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Modelling Supply Chain Management in Small Medium Entreprises (Case Study of Palembang SMEs)

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Abstract

To almost all economies in the world, Small and Medium Scale Enterprises (SMEs) is important due to its role in contributing to economic development of many countries around the world. With no exception, SMEs also have to be competitive and resilient to survive in todays challenging environment In this area, competition not only between firm but between Supply Chain. Supply Chain Management (SCM) literature proposes that integrated control of these multi-firm network can provide significant benefit. The utilization of information technology (IT) in turn, is considered an imperative requirement for managing these network and has been associated with significant supply chain efficiency improvements. The flexibility, quick decision-making, and co-operation from employees of the SMEs characteristic should build a specific patern of IT for this kind of firm. This paper provide a framework that constructs the model of IT specifically for SMEs Supply Chain Management. The SCM model that fits with SMEs structure in this study is two-stage model proposed by Cahpmar (2007). Its conclude that IT is powerful technology for communication at the buyer-supplier interface in SMEs. IT infrastructure of SMEs is an important factor in determining the usage level of Webpage, Application Software, Internet Network and website can lead the supply chain in area of buyer supplier partnership and beteer co-ordination and ensure competitive advantage of SMEs.

Keywords : *Supply Chain Management (SCM), Information technology, Small and Medium Scale Enterprises (SMEs)*

1 INTRODUCTION

Supply Chain Management (SCM) is defined as a series of interconnected activities which are concerned with planning, coordinating and controlling materials, parts and finished goods form supplier to customer (Stevens, 1989). SCM is one of the most powerful executive paradigms for competitive advantage of production companies and service providers (Gunasekaran, 2004). Today, organizations or individual firm are not important but rather the creation of added value occurs in the supply chain and its management. Just as competition

has increased, customer expectations are also constantly changing. In other words, more emphasis needs to be put on faster distribution, higher customer orientation, and better service quality and by timely access to information different production and distribution sectors should be supported.

To the effectiveness control of todays complex supply chains the use of Information Technology (IT) considered important. Recent study explored that there is so many benefit brought about by IT to the industries. Within the application of IT, industry can improve supply chain agility, reduce cycle time, achieve higher efficiency, and deliver products to customer in a timely manner (Radjou, 2003). Besides, the implementation of IT in the SCM can enable a firm to develop and accumulate knowledge stores about its customers, suppliers and market demands, which in turn influences firm performance (Tippins, and Sohi, 2003).

However, current status of literature indicates that the impact IT in terms of SCM in the large firm leaving out SMEs who anyways start with a disadvantage due to their inherent resource constraints. Given that majority of the firms in economies today are Small and Medium Enterprises (SMEs), they are the ones that are acquired effective and efficient in gaining global competition and play very fundamental function in the economies of many developing countries through the creation of employment and provision of support services to larger firms (UNCTAD, 1993). Some research found that SMEs face a number of challenges which are likely to explain the performance of their supply chains and their survival, one of them is information technology accessibility (Onugu , 2005). Due to these identified limitations in the previous literature, this paper tend to built a model for IT model specifically on SMEs SCM.

2 SUPPLY CHAIN MANAGEMENT AND INFORMATION TECHNOLOGY

Today, SCM is a critical element in todays highly complex and competitive business environment. It has direct influence on key issues like cost to market, time to market, responsiveness to changing customer demands and market dynamics and the overall business. SCM has received attention since early 1980s (Moore, 2008). It can be described as a path of value creation frombasic producer through customer including all transportation and logistic sevices that connect them. In other words, SCM is a system which includes material suppliers, production facilities, distribution services and customer linked together by the feed forwars flow of materials and the feedback flow of formation (Stevens, 1989).

The beginning of SCM can be marked through initiatives such as Efficient Customer Response (ECR), Just in Time (JiT) and Vendor Managed Inventory (VMI) supporting mainly 1:1 relationships of trading partners. At the same time, several organizations and committees established various standardsfor the modeling of supply chains and the collaboration between suppliers and their customers, whichalso often assumed 1:1 relationships and considered the supply chain as a concatenation of such relationships.

During the following time, SCM systems were coming closer to their original aim of a global view and optimization of companies networks. Their functionality is no more part of Enterprise Resource Planning (ERP) systems, but rather implemented in separate packages offered from leading software vendors. Consolidation processes and the need to strengthen cooperation in order to become more competitive are reinforcing this trend. As the competition is shifting from individual companies to entire supply chains, SCM systems have to

afford the necessary configuration, planning and execution tools to analyse and optimize the supply chain as an entity itself.

Obviously, Supply chain management confines the notion of an organization to coordinate the activities from procurement to the final customer. Each component of the SCM activity supports another by focusing on each component operations across firms boundaries (McIvor and McHugh, 2000). Procurement in almost literature consider vital aspect of supply chains. According to Carr (2002), the constructs of procurement practices are strategic purchasing, purchasing risk taking and purchasing knowledge and skill. Strategic purchasing involves planning, evaluating, implementing and controlling the operational activities of the purchasing function an effort to meet the objectives of the firm. Purchasing risk taking is about the long term focus of the purchasing function to take on risk when appropriate opportunities present themselves and relentless pursuit of company objectives by purchasing professionals. Then, the construct of purchasing knowledge and skills looks at the extent to which persons handling the procurement function exhibit high purchasing knowledge and skills. This includes ensuring that persons handling the procurement function are qualified, have the skills to monitor and interpret supply market changes as well as handle aspects of relationship with suppliers.

Bowersox (1996) assert that a supply chain typically consist of the geographically distributed facilities and transportation links connecting these facilities. In services such as retailstores or a delivery service the supply chain reduces to problem if distribution logistic, where the start points is the finished product that has to be delivered to the client in a timely, manner. As a long as a pure service firm or a consulting operation, the supply chain is principally the information flow. Meanwhile, SCM requires a serious integration from planning process to order and sales. Niu (2010) recognize the components of a linear supply chain as upstream supply chain, internal supply chain and downstream supply chain. Each component of the SCM activity supports another by focusing on each component operations across firms boundaries (McIvor and McHugh, 2000). In order to be successful in SCM, firms should share their stock, production and promotion estimations and plan with customers and suppliers which form the other rings of the chain. In this area, Information access and data transfer are highly recommended in SCM systems. Reservation of information and avoiding use use of technology by some firms reduce pace and effectiveness of supply chain.

To achieving a high performance in SCM, the role of IT is prerequisite. A supply chain with fully integrated IT system is one where nearly all the organizations significant business relationships with customer, supplier and employees are digitally activated and mediated. Supply chains with a well integrated IT system sense and respond to their environment far more rapidly than traditional supply chains; giving them more flexibility to survive in turbulent times (Moore, 2008). In addition, supply chain IT can improve supply chain efficiency by reducing uncertainties associated with information unavailability, incompletion and distortion (Niu, 2010; Omar et al., 2010).

Jaana Auramo et al (..) investigates the role of IT in SCM. They develop three different types of IT in use in SCM as follows: transaction processing, supply chain planning and collaboration, order tracking and delivery coordination. Transaction processing stands for the use IT for increasing the efficiency of repetitive information exchanges between supply chain partners. In this type of IT use the exchange information is typically related to such task as order processing, billing, delivery verification, generating and sending dispatch advices

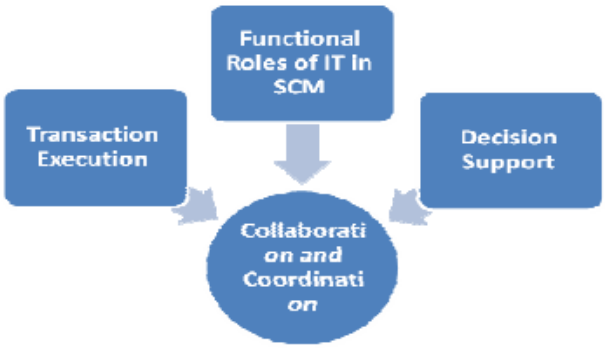


Figure 1: Functional Role of IT in SCM (Moore, 2008)

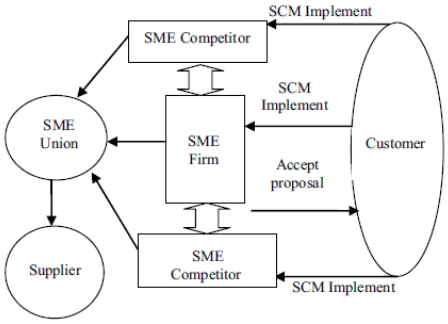
and producing order quotes. The supply chain planning and collaboration type represents the use of IT for sharing planning-related information such as demand forecasts and other demand information, inventory information, and producing capacity information, with the intention of increasing the effectiveness of the supply chain. And the last is the third type of IT use in SCM, order tracking and delivery coordination which refers to the monitoring of individual orders or shipments, which include of component or final product, with the aim of coordinating their delivery or conveying timely information of their location.

3 SUPPLY CHAIN MANAGEMENT IN SMALL MEDIUM ENTREPRISE

Small and Medium enterprises are defined in several ways, but most commonly as firm that have up to 250 employees. In other literature, SMEs describe as an entity which deploys limited resources due to its small size, with less information and integration, and employs less trained workers with short-term goals 9Persona et al., 2004). As a group, these enterprises already provide wide-scale employment: jobs in small and medium enterprises account for more than half off all formal employment worldwide and 45% of formal employment in developing countries (Ayyagari et al, 2007). SMEs are seen by many national governments and international development organizations as important engines of innovation, economic growth, employment and poverty reduction.

Because of their characteristic which are small and highly fragmented, SMEs are at a natural disadvantage when dealing with the overall management of the supply chain(s) that concerns them. Unlike big firm, which have greater geographic reach and more abundant resources, SMEs generally do not have a clear view of the entire supply chain beyond their immediate operations and contacts. Therefore, these SMEs can only manage the supply chain within their close proximity. Also, by restricting themselves in this manner, they must be subservient to the larger players in the chain, wield little or no management control, and be subject to foreign exchange variations.

But certain studies found that SME received SCM in different way. It is assumes that SMEs do not perceive their supplier to be their partners but perceive them to be a process which protects them against lack of production (Udomleartpresert et al., 2003). Udemleartpresert proposed Vertical Chain Management Model to increase SMEs bargaining power and



Source: Udomlearttprasert, P., Jungthirapanich, C. ve Sommechai, C., "Supply Chain Management-SMEs Approach", IEEE, 3, 2003

Figure 2: Vertical Chain Management Model

relationship with customer. The aim of this model is to maximizing bilateral benefits with supplier in the chain and gaining bargaining power over supplier through establishment of a union by SMEs operating in the same sector.

However, most studies on SCM did not take the size of firm as consideration. It means there is no sufficient research on to what extent SCM fits to SMEs and whether it is right to implement exactly the same SCM, which is implemented on big firms, on SMEs. Arend and Wisher (2005) found that SMEs do not implemented SCM rightly, they do not use SCM strategies fullyand they do not select SCM freely. In fact, there is week harmony between SCM and SMEs. Within their study, it was concluded that SMEs are willing to use supply chain after they begin using their suppliers electronic data interchange (EDI) system.

In the research conducted by Hatice Cahpmar (2007) on SME Supply Chain Management Model, it was concluded that SMEs Supply Chain devided into 2 stage. The first stage of the model takes places place in supply and production centers and the scond stage takes place in product and customer center in consideration of their features and qualification. In supply-production stage of the model there are supply center, customer center and production center. SME union, which is among these institutions, provides integration among institutions at the first stage. The second stage, which is product-customer center, consist of bulk supplier, retail dealer and customer center, there is information flow in the opposite direction.

3.0.1 Supply and Production Center Stage

In Supply-production stage of the model, there are supply center, customer center and production center. In this stage, there is SME Union which is provides integration among institutions at the first stage. Supply centers including supply policy is conducting to meet the supply needs for different sector of SME. Because of supply capacity of SMEs is small, they tend to avoid making cooperation with bigger supplier (Donk et al., 2005). Within this center, saving time, reducing cost, stable prices and regular supply opportunities, continous supply, stable prize and acceptable quality can be achieved by SMEs (Vaaart et al, 2006, Cahpmar, 2007).

Second institution in supply centers-production centers involves raw materials, semi-products and material constitute distribution centers operation fields and stages especially

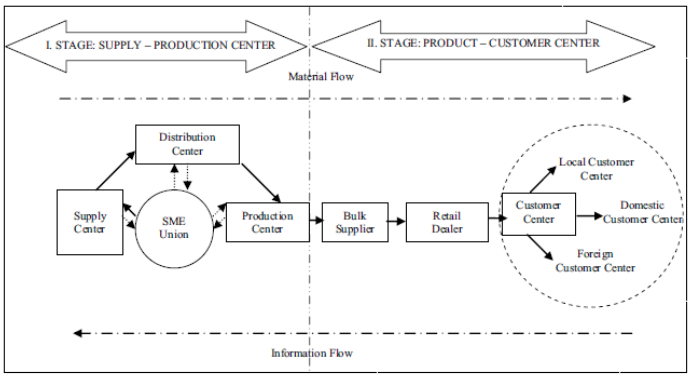


Figure 3: SME Supply Chain Management Model (Cahpmar, 2007)

in accordance with their capacities. This institution laso preferred both single and multiple stage distribution centers depend on factors ssuch as intensity, variety and distance to production and operation centers.

Last function of supply-production center stage is stocking and production activities. Under these circumstances classical stocking system such as significant cost of storage, labor, stock losses and profit lossess of capital in stock are preferred to be implemented (Oktav, 1990). Stocking and stocking policies of supply chains at supply and production center stage are important in term both cost and capital need.

However, in order to provide fluidity targeted by the system in the production stage in supply chains, basic factors such as demandable production, technology, even elasticity in production and innovation should be targeted (Narasimhan et al., 2004). Moreover, market demand of productionand performance conditions of markets in which product will be distributed researched and determined.

3.1 Product and Customer Center Stage

In the second stage which cover product and customer center. Production capacity, product and product fluidity in supply chains form the enterprises strategic policies for cost and capital need. In this area, products which are elastic, demanded, innovative and aesthetic and cost less are very important in the system (Monkhouse, 1995). In SMEs, qualified product targets which include main elements such as costs, technological level and price should be selected.

Bulk supplier, semi-bulk supplier and retail dealer institution also take place at product and customer stage which take places place in economical and rational fluidity of supply chains. In these stage, selection and evaluation such as stock, security, time values, and cost in term of intermediary institutions number, qualification, and distribution opportunities should be made.

Customer centers focues on customer markets in SMEs supply chain strategies in three ways, there are local, domestic and foreign customer center. Local customer center process in which SMEs enter the market directly. In this process, the product is produced and then presented to the market and customer taking demand and order condition into consideration.

Domestic customer center is the process in which SMEs products access the market via intermediary institution and the distribution can usually be made to the outside of locality. And last, is important function of supply chain which is foreign customer center that focus on export-oriented. In this context, beside face to face marketing, the flow of information to customer service network through the internet will improve efficiency and responsiveness (kumaran and Ganesan, 2011). While, organizing all these operations, main elements such as demand frequency of the product by customer, its compatibility with standards, acceptable quality and price should be taken into consideration (Akgemci, 2001).

4 INFORMATION TECHNOLOGY IN SMEs

Recently, there is a widespread interest in understanding the factors that affect IT usage in SMEs. Maguire et al. (2007) pointed out that SMEs can gain competitive advantage through the use of information and communications technology. The key variables and challenges facing organizations in harnessing information and communications technology for growth are also discussed (Matthews, 2007; Bayo-Moriones and Lera-Lopez, 2007). According to Esselaar et al. (2007) the use of information and communications technology increases the labor productivity. Sygn (2007) indicated that competitors are one of the important external factors considered by SMEs in IT adoption. IT usage increases companys competitive advantages as well as its efficiency in international market.

Hence, some studies found out that IT training would give positive impact on IT usage of employees. IT can be used to support the business relation with suppliers and customers. Ang et al (2001) explore the impact of external, organizational, and technological factors to support total quality management. And in the respect of the research made by Kutlu and zturan (2008), it is pointed out that the increased use of IT in SMEs is mainly for operational and routine tasks.

Moreover, there are number studies support business value from SMEs adopting the Internet. The main issues and barriers with regard to the level of Internet and ecommerce adoption and activity are investigated by Stansfield and Grant (2003). Kula and Tatolu (2003) described the reasons for internet usage of SMEs are mostly for external communication and gathering information for market and product research. Then, Lohrke et al. (2006) found the important benefit of the internet usage as reducing SMEs transaction costs. In another research, Koh and Maguire (2004) explored e-business and knowledge management approaches used by SMEs in the UK. The result showed that they have increasingly applied e-business activities but knowledge management is a relatively new concept and most of them do not use knowledge management applications. Meanwhile, Kaynak et al (2005) investigated the factors on e-business and ecommerce information technology adoption decisions made by SMEs.

Mardikyan (2010) analyzing the usage of IT in SME. In this circumstances, the research investigated the purpose of the IT usage in SMEs and put forward the key factors affecting the level of IT usage. In order to measure IT usage of a company, internet usagelevel, web page usage level and software usage level of the company was evaluated. The study states that most of SMEs uses IT for their basic needs but within the result, it is also showed the tendency to use it for more advance activities.

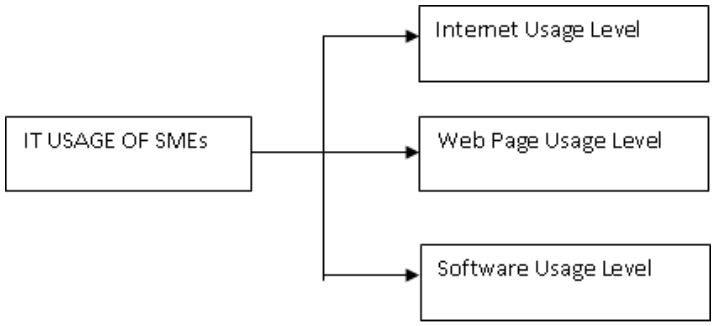


Figure 4: analyzing the usage of IT in SME

5 CONCLUSION

As competition began to increase, and the supply-based market was replaced by the consumer-based market where there were plenty of suppliers to satisfy the consumers demand, corporations were compelled to improve their performance in order to survive in this everchanging market. Thus, rapid changes in information technology (IT) force enterprises to adapt new development. In other words, IT is critical to the success of most businesses especially small and medium sized enterprises (SMEs).

IT is a powerful technology for giving information and communication in Supply chain in Small Medium Entreprises. Within IT in SMEs supply chain management would be increasing SMEs performance by increasing efficiency in their supply and production center-product and customer center. On the other hand, SMEs have been showing more concern for information technologies day by day. Despite using IT in basic level, they should improve their businesses by investing on new technologies such as IT infrastructure. IT infrastructure of SMEs is an important factor determining the usage levels of internet, webpage and software. By having better SCM, the SMEs can perform better as important engine of innovation, economic growth, employment and poverty reduction.

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