# FACTORS CONTRIBUTING TO E-READINESS OF SMES

By

**LIM CHIA YAN**

Research report submitted in partial fulfillment of the requirements for the degree of Master of Business Administration

**UNIVERSITI SAINS MALAYSIA**

**APRIL 2003**

## LIST OF TABLES

## LIST OF TABLES

## LIST OF FIGURE

# ABSTRAK

Salah satu objektif untuk kajian ini ialah mengukur tahap kesediaan SMEs di Utara Malaysia untuk menceburi e-perniagaan, e-dagang dan Internet. Objektif yang kedua ialah menganalpasti faktor-faktor yang mungkin mempengaruhi kesediaan SMEs di Utara Malaysia untuk menceburi e-perniagaan, e-dagang dan Internet. Berdasarkan hasil pengajian, penyelidikan dan hasil kerja yang ada, lima faktor telah dikenal pasti untuk digunakan dalam kajian ini. Kesediaan untuk menceburi e-perniagaan, e-dagang dan Internet (E-readiness) digunakan sebagai pembolehubah bersandar, infrastruktur dan teknologi, sumber manusia, keselamatan informasi dan faktor organisasi (penentangan terhadap perubahan dan sokongan pengurusan atasan) sebagai pembolehubah tak bersandar. Selain daripada itu, saiz organisasi dan jenis organisasi digunakan sebagai pembolehubah kawalan. Borang soal selidik telah dihantar menggunakan pemsampelan mudah kepada 300 SMEs di Penang, Kedah and Perlis. Keputusan kajian menunjukkan SMEs di Utara Malaysia bersedia untuk menceburi e-perniagaan, e-dagang dan Internet. Kajian ini juga menunjukkan infrastruktur dan teknologi mempunyai kesan terhadap kesediaan SMEs untuk menceburi e-perniagaan, e-dagang dan Internet. Selain daripada itu, sokongan pengurusan atasan juga mempunyai kesan terhadap kesediaan SMEs untuk menceburi e-perniagaan, e-dagang dan Internet. Namun begitu, sumber manusia, keselamatan informasi dan penentangan terhadap perubahan tidak mempunyai kesan terhadap kesediaan SMEs untuk menceburi e-perniagaan, e-dagang dan Internet.

## ABSTRACT

One of the objectives of this study is to investigate the level of e-readiness of SMEs in Northern Malaysia. Another objective is to investigate the factors contributing to the e-readiness of SMEs in Northern Malaysia. Based on literature, researches, and works available, five variables are used in this study. E-readiness is the dependent variable, while infrastructure and technology, human capital, information security, organizational factors (resistance to change and top management commitment) are the independent variables. Besides, organization size, and organization type are used as the control variables. Questionnaires were distributed using simple sampling method to 300 SMEs in Penang, Kedah and Perlis. The finding of study shows that SMEs in Northern Malaysia are ready to go for e-business, e-commerce and Internet. The findings showed that in general infrastructure and technology has significant impact on SMEs' e-readiness. Besides that, top management commitment also influence on SMEs' e-readiness. However, human capital, resistance to change, and information security do not have significant impact nor contribution on e-readiness in SMEs.

# Chapter 1

# INTRODUCTION

## 1.1 Introduction

World economic growth depends increasingly on information and communications technologies (ICTs) and the abilities of countries and enterprises to collect, process, and use digital information. During the last few years, companies have been able to achieve and sustain competitive advantage for the most part by the role that Information Technology (IT) has played in propelling and accelerating the globalization of business. Recent IT developments are changing and will continue to change the business arena in the near future.

Many see the Internet as a revolutionary technology that will alter the way business, commerce, medicine, science, communications, the law, politics, and government are conducted. Andrew Grove (1996), the chairman of Intel Corporation, predicts that the Internet will become so pervasive that in the future every business will be an Internet business or no business at all. The Economist's 'ECommerce' survey 26 February 2000, cites Forrester Research, an Internet research firm, estimates that revenues in the Business to Consumer segment will grow from US$20 billion in 1999 to US$184 billion by 2004 (Ure, 2002).

Also, the 1990s have witnessed the proliferation and hyper-growth of the Internet and Internet technologies, which together are creating a global and cost-effective platform for businesses to communicate and conduct commerce. Indirectly, the Internet is enabling smaller businesses to gain the efficiencies and cost savings that once were

afforded only to larger businesses. There is evidence that shows how SMEs around the world are embracing e-commerce and spending increasing amounts on information technology in different regions (Mora-Monge, Metts & Rao, 2001). Research also shows that SMEs using the Internet to conduct business have higher revenues (Mora-Monge et al., 2001).

Internet is thus a new way of conducting, managing and executing business transactions using modern Information Technology. The Internet provides access 24 hours a day, seven days a week – any time anywhere. Thus, time and place are no longer the binding factors. In essence, the Internet is allowing businesses to enter niche markets at no additional cost (Kleindl, 2000). There are 2 types of Internet component: E-commerce and E-business.

E-commerce builds on the structures of traditional commerce by adding the flexibility offered by electronic networks. Existing research points out that e-commerce can offer readily discerned benefits in comparison to traditional environments through reduced transaction costs and search costs, more competitive product prices (Bakos, 1991) and improved transaction efficiency (Lee & Clark 1996; Srinivasan, Kekre & Mukhopadhyay, 1994).

"E-business will change Asia more than it changes the U.S.," said Kristian Steenstrup, research director at Gartner (Rao, 2001). E-business plays an important role to help the companies change the way of doing business. This would enable the company to engage in communication flows with local and overseas client and agents more cost

effectively. E-business also improves processing and customer response time through e-mail, EDI, intranet and etc.

E-business and e-commerce take place over four major Internet domains: B2C (business to consumer), B2B (business to business), C2C (consumers to consumers), and C2B (consumers to businesses). Other Internet domain included G2C, G2B, B2G and C2G that is related to government relations (Kotler, 2003).

One of the most important factors to sustain a company's long-term business survival is constantly ensuring relevance and maintaining the competitiveness within the changing dynamics of doing business. The traditional way of doing business has been replaced by e-commerce and e-business is the solution being pursued by many highly profitable companies nowadays like Intel, Hewlet Packard, Dell, General Electric and so on. Due to the impact of technology and Internet on the overall business transaction and communication environment, there has been considerable interest in understanding the degree of e-readiness (which measures the capacity of nations to participate in the digital economy.) of Malaysia businesses. In addition, e-readiness of SMEs has been a topic of considerable interest due to the obvious impact the Internet may have on the economics of their business. However, a lot of studies have been worked on e-commerce, e-business and Internet separately and no studies have focus on e-readiness (which included e-commerce, e-business and Internet). Besides, no studies have been done on e-readiness in Malaysia, whereas other studies on e-readiness are using country as the unit of measurement.

## 1.2 Research Problem

Over the years, Malaysia has transformed from a commodity-based producing nation to being a manufacturer of industrial products. When the economic slump hit the Malaysia in 1997, many companies suffered tremendous losses with the exception of the small and medium industries (SMEs) (SMIOSS, 2002). At present, SMEs constitute over 90% of all enterprises in Malaysia and is recognized as the backbone of the country's economy. With the advent of the ASEAN Free Trade Area (AFTA) 2003, WTO and globalization, SMEs needs to strengthen their resilience to the challenges and to explore the opportunities in this new economic era (SMIOSS, 2002).

SMEs are the most common form of enterprises in the Malaysian economy. This is evident from the number of SMEs operating in the manufacturing sector.

Table 1.1

*SMEs as a percentage of total manufacturing firms*

| Year | Percentage of Total Manufacturing Firms |
|---|---|
| 1963 | 99.6 |
| 1968 | 99.0 |
| 1981 | 97.7 |
| 1985 | 64.0 |
| 1995 | 84.0 |
| 1996 | 86.0 |
| 1999 | 91.1 |
| 2000 | 92.0 |
| 2002 | 90% |

Source: Chee(1986) and NPC, The Star 2002

SMEs so numerous and productive that their total economic output exceeds those of large companies. Therefore, in order to determine their relative economic importance, it is essential to measure the percentage of the economy's total output and service (GDP) that come from SMEs (Hashim, 2000).

Table 1.2

*SMEs contribution to GDP*

| Year | Percentage of Contributions to GDP |
|---|---|
| 1991 | 20 (RM4.3 billion) |
| 2000 | 40 |
| 2002 | (RM 50.8 billion) |
| 2020 | 50 |

Source: MITI, The Star 2002

As the SMEs sector of Malaysia constitute majority of business activities in Malaysia and their contribution to economic growth is significant, various efforts have been channeled to ensure that they remain globally competitive. SMEs are revolutionizing their business practices but need to do so at a faster rate in order to adjust and cope with the many uncertainties and rapidly changing conditions. They must maintain their competitive edge, adopt new models of growth, develop a global network of product exchange and establish wider international network.

Involvement in networked economy is one of the new challenges that are faced by SMEs today. Many SMEs are left behind in the race of networked economy. Whereas big organizations can generally muster the resources needed by networked economy, the challenge is in getting SMEs on board the Internet agenda by working around their resource and skills shortages. If SMEs get left behind in the new economy, the whole country Malaysia gets left behind. Therefore, SMEs need to access their readiness level to involved in network economy activities (e-commerce, e-business and Internet) and understand the factors contribute to the e-readiness for them to increase their readiness level.

A wide range of studies on e-readiness shows the fundamental uncertainties and ambiguities in theory and in practice. To date, such studies lack robust foundations

and empirical analysis, and provide little guidance for business and government – thus obscuring the realities as well as the opportunities. Furthermore, all the e-readiness studies are using country as the unit of measurement. Current e-readiness indices assume a fixed, one-size-fits-all set of requirements, regardless of the characteristics of individual countries or the demands of specific applications. Moreover, most e-readiness studies provide little information on how their indices were constructed, or how they might be tweaked to analyze particular e-business opportunities (Siegel, Haghseta & O'Donnell, 2002).

The decision maker particularly the chief executive officers and chief financial officer in most organization have difficulty in evaluating and adopting Internet strategy. As there are many factors affecting decision-making in adoption of Internet, therefore this study investigate the factors contributing to the organization's level of e-readiness. Akkeren and Cavaye (1999) have identified the factors influencing IT adoption are similar to the factors influencing e-commerce adoption (particularly in small business). Based on study from Fink (1998), there are a lot of factors of successful adoption of IT in SMEs (Appendix A). However, this study only focuses on infrastructure and technology, human capital, resistance to change and top management commitment as the main factors contributing to e-readiness because the measurement unit of this study is SMEs organization and the focus on this study is on e-readiness. Besides, another factor, information security, has been selected as another factor in this study based on the result of literature review indicated that information security is another main barrier for an organization to involve in networked economy. This study can help managers make better decision on how to increase their organizations' e-readiness and more competitive in dynamic changed business environment.

## 1.3 Research Objectives

The specific objectives is to identify the level of e-readiness of SMEs in Northern Malaysia and the various factors that may influence the level of e-readiness among the SMEs in Northern Malaysia.

## 1.4 Research Questions

This research is intended to study factors contributing to e-readiness of SMEs operating in Northern Malaysia. This research paper will answer two research questions:

1. What is the level of e-readiness of SMEs in Northern Malaysia?
2. What are the factors that contribute to the e-readiness of SMEs in Northern Malaysia?

## 1.5 Significance of Study

This study will examine various factors that contribute to the e-readiness of SMEs and can be used as a basis for SMEs in Malaysia to assess their organizations' capacity to participate in the networked world and make the necessary preparations to be involved in a networked economy.

## 1.6 Definition

This section provides brief definitions to the important terms and variables used in this study.

### *1.6.1 E-readiness*

Over the last four years, a number of e-readiness assessment tools have been developed, most of tools use widely varying definitions for e-readiness (APEC, 1999; Grant, 1999; Hartman, Sifonis & Kador, 2000; McConnell, 2000). Thus, what is the most accurate definition of e-readiness? The answer to this question is an ongoing debate, no standard definition for e-readiness is perfect.

For the purpose of this study, e-readiness is defined as the ability of an organization to pursue value creation opportunities facilitated by the use of the Internet (include e-commerce and e-business). This definition is adapted from Siegel, Haghseta and O'Donnell (2002). E-commerce is the process of buying and selling goods and services electronically involving transaction using Internet, network and other digital technology (Laudon & Laudon, 2002). E-business is the use of the Internet and other technology for organizational communication and coordination and the management of other business processes from E-commerce (Laudon & Laudon, 2002).

### *1.6.2 SME (Small Medium Enterprises)*

The definition of SME in Asia varies from country to country, according to the number of employees and the amount of invested capital or turnover (Hor, 2001). In Malaysia, there are not less than 18 ministries and more than 60 government agencies involved in assisting the development of SMEs (Hashim, 2000). These agencies used different criteria to classify SMEs. For this study, the SME is defined according to the classification of Ministry of International Trade and Industry as (Sulaiman & Hashim, 2000):

1. A small-scale firm is a company "with less than 50 full time employees, and with an annual turnover of not more than RM10 million".
2. A medium-scale enterprise is a company "with between 51 and 150 employees, and with an annual turnover of between RM10 million and RM25 million".

### *1.6.3 Infrastructure and Technology*

The ability to exchange information, goods, and services with the rest of the world is necessary for participation in the networked economy. The key elements of infrastructure and technology that adapted from study of McConnell (McConnell, 2001) includes:

1. Availability of telecommunications service, high bandwidth, networked computers and applications in an organization
2. Affordability and reliability of network access, including the cost of service, downtime, and the prevalence of sharing access among individuals.
3. Computer hardware, software, data and storage technology, and networks providing a platform of shared information technology resources for the organization.

### *1.6.4 Human Capital*

Human capital refers to skills and efficiency of workforce in the organization to support networked economy involvement that adapted from the study of McConnell (McConnell, 2001). The intellectual capital needed include expertise in hardware and software, network connectivity, web based programming and web based application.

### *1.6.5 Information Security*

Information security is a concern whether the processing and storage of networked information can be trusted, this definition adapted from the study of McConnell (McConnell, 2001). The security application such as firewall can be used to protect the organization system from unauthorized access from hackers or attacks from virus diffusing around the Internet. Digital signatures and encryption are some ways to protect the online transactions interference from unauthorized parties and ensure the information privacy.

### *1.6.6 Organizational Factors*

Two organizational factors are considered in this study, resistance to change and management commitment.

In an organizational setting, resistance is an expression of reservation that normally arises as a response or reaction to change (Purchase, 2002). Most employees tend to react with resistance to change rather than seeing change as a chance to initiate improvements.

Management commitment is the dedication or contribution from the top management to ensure the success of a project by allocating the necessary time and resources and adopting positive approaches to the project (Au, 2000).

### *1.6.7 Organization Size*

SMEs organization size can be defined as follows (Sulaiman & Hashim, 2000):

1. A small-scale firm is a company "with less than 50 full time employees, and with an annual turnover of not more than RM10 million".
2. A medium-scale enterprise is a company "with between 51 and 150 employees, and with an annual turnover of between RM10 million and RM25 million".

However, organization size whether medium or small scale, which refers to number of employees in SMEs organization, is used as control variable to test its effect to the e-readiness of SMEs.

### *1.6.8 Organization Type*

In determining economic contribution of SMEs in Malaysia, they can be categorized into three broad sub sectors briefly explained below (Hashim, 2000):

- The General Business Sector

SMEs that operate in this sector comprise those mainly involved in construction, wholesale and retail trade, transport and storage, business services and activities, and providing services such as hotel and restaurant businesses.

- The Manufacturing Sector

Among the major activities are processing and production of raw material such as food, textile, wood, chemicals, petroleum, rubber, plastic, metallic and nonmetallic materials, and transport equipment. However, the SMEs involved in supplying electrical and electronics appliances and components have been growing in recent years.

- The Agricultural Sector

These SMEs contribute to the national economy as agricultural producers and natural-product producers of rubber, padi, oil palm, coconuts, cocoa, pepper, tobacco, livestock, timber, fish, fruits and vegetables (Hashim, 2000).

For this study, organization type is grouped to 2 categories: Manufacturing and Non-Manufacturing. It acts as control variable in this study to determine whether the type of organization affects the e-readiness of SMEs.

## 1.7 Organization of the Report

This report is organized into five chapters. The first chapter gives introduction to the research topic, followed by research problems and objectives, and definitions of terms and variables in this study. Chapter two presents the literature reviews on findings in e-readiness done by previous researchers. The conceptual framework, research methodology and hypothesis for this study are presented in Chapter 3. Chapter 4 provides the analysis and interpretation of the data. It highlights the results of analysis using different statistical tools. Chapter 5 explains the findings, its implications and recommendations. The study's limitations and suggestions for future research are also presented.

# Chapter 2

# LITERATURE REVIEW

## 2.1 Introduction

Firms such as Cisco Systems, Dell Computer and GE report impressive payoffs by making the Internet a key element in their strategies and business models, and by transforming their "brick-and-mortar" operations into e-business organizations. Cisco Systems and Dell Computer report in excess of 250% return on invested capital, and over US$650,000 in revenue per employee. They also have the highest gross profit margin in their respective industries. From a survey finding of over 400 information technology managers worldwide, relative to larger firms, smaller businesses who make effective use of Internet opportunities may also find that they are more innovative, faster in responding to environmental demands, and better able to quickly change or adapt business models to gain competitive advantage (Engler, 1999). As a result, traditional firms, especially small organizations, are under increasing pressure to follow suit, and to achieve the often-cited benefits of e-business.

According to the SMI Association of Malaysia, there are around 100,000 SMEs in the country that makes up some 91 percent of the country's industrial establishments (Business Times, 2000). For SMEs organizations, who plays an important role in Malaysia, to increase their competitive advantages against large organization, management in these firms are faced with the task of identifying opportunities, and assessing their e-readiness and justifying Internet technology investments. "The longer Malaysia's SMEs wait, the further they will be left behind as e-commerce

begins a transformation in the way business is conducted", said SMI Association of Malaysia president Looi Teong Chye.

Akkeren and Cavaye (1999) have identified the factors influencing IT adoption are similar to the factors influencing e-commerce adoption (particularly in small business), thus, some of the factors of successful adoption of IT in SMEs from Fink (1998) study will be then employed as independent variables for this research based on the unit of analysis in this research is a SME organization and the focus on this study is on e-readiness. The listing of the factors is in Appendix A. The factors included in-house IT expertise (human capital), availability of IT (infrastructure and technology), IT implementation (top management commitment) and organizational culture (resistance to change). The major difference between the study from Fink (1988) and this study is this study is focus on networked economy involvement whereas the study from Fink is focus on IT adoption. The TAM model does not used in this study because TAM is focus on the perceived usefulness and perceived easy to use that influencing the acceptance of IT which is not the focus of this study.

## 2.2 E-readiness

APEC defines readiness as the degree to which an economy or community is prepared to participate in the digital economy (APEC, 1999). A definition by McConnell on e-readiness is the capacity to participate in the global digital economy (McConnell, 2000). McConnell's definition of e-readiness lacks descriptive details, but the basic meaning points to the capacity to participate in digital way of doing business.

In Hartman, Sifonis and Kador (2000) study, Net readiness is measure of a company's preparedness to exploit the enormous opportunities in the e-economy landscape. Grant (1999) mentioned in its maturity model where a business is "ready" to implement e-commerce strategy, with the business plans and expectations clear, with no insurmountable obstacles impeding progress, and have identified any needed partners or professional support. Another report by Parker (2000) described readiness as "preparedness" to operate in an e-commerce marketplace.

For this study e-readiness covers e-commerce readiness and e-business readiness. E-commerce readiness is defined as the firm's preparedness to participate in the Internet economy by transforming its businesses to be conducted electronically. On the other hand, e-business readiness is defined as the firm's preparedness to participate in the Internet economy to facilitate the organizational communication and coordination, and the management of other business processes from E-commerce.

The success of the Internet initiatives of a firm or enterprise depends not only its own effort to digitize its value chain, but also on the readiness of its customers, supplier and trading partners to engage in electronic interactions and transactions (Barua, Whinston & Yin, 2000). Successful e-readiness practice requires readiness on the part of all players in the value chain, and companies that adopted e-commerce or e-business must investe in increasing their trading partners' readiness (Barua, Whinston & Yin, 2000).

E-commerce application includes the use of many different types of online facilities doing business: order registration, electronic advertising, electronic billing system,

electronic marketing, online delivery status and tracking and customer services support.

E-business application includes the use of many different types of online facilities to communicate and coordinate: production planning, JIT management, scheduling, outsourcing and other business operation process.

Malaysia's e-readiness is at a comparable level with other developed countries and has a strong foundation and framework to take the country to more advanced levels, according to an assessment applied to within and outside the Multimedia Super Corridor (MSC) in 2001 (Malaysian National News Agency, 2001). One hundred parameters relating to e-readiness were looked at and divided into six categories in this assessment:

1. basic infrastructure and technology,
2. access to necessary services,
3. current level and type of use of the Internet,
4. promotion and facilitation activities,
5. skills and human resources and,
6. positioning for the digital economy.

## 2.3 Infrastructure and Technology

Internet is an international network of networks that is a collection of hundreds of thousands of private and public networks (Laudon & Laudon, 2002). E-commerce and e-business simply cannot function without adequate telecommunications network and Internet infrastructure. Only users or enterprises who able to access these networks,

though proprietary or shared access devices or terminal/kiosks, are able to participate in e-commerce or e-business, and the larger number of users with network access, the greater the potential benefits of e-commerce and e-business.

There are six components to support e-business readiness suggested by Julta, Bodorik and Dhaliwal (2002). However, the foundation for all e-business readiness is based on the modern technologies and the access to those technologies in the areas of communication and information. Included in communications and information systems infrastructure are networking and computer hardware, underlying application software technologies for e-business applications, and applications representing automated business processes. (Julta, Bodorik & Dhaliwal, 2002). IT infrastructure is a major business resource and a potential source for attaining sustainable competitive advantage (Keen, 1991). To be a player in virtual marketplace, a large investment in personnel and infrastructure is required (Kleindl, 2000).

Insufficient access to appropriate information infrastructure of suitable quality, and at reasonable cost, is a fundamental barrier to the SMEs adoption and use of e-commerce and e-business (APEC, 1999). The information infrastructure required for e-commerce and e-business involves dependable telecommunication links and Internet services being available to firms such as SMEs. APEC study showed that the firms with higher quality of telecommunication access might be using this capacity to become more advanced, while other firms with limited quality access view this factor as a critical barrier to their adoption of e-commerce and e-business.

The Star INTECH section (April 18 2000) addressed the Internet infrastructure issues in Malaysia. According to the report, IDC Malaysia country manager Selina Chin commented that the Internet infrastructure in Malaysia is insufficient to sustain an Internet economy. She further pointed out that the bandwidth issue needs to be resolve for e-commerce to really take off. She also reported that the majority of the Malaysian companies are still using dialup Internet access, not enough are using ISDN or leased line.

Most of the nation wide e-readiness assessment tools are using infrastructure and technology as one of the assessment criteria. Therefore, to assess an organization's level of e-readiness, infrastructure and technology as criteria should not be omitted from the research.

## 2.4 Human Capital

Human capital refers to the knowledge and skills of a firm's workforce. From the human capital perspective, employees are viewed as a capital resource that requires investment. As the dynamics of competition accelerate, people are the only sustainable source of competitive advantages. Finding the human capital necessary to run an Internet project effectively is a difficult task. A lot of IT specialist, especially Web-based expertise, is needed for an organization's e-readiness. In order to achieving organizational vision to be involved in networked economy, create and nurture a well-developed human capital base, where skills and work ethics are of highest quality and will be self-generated is needed. In this regard, most of the organizations have invested heavily on the human capital and will continue to do so in the future towards the creation of greater and larger pool of human capital.

Organizations with more IT experience or greater IT already in use are more likely to adopt IT (Fink, 1998). Staff involvement in IT development and IT training carried out had a positive effect on IT adoption (Doukidis, Smithson & Lybereas, 1994). The lack of sufficient online procurement experts within the company is one of the biggest hurdles many companies face in implementing online procurement systems (Mohsen, 2001). However, National Computer Board assessed the state of e-commerce in all of the country's eight industry sectors, Malaysia like in Singapore, few SMEs have trained IT personnel and that this function is often undertaken by an accountant or the owners, who may not welcome a "diversion" from their core activities. Thus, SMEs are usually regarded 'poor' in human, financial and material resources. This caused them to rely more extensively than larger organization help (Yap, Soh & Raman, 1992). However, the finding from the studies on the factors important to SMEs when adopting IT appears to contradict previous studies which indicated that small businesses largely rely on external expertise and resources when computerizing because of lack of internal IT management and skill (Fink, 1998). Besides, the study from Panjang Adni (2002) and Dahlan, Ramayah and Koay (2002) has indicated that the more skills and experience that the users possess, the higher their data mining readiness level. Therefore, human capital of an organization is one of important factor contributes to SMEs e-readiness.

## 2.5 Information Security

Security threats are growing both in scope and sophistication, therefore organizations of all types and sizes will continue to strengthen their defenses against these threats. While some will rely on internal systems and resources, others may lack the training, skills and resources to secure their IT infrastructure. In most cases, it is the MNCs that

have the expertise and resources to secure their infrastructure while the SMEs, most often depend on vendors for advice and assistance. Even SMEs realize the importance of security, they are often deterred by the cost associated with it.

"The Internet was built for availability, and not so much for security," observed Angu Selvan, Head of Internet Technology, Nokia Internet Communications (Blond, 2002). To most consumers, the issue of security and privacy over the Internet is the most overwhelming barrier facing the adoption of e-commerce (Mohd Suki 2001). Widely published security issues on the Internet, where hackers have accessed personal financial information being sent electronically, have done little to boost consumer confidence in the Internet as a conduit for commerce (Goodwin, 1991). There is also a great concern, among the Internet users, regarding the security of financial information transmitted over the Internet (Gupta, 1995). In general, consumers tend to be more comfortable providing sensitive information in a realm where they can see with whom they are dealing, revisit the physical location of the business if necessary, and exert a perceived amount of control over the situation (Janes, Lambert, Pollett & Reid, 1997). Yee (1998) studied the potential of e-commerce among teaching staff and students of a university in Sarawak and found that users were not convinced with the method and security of payment through the Internet. Studies by Teo (1998) and Tang (1998) found e-commerce to be a very convenient way to do business. However, many had nagging doubts about the security of transactions (Ramanathan, 1999).

Comparison between the factors influencing the adoption decision of e-commerce amongst individuals and organizations demonstrated that the difference is only the focus of decision makers (Jantan & Nasirin, 2000). Besides, three factors which have

been cited by many (Sulaiman & Jani, 2001) of a great concern in the implementation of e-commerce are security, privacy and property protection. The findings of the research conducted on the SMEs in Australia (Lawrence, Corbitt, Tidwell, Fisher & Lawrence, 1998) illustrated that electronic security is the single major barrier to e-commerce. Study from Salisbury, Rodney, Allison and David (2001) indicates that increased levels of perceived Web security will lead to greater intent to purchase products on the Web. Besides, study from Min and Galle (2002) also indicates that the buying firm's perceived concern over the lack of security has the greater negative effect on the adoption of the Internet than that of EDI for e-purchasing. Therefore, information security that always concerned by Internet user should be a fundamental factor for a SMEs organization to be e-ready.

## 2.6 Organizational Factors

### *2.6.1 Resistance to Change*

One of the most well-documented findings from studies of individual and organizational behavior is that organizations and their members resist changes. (Robbins, 1994). McNurry (1973) have quoted "Industrial progress finds one of its greatest handicaps is the frequent resistance of both management and workers to change of any sort". Traditional management thinking views resistance as the enemy (Waddell & Amrik, 2002).

Change brought about by technology poses significant challenges to small business management (Fink, 1998). Internet can result in a fundamental and radical change in the manner in which business is done. Therefore, resistance to change from individual and organizational may develop. Two examples, from Forrester's Therese

Torris (1999) and Andersen Consulting's Vernon Ellis (1999) respectively, illustrate resistance to change of e-commerce in Europe:

- "Fulfilling its promise won't come easy. The region must build eCommerce networks to help overcome social fears and resistance to change."

- "...the biggest threat, I believe, is a cultural one. For, despite deepening pockets of technical excellence and proof of success in key areas, we remain risk-averse, not willing to embrace wholeheartedly the entrepreneurial spirit that is taken for granted across the Atlantic"

The organizations should understand the reasons for the resistance to overcome the problem when involved in networked economy that will facilitate e-commerce adoption.

### *2.6.2 Top Management Commitment*

Management commitment to technology acquisition, application and exploitation must be seen as well as felt through the organization. Top management must be directly involved in technology-related decision even if there exist technically qualified staff in the organization. A "hands-off" approach must be avoided. Mechanisms to ensure integrated decision-making must be put in place (Azzman, Karthyeni & Ahmad, 1998).

As an organizational factor, top management commitment is required to ensure successful adoption Internet technology. The importance of leadership to the change management process is highlighted by the fact that change requires creating a new

system and then institutionalizing the new approaches (Samuel & Louis, 1890). Management needs to monitor employees' response to technological change, and institute appropriate action programs for IT acquisition, implementation and operation (Fink, 1998). For example, the CEO has been shown to play a significant role in the successful adoption of IT in small business (Thong & Yap, 1995). According to 1998 E-commerce India Survey Report, senior level support and budget allocation were given due weightage as actions taken for integration of e-commerce technologies with existing processes. The survey also reported that IT Department and Executive Committee are the biggest sponsors.

## 2.7 Organization Size

One of the studies from Thong and Yap have used organization size as one of the factors facilitating IT adoption in small business (Fink, 1998). Powell and Dent-Micallef (1997) who found that IT mainly contributes to competitive advantage if deployed parallel with other complementary resources – such resources could be connected to size. The size of a firm can have two important, but opposite, effect on an industry's competitive dynamics. The larger a firm, the greater is its market power and resource. But, the smaller organization is more innovative. The general belief is that organizational size and innovation are inversely proportional (Kenmore, 2000). That is, the larger the firm the less likely it is to innovate. Many people who live and breathe large organizations carry the belief that once an organization reaches a certain size, it inevitably loses its capacity to act entrepreneurial and to stimulate and foster innovation. Small sized manufacturers were found to be using e-commerce more compared to the medium and large sized manufacturer (Sulaiman & Jani, 2001). However, Wierenga and Ophuis (1997) noted that the size of a manufacturer is

positively related to adoption and innovation. In the seventies, Ein-Dor and Segev (1978) correlated the size and age of the manufacturer with the use of microcomputers.

Involvement in networked economy needs creativity and innovation of an organization. As SMEs is a small or medium size of organization, SMEs should posses the benefit of being creative and innovative. However, well-established large size organizations have deeper and broader networks of relations from which to learn about and explore business opportunities. In the information system literature there is evidence of large firms being more sophisticated and allocating more resources to their IS function (Raymond, 1990). Large size firms have greater tolerance for experimentation and failure than smaller firms. Large size firms also tend to possess higher quality resources and they are generally able to produce or attract higher quality resources with greater ease than smaller firms. Thus, small size whether is an advantage for SMEs organization to be involved in networked economy still is a question that needs to be further studied.

## 2.8 Organization Type

The role of SMEs is very important in supporting national industrialization efforts through forging linkages across the manufacturing sector. Of an estimated 20,000 manufacturing establishments operating in Malaysia, more than 90 per cent were small and medium sized establishments. Despite their number, SMEs contributed only 27.0 percent to total manufacturing output and 26.2 percent to total value-added in the sector. In terms of employment, 868,000 workers or 38.9 per cent of the total number of workers are in the manufacturing sector. Most of the SMEs were concentrated in