E-COMMERCE AND LOGISTICS: AN EXPLORATORY STUDY

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ABSTRACT

As more companies adopt e-commerce, there is a need for businesses to understand the implications of the virtual value chain activities. This exploratory study looks at how e-commerce has transformed the logistics industry in Malaysia - more specifically at the downstream activities, which include the distribution and sale of products to customers. It also looks at some issues of concern and also opportunities that this brings to the traditional logistics companies. Review of literature shows that e-commerce has had a positive effect on the logistics industry as a whole in the world. It was also revealed that almost all the Malaysian companies (involved in e-commerce) studied, outsourced their delivery services. Choice of the third party logistics (3PL) provider is crucial. Maintaining a good relationship especially communication between the e-commerce companies and the Logistics Service Provider may be a matter of survival.

INTRODUCTION

Contrary to the fears of many academics and analysts, commerce over the Internet or e-commerce (EC) as it is more popularly known is booming and is growing faster than any other business trend. The market slump in Internet stocks during mid-2000 broke the dot-com bubble and made people more cautious but that has changed and more and more people are now shopping online (Mullaney *et al.* 2003). The growth of the Internet has also led to the increasing importance of information, which has become as important

as products and services (Hagel & Singer, 1999). As more and more "brick-and mortar" companies get involved in e-commerce activities, it is only natural that their traditional business operations including logistics are affected in some way or the other.

E-commerce also offers companies flexibility in option pricing and customization of products and services by reducing the constraints of time and space (Bhatt and Emdad, 2001). With the World Wide Web, you are not restricted by geographical and political limitations even though the latter may exist to some extent. Traditional markets or physical markets disappear and are replaced by a virtual world, which has no boundaries. A company in Kuala Lumpur, Malaysia can now receive orders from as far as Hawaii. Thus, e-commerce is an easier way of entering new markets. This has presented several opportunities for carriers and 3PL companies for handling the fulfillment and distribution of Internet sales.

Traditionally, the downstream logistics activities, which specifically include the distribution of products to distributors and customers, are usually outsourced to logistics service providers (LSPs). Other experts also use the term "third party logistics" (3PL) provider (Lambert *et. al.*, 1999; Harps, 2003). For consistency, the term 3PL will be used throughout this paper. E-commerce initiatives are having a positive effect on the logistics industry. For example, courier company DHL Worldwide Express estimates that US$ 2 billion in revenues (or 40 percent of its entire business) was processed by electronic applications (Mazurkewich, 2000). As more companies adopt e-commerce, there is a need for businesses to understand the implications of the virtual value chain activities. Most studies on e-commerce focus on marketing issues whereas logistics, which forms the backbone of e-commerce operations, are commonly neglected (Delfmann, *et al.*, 2002). According to another report in the Star, the Asia-Pacific region has the potential to account for nearly a quarter of the total global Internet Economy by 2004, which translates into about US $1.6 trillion value 90 percent of which is likely to be business to business (B2B) sector (E-commerce back on fast growth path, summit told, 2003).

Very few studies have been carried out on this topic in Malaysia and this exploratory study looks at how e-commerce has transformed the logistics industry by discussing some issues of concern and opportunities that this brings to the traditional logistics companies. More specifically, it looks at how the downstream activities, viz., how businesses ensure that finished products are delivered to customers on time by looking at a few Malaysian companies selling products online.

REVIEW OF LITERATURE

It is sad to note that negligible studies have been conducted in Malaysia to examine how the adoption of e-commerce by traditional companies has changed the way they manage the logistics activities. These companies known as "Click and Mortar" stores

differ from pure e- such as E-Bay and Amazon.com in that they have both a physical as well as online presence. Malaysian examples include Royal Selangor and Citra Spice Mart (M) Sdn Bhd. These companies already have a supply chain and logistics structure in place. On the other hand, pure e-commerce companies such as Amazon.com, that exist solely on the net and do not have any existing physical structure, had to develop their own supply chains. Outsourcing delivery services may have several advantages over carrying it out in-house. In fact most e-commerce companies outsource their delivery services to 3PL providers, who then deliver the products straight to the customer (Mutum, 2003)[2].

E-Logistics and the Value Chain: The physical value chain includes the strategically relevant activities through which a firm conducts its business (Porter, 1985). It consists of five core activities including inbound logistics, operations, outbound logistics, marketing and sales, and services. It also includes four support activities: firm infrastructure, human resources management, R&D and procurement. Logistics supports both purchasing and sales activities of companies of the company at all stages of the supply chain. Besides ensuring that raw materials arrive when needed and ordered goods are delivered to customers in time, logistics management also involves the management of raw materials through various stages as the raw materials go from storage through the production process and finally as finished products.

The virtual chain on the other hand, offers a number of distinct advantages over the physical value chain. With globalisation, two main strategies are increasing in importance for many companies, namely, flexible capacity management and global presence. Information technology (IT) plays an important role in both strategies. The use of IT in logistics is not new and many companies now take advantage of the Internet to link to logistics functions. Alliances are forged between customers and manufacturers, advertising products and services selectively with effects of audio, video, and graphics, and saving time and money in efficiently processing customer orders and enquiries. Companies are rapidly testing and adopting new technologies, which they hope would benefit them in improving their supply chains.

One notable project is the Auto-ID Center project, sponsored by Wal-Mart Stores, Gillette, Proctor & Gamble and 84 other companies. This project, which is currently in the pilot stage, involves the development of chips with identification numbers on individual packages such as a pack of razors or bottle of shampoo. Electronic readers will automatically track the product as they move from warehouses to stores. This might drastically change the supply chain.

Delivery Methods: The question of how these companies deliver the product, is another issue. Logistics and in particular the supply chain dimension of e-business are largely neglected and managed poorly, while the low performance of basic logistics is currently hampering turnover and revenues of e-commerce applications severely (Cooke, 1999; Hoek, 2001). This often results when companies create demand that they cannot fulfill. He proposed the strategic and integral supply chain involvement rather than a virtual

integration, which is applied in an operational manner and in segments of the supply chain only.

A practical approach, include the creation of an e-supply chain which is a supply chain that can fulfill orders and assure supply in the physical sphere. Cost decreases and performance enhancements are some of the expected advantages of a more integrated supply chain. Logistics and distribution in particular might be the "crucial element" responsible for the success of online retailers. Some other authors have pointed out that downstream logistics provide several opportunities for transportation and 3PL providers with the realization of the importance of customer service (Yannis, 1998; Alshawi, 2001).

E-commerce has radically changed the way in which many organizations have traditionally traded - more specifically, with regards to the interface between the buyer and the supplier. According to McIvor *et al.*, (2000), the application of electronic commerce technologies are making it hard to specify the traditional boundaries in the value chain between suppliers, manufacturers and end customers. Organizations can achieve several benefits through the effective implementation of electronic commerce technologies including electronic data interchange (EDI) and the Internet. In today's increasingly competitive environment organizations are becoming more dependent on their suppliers for flexibility and fast reaction to market requirements.

E-commerce companies are mostly concerned with the initiation and agreement phases of a transaction conducted via the Internet. However, whenever physical goods are involved, the subsequent phases of the transaction involves the physical flows between the seller and the buyer (Delfmann *et al.*, 2002). This process provides a potential field of activity for 3PL providers. Businesses involved in e-commerce today need sophisticated logistics support and often need to outsource for warehousing and distribution services. The integration of two kinds of activities - ones that are embedded into the physical value chains and the others that are built through information into the virtual chain, plays a critical role in the success of e-commerce in spite of their dependence on the characteristics of the products and services (Bhatt and Emdad, 2001).

Disintermediation: There are different types of business models: some companies prefer to handle their own distribution, while others contract (outsource) with outsiders. Each business model has its own advantages and disadvantages. Outsourcing logistics to third parties has several advantages. A study by Persson and Virum (2001) discusses the potential advantages of outsourcing. They identified the more frequently cited reasons as: better focus on the core business; access to world-class processes, products, services or technology; better capability of adjusting to changing environment needs; risk-sharing; releasing resources for other businesses; reducing the need for capital investments; better cash-flows; reducing operating costs; exchanging fixed costs with variable costs; access to resources not available in own organization; and reducing difficulties related to managing an operation or parts of the business.

One of the major implications of E-commerce has been the reduction of intermediaries between the buyer and seller, thus improving their relationship. The elimination of supply chain elements or intermediaries is also known as disintermediation and the rise of a global e-marketplaces are logistical implications of e-commerce (Delfmann, *et al.*, 2002). Disintermediation has resulted in the breakdown of the traditional supply chain where the retailer was the only interface with the customer. In other words, e-commerce buyers can now obtain a better price and sellers can obtain the feedback from their buyers directly and quickly. This also means reduction in errors, paperwork, delivery times and overhead costs (Hawkins et. al., 1999).

The longer a supply chain, the more uncertainties will appear and the more costs will be incurred. Lowering the members of a supply chain means that the costs will be lower and this cost saving finally passes to the ultimate consumers. Dell Inc's integrated supply chain eliminates retailers and sells directly to customers. Their build-to-order system, whereby they build a computer only when they receive an order, ensures lower inventory levels. This is combined with a streamlined supply chain. At the end, Dell can produce quality products at lower prices to satisfy its ultimate customers (Dell Inc. website, 2004).

Developing Relationships: The perception of 3PL has changed a lot as compared to about a decade ago. It was then seen as an emerging industry. Today it has become a key component of logistics management strategy in many industries. As the 3PL providers move from serving mainly national markets to international markets, this will lead to profound changes in the way they conduct their business activities. One such change will be the movement of the planning and control of the logistics processes, from national to international offices, due to the growing import of consumer goods together with the development of international logistics networks. It is expected that this will further result in the use of advanced communication technology by International customers and reduction in deals with local service providers (Persson and Virum, 2001; Gooley, 2002).

E-commerce has had another interesting effect. Rivals to the more established courier companies are also collaborating to build vertical exchanges designed to reduce transaction costs and simplify operations. One such example is that of a joint venture to handle logistics between bulk-shipping firms Amoco, Cargill and the Royal Dutch/ Group and Clarksons, the ship-brokering group. Another trend gaining in popularity is the creation of broad exchanges, which are like portals where users can shop around for shippers, track deliveries and even make payments. An example is the Global Transport exchange (GTX) formed as a joint venture by Hutchison Port Holdings' Portsnportals.com and Oracle. GTX, based on Oracle's e-business marketplace platform, will enable buyers and sellers of logistics and transportation services to transact and share information via the Internet. This was hoped to provide an online marketplace for trading in trucking, airfreight, rail, shipping and warehouse capacity as well as integrated logistics. (Mazrurkewich, 2000; Hutchison Port Holdings web page, 2000).

An example of a successful relationship between an e-commerce company and 3PL providers involves the largest sales and distribution event in e-commerce history. The online book store, Amazon.com teamed up with FedEx and the U.S. Postal Service to deliver more than 789,000 copies of the latest Harry Potter book "Harry Potter and the Order of the Phoenix" to customers across the US starting on Saturday, June 21, the first day the book was available to the public (Business Wire, Inc., 2003).

METHODOLOGY

Research of previous work was conducted using online databases provided by Proquest, Lexis Nexis and Emerald Fulltext. Besides the secondary research, information provided on websites of 12 selected Malaysian companies, who have adopted or are full-fledged e-commerce companies, were analyzed to see whether they provided any information about their delivery activities. These companies (selling products) were chosen at random from companies listed in the Jaring Internet Magazine published by Mimos Bhd. (Issues: November, 2002 to April, 2003). The companied selected cover a wide range of products ranging from electronic products to even groceries.

E-mails were also sent to these companies to obtain information about their delivery services. The list of companies analysed are given in Figure 1.

Figure 1: List of companies involved in E-commerce

No	Company name	Web site	Description
1	All Ninety Nine Sdn Bhd	http://www.all99.com	Web-based retailer offering products ranging from Flowers & Hampers to electrical products, toys and games etc.
2	Interbase Resources Sdn Bhd	http://auc.buysell.com.my	Malaysian auction site. Formerly known as Lelong.com.my.
3	Pharmaniaga Solutions Sdn Bhd	http://www.ehealth4all.com	e-Store hosts products distributed by Pharmaniaga Group of Companies.
4	Pengallery (M) Sdn Bhd	http://www.Pengallery.com	Specialize in sales of brand name quality writing instruments, related products and lighters.

(continued)

No	Company name	Web site	Description
5	Royal Selangor Pewter	http://www.selangorpewter.com	Markets its range of over 500 products, including pewter products, Selberan Jewellery and Comyns silverware.
6	Pasarborong Online Sdn Bhd	http://www.pasarborong.com	Online grocery store, selling groceries ranging from fresh vegetables to fishes.
7	Aigner Technologies (M) Sdn Bhd	http://www.avons.com	Online store selling audio and visual products including camera and handphones.
8	Megabuy Sdn Bhd	http://www.megabuy.com.my	IT retail chain store established since 1999.
9	Value-*i*-Store Sdn. Bhd	http://www.vis.com.my	This virtual supermarket, sells items ranging from books and flowers to computers.
10	Sony (Malaysia) Sdn. Bhd.	http://www.sonystyle.com.my	Online store selling Sony products.
11	Touch of Eden Florist	http://www.touchofeden.com	Online florist.
12	Linear Channel Sdn Bhd	http://thesaxyclub.com.my	First e-commerce lingerie site in Malaysia.

FINDINGS AND DISCUSSION

The research shows that an increasing number of companies in Malaysia are outsourcing components of their logistics and supply chain functions to 3PL providers. It was also revealed that almost all the Malaysian companies studied outsourced their delivery services. Some of them used more than one 3PL company.

Most of the 3PL providers were the big international players, usually the well-known and established companies, which operate worldwide such as Federal Express (FedEx), DHL and UPS. Some used the courier service provided by Pos Malaysia and the local courier company, Nationwide Express.

A few companies were found to use more than one 3PL provider to deliver their products. Pengallery (M) Sdn Bhd. ships orders internationally using Federal Express or DHL. On the other hand, Royal Selangor Pewter uses TNT Express, FedEx and UPS to deliver products to their customers.

Some of the companies studied were found to have their own delivery service. However, these were limited to a small geographical area. PasarBorong online Sdn. Bhd, Malaysia's pioneer online grocery store, has its own trucks delivering groceries to selected areas of the Klang Valley. Requirements for special handling for their healthcare products was the main reason that Pharmaniaga Solutions Sdn Bhd gave for having their own delivery services. An interesting case was that of the Malaysian auction site Buysell.com.my, which follows the consumer to consumer (C2C) business model, delivery is entirely up to the seller and buyer (Mutum, 2003).

Some companies have their own delivery service but also outsource whenever needed. Megabuy Sdn Bhd's standard operating procedure is to deliver the next business day upon the completion of the online transaction or clearance of payment for stock available. They have the support of their own service logistics infrastructure and 18 pick-up points countrywide. Deliveries are handled either by their official courier company (which was not identified), own transport, or a contracted transport company (which was also not identified).

Customers would feel more secure with e-commerce companies with web sites that have links to recognized shipping companies (Adams, 1998). A major complaint of online customers is that e-commerce companies usually do not deliver on their promises. According to a survey by Arthur Andersen, the two top problems experienced by end consumers purchasing products on-line in the US in 1999 are logistical factors related to supply chain performance. These include products not received in time or being out of stock (Hoek, 2001).

The Malaysian courier company Nationwide Express allows the customer to check a shipment's status as it progresses through their hubs and scanning stations. The customer can also view the name of the person who signed for the package just by clicking on the consignment number. FedEx, the global leader in the logistics industry, has been able to harness the Internet by developing and providing a wide range of e-services to meet the ever-changing customer needs. They have gone beyond tracking services and customers can even view and print the package recipient's handwritten signatures as proof of delivery (Mullaney *et al.*, 2003; Track My Shipment, 2003; Song, 2003; Sanchez, 2003).

As noted earlier, many e-commerce companies prefer to outsource their delivery services to a 3PL provider. Thus the choice of the partner is indeed crucial. A supply chain should accommodate volatility and there should be accommodating vendors who are motivated to keep your deliveries operating smoothly. However, the development of close business partnerships to optimize inter-organizational processes remains one of

the difficult aspects not only because of technology issues but also because of strategic, cultural and organizational implications (Carter, 2001; McIvor, *et al.,* 2000)

Whether a logistics outsourcing partnership is successful or not depends on a number of factors. Boyson, *et al.* (1999) identified some effective means and methods for evaluating and selecting 3PL providers from outsourcing users perspective and also gave the most effective means for organizing, operating and monitoring these relationships. According to them, a strategic approach involves the identification of long-term goals and the separation of supply chain activities into those that are essential to achieving core goals. They gave that outsourcing should only be considered for non-core activities. Companies should evaluate the costs and benefits of insourcing versus outsourcing for each of the activities and, when advantageous, outsource multiple activities. Finally they emphasized the need for companies to ensure that gains from outsourcing do not dissipate after the initial year. Building steps for continuous improvement into the relationships could do this.

CONCLUSIONS AND IMPLICATIONS

Review of literature revealed that e-commerce has had a positive effect on the logistics industry as a whole in the world and Malaysia is not an exception. Many of these logistics companies are also investing heavily in e-commerce applications as they realize the advantages of investing in technology. To manage the changes brought about by e-commerce, two main strategies were identified, namely, flexible capacity management and global presence. However, they may give rise to other problems and involve change management. On the other hand, newer e-commerce companies may find it easier as they have the advantage of being able to structure their strategies along with their overall organization better than traditional companies.

Companies involved in E-commerce are mostly concerned with the initiation and agreement phases of a transaction conducted via the Internet. However, they should not underestimate the importance of subsequent phases of the transaction especially those involving the physical flows between the seller and the buyer. They have the choice of either carrying out their own delivery or outsourcing it. This part of the transaction provides a potential field of activity for 3PL providers and they should actively target the new e-commerce companies that do not have a proper in-house logistics system. Some tradition companies coming online are also looking at ways of streamlining their value and supply chains and want to focus on activities, which they consider more important while outsourcing their logistics functions. This provides another opportunity for the 3PL providers.

The exploratory research shows that an increasing number of Malaysian companies are outsourcing components of their logistics and supply chain functions to 3PL providers. It was also revealed that almost all the companies studied outsourced their delivery services. Some of them used more than one 3PL provider, most of which were the big

international players. Only a few had their own delivery service and these were those whose distribution was limited to a small geographical area.

Outsourcing presents several advantages over having delivery services in-house. However, the choice of service provider is crucial. In fact, this decision may be a matter of survival of e-commerce companies. It is absolutely essential to have a good working relationship with the 3PL provider. An open communication between the marketing and the logistics people in the company will ensure that marketing departments does not make promises that logistics providers cannot keep and also that they can handle surges in demand created by marketing campaigns. This works both ways. 3PL companies also need to develop closer connections with their customers (Persson and Virum, 2001).

Even though Asian firms have been slow to adopt e-logistics solutions, European and US partners of these firms are forcing them to do so. According to Samuel S. David, the FedEx Philippines country manager, some of their local clients have skipped the warehousing stage in their supply chain and now go directly to distribution (Sanchez, 2003). However, this may not be as easy as it sounds. This gives rise to particular problems especially as it may involve a lot of changes in the way a company manages its business. Change management is never easy. However, this might not be a serious problem for the virtual companies, as they do not have to face the problem of restructuring pre-existing physical structures. Malaysian e-commerce companies can look at the example of how Amazon.com teamed up with FedEx and the U.S. Postal Service so they can also successfully collaborate with 3PL providers to deliver customer satisfaction.

Future research can look in detail how adoption of e-commerce has changed the value and supply chains in Malaysian companies. There is a need to study the economic, cultural and other strategic implications of the effect of blurring boundaries between traditional boundaries in the value chain between suppliers, manufacturers and end customers.

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