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A STUDY OF SUPPLY CHAIN MANAGEMENT

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ABSTRACT :

The process of planning, implementing and controlling the efficient, cost-effective flow and storage of raw materials, in-process inventory, finished goods and related information from the point of origin to the point of consumption for the purpose of conforming to customer requirements. Successful supply chain management is extremely complex because of large number of players with varying interest or objectives are involved.

KEYWORDS : *Supply, Chain Management, distribution system ……..etc.*

INTRODUCTION :

Supply Chain Management is a network of facilities that produce raw materials, transform them into intermediate goods and then final products, and deliver the products to customers through a distribution system. The management of the supply chain and the roles of various actors involved differ from industry to industry and company to company. As a result Supply Chain Management (SCM) has become a vital issue for manufacturers, professionals and researchers. It is felt that to manage the supply chain effectively entire structure of supply chain must be understood properly. This paper attempts to provide the reader a complete picture of supply chain management through a systematic literature review. It presents main activities of supply chain and the step-by-step approach for understanding a complete picture of supply chain.

Organizations adopt numerous business improvement methodologies to improve the business performance. Manufacturers and researchers have noted a number of problems regarding supply chain activities in their research and practice (Sridharan et al., 2005). It is observed that usually either a system (Integrated approach) or a subcomponent in supply chain (Disintegrated approach) is focused and discussed in the literature but fails to answer the rational (why, what, how) behind supply chain activities (Spens & Bask, 2002). This paper addresses these questions with the help of structured literature review, which not only helps to understand the management of supply chain but also provide the a six step approach to manage the supply chain.

CONTENTS –

Supply Chain Management According to Lambert and Stock [1993], logistics, a widely accepted term by today's professionals, had in the past a variety of names including physical distribution, supply chain management and business logistics.

The Council of Logistics Management defines logistics as: "The process of planning, implementing and controlling the efficient, cost-effective flow and storage of raw materials, in-process

inventory, finished goods and related information from the point of origin to the point of consumption for the purpose of conforming to customer requirements" According to the above definition logistics consists of the following four flows:

Material Flow: Flow of materials from their sources through necessary processes includingtheir storage, retrieval and the delivery of finished products.

Merchandise Flow: Flow'of finished goods from finished good's stores in the distribution channels to the customers.

Money Flow: Flow of money including advances from organizations to suppliers of raw materials, energy, services, etc. and into organizations from the wholesalers, distributors, customers, etc.

Information Flow: Flow of required information from and into the organization through various communication channels in the logistics system.

Since, interruptions in any of the above four flows affect an organization's raw materials supply (purchasing), manufacturing (operations) and marketing (distribution) functions. According to Fawcett and Fawcett [1995], there exists a need to integrate these flows through effective management of infrastructure, materials, technology and people. The typical managerial decision problem that one encounters in real life while dealing with the management of above four flows of the logistics system is summarized in Table 1.1. In this thesis, the concern is with the supply chain management of an oil refinery. More specifically, it is concerned with the decisions on infrastructure facilities and transportation of crude oil to the refinery, and the movement of finished products out of the Refinery.

SUPPLY CHAIN MANAGEMENT PRACTICES

In India approximately 13 percent of the GDP is spent on logistics (Planning Commission report-zooz), whereas this Figure is only 10 percent for developed countries. Supply chain management and logistics are still in the embryonic stage in India. The current lull in the economy is forcing many industries to examine their costs, and cut it down in size. Today excellent logistics management has become essential for success of companies. Logistics function includes the total flow of material, from the acquisition of raw materials to delivery of finished products to the ultimate users. As such, it includes the activities of sourcing and purchasing, conversion including capacity planning, technology selection, operations management, production scheduling, materials planning, distribution planning and management of industry warehouse operations, inventory management, inbound, internal, and outbound transportation; linkage with customer service, sales, reverse logistics, promotion and marketing activities.

Successful supply chain management is extremely complex because of large number of players with varying interest or objectives are involved. Though the supply chain of each company has its own unique features, the following general principles help in management of supply chains.

- Begin with the customer
- Manage logistic assets
- Organize customer management
- Integrate sales and operations planning
- Leverage manufacturing and sourcing
- Focus on strategic alliances and relationship management
- Developcustomer driven performance measures

A significant new trend has been evolving in logistics management in the last decade - one that involves the collaboration of all participants in the supply chain in order to reduce the cost of total logistics system. It has been referred to as "Supply Chain Management", "Logistics Partnership" or "Inter-Corporate Logistics Management". In traditional Logistics "total cost concepts" model, companies worked to manage logistics as an entity and to lower the total logistics costs to the organization.

The model evolved balancing trade-off among production run lengths, inventory, transportation, and warehousing and customer service. Later an increasing number of companies

realized that though the total cost concepts might be useful, it is tainted because it does not consider the efficiency of the entire supply chain. The supply chain management on the other hand involves the active collaboration of two or more participants in the supply channel (Supplier, manufacturer, distributor, and/or customer) to manage all the logistics resources in the most efficient manner possible. The concept of "quick response" gained broad favour as companies in all parts of supply chain developed an appreciation of its potent benefits.

Quick response involves the integration of the supply chain, effectivelylinking retailers, suppliers(manufacturers/ distributors) and carriers in close communication and integrated decision making.

Key elements of quick response includes:

- Point-of-usage data capture
- Hem - level management
- Rapid Communication
- Partnerships
- Discipline and commitment

Effective quick - response systems' benefits include lowering inventories by as much as 40 percent, improving in-stock availability significantly, cutting transaction and administrative costs in to half, reducing replenishment lead to a third or less of their former levels, identifying slow-selling items sooner, and reducing operating costs for all players in the supply chain.

Supply chain management strategy involves determination of what performance criteria the logistics system must maintain - more specifically, the service levels and cost objectives the logistics system must meet. Because cost and service normally involve a trade-off, a company must consciously consider that trade-off and determine the desired supply chain performance. This process involves consideration of the company's strategic objectives, its specific marketing strategy and customer service requirements and its competitors' cost service position.

Supply chain planning involves the development and management of all logistics resources in order to attain the desired cost-service performance consideration, it might include number and location of warehouses, type of warehouses, mode and carrier selection, inventory position, inventory levels, orderentry technologies and information system, and so forth.

Stochastic Optimization of Hindustan Thermal Power Plants and Generation Portfolios Instruments and methods used in financial mathematics are increasingly being used for the valuation and management of power generation portfolios in the energy industry, particularly for the valuation of thermal power plants. Uncertain future developments of the prices for power, gas, coal, and oil, but also power plant outages, have a considerable impact on the value of a plant. Therefore, the valuation of flexibilities as real options in line with market conditions must be based on highly realistic scenario analyses and not only on forecast curves of the relevant future impacts.

This particularly applies if several different generation units and primary energy sources are managed in one portfolio. In this case, the use of a deterministic method without consideration of market price volatility is not sufficient for option valuations and for the optimal management of the generation portfolio. Whereas the real option value of power plants without time integral fuel restrictions and without restrictions on start-ups / shut-downs per year can also be determined using Monte Carlo simulation, optimization models based on scenario trees must be applied to generation capacities which are subject to such restrictions.

For the valuation and optimization of thermal generation portfolios, Decision Trees has developed the stochastic optimization tool HPP. This tool integrates the adequate modeling of future uncertainties with the modeling of all technical, contractual and market-specific features of thermal power plants, fuel storages, supply contracts and energy markets. To generate scenarios, the system uses stochastic processes specifically adapted to the characteristics of energy market prices. In addition to the generation of scenario trees to map uncertain future developments, all technical and contractual

conditions of the portfolio elements, such as, power plants, gas storage facilities, or supply contracts, are modeled in detail.

This includes generation efficiencies in dependence of ambient conditions, minimum operation and standstill times, different start-up and shut-down ramps, or restrictions on the number of start-ups as well as maintenance plans and the consideration of unscheduled outages. HPP offers the option of an integrated stochastic optimization for complex generation portfolios by mapping power plants, district heating networks, supply contracts with complex price formulas, gas storage facilities, power, fuel and CO_2-markets all at once. A joint modeling of assets is required if, for example, joint supply contracts are used, if power plants feed energy into a common district heating network or if they offer power generation capacities to the ancillary services market. In addition to the optimal day-ahead dispatch of generation portfolios, HPP can also be used for long-term portfolio optimization on forward markets. Furthermore, HPP offers the optimization of balancing energy offers.

CONCLUSION –

Supply chain management strategy involves determination of what performance criteria the logistics system must maintain - more specifically, the service levels and cost objectives the logistics system must meet. Because cost and service normally involve a trade-off, a company must consciously consider that trade-off and determine the desired supply chain performance. This process involves consideration of the company's strategic objectives, its specific marketing strategy and customer service requirements and its competitors' cost service position.

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