



Research Article

Impacts Of Information Technology Capabilities on Small and Medium Enterprises (Smes) and Large Enterprises

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Abstract

Generally, this study was conducted to investigate the impacts of information technology capabilities (ITCs) on small and medium enterprises (SMEs) and large enterprises in Malaysia by measuring their competitiveness. A new empirical framework was designed to assist domestic companies to determine appropriate ITCs such as dynamic, integrating, and utility capabilities to attain competitive advantage (CA). A questionnaire is developed, tested in a pilot study, and finally distributed to a sample of 500 domestic companies in Malaysia. A total of 295 respondents have provided their answers to the questionnaire. The dynamic, integrating and utility capabilities account for 60.9% of the variance in the competitive advantage of SMEs and the dynamic and integrating capabilities account for 67.8% of the variance in the CA of large enterprises in Malaysia. This study proposes an empirical research framework that is important for SMEs and large enterprises to reap competitive advantage. Apart from contributing to the literature of knowledge management, this study would assist in developing appropriate recommendations to adopt ITC for domestic companies. This research is one of the limited studies in Asia and Malaysia that examines how to adopt ITC to reap CA in SMEs and large enterprises in Malaysia.

Keywords: Information technology (IT), IT capabilities, competitive advantage, SME, large enterprises

Introduction

Forty-percent of local companies in Malaysia failed within the first five years of company establishment (Leitrim, 2013). Some literature even reported a higher percentage of company failure, which was

over 60%, in the first five years of establishments (Noor and Pi-Shen, 2009). These high percentages of failure reflect serious challenges and obstacles faced by domestic companies in the era of globalisation (Veera, 2010).

Among the key challenges faced by local companies are insufficient resources to exploit competitive advantages (CAs) beyond domestic markets (Westhead et al., 2002). Expanding business internationally is definitely a risky venture for those domestic companies which do not directly involve in exporting. Another main challenge of domestic companies in Malaysia is the lack of knowledge management (KM) capabilities such as management and business skills (Ahmad and Seet, 2009; Chong and Mahmoud, 2013).

There are also very low information technology (IT) investments among domestic companies in Malaysia. Three quarters of domestic companies (73%) did not use information technology (IT) in running their businesses and only 12% of them had their own company websites (SME Corp, 2013). Low IT investment is an impediment for domestic companies to reap competitive advantage. Instead of IT investments, domestic companies tend to fully rely on external IT experts and had little long-term planning and poor business process enhancement (Premkumar, 2003). Hence, with limited IT allocation, when right IT capability (ITC) is identified and invested, domestic companies can catch up with their counterparts in advanced economies to reap organisational competitive advantage (CA).

Past research indicated positive influence of IT in creating sustainable CA for domestic companies (Chang and Chuang, 2011; Jee-Hae et al., 2012; Paul, 2008), but most of the literature was done in western countries (Tallon, 2008) or other countries such as Japan (Nonaka, 1994), Taiwan (Chang and Chuang, 2011; Jian-Liang, 2012), Hong Kong (Ngai and Chan, 2005) and Iran (Yaghoubi et al., 2011). The results of the previous literature could not be generalised to Malaysian context due to cultural and business customs' differences. Moreover, there is also limited research in testing the moderating impact of employee size in developing suitable information technology capabilities (ITC) for sustainable CA.

Malaysia, being a multiethnic and multicultural country, practicing diverse culturally shaped KM activities in organisational teams and departments (Furner et al., 2009). This cross-cultural KM has overcome culturally shaped blind-spots in conducting research (Giudice et al., 2012). With this, Malaysia which possesses essential ITCs could contribute to sustainable organisational CA, vis-a-vis other counterparts around the world such as the European Union, the United States, and Australia (Marchand et al., 2000; Lew et al., 2014).

Therefore, a study of the nature of multiethnic and multicultural KM in Malaysia is potentially very fruitful for cross-cultural KM that can have implications for countries with similar cultural and developmental levels to attain CA.

Theory and Hypotheses

Past prominent studies were explored and reviewed using systematic literature review (Kitchenham et al., 2007).

Competitive Advantage (CA)

Knowledge management (KM) can affect organisational competitive advantage (CA) by generating direct profits or costs that can be linked to organisational vision and strategy or creating economies of scale and business scope enhancements (Chang and Chuang, 2011).

Management researchers had been exploring the concept of CA in terms of organisational differentiation (Porter, 1985) or "resource-based" view (Peteraf and Barney, 2003). In order for domestic companies to reap CA, its IT and human capital resources must have value, rarity and be inimitable among rivals. The most recent studies had extended the research scope of Peteraf and Barney (2003) by linking ITC with CA in their studies (Chang and Chuang, 2011; Jee-Hae et al., 2012; Jian-Liang, 2012).

According to Prior (2006), CA is gained by exploiting a unique blend of KM activities

to access organisational resources. Prior (2006) mainly focused on how to intensify the organisational core capabilities and resource activities to maintain and improve its CA. Based on the definition of Prior (2006), this study considers KM as the “activities” and ITC as the “resources” to perform KM activities for an organisation to be different from competitors.

Information Technology Capability (ITC)

Knowledge acts as a foundation for knowledge management (KM) activities and Information Technology Capability (ITC). In turn, KM activities and ITC are supported by IT applications (Lew et al., 2013; Mushref and Ahmad, 2011). Sher and Lee (2004) proved that IT applications often resulted in greater ITC. Previous studies such as Chang and Chuang (2011), Jee-Hae et al. (2012) and Tallon (2008) investigated the effect of IT application deployment on the organisational CA. The findings showed that organisations that possessed ITC often gained higher organisational CA.

Various ITC were proven to assist organisations in achieving organisational CA from past research. In this study, ITC is considered as a group of components, namely dynamic capability (Lew et al., 2014; Tallon, 2008), integrating capability (Christopher, 2006; Sher and Lee, 2004) and utility capability (Lew et al., 2014; Ngai and Chan, 2005).

Small and Medium Enterprise (SME)

The information technology (IT) adoption rate of SMEs is very low while netizens were amounting to 19.2 million (65.8%) of Malaysian population (ITU, 2013). Three quarters of domestic companies (73%) did not use IT in running their businesses. From the 27% of SMEs, only 12% of them had their own company websites (SME Corp, 2013). These low statistics sign IT investment is an impediment for domestic companies to reap competitive advantage (CA). Instead of increasing IT investments, domestic companies depend on IT outsourcing (Premkumar, 2003).

The objective of this study is to examine the role of ITC for organisational CA in competitive environment. Specifically, this research seeks to address the following two research questions (RQ):

RQ1. How does ITC relate to CA?

RQ2. How does employee size influence the impact of ITC on organisational CA?

Hence the following hypotheses were also outlined:

H1: Employee size moderates the level of enhancement on organizational CA with dynamic information technology capability (ITC).

H2: Employee size moderates the level of enhancement on organizational competitive advantage with integrating ITC.

H3: Employee size moderates the level of enhancement on organizational competitive advantage with utility ITC.

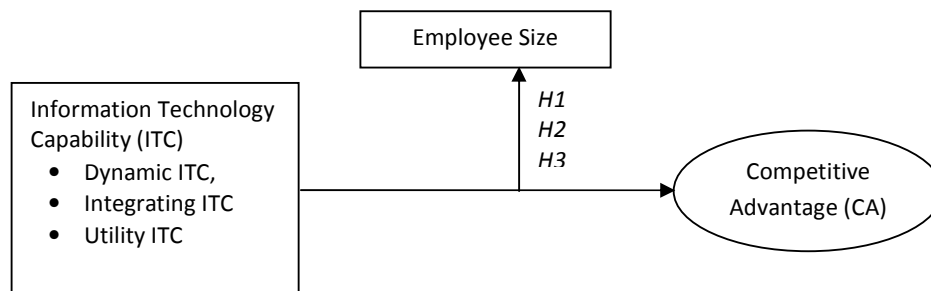


Fig 1: Research Framework

Research Methodology

The present study is a quantitative study. Principles of “always maximise your sample size” and “samples sizes of 300 are required” were considered and followed larger samples frequently generate more stable and replicable results (Hair et al., 2010). Hence, a questionnaire is developed, tested in a pilot study, and finally distributed to 500 domestic companies in Malaysia. The population of this project is domestic companies that involve in any business/ industry in Malaysia. Each respondent is given 30 minutes to answer the questionnaire. A pilot study is carried out prior to the main survey and preliminary questionnaire is distributed to 200 respondents to test the validity of the survey questions. The study uses structural equation modelling to analyze the data.

The questionnaire uses a five-point Likert scale ranging from 1 – strongly disagree to 5 - strongly agree to measure the dependent and independent variables. There are 12 questions that measure information technology capability (ITC), which is composed of 3 questions measuring dynamic (D) capability, 3 questions measuring integrity (I) capability

and 6 questions measuring utility (U) capability. Besides, there are also 18 questions in the questionnaire that measure organisational competitive advantage (CA).

Results

A total of 295 respondents had provided their answers to the questionnaire. The response rate is 59% (295/500). Seventy-six percent of the respondents are females and 26.4% are males, as indicated in Table 1. In terms of age, 41.7% of them are young respondents with the age of 26-30 years old. Twenty-eight percent of them fall within the age of 31-35 years old and 15.3% of them are adults with the age of 36-40 years old. Eighty-six percent of the respondents are department head and 13.6% of them are section head. Thirty-four percent of the respondents come from IT/Electronic Data Processing (EDP) department, 18.3% from R&D department and 5.4 % from product department. One quarter of the respondents work in small enterprises with 1-50 employees and another one quarter of our respondents work in large enterprises with 501 employees and above.

Table 1: Demographic Profiles of MSC Malaysia Managers and Companies

Demographic Profile	Number	Percentage
Gender		
Female	78	26.4
Male	217	73.6
	N = 295	100%
Age		
21 - 25	18	6.1
26 - 30	123	41.7
31 - 35	83	28.1
36 - 40	45	15.3
41 - 45	14	4.7
46 - 50	12	4.1
	N = 295	100%
Position		
Section Head	40	13.6
Department Head	253	85.8
Others	2	0.7
	N = 295	100%
Department		
IT / EDP	101	34.2
Quality Control / Assurance	12	4.1
Marketing and Sales	6	2.0
Product Development	16	5.4
Finance	12	4.1
Customer Service	6	2.0
Human Resource	6	2.0
Production	6	2.0
Engineering	11	3.7
R&D	54	18.3
Others	65	22.0
	N = 295	100%
Number of Employees		
1 - 50	76	25.8
51 - 100	35	11.9
101 - 150	44	14.9
151 - 200	18	6.1
201 - 250	18	6.1
251 - 300	6	2.0
301 - 350	11	3.7
451 - 500	12	4.1
501 and above	75	25.4
	N = 295	100%

In this study, the respondents are divided into two groups based on the employee size in their organizations, namely small and medium enterprises (SMEs) (< 150 employees) and large enterprises (\geq 150 employees) (SMECORP, 2010). The path estimates displayed in Table 2 show that employee size moderates the relationships of Dynamic capability (D) \rightarrow CA, Integrating capability (I) \rightarrow CA and Utility capability (U) \rightarrow CA relationships.

While the analysis results of SMEs exhibit significant relationships of D \rightarrow CA, I \rightarrow CA

and U \rightarrow CA, large enterprises show significant relationships of D \rightarrow CA, I \rightarrow CA but non-significant relationship of U \rightarrow CA. For SMEs, all H1, H2 and H3 are supported but for large enterprises, H1 and H2 are supported and H3 is not supported. The dynamic, integrating and utility capabilities account for 60.9% of the variance in the competitive advantage of SMEs and the dynamic and integrating capabilities account for 67.8% of the variance in the competitive advantage of large enterprises in the current study.

Table 2: Testing for Employee Size as a Moderator

Path Estimate	SMEs ($<$ 150)	Large Enterprises (\geq 150)
D \rightarrow CA (p value)	0.357*** (0.000)	0.419*** (0.000)
I \rightarrow CA (p value)	0.399*** (0.000)	0.073* (0.029)
U \rightarrow CA (p value)	0.355*** (0.000)	0.701 (0.057)
R ²	0.609	0.678

Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Discussion and Recommendations

Since knowledge is perceived as a processed resource and capability (Benbya et al., 2004; Sher and Lee, 2004), the key objective of having appropriate IT applications in the domestic companies is to assist them in accomplishing their KM

activities, which involves creating, storing, sharing and utilising knowledge. Based on this notation and the previous definitions (Lew et al., 2014; Leonard- Barton, 1995; Porter, 1985; Prior, 2006), this study contributes to the existing knowledge by providing a new definition to CA, which is "The capability (Leonard-Barton, 1995;

Porter, 1985) of creating, storing, sharing and utilising knowledge (Prior, 2006) using dynamic capability, integrating capability and utility capability.”

As indicated by Table 2, dynamic capability is important for SMEs and large enterprises to achieve organizational CA. Dynamic capability refers to the ability of SMEs and large enterprises to provide fast responses to the external challenges (Sher and Lee, 2004). SMEs and large enterprises need to be flexible and innovative when entering a new market or initiate a change in their business strategies. Hence, this study recommends SMEs and large enterprises to adopt easy to use and easy to remember mechanisms in collecting organizational knowledge and providing timely access to knowledge amid changing demand and volatile markets. For instance, SMEs and large enterprises could adopt individual social networks and corporate memories, which will support speedy decision in SMEs and large enterprises. Document management tools and communication and coordination tools could also be used to enhance dynamic capability among organizational participants in SMEs and large enterprises.

The second determinant, integrating capability, has stronger impact on organizational CA of SMEs as compared to large enterprises (Table 2). Respondents in SMEs think that it is more important to have appropriate IT applications to link individual components and services in the companies for the purpose of data sharing. It is more important to ensure that information from different departmental repositories is integrated in a unified view in SMEs compared to large enterprises. In order to enhance competitive advantage, it is recommended that the workflow automation systems be used to enhance speedy integrating capability SMEs. Corporate portals could also be adopted to enhance the integrating capability of SMEs by combining data, telecommunication, hardware and software from different departments and databases.

The third factor, utility capability or the basic and common services of ICT

infrastructure, is very important for SMEs to perform better in the business world. SMEs view utility capabilities such as ICT planning, training, education, customer service and support as critical to achieve competitive advantage. Undeniably, large enterprises have more capital for ICT investments and ITC enhancements as compared to SMEs (Aragon-Sanchez and Sanchez-Marín, 2005; Hashim and Wafa, 2003). While the previous literature discovered that ICT applications enable ITC (Lew et al., 2013; Mushref and Ahmad, 2011), the lack of ICT investments lead to inadequate ITC in SMEs when compared to large organizations.

Research Implications

This study proposes a research framework that is important for SMEs and large enterprises to reap competitive advantage. Since this research is one of the limited studies in Asia and Malaysia, it will be able to be the forerunner of how to adopt ITC to reap CA in SMEs and large enterprises in Malaysia. Apart from contributing to the literature of knowledge management, this study would showcase by developing appropriate recommendations to adopt ITC for domestic companies.

Considering SMEs are vitally important for economic health, in both high-income and low-income economies globally, this research framework will contribute to the significant advancement of key knowledge-based clusters such as the information technology, biotechnology, tourism, education and healthcare, Islamic finance, manufacturing and electrical and electronic industries, worldwide.

As approaching 2020, the findings of this study will also help Malaysian government to achieve the key objectives of the Economic Transformation Programme, which is to create an information rich, high income and intelligent nation, by recommending ways to assist SMEs and large enterprises to reap CA towards the creation of a K-Economy.

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