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E-COMMERCE AND THE DOWNSTREAM 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 - more specifically at the downstream activities, which includes 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. Newer e-commerce companies have the advantage of being able to structure their strategies as compared to traditional businesses. We also look at the suggestions provided by various authors. The study 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 shopping online (Mulaney et al. 2003). As more and more “brick-and mortar” companies get involved in e-commerce activities, it is only natural that their traditional business operations are affected in some way or the other. The growth of the Internet has led to the increasing importance of information, which has become as important as products and services (Hagel and Singer, 1999). According to Rodrigues, the VP of E-Net Solutions Sdn Bhd, 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

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value of which 90 percent of which is likely in the business to business (B2B) sector (Star, 2003).

The use of information technology in logistics is not new and many companies now take advantage of the Internet to link to logistics functions (Sanchez, 2003). 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 focuses on marketing issues whereas logistics, which forms the backbone of e-commerce operations, are commonly neglected (Delfmann, et al., 2002). In fact there has not been any studies 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 “Brick and Click” 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 (www.royalselangor.com) and Citra Spice Mart (M) Sdn Bhd (www.citraspicemart.com). On the other hand, pure e-commerce companies such as Amazon.com that exist solely on the net and don’t have any physical structure had to develop their own supply chains. For purpose of this paper we will be looking at only one particular aspect of the downstream activities, viz., how businesses ensure that finished products are delivered to customers on time.

Objectives:
This paper looks at how e-commerce has transformed the logistics industry and more specifically at downstream activities, which includes 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. In line with these, specific objectives of this exploratory study are:
a) To discuss how the adoption of e-commerce has affected the traditional delivery functions, and
b) To discuss the effect of e-commerce on the logistics industry with special reference to Malaysia.

METHODOLOGY
Research of previous work was conducted using online databases provided by Proquest, Lexis Nexis and Emerald Fulltext. 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 gave 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). E-mails were also sent to these companies to obtain information about their delivery services. The list of Companies with a brief description is provided in Appendix I.

DEFINITION OF E-COMMERCE
Most people simply understand the term E-commerce or Electronic Commerce to mean the act of buying and selling products using the Internet. According to Ecommerce Digest web
site (Ecommerce Digest, 2003), the term refers to selling online, with or through a website, or by means of email. This is not limited to physical products but also includes the selling of online services in one transaction (such as a software) or over time with subscription. For example, Malaysiakini.com sends full news items and articles to its subscribers as compared to online visitors to its website who are able to access only a few portions of the site. E-commerce companies sell directly via the Internet. They present, market and sell their products/services on the Web. This results in the physical or digital delivery of goods or the performance of some kind of service.

More recent definitions of the term refer to both financial and informational electronic transactions between an organization and any third party (Chaffey, 2002). Thus, non-financial transactions such as customer enquiries may be included into this definition.

Incorporating the Information aspect, a broader definition of the term was given by Zwass (1998):

The sharing of business information, maintaining business relationships, and conducting business transactions internationally by means of telecommunication networks.

E-Commerce Classification by Nature of Transactions

Before we talk about the downstream activities of the supply chain and their link to e-commerce, we need to understand the common classification of EC. Various authors have classified them differently, however for this research the following are the most important (Turban et. al., 2000):

a) Business-to-business (B2B, B-B)

This refers to all commercial transactions between an organization and other organizations (inter-organizational). The failure of a number of B2B startups has led to the realization that B2B exchanges are not so much about the dollar value of transactions that are being brokered and cut but rather relationship between a big buyer and its smaller suppliers and processing paperwork. Now many companies involved in this model have realized the long-standing relationships companies have with their suppliers (Ward, 2003). Networked B2B transactions in the US was estimated at US$ 2.4 trillion according to Forrester Research Inc. In spite of the fact that several such companies failed, businesses carried e-commerce worth of about US $3.9 trillion this year (Mullaney et al., 2003).

b) Business-to-consumer (B2C, B-C)

This model applies to any business or organization that sells its products or services to consumers over the Internet. Amazon.com, the online bookseller that launched its site in 1995 stands out among all the online B2C companies. However, in addition to online retailers of products and now includes companies providing online services such as online banking, travel services, online auctions, health information and real estate sites. In Malaysia some outstanding companies following this model include, Air Asia Sdn Bhd (www.airasia.com) and Royal Selangor (www.royalselangor.com).
c) **Consumer-to-consumer (C2C)**

These are informational or financial transactions between consumers, but usually mediated through a business site. Contrary to popular belief, E-Commerce does not need huge investments or neither is it limited to big companies. A good example of consumer-to-consumer (C2C) transaction where consumers can sell to other consumers is that of online auctions such as those provided by Buysell.com.my (formerly known as Lelong.com.my). It is this business model which has taken off in a big way with a lot of transactions being conducted over C2C sites. Now anybody can start a business from home by putting up items on these auction sites. According to information provided to the online auction site, E-Bay, users transacted more than US$5 billion in annualized gross merchandise sales (value of goods traded on their site) in the year 2000 (Mutum, 2003). In spite of the fact that most well known auction sites follow the C2C model where consumers sell to other interested and willing consumers with the organization acting as a middle man, online auctions may occur in both B2B and B2C markets.

There are other models such as “Consumer-to-business” but the amount of such transactions is very small. It is important to note that companies may be involved in more than one model and may cover more than one segment (Arthur, 1996). It may be involved in B2C and B2B at the same time. In Malaysia, Pasarborong Online Sdn Bhd introduced the online groceries concept. The company sells groceries through their website at www.pasarborong.com to individual consumers (B2C) as well as to organizations (B2B). FedEx is involved in delivering packages for businesses. However, they also serve individual customers too.

**EFFECT OF E-COMMERCE ON COMPANIES’ VALUE AND SUPPLY CHAINS**

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. Traditionally the downstream activities, which include the distribution and sale of products to distributors and customers, were 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.

**Advantages of Virtual Chain**

The virtual chain on the other hand, offers a number of distinct advantages over the physical value chain. 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. 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 is replaced by a virtual world, which has no boundaries. A Company in Kuala Lumpur, Malaysia can now receive orders from as far as Hawaii. How these companies deliver the product is another issue. Thus, e-commerce is an easier way of entering new markets.

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. In today's increasingly competitive environment, organizations are becoming more dependent on their suppliers for flexibility and fast reaction to market requirements. They gave three case studies to illustrate the benefits that organizations can achieve through the effective implementation of electronic commerce technologies such as electronic data interchange (EDI) and the Internet.

Disintermediation
As opposed to the traditional supply chain where the retailer was the only interface with the customer, e-commerce has led to the disintermediation phenomenon (Hawkins et al., 1999). One of the major implications of E-commerce has been the reduction of intermediaries between the buyer and seller, thus improving their relationship. Buyers can obtain a better price and sellers can obtain the feedback from their buyers directly. This also means reduction in errors, paperwork, delivery times and overhead costs. Now customers can order directly from businesses over the Internet. 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). 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. Delfmann, et al., (2002) argued that the logistical implications of e-commerce could be differentiated into two main categories, namely, the rise of e-marketplaces, and the elimination of supply chain elements (disintermediation). Two main strategies are increasing in importance, namely, flexible capacity management and global presence. 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. And as we all know, change management is never easy. It might be easier for the new firms as they figure out their strategies anew.

According to Bhatt and Emdad, (2001) businesses involved in electronic commerce, need to integrate 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. According to them, their integration plays a critical role in the success of e-commerce in spite of their dependence on the characteristics of the products and services. Hoek (2001) also noted that the supply chain dimension of e-business is largely neglected and managed poorly, while the low performance of basic logistics is currently hampering turnover and revenues of e-
commerce applications severely. 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. A more integrated supply chain is expected to lead to cost decreases and performance enhancements.

**IT Innovations and Effects on the Logistics Industry**

Traditional 3PL providers such as Federal Express, UPS and others have invested in advanced IT systems. According to an article in the Far Eastern Economic Review, 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). 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 (Nationwide Website, 2003). 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 (Song, 2003).

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 warehouse to store. This might drastically change the supply chain (Mullaney *et al.*, 2003).

E-commerce has had another interesting effect on the courier companies too. 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 joined venture by Hutchison Port Holdings’ Portsportal.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. (Mazurkewich, 2000; Hutchison Port Holdings web page, 2000).
DELIVERY METHODS

There are different types of business models: Some companies handle their own distribution, while others contract (outsource) with outsiders. Each business model has its own pros and cons.

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 involve 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 needs sophisticated logistics support and often needs to go outsource for warehousing and distribution services.

Of the 12 Malaysian companies surveyed, all but two (2) outsourced their delivery service to other companies. Based on the findings, most of these are 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. Customers would also feel more secure with web sites that have links with these recognized shipping companies (Adams, 1998).

A few companies use more than one 3PL provider to deliver their products. For example, Pengallery (M) Sdn Bhd. ships order internationally using Federal Express or DHL. Royal Selangor Pewter also uses TNT Express, FedEx and UPS.

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, own transports, or a contracted transport company.

Among the few that have their own delivery service is PasarBorong online Sdn. Bhd, which has its own trucks delivering groceries to selected areas of the Klang Valley only and Pharmaniaga Solutions Sdn Bhd, which also maintains their own deliveries. According to the later, they do so as special handling-required for their healthcare products. The rest of the companies didn’t specify how they delivered their products.

As for the Malaysian auction site Buysell.com.my, which follows the C2C business model, delivery is entirely up to the seller.

ISSUES IN OUTSOURCING

The perception of third party logistics has changed a lot as compared to about a decade ago, which was then seen as an emerging industry. Today it has become a key component of
logistics management strategy in many industries (Gooley, 2002). 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-flow; reducing operating costs; exchanging fixed costs with variable costs; access to resources not available in own organization; and, difficulties related to managing on operation or parts of the business.

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. On 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 is deals with local service providers (Persson and Virum, 2001).

3PL Providers: Choice and Relationship
As mentioned earlier, 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 provider, which then deliver it straight to the customer.

A major complaint of online customers is that e-commerce companies usually don’t 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 out of stock (Hoek, 2001). In fact, the problem may be due to the outsourced company but ultimately it might effect your reputation. Therefore it is absolutely crucial to hire a company, which has experience in delivering similar products.

Whether a logistics outsourcing partnership is successful or not depends on a number of factors and 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. A supply chain should accommodate volatility and there should be accommodating vendors who are motivated to keep your deliveries operating smoothly (Carter, 2001). 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 (McIvor, et al., 2000)

DISCUSSION AND CONCLUSIONS

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 involves 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 companies 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 company. Most of the 3PL providers were the big international players. Only a few had their own delivery service and were 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 won’t 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). The following example illustrates a successful relationship between an e-commerce company and a 3PL provider. In the largest sales and distribution events in e-commerce history, Amazon.com (www.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).

Future research can look at 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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