Chapter 6
A Web-Based System for Supply Chain Collaboration to Enhance Agility and Flexibility

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ABSTRACT

Recently, enterprises have increased their competitiveness through supply chain collaboration to efficiently allocate resources using the internet. However, supply chain collaboration usually fails because information is usually confidential. Many studies have discussed strategies of supply chain collaboration via internet but only a few of the strategies can be implemented in practice. Therefore, this research builds an information exchange platform to share production and inventory information over internet to ensure on-time delivery. This platform is implemented in a panel manufacturing company and 10% on-time delivery increase with 2% quality improvement after adapting this system. This result demonstrates the usefulness of using online platform to immediately share information will improve one-time delivery and quality assurance.

INTRODUCTION

With the rapid changes (high product variety, customization, and the bullwhip effect) in the manufacturing environment, supply chains have faced on-time delivery and material shortage uncertainties. These uncertainties result from poor management of information from suppliers, manufacturers, and customers. For instance, suppliers promise on-time delivery of components but usually fail to meet promised due dates because of uncertainties within their production line. A delay or materials shortage caused by suppliers will increase production lead times and the possibility of late delivery. To reduce uncertainties, supply chain collaboration becomes a pertinent strategy for enterprises to enhance their competitiveness. Furthermore, building a platform to integrate information from different echelons and accurately transfer information to accurate supply chain echelons will be an important step towards supply chain collaboration. Although the impact of using a web-based platform to share supply chain information

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has been thoroughly discussed in the literature (Fedorowicz et al., 2008; Cassivi et al., 2008; Pick et al., 2009; Arinze, 2012), its effectiveness in a practical implementation has not yet been demonstrated.

Therefore, this study develops a web-based information platform based on the opinions of panel manufacturing industry supply chain management experts. In addition, this study analyzes the required information and parameters in constructing a web-based platform to improve on-time delivery and production scheduling. The platform is implemented in the same panel manufacturing company to understand its usefulness and the effect on the supply chain. This study is expected to achieve the following objectives.

1. Identify information required to improve supply chain collaboration.
2. Construct and implement a web-based platform to realize the usefulness of the developed hierarchy.

The reminder of this paper is presented as follows. In Literature Review Section, a review of literature pertinent to the problem under study is presented. Information Platform Structure Section discusses the platform structure in detail. Empirical Study Section presents the empirical study and the results obtained from the panel manufacturing company. In Implementation of the Concept Section, the implementation steps of the platform are presented. Finally, we present our conclusions in Conclusion Section.

LITERATURE REVIEW

Supply chain management (SCM) was first introduced by Oliver and Webber (1982). The purpose of SCM is to identify and integrate the resources and procedures of different companies in a supply chain. The integration enhances the efficiency of the supply chain that is achieved with information and profit sharing. SCM integration includes coordination and collaboration with partners, which can be suppliers, intermediaries, third party service providers, and customers.

Kalakota & Robinson (2001) defined electronic SCM as using information technology and the Internet to construct the information channels of SCM. Figure 1 describes the structure of electronic SCM. In Figure 1, suppliers and customers share their information with the enterprise using the Internet. Enterprise represents the company with the highest bargaining power in the supply chain. This can be a manufacturer, distributor, or retailer. To manage the shared information, enterprise can construct a platform for uploading and analyzing information so that the efficiency of the supply chain can be enhanced. The innovation of the Internet and the rapid growth of the world wide web have transformed traditional services such as purchase, order, product, sale, transport, and accounting over the Internet. This transformation has reduced order lead times and has resulted in the creation of a support infrastructure for B2B (Business to Business) relationships. Suppliers use the Internet for information sharing to maintain good relationships with manufacturers and retailers (Klein & Rai, 2009; Maloni & Benton, 1997; Simatupang & Sridharan, 2005; Madlberger, 2009; Hadaya & Pellerin, 2008). Furthermore, companies can use the B2B model for price comparison and for seeking business partners (Klein, 2005; Richard & Devinney, 2005; Soosay et al., 2008).

El-Gayar and Fritz (2010) proposed a web-based multi-perspective decision support system with a multi-criteria decision framework for information security planning and management. Their system is tested through scenarios and the results show that priorities become apparent, affecting the final decision outcome based on user preferences. Wu and Chuang (2010) use Innovation diffusion theory (IDT) with multi-stage analysis to identify key external antecedents that affect the rate of e-SCM diffusion.