

CHAPTER TWO: LITERATURE REVIEW

2.1 INTRODUCTION

This chapter aims to provide evidence of the selected literature review on supply web based supply chain management and its capabilities with relation to firm performance. The main purpose of the literature review is to explore the key capabilities of web based supply chain management to develop a research model for this study. In this chapter, a relevant literature review is conducted in a systematic manner to unfold the disciplines of supply chain management and empirical studies of web based supply chain management in a working environment related to performance.

2.2 SUPPLY CHAIN MANAGEMENT

When facing the gradually competitive industry environment, the enterprises must properly integrate the department resources such as the internal procurement, production and sales. Besides, they should also closely cooperate with the suppliers and customers in order to control the competitive factors such as quality, delivery and cost and improve their competitive advantages. It also explains the reason why supply chain management (SCM) becomes more and more important.

SCM refers to the planning and negotiation of product service process and information process among the material suppliers, manufacturing and customers (Scannell, Vickery & Droge, 2000).

SCM has been defined to explicitly recognize the strategic nature of coordination between trading partners and to explain the purposes of SCM, to improve the performance of an individual organization and the whole supply chain. Sander and

Premus (2002) had conducted an empirical study on American manufacturing industry and found out that IT operation on supply chain management can enhance competitive advantages and improve organizational performance. Thus, the web based--supply chain capability becomes one of the ways for the enterprises to enhance their competitiveness.

2.2.1 Web based Supply Chain Management Systems

With the rapid growth of IT, many companies are taking advantage of Internet technology to better manage their supply chains. The Web-based SCM system has provided an alternative means of managing an ever-increasing number of suppliers and customers and creating the necessary links among data, information and effective communication.

White (1996) pointed out that the combined use of the Internet with SCM allows customers and suppliers to share mission-critical information on a timely basis to enable effective, real-time decision-making.

Kalakota and Whinston (1996) viewed Web-based SCM applications as mission-critical business applications that are used by companies to run their businesses, such as taking customer orders and order management; planning the distribution of inventory and forecasting demand; accounting; and managing the flow of materials.

Lancioni *et al.* (2003) conducted and compared two surveys about trends of Internet applications in SCM in US supply chain networks in 1999 and 2001, respectively. The results indicated that there had been a large increase in Internet usage in various supply chain applications, such as purchasing/procurement and transportation.

On the other hand, García-Dastugue and Lambert (2003) identified seven Internet-enabled coordination mechanisms to improve business practices in supply chains. However, Pant *et al.* (2003) highlighted the internal and external challenges to implementing a highly integrated e-supply chain system. They proposed a framework for implementing an e-supply chain system based on the complexity of an organization's operation and its ability to integrate partners in the supply chain.

2.3 CAPABILITIES OF A WEB BASED SUPPLY CHAIN MANAGEMENT

What are the key capabilities of a web based supply chain management systems (WSCMS)? Bullen and Rockart (1986) defined capabilities as 'the limited number of areas in which satisfactory results will ensure successful competitive performance for the individual, department, or organization. Capabilities are the few key areas where 'things must go right' for the business to flourish and for the manager's goals to be attained'. Besides, a number of studies have attempted to identify the capabilities in terms of key success factors of SCM, EDI, and ERP systems.

Bauer (2000) suggested that there are four key capabilities in e-business for the automotive industry. The first capability is understand and work with diverse social and business cultures around the globe. The second is ensuring that there is a physical Internet infrastructure available. The third is understands the state of the physical infrastructure of the suppliers, and the fourth is changing internal management processes and points of view.

Power *et al.*, (2001) examined the critical success factors that influence the agility of organizations in managing their supply chains. In their studies, they determined seven capabilities in responsive SCM using factor analysis.

Umble *et al.*, (2003) identified the key success factors (CSFs) for the implementation of ERP systems. Angeles *et al.*, (2000) reported 13 electronic data interchange (EDI) implementation success factors or key capabilities that are considered relevant in implementing an inter-organizational system.

However, Swafford *et al.*, (2006) identified three major dimensions (procurement, make and delivery) as to the evaluation on e-supply chain capability. Unfortunately, the literature on the capabilities of web based supply chain management is very limited. In this study the dimensions of web based supply chain management capability is used, which were proposed by Ngai, Cheng and Ho (2004). They managed to identify five key capabilities of web based supply chain management in their study. The next section discusses the dimensions of web based supply chain management.

2.3.1 Key Capabilities Dimensions of web Based Supply Chain Management

Ngai et al. (2004) classified web-based capabilities into the following five dimensions: communication, top management commitment, data security, training and education, and reliability of hardware and software. Each dimension is described as follows:

Communication

The growing trend of globalization has imposed higher standards for communication networks in SCM. Thus, many organizations have been using the Internet for SCM (Lancioni *et al.*, 2000) in order to achieve effective communication, internally and externally. According to Badiru (1988), communication is a pre-requisite for the cooperation of employees in the successful implementation of project.

The Internet can also reduce the problem of internal coordination by allowing both internal and remote employees to access current information when it is released. The Internet can be considered as an effective communication tool in SCM (McIvor *et al.* 2003, Strader *et al.*, 1998). With the successful implementation of WSCMS, information and material that flows across multiple organizations are integrated to create a supply chain that improves communication between customers and suppliers. Parties in the supply chain will then enjoy a greater degree of information sharing.

Top Management Commitment

The commitment of top management has been recognized as one of the most important elements in the successful implementation of electronic data interchange (EDI) (Angeles *et al.*, 2001, Emmelhainz, 1988, Scala and McGrath, 1993), Information systems (Bruwer 1984) and Enterprise Resource Planning (ERP) systems (Umble *et al.*, 2003).

Since the primary responsibility of top management is to provide sufficient financial support and adequate resources for building a successful system, the support from management will ensure that the web based supply chain management system (WSCMS)

project has a high priority within the organization and that it will receive the required resources and attention. The lack of financial support and adequate resources will inevitably lead to failure. Apart from this primary support, psychological or behavioral support is also important to the smooth implementation of the project, especially if there is significant resistance from the staff involved.

Data Security

With the greater use of the Internet in SCM, organizations are able to gather more data than before, allowing managers to make timely and effective decisions on matters such as production runs and costs. Such data could be extremely valuable to help sharpen the competitive edge of an organization. Warren and Hutchinson (2000) have informed that there are several security risks associated with WSCMS; therefore, some level of data security is required for the successful implementation of supply chain management systems (SCMS).

Training and Education

Training and education are important for the successful implementation of any new system (Robbins, 2005; Sprague & McNurlin 1993). Previous researchers have included the training and education of end-users as an important issue for the successful implementation of EDI (Angeles *et al.*, 1998, Cater *et al.*, 1987), IS (Nath, 1989) and ERP systems (Umble *et al.*, 2003). Hills (1997) also pointed out the importance of training and education in ensuring the success of an Intranet implementation. Adequate

training of the employees in an organization is important in allowing the benefits and advantages of using the Internet in SCM to be fully realized.

Reliability of Hardware and Software

A high-quality technical system is absolutely essential in ensuring the success of a computer-based system (Zhu, 2004). In order to encourage the use of the Internet in SCM, a reliable system must be made available. The reliability of the SCMS hardware and software is very important since it affects the performance of the system. Reliability is also considered to consist of the accuracy of the data, adequate maintenance of the system, and the capability of the hardware.

The next section of this chapter will emphasize on firm performance and its relation to the dimensions of web based supply chain management systems.

2.4 FIRM PERFORMANCE

The definition of organizational performance depends on the intellectuals' different views. Vickery et al (1991) considers that the organizational performance refers to how well an organization achieves its market-oriented goals as well as its financial goals. Thus, they set up the measurement performance items as return on assets, market share and growth rate. This study followed the indicators adopted by Barua et al. (2004) and Li et al. (2006) as the base for designing the questionnaire evaluating organizational performance, including market share, sale growth and profit margin on sales.

2.5 RELATIONSHIP BETWEEN WEB BASED SUPPLY CHAIN MANAGEMENT AND PERFORMANCE

Turban et al. (2000) indicated that the powerful IT calculation capacity, Internet connection and communication functions operated by the enterprises could result in more efficient information exchange among the enterprises. The operational process would be more successful and enterprises would further reduce the stocks and increase the inventory turnover rate and organizational performance. Sander and Premus (2002) had done an empirical study on American manufacturing industry and found out that IT operation on supply chain management can enhance competitive advantages and improve organizational performance. Thus, the e-supply chain capability becomes one of the ways for the enterprises to enhance their competitiveness.

Similarly Mukhtar et al (2007) found that if Malaysian small and medium sized firms want to be competitive in global exports, they have to restructure their supply change management systems and must integrate information and communication technology (ICT) in their supply chain and logistics systems.

There were rarely studies have been conducted with respect to the influence of e-Supply chain capability on firm performance. Most of the particular studies subjectively evaluated the influence degree of IT on the activities of supply chain (Byrd & Davidson, 2003) and they lacked of objective evaluations.

The purpose of this study is therefore to empirically test a framework identifying the relationships among e-Supply chain capability, competitive advantage and organizational performance.

2.6 RESEARCH FRAMEWORK AND HYPOTHESES

The research framework/model proposed in this project is shown in Figure 2.1. According to research objectives, there were two hypotheses proposed based on the relationship identified in the research model:

H1: Five dimensions of web based-supply chain capability will have direct positive association with firm performance.

H1a: communication as one of the capability of WBSCM will have direct positive association with firm performance.

H1b: Commitment from top management as one of the capability of WBSCM will have direct positive association with firm performance

H1c: Data Security as one of the capability of WBSCM will have direct positive association with firm performance

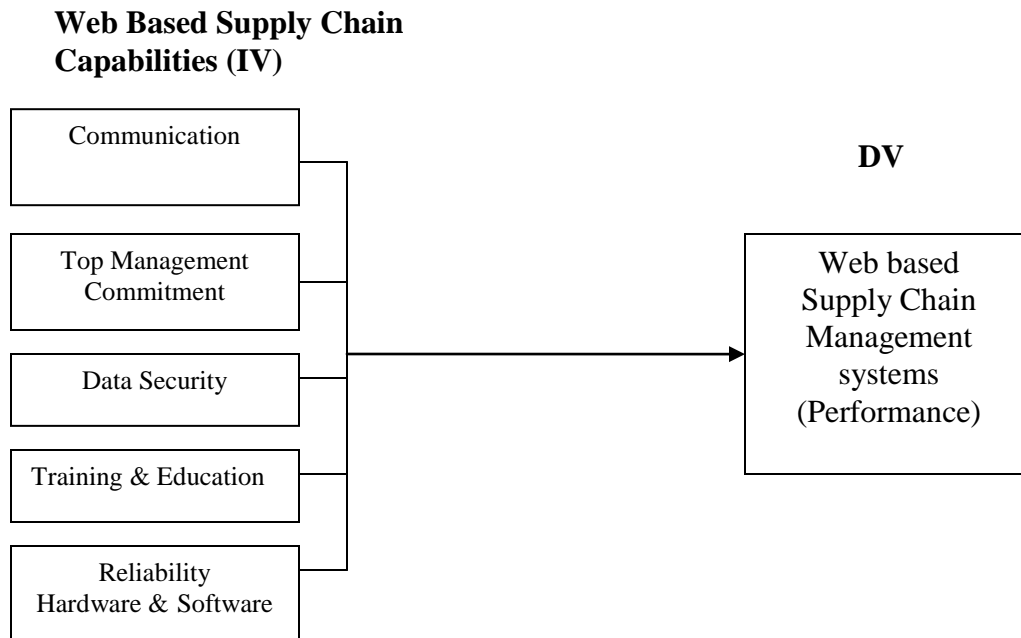
H1d: Training and education as one of the capability of WBSCM will have direct positive association with firm performance

H1e: Reliability of software and Hardware as one of the capability of WBSCN will have direct positive association with firm performance

In addition to the preceding hypothesis, this study is also sought to examine which facets of web based supply chain capability will have the most influence on firm performance. Since the evidence on this is unavailable, it is hypothesized that each facet will contribute equally to variance in firm performance. Therefore the following hypothesis is offered.

H2: Five dimensions of web based-supply chain capability will affect/influence the firm performance.

Figure 2.1 Research Model



2.7 SUMMARY

The second chapter of the study has reviewed the relevant literature of supply chain management, particularly from electronic or Internet based supply chain perspective with relation to firm performance. This chapter has also reviewed the literature of supply chain management with ICT perspective and approaches in electronic supply chain management. On the later part, this chapter narrows down the review by focusing on the web based supply chain management and identified five key capabilities of the web bases supply chain system and its relation to firm performance. This chapter also developed the research model of the study followed by the development of the research hypotheses.