

ICT Adoption among Malaysian SMEs: A Review

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Information and Communication Technology (ICT) practices among Malaysian SMEs have received extensive attention recently from the government via various incentive schemes to enhance the usage of ICT among Malaysian SMEs. However, the process of getting those incentives and adopt ICT among businesses in Malaysia is still very slow. Therefore, the aim of this paper is to critically analyze the reasons behind this low percentage of ICT adoption among Malaysian SMEs. In order to address this issue, extensive literature and empirical studies will be critically analyzed to find out the key challenges that prevent Malaysian SMEs to adopt such practices. It is well known that the best IT practices among businesses in general could provide good solutions for them to drive them towards innovation and improving their competitive edge in this globalization era. Hence by identifying what are the key problems/challenges for SMEs in adopting such practices, we are able to propose some sort of recommendations by identifying the best IT practices worldwide among businesses and whether these practices are workable or can be adopted among Malaysian SMEs. This study will open further discussion on this important issue by shedding light on the best ICT practices or ICT models among businesses.

Keywords: ICT, SMEs, penetration/adoption, and Malaysia

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1. Introduction

Small and Medium-sized Enterprises (SMEs) operate in almost every industry in Malaysia. In particular, SMEs play a vital role in the Malaysian manufacturing sector, so much so that they accounted for 92% of establishments (SMIDEC, 2002). In addition to this, Malaysian SMEs contribute significantly to the country's development as a whole. For example they contribute 27.3% of total manufacturing output, 25.8% to value added production, 27.6% of fixed assets and they employ 38.9% of the country's workforce (SMIDEC, 2002, Saleh and Ndubisi, 2006). Apart from their role in terms of contribution to exports, employment and economic growth, there are wide debates in literature on how to enhance their survival especially considering that Malaysian SMEs are facing a real threat from China. Saleh and Ndubisi (2006) have identified many challenges that are facing Malaysian SMEs such as red tape in government agencies that deliver incentives; limited access to funds from financial institutions; lack of human capital; high level of international competition due to globalisation, these include AFTA and competition from MNCs and new competitors (e.g. China, India); and poor access to new technologies and underutilisation of existing ones.

However, in this study our primary focus is on the challenges or factors that affect the SMEs' environment with regard to adopting ICT and e-commerce. According to Chye (2003), one of the most important issues in front of Malaysian SMEs is to face the global competitors, in particular, the tough competition from China. The author argued that if Malaysian SMEs are willing to continue to exist, expand and to be more

profitable, they have to invest in areas such as adoption of ICT, and introduction of a highly skilled workforce. Chye (2003) argues as well that SMEs in Malaysia have to cut costs and be more efficient and effective and the best way to achieve that is via adoption and adaptation of ICT to achieve economies of scale. Hence, ICT investment and innovation is becoming very necessary for businesses to survive in this 21st century.

It is worth noting here that the majority of SMEs in Malaysia underutilized ICT applications in comparison with many other developed nations. For example, according to SMI association of Malaysia (2002), only 30% of Malaysian SMIs had websites in comparison with 80% of SMEs in Europe and American. According to Microsoft Malaysia (2006), reported by TMNet Sdn Bhd, there are only 8,000 SMEs using broadband facilities. Other countries such as Singapore, Thailand and China have higher figures in terms of ICT readiness. Hence the key questions of this study are: why this low percentage of adoption of IT among Malaysian SMEs? What are the best and convenient practices available to them? Are they aware of that? Are they aware of the importance of IT practices in their businesses, that could provide good solutions for them and drive them towards innovation and improve their competitive edge in this globalization era?

Hence, the objective of this paper is to analyze the reasons behind this low percentage of ICT practices in SMEs in Malaysia. In order to address this issue, extensive literature and empirical studies will be critically reviewed to find out the key challenges in preventing Malaysian SMEs to adopt such practices. Therefore, by identifying these challenges, we are able to propose some sort of recommendations by identifying the best IT practices worldwide among businesses and whether these practices are workable or can be adapted among Malaysian SMEs. This study will open further discussion on this important issue by shedding light on the best ICT practices or ICT models among businesses.

2. Malaysian SMEs – Facts and Figures

As indicated earlier, Malaysian SMEs play a vital role in the country's development as well as being an important driver in alleviating poverty in the country. According to the Malaysian Chinese Association (MCA, 2005), SMEs accounted for 92% of the 700,000 registered companies in Malaysia and make up 33% of the total working population.

According to Bank Negara Malaysia (BNM, 2004), SMEs in Malaysia can be divided into three broad categories. The first category comprises manufacturing & manufacturing related services, the second category includes primary agriculture and the third includes service sectors (including ICT). According to BNM, in order for an enterprise to be considered an SME, the two points to be considered are the annual sales (turnover) as well as in terms of the number of full time employees, as indicated in Table 1 below. As mentioned earlier, SMEs in Malaysia operate in various industries, but they play a major role in the manufacturing sector. According to SMIDEC (2002) and Saleh and Ndubisi (2006), SMEs in the country accounted for more than 90% of the total manufacturing establishments in Malaysia, and around 28% of the total manufacturing output. Furthermore, around 40% of Malaysian SMEs in the manufacturing sector are in the resource-based sector (Johan, 2005). In addition, Malaysian SMEs play an important role in the service sector as well. There are around 192, 527 establishments in this sector, around 98% of which are made up of SMEs (Department of statistics and Saleh and Ndubisi, 2006). As reported in Table 2 below, wholesale and retail trade is the largest in the service sector, accounting for 88.8% of participating SMEs followed by education and health sectors, then by professional services (such as legal, accounting, engineering, etc) followed by selected services (such as hotels and other lodging places, travel agencies and tour operator services, share, commodity and foreign exchange brokers, among others.)

Table 1: Classification and definition of Malaysian SMEs

<i>Category</i>	<i>Micro-enterprise</i>	<i>Small enterprise</i>	<i>Medium enterprise</i>
Manufacturing, manufacturing-related services and agro-based industries	Sales turnover of less than RM250,000 <i>or</i> fewer than five full-time employees.	Sales turnover between RM250,000 and RM10 million <i>or</i> between five and 50 full-time employees.	Sales turnover between RM10 million and RM25 million <i>or</i> between 51 and 150 full-time employees.
Services, primary agriculture and information and communication technology (ICT)	Sales turnover of less than RM200,000 <i>or</i> fewer than five full-time employees.	Sales turnover between RM200,000 and RM1 million <i>or</i> between five and 19 full-time employees.	Sales turnover between RM1 million and RM5 million <i>or</i> between 20 and 50 full-time employees.

Source: compiled from BNM (2004) and Saleh and Ndubisi (2006)

Table 2: Distribution of Malaysian SMEs in the Services Sector

<i>Segment</i>	<i>Total Number of Participating Companies</i>	<i>Total Number of Participating SMEs</i>	<i>Percentage of Participating SMEs (per cent)</i>
Education and health	8,558	8,438	4.5
Professional services	5,548	4,840	2.6
Selected services	4,146	3,844	2.1
Transportation and communication	3,908	3,473	1.9
Computer industry services	283	186	0.1
Wholesale and RETAIL TRADE	170,046	165,640	88.8
Telecommunications	38	7	0.0
Total	192,527	186,428	100

Source: data compiled from Department of Statistics and Saleh and Ndubisi (2006).

3. Importance of ICT applications

According to a report by OECD (2004), ICT and e-business applications are essential to every business as they provide various benefits across a wide range of intra and inter firm businesses processes as well as transactions. In addition to this, ICT applications enhance information and knowledge management within the business and could reduce transaction costs and enhance the speed and reliability of transactions for both business to business (B2B) as well as business to customer (B2C) transactions.

ICT (such as computer terminals, internet, e-mail, etc.) and e-commerce (e.g. sale or purchase of goods/services over the internet) could provide wide benefits to business processes. For example, in any business including SMEs, ICT and its application would make communication inside the business faster and will assist them in terms of efficient resource management. Furthermore, ICT applications such as ERP (Enterprise Resource Planning) and KMS (Knowledge Management System) provide businesses with a good source that can be used to store, share, and utilized acquired knowledge and know-how. Customer databases could assist employees as well as senior management to correspond and respond to customers needs in a more effective and faster way (OECD, 2004).

Furthermore, according to Moodley (2002) and OECD (2004), e-commerce and internet could well assist in reducing transaction costs and increasing the speed and reliability of transactions. The use of e-commerce and internet can also be a good instrument in reducing inefficiencies resulting from lack of coordination

between businesses. For example, internet-based B2B interaction and communication could reduce “information asymmetries” between supplier and buyers and bring a closer relationship between trading partners. According to the OECD (2002) report, adopters of e-commerce have the benefits of reducing transaction costs, enhancing transaction speed and reliability and getting the maximum value from transactions in terms of their value chains. In terms of B2C context, e-commerce and internet are effective and reliable tools that lead to better communication. For example, the website for a business can provide good information, profile, products, services etc. and hence this enhances the quality of a business’ services to customers and attract new customers as well. The use of websites by businesses including SMEs could provide good tools to collect information and address customers’ needs and this can perhaps be used for the purpose of innovation and product development.

According to Zantout and Marir (1999), cited by Suhaiza (2006), utilization of ICT is an important factor in effective knowledge management; it allows “information storage, its treatment and circulation”. However, in the case of Malaysia, ICT applications have been the focus of the Malaysian government (more details later) through the introduction to what is called MSC (Multimedia Super Corridor) which is encompassing seven flagship applications such as electronic government, smart school, research and development cluster, worldwide manufacturing web, etc. The government strongly emphasizes the use of ICT in both public as well as private sectors, and has been urging SMEs to use ICT and e-commerce in their daily operations as an effective tool to enhance their businesses as well as strengthen the Malaysian economy (MAMPU, 2003).

The importance of ICT links well with the Malaysian vision to become a developed country by 2020. Therefore, it is important for Malaysian SMEs to realize the benefits of ICT as a vital tool to survive and to be able to compete at the international level and to meet the challenges ahead as a result of globalization, technological advances and liberalization. Hence by adoption of ICT and its application, Malaysian SMEs can enter into non-traditional markets (Johan, 2005).

4. ICT adoption among Malaysian SMEs – review of the literature

As we discussed earlier, adoption of ICT is an important driver in terms of business development as well as economic development, i.e., both at micro and macro levels. Hence the impact of ICT on businesses’ management has received much attention among business practitioners as well as academics (Spanos, et al. 2000). According to Limaye et al. (1991) and Leidner et al. (1999) cited by Spanos (2000), the impact of information and communication technology usage could depend on the culture and this may differ between countries. Therefore, it is not appropriate to conclude that ICT findings will be relevant and applicable to every country as culture may differ between countries (Spanos et al., 2000). Adding to this, there are other factors or resources e.g. availability of resources, government policies etc which could affect the ICT use, and this perhaps may differ across the globe. Hence, there are many other factors that could influence the adoption and adaptation of ICT among Malaysian SMEs.

Kapurubandar et al. (2004), argue that many businesses in developing nations are still doubtful about utilization of ICT and e-business widely. They argue that SMEs should understand the potential benefits of utilization of ICT and e-commerce in their businesses. Table 3 reported some of the barriers for e-commerce development among both developed and developing nations. As can be seen from the table, the resources and other factors which are available for developing countries are lacking behind those of developed nations. For example, in terms of infrastructure, developed nations are obviously far ahead (e.g. better ICT, easy access to phones and internet etc.) in comparison to developing countries. Another important factor as shown in Table 3 is social and cultural issues, where it can be seen that there is a high digital literacy rate in developed nations in comparison with the developing ones. Furthermore, government and industrial policies are better and more adequate in developed countries in comparison with developing countries. According to Corso et al. (2003), lack of financial resources and manpower are important factors that affect the level of ICT adoption among SMEs. Therefore, it is important for policymakers as well as businesses to understand the factors which could affect the adoption and adaptation of ICT and e-commerce among businesses. Perhaps the governments in developing nations should enhance and improve the availability of infrastructure (e.g. easier access to internet and technology applications) as well as other resources in order for businesses to be more innovative and effective and compete in this globalized world.

Table 3: Availability of resources in developed countries vis-à-vis developing countries

Developed nations	Developing Nations
Infrastructure: Reliable and adequate Infrastructure (e.g. ICT, telecom, cheap and easy access to internet and phones)	Inadequate infrastructure
Economy: Financially stable	Lacking financial resources and unstable
• Cultural and social issues e.g. High digital literacy rate	Low or poor literacy rate
Business culture: Virtual trading	Face to face trading
Regulatory: Adequate government, industrial policies, internet policies and among others relevant policies	Inadequate policies or sometimes do not exist

Source: Compiled from Kapurubandara et al. (2006)

Furthermore, many empirical studies such as Andrus (2000), Khalid (2001), among others have proved that technological innovation and high productivity play an important role in any business organization. Hence, being innovative, adopting new IT practices and employing them are some of most critical and important issues among Malaysian SMEs. According to studies by Zakaria and Hashim (2003) cited by Omar (2004), only 15% of SMEs in Malaysia incorporate some form of internet applications into their businesses. According to Omar (2004), internet technology could provide a good solution for Malaysian SMEs and strike them into innovation. Furthermore, Haron et al. (2004) examined the awareness, perception and readiness on ICT among Malaysian SMEs. They argued that there are many factors (such as high cost, lack of expertise, company's size, profile, type and size of business, among others) associated with the lack of use of ICT among Malaysian SMEs. For example, they found that wood and wood products industries have very positive and high perceptions about ICT in comparison with other industries such as textile, garments and leather. Furthermore, they found that SMEs are using ICT (such as electronic mail, phone etc) widely in advertisements, supplier relationship and customer relationship. However, one of the key findings of this study is that there is still a lack of awareness among Malaysian SMEs about adoption and utilization of ICT and this requires huge investment as well as technical expertise. Therefore, Haron et al.'s study should investigate in more depth why many Malaysian SMEs are not aware of the benefits and the importance of ICT. Is it because of a lack of government and industrial policies promoting the benefits of adoption of ICT among Malaysian SMEs? Is it because there are no or inadequate incentives towards utilization of ICT? Or are there other more important factors than ICT for SMEs to look at?

Zailani et al. (2006), argues that there is a need for Malaysian businesses to adopt ICT in order to achieve "business excellence" in this globalized world. We agree that ICT is an important driver in any business, but the key issue here is that Malaysian SMEs have to understand the long term benefits of adoption and adaptation of ICT into their businesses and most importantly, infrastructure and government support has to be there to facilitate such adoption.

Zailani et al (2006), has examined the adoption of ICT among Malaysian SMEs. They found that SMEs with a positive attitude towards adopting of ICT will achieve effective knowledge management. In addition, they also examined some factors (such as technological, organizational and environmental characteristics) that affect technology adoption. They found that these factors have a positive impact on ICT adoption. As indicated before, we believe that government support and incentives in this regard play an important factor and should have a positive impact on ICT adoption among Malaysian SMEs.

5. Government policies towards supporting ICT among Malaysian SMEs

The Malaysian government has been emphasizing on the use of ICT among Malaysian SMEs as ICT becomes extremely relevant and important for them to be competitive in this globalized and competitive world. Hence, the Malaysian government puts a huge effort to enhance the development of Malaysian SMEs, this is evident from the Second Industrial Master Plan (IMP2), as well as during the seventh and eighth Malaysian plans (Government of Malaysia, 2001; Saleh and Ndubisi, 2006). According to MITI (2005), the IMP2 has initiated many policies and programmes to enhance the development of SMEs. This plan was formulated to improve the growth of the manufacturing sector through the entire value chain, and encourage cluster-based industrial development. However, to complete the second industrial plan (IMP2) which ended in 2005, the Malaysian government has initiated and formulated the Third Industrial Master Plan (IMP3) 2006-2020, which coincides with the country's vision to 2020. This vision envisages a fully developed and knowledge rich society in the country, with emphasis on the importance of ICT and its development to gain international competitiveness (Johan, 2005). The preparation of IMP3 involved the creation of three bodies, an industrial planning committee, a steering committee and nine Technical Resource Groups (TRG). The objective of these groups is to enhance the development of SMEs and analyze achievements under IMP2, and assess the current performance and development profile of SMEs in the manufacturing and selected service sectors. This analysis will form the basis for the formulation of policies and strategies on SMEs to be incorporated into IMP3 (MITI, 2005; Saleh and Ndubisi, 2006).

To realize the aims of IMP2, policies and programmes for SME development in the seventh and eighth Malaysian plans addressed several issues (MITI, 2005; and Saleh and Ndubisi, 2006) which include the following:

- access to markets
- increasing technology capabilities
- enhancing the adoption of ICT
- increasing product quality
- enhancing supply of skilled of labour
- increasing access to finance.

As the focus of this paper is on ICT adoption, it is worth noting here that the Malaysian government has initiated many new measures to enhance delivery system and quality services. In this regard, a number of customer service centers and one-stop centers were established in the country. For example, in 2005, Malaysian Chinese Association (MCA) has launched a one stop ICT center to enhance SMEs transformation of their businesses such that they have a better use of ICT as well as to facilitate the development of ICT based SMEs in the country (MCA, 2005). In addition to that, the 2006 budget has introduced some incentives in strategic areas such as ICT industries, biotechnology and high technology manufacturing to face the global competition and the external challenges (BNM, 2005). Furthermore, certain companies which are undertaking ICT and multimedia services have been given some incentives such as tax exemption and allowances up to 50%. The Malaysian government continues to support the development of soft technology via a large allocation to the education and to enhance the manpower in the country. Hence, the government has launched the Ninth Malaysian Plan in 2006 (2006-2010) which provides the foundation for further development in key and strategic sectors in the country such as manufacturing, services, agriculture, ICT and biotechnology. This plan has focused on the development of human capital as well as R&D and innovation among Malaysian firms which include SMEs. It is worth noting here that this plan has also paid attention to the promotion of SMEs with high innovation capabilities to be part of what's called the global supply chain. The plan has also focused on the halal sector in the country by providing all the necessary support to make Malaysia an international hub in this sector (Government of Malaysia, 2006). Perhaps this provides SMEs a good opportunity to be part of this development as there is a huge potential for them to export their products overseas. Hence, ICT adoption and e-commerce is extremely important for SMEs to enter strongly into and be competitive in the global market.

Table 4: Selected grants and Incentives which are available for Malaysian SMEs

<i>Institutions</i>	<i>Grants/incentives</i>	<i>Introduction</i>	<i>Form of assistance</i>
SMIDEC*	Grant for business planning & development	Provides assistance to SME's to undertake studies in business planning, technology and market development	In the form of a matching grant where 50% of the approved project cost is borne by the government and the remainder by the applicant.
	Grant for product & process development	Provides assistance to SME's to improve and upgrade existing product, product design and processes.	In the form of a matching grant where 50% of approved cost is borne by the government and the remainder by the applicant.
	Grant For Productivity & Quality Improvement & Certification	Provides assistance to SME's for productivity and quality improvement and to comply with international quality standards and certification	In the form of a matching grant where 50% of approved project cost is borne by the government and the remainder by the applicant.
	Grant for Rosettanet	Provides assistance to local E&E companies to achieve Rosettanet, an internet based common messaging standard for global supply chain management.	Maximum grant RM 100,000RM, in the form of a matching grant
	Factory auditing scheme	Provides assistance to SMEs in undertaking diagnostic audit on their manufacturing operations.	Maximum grant per company is 100,000RM where 50% of approved project cost is borne by the government and the remainder by the applicant.
	Soft Loan For ICT Adoption	Provides assistance in the form of soft loan for SMEs to use (ICT) to enhance competitiveness, efficiency and productivity.	loan amount is RM20,000 and the maximum loan amount is RM250,000. Interest rates are at 3% p.a with a repayment period of up to 5 years.
	Grant for Enhancing Marketing Skills of SMEs	Provides assistance for SMEs to improve their marketing strategies to compete in both the domestic as well as export markets	Assistance is given in the form of a matching grant where 50% of the amount required for training would be provided by the government and the remainder by the applicant
MATRADE**	Market Development Grant	To provide a matching grant to assist SME's to undertake activities for the development of export markets	Companies can obtain a 50% reimbursement grant on the approved cost of the eligible activities subject to a maximum of RM100,000 per company.

Notes: *Small and Medium Industries Development Corporation; **Malaysia External Trade Development Corporation

Source: Prepared by authors based on SMIDEC (2002, 2004); BNM (2005), and MITI (2002).

Furthermore, Malaysian SMEs have the opportunity to access various grants and incentive schemes including financial, tax incentives, business advisory assistance etc. but many SMEs are still unaware of these programmes. It is worth noting here that ICT spending in the manufacturing sector is dominated by

MNCs and large companies involved in high technology (Johan, 2005), this indicates that Malaysian SMEs are spending less on ICT utilization in comparison with MNCs and larger companies which are more capable of doing so. However, gathering by the literature (MITI, 2002; BNM, 2005; SMIDEC, 2002; 2004), with regards to the availability of grants and incentive schemes for Malaysian SMEs, we noticed that this sector has been the focus of the government and its agencies, which has been initiating many grants, programmes, and incentives etc. However, some of these incentives and grants can be summarized as shown in Table 4, above. As indicated in this Table that SMIDEC (established in 1996) is one of the main agencies in Malaysia which has been offering various incentives and grants through many programmes to assist SMEs to develop and grow further and to be able to compete at the international level.

6. Conclusion

This paper has identified a number of important trends and issues within Malaysian SMEs. It has also shed some light on the practices and attitudes with regard to global operations. In addition it is believed that this paper will help SME policymakers in formulating their strategies. Adoption of ICT is an important driver for business growth, so more should be done to incorporate this in the overall strategy. SMIDEC is doing an excellent job by nurturing SMEs but more needs to be done as competition from other countries especially China, India and other Asian countries is a real and imminent threat. We also believe more should be done to promote the use of Information Technology in SMEs and high value activities such as product design and engineering should be encouraged.

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