

# Demand Information Sharing for an Efficient Collaborative Supply Chain Planning

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## **ABSTRACT**

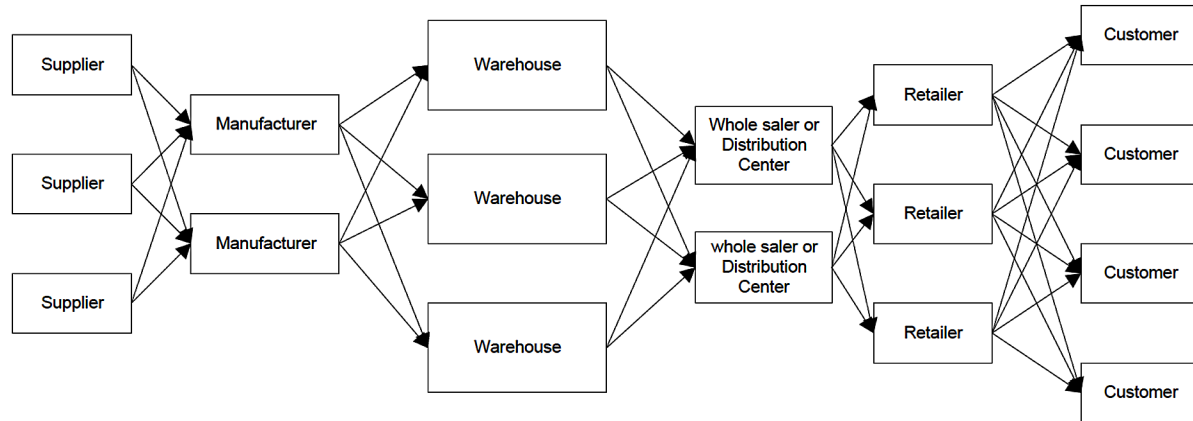
*Nowadays, many consumer goods manufacturers and retailers have understood the need to work together in order to elevate their performance. Such mutual cooperation, focusing beyond day-to-day business and transforming from a contract-based relationship to a value-based relationship is well received in the industries. Also, coupling information sharing in their collaborative setup is valued as an effective forward step. Moreover, advent of technologies naturally supports information sharing across the supply chain. As meeting consumers demand is the main aspect of supply chain, studying supply chain behavior with demand as a shared information makes it more beneficial. The chapter shall analyze demand information sharing in a two-stage supply chain with the performance measure being total cost in terms of profit. In order to quantify and understand better, the different levels of collaboration and their impact on the performance measure are analyzed using discrete event simulation. Arena software is used to simulate the required inventory control scenarios.*

## **1. INTRODUCTION**

### **1.1 Background**

Most organization in order to stay competitive in the market, are gradually understanding the need to focus towards collaborating their different supply chain entities. Consistent higher profits and end customer satisfactions are the key driving factor to work towards an efficient supply chain and a collaborated supply chain is found to be an undeniable solution towards it (Srivathsan & Kamath, 2018). Among the many framework and strategies available for collaboration, Information Sharing within the supply chain is found to have reaped considerable benefits. Advent of technology like electronic data

*Figure 1. A typical supply chain (Source: Chang and Makatsoris, 2001)*



interchange (EDI) has aided this concept naturally and mutually the supply chain members find it fruitful when integrated together. When it comes to collaborative techniques, organizations look to adopt tools like collaborative planning, forecasting and replenishment (CPFR), just in time purchasing (JIT) and vendor managed inventory (VMI) (Park et al., 2010). Once the collaboration strategy is identified the right information that could be shared up the stream is evaluated, as the need is to bring down on any risk and uncertainty faced so that profit and customer satisfaction could be expanded. When it comes to Information Sharing there are many information's that is beneficial when shared across the chain, but this chapter finds demand to be the most significant one among all the other information of share and it studies on how the profit enhances when demand as an information is shared.

Simulation is about replicating the real-world events over time. Simulation models have supported to understand the processes in many domains like healthcare, aeronautical, etc. and supply chain system is one among it (Rossetti, 2010). An inventory management in a supply chain system being a very complex process with the stochastic demand from consumers, and which follows more of either a discrete or a continuous distribution makes it an ideal entity to be evaluated via simulation. There are various classifications of simulations but a stochastic consumer demand in supply chain could be well studied in Discrete Event Simulation. Also, Arena being a popular simulating tool, is identified and used for modeling the supply chain collaboration models.

## **1.2 Problem Statement**

According to (Chang and Makatsoris, 2001) the phrase Supply Chain Management phrase came up in the early 1990's and it was a process of integrating the supply chain members so that the goods are produced in the right amount, at the right place, at the right timed while in parallel satisfying the customer and keeping the cost to the minimum. The authors have represented a typical supply chain as per Figure 1. It consists of the various organizations involved from the supplier to the customer (Chang and Makatsoris, 2001).

(Nishat et al, 2006) suggest that a traditional supply chain system does not focus on waste elimination. They further share that traditional supply system meet uncertainties in its information or material flow by means of buffer goods which is met at higher costs and are very

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