Chapter 67
Coordination in Supply Chain Management

Mohsen Sheikh Sajadieh
Sharif University of Technology, Iran

Alireza Boloorirabani
Wayne State University, USA

ABSTRACT

The aim of this chapter is to review various perspectives on supply chain (SC) coordination issues and appreciate a range of coordination categories and mechanisms. The application of information technology in supply chain coordination (SCC) and the related cases are also studied in this chapter.

DEFINITION

As explained by Chopra and Meindl (2003), A SC comprises all stages involved, directly or indirectly, in fulfilling a customer request. The SC includes suppliers, manufacturers, warehouses, transporters, retailers, and customers themselves. Generally, a SC comprises different functions such as production, purchasing, procurement, inventory, logistics, planning, etc. SCs usually comprises of several activities spread over several organizations and companies. For that reason and in order to satisfy the final SC customers, it is essential to develop coordination systems and mechanisms by which all responsibilities, activities, and configurations are aligned with the objectives of the SC in general.

In traditional SCs, the members perform independently, and the decisions are made alone at the place of each member. Obviously, the result of these behaviors is local optimization. In other words, they usually do not optimize the performance of whole system. However, increasing competition and demand from customers to deliver products faster and cheaper do not let the SC members to compete independently. Thus, to improve the performance of SC, its members should behave as a joint system and attempt to coordinate with each other. SCC is a win-win arrangement between the parties, and can be considered as a strategic response to new challenges faced in today's economy.

There is no unique definition for SCC. However, it can be generally defined as the joint efforts of independent companies for planning and execut-

DOI: 10.4018/978-1-4666-2625-6.ch067

ing SC operations such as product development, product delivery, information exchange, etc so that both risks and benefits are fairly shared, and improved business success are provided for the SC members.

Many issues should be taken into account in order to achieve a stable and mutually beneficial coordination. Some of these main factors can be summarized as human, technology, SC members' strategies, their relationship, rewards, profits sharing, information and knowledge sharing, objectives alignment, regular scheduled meetings of stakeholders to decide on conflicts, resistance in following the instructions of other SC members, agreement on nature of intermediates as well as knowledge of SC concepts and so on (for more information see Gittell and Weiss, 2004).

Lack of coordination may result high inventory costs, high manufacturing costs, high lead times, low customer service level, low capacity utilization, low flexibility, inaccurate forecast, low quality, etc.

Although coordination is generally beneficial, it faces some difficulties in practice. The main barrier for successfully coordinating a SC is the differences in interest of different members. Companies working together in a SC usually have different views and awareness of the market needs, and therefore they base their decisions on local perspective. The result is mismatch of supply and demand, and consequently a breakdown in SCC. Moreover, incompatible goals of SC members or disagreement over the scope and the responsibility of decisions and actions which are going to be taken jointly may cause difficulties in practice. Irrelevancy of rules, procedures and technologies of an organization to the new limitations and conditions of inter-organizational relationship also may result in misalignment.

It should be mentioned that although coordination generally improves the performance of SCs, it may not be beneficial for some cases. For instance, joining the information systems of SC members under different operational conditions may result in high adoption costs and makes the coordination worthless. Therefore, for each SC, at first it should be decided whether to employ the coordination mechanisms or not, i.e. it should be investigated if SCC is beneficial or it may result in higher SC costs.

COORDINATION CATEGORY

SCC is categorized by Arshinder et al. (2008) considering different functions and interfaces of each SC. Based on their study SCC is visualized as inventory management, logistics, etc. Inventory management includes deciding on reorder point, order quantity, ordering time and so on. Logistics comprises the processes of effectively and efficiently planning, implementing, and controlling the flows of materials, services, and related information through SC.

On the other hand, coordination problems at the interfaces of SC can be summarized as production-distribution coordination, procurement-production coordination, inventory-distribution coordination, and production-inventory coordination (Arshinder et al., 2008).

In production-distribution coordination problems there is a tradeoff between production which can be considered as manufacturing the products and distribution which can be defined as moving goods towards further steps through the SC to the final consumer. Coordinating these two main functions may result saving in SC costs because of reducing inventory and stock-out, balancing production and transportation lots, and the economies of scale of production and/or transportation.

In procurement-production coordination problems there is a tradeoff between suppliers which usually expect manufacturers to be committed to purchase large amounts of product in constant volume with flexible delivery times on one hand and manufacturers which want timely supply in small lots as a result of varying demand on the other hand.