

ICT Adoption in Malaysian SMEs

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Abstract. Many studies show that SMEs are the driving engine of growth, job creation, income generation and competitiveness in domestic and global markets. They also play a pivotal role in innovation and productivity growth. ICT is important tool and regarded as enabler to bring up the competitive level of SMEs in business arena. This paper, therefore, examines the factors that may affect the adoption of internet-based information and communication technologies (ICT) among SMEs in Malaysia as well as the factors affecting their willingness to adopt ICT usage.

Keywords: Malaysia, ICT Adoption, SMEs

1. Introduction

The emergence of information and communications technologies (ICTs) has affected many industries and organizations. 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.

ICT refers to technologies that provide access to information through telecommunications. Beckinsale and Ram (2006) defined ICT as 'any technology used to support information gathering, processing, distribution and use'. ICTs can be viewed as all form of technologies and product for a wide range of software, hardware, telecommunications and information management techniques, applications and devices, and are used to create, produce, analyse, process, package, distribute, retrieve, store and transmit or receive information electronically in a digital form such as computers, email, internet, websites, social networking and other wireless communications devices, networks, broadband, and as well as the various specialised devices and applications associated with them, such as satellite systems and videoconferencing (Porter and Millar, 1985; Brady et al., 2002, Nicol, 2003).

ICT is important tool that provides the opportunity for small to medium enterprises (SMEs) to improve their competitiveness in business arena. In the rapidly changing business environment of the twenty-first century, it is extremely important for SMEs to adopt ICT in order to maintain their competitive edge, develop a global network of product exchange and establish wider international network. The effective use of information system (IS) and information technology (IT) can provide SMEs with the opportunity to take advantage of ICT in order to enhance the way they conduct business and increase core competencies.

The SMEs sector is the great important to Malaysia economy. SMEs has been recognized as the backbone of the economy and played a significant 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. Being operating with small capital requirement, SMEs is always taken as a platform for young and aspiring entrepreneurs to start their businesses. According to the National SME Development Council (NSDC), 99.2 percent (518,996) of total business establishment in Malaysia are made up of SMEs. The SME sector currently employs about 5.6 million people, contributes 32% to Malaysian gross domestic product and 19% of total exports of the nation.

Through many government programmes, SMEs have been allocated various information and communication technologies funds to assist them to adopt information technology. This is because ICT is

regarded as enabler to bring up the competitive level of SMEs in business arena. Despite these efforts, however SMEs in Malaysia remain on the wrong side of a digital divide (Karkoviata, 2001). 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. Given this backdrop, what is the awareness level of ICT amongst the owner of Malaysian SMEs? What is the extent of ICT utilization amongst Malaysian SMEs? Are SMEs in Malaysia, making adequate use of ICT? What are the factors enable or inhibit the adoption and use of ICT by Malaysian SMEs? This study, seeks to answer these questions through a survey of SMEs in Malaysia. Therefore the objective of the study is to examine the awareness level of ICT and factors that may affect the adoption of internet-based information and communication technologies among SMEs in Malaysia. Specifically the study will: (i) investigate the basic understanding of ICT amongst Malaysian SMEs, (ii) determine the awareness levels of ICT amongst the owner of Malaysian SMEs, (iii) investigate the extent of ICT utilization amongst Malaysian SMEs in their work and (iv) determine the factors leading to ICTs usage by Malaysian SMEs.

2. Literature Review

Although SMEs form a substantial constituent of the global economy, there is limited knowledge available surrounding the adoption of ICTs 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 et al., 2003). While ICT adoption studies among SMEs has become increasingly popular as information system continues its relentless march into almost every aspect of organisational 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. Based on Gallagher and Auger (1997), determining why small businesses choose (or not) to adopt and implement e-business technologies and for what purposes, have become important issues for both policy makers and academia.

According to Martin and Matlay (2001), adoption and implementation of new technologies is essential to the survival and growth of the small business sector. This supported by Chaston et al. (2001), who investigate the factors affecting the IT acceptance by 188 small businesses in the United Kingdom. The findings conclude that small businesses that readily adopt new ideas and are willing to exploit new knowledge will have a competitive edge over their competition. Ramsey et al. (2003), pointed out that the main incentives behind the adoption of ICTs by SMEs are relate to the gain from ICTs in such areas 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.

Generally, there are three common models employed in technology acceptance researches, namely, the Theory of Research Action (TRA), the Theory of Planned Behaviour (TPB) and the Technology Acceptance Model (TAM). TAM, however, is a better model used by researchers to study user acceptance and use of technology as it is a parsimonious model that explains much of the variance in users' behavioral intention related to IT adoption and usage across a wide variety of context (Taylor and Todd, 1995). Davis (1989) and Davis et al. (1989) developed TAM. TAM is an adaptation of the TRA (Fishbein and Ajzen, 1975, Ajzen and Fishbein, 1980), designed to understand the causal chain linking external variables to IT usage intention and actual use in a workplace. TAM model employed by Davis (1989) theorized that perceived usefulness (PU) and perceived ease of use (PEOU) as the two main determinants of user acceptance and use of technology.

Davis (1989) defined PU as the degree to which an individual believes that using the system will enhance his job performance. It suggests that using computers in workplace would increase user's productivity, improve job performance and enhance job effectiveness and usefulness. PEOU 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 be easier to use than another is more likely to be accepted by users and the more complex a technology is perceived as being, the slower will be its rate of adoption. Davis suggests that perceived ease of use may actually be a causal antecedent to perceived usefulness.

TAM studies have been performed by many different researchers with different research purposes, subjects, information systems, and tasks applying research methodology under different environments. Since its development, TAM (Davis, 1989) has been replicated and extended by a quite large number of studies (e.g. Igarria et al., 1995, Igarria et al., 1997, Teo, 2001) and shown a strong relationships on acceptance and use of technology. Igarria et al. (1997) determined the factors affecting personal computer acceptance in small firms in New Zealand. Among the factors that directly influence personal computer acceptance were perceived ease of use and perceived usefulness. The findings indicate that perceived ease of use is a dominant factor in explaining perceived usefulness and system usage and it was also found that perceived usefulness is a strong antecedent of system usage.

According to Venkatesh and Davis (2000), although the TAM serves as a prevalent explanation of attitude, intentions, and actual use of new systems, it may be too parsimonious, which implies it should be supplemented and extended with other constructs. The study done by Al-Gahtani (2003), investigate the associations of five perceived attributes of computer technology namely relative advantage, compatibility, complexity, trialability and observability to its adoption and use. The findings found that each attributes was hypothesized to positively correlate significantly with computer adoption and use, except complexity. Complexity as a negative attribute was hypothesized to negatively correlate with computer adoption and use. Perceived complexity is defined as the degree to which an innovation is perceived as relatively difficult to understand and use (Rogers and Shoemaker, 1971).

Among attitudes towards technology, security is an important factor that influences the use of the technology. Kalakota & Whinston (1997) defined security as a threat which creates “circumstances, condition, or event with the potential to cause economic hardship to data or network resources in the form of destruction, disclosure, modification of data, denial of service and/or fraud, waste and abuse. Perceived security is about the self-belief that a user has in the system to conclude a transaction securely and to maintain the privacy of personal information. A study done by Sathye (1999) reported that security was found to be significant obstacles to the adoption of online banking in Australia.

Grandon et. Al., (2004) and Seyal et al., (2004) has broadened the scope of the studies by include organizational readiness as a determining point of ICT adoption. Organization readiness refers to the top managers’ perceptions of ICT technologies and their perceptions of the availability of resources, rules and procedures within the organization that promotes adoption of these technologies (Iacovou et al, 1995).

2.1. Hypotheses

Based on the literature review above, we can conclude that there are several internal and external factors which contribute to the adoption of ICTs. Therefore, this study integrates perceived usefulness, perceived ease of use, perceived complexity, perceived security, and organizational readiness to predict the SMEs perception toward ICT. Therefore, we proposed the following hypothesis to reflect the research model:

- H1: Perceived ease of use will have a positive effect on perceived usefulness of ICT
- H2: Perceived usefulness of ICT is positively related to the intent to use such technologies.
- H3: Perceived ease of use of ICT is positively related to the intent to use such technologies
- H4: Perceived Complexity will positively influence the intention to use ICT
- H5: Perceived Security will positively influence the intention to use ICT
- H6: Organizational readiness and competence will positively influence the intention to use ICT

3. Methodology

3.1. Research Instruments

In this study ICT adoption is referred to the usage of ICT such as computer hardware, software and network to connect to the internet. In order to determine the factors that may affect the adoption of internet-based information and communication technologies (ICT) among SMEs in Malaysia as well as the factors affecting their willingness to adopt ICT, primary data was collected using a questionnaire. Prior the full-

blown data collection process is undertaken, a pilot study was conducted to validate the content of questionnaire in terms of validity, logic and accuracy. Following to the comments received, minor adjustments were made before the distribution of the questionnaire. The final version of the questionnaire consisted of two sections. The first section of the questionnaire was designed to identify the demographic characteristic of the respondents, ICT applications, awareness level and their extent of usage. The second section contains a series of questions on perception regarding factors that affecting their willingness in using ICT.

Perceptions towards ICT were measured using Likert scales statements, to which respondents were required to state their level of agreement or disagreement. A five interval Likert scale was used where scale indicates: 1 as strongly disagrees; 2 as disagree; 3 as neither disagrees; 4 as agree; and 5 as strongly agree. The scale was further collapsed into only three namely; Agree, Neutral and Disagree during analysis to make the findings more meaningful. Parallel with the definition given by Small and Medium Industries Development Corporation's (SMIDEC), 'a company is considered a SME if it is a company with an annual sales turnover not exceeding RM 25 million and full time employees not exceeding 150', the present study will focus on a firm with 50-150 full-time workers and an annual turnover in the range of RM 10 million to RM 25 million. This study focuses on SME because although SME make up more than 90% of businesses in Malaysia, there has been very little research done on ICT in SME. To this extend, Multivariate analysis such as factor analysis will be applied to determine the factors that effects ICT acceptance by SMEs in Malaysia.

3.2. Sampling Procedure

Due to resource constraints, the populations of the study are restricted to 500 SMEs manufacturing company located in the Southern Malaysia. Convenient sampling is used to select the sample from the SMEs list provided by Small and Medium Corporation (SMI Corp) website. Based on the list, respondents under Johor and Melaka directory are randomly selected. These companies will be contacted to obtain cooperation to fill up the questionnaires as well as their consent for an interview. Upon receiving their consent, a cover letter of the questionnaire contained information on the survey and postage paid return envelope are sent to them. The questionnaires were sent to owners rather than employees because IT illiteracy problems reported are faced by the owners and the owner know the future trend of their companies better.

4. Conclusion

Information Communication and Technology is found to play an important role for any organisation. The use of ICT that range from mainframe to personal computers, from word processing to sophisticated application and systems can provide a wide variety of benefits to different organisation. The objective of this study is therefore, to examine to the awareness level of ICT and factors that may affect the adoption of ICT among SMEs in Malaysia. The findings are expected to contribute to a better theoretical understanding of the factors that promote ICT usage among the SMEs. It is critical to have more empirical evidence of the factors affecting the adoption of ICT to help managers, regulatory bodies and ICT providers further access the benefits of its continuous and potential development. In addition, these study also useful as a basis for future research of SMEs in Malaysia. The research can be provided by using different model or using other measure of ICT acceptance and attempts to fill the research gap.

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