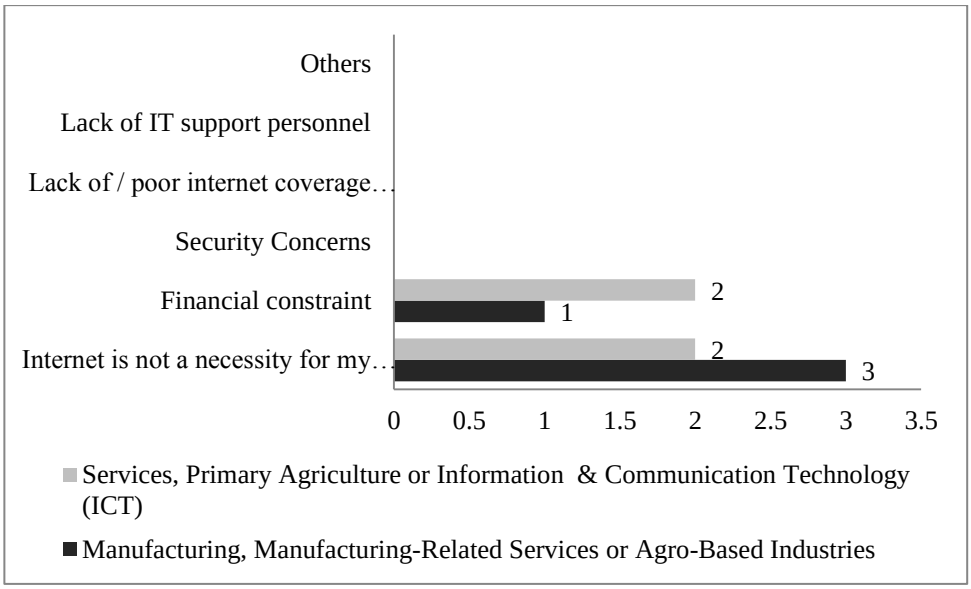

Figure 4.9 Reason for not using internet

4.3 **Reliability and validity of the constructs**

The Cronbach's alpha is used to test the internal reliability of each of the composite constructs. The reliability analysis conducted to find out to what extent the items in the survey were related to each other and to decide which items to keep and which item to exclude. The Cronbach's alpha, the measure of internal consistency, was used to determine the reliability of the measuring instrument (Gliner & Morgan, 2000). The purpose of the reliability analysis is to determine how well set of items taps into some common sources of variances (Viswanathan, 2005), and is frequently measured by Cronbach's alpha.

The Cronbach's alpha coefficients ranging from 0.833 to 0.911 that exceed the recommended value of 0.50 (Hair et. al., 1998). Based on this value, it shows a good internal consistency among scales employed in this study. Refer to Table 4.7 for the reliability measurement analysis for this study. These alphas equal to 0.945,

0.949, 0.940, 0.901 and 0.946 for perceived ease of use, perceived usefulness, behavioral control, subjective norms and intention to adopt.

According to Churchill (1979), a value of 0.60 or more indicates satisfactory internal consistency and reliability in explanatory studies. In measuring instrument, validity is one of the most important facts which should be demanded. In order to ensure data validity and reliability, this study has undergone pre-test by having the research supervisor to review it. As for reliability, all composite constructs show strong internal consistency which consequently the constructs validity of these concepts is considered acceptable.

Table 4.7 Reliability Measurement

Variable	Number of Items	Cronbach's Alpha
PEOU	5	.945
PU	5	.949
BC	5	.940
SN	5	.901
ADOPT	4	.946

4.4 Data Screening and Pre-Analysis

Pre-analysis and data screening is required to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. There are four reasons for screening the data prior conducting data analysis according to Mertler and Vannatta (2002) : (a) a researcher will not be able to discern the extent to which result are valid if inaccurate data are present, (b) a researcher should determine if data are missing and address this issue, (c) a researcher must assess the impact of

outliers and minimize their effect, if a distortion occurs, and (d) a researcher should assess the adequacy of fit between the data and procedural assumptions.

In order to assess the normality of the primary data, Figure 4.10 indicates histogram of normal P-Plot of regression standardized residual (Sahin & Thompson, 2007). The normal plot regression standardized residual for the dependent variable from four independent variables indicates a relatively normal distribution. Hence, parametric tests can be applied to primary data.

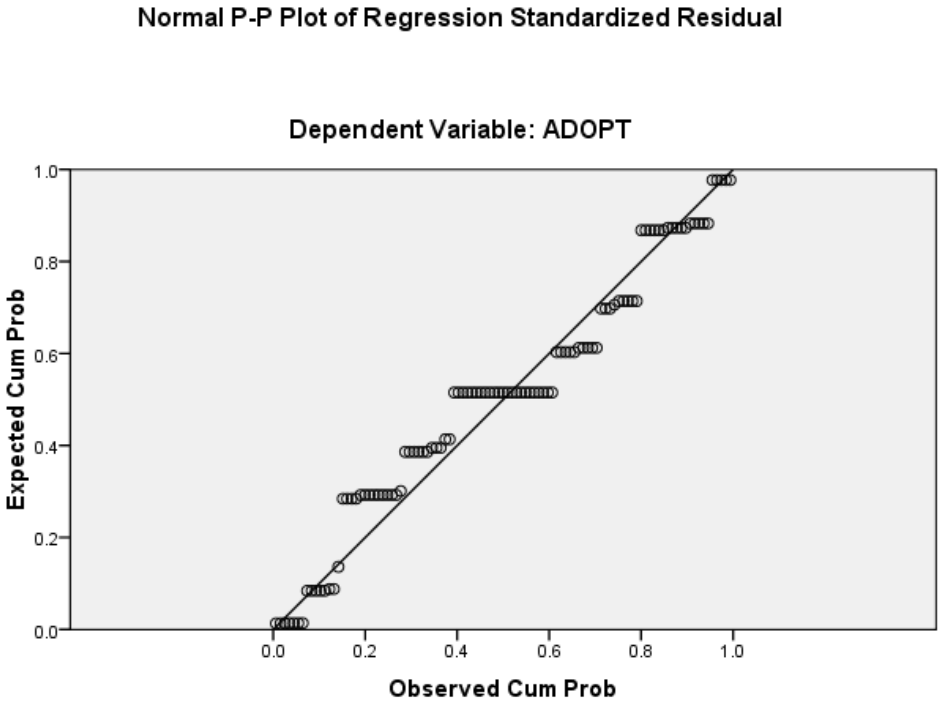

Figure 4.10 Histogram of Normal P-P Plot of Regression Standardized Residual

4.5 **Multicollinearity diagnostic**

Multicollinearity refers to "the successive inclusion of additional variables that lift the collinearity of the full set of explanatory variables to a 'harmful' level" (Sekaran, 2003). It represents the degree in which one variable can be predicted by

the other variables in the analysis. The variance inflation factor (VIF) is the most common measure of multicollinearity. It may cause estimation problems if the VIF value is larger than 10. Calculating tolerance and VIF values are good measures to test multicollinearity (Hair et. al., 1998). Table 4.8 shows the VIF value of independent variables in this study which are in the range of 2.328 and 3.494, which is much lower than 10. Therefore multicollinearity issue does not exist.

Table 4.8 Test of Collinearity

Independent Variables	Collinearity Statistics	
	Tolerance	VIF
Perceived Ease of Use	.286	3.494
Perceived Usefulness	.406	2.463
Behavioural Control	.307	3.262
Subjective Norms	.429	2.328

According to Hair et. al (1998), tolerance value should be within the range of 0 to 1. VIF values should vary between 1 to 10, in which the value should not be closer to 10 and the closer to 1 is the better.

4.6 **Descriptive Statistics**

Table 4.9 describes the descriptive statistics for the variables used in this study. The table shows minimum, maximum, standard deviation, skewness and kurtosis for all variables. The minimum and maximum value are showing that all variables are consistently within the point of scale that have been measured (from 1 to 5). Out of all variables item, SN3 had the lowest mean score (3.47), while ADOPT2 at the highest mean score (4.15).

Skewness measures the symmetry of distribution. According to Hair et. al (1998), any skewness value which fall outside the range (-2 - +2), indicates a slight skewed distribution. However, according to kurtosis, any kurtosis value which falls inside the range of -1 to +1 are normally distributed. In this study all variables fall inside the range of -2 to +2 of skewness which indicates the skewness is not seriously violated. Since the variables distributions are not far different from the normal distribution range values, therefore the distribution is normal and parametric analysis is being carried out.

Table 4.9 Descriptive Statistics

Items	Mean	Skewness	Kurtosis
PEOU1	4.01	-0.02	-1.32
PEOU2	3.83	-0.41	-1.02
PEOU3	3.78	-0.35	-0.95
PEOU4	3.98	-0.09	-1.02
PEOU5	3.81	0.37	-1.36
PU1	3.83	-0.41	-1.02
PU2	3.86	-0.59	-0.68
PU3	4.00	-0.66	-0.84
PU4	4.04	-0.07	-1.62
PU5	3.68	-0.39	-1.34
BC1	3.99	0.02	-1.52
BC2	3.71	-0.41	-0.70
BC3	3.92	0.02	-1.17
BC4	3.80	-0.36	-1.00
BC5	3.76	-0.40	-1.47
SN1	3.74	0.44	-1.30
SN2	3.60	-0.36	-0.53
SN3	3.47	-0.11	-1.33
SN4	3.81	0.36	-1.27
SN5	3.77	-0.43	-0.74
ADOPT1	4.04	-0.46	-1.10
ADOPT2	4.15	-0.73	-0.79
ADOPT3	4.11	-0.21	-1.70
ADOPT4	3.82	-0.36	-1.00

4.7 **Multiple regression**

In order to analyze and examine the factors influencing the adoption of the internet-based ICT among Malaysian SMEs, standard multiple regression analysis is used to test the research framework. The general purpose of multiple regressions is to learn more about the relationship between several independent or predictor variables and a dependent or criterion variable. It is used to account for (predict) the variance in an interval dependent, based on linear combinations of intervals, dichotomous, or dummy independent variables (Garson, 2005). Multiple regressions would be able to establish that a set of independent variables explains a proportion of the variances in a dependent variable at a significant level (significance test of R square), and can establish the relative predictive importance of the independent variables (comparing beta weights) (Garson, 2005).

The dependent variable (ADOPT) is respondent's self-reported adoption intention of Internet-based ICT among Malaysian SMEs to support their business. To test the proposed hypotheses, multiple regression analyses are conducted on the constructs: perceived ease of use (PEOU), perceived usefulness (PU), behavior control (BC), subjective norms (SN) and intention to adopt (ADOPT). In this study, regression analyses are used to study the direct effect of adoption drivers among Malaysian SMEs to adopt Internet-based ICT in their business. The concern of this model is whether the variables have the influence as per hypothesized. For this purpose, multiple regressions is conducted to analyze the direct relationship between perceived ease of use (PEOU), perceived usefulness (PU), behavior control (BC) and subjective norms (SN) with Intention to adopt (ADOPT).

Part of the criteria for successful regression is that the selection of the independent variables should be based on their theoretical relationship to the dependent variable (Hair et. al., 1998). Since all the variables in this study were chosen based on past researches with solid theoretical base supporting the choice of these variables, the criteria should be satisfactory fulfilled.

4.8 Direct Effect on Intention to Adopt

The regression analysis is used to analyze the relationship between perceived ease of usefulness (PEOU), perceived usefulness (PU), behavior control (BC) and subjective norms (SN) with intention to adopt (ADOPT). The correlation between the independent variables and intention to adopt (ADOPT) are high (R=0.898). The adjusted R^2 is at 79% which means that the model, or the drivers of adoption, significantly explains 79% of variance in the intention to adopt Internet-based ICT. Hence, this shows a good proportion for this study, and it shows that the model has been well constructed. Table 4.10 summarize the regression analysis result.

Table 4.10 Regression Analysis: Model Summary

Mode	R	R Square	Adjusted R Square
1	.898[a]	0.806	0.798

Predictors: (Constant), PEOU, PU, BC, SN

Table 4.11 Regression Analysis: Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-0.424	0.250		-1.697	0.093
PEOU	1.114	0.107	0.867	10.423	0.000
PU	0.371	0.082	0.318	4.551	0.000
BC	-0.361	0.097	-0.299	-3.716	0.000
SN	0.011	0.086	0.009	0.126	0.900

Dependent Variable: ADOPT

Perceived ease of use (PEOU), Perceived Usefulness (PU), Behavioral control (BC) and Subjective norms (SN) were found to have a positive influence on the Internet-based ICT adoption intention. The positive influence of PEOU, PU and ADOPT suggested by TAM is confirmed by the findings. This suggests that ease of use of the technology and the degree in which the Malaysian SMEs is satisfied with the Internet-based ICT to support their business are imperative in predicting the potential Malaysian SMEs intention towards the adoption. Perceived ease of use, perceived usefulness and subjective norms has been found to be antecedent of the intention to adopt Internet-based ICT. While on the other hand behavior control was found not significant towards intention to adopt. From this coefficient table of regression analysis (Table 4.11) , perceived ease of use was found to be the only independent variable with a most significant impact on intention to adopt (b=.867, p<.000) when all of the variables were entered into regression equation. Malaysian SMEs most likely intend to adopt Internet-based system in their business as they believe that Internet-based ICT adoption would be free from effort. The most striking and puzzling findings was subjective norms had an insignificant impact towards the intention to adopt Internet-based ICT in Malaysian SMEs business (b=0.009,

p>.000). This somehow contradicts previous findings that grasped the effect of subjective norms on technology acceptance. Details findings are presented below.

4.8.1 Perceived ease of use and Intention to adopt

The result of regression test shows that the standardized path coefficient is 0.867, which is significantly at 0.05 level. Therefore, the first hypothesis is supported and this result indicates that perceived ease of use influences intention to adopt Internet-based ICT. The result corresponds to the prior research that perceived ease of use has been found significantly influence intention to adopt the technology. Perceived ease of use is defined as the degree to which an individual believes that using computer or computerized system will be free from physical and mental efforts (Davis, 1989). Hence an application perceived to easier to use than another is more likely to be accepted by users. David also suggests that perceived ease of use may actually be causal antecedent to perceived usefulness.

4.8.2 Perceived usefulness and Intention to adopt

The result shows that standardized path coefficient is 0.318 which statically significant at 0.05 level. There is a positive relationship between perceived usefulness and intention to adopt Internet-based ICT. With this finding, the second hypothesis is supported. This empirical data shows that the relationship between PEOU and PU are consistent with previous TAM research. Therefore, the results support the robustness of TAM in studying antecedents to consumer adoption of different type of information technology. The significance relationship between perceived usefulness and intention to adopt support perceived usefulness as a good

measure to predict any emerging of existing and new technology. This finding corresponds to the same model used by Jantan, Ramayah & Chin (2001) in studying various factors influencing personal computer acceptance by small and medium sized companies.

4.8.3 Behavioral control and Intention to adopt

Based on the result, it shows that standardized path coefficient is -0.299 which is statistically significant at the 0.05 level ($p < 0.05$). Consequently, there is negative relationship between behavioral control and intention to adopt, because t-value is -3.716. Thus, the third hypothesis is accepted and shows that behavioral control influences the Internet-based ICT adoption among Malaysian SMEs. Behavioral control has been shown to have an effect on the key dependent variable such as intention and behavior in variety of domains (Ajzen, 1991). The existence of relationship between behavior and intention has been documented (Ajzen & Fishbein, 1975).

4.8.4 Subjective norms and Intention to adopt

The result of shows that standardized path coefficient is at 0.009 which is not statically significant at 0.05 level ($p > 0.05$), and consequently does not support H_4. Hence the path from subjective norm to intention to adopt failed to achieve significance. Therefore this fourth hypothesis is rejected and this indicates that subjective norms do not significantly influences the intention to adopt Internet-based ICT among Malaysian SMEs. The lack of significant subjective norms (SN) also found in prior research. This is in accord with the result of Mathieson (1991) that

found subjective norms posed insignificant effect towards intention. According to Shih & Fang (2004), behavioral intention was not predicted by subjective norms.

4.9 Analysis Summary

This chapter four presents the data analysis of the study that focused on examining the research model in Figure 3.1 and it consists of three sections. The first section described the respondents' profile crosstab analysis. The second section demonstrated the goodness-of-fit indexes for the measurement model and reliability of validity of the measurement and instruments. In the next section, the hypothesis tests are examined using data analysis and results are presented to assess the direct effect between the independent variables and the dependent variables in this study. Specifically, the data analysis procedures used to test the research hypotheses and proposed model are as the following (a) descriptive analysis statistic on the response (b) multiple regression on the direct effect of the hypotheses. Subsequently, the following chapter five presents the conclusion and recommendation based on the research analysis. Table 4.12 summarizes the finding of this study based on the analysis performed.

Table 4.12 Summary of research findings

Hypothesis	Statement	Result
H1	Perceived Ease of Use has relationship with Intention to Adopt	Supported
H2	Perceived Usefulness has relationship with the Intention to Adopt	Supported
H3	Behavioral Control has relationship with the Intention to Adopt	Supported
H4	Subjective Norms has relationship with the Intention to Adopt	Not Supported

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter presents the conclusion and recommendation based on the research findings in Chapter four. This chapter will summarize the study which has been conducted. Included in this chapter are the review of the purposes of the study, restatement of the research questions, research methodology used and the summary of the study result, conclusion and discussions. Recommendations for further, future research and possible studies concluded this chapter.

5.2 Summary

5.2.1 Purpose of the study

The purpose of this study is to determine the factors which influence Internet-based ICT adoption among Malaysian SMEs.

5.2.2 Assessment of Research Objectives

The general objective of this study is to identify and understand the factors that possibly predict the intention to use Internet-based ICT among Malaysian SMEs in supporting their business. As described in problem statement, it is quite discouraging to know that there is a poor rate of ICT adoption among local Malaysian SMEs despite a lot of programs and grants supported by the government

of Malaysia. The generic objective is narrowed down into several specific objectives.

First objective is to assess current Internet-based ICT usages among Malaysian SMEs. The questionnaire has been distributed using self-stamped postal mail and online survey (using Survey Monkey). One hundred and fifty questionnaires distributed respectively using both online and offline method. There are one hundred and three respondents participated in this study (34.33 per cent response rate) with the. Nineteen responses (18.45 per cent) were received through postal mail, and the remaining 84 responses (81.55 per cent). Fifty seven respondents (55.3%) are from manufacturing SMEs and the remaining 46 (44.7%) are services type of SMEs. In term of number of employees, most of the manufacturing SMEs employ 5-50 full-time employees (67%) out of fifty seven manufacturing SMEs. While on the other side of services based SMEs, most of the SMEs most of the services type of SMEs employs 5-19 full-time employees, which constitutes 43% out of forty six respondents. Service types of SMEs are generally smaller in full time employee size if compared to manufacturing type of SMEs.

From the perspective of company annual sales turnover, manufacturing SMEs make between RM250, 000 and less than RM10 million of annual sales turnover. While services type of SMEs are making RM200, 000 to less than RM1 million of annual sales turnover. In considering the total number of full time employees and annual sales turnover, most of the SMEs who responded to this survey can be categorized as small-scaled manufacturing and services SMEs based on NSDC SMEs definition (2005).

Most of the respondents are local or domestic owned companies except a relatively small number of companies are foreign or joint venture type of SMEs. With the majority of the companies are started and established before January 1997, this number shows that a lot of the respondents are from the company which started before the official launched of MSC in 1997.

The second objective is to determine the acceptance level of Internet-based ICT among Malaysian SMEs.

It is a positive indication as the most popular internet-based ICT usage is for communication (email) and information search. From the one hundred and three respondents, ninety eight SMEs are using email to support their business. This findings substantiates the previous researchers' studies that emailing is one of the most common activities in ICT. Tanburn and Singh (2001) found out that e-mail is the most widely adopted e-commerce. Hussin and Noor (2005) discovered that Malaysian SMEs used internet mainly for emailing and seeking information. Alam et. al. (2007) found similar result in the usage pattern and found out that there is a significant portion of Malaysian SMEs used email as communication channel. The second most popular internet usage among the Malaysian SMEs is for information search and corporate website. This is a good indication of the acceptance level and perception of the Malaysian SMEs towards Internet-based ICT.

The third objective is to identify the hindrance factor which prevents Malaysian SMEs from adopting and using Internet-based ICT to support their business.

Based on the analysis of this study, there are a quite small number of companies which never used Internet-based ICT to support their businesses (five out of one hundred and three). Five SMEs do not t think that internet is a competitive or necessary tool in their business and three SMEs indicate that the financial constraint as the reason for not to use internet-based ICT. However, "Internet is not necessity for my business" should not be a reason because internet application such as e-mail such as Gmail, Yahoo mail and social networking such as Facebook and tweeter nowadays are common to community. E-mail and social networking can be used at the low cost mean of advertisement and communication which may support the business. Using financial constraint as the reason may meant SMEs may have limited budget or Internet-based ICT is not the investment priority in the business. This findings suggest that SMEs have sensed views and beliefs of the existence of limited financial capabilities for adopting and investing in information technology (Cohan & Peslak, 2005)

Levy et. al. (2001), found out that SMEs restricted information system investment with many investing at start-up, but there is no further investment until the business outgrows existing system. Other potential reason of the financial constraint which indicated by Malaysian SMEs as the hindrance of using Internet-based ICT is could be due to the lack of awareness of the assistance or incentives provided by the government or respective agencies in encouraging the ICT adoption among the SMEs.

The fourth objective is to determine the Internet-based adoption factor.

The four factors: perceived ease of use, perceived usefulness, behavioral control and subjective norms 82.6 per cent of variance in Internet-based ICT adoption. Perceived ease of use, perceived usefulness and behavioral control are found to be statistically and significantly influence the Internet-based ICT adoption intention with the perceived ease of use is the strongest predictor, followed by perceived usefulness and behavioral control. Subjective norm is not significantly influence on Internet-based ICT adoption in this study.

Perceived ease of use as a significant predictor in Internet-based ICT adoption is in an accord with the result of the previous researchers' studies. Davis (1993) found out that there is a direct effect of perceived ease of use towards using a system and actual system use. Since TAM also applied to the online business, perceived ease of use also has been found to be a significant of antecedent towards adopting online store (Moon et. al., 2001)

Perceived usefulness is significant predictors in influencing Internet-based ICT adoption. Previous studies from different researchers have found that perceived usefulness is significant in affecting the ICT adoption. Ndubisi (2007) found out that perceived usefulness and perceived ease of use were strong determinants of behavioral intention to adopt internet banking. The positive effect of perceived usefulness towards behavioral intention to use online retailer has been supported by scholars (Gefen & Straub, 1997) (Koufaris, Kambil, & LaBarbera, 2002). Their studies supported prior research findings in that they found that there was a

significant effect of perceived usefulness on intention to adopt in the online distribution context.

Behavioral control is significant predictors in influencing the Internet-based ICT adopting among Malaysian SMEs. The result corresponds to the prior research that behavioral control has been found to significantly influence behavioral intention to adopt. The existence of a strong relationship between intention to adopt and behavior control has been documented (Ajzen & Fishbein, 1975). Mathieson (1991) found that control is significant determinant of intention to adopt technology. In general behavioral control is composed of elements of individual constraint that are related to the individual user's economy, experience, and skill in using a service. The similar pattern of result found by Taylor and Todd (1995) which is consistent with the previous studies that the perceived behavioral control directly influence intention to adopt.

Subjective norm is not a predictor to influence Internet-based ICT adoption. Even though Ajzen (1991) proposed that intention can be predicted by subjective norm, the result of this study has showed that this is not the case for Malaysian SMEs intention towards the intention to adopt Internet-based ICT In general, a subjective norm is defined as “the social pressure to perform or not to perform the behavior” (Ajzen, 1991). It is related to normative belief about the expectation from other people either through interpersonal and external influences. A person may perform a behavior in order to comply with his or her important referents regardless his own perceived and attitudes towards the behavior. The lack of significant subjective norms towards behavioral intention also found in prior research. Mathieson (1991)

found that subjective norm has no significant effect on intention. According to Mathieson (1991), Liao et. al. (1999) and Shish & fang (2004), behavioral intention was not predicted by subjective norm.

5.3 **Theoretical and practical implication**

This study has significant implications for research on ICT adoption among the SMEs. The participants of this study responded to sixteen questionnaires in the distributed survey. One hundred and three respondents expressed the answers and views based on their sense of evidence of lived experiences about Internet-based ICT adoption from the enterprise context. The result suggests that factors identified are capable of providing an adequate explanation of SMEs' entrepreneur adoption decision making process towards Internet-based ICT. With the arrival of Internet-based ICT the notion of uncertainty is introduced into technology acceptance because SMEs are required to use internet in order to communicate, collaborate and transact within and without organizational barriers. While conventional SMEs is well described by economic and marketing theories, overwhelming evidence suggests that technology related variables such as Internet-based ICT adoption is become important elements which contributes to the SMEs efficiency and competitiveness.

Besides explaining the factors of ICT adoption among the Malaysian SMEs, this study also provides useful insights into knowledge gap in understanding ICT adoption among the SMEs. At the same time, government has to increase its effort to increase the awareness among SMEs about the potential benefits of ICT to small and medium enterprise. The government may have to either enforce training or provide

some inducement to encourage SMEs to implement and further adopt ICT to support their business.

In reviewing the factor which hinders the SMEs towards adopting Internet-based ICT to support their businesses are financial constraint and the inappropriateness of the Internet-based ICT for their business. According to past studies which conducted within the same technology acceptance context, the financial constraint or lack of fund suggests three challenges threaten the sustainability and competitiveness of the enterprise. The first implication stems from the lack of tactical investments in technology resulting in mixed results from information technology (IT) proposals. The second implication might due to difficulties in quantifying the impact of technology in, which will negatively affect SMEs (Cohan & Peslak, 2005). The third implication is technology adoption rates, which stems from companies applying less proper technology initiatives promoting sustainability and growth in the SME organization. Another factor identified from this study is the respondents feel that the Internet-based ICT seems to be inappropriate for the business. In this digital era, information and communication technology is part of human life, for example information search is just at fingertips. The sensed lack of benefits from the technology investment in SMEs may cause another problem. This gap should be eliminated by providing thorough awareness of the benefits, efficiency and capabilities of the Internet-based ICT in evolving and supporting SMEs businesses and eventually to be competitive in the globalization.

5.4 **Suggestion for future research**

It is recommended that future research to thoroughly analyze the generic sector of manufacturing and services type of SMEs. This study use a general categorization of Malaysian SMEs for example services, primary agriculture and information and communication technology into a single category as outlined by SME Corp Malaysia. Same goes to manufacturing sector where this study categorize manufacturing, manufacturing related services and agriculture. Future research might want to study in thorough for each sub sector within manufacturing and services generic sector to have a deep dive understanding of the factors of Internet-based ICT adoption for each one respectively.

Another area of research might be a comparative study of Internet-based ICT adoption by industry, company size and gender. Alexander (2006) found out that the technology level use differ from one industry to one another. Further investigation by industry, company size, and gender might explain that organization in specific demographic segments might set up a unique approach to investment and adoption of technology that can create a successful model for other SMEs.

Future studies might want to investigate Internet-based ICT adoption to compare the adoption behavior among the region in Malaysia. For example to study about the Internet-based adoption behavior among northern, western or eastern region of Malaysia. This would help to build knowledge about Internet-based ICT adoption situation in other regions of Malaysia Therefore, researchers can discover growth and development of Internet-based ICT either regionally or nationally

To further extend the future study into comprehensive and global study, future research also may look into comparisons of Internet-based ICT adoption between Malaysia and other developing countries like Singapore, Thailand, Vietnam, Indonesia and the Philippines. This type of study presents and compares growth, development and trend of ICT in the South East Asian region.

5.5 **Conclusion and Recommendation**

The pertinent research results indicated that the current Internet-based ICT perception and adoption level among the Malaysian SMEs have not progressed to the expected stage adoption for example not all SMEs have use internet to publish their corporate website, and not all companies use internet as information search tool. The major implication of this study expressed crucial need for Malaysian government and related supporting parties or organization develop extensive plan in promoting Internet-based ICT among the SMEs

There are lot of available improvement can be driven to improve awareness among the SMEs by the governments or respective agencies. Advertisement through online and offline channel such as radios, television, banners, newspaper and campaign to highlight the advantages of adopting and using ICT in the business. For example, recent television advertisement from TM on the use of ICT can lead to more customer calls, reduce administration cost, and easier data storage (http://www.tmsme.biz). Such promotional activities can help SMEs to understand the relative advantage of ICT usage. This campaign and advertisement should goes not only to the major cities but throughout all states in Malaysia to reach all SMEs at

respective areas. Another way to enhance the to use of ICT in the SMEs sectors, that the government should enforce standardized, consistent and uniform policies in all SMEs sectors, agencies or subsidiaries in implementing ICT system.

Internet infrastructure should be made available nationwide regardless in rural or urban areas. The convenience of internet access everywhere in the nation can encourage people to use the internet services and keep them connected to the world. For example, Penang state launched a project called "Penang Free WiFi" in September, 2008 in which provides free wireless throughout the state and makes the state as first WiFi (Wireless Fidelity) state. (Filmer, 2008).

More telecommunication licenses should be given. Government can encourage healthy competitions among telecommunication providers by giving more Licenses to them so that they can provide low-cost wireless Internet connection across the nation. The number of Internet users will increase too.

In order to encourage e-commerce and e-business, SMEs should provide discounts for online purchasers. Cheaper products or services sold online definitely can encourage Internet users to make online purchases. Thus, the usage of the Internet particularly e-commerce and e-business will likely boost too.

It is undeniably that Malaysian government has put in considerable efforts in the development of nationwide ICT. Comprehensive ICT plans have been devised and implemented within the past decade. These comprehensive plans are translated into reality by setting up of hardware infrastructure such as Multimedia Super

Corridor in 1997 to kick off all ensuing ICT projects throughout the nation. The initiative was also responsible to enhance ICT policy enforcements such as Communications and Multimedia Commission Act in 1998 to protect ICT users nationally and internationally. The 10th Malaysia Plan clearly articulates the central role of ICT (information and communications technology) as the bedrock for the nation to vault forward to a high-value economy.

Nevertheless, if there is no positive support and collaboration from SMEs, the possibility of an increased ICT implementation throughout the industries in Malaysia may be unattainable. While the Government can play a part by providing financial aid in the form of grants and other incentives, SMEs themselves need to be a believer of ICT as an enabler towards a better business future. The encouraging evidence is that manufacturing and service SMEs are currently using the Internet for e-mail activities and information search.

REFERENCES

Borneo Post. (2012, May 24). Retrieved Feb 16, 2013, from Borneo Post: http://www.theborneopost.com/2012/05/24/smes-expected-to-contribute-62-pct-to-employment-by-2020/

Digital Malaysia. (2012, Sept 19). Retrieved Feb 24, 2013, from Digital Malaysia: http://www.perdana.org.my/ceoforum/wp-content/uploads/2012/09/Plenary-Session-Datuk-Badlisham.pdf

MSC Malaysia Annual Industry Report. (2012). Multimedia Development Corporation Sdn. Bhd.

The Star Online. (2012, Dec 21). Retrieved Feb 24, 2013, from Global report ranks Malaysia among the most ICT-enabled: http://biz.thestar.com.my/news/story.asp?file=/2012/12/21/business/12478937&sec=business

www.internetworldstats.com. (2012, June 30). Retrieved February 12, 2013, from Internet World Stats: http://www.internetworldstats.com/stats.htm

Ajzen, I. (1991). *The Theory of Planned Behavior : Organisational Behavior and Human Decision Processes*, 50, 179-211.

Ajzen, I. (2001). *Nature and operation of attitudes. Annual Review of Psychology*, 52, pp. 27–58.

Ajzen, I., & Fishbein, M. (1975). *Belief, attitude, intention, and behavior*. .

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*.

Alam , S., Khatibi, A., Ismail , H., Ismail , B., & Ahmad, S. (2007). Factors Affecting E-Commerce Adoption in the Electronic Manufacturing Companies

in Malaysia. International Journal of Commerce and Management. 17(1/2), 125-139.

Alam, S. (2009). ICT Adoption in Small and Medium Enterprises : an Empirical Evidence of Service Sectors in Malaysia. Vol 4. No. 2.

Alam, S., Khatibi, A., Ismail , H., Ismail, B., Hishamuddin, & Ahmad, S. (2005). Perceived Benefits of E-Commerce Adoption in the Electronic Manufacturing Companies in Malaysia. *Journal of Social Sciences,*, 1(3), 188-193.

Alexander, C. (2006). *A study of environmental, organizational and information technology issues in e-business adoption and assimilation in small firms (Doctoral Dissertation).* ProQuest Dissertations & Theses (Publication No. AAT 3229854).

Alexander, C. (2006). A study of environmental, organizational and information technology issues in e-business adoption and assimilation in small firms. (Doctoral dissertation). 31.

Association for Progressive Communications . (2012). *Association for Progressive Communications*. Retrieved March 6, 2012, from http://www.apc.org/en/glossary/term/259

Babbie, E. (1990). Survey Research Methods (2nd ed.). California: Wardsworth Publishing Company.

Basyir, A. (2000). A Model of Consumers' Acceptance of Internet Shopping. *MBA thesis, School of Management, Universiti Sains Malaysia, Penang*.

Bernadas, C., & Verville, J. (2005). Disparity of the infusion of e-business within SMEs . A global perspective. International Journal of Technology Management. 31(1/2),39-46.

Bernama. (2012, February 12). *Malaysia among top 3 in economic impact of Internet study*. Retrieved February 12, 2013, from New Straits Times: http://www.nst.com.my/latest/malaysia-among-top-3-in-economic-impact-of-internet-study-1.40267

Burgess, & Ed, S. (2001). Managing Information Technology in Small Business. *Challanges and Solutions* .

Burns, S., & Bush, R. (2000). Marketing Research. USA: Prentice Hall.

Chapman et al. (2000). Building Internet capabilities in SMEs. *Logistic Information Management*, 353-360.

Chapman, P., James-Moore, M., Szczygiel , M., & Thompson, D. (2000). Building Internet Capabilities in SMEs. Logistics Information Management. 13(6), 353-360.

Chaston et. al. (2001). E-commerce: An Opportunity to Examine Organizational Learning in Process. *International Journal of Small Business*, 13 - 30.

Cheung et. al. (1999). Relaxing the Theory of Planned Behavior in understanding waste paper recycling . *Environment and Behavior*, 31(5), 587-612.

Chong, S., Pervan, G., & Bauer, C. (2001). Implementation Success of Internet-based Electronic Commerce for Small-and Medium-sized Enterprises in Australia. *14th International Bled Electronic Commerce Conference, Bled, Slovenia, June 25-26.*

Cohan, P., & Peslak, P. (2005). CFO's to tech: I'll spend for the right technology. Financial Executive,. 21(3), 30-34.

Croxall, K. (2002). *Family and consumer sciences preservice teachers' computer technology preparation.* Retrieved March 19, 2013, from http://proxy.lib.iastate.edu:2048/login?URL=http://proquest.umi.com.proxy.li

b.iastate.edu:2048/pqdweb?did=726479721&sid=1&Fmt=6&clientId=60760&RQT=309&VName=PQD

Davis et al. (1989). User Acceptance of Computer Technology. *A Comparison of Two Theoretical Models, Management Science,* 982-1003.

Davis, F. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Computer Technology. *MIS Quarterly*, 319 - 339.

Denscombe, M. (1998). The Good Research Guide for Small-scale Social Research Projects, Open University Press, Buckingham.

Descombe, M. (2000). Good the Research Guide; for small scale social research projects. Open university Press. Buckingham, Philadelphia.

Eagly, A., & Chaiken, S. (1993). The Psychology of Attitudes.

EPU. (2000). *The Third Outline Perspective Plan: 2001-2010. Economic Planning Unit . Prime Minister Department, Putrajaya, Malaysia.*

Filmer, A. (2008). *Penang Launches Statewide Free WiFi Project. In TheStar Online [Online]*. Retrieved 3 21, 2013, from http://star-techcentral.com/tech/story.asp?file=/2008/9/18/penang/20080918104832&sec=penang

Fink, A. (2009). How to conduct surveys: a step-by-step guide. Los Angeles: SAGE.

Fishbein, & Ajzen. (1975). *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research.*

Fok , C. (2001). Self-efficacy of An Individual on Internet Use In Organizations. *MBA Thesis, School Of Management, Universiti Sains Malaysia, Penang*.

Fong, C. (2002). *Keynote address by the Minister of Human Resources in conjunction with the launching of the seminar for small and medium industry (SMI) employers,May 21, 2002, Hotel Nikko, Kuala Lumpur, Malaysia.*

Fu, F., Richards, K., D, E., & Jones, E. (2010). Motivating salespeople to sell new products. *Journal of Marketing*, 61-76.

Garson, G. (2005). Multivariate Analsyis in Public Administration. Vol. 2005, North Carolina: College of Humanities and Social Sciences.

Gefen, D., & Straub, D. (1997). Gender differences in the perception and use of email: An extention to the technology acceptance model, MIS Quarterly. 21(4), 389-400.

Gliner, J., & Morgan, G. (2000). Research methods in applied settings: An integrated approach to design and analysis. Hillside, New Jersey: Lawrence Erlbaum Associates.

Hair et. al. (1998). Multivariate Data Analysis with Readings .

Hamel, G. (1998). Changing the rules of the game, Business Strategy Review. *The challenge today*, 19-26.

Hamid, H. (2009, Oct 5). *New Straits Times*. Retrieved Feb 16, 2013

Hamill, J., & Gregory, K. (1997). Internet Marketing in the Internationalisation of UK SMEs. *Journal of Marketing Management*.

Hassan, S. (2010). *Integrating ICT in Teachnig and Learning : Country Report : Malaysia.*

Hobson, S. (2000). Making an e-fit. *Conspectus*, 20-1.

Hung , S., Ku, C., & Chang , C. (2003). Critical Factor of WAP services Adoption: An Empirical Study . Electronic Commerce Research & Application. 2(1), 42-60.

Jantan, M., Ramayah, T., & Chin, W. (2001). *Personal Computer Acceptance By Small and Medium Sized Companies Evidence From Malaysia*, 3 (1), 1-14.

Jantan, M., Ramayah, T., & Chin, W. (2001). Personal Computer Acceptance By Small and Medium Sized Companies Evidence From Malaysia. *Jurnal Manajemen & Bisnes*, 1-14.

Jeong, N. (2007). *Principles of Public Administration: An Introduction.* Karisma Publications.

Karahanna et. al. (1999). Information Technology Adoption Across Time: A cross sectional comparison of pre-adoption and post-adoptiuon beliefs. *MIS Quarterly*, 23(2), 183-213.

Karkoviata, L. (2001). SMEs reluctant to go online, Asian Business . 37(4), 75-76.

Khodadadi, M., Keivani, F., & Jouzbarkand, M. (2011). Conceptual Evaluation E-commerce, objectives and the necessary infrastructure ; 2011 International Conference on Innovation, Management and Service.

Kinnear, T., Taylor, J., Johnson, & Armstrong. (1993). Australian Marketing Research. Sydney: McGraw-Hill.

Koufaris, M., Kambil, A., & LaBarbera, P. (2002). Consumer Behavior in web based commerce: an empirical study. International journal of Electronic Commerce. Vol 6, No.2. 115-138.

Lange et al. (2000). SMEs and Barriers to Skills Development: A Scottish Perspective. *Journal of European Industrial Training*, 5-11.

Lau, S. (2002). Strategies to motivate broker adopting online trading in Hong Kong financial market. *Review of Pasific Basin Financial Markets and Policies*, 5(4), 471-489.

Lettieri, E., & Masella, C. (2006). Measuring the Value and Sustainability of Internet-based ICTs in Healthcare Organisations. International Journal of Healthcare Technology and Management. 7(3/4), 319-332.

Levy, M., Powell, P., & Yetton, P. (2001). SMEs: Aligning IS and the Strategic Context: Journal of Information Technology. 16(33), 133-144.

Liao, S., Shao, Y., Wang, H., & Chen, A. (1999). The adoption of virtual banking: an empirical study. International Journal of Information Management. 19(1), 63-74.

Lim, T. (2006, Aug). Retrieved from http:// www.infotech.monash.edu.my/news/media.html.

Lu et. al. (2003). Technology Acceptance Model for Wireless Internet. *Internal Research: Electronic Networking Applications and Policy*, 206-222.

Lucchetti, R., & Sterlacchini, A. (2004). The Adoption of ICT among SMEs: Evidence from an Italian Survey. Small Business Economics,. 23(2), 151-168.

Luck, D., & Rubin, R. (1987). Marketing Research (7th Ed.). USA: Prentice-Hall.

Madden et. al. (1992). A Comparison of the Theory of Planned Behavior and the Theory of Reasoned Action. *Personality and Psychology Bulletin*, 18, 3-9.

Mahalingam, E. (2012, Oct 6). *Recharging the SME industry*. The Star.

Marshall, C., & Rossman, G. (1999). Designing qualitative research SAGE Publication, Inc. 3.

Martin, L., & Matlay, H. (2001). *Blanket' approaches to promoting ICT in small firms: Some lessons from the DTI Ladder adoption model in the UK*.

Mathieson, K. (n.d.). Predicting user intention: Comparing the technology acceptance model with the theory of planned behavior . Information System Research. 2, 173-191.

Mehling, M. (1998). Small Businesses are Eager to Sell Wares on the Web. *Computer Reseller News* , 87,94.

Moon et. al. (2001). Extending the TAM for a Worldwide Context, Information and Management. 38(4), 217 - 230.

Moore, N. (2000). How To Do Research. The Complete Guide to Designing and Managing Research Projects, Library Association Publishing London.

Ndubisi, N. (2007). Customers' perceptions and intention to adopt Internet banking: the moderation effect of computer self-efficacy . 315 - 327 .

NEAC. (2010). *New Economy Model (NEM) for Malaysia.* . National Economic Action Council.

Normah, M. (2006). "SMEs: building blocks for economic growth". *National Statistics Conference, National Statistics Departments,* . Kuala Lumpur,.

Nysveen, H., Lexhagen, M., & Hem , L. (2005). Festival Cordination: An exploratory study on intention to use mobile device for cordination of festival. . 133-146.

O' Cass, A., & Fenench, T. (2003). Web Retailing Adoption: Exploring the nature of internet users web retailing behavior; Journal of Retailing and Consumer Services. 10,81-94.

Payne, J. (2002). E-Commerce Readiness for SMEs in Developing Countries: A Guide for Development Professionals. USA: Academy for Educational Development.

Pearson, J., & Grandon, E. (2005). An empirical study of factors that influence ecommerce adoption/non-adoption in small and medium sized businesses. *Journal of Internet Commerce,* 4(4), 1-21.

Peslak, A., Cecucci, W., & Sendall, P. (2012). An Empirical Study of Social Networking Behavior Using Theory of Reasoned Action. *Journal of Information Systems Applied Research*, 12-23.

Pires, G., & Aisbett, J. (2001). A dual Marketing and Informational Perspective to E-Commerce Adoption. A Newcastle University Research Publications.

Poon, S., & Swatman, P. (1998). A Combined-method Study of Small Business Internet Commerce. *International Journal of Electronic Commerce*, 31-46.

Poon, S., & Swatman, P. (1999). *An exploratory study of small business Internet commerce issues. Information & Management*, 35, 9-18.

Ramayah, T., Siron, R., Dahlan, N., & Mohamad , O. (2002). Technology Usage Among Owners/Manager of SMEs: The role of demographic and motivational variables. *The Proceedings of 6th Annual Asia-Pacific Forum for Small Business on Small and Medium Enterprise Linkages*, 112-145.

Ramsey et. al. (2003). E-opportunities of Service Sector SMEs. *An Irish Cross border Study, Journal of Small Business and Enterprise Development*, No. 3, pp. 250-64.

Rodgers, J., Yen, D., & Chou, D. (2002). "Developing E-Business: A Strategic Approach," Information Management & Computer Security. 10(4), 184-192.

Rogers, E. (1983). *Diffusion of Innovations (3rd Ed.).* New York: The Free Press.

Sahin , I., & Thompson, A. (2007). Analysis of Predictive Factors That Influence Faculty Members' Technology Adoption Level.Journal of Technology and Teacher Education. 15(2),167-190.

Saleh, A., & Ndubisi, N. (2006). An Evaluation of SME Development in Malaysia. *International Review of Business Research Papers*, 1-14.

Sekaran, U. (2000). *Research Methodsfor Business - A Skill Building Approach , 3rd ed. New York: John Wiley and Sons*.

Sekaran, U. (2003). *Research Methods for Business: A SkillBuilding Approach .USA: John Wiley & Sons.*, 4th Ed., pp 176, 203, 407.

Sendecka, L. (2006). Adoption of mobile service. Moderating effects of service's information intensity . Norges Handelshoyskole, Bergen.

Seok-Jae, O., & Shon, J. (2006). The determinant of internet banking usage behavior in Korea: A comparison of two theoritical models.

Shaughnessy, J., Zechmeister, E., & Jeanne, Z. (2011). Research methods in psychology. (9 ed.). New York, NY: McGraw Hill.

Shiels, H. M. (2003). Insights From SMEs. Logistics Information Management. *Understanding the Implications of ICT Adoption*, 312-326.

Shih, Y., & Fang, K. (2004). The use of decomposed theory of planned behavior to study internet banking in Taiwan. Internet Research. Vol 14, No.3, pp 213-223.

Smallbone, D., & Wyer, P. (2000). Growth and Development in Small Firm .

St Pierre, J., & Raymond, L. (2004). "Short-term effects of benchmarking on the manufacturing practices and performance of SMEs",. *International Journal of Productivity and Performance Management,*, Vol. 53, pp. 681-99.

Tan , K. (2009). An Empirical Study of Internet-based ICT Adoption among SMEs in Southern Malaysia.

Tanburn , J., & Singh, A. (2001). ICTs and Enterprises in Developing Countries: Hype or Opportunity? Series on Innovation and Sustainability in Business Support Services (FIT).Geneva: SEED Working Paper.

Taylor, S., & Todd, P. (1995). Understanding Information Technology Usage: A test of competing models. *Information System Research*, 6,144-176.

Teo, T., & Pok, S. (2003). Adoption of WAP Enabled Mobile Phone among Internet Users. OMEGA (31:3), 483-498.

Venkatesh et. al. (2003). *User acceptance of information technology; Toward a unified view*, *MIS Quarterly*, 27(3), 425-478.

Venkatesh et. al. (2003). Toward A Unified View. *User Acceptance Of Information Technology*, 425-478.

Venkatesh, V. (2000). Determinants of Perceived Ease of Use: Integrating Control, Intrinsic Motivation, and Emotion into the Technology Acceptance Model. *Information Systems Research*, 11(4), 342-365.

Venkatesh, V., & Davis, F. (2000). *A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies , Management Science*, 46(2), 186-204.

Viswanathan, M. (2005). Measurement error and research design. Thousands Oaks, California. Sage Publications Inc.

Wang , Y., Shun Wang, Y., Min Lin , H., & Hsin & Tang , T. (2003). Determinants of User Acceptance of Internet Banking : An empirical study : International journal of service industry management. 14(5) , 501-519.

Wong, K. (2001). Individuals Acceptance Towards Internet Job Search. *MBA thesis, School of Management, Universiti Sains Malaysia, Penang*.

Yeung, M., Shim, J., & Lai, A. (2003). Factor Affecting E-Commerce Adoption An empirical Evidence; Communication of the ACM,. 46(9).

Yin, R. (1994). Case study research – design and methods, SAGE Publication, 2ed. 18.