A Comparison between Traditional SCM and e-SCM
-An Example of LEXUS Taiwan

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ABSTRACT

In today's business environment, enterprises have to consider their global reach as it is important to a firm's survival, especially for multinational firms that are more profitable and grow faster. The enterprises use of the Internet in supply chain management provides rapid connections with the interior department's fragmentation and their exterior operations to reduce response times and resolutions of their customer service problems. What though are the differences for SCM now that they use the Internet, compared to previous times? Following that, this paper will identify the role of high-technology in SCM. A network direction is proposed to encourage more integrated level of e-SCM adoption which in turn further strengthens the relationship between a network direction and its implementation.

Keywords: Supply chain management, e-SCM, Customer Relationship Management, e-commerce, e-Business

INTRODUCTION

The supply chain is a global network used to deliver products and services from raw materials to customers, through an engineered flow of information, physical distribution and cash. In other words, supply chain management includes the design, planning implementation, control and monitoring of supply activities with the objective of creating net value, building a competitive infrastructure, leveraging worldwide logistics, synchronising supply with demand, and measuring performance worldwide. Although SCM has gained in popularity, there remains confusion about its precise meaning and definition. Some field experts regard SCM as an operational process that involves the flow of materials and products.

The channels develop when many exchanges take place between producers and customers. The position of firms that bring products or services to the market has been called the supply chain. The objective of a supply chain is to maximise the overall value generated, such as faster delivery, improved quality or reduced costs, with the primary purpose for the existence of any supply chain being to satisfy customer needs. The 'supply chain management' term has been used for almost 20 years and has been defined as the integration of activities that procures materials, transforms them into intermediate goods and final products, before delivering them to customers (Heizer and Render, 2001).

Hence, supplier selection is one of the most important decision making problems, since selecting the right suppliers significantly reduces the purchasing costs and improves corporate competitiveness (Cebi and Bayraktar, 2003). Supplier management is one the most important parts in any supply chain management and has gained an increased importance during the globalisation process.

THE INTEGRATED SCM

SCM is term that has grown radically in use and popularity since the late1980s. Many people use the term as a substitute or synonym for logistics (Lambert, et al., 1998). With the fast growth in technology, enterprises are facing more a competitive environment and more serious global competition. The process of global agitation that connects technology and speed, the SCM and global logistics management, is a new model for enterprises to put into practice. In this new model, enterprises have to consider how the global marketplace integrates production, purchasing, logistical support, product designs and marketing, competently enough to respond to the customer's immediate demands. In relation to the business process of integration in SCM, the necessary concerns for many of the functions are supposed to be included in SCM (Wu et al, 2004). Consequently, the supply chain is a combination of processes, as it integrates where the raw materials are manufactured into the final products and then their delivery to customers (Rafele, 2004). As

Cooper et al. (1997) suggested, it is based on a basic statement originating from the managing of organisational operations, which in turn can be traced back to channels and systems integration research during the 1960s and more recently work on information management and inventory control (Walters and Rainbird,2004). A chain usually implies in a line, where relationships connect from one link to the next. However, there are two problems with this. Firstly, not all goods run along the direct line's chain. For example, Dell's monitors are shipped with its computers. Secondly, the information flow is managed to gain a competitive advantage in the supply chain but it does not always flow sequentially. In fact, information that is shared with many nodes at once results in faster and quicker supply chains. The nature and the direction of the linkage are unclear in this definition.

Therefore, SCM is a foundation of a competitive advantage and a lever for a profit edge. Considering this, the goals of SCM can be categorised as the following (Chou, et al, 2004):

1. To reduce costs by matching production to demand.
2. To reduce production costs by reforming the product flow within the production process and by improving the information flow between business partners, as well as to improve customer satisfaction by offering increased delivery speed and flexibility through the cooperation.

To stay competitive, enlightened companies have strived to achieve greater coordination and collaboration among supply chain partners in an approach called "supply chain integration", in which Information Technology plays a key role in furthering their goals. The most visible manifestation of the Internet has been a more profound impact on B2B interaction, especially in the area of supply chain integration (Lee and Whang, 2001).

In fact, e-business has already impacted on supply chain integration; as it is a new model that is being incessantly developed. By adopting an e-business approach for supply chain integration, companies can efficiency improvements, better benefit deployment, faster times to market, reduction in total order completion times, enhanced customer service and responsiveness, find new markets, higher return on assets, and higher shareholder value. As well as this, e-Business partners can redefine the logistics flow, as the roles and responsibilities of members may change at any time to improve the supply chain efficiency. A supply chain network jointly creates new products, pursues mass customisation, and penetrates new markets and customer segments. New rules for the supply chain have arisen as a result of this integration by redefining the Internet (Lee and Whang, 2001).

Integration can not be completed without a tight linkage of the organisational relationships between companies. The success of any supply chain integration is predicated on the close cooperation that is inspired by a perception of mutual benefit. The e-business approaches can go a long way toward by fostering the necessary level of trust and commitment (Lee and Whang, 2001).

THE DEVELOPMENT OF INFORMATION SYSTEMS SUPPORT FOR SUPPLY CHAINS

The SCM have to augment customer demands that are intended for the advances of recent technologies in communication and information systems to create a competitive global environment (Tracey and Tan, 2001). At the beginning of the 1960s, SCM started to link functions to better serve their customers. In the 1970s, technology helped organisations to perform transaction concentrated activities for their orders, the storage of goods and for their materials (Fredendal and Hill, 2001). During this stage Material Requirement Planning (MRP) developed into SCM, integrating it to improve their performance for Distribution Resource Planning (DRP) organisation to connect materials management activities, figure order processing to inventory management, orders from suppliers, and the planning of the schedule. The other factors SCM comprised of advances in technology, augmented stress on customer services, the rising credit of the systems approach and total cost concept, the profit leverage from logistics, and the realisation that it can be used as a strategy for challenging the marketplace (Lamber , et al.,1998).

Until the 1970s and 1980s, MRP and JIT had flexible manufacturing and systems that were interfaced directly with the customers order to guarantee delivery on time. The design of manufacturing techniques were used to simplify the number of components required, as manufacturing was very important in MRP systems and was one of the methods that looked into the management of the total supply chain (Chaffey, 2002).

The linking of electronic communication has been used a key tool for at least 20 years. EDI was the first tool that diffused and enabled communication, whilst more recently Internet applications seem to have overcome most of its original limitations (Caglinao, et al., 2003). In the late 1970s and 1980s, US firms faced competition from their Japanese counterparts, especially in the automobile industry, where Japanese car manufacturers Toyota utilised JIT delivery to achieve efficient inventory management. The solution at the times was to communicate through batch orders and via a standard called Electronic Data Interchange (EDI) (Mount and Caulfield, 2001). However, companies started using EDI to manage their goods and materials in the distribution process (Chaffey, 2002).

The age from the 1980s and 1990s, saw SCM and Efficient Consumer Response (ECR) become involved with suppliers and customers. The two main goals of SCM was to make the most efficient and effective supply chain for the benefit of all the company, not just one part of the channel, as well as to make the most of their opportunities for customer by ensuring that the stock at all stages .Prior to the 1980s, most organisations worked quite independently from their suppliers. The origin of SCM to integrate their external partners was founded in the material industry's quick response program and the grocery industry's efficient consumer response initiative (Lummus and Vokurka, 1999). Quick response (QR) is a business strategy that is facilitated by the use of Internet Technology (IT) to improve communication and coordination between supply chain partners. It is a customer drive business strategy for cooperative planning with supply chain partners. It makes sure that the commodities are in the correct place, at this exact time, using IT to reduce inefficiencies in the supply chain. A related strategy is ECR, which was originally based on QR, but specifically applies QR values to the organization (Harries et al., 1999). QR, ECR and JIT aimed to continue to keep inventories as low as possible. QR and ECR extended past the paired relationships that are often found in manufacturing by creating partnerships that extended to all levels of the supply chain. As the available on QR have mainly focused on the demanding characteristics of QR planning, we often disregard some of the necessary elements that are needed when QR is seen as a total business strategy. One of the key drivers of this business strategy is the degree of competition being experienced by global firms. Strader et al. (1999) suggest that it's this great effort in most industries that is making organisations look toward better ways of improving their product quality, customer service and operating efficiency, just to remain competitive. QR and ECR are two of the business outcomes that firms have used to meet this competitive challenge. Using QR, the run of products and the flow of information are both faster than before. Goods are moved forward to the customer faster, by reducing manufacturing and shipment times and by reducing inefficiencies in the supply chain (Mackay, et al., 2003).

From the 1990s, Technological Interface Management (TIM) was created, as enterprise resource planning systems were incessantly needed to support primary data interfaces with suppliers and customers. Customers leave their information behind when they visit the websites and make transactions. The data can be collected and used by suppliers and agents to improve offers. Nevertheless, customers have become more aware of the value of information and technology on the Internet that enables them to protect their private information, with the opportunity for mediators to act as customer agents and not supplier agents continually grows (Chaffey, 2002). The most publicised SCM was the one at Wal-Mart. Many companies were pushed into supply chain integration with Wal-Mart. In 1983, when bar codes were printed on most goods, Wal-Mart introduced checkout scanners in all its stores. They updated inventory numbers for individual items at the point of sale and enabled their head office to simply move their combined sales and inventory data to its IT department. In 1989 Wal-Mart completed a two-year satellite communications network installation that sent data from all their stores to its head office, providing real-time inventory data. In 1990, the retailer implemented joint planning, forecasting and replenishment processes that brought suppliers and distributors together to build a combined planning calendar (Johnson, 2002).

By the mid to late 1990s, the significance of SCM was broadly familiar. The Supply-Chain Council (SCC), organised in 1996 by Pittiglio Rabin Todd & McGrath (PRTM) and AMR Research, had 69 voluntary member companies (www.supplychain.org), which currently includes 1,000 corporate members world-wide from a wide section of industries, including manufacturers, services, distributors, and retailers. Since the late 1990s, primary companies have positioned a larger emphasis on cost reductions and innovations at the suppliers end of the chain, rather than at the customers end (Laseter and Oliver, 2003). Therefore, the separate component terms, have not conveyed and emphases

the web of connections between partners and customers, particularly for information sharing, nor has it focused on customer needs (Sherer, 2005).

Through the late 1990s academic institutions began to identify the significance of SCM. In 1997, Michigan Sate University set up a Marketing and Logistics Administration Department, with many of their operations and moved into a new department named Marketing and Supply Chain Management. In 1998 Arizona State University recognised a Supply Chain Management Department by joining their purchasing, operations and logistical faculties (Larson and Rogers, 1998). Journals focusing on SCM were introduced in 1997, including 'Supply Chain Management: An International Journal' and 'The Supply Chain Management Review', despite the fact that journals in other disciplines, like the 'Journal of Marketing Theory' (Sherer, 2005).

At a point in the latter part of the 20th century, organisations had to broaden their supply chain re-engineering, JIT manufacturing and distribution, Efficient Consumer Response (ECR) and agile paradigms, to new levels of supply chain efficiency and integrate them with the latest high technology.

WHAT DOES EFFICIENT INTERNET TECHNOLOGY BRING TO SCM?

High technology is an important factor for companies to consider when gathering ideas for customer opportunities; increase the company's capability to compete, and so that they can reach long term development goals. Internet technology can be categorised as shown below (Tjader, 2004):

1. E-commerce information arranges for customers to purchase products and services by the company's website.
2. Information delivery and data exchange – so that collaboration between companies becomes clearer, to understand customer needs, and to provide the manufacturing, transportation, and sales information required.
3. The Internet is a highly integrated communication tool for customers, suppliers, manufacturers, distributors, and other key alliance partners.
4. With the purpose of complete SCM to make sure everything functions efficiently, frequent information systems have been developed to support SCM. In the earliest information systems, SCM primarily supported individual functions, such as the purchasing departments.

Since there was not much inter-organisational coordination between the departments in a company or with suppliers and customers, the systems could be developed to match internal departmental processing requirements. Inter-organisational coordination was accomplished by some early adopters with the use of EDI systems (Thompson, 1967).

As harmonisation in the supply chain became more important from the 1980s and the term "Supply Chain Management" was invented, the systems evolved to reflect the capability of the technology in SCM. Only recently have companies turned to the integration of CRM systems with SCM systems, in order to be agile for customer contributions. On the other hand, customers are able to be served, listened to and valued, even though they can't always be controlled. At the same time as relationships with customers being managed, customer need may not always be controllable. What may be controllable is the flexibility of the network to adjust to changing needs. The information systems that have been developed to judge customer demand are the CRM systems.

Furthermore, SCM systems are focused on reducing costs but CRM systems are focused on enhancing revenue. The missing link between supply and demand systems can lead to an excess inventory, additional costs, and unsatisfied customers. The focus of information systems to support efforts in the customer fulfilment process should centre on value, not supply, as organisations need to focus on networks, not linear chains of flows. Information has become the key driver of any advantage, so information systems have evolved to link supply and demand in a networked fashion, enabling companies to link customer demand directly to their network supply chains. Information technology will soon no longer be an obstruction to the flow of networked information through the linking of the supply and demand information. To integrate an organisation and technology is relevant for information technology, as organisations will believe in their financial consignment and benefits of such electronic inter-organisational systems when they are integrated into their e-commerce relationships and delivery mechanisms (Sarkis,et al., 2004).

WHAT IS DIFFERENCE BETWEEN TRADITIONAL SCM AND e-SCM?

Traditional supplier selection problems are based on invoice costs. Many decision makers use countable and uncountable criterion such as quality, delivery, flexibility, cost, and response in the selection and assessment process. The main questions for the selection process are the needs of the firm the level of the success of the selection criterion to complete these needs (Dogan and Sahin, 2003).

Traditional SCM always used the telephone, fax and regular mail to contact their upstream (supplier) and downstream (customers) connections, however, the use of face-to-face negotiation is not longer needed, as it involved lots of time and costs. The traditional technological support for supply chain relationships are the Electronic Data Interchange (EDI) systems. By its very definition, EDI is an inter-organisational process, so business partnerships have been shown to be very important in the adoption and use of EDI. Also the traditional approach to SCM which includes the use of computer to EDI systems could require hearty technology expenditures but in the e-SCM environment, which is primarily Internet-based, the costs of information exchange along the supply chain are greatly reduced. In fact, it has been stated that operating in the e-SCM context only requires a free Web. Like William (2002) said the changeability between traditional and e-SCM includes the following points:

1. e-SCM places less relative value on long-term partnerships and strategic alliances, when compared to traditional supply chain organisations because of the reduction in technological expenditures associated with forging new relationships in the Internet based e-SCM.
2. Comparing traditional SCM and e-SCM, e-SCM can increase in partnership opportunities.
3. The cost savings opportunities are more effective in e-SCM.
4. Short-term, cost-driven benefits can be realised, and long-term partnerships can be developed as needed. The need for partnerships may not be as forceful as in the traditional supply chain but it allows firms to implement short-term competitive relationships that may have opportunities for ongoing relationships.
5. Autocratic leadership will be cost effective, highly responsive but structurally ineffective when operating in an e-SCM environment.
6. Participative leadership will be structurally effective and cost ineffective when operating in an e-SCM environment.
7. Transformational leadership will be both cost and structurally effective when operating in an e-SCM environment.

Different companies in a supply chain have different objectives. Due to the different needs of interior operations and differences in supply availability, members in a supply chain often use different types of IT systems. Comparably, IT systems between the supply chain members make the development of information sharing resource allocation and customer responsiveness much simpler (Tjader, et al., 2004). Finally, e-business integration is not new; as many companies have already pursued it as a way to gain a competitive advantage. The business can use the Internet to gain global visibility across their extended network of trading partners and help them respond quickly to changing business conditions, such as customer demand and resource availability.

Traditional supply chain analysis distinguishes between primary activities that add directly to getting the goods and services to the customer and delivery to buyers, support and servicing after the sale, and for support activities which provide the input and infrastructure that allows the primary activities to take place. The major distinction between the e-SCM and the traditional supply chain is that the e-SCM, while structurally based on technology-enabled relationships, makes decisions based upon efficiency benefits. As e-SCM was created using electronic linkages, it thereby provided low switching costs, which allows for the supply chain design to be very adaptable to changing trends, consumer preferences and competitive pressures (Williams et al, 2002). It can be argued that internet technologies can reduce production times and costs by increasing the flow of information, as a way to integrate different supply chain activities. Through doing this, the supply chain can be made more efficient and the services delivered to customers more readily. The supply chain involves electronic commerce that was used to traditional supply chain activities, such as market research, procurement, logistics, manufacturing, marketing and distributing (Chaffey, 2002). The Internet's strengthening influence of convergence can be depicted.

The low-cost connectivity makes it possible for small and mid-sized companies to take advantage of SCM techniques. It is the main reason that the traditional supply chain management developed e-SCM. Companies willing to

adopt Internet technologies and business models in an opportunistic way will clearly gain competitive advantages. Information Technology (IT) has contributed to the growth of world economy, as well as the Internet changing the way that companies practice business.

The current and future technological capability of the Internet means that it will be possible for demand data, as well as supply capacity data, to be clear to all the companies in the supply chain. In addition, using Internet based information transfer; supply webs will e replace the traditional organisational role of information within supply chains, thus making for a more interactive approach for supply chain partnering (Kehoe, and Boughton, 2001).

CONCLUSION

E-business and e-commerce are fundamentally different. E-commerce uses electronic media to conduct transactions, such as buying, selling, or exchanging products, services and information via computer networks, whereas E-business is the transformation of key business processes through the use of Internet technologies. It is a more generic term than e-commerce because it refers not only to buying and selling but also to servicing customers, collaborating with business partners, and conducting business transactions within an organisation. The significance of e-commerce and e-business will vary between every business and organisation in terms of its adoption by customers in its marketplace and the amount of investment needed. In particular, as we have seen, adoption is likely to vary between business and customers. For this reason it has become conventional to consider business to business (B2B) e-commerce and business to consumer (B2C) and e-commerce separately. The B2B Company is a medium to large company that sells paints and chemicals that are used for coating products manufactured by other companies. By transforming key business processes through the use of Internet technologies, e-business has mainly focused on supply chain management, cycle time, and rapid response, globalisation, enhancing productivity, reaching new customers and sharing knowledge across institutions. The physical products though can not be transmitted electronically, as they depend on good logistics and supply chain processes to expedite product movement. E-SCM that uses electronic means for communication can provide both front and back end support. Thus, e-business technology has emerged as a key enabler to drive supply chain performance (Tjader, et al., 2004).

The benefits of e-business do not just take place because of technological implementations; they depend greatly upon the supporting business environments and the degree to which supporting businesses can utilise the coordinated internal organisational systems. When members of a supply chain can stand on a unified front, the real benefits of e-business will materialise. If the e-business adaptation gap is large among supply chain members, then business transactions and information sharing will be improved efficiently (Tjader, 2004).

In the repeatedly demanding global economy, organisations need to be able to respond to the demands of their customers, as the effective management of supply chains is a critical factor differentiating successful organisations. One of the key factors affecting the operational success of a supply chain is the efficient flow of information through the supply chain (Kehoe, and Boughton, 2001). The global supply chains are involved not only in the supply of products but also the supply of high technology services like outsourced software and call centres that create special research opportunities and challenges (Sivakumar and Roy, 2004).

The challenges can be classified into the following sections (Chou, et al., 2004):

1. Changing power to customers: Most e-commerce experts have argued that the supply chain is power from the seller to the buyer. Not only have consumer benefited from this power but also the purchasing agents within the business that runs this service.

2. Facilitate global interconnectivity. The Internet not only provides businesses and individuals with convenience and flexibility for transactions and communications but also brings competition into the global arena.

3. Collaboration. The Internet enables the trading partners within the supply chain to better coordinate and collaborate for mutual benefits. Technologies that are based on the Internet make for a seamless integration with business partners.

4. The Internet changes the way supply chains are managed, planned and controlled. SCM related information and decision are integrated into the web, breaking the old paradigms of inter organisational boundaries. By implementing

web based SCM and CRM, companies can virtually eliminate the boundaries among business partners to form an extended enterprise.

As we can see, Internet and web technologies can support the whole supply chain's operations, as well as being fast and inexpensive. Furthermore, customers can instantaneously make sure of the status of their orders by just click on their computer mouse. Especially, Web technologies create these contributions to SCM, even though the completion of Web-based SCM possesses huge possibilities for cutting costs and driving efficiency, we also have to consider the cultural and technical processes.

Furthermore, e-SCM is quite different from the traditional supply chain organisation which has basic goals for partnerships and alliances, based on the supply chain increasing their constancy and the long-range cost benefits for the improvement of long-term relationships. Therefore, relationships with suppliers have moved from being adversarial to ones promoting trust. Put simply, it has advanced from being competitive to being collaborative (Williams et al, 2002).

The use of IT to share data between buyers and suppliers has created an effective e-SCM. As a major problem in most supply chains is their incomplete visibility of real demand, shared information between supply chains partners can only be completely leveraged from side to side process integration. This process integration means a collaborative relationship between buyers and suppliers, joint product development, common systems and shared information. This form of collaboration in the supply chain is becoming ever more prevalent as companies focus on managing their core competencies and outsourcing all their other activities. We have to consider how the information in the furthest point on real final demand penetrates (Barratt, 2004).   Historically, a firm was not likely to make either its supplier or customer a partner. In many industries, each firm played one supplier against another, demanding and getting lower prices (Dobyns, 1990).

Consequently, the supplier also has to select a regular and technical approach, as most of the companies can improve their competitive advantage through the wealth of a good supplier manager.

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