

# Chapter 10

## IT-Based Classification for Supply Chain Coordination Mechanisms

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### ABSTRACT

*Managing dependencies via coordination is an effective solution for the problems that arise from these interdependencies in supply chains. This can be practical via a set of methods called coordination mechanisms. Numerous coordination mechanisms have been discussed before in literature. This paper develops a new classification of these mechanisms on the basis of information technology (IT) impact on them. This classification proves the important role of IT in better coordinating supply chains and help managers distinguish between coordination mechanisms that are created and improved by information technology and thus lead them to have the best choice based on their infrastructures and organization type.*

### INTRODUCTION

#### Background

Coordinating is one of the best responses of the dependencies that appear between organizations in a supply chain which can improve the overall performance. It can be applicable via a set of methods called coordination mechanisms, for managing interactions (Xu & Beamon, 2006). The importance of coordination mechanisms is

somehow that coordinating without a preplanned set of mechanisms managed by supply chain manager is impossible today.

Several coordination mechanisms had been mentioned over years but few papers had been classified them in a structural manner. The importance of information technology as a new solution and a tool for improving the effectiveness and efficiency of the whole chain in another side, lead us to develop a new classification for supply chain coordination mechanisms based on IT.

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Obviously, this study tries to help managers distinguish IT-facilitated and IT-enabled coordination mechanisms in the process of selecting mechanisms based on existing budget, type of their enterprise, and infrastructure.

## **Purpose and Content**

The purpose of this paper is to describe different coordination mechanisms and suggest a new classification based on information technology. By this classification, the significant role of IT in coordinating supply chains will be proved.

This paper is organized as follows. First of all, the concepts and definitions of supply chain and coordination will be described briefly. Furthermore, to develop a better understanding of the existing classifications, a detailed review about them will be mentioned. Followed by, information technology and its impact on coordination mechanisms will be discussed in detail. Then, our discussed IT-based classification will be proposed. And the article finally will be finished by conclusion.

## **SUPPLY CHAIN AND ITS COORDINATION**

### **Supply Chain**

Supply chain consists of all activities related to product flows and conversion of materials from providing raw materials to delivery of final products to end users. It also involves information flows related to them. Beside of material flow, two other flows, information flow and financial resource flow, also exists which add value for customers and other stakeholders (Liu et al., 2005). This process needs a management to effectively integrate independent supply chain members to act as a unified system in order to minimize system costs and satisfy member requirements (Simchi-Levi et al., 2007).

### **Supply Chain Coordination**

A supply chain system consists of many members that may belong to different companies and organizations. Each organization has different ways and solutions to optimize their performance. This sub-optimization of each organization, as a part of the chain, may conflict the whole chain performance.

This decentralized decision making should be coordinated to improve and optimize chain performance. That's why coordination become vital in performance optimization of supply chains and become a strategic response to the issues resulting from dependencies between chain members (Xu & Beamon, 2006). So coordination can be defined as: "The act of managing dependencies between entities and the joint effort of entities working together towards mutually defined goals" (Malone & Crowston, 1994). Coordination is the central lever of supply chain management and it's necessary for better efficiency and effectiveness of the whole supply chain so it must be considered as a part of the strategic planning process of each organization (Behra & Mukherjee, 2011).

Several papers in literature have mentioned benefits of coordination in supply chain. Some of these include: risk reduction and competitive advantage (Min, 2001), inventory reduction (Lee et al., 1997), cost reduction (Sahin & Robinson, 2005), increased in customer retention, reduction in lead time and revenue enhancements (Fisher et al., 1994; Horvath, 2001). The importance of coordination is such as some papers use term coordination in their definition of supply chain management (Stevens, 1989; Langley & Holcomb, 1992; Monczka et al., 1998; Chandrashekar & Schary, 1999; Lummus & Vokurka, 1999; Mentzer et al., 2001; Vakharia, 2002; Arunachalam, Sadeh, Eriksson, Finne, & Janson, 2003).

Beside this, coordinating supply chain members is not always beneficial. Joining information systems for effective information sharing may have high costs for some members (Zhao & Wang,

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