

## Chapter 13

# Adoption and Utilization of ICT in the Chinese Third- Party Logistics Industry

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### ABSTRACT

*This chapter reports the findings of a questionnaire survey on the adoption and utilization of information and communication technology (ICT) – an important tool to enhance efficiency and responsiveness in modern-day supply chains – in the Chinese third-party logistics (3PL) industry. As a global manufacturing base, China has a burgeoning 3PL industry serving a large number of domestic firms as well as multinational corporations. With more and more organizations outsourcing their logistics function to 3PL firms, the latter have to make use of ICT for efficient communication with clients and coordination of activities in order to work hand-in-hand with customers to meet their day-to-day logistics needs. To investigate the status quo of ICT utilization in China, a questionnaire survey was conducted in 2009 to investigate the level of ICT adoption by the 3PL firms. For comparison, the findings of the Annual Third-Party Logistics Studies from 2007 to 2013 in this regard were also analyzed. The questionnaire survey results reveal that ICT is being widely adopted in the Chinese 3PL industry suggesting a high level of awareness of its significance and benefits to both the service providers and the clients. The ICT used ranges from low-tech telephone, facsimile, Internet access, to more advanced and sophisticated radio frequency identification technology and enterprise resource planning system. While small 3PL companies are using less expensive ICT at a tactical level mainly to cut costs and reduce errors in the day-to-day logistics operations, medium-sized and large firms have evolved to make use of more expensive ICT for planning and strategic purposes, such as business control, customer integration, and service differentiation. Transportation management system is regarded as the most important IT for business to most 3PL firms surveyed whereas the significance of other systems for warehouse management, or-*

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*der management, and inventory management, etc. varies depending on the services provided and the resources available. A follow-up review of the recent literature suggests that ICT adoption in the 3PL industry of China has not significantly increased since the 2009 survey but the general awareness of the importance of ICT capabilities is growing.*

## INTRODUCTION

Efficiency and responsiveness can be regarded as the primary goals in supply chain management (Chopra & Meindl, 2012). 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 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), Bowersox et al. (1999), Edwards et al. (2001), and Kathuria et al. (1999). Benefits of ICT adoption and utilization 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-sized enterprises (SMEs). 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 SMEs 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

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