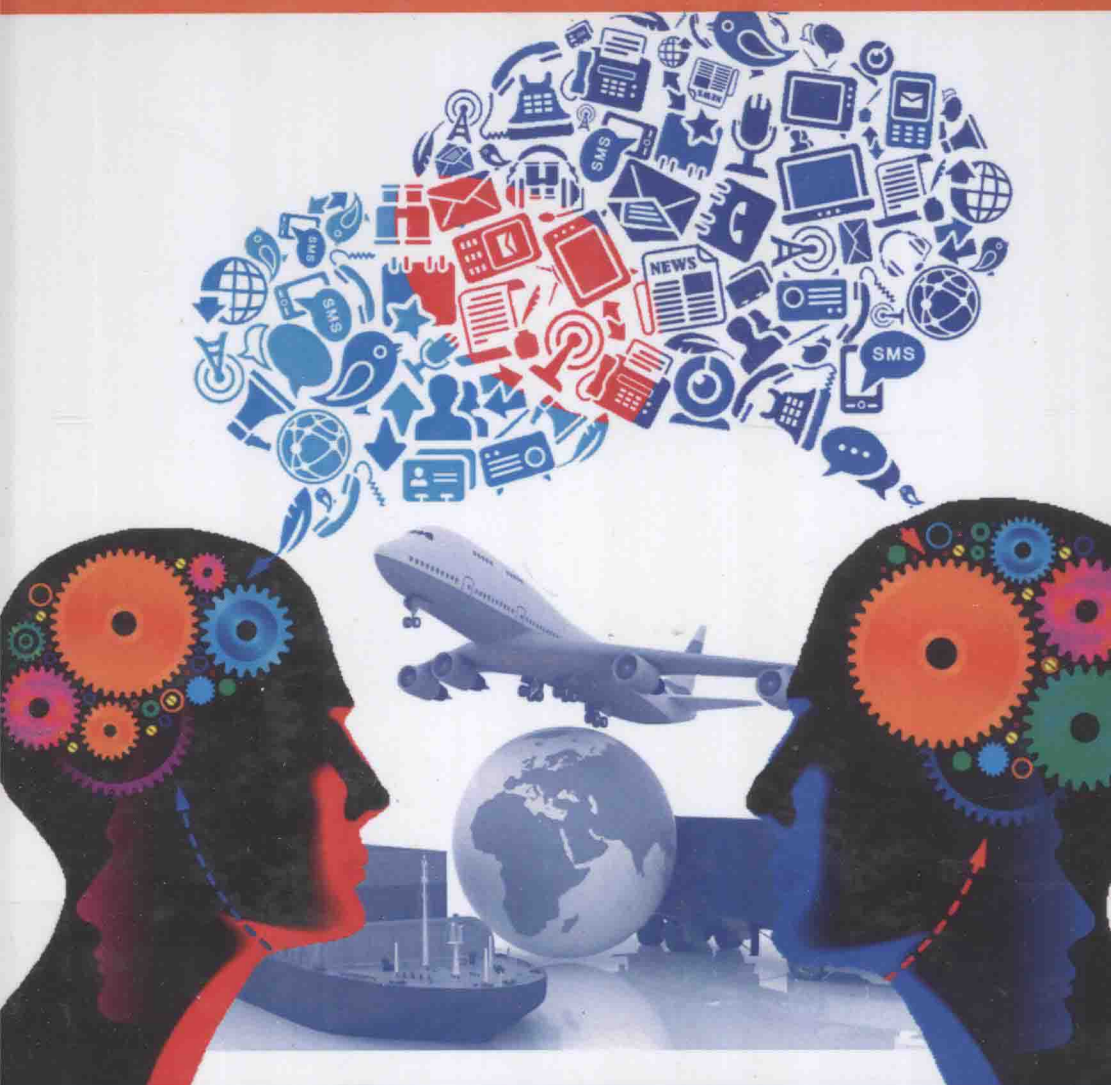


# GLOBAL COMPETITIVENESS IN SUPPLY CHAIN MANAGEMENT



**BALDEV SINGH CHHIKARA**

# Global Competitiveness in Supply Chain Management

Baldev Singh Chhikara



**RANDOM PUBLICATIONS**  
NEW DELHI (INDIA)

## **Global Competitiveness in Supply Chain Management**

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ISBN 978-93-5111-660-8

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Published in 2015 in India by

**RANDOM PUBLICATIONS**

4376-A/4B, Gali Murari Lal, Ansari Road

New Delhi-110 002

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*Type Setting by : Friends Media, Delhi-110089*

*Digitally Printed at : Replika Press Pvt. Ltd.*

# **Global Competitiveness in Supply Chain Management**

# Preface

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A Supply Chain encompasses all activities in fulfilling customer demands and requests. These activities are associated with the flow and transformation of goods from the raw materials stage, through to the end user, as well as the associated information and funds flows. There are four stages in a supply chain: the supply network, the internal supply chain, distribution systems, and the end users. Moving up and down the stages are the four flows: material flow, service flow, information flow and funds flow. E-procurement links the supply network and manufacturing plant, e-distribution links the manufacturing plant and the distribution network, and e-commerce links the distribution network and the end users. The supply chain begins with a need for a computer. In this example, a customer places an order for a Dell computer through the Internet.

With the globalization of the business, the dimensions of business are changing rapidly. With the emergence of competition at global level, the customer is the one who is benefited the most. He has now options, as he can choose, what he would like to buy from various alternatives, and also he can dictate terms. In order to attract customers, companies are introducing products with innovative features. This leads to the products with lower life cycle. The ability of a company to introduce new models at short notice depends heavily on the ability of its suppliers to provide support by way of supply of components at the right time.

As an operations management major, it is my concern to know how supply chain works for making an organization globally competitive. First of all, globalization is a challenge and an opportunity. The options for companies that are experiencing sustainable global competition are to develop workable strategies in supply chain and processes to survive and thrive or die. Moreover, supply chain management is considered as a competitive weapon due to the significant effects that supply chain activities have on all elements of an organizations financial performance, including operating costs, revenue growth, and asset management. By this, we can see that supply chain can really affect any corner of an organization.

This book focuses on concepts, principles and real life experiences which improve understanding of the Supply Chain Management (SCM).

I would like to thank my team for standing beside me throughout my career and writing this book. My special thanks go to "Random Publications" who have published the book.

*– Baldev Singh Chhikara*

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# Supply Chain Management

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## OVERVIEW OF SUPPLY CHAIN MANAGEMENT

A Supply Chain encompasses all activities in fulfilling customer demands and requests. These activities are associated with the flow and transformation of goods from the raw materials stage, through to the end user, as well as the associated information and funds flows.

There are four stages in a supply chain: the supply network, the internal supply chain, distribution systems, and the end users. Moving up and down the stages are the four flows: material flow, service flow, information flow and funds flow.

E-procurement links the supply network and manufacturing plant, e-distribution links the manufacturing plant and the distribution network, and e-commerce links the distribution network and the end users. The supply chain begins with a need for a computer. In this example, a customer places an order for a Dell computer through the Internet.

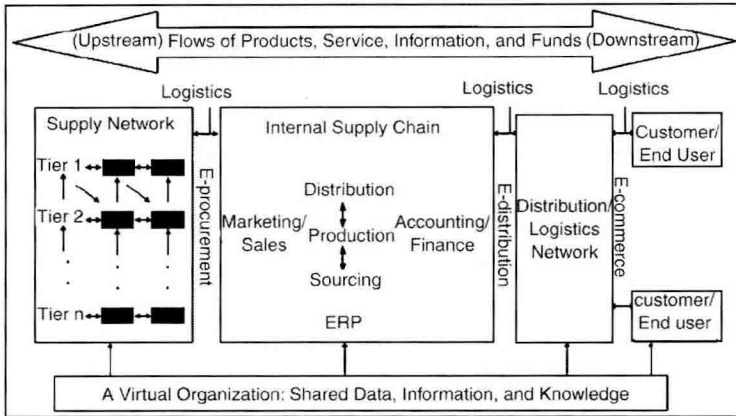
Since Dell does not have distribution centres or distributors, this order triggers the production at Dell's manufacturing centre, which is the next stage in the supply chain. Microprocessors used in the computer may come from AMD and a complementary product like a monitor may come from Sony. Dell receives such parts and components from these suppliers, who belong to the up-stream stage in the supply chain. After completing the order just as to the customer's specification, Dell then sends the computer directly to the users through UPS, a third party logistics provider.

In this supply chain, Dell Computer is the captain of the chain; the company selects suppliers, forges partnerships with other members of the supply chain, fulfills orders from customers and follows up the business transaction with services.

Now, consider a case of purchasing a pack of Perdue chicken breast at Sam's Club. When customers buy trays of chicken breast at Sam's Club, the demand is satisfied from inventory that is stocked in a Sam's Club distribution centre.

Production at a Perdue Farms manufacturing facility is based on forecasted demand using historical sales data. Perdue Farms runs a vertical supply chain starting from the eggs, to the grains that feed chicks proceeding to manufacturing, packaging, and delivery.

Packaging materials come from suppliers. These two different types of supply chain, responsive supply chain and efficient supply chain.



**Fig.** Supply Chain in e-business Environment

Supply Chain Management is a set of synchronized decisions and activities utilized to efficiently integrate suppliers, manufacturers, warehouses, transporters, retailers, and customers so that the right product or service is distributed at the right quantities, to the right locations, and at the right time, in order to minimize system-wide costs while satisfying customer service level requirements. The objective of Supply Chain Management is to achieve sustainable competitive advantage. A company's supply chain in an e-Biz environment can be very complicated. Logistic function facilitates the physical flow of material from the raw material producer to the manufacturer, to the distributor, and finally, to the end user. Sourcing or purchasing of the company is responsible for selecting suppliers, negotiating contracts, formulating purchasing process, and processing order.

Production is responsible for transforming raw materials, parts or components to a product. Distribution is responsible for managing the flow of material and finished goods inventory from the manufacturer to customer. Enterprise Resource Planning systems integrate the entire company's information system, process and store data, cut across functional areas, business units, and product lines to assist managers make business decisions. As an IT infrastructure, ERP influences the way companies manage their daily operations and facilitates the flow of information among all supply chain processes of a firm. For example, a computer manufacturer's supplier network includes all the firms that provide items ranging from such raw materials as plastics,

computer chips, to subassemblies like hard drives and motherboards. A supplier of motherboard, for example, may have its own set of suppliers that provide inputs that are also part of the supply chain. Distribution management involves the management of packaging, storing, and handling of materials at receiving docks, warehouses, and retail outlets. A major part of distribution management is transportation management, which includes the selection, and management of external carriers or internal private fleets of carriers.

E-commerce uses advanced technology to assist business transactions in a web-based environment and facilitates the transaction of information flow and fund flow. E-commerce involves business-to-business transaction such as Covisint, business-to-customer transaction, customer-to-business transaction, and customer-to-customer transaction such as e-Bay auction.

E-commerce is conducted via a variety of electronic media. These electronic media include electronic data interchange, electronic funds transfer, bar codes, fax, automated voice mail, CD-ROM catalogs and a variety of others. E-distribution instructs where to locate the sources of supply and advises how to access them, as well as how to move the materials to the retailers via the Internet or a web-based environment. E-procurement is a part of E-commerce. E-procurement completely revolutionizes a manufacturing or distribution firm's supply chain, making a seamless flow of order fulfillment information from manufacturer to supplier.

*Now we have characterized the nature of supply chain management, we are ready to make a few relevant points:*

- The role of supply chain management is to produce products that conform to customer requirements.
- The objective of supply chain management is to be efficient and cost-effective through collaborative efforts across the entire system.
- The scope of supply chain management encompasses the firm's activities from the strategic level through the tactical and operational levels since it takes into account the efficient integration of suppliers, manufacturers, wholesalers, retailers, and end users.

## **THE CONSUMER GOODS INDUSTRY**

Traditionally, manufacturers were the dominant forces in the supply chain in the consumer goods industry. With the trend towards retail consolidation and the emergence of large retailers, power in the supply chain has been shifting towards the retail level. Whereas manufacturers previously designed, produced, promoted and distributed their products or brands and retailers depended on their leadership, with this power shift, retailers have been able to exert pressure back into the supply chain. They have forced manufacturers to change their supply chain strategies and, for example, include tailored pallet packs, scheduled deliveries, continuous replenishment systems, etc.

The supply chain in the consumer goods industry includes all parties directly or indirectly involved in receiving and fulfilling customer requests, *e.g.* manufacturers, suppliers, wholesalers, retailers, third party service providers (transporters, warehouses) and customers. Supply chains are dynamic and involve the constant flow of products, information and finance between the different stages). The first flow (products and related services) is one of the main elements in supply chain management.

Traditionally, it is the major topic in logistics, because customers expect their orders to be delivered on time, reliably and damage free. Information flows comprise, for example, orders, inventory, demand or sales data. These flows are important for replenishment and (demand) forecasting at all stages of the supply chain. Financial flows include the transfer of funds or cash between the supply chain partners.

## **DEFINE THE SUPPLY CHAIN MANAGEMENT**

Supply chain management is defined as the planning and management of all business activities involved in fulfilling customer requests, such as sourcing, procurement, operations, marketing and logistics management. It not only focuses on processes or functions within one particular company, but also includes coordination and collaboration with other parties in the supply chain.

The main goal of supply chain management is to facilitate the integration of supply and demand management for the purposes of improving the performance of individual companies and the supply chain as a whole. The objective of supply chain management is thus to maximise overall value generated and it focuses strongly on supply chain profitability.

Supply chain management (SCM) is the process of planning, implementing and controlling the operations of the supply chain as efficiently as possible. 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. The definition one American professional association put forward is that Supply Chain Management encompasses the planning and management of all activities involved in sourcing, procurement, conversion, and logistics management activities.

Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, Supply Chain Management integrates supply and demand management within and across companies. More recently, the loosely coupled, self-organizing network of businesses that cooperates to provide product and service offerings has been called the Extended Enterprise. Some experts distinguish Supply Chain Management and logistics, while others consider the terms to be interchangeable. Supply Chain Management can also refer to Supply chain management software which are tools or modules used

in executing supply chain transactions, managing supplier relationships and controlling associated business processes. Supply chain event management (abbreviated as SCEM) is a consideration of all possible occurring events and factors that can cause a disruption in a supply chain. With SCEM possible scenarios can be created and solutions can be planned.

## **PROBLEMS OF SUPPLY CHAIN MANAGEMENT**

Supply chain management must address the following problems: .  
Distribution Network Configuration: Number, location and network missions of suppliers, production facilities, distribution centers, warehouses, cross-docks and customers. Distribution Strategy: Including questions of operating control (centralized, decentralized or shared); delivery scheme (*e.g.*, direct shipment, pool point shipping, Cross docking, DSD (direct store delivery), closed loop shipping); mode of transportation (*e.g.*, motor carrier, including truckload, LTL, parcel; railroad; intermodal, including TOFC and COFC; ocean freight; airfreight); replenishment strategy (*e.g.*, pull, push or hybrid); and transportation control (*e.g.*, owner operated, private carrier, common carrier, contract carrier, or 3PL).

Information: Integration of and other processes through the supply chain to share valuable information, including demand signals, forecasts, inventory, transportation, and potential collaboration etc.

## **INVENTORY MANAGEMENT**

Quantity and location of inventory including raw materials, work-in-process and finished goods. Cash-Flow: Arranging the payment terms and the methodologies for exchanging funds across entities within the supply chain. Supply chain execution is managing and coordinating the movement of materials, information and funds across the supply chain. The flow is bi-directional. Activities/functions Supply chain management is a cross-functional approach to managing the movement of raw materials into an organization, certain aspects of the internal processing of materials into finished goods, and then the movement of finished goods out of the organization towards the end-consumer.

As organizations strive to focus on core competencies and becoming more flexible, they have reduced their ownership of raw materials sources and distribution channels. These functions are increasingly being outsourced to other entities that can perform the activities better or more cost effectively. The effect is to increase the number of organizations involved in satisfying customer demand, while reducing management control of daily logistics operations. Less control and more supply chain partners led to the creation of supply chain management concepts. The purpose of supply chain management is to improve trust and collaboration among supply chain partners, thus improving inventory visibility and improving inventory velocity.

Several models have been proposed for understanding the activities required to manage material movements across organizational and functional boundaries. SCOR is a supply chain management model promoted by the Supply Chain Management Council. Another model is the SCM Model proposed by the Global Supply Chain Forum (GSCF). Supply chain activities can be grouped into strategic, tactical, and operational levels of activities.

### **Strategic**

Strategic network optimization, including the number, location, and size of warehouses, distribution centers and facilities. Strategic partnership with suppliers, distributors, and customers, creating communication channels for critical information and operational improvements such as cross docking, direct shipping, and third party logistics. Product designs coordination, so that new and existing products can be optimally integrated into the supply chain, load management Information Technology infrastructure, to support supply chain operations.

Where-to-make and what-to-make-or-buy decisions Aligning overall organizational strategy with supply strategy. Tactical Sourcing contracts and other purchasing decisions. Production decisions, including contracting, locations, scheduling, and planning process definition. Inventory decisions, including quantity, location, and quality of inventory. Transportation strategy, including frequency, routes, and contracting. Benchmarking of all operations against competitors and implementation of best practices throughout the enterprise.

Milestone payments focus on customer demand. Operational Daily production and distribution planning, including all nodes in the supply chain. Production scheduling for each manufacturing facility in the supply chain (minute by minute). Demand planning and forecasting, coordinating the demand forecast of all customers and sharing the forecast with all suppliers. Sourcing planning, including current inventory and forecast demand, in collaboration with all suppliers. Inbound operations, including transportation from suppliers and receiving inventory. Production operations, including the consumption of materials and flow of finished goods. Outbound operations, including all fulfillment activities and transportation to customers.

Order promising, accounting for all constraints in the supply chain, including all suppliers, manufacturing facilities, distribution centers, and other customers. Supply chain management Organizations increasingly find that they must rely on effective supply chains, or networks, to successfully compete in the global market and networked economy. In Peter Drucker's management's new paradigms, this concept of business relationships extends beyond traditional enterprise boundaries and seeks to organize entire business processes throughout a value chain of multiple companies.

During the past decades, globalization, outsourcing and information technology have enabled many organizations, such as Dell and Hewlett Packard, to successfully operate solid collaborative supply networks in which each specialized business partner focuses on only a few key strategic activities. This inter-organizational supply network can be acknowledged as a new form of organization. However, with the complicated interactions among the players, the network structure fits neither “Market” nor “Hierarchy” categories. It is not clear what kind of performance impacts that different supply network structures could have on firms, and little is known about the coordination conditions and trade offs that may exist among the players.

From a system’s point of view, a complex network structure can be decomposed into individual component firms. Traditionally, companies in a supply network concentrate on the inputs and outputs of the processes, with little concern for the internal management working of other individual players. Therefore, the choice of an internal management control structure is known to impact local firm performance. In the 21st century, there have been a few changes in business environment that have contributed to the development of supply chain networks.

First, as an outcome of globalization and the proliferation of multi-national companies, joint ventures, strategic alliances and business partnerships, there were found to be significant success factors, following the earlier “Just-In-Time”, “Lean Management” and “Agile Manufacturing” practices. Second, technological changes, particularly the dramatic fall in information communication costs, which are a paramount component of transaction costs, have led to changes in coordination among the members of the supply chain network.

Many researchers have recognized these kinds of supply network structures as a new organization form, using terms such as “Keiretsu”, “Extended Enterprise”, “Virtual Corporation”, Global Production Network” and “Next Generation Manufacturing System”.

In general, such a structure can be defined as “a group of semi independent organizations, each with their capabilities, which collaborate in ever changing constellations to serve one or more markets in order to achieve some business goal specific to that collaboration”.

## **DEVELOPMENTS IN SUPPLY CHAIN MANAGEMENT**

Six major movements can be observed in the evolution of supply chain management studies:

- Creation, Integration, and Globalization, Specialization Phases One and Two, and SCM 2.0.
- *Creation Era*: The term supply chain management was first coined by an American industry consultant in the early 1980s. However the

concept of supply chain in management, was of great importance long before in the early 20th century, especially by the creation of the assembly line. The characteristics of this era of supply chain management include the need for large scale changes, reengineering, downsizing driven by cost reduction programmes, and widespread attention to the Japanese practice of management.

- *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. This era of SC evolution is characterized by both increasing value added and cost reduction through integration.
- *Globalization Era:* The third movement of supply chain management development, globalization era, can be characterized by the attention towards global systems of supplier relations and the expansion of supply chain over national boundaries and into other continents. Although the use of global sources in the supply chain of organizations can be traced back to several decades ago (e.g. 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. This era is characterized by the globalization of supply chain management in organizations with the goal of increasing competitive advantage, creating more value added, and reducing costs through global sourcing.
- *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 the four walls and distributing management across specialized supply chain partnerships. This transition also refocused 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). The specialization model creates manufacturing and distribution networks composed of multiple, individual supply chains



specific to products, suppliers, and customers who work together to design, manufacture, distribute, market, sell, and service a product. The set of partners may change according to a given market, region, or channel, resulting in a proliferation of trading partner environments, each with its own unique characteristics and demands.

- *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. At any given moment, market forces could demand changes within suppliers, logistics providers, locations, customers and any number of these specialized participants within supply chain networks. This variability has significant effect on the supply chain infrastructure, from the foundation layers of establishing and managing the electronic communication between the trading partners to the more complex requirements, including the configuration of the processes and work flows that are essential to the management of the network itself. Supply chain specialization enables companies to improve their overall competencies in the same way that outsourced manufacturing and distribution has done; it allows them to focus on their core competencies and assemble networks of best in class domain specific partners to contribute to the overall value chain itself—thus increasing overall performance and efficiency. The ability to quickly obtain and deploy this domain specific supply chain expertise without developing and maintaining an entirely unique and complex competency in house is the leading reason why supply chain specialization is gaining popularity. Outsourced technology hosting for supply chain solutions debuted in the late 1990s and has taken root in transportation and collaboration categories most dominantly. This has progressed from the Application Service Provider (ASP) model from approximately 1998 through 2003 to the On Demand model from approximately 2003-2006 to the Software as a Service (SaaS) model we are currently focused on today.
- *Supply Chain Management 2.0 (SCM 2.0):* Building off of globalization and specialization, SCM 2.0 has been coined to describe both the changes within the supply chain itself as well as the evolution of the processes, methods and tools that manage it in this new “era”. Web 2.0 is defined as a trend in the use of the World Wide Web that is meant to increase creativity, information sharing, and collaboration among users. At its core, the common attribute that Web 2.0 brings is it helps us navigate the vast amount of information available on