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COMPETITIVE ADVANTAGES THROUGH IT INNOVATION ADOPTION BY SMES

S. Moghavvemi

Faculty of Business and Accountancy, University of Malaya, Kuala Lumpur,
Malaysia, moghavvemi_2006@yahoo.com

Fatemeh Hakimian

Faculty of Business and Accountancy, University of Malaya, Kuala Lumpur,
Malaysia, mahboobeh1000@yahoo.com

Tengku Mohd Faziharudean Tengku Feissal

Faculty of Business and Accountancy, University of Malaya, Kuala Lumpur,
Malaysia, deanfeissal@um.edu.my

Abstract

Purpose—*This paper seeks to explain the impact of IT innovation on competitive advantage; the barriers and the benefits companies gain from adopting and using these innovations and propose a model with which it is possible to measure determinants of IT innovation adoption among SMEs.*

Design/methodology/approach—*This paper presents conceptual consideration on the role of SMEs in the Malaysian economy and the effect of government policy in encouraging companies to adopt IT innovation. The proposed research framework will be empirically validated using survey data. This study is an ongoing research, in the existing stage a theoretical argument is developed and methodology is in the process of being tested through regression analysis.*

Findings—Conclusions are drawn on the status of Malaysian SMEs to adopt IT innovation. We added attitude and self-efficacy to the Innovation Diffusion Theory to suit it to the individual situation. Therefore a novel approach is needed in order to study and understand it.

Research limitations/implications—The paper represents work in progress.

Practical implications—This paper present the theoretical framework for further study of IT innovation adoption among Malaysia SMEs.

Originality/Value—The Information Technology concept is considered a powerful competitive weapon in the modern economy. This study used Innovation Diffusion Theory as the base theory, and added attitude and self efficacy as determinants to measure the individual's perception toward innovation adoption. Individual self-efficacy and attitude toward innovation adoption shape beliefs and perceptions toward innovation, leading them to adopt or reject an innovation. Adding these factors to Innovation Diffusion Theory will narrow the breadth of the theory and possibilities to frame a single study which allows examination of the individual and technological dimension toward technology adoption.

Keywords: IT innovation adoption, competitive advantage, Innovation Diffusion Theory, SMEs, Malaysia.

Research type: conceptual paper.

1. Introduction

In today business world, increasing globalization and rapid technological revolution presents serious challenges to a company's ability to maintain their competitiveness (Hitt et al, 1998). Thus, in economic globalization, competition is more dynamic and innovation is vital for future business growth (Jin, 2007). According to Hitt et al. (2001) firms need to actively participate in the global market, use the latest technology, continue to develop new technology, and structure themselves to be ahead in these markets. So, information technology has the potential to enhance operational efficiency and effectiveness, change the way businesses compete to create strategic opportunity and redraw competitive boundaries (Lai et al, 2006). IT is considered as the new competitive weapon, crucial in developing a sustainable competitive advantage, and is also the primary management tool in competitive market to enhance the competitiveness of firms as well as productivity and flexibility, even in small and medium sized enterprises—SME (Jin, 2007; Mata et al, 1995; Byrd, Turner, 2001; Lai and Li, 2005). SMEs are the most active economic growing force in nearly all countries, playing a significant role in economic growth and considered the backbone of industrial development (Guriting et al, 2006; Ramayah et al, 2003; Alam, Kamal 2009).

Recently, the essential role of SMEs in Malaysia has led the government to reissue some rules and policies on their IT adoption interest. So, in this way, the Malaysian government started a policy to convince small and medium sized enterprises (SMEs)

to adopt IT products as a new, more efficient way of performing a job. One of the most important strategic technology priorities is MSC Malaysia named cloud computing for 2010. The government used the element of cloud computing to deliver some government service in Malaysia, and hope that cloud computing adoption would lead Malaysia to an advanced economy. The incentives for implementing these technologies have been motivated by the desire to improve efficiency and to reduce costs and wastage for government (Weerakkody et al, 2011) and introduce small and medium sized enterprise new technology which improve their job performance and lead to economic growth. They announced that they wanted SMEs to contribute 50% of the country's GDP from the current 32%, with the application of new technologies being the key in achieving this goal. They allocated funds to help smaller companies upgrade their processes and increase efficiency. Survey shows that only 5% of Malaysian SMEs have fully automated IT and communication operations, and only 30% have any form of enterprise level ICT solutions (Malaysian International Report, 2010). Research around the globe has shown that IT adoption by SMEs is still low and has not reached expectations (Yu, Tao, 2009). The limited productivity among small and medium sized enterprises (SMEs) has been the focus of many business studies (Wielicki, Arendt, 2010). To answer the question of how and why individuals adopt new technology, numerous theories have arisen. Theory of innovation diffusion (IDT) is one of the base theory which many researcher used to investigate technology adoption, but the breadth and depth of the theory makes it difficult to frame a single study within the structure (Straub, 2009). This study uses IDT as a base theory and added attitude and self-efficacy to measure technological and individual dimension of technology adoption among SME owners in Malaysia.

2. Competitive Advantage of Using IT

While a variety of definitions of the term Information Technology (IT) have been suggested, this paper will use it as an area of research that includes study, design, development, implementation, support and management of computer-based information systems, particularly computer software and hardware (Sophonthummapharn, 2008). In short, IT can be defined as an infrastructure that is capable of electronically converting, storing, retrieving and managing data and information, in the form of graphics, text, video, and sound. In most literature, terms such as information systems (IS) as well as information and communication technology (ICT) are often interchangeably used and mixed with the term IT. There are several purposes for which IT can be used: amongst others, for value creation, problem solving (Melville et al, 2006) as well as for the purposes of communicating (Ryssel et al, 2004). Given that IT usage enables efficiency and considering that IS must be able to generate returns on investment, the usage of IT can also be seen as strategic and an important competitive advantage enabler (Valacich, Schneider, 2010).

Porter and Millar (1985) highlighted that there are three ways in which IT can impact competition among business organizations, whereby the adoption establishes

new businesses, develops competitive advantage and finally, it totally changes the industry structure. By adopting an appropriate technology, a business organization can reach greater heights of competency, see improvements in its performance and ensure that its competitive advantage is retained. Furthermore, in order to prevail against rivals in today's business environment, having precise information is crucial, which can only be attained by having an appropriate IT infrastructure. According to Porter and Millar (1985) competitive advantage stems from the ability of a business organization to create a value exceeding the cost involved in developing that particular product or service. Sustained competitive advantage flows from organizational capabilities and resources that are rare, valuable, non-substitutable and imperfectly imitable. In sustaining competitive advantage, business organizations must have the capability of implementing strategies based on the organization's internal strength, ability to respond to environmental opportunities, avoid or improve internal weaknesses as well as the ability to neutralize threats. In other word, IT is being promoted as one of the critical resources that can be used by business organization to gain competitive advantage.

Therefore, IT is best used when it supports the business organization's strategy towards achieving or sustaining competitive advantage against their rivals (Valacich, Schneider, 2010). Some sources of competitive advantage which can gain from IT implementation include having the best-made product on the market, delivering superior customer service, achieving lower cost than rivals, having a proprietary manufacturing technology, having shorter lead times in developing and testing new products. Besides, these competitive advantages can be gained or sustained by business organizations if IT is used effectively (Valacich, Schneider, 2010).

Given the increasing level of competition within the industry and rampant usage of IT, adoption of IT by a business organization would be a strategic necessity, more than any other reason. Moreover, IT has a positive effect on a business organization's performance in the area of profitability, market share and value as well as reduction in cost of operation, increases speed of delivery by suppliers, better co-ordination of organizations within the value chain, closer and personalized relationship among employees and trading partners, communication with customers, larger market share and new business opportunities, access to knowledge and market information, and a tool to facilitate new ways towards management and organization of business (Khong et al, 2010; Bartelsman, Doms, 2000; Brynjolfsson, Hitt, 2000; Dedrick et al, 2003; Devaraj, Kohli, 2003; Melville et al, 2006). In a lot of research it is found that SMEs can expand their business by taking proper advantage of IT. Several studies have revealed that SMEs are able to provide customers with more personalized service in comparison to the larger business organizations, giving the SMEs a competitive advantage. Hence, SMEs are able to compete globally, given the closer relationship between the supplier and the customer as well as improved efficiency with the help of IT (Chong et al, 2001).

3. IT Adoption in Malaysian SMEs

A number of barriers leading to the lack of IT adoption have been identified, which includes shortage of resources, (expertise and financial), lack of skills and knowledge with regard to advantages of IT (Blackburn, Athayde, 2000; Wielicki, Cavalcanti, 2006; Ndubisi, Jantan, 2003; Utomo, 2001; Jin, 2007; Chong et al, 2001). Since SMEs play a vital role in the Malaysian economy, the Government is committed towards creating the foundation to support and nurture the development of SMEs into becoming the main growth engine for the country. SME Corp (known as SMIDEC, established in 1996) helps SMEs in promoting and coordinating the development of SME in Malaysia. It provides technical and advisory support services in collaboration with other related agencies involved in SME development. Review of literature showed that the bulk of the Malaysian industry sector “consists of small traditional firms using low-technology and low-skill technologies.” According to statistics, 82% of SMEs only use computers for office work such as billing and invoicing, while 94% have no e-commerce exposure. Only 53% own a corporate website, with no e-commerce capabilities (Star online portal, SME Eager to Tap e-Commerce, December 2009). A study by Khong et al. (2008) on 406 managers/owners of SMEs in the southern region of Malaysia found that SMEs in Malaysia are often in a dilemma when deciding adoption of IT. In a study conducted by Hashim (2007), the usage of ICT is low, ICT skills level is poor and the ICT adoption is slow and late as the ICT adoption is deemed difficult by SME owners.

More recently, literature has emerged on the major problem which is making SMEs stay away from adoption. Subsequently, the problems encountered by SMEs are caused by internal and external environments, such as the lack of capabilities and resources, poor management, low technology, competition, economics, technology, socio-cultural, and international factors (Hashim, 2000). According to Ghosh and Kwan (1996), the problems faced by SMEs in Malaysia are cost, shortage of workers, and competition. Furthermore, the economic crisis provides a big challenge to the business operation and adds to the difficulty in assessing financial assistance or funding. Since SMEs have a limited capital, they do not plan to modernize their business by spending in information technologies such as e-commerce and software such as ERP and e-HRM to enhance their business competitiveness. In a study by Reynolds et al (1994), it was concluded that SME owners / managers are not keen on adopting technologies that are sophisticated if they are not able to comprehend even the basic ones. This reveals that SMEs do come across certain problems in formulating internal innovation strategies given their limited resources and technological competencies.

4. Theoretical Background

According to Rogers (1983) adoption is the decision to make full use of an innovation as the best course of action and passes through a sequence of stages before acceptance of a new product, whereas rejection is the decision not to adopt an available innovation

(Knol, Stroken, 2001). Innovation adoption is “the process where an individual or another decision making unit passes knowledge of an innovation, to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision” (Roger, 1995; Knol, Stroken, 2001). IT adoption is the business to adopt or absorb IT solution as a means to grow and manage their business (Jin, 2007). In assessing the determinants of IT adoption in SMEs, a number of studies have considered the technological, environmental, organizational and individual aspects of the business organization. Rogers (1962) developed the Innovation Diffusion Theory and posited that innovations are not equivalent units of analysis and explains how an innovation can be accepted and disseminated among customers. Some innovations receive high level of adoption in few years by specific population, in contrast; others need decades. The process begins with the consumer’s awareness of an innovation, and during this stage, consumers actively seek or receive information and shape their favourable or unfavourable beliefs and perception regarding the innovations. This is the leading cause of adoption or rejection decision (Yu, Tao, 2009). In IDT, Roger explains five general attributes of innovation: relative advantage, complexity, trialability, observability, and compatibility (Roger, 2003).

Relative advantage is defined as “the degree to which an innovation is perceived as being better than precursor.” Compatibility is “the degree to which an innovation is perceived as being consistent with the existing values, needs, and past experiences of potential adopters.” Complexity relates to the difficulty or ease to use of innovation. Trialability is defined as the degree to which an innovation may be experimented with on a limited basis. Observability is related to the visibility of results of an innovation compared to others (others using the system in organization, and tangibility of the results of using new technology (Agarwal, Prasad, 1998; Karahanna et al, 1999; Rashid, Al-Qirim, 2001; Sparling et al, 2007; Raman, 2006).

Everett Rogers’s theory of innovation diffusion presents as a foundational understanding of adoption theories which is used in a broad domain of comprehend to prediction of change which is initiate by his work in 1962 *The Diffusion of Innovations* as the most influential and arguable book in this area. In consequence, Rogers (1962) developed Innovation Diffusion Theory and posited that innovations are not equivalent unit of analysis. Some innovations receive high level of adoption in few years by specific population; in contrast other need decade. Roger’s concept of IDT has recently been challenged in many areas of business such as farming, medicine, justice, and others (lee, 2011). Initially Rogers argued that individuals are classified based on how quickly their adoption of innovation occurs. Accordingly, Roger has categorized them to innovators (2.5%), early (13.5%), early majority (34%), late majority (34%) and laggard (16%).

Rogers (1995) posited that the innovation process goes through channel that are created over time among members of an organization, the process stage include knowledge, persuasion, decision, implementation, and confirmation. The decision stage seeks commitments on innovation stage and adopters consider characteristics of innovation to adopt or reject the innovation. The five attributes of innovation which are explained by Roger IDT are: relative advantage, complexity, trialability, observability,

and compatibility. Relative advantage is defined as “the degree to which an innovation is perceived as being better than precursor.” Compatibility is referred to as “the degree to which an innovation is perceived as being consistent with the existing values, needs, and past experiences of potential adopters.” Complexity is “the degree to which an innovation is perceived difficult to understand and use” complexity of innovation has negative relation with its rate of adoption. Trialability is defined as the degree to which an innovation may be experimented with on a limited basis. Visibility and result demonstrability are two construct of observability that Moore and Benbasat considered in the model. Visibility related to the others using the system in organization, and result demonstrability explains about tangibility of the results of using new technology including their communicability and observability.

Innovation is adopted in phases that include first knowledge, formation of an attitude, a decision to adopt or reject, implementation, use and confirmation. The Innovation Diffusion theory measures the innovation characteristics toward innovation adoption and explains the diffusion of innovation across the time and innovation decision process. As mentioned in previous studies, theories of adoption and diffusion have different perspective and scope on the change process, but there are three categories of characteristics which are the same in most related theories. These three categories are included as individual characteristics, innovation characteristics, and contextual characteristics. Individual characteristics are referring to individual differences such as state or trait based characteristics. Individual characteristics are those characteristics to influence on people adopt or avoid changes. Agarwal, Prasad, 1998; Wood, Swait, 2002 has also been shown that personality traits may predispose certain people to adopt or not to adopt innovation. The second category of characteristics as innovation one refers to how easy as innovation is to use and how the use of an innovation can be compatible with the lifestyle of an individual. The last one, contextual characteristics are related the environment and surrounding of an individual during the adoption process. In general, contextual characteristics are referring to work-based organization, but it may consider as facilitators of changes regarding mass media or individuals acting.

As mentioned before, Rogers’s model is one of the fundamental frameworks in the area of adoption and diffusion which is used by researchers in this field for many years. In addition, it contemplates the innovation in a process of period of time. Besides all strength of this model, it seems that the individual anchors are not much considers that this study aims to cover it. The two individual phases of “attitude” and “self efficacy” are the ones that should think about and deem in the innovation adoption process. However, the individual issues has been consider in IDT as well, one question that needs to be asked is whether attitude and self efficacy is measure in this process.

5. Model Development

This study draws upon the Innovation diffusion theory to extend and develop a model to measure individual and technological dimension toward technology adoption.

The proposed theoretical model is developed to provide a comprehensive understanding of the determinants that affect the adoption of innovative IT within SMEs owners. The basic IDT consists of several constructs that are hypothesized to relate to the intention to adopt a new system (Roger, 1962). In the case of IT innovation, we expect IDT constructs to be important determinants of SMEs owners adoption. To extend and improve the IDT we focus on the effect of attitude and self efficacy on IT adoption.

This study therefore set out to assess the effect of attitude and self-efficacy by individuals who fact to adopt or not to adopt IT innovation. This study systematically adds these two variables to the IDT in the same level with relative advantage, compatibility, complexity, triability, and observability to measure the different dimensions of technology adoption as shown in the following research framework:

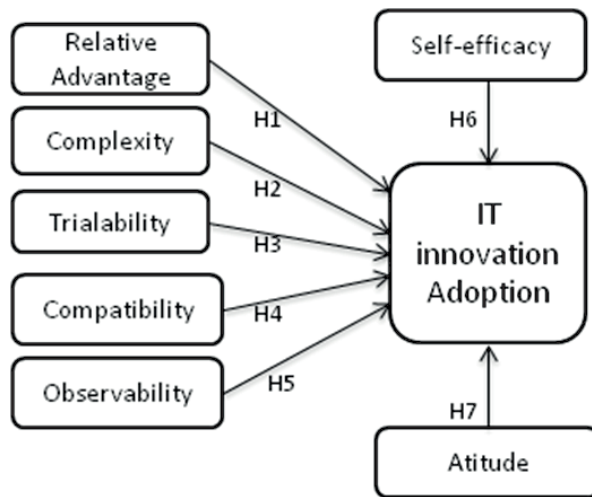


Figure 1. Research Model

5.1. Relative Advantage

Relative advantage is defined as the degree to which using IT innovation is perceived as being better than using its predecessor (Moore, Banbasat, 1991). The nature of the innovation determines what specific type of relative advantage is important to users. Rogers’s conceptualization of relative advantage is very similar to Davis’s perceived usefulness. Previous study found relative advantage as best predictor of adoption and usage (Agarwal, Prasad, 1997; Karahanna et al, 1999; Moore, Benbasat, 1991; Plouffe et al, 2001). For example, Lu et al. (2009) found relative advantage as important determinant of Wi-Fi technology adoption among University faculty members. Kendall et al. (2001) refined relative advantage as the benefit to SMEs in term of wider market coverage, lower business costs, and importance of doing business on the internet in the future. We expect that if SME owners believe that IT innovation is useful and will

improve their job performance, they would have a higher intention to adopt and use IT innovation. As IDT supports the assumption that relative advantage is a necessary precursor of intention adoption, this study hypothesizes:

H1: The perception of relative advantage of IT innovation will have a significant influence on SME owner's intention to adopt IT innovation.

5.2. Complexity

Complexity is defined as the difficulty perceived by the SMEs in adopting IT innovation. Rogers's conceptualization of complexity is very similar to Davis's perceived ease of use. Specifically, it is the degree to which an innovation is perceived as relatively difficult to understand and use (Rogers, 2003). According to Hester and Scott (2007) absence of ease of use had a negative impact on perceptions of Wiki technology and lead to decreased adoption and usage. We expect that if IT innovation is easy to use SME owners would have a higher intention to adopt and use IT innovation. Given the well established rationale and empirical support for an effect of complexity on adoption, this study hypothesizes:

H2: The perception of complexity of IT innovation will have a significant influence on SME owner's intention to adopt IT innovation.

5.3. Trialability

Trialability is defined as the degree to which it is possible to try using the IT innovation (Moore, Benbasat, 1991). Trialability is more important for early adopters as the ability to try the technology will decrease levels of uncertainty (Rogers, 2003). Increase user experience will decrease the importance of Trialability. According to Murphy (2005) the more easily the innovation can be tried, the more easily it will be adopted. Lu et al. (2009) investigated Wi-Fi adoption among University faculty members, and found that faculty who did not have their own laptop were unable to experiment with Wi-Fi technology which led to a lesser rate of adoption. We expect that if SME owners are able to try using the IT innovation the probability to adopt and use such innovation would be higher. Following this rationale, this study hypothesizes:

H3: The perception of Trialability of IT innovation will have a significant influence on SME owner's intention to adopt IT innovation.

5.4. Compatibility

Compatibility is defined as the degree to which IT innovation is perceived as consistent with the existing values, past experiences and needs of potential adopters (Rogers, 1995). According to Kolodinsky et al. (2004) compatibility has a positive connection with use of internet banking. Thus, in the current study SMEs owners with negative feeling towards the information technology might find it difficult to adopt and use IT innovation. We expect that if IT innovation is consistent with the existing technology, and SME owners past experience, they would have a higher intention to adopt and use such innovation. Consistent with this view, this study hypothesizes:

H4: The perception of compatibility of IT innovation will have a significant influence on SME owner intention to adopt IT innovation.

5.5. Observability

Observability defined as the degree to which the results of the innovation are visible to others (Roger, 1995). Rogers' attribute of observability is divided into two constructs of (1) result demonstrability (the tangibility of the results of using an innovation), and (2) visibility which refers to the extent to which potential adopters see the innovation as being visible in the adoption context. Visibility increases the relative exposure of the innovation. Wei (2001) investigated adoption of cellular phones in Hong Kong and found that only observability continued to have a significant impact on the likelihood of adoption. We expect that if IT innovation is visible in the work environment, SME owners would have a higher intention to adopt and use IT innovation. Based on this theoretical argument, this study hypothesizes:

H5: The perception of observability of IT innovation will have a significant influence on SME owner's intention to adopt IT innovation.

5.6. Self Efficacy

Another factor that an individual considers important in this stage is self efficacy. Self efficacy refers to one's belief about his or her ability to do a specific task given a set of circumstances. Therefore it's about the individual's ability and one's judgments about their capabilities to use innovation (Straub, 2009). A higher level of self efficacy will lead to higher intention to adopt and use innovation. Literature shows that the complexity of innovation prevents users to adopt and use innovation. In the IS research, self efficacy define as "people's judgments of their capabilities to organize and execute course of action required to attain designated types of performance" (Bandura, 1986). Prior research in the technology acceptance context found that computer self efficacy has a positive effect on computer usage behaviour (Thong et al. 2002; Venkatesh, Davis, 1996; Venkatesh, 2000). In the other word a high level of self efficacy will lead to a high level of intention to adopt and use IT innovation (Compeau, Higgins, 1995, Agarwal et al, 2000). We expect that if SME owners believe that they have the skill and ability to use IT innovation, they would have a higher intention to adopt and use IT innovation. Therefore, from the above argument, this study hypothesizes:

H6: SME owner's perceptions of self-efficacy about using IT innovation have a significant influence on SME owner's intention to adopt IT innovation.

5.7. Attitude

The innovation decision process is a mental process that an individual or a unit of adoption go through, with the first stage being gathering knowledge on an innovation, and to form attitudes toward the innovation, to making decision whether to adopt or reject, and adopting an innovation and implementation of new ideas to the last stage to confirm this decision (Roger, 2003). The most important factors in all phases is positive

or negative attitude toward adopt and use innovation which related to different factors. Shaping an favourable or unfavourable attitude toward innovation will affect adoption; a more favourable attitude toward innovation leads to stronger intention to adopt and use innovation. Many model/theories tested the effect of attitude on behavioural intention and result shows that attitude is an important factor toward intention- i.e., TRA, TPB, and TAM. Therefore, it is important to consider attitude as an important factor that leads to intention to adopt or reject the innovation. We expect that if SME owners have a positive attitude toward IT innovation, they would have stronger intention to adopt and use innovation in their company. Following this line of reasoning, this study hypothesizes:

H7: Attitudes about using IT innovation have a significant influence on SME owner intentions to adopt IT innovation.

6. Research Methodology

The sampling frame is made up of SME owners involved in providing professional services in the areas of manufacturing, telecommunication, education, banking and finance, service, and agriculture in the Klang Vally in Malaysia. The survey is in progress and contains a number of questions that were designed to capture information about the constructs in the research model. We modified some previously validated scales and adapted them to the context of IT adoption. The study used the original questionnaire from IDT to measure relative advantage, compatibility, complexity, trialability, observability. Attitude and self efficacy items are adopted from Venkatesh et al. (2003) to measure SMEs owner skill and ability and their attitude toward IT adoption. To suit the context of the study, some words have been modified accordingly. Likert scales (1-7) ranging from “extremely agree” to “extremely disagree” was used for all construct items. This model will be empirically validated using survey data. Random samples of managers that are owner of the SMEs, or manager of the company in Kuala Lumpur, Malaysia are targeted for sampling. We choose manager or owner of the company because most influential people affecting innovation and change in organizations are top managers (Damanpour, Schneider, 2006) from the sample we choose sub sample that include the SMEs owners that their work related to information technology and they use IT technology. Regression is a statistical tool which appropriate to explain the relationships among variables and examine the structure of interrelationships expressed in a series of equations (Hair et al. 2006).

7. Conclusions

Information technology is critical for SME growth, and can increase competitive strength of companies from process reengineering, cost reduction, efficiency and effectiveness. SMEs in Malaysia need to be competitive in the rapidly growing

environment. To be competitive, they need to adopt new technologies by acquiring IT knowledge and making use of platforms set by the government. The use of IT reduces the cost of business process, customer or suppliers, differentiates product and services/ reduces the differentiation advantage of competitors, creates new products and services and make radical changes to business processes, improve quality, efficiency, and reduce the time span to market and expand regional business. The main research question is what are the factors that may affect small and medium size enterprise to adopt and use IT innovation? To find the determinants of IT adoption among SME owners we chose Innovation diffusion Theory (IDT) as a base model to investigate IT innovation adoption by SME owners in Malaysia. We consider attitude and self efficacy as individual determinants toward IT adoption and added them to the IDT model. We expect that these factors have significant effect on SMEs owner adoption behaviour. This is an ongoing research, and at this stage, we are mainly developing a theoretical argument and methodology that is currently in the process of being tested. Therefore, the conclusions are in stage of assumptions and will be validated through data analysis.

The result of this study will help government to identify determinants of IT innovation adoption among SMEs owners in Malaysia. The Malaysian government needs to assist the SME's in providing assistance in terms of monetary and guarantee scheme in acquiring IT skills and equipment as they contribute greatly to the country's employment and GDP. In the current study, our target behaviour is related to the use of IT innovation in general and not to any application or specific systems. Thus, future research should use this model as a base model to examine different system/innovation adoption in different context.

Literature

- Agarwal, R.; Prasad, J. 1997. *The role of innovation characteristics and perceived voluntariness in the acceptance of information technologies*. Decision Science. 28(3): 557-582.
- Agarwal, R.; Prasad, J. 1998. *A conceptual and operational definition of personal innovativeness in the domain of information technology*. Information system research, 92:204-215.
- Agarwal, R.; Prasad, J. 2000. *A Field Study of Adoption of Software Process Innovations by Information Systems*. IEEE Transactions on Engineering Management. 47(3): 295-380.
- Alam, S.H.; Kamal, M.N. 2009. *ICT Adoption in SMEs: an Empirical Evidence of Service Sectors in Malaysia*, International Journal of Business and management. 4(2):112 -125.
- Bandura, A. 1986. *The social foundations of thought and actions*. Englewood Cliffs, NJ: Prentice-Hall.
- Bartelsman, E.; Doms, M. 2000. *Understanding Productivity: Lessons from Longitudinal Micro data*. Journal of Economies Literature, 38: 569-94.
- Blackburn, R.; Stokes. D. 2000. *Breaking down the barriers: using focus groups to research small and medium-sized enterprises*. International Small Business Journal. 19(1):44-67.
- Brinjolfsson, E., Hitt. L.M. 2000. *Beyond Computation: Information technology,*

- organizational transformation and business performance*. The journal of Economic Perspectives. 14(4): 23-48.
- Byrd, T.A.; Turner, D.E. 2001. *An Exploratory Examination of the Relationship between Flexible IT Infrastructure and Competitive Advantage*: Information & Management. 39: 41-52.
- Chong, H.; White, R.E.; Prybutok, V. 2001. *Relationship among organizational support, JIT implementation, and performance*. Industrial Management & Data Systems, 101 (6): 273 – 281.
- Compeau, D.; Hingpins, C.A. 1995. *Application of social cognitive theory to training for computer skills*. Information Systems Research. 6(2): 118-143.
- Damanpour, F.; Schneider, M. 2006. *Phases of the Adoption of Innovation in Organizations: Effects of Environment, Organization and Top Managers*, British Journal of Management. 17: 215-236.
- Dedrick, J.; Gurbaxani, V.; Kraemer, K. L. 2003. *Information technology and economic performance: A critical review of the empirical evidence*. ACM Computing Surveys, CSUR, 35(1): 1-28.
- Devaraj, S., Kohli, R. 2003. *Performance impacts of information technology: Is actual usage the missing link?* Management Science. 49(3), 273-289.
- Guriting, P.; Ndubisi, N.O. 2006. *Borneo online banking: Evaluating customer perceptions and behavioral intention*. Management Research News. 29: 6-15.
- Ghosh, B.C.; Kwan, W. 1996. *An analysis of key success factors of SMEs: A comparative study of Singapore/Malaysia and Australia/New Zealand*. Paper presented at ICSB 41st World Conference, Stockholm, 17-19.
- Hair, J.F.; Black, W.C.; Babin, B.J.; Anderson, R.E.; Tatham, T.L. 2006. *Multivariate Data Analysis*, (6th ed.), Upper Saddle River, NJ: Prentice Hall.
- Hashim, J. 2007. *Information Communication Technology ICT. Adoption among SMEs Owners in Malaysia*. International Journal of Business and Information. 2(2): 221-240.
- Hester, A.; Scott, J. 2007. *Organizational Wiki Usage: A Conceptual Model*. Paper presented at the Twenty-Eighth International Conference on Information Systems. Montreal. Quebec, Canada.
- Hitt, MA.; Ricart I Costa JE.; Nixon, RD. 1998. *The new frontier*. In Managing Strategically in an Interconnected World. Hitt MA, Ricart I Costa JE, Nixon RD (eds). Wiley: Chichester; 1-12.
- Hitt, M.A.; Ireland, R.D; Camp, S.M.; and Sexton, D.L. 2001. *Introduction to the Special Issue Strategic Entrepreneurship: Entrepreneurial Strategies for Wealth Creation*. Strategic Management Journal, 22(6:7) 479-491.
- Hong, K-K.; Kim, Y-G. 2002. *The Critical Success Factors for ERP Implementation: An Organizational Fit Perspective*. Information & Management. 40: 25-40.
- Jin, N. (2007). *A Study of Information Technology Adoption for Small and Medium Sized Enterprises Strategic Competitiveness*. IEEE. 1-4244-1312-
- Karahana, E.; Straub, D.; Chervancy, N. 1999. *Information technology adoption across time: a cross-sectional comparison of pre-adoption and post-adoption beliefs*. MIS Quarterly, 23(2): 183–213.
- Kendall, J.; Tung, L.; Chua, K.; Hong, C.; Ng, D.; Tan, S. 2001. *Receptivity of Singapore's SMEs to electronic commerce adoption*. Journal of Strategic Information Systems. 10(3): 223-242.
- Knol, W.H.C.; Stroeken, J.H.M. 2001. *The Diffusion and Adoption of Information Technology in Small-and Medium-Sized Enterprises through IT Scenario*. Technology Analysis Strategic Management. 13, 2.
- Khong, S.T.; Sing, C.C.; Binshan, L.; and Uchenna, C.E. 2010. *Internet-based ICT Adoption among SMEs –Demographic Versus Benefits, Barriers and Adoption*

- Intention*. Journal of Enterprise Information Management, 23 (1): 21-55.
- Kolodinsky, J.M.; Hogarth, J.M.; and Hilgert. M.A. 2004. *The adoption of electronic banking technologies by US consumers*. The International Journal of Bank Marketing. 22(4:5) 238-59.
- Lai, V.S.; Li, H. 2005. *Technology acceptance model for internet banking: an invariance analysis*. Journal of Information and Management. 42: 373-386.
- Lai, F.; Zhao, X.; Wang, Q. 2006. The impact of information technology on the competitive advantage of logistics firms in China. Industrial Management & Data systems. 106:1249-1271.
- Lee, G. 2011. *New method approach toward efficiency*. The Journal of American Academy of Business. Cambridge, 17:1.
- Lu, Y.; Quan, J.; Cao, X. 2009. *The Perceived Attributes of Wi-Fi Technology and the Diffusion Gap among University Faculty Members: A Case Study*. Communications of the Association for Information Systems. 24: 69-88.
- Mata, F.J.; Fuerst W.L.; Barney, J.B. 1995. *Information technology and sustain competitive advantage: A resource-Based analysis*. MIS Quarterly, 19(4): 487-505.
- Melville, N.P. 2010. *Information systems innovation for environmental sustainability*. MIS Quarterly. 34 (1):1-21.
- Malaysian SME Annual Report. 2009/2010.
- Melville, N.; Gurbaxani, V.; Kraemer, K. 2006. *The Productivity impact of information technology across competitive regimes: The role of industry concentration and dynamism*. Decision Support Systems. 43:229-242.
- Moore, G. C.; Benbasat. I. 1991. *Development of an instrument to measure the perceptions of adopting an information technology innovation*. Information Systems Research. 2(3): 192-221.
- Murphy, E. 2005. *Issues in the adoption of broadband &-enabled learning*. British Journal of Educational Technology. 36(3): 525-536.
- Ndubisi, N.O.; Jantan, M. 2003. *Evaluating IS usage in Malaysian small and medium-sized firms using the technology acceptance model*. Logistics Information Management. 16 (6): 440 – 450.
- Plouffe, C.R.; Hulland, J.S.; Vandenbosch, M. 2001. *Research report: richness versus parsimony in modelling technology adoption decisions--understanding merchant adoption of a smart card-based payment system*. Information Systems Research. 12(2): 208-222.
- Porter, M.E.; Millar. V.E. 1985. *The information revolution is transforming the nature of competition*. Harvard Business Review. 149-174.
- Raman, M. 2006. *Wiki Technology as a "Free" Collaborative Tool Within an Organizational Setting*. Information Systems Management. 23(4), 59-66.
- Rashid, M.A.; Al-Qirim. N.A. 2001. *E-commerce technology adoption framework by New Zealand small to medium size enterprises*. Research Letters in the Information Mathematical Science. 2(1): 63-70.
- Ramayah, T.; Jantan, M.; Noor. M. N. M.; and Ling. K. P. 2003. *Receptiveness of Internet banking by Malaysian consumers*. Asian Academy of Management Journal. 8: 1-29.
- Reynolds, P. D.; Storey, D.; Westhead. P. 1994. *Cross- National Comparison of the Variation in New Firm Formation Rates*. Regional Studies. 28: 443–456.
- Rogers, E. M. (1962). *Diffusion of innovations* (1st ed.). New York: Free Press.
- Rogers, E. M. 1983. *Diffusion of Innovations*. 3rd Ed., New York: Free Press.
- Rogers, E. 1995. *Diffusion of Innovations*. 4th Ed... New York, Free Press.
- Rogers, E. 2003. *Diffusion of Innovations*. 5th Ed.. New York, Free Press.

- Ryssel, R.; Ritter, T. 2004. *The impact of information technology deployment on trust, commitment and value creation in business relationships*, Journal of Business & Industrial Marketing 19(3): 197-207.
- Sophonthummapharn, K. 2008. *A comprehensive framework for the Adoption of techno-Relationship Innovations: A framework for electronic customer relationship management*. Marketing Intelligence & Planning. 27(3):380-412.
- Sparling, L.; Toleman M.; Cater-Steel, A. 2007. *SME Adoption of e-Commerce in the Central Okanagan Region of Canada*, 18th Australasian Conference on Information Systems; 5-7 December.
- Straub, E.T. 2009. *Understanding Technology Adoption: Theory and Future Direction for Informal Learning*. Review of Educational Research, ProQuest Educational Journals, 79(2): 625-64.
- Thong, J. Y. L.; Hong, W.; and Tam, K.-Y. 2002. *Understanding user acceptance of digital libraries: What are the roles of interface characteristics, organizational context, and individual differences?* International Journal of Human-Computer Studies. 57: 215-242.
- Utomo, H.; Dodgson, M. 2001. *Contributing factors to the diffusion of IT within small and medium sized firms in Indonesia*. Journal of Global Information Technology Management. 4 (2): 22-37.
- Valacich, J.; Schneider, C. 2010. *Enhancing the motivational affordance of information systems: The effects of Real-Time performance feedback and goal setting in group collaboration environments*. Journal of Management science. 56:4.
- Venaktesh, V.; Davis, F.D. 1996. *A Model of the Antecedents of Perceived Ease of Use: Development and Test*. Decision Sciences, 27(3): 451-481.
- Venakatesh, 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.
- Venakatesh, V.; et al 2003. *User Acceptance of Information Technology: Toward A Unified View*. MIS Quarterly. 27 (3):425-478.
- Weerakkody, V.; El-Haddadeh, R.; Sadol, T.; Ghoneim, A.; and Dzapka, P. 2011. *E-government implementation strategies in developed and transition economies: A comparative study*. International Journal of Information Management. 1-9.
- Wei, R. 2001. *From Luxury to Utility: A Longitudinal Analysis of Cell phone Laggards*. Journalism and Mass Communication Quarterly. 78(4): 702-19.
- Wielicki, T.; Cavalcanti, G. 2006. *Study of digital divide: measuring ICT utilization and implementation barriers among SMEs of central California*. Conference on Business Information System. 277-294.
- Wielicki, T.; Arendt, L. 2010. *A knowledge-driven shift in perception of ICT implementation barriers: Comparative study of US and European SMEs*. Journal of Information Science. 36(2): 162-174.
- Wood, S.L.; Swait, J. 2002. *Psychological indicators of innovation adoption: Cross-classification based on need for cognition and need for change*. Journal of Consumer Psychology. 12 (1): 1-13.
- Yu, C.; Tao, Y. 2009. *Understanding business-level innovation technology adoption*, Technovation, 29: 92-109.

INFORMACINIŲ TECHNOLOGIJŲ INOVACIJŲ TAIKYMO KONKURENCINIAI PRANAŠUMAI SMULKIOJO IR VIDUTINIO VERSLO ĮMONĖSE MALAIZIJOJE

S. Moghavvemi

Malajų universitetas, Kuala Lumpūras, Malaizija, moghavvemi_2006@yahoo.com

Fatemeh Hakimian

Malajų universitetas, Kuala Lumpūras, Malaizija, Mahboobeh1000@yahoo.com

Tengku Mohd Faziharudean Tengku Feissal

Malajų universitetas, Kuala Lumpūras, Malaizija, deanfeissal@um.edu.my

Santrauka. Informacinių technologijų koncepcija yra laikoma galingu modernios ir konkurencingos ekonomikos ginklu. Šiame straipsnyje siekiama: paaiškinti IT inovacijų poveikį konkurenciniam pranašumui; trukdžius ir naudą, kurią įmonės gauna taikydamos šias inovacijas; pasiūlyti modelį, kuris galėtų pamatuoti IT taikymo smulkiojo ir vidutinio verslo (toliau – SVV) įmonėse determinantus. Straipsnyje pristatomas teorinis IT inovacijų taikymo Malaizijos SVV įmonėse tolesnių studijų pagrindas. Pateikiami koncepciniai SVV įmonių vaidmens Malaizijos ekonomikoje svarstymai bei viešosios politikos, skatinančios įmones diegti IT inovacijas, poveikis.

Straipsnio autoriai inovacijų difuzijos teorija rėmėsi kaip pagrindu, papildydami požiūrio į inovacijų diegimą ir savaiminio veiksmingumo aspektais kaip individo inovacijų diegimo suvokimo matavimo determinantais. Individualus savaiminis veiksmingumas ir požiūris į inovacijų diegimą formuoja nuostatas, vedančias prie inovacijų priėmimo arba atmetimo. Šie į inovacijų difuzijos teoriją įtraukti veiksniai susiaurina jos plotmę ir leidžia formuoti studiją, tiriančią individo ir technologijos dimensijas technologinio adaptyvumo aspektu. Dėl šios priežasties būtinas naujas prieigos metodas siekiant išsamaus tyrimo ir supratimo.

Pasiūlyto tyrimo struktūra bus empiriškai validuojama apklausos duomenimis. Ši studija yra tęstinė ir esamoje studijoje teoriniai argumentai plėtojami ir metodologija išbandoma naudojant regresinę analizę. Išvados daromos dėl Malaizijos SVV adaptyvumo diegiant IT inovacijas.

Raktažodžiai: informacinės technologijos, inovacijų diegimas, konkurencinis pranašumas, kliūtys, inovacijų difuzijos teorija, SVV įmonės, Malaizija.