Effectiveness of critical success factor (CSFs) in electronic supply chain management for Thai manufacturing SMEs industry

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Abstract

This study investigates CSFs of the Electronic Supply chain to improve performance in Thai manufacturing SMEs. The results suggest that Electronic Supply chain is significant to formulating performance benefits. This paper provides a model relating benefits to factors concerned with the E-SCM in Thai manufacturing SMEs.

Keywords: E-Supply chain, Thai manufacturing SMEs

INTRODUCTION

In recent day, Supply Chain Management plays a key role in every business transaction especially in a manufacturing business**.** Also, SCM is played a key role as a competitive success for companies. In other words, competitive success depends on the efficient management of the company such as relationship between company and their suppliers, of the skill of resources, capabilities of its suppliers, distributors/dealers, and business processes. SCM is regards as a critical success component of e-business implementation (Croom, 2005). The internet and information technologies allow efficient inter-organizational information flows, and facilitating SCM (Ooi et al., 2009). Due to the advancement of technology the speed of organization operational accelerated. The organization operational became wider. Due to the gradual changes, the organizations started to operate the companies which can improve the efficiency of manufacture and reduce the costs of production. The organizations found that to remain their competitiveness, it was not enough to improve only the internal procedure (Rayes et al., 2000).

For the SMEs in Thailand, the supply chain of various industries including many member manufacturing companies from automotive company, food Company, Textile Company etc. Among them, the Thai SMEs play critical roles. The number of organizations has increased in every year (OSMEP, 2015). The Office of Small and Medium Enterprises Promotion (OSMEP) has tried to help the SMEs to enter global supply chain and expand the capacity of production.(2015).

Improving and developing information technology would augment the integration among organizations. All information and material flow and logistics could be linked more rapidly and accurately in supply chain which improve the effectiveness of supply chain management of SMEs manufacturing companies and their competitiveness. Therefore, the first main thing must understand the critical factors of the company managers' implementation of e-SCM.

This research identified the CFSs of e-SCM implementation of SMEs manufacturing, and explored the effect of e-SCM implementation under each critical factor based on the organizational results. Furthermore, this research results will help the manufacturing manager to reduce the probability of failure when implement the e-SCM. However, the main objectives of this research were as followed; 1) to identify the state of the e-SCM implementation in Thai manufacturing SMEs industry, 2) to identify the critical factors which affect the e-SCM implementation in Thai SMEs manufacturing industry.

LITERATURE REVIEW

Theories of supply chain and electronic supply chain management

Prior 1990s, the concept was often introduced term as "logistics" and "operation management". Then, due to the speed of change about the market evolution term "supply chain management" came into attention first and became commonly used in the late 1990s. Most of companies were be aware of the supply chains they participate. Chopra and Meindl (2007) stated that an inter-organizational business processes to create a shared market opportunities. However, Koch (2002) defines SCM combination of art and science which can improves all business process involved in manufacturing and delivering it to the end of last customers.

In currently, information technology in supply chain management has significantly changed the way to conduct in their business processes. According to Haug et al., 2001, IT is considered to be significant strategies important to most companies. IT plays an important role for building close buyers and supplier's relationships. Company need to improve e-business technologies in their supply chain if they want to have collaborate with their partners (Subramani's, 2004). Many researchers stated that the IT benefits related to supplier and customer relationship management such as information sharing in their supply chain, reduces transaction costs, enhances transaction processing; provide quick response to customer demands (Kwon and Stoneman, 1995; Hollander et al., 2000; and Chou et al., 2004).

Electronic supply chain is to integrate all information either from customer's side or supplier's sides and to facilitate manufacturing products for sustaining requirement of the market place (Khan et al., 2014). Many companies are increasingly adopting Electronic business processes such as customer relationship management modules; electronic catalogues etc. to assist their operations through reorganizing and integrating their business processes (Kraemer et al., 2006). Electronic supply chain integration enables efficient information sharing between suppliers and customer service network through the internet and information technologies (Wohlwend and Fulton, 2005; and Cheng and Lin, 2004).

Related to theories of electronic business adoption in supply chain, Roger (1995) studied on e-business adoption of innovation theory suggests that companies need to consider factors such as relative advantage, compatibility, complexity and observe-ability when adopting new innovation (Ooi et al., 2009). On the other hand, Ifinedo (2011) stated that technology-organization-environment (TOE) model explores the implementation of the new technologies depended on factors for example organization, technology and environment as shown in figure 1.

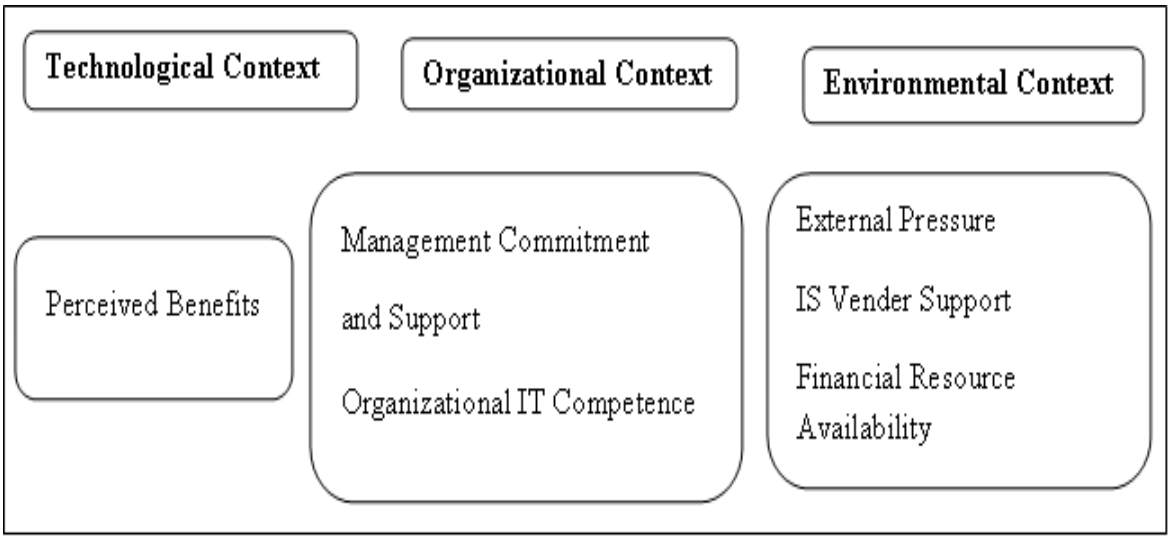

Figure1: TOE model, adapted from Ifinedo (2011)

Critical success factors in supply chain and electronic supply chain

The TOE model integrates different individuality of the technology, organizational and macro-environment factors (Li et al., 2010). This model includes factors; perceived benefits, top management commitment, organizational IT competence/ organizational readiness, external pressure, vendor support, and financial resources availability (Ifinedo, 2011). Viswanadham and Gaonkar (2010) found that high speed, low cost communication and collaboration with suppliers are critical success factors of the electronic supply chain. Moreover, a significant factors influencing the adoption of e-business is concerned with losing any competitive position in the market, with many powerful customers demanding more accurate information about products (Adshead, 2001).

Furthermore, many critical success factors in supply chain and electronic supply chain studies discovers the key success factors are good planning, well designed distribution system, highly top management commitment, clear goals objective and business requirement, change management, underlining infrastructure, application readiness and, supply chain partnership selection, and close relationship with their partners (Bowersox et al., 2010; Tate, 1996; korpela and Tuominen, 1996; and Chiu, 1995). Meanwhile Tate (1996) stated that the main part of successful supplier relationship are operational, culture and value compatibility, understanding business needs, effective communication, mutual commitment, flexibility, fairness and trust (Lonngren, et al., 2010). Moreover, Lonngren, et al., (2010) concluded that the trust among the is a one critical success factors in supply chain. This is agreement with many researchers that list communication as one of the critical success factors in supply chain and electronic supply chain (Thakkar, 2013; Dinter, 2012; Ngai et al., 2004; and Razzaque and Sheng, 1998).

To sum up, many critical success factors studies works in electronic supply chain agreed that one of the most critical success factors of electronic supply chain is the information technology (IT) factor (Hwang and Lu, 2013; Farzin and Nezhad, 2010; Puschmann and Alt, 2005; Favilla and Fearne, 2005; Guanasekaran and Ngai, 2004; Ngai et al., 2004; and Chow, 2004). IT is also apparent in other supply chain management critical success factors studies such as in supply chain partnership (Lonngren et al., 2010). Although IT is a major factor in supply chain management critical success factors, it will not be working well if there is no support from the

company. Moreover, IT and organizational must be parallel. However the corporate culture of the organization is weak if top management support is irrelevant in supply chain.

Electronic supply chain in SMEs

Electronic supply chain in SMEs is a tactic that helps the organization to function in a more agile and cost effective manner by integrating the processes of various partners at all three levels which are strategic, tactical and operational (Khan et al., 2014). Electronic supply chain can improve the performance of SMEs and growth their profitability by enhancing their ability to obtain supplies of the right quality, at the right time, and at the most favored prices. Furthermore, the integration of Electronic supply chain requires effective information flow and communication in the entire supply chain, and integrate enables efficient information sharing between suppliers and customer network through the internet and IT technology (Lee, 2003; Cheng and Lin, 2004; and Wohlwend and Fulton, 2005). However, Yin and Khoo, 2007 stated that the environmental uncertainty and dynamics of the supply chain activity emerges create difficulties for the effectivenesst of the supply chain implementation.
However, in order to implement electronic-business practices success in their business processes, SMEs should be make huge investment and share information efficiently (Chong and Ooi, 2008). Furthermore, the company also needs to develop long term relationship with their partners.

Electronic Supply Chain Performance

Electronic Supply Chain Performance; which measured by benefits of adopting e-supply chain management. The new business are increasing an important role in managing e-SCM as companies are able to achieve the reduced cost, and increased responsiveness of their supply chains through e-business environment (Brynjolfsson and Kahin, 2000). Many companies have implemented e-supply chain have a numerous benefits such as;

- information visibility and sharing,
- real time communication, order tracking,
- better real time forecasting decision,
- faster delivery,
- improved partner relationships,
- understanding of customer needs,
- increased customer satisfaction,
- faster market adaptation,
- reduced resources, increased
- Profit, cost savings, and so on (Brynjolfsson and Kahin, 2000).

Moreover, based on Accenture poll survey (2002) reported on the impact of supply chain management and internet, these initiatives were credited with cost reductions, improved efficiencies, better customer service, more revenues and greater competitiveness by over 80 percent of the companies responding. Moreover, the poll survey indicated that the cost reduction in the short time was main reason that companies were turning towards supply chain partners to outsource functions

. Also, Horvath (2001) stated that the benefits to businesses with supply chain capabilities will be develop customer satisfaction, radically improved customer responsiveness, improved customer retention and more effective marketing, and increased flexibility for changing market

conditions. In the same way, Viswanadham and Gaonkar (2010) found that adding customer value is one of the most important assets for organizations.
To sum up, the benefits for implementing the e-supply chain gain the competitive advantage to the companies where have implemented the e-supply chain system.

Methodology

This research conducted quantitatively and followed by qualitatively, in particular quantitatively by finding the sample size of SME manufacturing in Thailand. The total number of SMEs companies is 2,896,150 which comprise of small companies 2,884,050 and medium enterprise about 12,100 (OSMEP, 2015)
From the above total number of SMEs manufacturing companies, the researcher uses 5% confident interval with 95% confidence level, the sample size of ....respondents is required to be surveyed. The formula used as follows:

Sample size = * (p) * (1-p)/ as
Z=Z value (for 95% confidence level)
P=percentage picking a choice
C=confidence internal

However for the structural equation model analysis, the sample size calculation is done by using 15 times the number of variables, and finally the sample size will be as follows:

Sample size=15x78= 1,170 respondents

Since the result of the above calculation is between approximately 400 and 1,170. The respondents will be dispersed to cover all types of SME and industry sectors. Furthermore, followed up by semi-structured interviews among SMEs companies.

Framework Proposed

The proposed framework has three elements or groups lead to success of E-SCM implementation as depicted in Figure 2.

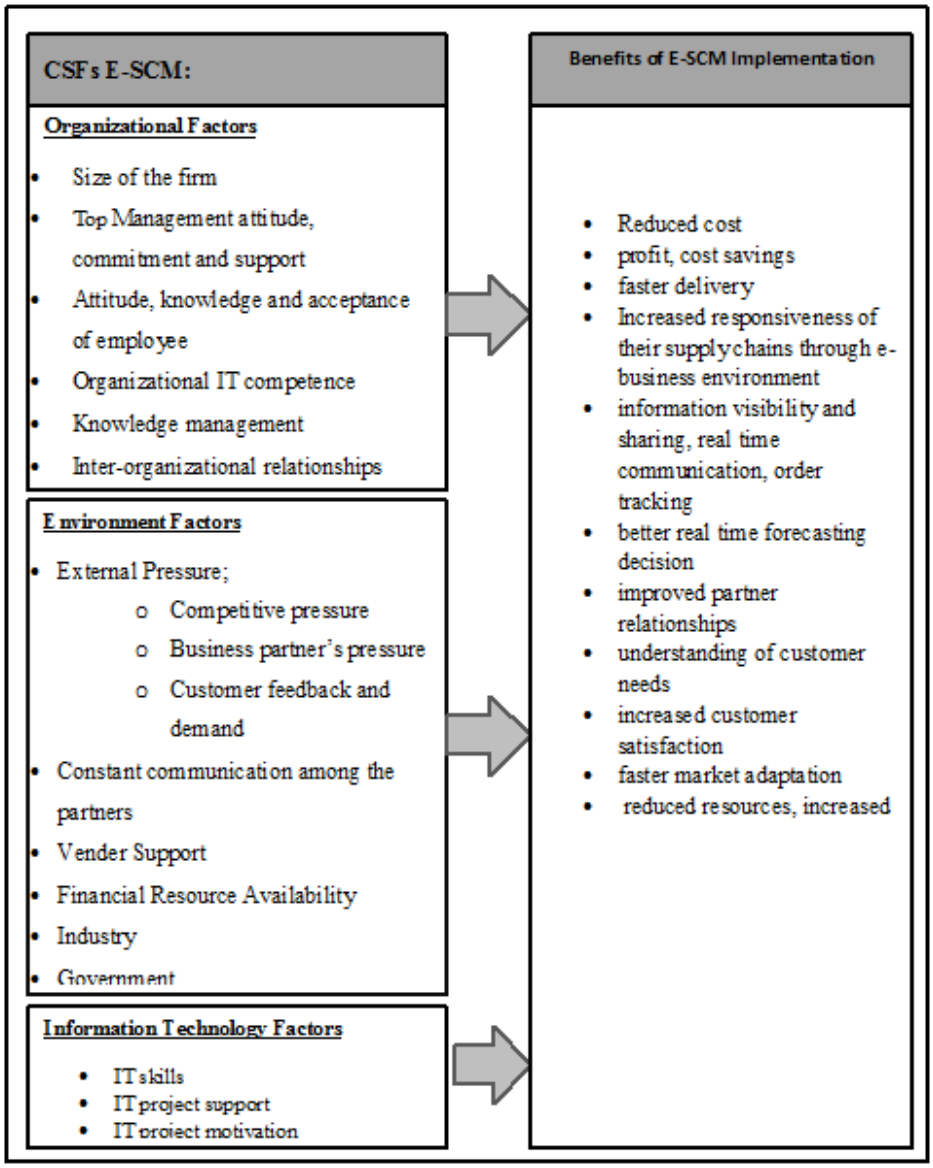

Figure2: The proposed framework.

The framework presented in figure 2 starts with the dominant critical factors hypothesized to play a more overriding role in the electronic supply chain implementation, and they should be ongoing throughout all implementation groups of factors. The figure combines the main critical factors of electronic supply Chan implementation which have been into three groups of factors. These are: 1). organizational factors, 2). Environment factors, and 3). Information technology factors.

In this model framework, the group of factor one which is *"organizational factor"* consists of many factors which is; size of the firm; top Management attitude, commitment and support; attitude, knowledge and acceptance of employee; organizational IT competence; knowledge management; and inter-organizational relationships. The group of factor two is *"Environment factors"* which consists of external pressure; constant communication among the partners; vender Support; financial Resource availability, industry; and government. And the last group of

factor is *"Information Technology Factors"* which emphasize on IT skills, IT project support, and IT project motivation.

These main factors of implementation have to be well managed, which will effects and gain the benefits of E-SCM which are reduced cost, profit, cost savings, faster delivery, increased responsiveness of their supply chains through e-business environment, information visibility and sharing, real time communication, order tracking, better real time forecasting decision, improved partner relationships, understanding of customer needs, increased customer satisfaction, faster market adaptation, and reduced resources.

CONCLUSION

The result of research on the sample companies this study shown that the main critical factors in particular organizational factor environment factor, and information technology factor have significant impact on their success of implementation of E-SCM. These factors play an important role to implement this project success. Furthermore, E-SCM implementers must be carefully considered and all addressed in every factors and all the stage at the same time to ensure successful MRP implementation.

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