

# **CHAPTER 3**

## **RESEARCH METHODOLOGY**

### **3.1 Introduction**

Basically the research type is a descriptive study where the study is undertaken to describe the answers to questions of what is the relationship between the attributes in organizational learning capabilities and knowledge management capabilities with e-business implementation in Malaysia. This chapter will give a brief elaboration on the statistical techniques adopted for data analysis.

### **3.2 Development of Hypothesis**

Training availability refers to quantity of education available to technology adopters or users (Bradford and Florin, 2003). Attewell (1992) argues that learning the technical knowledge required to use a complex innovation is challenging for innovation adopters. Accordingly, the level of training that firms' employees undergo in ERP systems is positively related to implementation success (Bradford and Florin, 2003). Venkatesh and Speier (2000) found that training availability was positively correlated with technology use intention. Training e-business systems thus may be necessary for realizing successful e-business systems adoption. Firms that devote significant training resources to IT

are more likely to implement e-business and realize its value successfully (Lee et. al 2007). Therefore, the following hypothesis is formulated:

**H1: Training availability is positively associated with e-business implementation**

Technical expertise refers to firm level of specialized technical expertise. Firms are more likely to adopt an innovation when technical expertise is available, and technical expertise thus can increase levels of firms' technology adoption (McGowan and Madey, 1998; Thong, 1999). Cragg and Zinatelli (1995) identified lack of technical expertise as a key factor inhibiting IS evolution and sophistication. The technical barriers were described by Love et al. (2001) as problems related to acquiring suitable technologies to meet business requirements, lack of education and expertise about the system requirements and risks related to security and authentication. E-business is considered a 'radical innovation' in the context of organizational innovation research because it contains a high degree of new knowledge as compared to existing technology and represents a clear departure from existing practices (Srinivasan, 2000). Firms with high levels of technical expertise can be expected to master the technical aspects of e-business and achieve e-business contribution to firm performance more completely than firms with lower levels of technical expertise. (Lee et. al, 2007)

**H2: Technical expertise is positively associated with e-business implementation success**

Knowledge level refers to the familiarity of firms' employee with a technology. If firms' employees are knowledgeable regarding a new technology, they are likely to be better capable of dealing with technology adoption. According to McGowan and Madey (1998), they found that level of electronic data interchange (EDI) knowledge positively influences the extent of EDI implementation. Firm with employees understand e-business is likely to realize the most success in e-business implementation (Lee et. al, 2007).

**H3: The knowledge level is positively associated with e-business implementation success**

Knowledge acquisition is defined as the business processes that use existing knowledge and capture new knowledge. E-commerce development requires concerted effort and experience in recognizing and capturing new knowledge (Etemad, 2004). Organizations generally have to acquire the know-what, know-how and know-why to assimilate any complex technology successfully (Attewell, 1992). Know-what is factual knowledge about a technological innovation and its features, know-how is knowledge about how to apply a technological innovation in an organization, and know-why is knowledge required to meaningfully measure the cost, benefits and risks of applying a technological innovation (Ravichandran, 2005). Furthermore, Moodley (2003) indicated that e-business infrastructure involves not only e-commerce initiatives but also is driven by acquisition knowledge and skills. Huber (1991) explained that knowledge acquisition is the process by which knowledge is obtained. Information

distribution is the process by which information from different sources is shared and thereby leads to new information or understanding. Relationships between knowledge acquisitions capabilities thus are expect to be positively related to e-business implementation success (Lee et. al 2007).

**H4: Knowledge acquisition is positively associated with e-business implementation success.**

Knowledge application is defined as the business processes through which effective storage and retrieval mechanisms enable a firm to access knowledge easily. From the technological innovation perspectives, knowledge transfer, knowledge integration and practical application of knowledge are the main elements for developing technological capabilities (Gilbert and Cordey-Hayes, 1996; Sveiby, 1997; Johannessen et al., 1999). Firms that stimulate and improve organizational application of knowledge are more likely to achieve successful e-business implementation success (Lee et. al 2007).

**H5: Knowledge application is positively associated with e-business implementation success**

Knowledge sharing is defined as the business processes that distribute knowledge among all individuals participating in process activities. The literature on the organizational effectiveness of IS emphasizes that a knowledge sharing culture is the main organizational condition for successful knowledge management and exploitation (Damodaran and Olpher, 2000). Liu et al. (2004) found that openness towards knowledge sharing is important to increase

organizational competitiveness. Previous studies also indicated that knowledge sharing is important for utilizing e-business (Jones and Price, 2004; Fiala, 2005).

**H6: Knowledge sharing is positively associated with e-business implementation success**

A summary of the hypothesis developed is illustrated in Table 3.1

**Table 3.1: Summary of Hypotheses**

<b>Construct</b>	<b>Definition</b>	<b>Reference</b>
Training available	<p>1) The quantity of education available on technology to adopters or users.</p> <p>2) Firms that devote significant training resources to IT are more likely to implement e-business and realize its value successfully.</p>	<p>Bradford and Florin (2003),</p> <p>Lee et al. (2007)</p>
Technical expertise	<p>1) The firm level of specialized technical expertise.</p> <p>2) Firms with high level of technical expertise can be expected to master the technical aspects of e-business and achieve e-business contribution to firm performance more completely than firms with lower levels of technical expertise.</p>	<p>McGowan and Madey (1998),</p> <p>Lee et al. (2007)</p>
Knowledge level	<p>1) The familiarity of firm's employee with a technology.</p> <p>2) E-business know-how provides the business and management skills to use e-business successfully</p>	<p>Thong (1999),</p> <p>Gibbs and Kraemer (2004)</p>
Knowledge	1) The business processes that	Gold et al. (2001), Lee

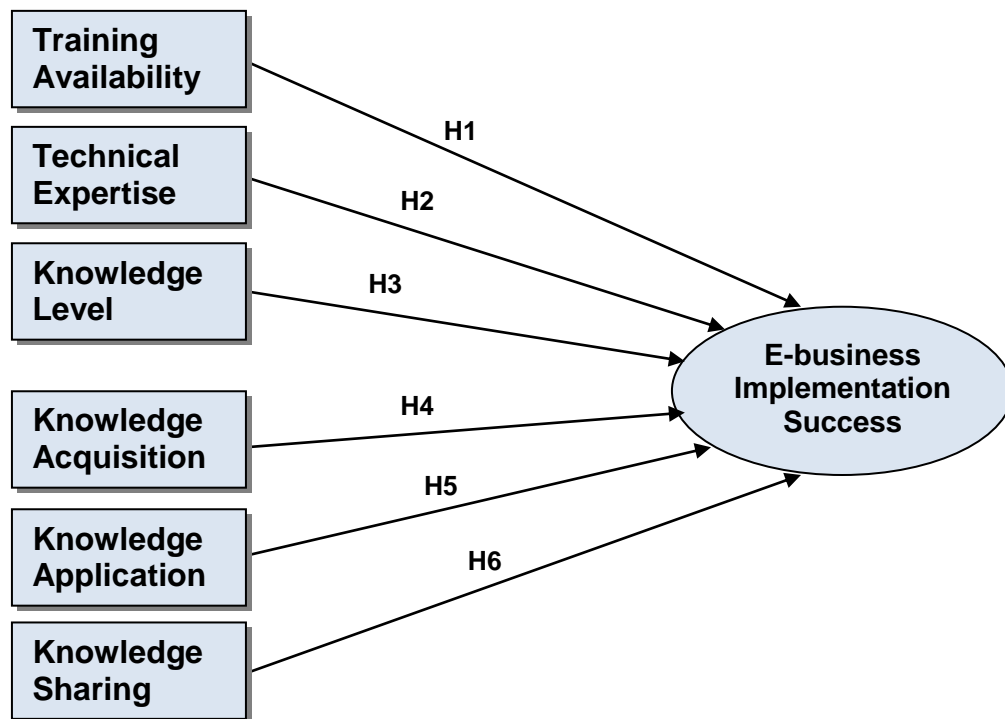
acquisition	<p>use existing knowledge and capture new knowledge</p> <p>2) E-business infrastructure involves the acquisition of knowledge and skills</p>	<p>et al (2007)</p> <p>Moodley (2003)</p>
Knowledge application	<p>1) The business processes through which effective storage and retrieval mechanisms enable a firm to access knowledge easily</p> <p>2) Firms that stimulate and improve organizational application of knowledge are more likely to achieve successful e-business implementation</p>	<p>Gold et al. (2001),</p> <p>Lee et al.(2007)</p>
Knowledge sharing	<p>1) The business processes that distribute knowledge among all individuals participating in process activities</p> <p>2) Knowledge could be stored in employees, or in the organizational rules, routines, structures and technologies</p>	<p>Gold et al. (2001), Lee et al. (2007)</p> <p>Argote et al. (2003), Walsh &amp; Ungson (1991)</p>

### 3.3 Research Model

The literature review highlighted the relationship between the variables that was found in previous study. Previous study was done in Taiwan in 2007 which involved large organizations in 202 selected firms (Lee et al., 2007). The model

was adopted to determine the factors that contribute to the success of e-business implementation in Malaysia.

**Figure 3.1: Framework for E-business Implementation Success**



Source: Adopted from Lee et al (2007)

### 3.4 Research Instrument

Structured questionnaire is used as the main instrument to conduct the research.

The questionnaire was divided into four sections that are:

**Section 1** - organizational learning capabilities

**Section 2** - knowledge management capabilities

**Section 3** - e-business implementation success

**Section 4:** - Respondent's Profile. This section covered demographic data and related information from the participating respondents. The questions included were gender, age, marital status, ethnicity, organization involvement in e-business

Section 1,2 and 3 required the respondent to rate their level of agreeableness which range from (1) Strongly Disagree to (5) Strongly Agree. These set of questions were also adopted from the previous study done by Lee et al. (2007). SPSS version 15 was used to analyze the data.

The items used for each section is illustrated in Table 3.2

**Table 3.2: Items and sources of the Items**

No	Variables	Items	Sources
1	Training Availability	<ul style="list-style-type: none"><li>• My organization views employee training as an investment, not an expense.</li><li>• My organization provided</li></ul>	Lee et al (2007)



		extensive training in e-business.	
2	Technical expertise	<ul style="list-style-type: none"> <li>• IS employees are generally very knowledgeable regarding technical matters.</li> <li>• My organization contains considerable technical expertise.</li> </ul>	Lee et al (2007)
3	Knowledge level	<ul style="list-style-type: none"> <li>• The organization contains a high level of e-business knowledge.</li> <li>• My organization hires highly specialized or knowledgeable personnel for e-business.</li> <li>• My organization is dedicated to ensuring that employees are very familiar with e-business.</li> </ul>	Lee et al (2007)
4	Knowledge acquisition	<ul style="list-style-type: none"> <li>• My organization has processes for acquiring supplier knowledge.</li> <li>• My organization has processes for generating new knowledge based on existing knowledge.</li> <li>• My organization has processes for acquiring customer knowledge.</li> <li>• My organization has processes for acquiring knowledge on developing new products/services.</li> </ul>	Lee et al (2007)
5	Knowledge application	<ul style="list-style-type: none"> <li>• My organization has processes for integrating different sources and types of knowledge.</li> <li>• My organization has processes for transferring organizational knowledge to employees.</li> <li>• My organization has processes for filtering knowledge.</li> <li>• My organization has processes for applying experiential knowledge.</li> <li>• My organization Has processes for applying knowledge to solve new problems.</li> </ul>	Lee et al (2007)
6	Knowledge sharing	<ul style="list-style-type: none"> <li>• My organization has processes for distributing knowledge</li> </ul>	Lee et al

		<p>throughout the organization.</p> <ul style="list-style-type: none"> <li>• My organization has processes for distributing knowledge among our business partners.</li> <li>• My organization has a standardized reward system for sharing knowledge.</li> <li>• My organization designs processes to facilitate knowledge sharing across functional boundaries.</li> </ul>	(2007)
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Sections 1, organizational learning capabilities had three items which were training availability, technical expertise and knowledge level. Section 2 had three items which were knowledge acquisition, knowledge application and knowledge sharing.

Lin and Lee (2005) explained that the organizational learning factors were using three constructs: training available, technical expertise, and knowledge level. Training available was measured using two items based on the work of Bradford and Florin (2003). Technical expertise was measured using a two-item scale adapted from McGowan and Madey (1998). A three-item measure taken from Thong (1999) was modified to measure extent to which employees in firm are familiar with e-business knowledge. According to Hult (1998), organizational learning is the degree to which organization creates, acquires and transfers knowledge and modifies its behavior to reflect new knowledge and insights.

The knowledge management processes were measured using three constructs with a total of 13 items: knowledge acquisition, knowledge application, and knowledge sharing, derived from those proposed by Gold et al. (2001). Cui et al.

(2005) mentioned that knowledge management capabilities consist of three interrelated processes: knowledge acquisition, knowledge conversion, and knowledge application. Efficient knowledge management processes, such as knowledge acquisition, application, and sharing, are important for new technology adoption (Lin and Lee 2005). All the items in the organizational capabilities and knowledge management were categorized in previous study done by Lin and Lee (2005) and Lee et al (2007).

### **3.5 Sampling Design**

The sampling procedure that adopted in this research was convenience sampling method with pre-planned sample size of 30% respondents of IT/IS executives in each organization. The study population will be comprised of IT/IS executives in GLC (Government Link Company) firms and banking sector in Malaysia. The GLC firms which will contribute to this study for example are Pos Malaysia, TM, TNB, KWSP and for banking sector, Maybank and CIMB. The distribution of questionnaire to the targeted respondent was using three methods which are e-mail, mail and going personally to the targeted organization. The respondent might be the IT/IS executives whom involved directly with the development, maintenance and operations of e-business implementation. Heijden (2001) stated that IS executives are used as informants because of their ability to answer questions related to e-business implementations.

### **3.6 Data collection procedure**

Data were collected using self-administered questionnaire survey. A total of 300 questionnaires were distributed via e-mail, hardcopy and personally to the target users. Among 300 copies distributed, 123 valuable responses were received. Completed questionnaires were collected within a month in 2009. The questionnaires were targeted among the IT/IS executives and staffs in the targeted organizations to have the significant data before analyzing it.

### **3.7 Data analysis techniques**

The survey was analyzed using the Statistical Package for Social Science (SPSS) version 15 software program. The details of the analysis comprised of major statistical analysis namely:

- Descriptive statistics in the form of frequency percentages and number of frequency were used to obtain summary statistics of respondents including gender, ethnicity, marital status, educational level and company involvement in e-business.
- Mean and standard deviation was used to test the significant of the variables.
- Correlation was performed to test the relationship between variables and the hypotheses.

- Factor analysis technique was used to perform data reduction and retain items that appropriate for the Malaysian context or business.
- Regression technique was used to explore the predictive ability of an independent or a set of independent predictors on one dependent criterion

### **3.8 Limitations of the Sampling procedure**

Firstly, the survey were distributed to the respondents which organization or firm residing in vicinity of Klang Valley. IT executives from other parts of country likes Johor Baharu, Penang were excluded from the research due to time and costs constraints. Possible biases exist when consider only one geographical area is selected as well as the sampling method may not be representative of the actual target organizations as a whole.

Secondly, the independent variables chosen for this study might be inadequate to identify the factors of e-business implementations success. There could be other variables that were excluded in this study which may be important in the Malaysia context.

Finally, respondents' bias and errors could not be avoided in this study. Potential reporting biases can exist when personal judgments are used to evaluate impact of e-business implementation towards company e-commerce, efficacy and coordination. Even though clear instructions and explanations were provided, there is no instrument available to ensure that all respondents understood the

questions or interpreted the question in the same manner. Respondent's involvement in e-business also could be limited and their answers were based on their level of understanding and interpretation.