A Survey-Based Study on ICT Adoption in the Third-Party Logistics Industry

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ABSTRACT

Information and communication technology (ICT) is an important tool to enhance efficiency and responsiveness in modern-day supply chains. Owing to fierce market competition and rapidly changing business environment, organizations are forced to focus on their core competency and outsource their logistics function to third-party logistics (3PL) firms. In order to work hand-in-hand with customers to meet their day-to-day logistics needs, 3PL companies have to make use of ICT for efficient communication with clients and coordination of activities. Through analyzing the survey results of the Annual Third-Party Logistics Studies from 2007 to 2009, this study looks into ICT utilization in the 3PL industry from a global perspective. To supplement the findings, a questionnaire survey was conducted to investigate the current status of ICT adoption by 3PL firms in China. As a global manufacturing base, China has a burgeoning 3PL industry serving a large number of domestic firms as well as multinational corporations, and is considered a representative developing country for investigation in the subject area.

Keywords: Information and Communication Technology, IT Adoption, Outsourcing, Supply Chain Management, Third-Party Logistics Industry

INTRODUCTION

Efficiency and responsiveness can be regarded as the primary goals in supply chain management (Chopra & Meindl, 2010). To achieve these two objectives, effective communication and real-time information sharing are the keys. Information and communication technology (ICT) therefore plays a vital role in managing modern-day complex supply chains. It permits effective coordination of day-to-day replenishment and distribution activities hence minimizes delay and waste. It also provides visibility to enable tracing and tracking of inventory thereby allows better control and greater flexibility in matching supply and demand. In addition, the technology enables internal as well as external integration. It helps promote collaboration among business partners through collective decision making using real-time data and information stored and

DOI: 10.4018/jisscm.2012100104
shared on a common platform. Together with automation employing data capture technologies such as barcode, global positioning, and radio frequency identification, ICT can significantly reduce labor, errors, and response time across the entire supply chain. This will not only lower total supply chain costs (i.e., higher efficiency) but also enhance overall customer service (i.e., improved responsiveness). In fact, significance and benefits of ICT in the logistics industry has long been recognized in many studies such as Bowersox and Daugherty (1995), Bowersox et al. (1989, 1999), Edwards et al. (2001), and Kathuria et al. (1999). Benefits of ICT adoption in other industries such as the healthcare industry have also been explored and acknowledged (Topacan et al., 2010).

**ICT for the Third-Party Logistics Industry**

Globalization and outsourcing have impacted significantly on modern-day supply chain management. The former has resulted in extended supply chains with global configurations and multiple entry and exit points. The latter has given rise to the prosperity of integrated logistics service providers who look after all the logistics activities in a supply chain for various customers. Information technology plays a significant role in these changes (Gunasekaran & Ngai, 2004). To facilitate communication, coordination, and collaboration, ICT is often employed to link up business partners in a supply chain. Electronic Data Interchange (EDI) that operates on private value-added networks (VAN) has long been used to automate business transactions between large organizations (Angeles, 2000). Fast expansion of the Internet and rapid advancement of Web technologies in the last couple of decades have extended the use of EDI from large to small and medium enterprises (SME). With greater functionalities and most importantly no requirement of expensive VAN to operate, Web-based EDI (or WEDI) and applications developed using eXtensible Markup Language (XML) protocol have become more affordable alternatives to the traditional EDI allowing SME to collaborate and directly compete with big companies in business. Similar experience is also witnessed in the development of other information technology (IT) systems such as Enterprise Resource Planning (ERP) that are used for both internal and external integration. New technologies such as Web Services, which allows information systems to be assembled from components downloadable from the Internet, permit organizations to easily integrate with business partners that run their own different internal systems (Fensel & Bussler, 2002; Hagel, 2002; Vidgen et al., 2004; Wu, 2004). The emerging Radio Frequency IDentification (RFID) technology for real-time tracking and efficient order assortment of fast moving products enables seamless integration between supply chain stages (Deloitte, 2003). Working together with other systems, it also facilitates full automation of routine logistics processes and may one day replace the widely used barcode technology completely (Vijayaraman & Ozyk, 2006).

With more and more organizations outsourcing their logistics activities to third-party logistics (3PL) firms, ICT has become an important asset to 3PL firms because they must integrate their systems with those of their clients in order to take over the logistics function effectively. As a bridge connecting clients and other members in the supply chain, ICT in 3PL firms plays a critical role in synchronizing and coordinating complex supply chain activities across logistics users and their customers (Lai et al., 2006). However, the high investment cost of some sophisticated IT systems such as ERP and the lack of IT expertise have dampened the adoption rate of ICT by 3PL firms (Sum et al., 2001). This issue is particularly critical for small logistics firms, which are usually limited in resources. With further technological advancement and reduction in utilization cost, however, there should be ample opportunities for 3PL service providers to further adopt IT to improve operational efficiency and competitiveness (Bhatnagar et al., 1999).
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