

Chapter XIII

Analyzing the Use of Information Systems in Logistics Industry

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ABSTRACT

Information and communication technology (ICT) refer to a family of technologies that facilitate information capturing, storing, processing, disseminating, and providing a supportive role for human activities to enhance organizational efficiency and effectiveness. With the use of ICT, organizations are expected to have better decision-making capabilities and faster execution of activities. Logistics activities in a company consist of a wide scope of processes ranging from planning and implementing material flow and storage, services, and information from the point of origin to the point of consumption. If ICT could be used to support these activities, logistics cost would decrease over the long term and the efficiency of logistics activities would increase substantially. In this chapter, we explain a method for studying the impact of ICT in logistics companies. This type of study is useful to devise a long term business process improvement policy in a country or a region. We suggest methods for collecting data and presenting them through descriptive and statistical analysis. We suggest the use of t-statistic method to test relationships between various variables and ICT implementation. We have provided a hypothetical case study to show the steps in the analysis. We believe that the chapter will be useful to researchers in conducting studies on the impact and suitability of ICT in logistics and other service providing sectors. The results obtained from this type of study can help the decision makers to understand the opportunities and hurdles in achieving greater efficiency in the organizational processes through the use of modern information technology.

INTRODUCTION

Business process efficiency can be enhanced by cutting down or shifting some nonvalue adding processes to automated processing. The pace of development in computer hardware and software and other technologies have enabled many companies to reorganize their business related processes, such as in finance or manufacturing. The use of information and communication technologies (ICT) or information technology (IT) helps to capture, store, process, and disseminate information to provide a supportive role for human activities in order to enhance organizational efficiency and effectiveness (Cohen, Salomon, & Nijkamp, 2002). The decision on the use of ICT is strategic (Huber, 1990) as ICT capabilities significantly influence overall logistics competence (Closs, Goldsby, & Clinton, 1997). ICT can improve an organization's ability to respond and change to a dynamic environment (Monteiro & Macdonald, 1996).

In the remainder of the chapter, we discuss the type of logistics services and their relation with ICT, development of a research framework, development of questionnaires, and finally the collection and analysis of data. The emphasis in this chapter is on the illustration of the method to analyze the use of ICT both in terms descriptive analysis and statistical analysis and then on helping readers draw conclusions based on the analysis. The chapter ends with conclusions and some remarks on possible extension of research work in the area of ICT and logistics.

Logistics Services

Logistics services are generally categorized into four groups: warehousing, freight forwarding, transportation, and depot operations (Andersen Consulting, 1998). Warehousing refers to receiving of goods, keeping their records, storing them in order for easy retrieval, receiving orders for withdrawal, withdrawal of goods from the store,

packaging, and finally preparing documentation for dispatch.

Freight forwarding refers to the coordination of freight movement, carrier selection, cargo clearance and tracking, and documentation of container cargoes. A freight forwarding agency obtains, prepares, and checks customs and insurance documentation to comply with various regulations of different countries. It may also develop appropriate routes for shipment and arrange payments for subsequent services on behalf of the clients.

Transportation refers to material transport from the shipper to the consignee carried out by sea (or river), air, and land. Transportation is an important part of logistics in terms of total logistics costs. Swenseth and Godfrey (2002) mention that the cost of transportation can be as high as 50% of overall logistics costs.

Depot operations refer to obtaining containers, doing major and minor maintenance, container modification, container inspections (to adhere to the standards as per the Institute of International Container Lessors), storing, releasing, and tracking of container movements. Therefore, proper documentation is necessary to manage containers properly.

Logistics and ICT

One study has shown that in the United States, logistics costs amounts to 6-11% of total sales and about 8-9% of a country's GDP can come from logistics activities alone (Langley, Allen, & Colombo, 2003). It is also shown that with the use of ICT, logistics costs could be reduced by as much as 50% (Gattorna & Berger, 2001). The use of ICT can enhance internal communication capabilities, speed and information accuracy (Huber, 1990). However, the adoption of ICT in different companies may be hindered by the size of the company. While large companies may be motivated to invest in ICT because of their long term business focus, smaller companies may not be

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