
THE STUDY OF SUPPLY CHAIN OPERATIONAL REFERENCE (SCOR) MODEL

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Abstract: *In today's business world the Supply Chain Management (SCM) plays the key role in all the parts of business for satisfy the demand and supply of customer. The aim of every supply chain should be to maximize the overall value generated. In this increasing competition and fast changes in markets has put supply chains in pressure. Thus in order to help organizations to overcome this pressure, supply chain council has suggested Supply Chain Operations Reference (SCOR) model. This is a step by step procedure which provides a unique framework consisting of five processes (plan, source, make, deliver and return) with process type, processes categories and decompose processes as three levels which help in implementing it in an organization, leading to path of improvement.*

This paper describes the evolution of various definitions of supply chain and SCOR Model. Supply Chain Management basically looks into the interrelationship and inter- linkages between various functions, processes and chain members and analyses the impact of their interaction on value additions and profit maximization as well as Supply Chain Operations Reference (SCOR) model through the literature review and the paper ends with a conclusion.

Keywords: *Supply Chain Management, Evolution of Supply Chain Management SCOR Model, Supply Chain.*

INTRODUCTION

A supply chain consists of all parties involved, directly or indirectly, in fulfilling a customer request. The Big umbrella supply chain includes the manufacturer and suppliers, along with transporters, warehouses, retailers, and even customers.

Within each organization, such as a manufacturer, the supply chain includes all functions involved in receiving and filling a customer request. Today's supply chain is cable to handle a new product development, marketing, operations, distribution, finance, and customer service.

According to Christopher (1994) a supply chain is "network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produces value in the form of products and services in the hands of the ultimate customer."

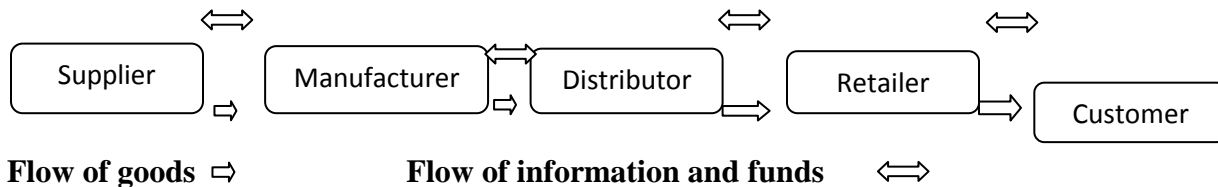


Fig. The Basic Supply Chain Block Diagram (Sunil Chopra & Meindl ,2001)

The customers are the core of the chain, as the prime purpose of the existence of any supply chain is to satisfy customer needs, in the process generating profit for itself (Chopra and Meindl, 2001).As per Sunil Chopra and Meindl (2001), "Supply Chain Management engages the management of flows between and among stages in supply chain to minimize total cost.

OBJECTIVES

1. Define the SCM and the study of evolution of SCM.
2. To understand the Supply Chain Operational Reference (SCOR) model.

RESEARCH METHODOLOGY

The literature review method is used .A literature review of research articles that specifically focusing in SCM, its evaluation and SCOR model. Various research papers from databases like Pro-quest, Emerald, Science Direct and EBSCO were identified and referred to. Within these databases, various journals such as International Journal of Logistics Management, International Journal of Information Management, International Journal of Physical Distribution and Logistics Management, Journal of Operations Management, Supply Chain Management: An International Journal, International Journal of Operations and Production Management etc. were referred.

First section of this paper, evolution of SCM evolved Secondary data sources, particularly online databases, books, journals, conference papers, etc. Second section of paper focusing on the analysis of literature, past theoretical frameworks.

Definitions of SCM

American Production and Inventory Control Society (APICS, 1990) define the supply chain as the processes from the initial raw materials to final consumption of the finished products linking across supplier-user industries. The supply chain contains the all functions inside and exterior of an industry, which facilitate the value chain to make products and provide services to customers (Inman, 1992). Some researchers suggested a clearer SCM definition by adding the information system necessary to monitor all of the activities (Lee, 2002; Morgan, 1995; Talluri, 2002).

The Council of SCM Professionals (CSCMP), which is the premier organization of supply chain practitioners, researchers, and academicians, has defined SCM as: “SCM encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all Logistics Management activities. Notably, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, SCM integrates supply and demand management within and across companies” (Ballou, 2007).

Scott and Westbrook (1991) described SCM as the chain linking each element of the manufacturing and supply process from raw materials to the end user. This management philosophy focused on how firms utilized their suppliers' processes, technology, information, and capability to enhance competitive advantage (Farley, 1997), and the harmonization of the manufacturing, materials, logistics, distribution and transportation functions within an organization (Lee and Billington, 1992).

Supply Chain Management can be broadly classified into following three types:

i. Operational : This is concerned with the routine activities of a facility to ensure that the more profitable way to fulfill customer order is executed examples are actions taken in course of placing and filling orders.

ii. Design: Design mainly focus on decision making regarding facility role, facility location, capacity allocation, market and network.

iii. Strategic: Strategic refers to what each process or function will try to do particularly well. These are decisions at the strategic level by business managers taken by understanding the dynamics of supply chain and development and their evolving objectives. Strategic planning is needed in order to challenge existing arrangements and to generate radical alternatives [4].

PROCESS VIEWS OF A SUPPLY CHAIN

A SC is a sequence of processes and flows that take place inside and between different stages and come together to fill a customer need for a product. Cycle and Push /Pull view are two ways to view the processes performed in a supply chain.

1. Cycle View: The processes in a supply chain are separated into a sequence of cycles, each performed at the interface between two consecutive stages of a supply chain.

2. Push/Pull View: The processes in a supply chain are divided into two categories depending on whether they are executed in response to a customer order or in anticipation of customer orders. Pull processes are driven by a customer order, whereas push processes are driven and performed in anticipation of customer orders.

SUPPLY CHAIN OPERATIONS REFERENCE (SCOR) MODEL OF SUPPLY CHAIN COUNCIL

SCOR modeling is referred today as the most popular methodology to analyze the Supply Chain Management (SCM) performance. The SCOR model is developed by Supply Chain Council in 1996 by Pittiglio Rabin Todd & McGrath and AMR Research. According to Supply Chain Council (SCC) supply chain is managing supply and demand, sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order administration, distribution across all channels, and delivery to the customer. Hence in order to fulfill very need of evaluating and performance improvement, SCC as a not-for-profit organization, has developed supply chain operations reference (SCOR) model. It can be used to explain supply chains that are very simple or very composite using a general set of definitions and enabling a common understanding. It lets companies quickly determine and compare the performance of supply chain and related operations within their company or against other companies.

SCOR is the set standard industry methods reference model which dramatically enhances supply chain operations. It contains a standard description of management processes, a framework of relationships among the standard processes, standard metrics to measure process performance, management practices that produce best-in-class performance, and a standard alignment to software features and functionality. SCOR model generally takes care of business problems through a standardized language, standardized metrics, and common business practices which speed up business change and to get better performance.

Scope of SCOR

The SCOR-model has been developed to describe the business activities associated with all phases of satisfying a customer's demand. The SCOR model constitute with several sections and is organized around the six chief management processes of Plan, Source,



Figure 4: SCOR model scope and structure

Make, Deliver, Return and Enable (shown in Figure 1). By describing supply chains using these process building blocks, the model can be used to describe supply chains that are very simple or very complex using a common set of definitions. As a result, disparate industries can be linked to describe the depth and breadth of virtually any supply chain. The SCOR model helps to successfully describe and provide a foundation for supply chain enhancement for global projects as well as site-specific projects.

FRAMEWORK OF REFERENCE MODEL

Process reference models integrate the well known concepts of business process reengineering, benchmarking and process measurement into a cross functional framework.

The Supply Chain Operations Reference (SCOR) model isolates important supply chain management processes and matches their process elements against industry specific best practices, benchmarking performance data and appropriate software applications, providing users with a framework for understanding where they need to make improvements.

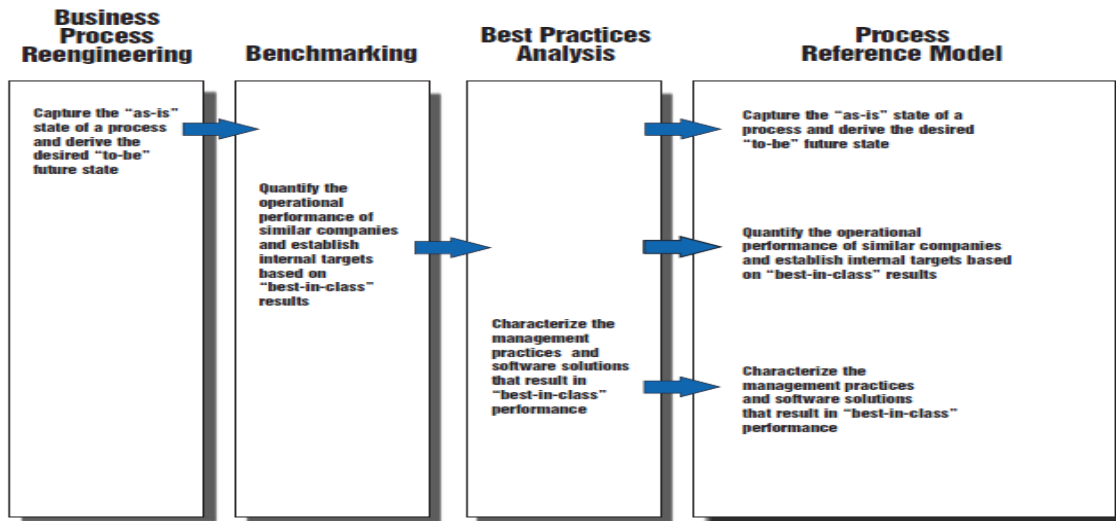


Figure 5: Process reference model

- Capture the "as-is" state of process and derive the desired "to-be" future state
- Quantify the operational performance of similar companies and establish internal targets based on "best-in-class" results.
- Characteristics the management practices and software solutions that results in "best-in-class" performance.

Process model provides companies with powerful tool in improving supply chain operations. It allows manufacturers, suppliers, distributors, and retailers with a framework to :

- Evaluate their own processes effectively
- Compare their performance with other companies both internal and outside their industry segment;
- Pursue specific competitive advantages;
- Use benchmarking and best practice information to priorities their activities;
- Quantify the benefits of implementing change;
- Identify software tools best suited their specific process requirements.

Business problems commonly addressed by SCOR are:

i. Business Management Challenges:

Strategy Development - identify, instrument, and deploy supply chain strategies within and across organizations *Merger, Acquisition or Divestiture* - merge or split up functioning supply chains to achieve merge, acquisition, or divestiture operational goals

Supply optimization and Re-engineering - improving individual, clusters, or networks of supply chains *Standardization, Streamlining* - improve operational control and cost by standardizing core processes

Management alignment - create standardizes management tools, reporting, and organizational structures *New business start-up (company and supply chain start-ups)* - create and deploy supply chains

Benchmarking - competitive assessment of qualitative and quantitative performance

Process Outsourcing - identifying and outsourcing non-value add processes.

ii. Technology Services

Software implementation (ERP, PLM, QC) - Pre-implementation definition and optimization of supply chains.

Workflow & Service Oriented Architecture - optimization of IT service provisioning.

iii. Evolving:

Skills development - standardization of skills definition, sourcing, and performance criteria

The SCOR reference model consists of 4 major sections:

1. Performance: Set metrics to describe process performance and describe strategic goals
2. Processes: set descriptions of management processes and process relationships
3. Practices: Management practices that produce significant better process performance
4. People: Standard definitions for skills required to perform supply chain processes.

1. Performance

Performance Attributes and Metrics are the part of performance section of Supply Chain Operational Reference model

A performance attribute is alliance of metrics used to convey a strategy. An attribute itself cannot be measured; it is used to set strategic direction.

Performance attributes are Reliability, Responsiveness, Agility, Cost and Asset Management Efficiency.

Reliability, Responsiveness, Agility are the considered as customer focused and Cost and Asset Management Efficiency are considered internal focused.

Metrics

A metric is a set for measurement of the performance of a process. SCOR metrics are diagnostic metrics.

SCOR recognizes three levels of predefined metrics:

- **Level 1** metrics are diagnostics for the on the whole health of the supply chain.

Level 1 consist of strategic metrics and key performance indicators (KPIs).

- **Level 2** metrics serve as diagnostics for the level 1 metrics. The diagnostic

Association helps to identify the root cause or causes of a performance gap for a level 1 metric.

- **Level 3** metrics serve as diagnostics for level 2 metrics.

2. Processes

The Process part in SCOR provides a set of pre-defined descriptions for activities most companies perform to effectively execute their supply chains. Plan, Source, Make, Deliver, Return and Enable are the six macro-level Supply Chain Operation Reference process renowned and broadly adopted.

3. Practices

The practices section, previously known as 'best practices', gives a collection of industry-neutral practices companies have recognized for their value. A practice is a unique way to configure a process or a set of processes. The commonness can be related to the automation of the process, a technology applied in the process, special skills applied to the process, a unique series for performing the process, or a unique technique for distributing and linking processes between organizations.

4. People

The People part of SCOR was introduced in Version SCOR 11 and provides a standard for describing skills required to perform tasks and manage processes. Generally these skills are supply chain specific. Some skills identified may be applicable exterior the supply chain process area.

Skills are described by a set definition and connection to other People aspects: Aptitudes, Experiences, Trainings and Competency level. Competency level is not included in the framework descriptions.

SCOR recognizes 5 commonly accepted competency levels:

- **Novice:** untaught learner, no know-how, requires and follows detailed Documentation
- **Beginner:** Performs the work, with limited situational perception.
- **Competent:** Understands the work and can determine priorities to reach goals.

- **Proficient:** Oversees all aspects of the work and can prioritize based on situational aspects.
- **Expert:** Intuitive understanding. Experts can apply experience patterns to new situations.

These competency levels are used similarly as process or practice maturity levels. The person or job specification is evaluated on the found (person) or desired (job specification) level of competency.

CONCLUSION

The SCOR model is a commanding tool of investigation to support the definition of competitive strategies for one company.

Advantages that an effective SCM would contribute to a company could be:

- Better management of inventories, which is translated in reduction of costs. If the suppliers can accede on line to the information of the stores and to the needs of production, it is possible to optimize the management of stocks and avoid collapses in the production.
- SCOR Model connect to clients for support by a better communications infrastructure, which lets efficient flows of information that allow a better answer to the new requirements of the market. – SCOR models helps in Strategic integration with the suppliers, enabling channels of feedback, sharing information and risks of the supply.
- Advancement in the administration of supply faults along the chain. Building an organized, efficient and solid productive block, will be facilitated by model ,which will be very well valued in the market and mainly by the clients.

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