



Supply Chain Management

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ABSTRACT

Supply chain management (SCM) is the management of a network of interconnected businesses involved in the ultimate provision of product and service packages required by end customers. This article focuses on the evolution of supply chain management and the developments in supply chain management since its evolution. It also focuses on the three concepts to be used in supply chain management which are Efficient Consumer Response (ECR), Vendor Managed Inventory (VMI), and Collaborative Planning, Forecasting and Replenishment (CPFR).

KEYWORDS : supply chain management , Efficient Consumer Response (ECR), Vendor Managed Inventory (VMI), and Collaborative Planning, Forecasting , Replenishment (CPFR).

Introduction

Supply chain management (SCM) is the management of a network of interconnected businesses involved in the ultimate provision of product and service packages required by end customers (Harland, 1996). Supply Chain Management spans all movement and storage of raw materials, work-in-process inventory, and finished goods from point of origin to point of consumption (supply chain).

Another definition is provided by the APICS Dictionary when it defines SCM as the “design, planning, execution, control, and monitoring of supply chain activities with the objective of creating net value, building a competitive infrastructure, leveraging worldwide logistics, synchronizing supply with demand, and measuring performance globally.”

Evolution of Supply Chain Management

Six major movements can be observed in the evolution of supply chain management studies: Creation, Integration, and Globalization (Lavassani et al., 2008a), Specialization Phases One and Two, and SCM 2.0.

1. Creation Era

The term supply chain management was first coined by a U.S. industry consultant in the early 1980s. However, the concept of a supply chain in management was of great importance long before, in the early 20th century, especially with the creation of the assembly line. The characteristics of this era of supply chain management include the need for large-scale changes, re-engineering, downsizing driven by cost reduction programs, and widespread attention to the Japanese practice of management.

2. Integration Era

This era of supply chain management studies was highlighted with the development of Electronic Data Interchange (EDI) systems in the 1960s and developed through the 1990s by the introduction of Enterprise Resource Planning (ERP) systems. This era has continued to develop into the 21st century with the expansion of internet-based collaborative systems.

3. Globalization Era

The third movement of supply chain management development, the globalization era, can be characterized by the attention given to global systems of supplier relationships and the expansion of supply chains over national boundaries and into other continents. Although the use of global sources in the supply chain of organizations can be traced back several decades (e.g., in the oil industry), it was not until the late 1980s that a considerable number of organizations started to integrate global sources into their core business.

4. Specialization Era—Phase One: Outsourced Manufacturing and Distribution

In the 1990s industries began to focus on “core competencies” and adopted a specialization model. Companies abandoned vertical integration, sold off non-core operations, and outsourced those functions

to other companies. This changed management requirements by extending the supply chain well beyond company walls and distributing management across specialized supply chain partnerships.

This transition also re-focused the fundamental perspectives of each respective organization. OEMs became brand owners that needed deep visibility into their supply base. They had to control the entire supply chain from above instead of from within. Contract manufacturers had to manage bills of material with different part numbering schemes from multiple OEMs and support customer requests for work-in-process visibility and vendor-managed inventory (VMI).

5. Specialization Era—Phase Two: Supply Chain Management as a Service

Specialization within the supply chain began in the 1980s with the inception of transportation brokerages, warehouse management, and non-asset-based carriers and has matured beyond transportation and logistics into aspects of supply planning, collaboration, execution and performance management.

The scope of Supply Chain Management

In this section, the development of the functional and organisational scope of SCM is described and it is concluded where the SCM literature stands today concerning these issues.

Logistics business concepts based on the SCM

Since the expression SCM was founded in the early 1980s, several approaches and concepts have been applied to realise the main idea behind SCM.

The three concepts to be presented below are Efficient Consumer Response (ECR), Vendor Managed Inventory (VMI), and Collaborative Planning, Forecasting and Replenishment (CPFR).

ECR was chosen due to its widespread use in companies and since it is considered to be a foundation for many other collaborative concepts (www.cpfr.org). VMI is perhaps the most common and famous collaborative concept and has been applied in many different types of industries over the last twenty years. VMI is also representative for a number of other similar concepts such as Automatic Replenishment Programs (Sabath et al., 2001), and Co-Managed Inventory (www.cpfr.org). Finally, the concept CPFR was chosen because of the attention it has received in recent years. This is considered to be the latest concept following in the footsteps of ECR and VMI and its importance is expected to increase over the next few years (www.cpfr.org).

Efficient Consumer Response, ECR

In the 1980s and beginning of 1990s the grocery industry in the United States was characterized by distrust between trading partners and arms length agreements. This “war” in the industry led to a loss of productivity and market shares (Alvarado and Kotzab 2001). At that moment, the grocery industry started to look at other industries and was inspired by the garment industry and their concept of QR (Hoffman and Mehra, 2000; Kurt Salmon Associates, 1993; Schary and

Skoett-Larsen, 2001), which can be considered as a precursor to ECR, although less comprehensive and more focused on bar coding and the technology base of Electronic Data Interchange, EDI (www.cpfir.org). In 1992, 14 trade association sponsors in the grocery industry in the United States created a group called Efficient Consumer Response Movement whose purpose was to change the business climate considerably. The ECR Movement hired the consultant firm Kurt Salmon Associates to investigate how to optimise the business practice for

the management of the supply chain. (Barratt and Oliveira, 2001) The report from Kurt Salmon Associates was presented in 1993 and can be seen as the foundation document for ECR. In the report ECR is defined as "a grocery-industry strategy in which distributors and suppliers are working closely together to bring better value to the grocery consumer (Kurt Salmon Associates, 1993, p. 1).

Vendor Managed Inventory, VMI

The need for more concrete results forced the grocery industry to go from the strategies in ECR to developing concepts to implement them. One of the most commonly mentioned outcomes from ECR which is more of a concept ready to implement, is VMI (Sabath et al., 2001). Even if VMI existed before 1992 when the ECR Movement was founded, ECR can be seen as the driving force behind the spread of VMI (Barratt and Oliveira, 2001; Cooke, 1998; Schary and Skjoett-Larsen, 2001). Probably one of the most common examples of a fully implemented VMI is the one between Procter & Gamble and Wal-Mart in the USA. This project was considered to be very successful and is one of the explanations for the spread of VMI in the grocery industry.

Nowadays, VMI is well established in many industries and is especially successful in the

automotive industry. (Cooke, 1998; Sabath et al., 2001) Since VMI has been adopted by many industries and among many types of companies (both suppliers, manufacturers as well as retailers can be involved in VMI collaborations), the understanding of the concept differs. However, the main idea is the same in all VMI collaborations; the normal order procedure from customer to supplier (vendor) is omitted and the vendor automatically replenishes the customer's inventory. The source of information that is the basis for the replenishment decision (instead of a purchase order) varies. According to Waller et al. (1999) the inventory level at the customer's warehouse is the information source. However, other possibilities or other complementary sources also exist, e.g. point of sales data transferred from the customer.

Collaborative Planning, Forecasting and Replenishment, CPFR

The grocery industry realised the problems with VMI and other concepts with similar structures and in 1995 Wal-Mart along with its supplier Warner-Lambert and the IT companies SAP and Manugistics, and the consulting firm Benchmarking Partners, started up a new way to collaborate in the supply chain. (Småros 2003) This concept, first called CFAR, was later named Collaborative Planning, Forecasting and Replenishment (CPFR). The CFAR project was successful and soon the association Voluntary Inter industry Commerce Standards Association (VICS), was given the responsibility to develop the concept further.

CPFR has a more comprehensive approach than earlier concepts, and includes planning, forecasting and replenishment processes (Skjoett-Larsen et al., 2003)

. As an example of what CPFR means, Lee (2000) describes the CPFR collaboration between Wal-Mart and Warner-Lambert very well: "Knowledge exchange is the basis for Wal-Mart's collaboration with Warner-Lambert (now part of Pfizer) on the forecasting and replenishment of pharmaceuticals and health-care products. Retailers such as Wal-Mart usually have the best knowledge of local consumer preferences through their interactions with customers and their possession of point of sale (POS) data. Pharmaceutical companies know about the properties of the drugs they produce and can make use of external data, such as weather forecasts, to help project demand patterns. Both parties contribute their respective knowledge and collaborate closely to determine the right replenishment plan." (Lee, 2000, p. 4) Barratt and Oliveira (2001) list some of the issues CPFR addresses in order to "cover the gaps

left by previous business practices (such as VMI). With CPFR, several issues are more fully addressed for the first time, such as:

1. □The influence of promotions in the creation of the sales forecast (and its influence on inventory management policy)
2. The influence of changing demand patterns in the creation of the sales forecast (and its influence on inventory management policy)
3. □The common practice of holding high inventory levels to guarantee product availability on the shelves
4. The lack of co-ordination between the store, the purchasing process and logistics planning for retailers

Conclusion

Supply Chain Management spans all movement and storage of raw materials, work-in-process inventory, and finished goods from point of origin to point of consumption (supply chain). This era of supply chain management studies was highlighted with the development of Electronic Data Interchange (EDI) systems in the 1960s and developed through the 1990s by the introduction of Enterprise Resource Planning (ERP) systems. OEMs became brand owners that needed deep visibility into their supply base. Specialization within the supply chain began in the 1980s with the inception of transportation brokerages, warehouse management, and non-asset-based carriers). Over the years SCM has become a very popular research area in many different disciplines. Later in 1992, 14 trade association sponsors in the grocery industry in the United States created a group called Efficient Consumer Response Movement whose purpose was to change the business climate considerably. Several approaches and concepts have been applied to realize the main idea behind SCM. The three concepts to be are Efficient Consumer Response (ECR), Vendor Managed Inventory (VMI), and Collaborative Planning, Forecasting and Replenishment (CPFR). The three concepts represent three different opportunities for handling the responsibility for planning of activities involved in the collaboration. Information sharing among the supply chain members is an important prerequisite for collaboration and has a great impact on the performance in the supply chain.

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