Chapter IV

The Effects of IT on Supply Chain Management in the Automobile Industry

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Abstract

This chapter introduces the concept of electronic supply chain design (eSCD) and empirically examines the impacts of eSCD on supply chain management. eSCD is a supply chain design that integrates and coordinates suppliers, manufacturers, logistic channels, and customers using information technology (IT). In this chapter, a model that shows the effects of eSCD on the customization capability of companies was developed. From previous studies, the model identifies three major effects of eSCD—electronic linkage effect, supply chain coordination effect, and co-engineering.
The model also shows a process through which an electronic supply chain network is transformed from a simple infrastructure for data exchange into a knowledge-sharing network for fast response and customization. The model was tested using the data collected from the automobile industry in Korea. It was shown that eSCD has significant effects on the supply chain coordination and co-engineering. It was also shown that eSCD affects the customization capability.

Introduction

The use of information technology in supply chains is becoming more important than in the past. One of the reasons is because business environments are moving from mass-production to customization. Supply chain combined with IT or Electronic Supply Chain (eSC) is a supply chain that integrates and coordinates suppliers, manufacturers, logistic channels, and customers using information technology (IT) (Briant, 2000; Kim & Im, 2002). The e-supply chain makes it easier and less costly to manage suppliers (Briant, 2000). IT can link all activities in a supply chain into an integrated and coordinated system that is fast, responsive, flexible, and able to produce a high volume of customized products at low cost.

eSCs are making a lot of impacts on the performance of supply chains in various industries (Fine, 1998). Moreover, eSCs are expected to bring more fundamental effects—from a simple network for information exchange to a network for knowledge creation and sharing (Kim & Im, 2002). However, not many studies have conceptualized various effects of eSC or empirically measured those effects. In this chapter, a new model is proposed to explain how an electronic network evolves from a network for simple data exchange into a space for knowledge creation and supply chain coordination. This model is empirically tested using the data collected from the companies in the Korean automobile industry.

Background

Electronic supply chain design (eSCD) is a process to build an electronic information network for transactions among supplier-manufacturer-retailer-customer in virtual space using IT (Kim & Im, 2002). eSCD has several aspects