CHAPTER 1

INTRODUCTION TO SUPPLY CHAIN MANAGEMENT

1.1 INTRODUCTION

Supply Chain Management (SCM) is a management of a network of interconnected business involved in the ultimate provision of product and service packages required by the end customers. Supply Chain Management spans through the movement and storage of raw materials, work-in-process inventory, and finished goods from point-of-origin to destination. A definition, put forth by an American professional association is that the Supply Chain Management encompasses planning and management of all activities involved in sourcing, procurement, conversion, and logistics management activities. Importantly, it includes also coordination and collaboration with channel partners, which can be suppliers, intermediaters, 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. The steps of supply chain management are shown in Figure 1.1.

![Block Diagram of Supply Chain Management](image)

Figure 1.1 Block Diagram of Supply Chain Management

1.2 COMPONENTS OF SUPPLY CHAIN MANAGEMENT

The SCM components are the third element of a four-squared circulation framework. The level of integration and management of a business
process link is a function of the number and level, ranging from low to high, of components added to the link. Consequently, adding more management components or increasing the level of each component can increase the level of integration of the business process link. The literature on business process reengineering, buyer-supplier relationships and SCM suggests various possible components that must receive managerial attention when managing supply relationships. It identified the components that Plan and control, the Work structure, the Organization structure, the Product flow, the facility structure, the Information flow facility structure, the Management methods, the Power and leadership structure, the Risk and reward structure, the Culture and attitude.

However, a careful examination of the existing literature will lead to a more comprehensive structure of the key critical supply chain components, the “branches” of the previous identified supply chain business processes, that is, what kind of relationship the components may have that are related with suppliers and customers accordingly.

A primary level channel participant is a business that is willing to participate in the inventory ownership responsibility or assume other aspects of financial risk, including primary level components.

A secondary level participant (specialized), is a business that participates in channel relationships by performing essential services for primary participants, including secondary level components, which are in support of primary participants.

Third level channel participants and components are those that will support the primary level channel participants, and those which are the fundamental branches of the secondary level components, may also be included.

Consequently, supply chain components do not lead us to the conclusion about what are the primary or secondary (specialized) level supply chain components. That is, what supply chain components should be viewed as primary or secondary and how these components should be structured in order to have a more comprehensive supply chain structure.
1.3 FUNCTIONS OF SUPPLY CHAIN MANAGEMENT

Supply chain management is a cross-functional approach to manage 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 toward the end-consumer. As organizations strive to focus on core competencies and are 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. Supply chain activities can be grouped into strategic, tactical, and operational levels of activities. The function of the supply chain management is listed below.

**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.

A product design 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 the overall organizational strategy with supply strategy.

**Tactical:** Sourcing contracts and other purchasing decisions. Production decisions, including contracting, scheduling, and planning process, 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.
Operational Level of Activities: 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 in inventory, production including the consumption of materials and flow of finished goods, outbound operations, including all fulfillment activities warehousing and transportation to customers, order promising accounting for all constraints in the supply chain including all suppliers manufacturing facilties distribution centers and other customers, from production level to supply level accounting all transit damage case & arrange to settlement at customer level by maintaining company loss through insurance company.

1.4 SUPPLIER SELECTION METHODS

In the earlier days for selecting suitable supplier manual / calculations has been used (refer Appendix 1). In present days several analytical methods are available as shown in Figure 1.2, summarizes some of analytical method for supplier selection process presented by De Boer et al (2001) and a stream of conceptual studies thereafter including works by Talluri and Narasimhan (2003) and Kumar et al (2004).

According to Figure 1.2, one model can be combined with other techniques in order to improve the quality of the tools, when being used in a supplier selection process. Ghodsypour and Obrien (1998) proposed an integration of an AHP and linear programming to consider both tangible and intangible factors in choosing the best suppliers and giving them optimal order quantities, so that the total purchasing value is maximized. Weber, Current and Desai (2000) combined a multi-objective programming (MOP) and (DEA) method to provide buyers with a tool for negotiating with vendors that were not selected right way, as well as to evaluate potential suppliers.
1.5 ORGANIZATION OF THE THESIS

Chapter 2 gives a detailed account of the survey of Literature in the field of Supply Chain Management, multi criteria decision making models like ANP, AHP and Fuzzy Logic.

Chapter 3 deals with the supplier selection process using Analytical Network process.

Chapter 4 deals with the supplier selection process using Analytical Hierarchy process.

Chapter 5 deals with the supplier selection with fuzzy based model and a sensitivity analysis is carried out for the selected supplier.

Chapter 6 furnishes results and discussions.
Chapter 7 shows the conclusion of the research work.

The main features of this study are shown in the form of a flow chart presented in Figure 1.3.

![Flow Chart of Supplier Selection Process](image)

**Figure 1.3** Flow Chart of Supplier Selection Process

1.6 **BRIEF SUMMARY**

This chapter provides a detailed information about supply chain management, components of supply chain management, functions of supply chain management and supplier selection methods have been discussed. Organization of the thesis has also been provided.