

# Analyzing Logistics as the Integral Component of Supply Chain Management

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## Abstract

*Supply Chain Management encompasses, planning, design, control and implementation of all business processes related to procurement, manufacturing, distribution and sales order fulfillment functions of a business. All these activities involve multiple networks of vendors and service providers which are integrated and co-coordinated by the Supply Chain Experts of the organization to move raw materials and finished goods from and to all distant locations across the globe. Logistics is the backbone on which Supply Chains are driven. Logistics refers to the management of the flow of goods and supplies involving information, data and documentation between two entities or points. Logistics plays important role in post procurement function of delivery of raw material from the supplier to the point of production and Finished Goods Supply chain management from the point of dispatch from factory to the point of delivery to the customer. The flow of goods flows through a network of transportation by road, rail, air or ship and intermediary warehouses to hold inventories before moving to the forward locations. The entire activity involves multi-tier suppliers, agents, and agencies including freight forwarders, packers, customs department, distributors and Logistics service providers, etc.*

*Keywords: Analyzing Logistics, Integral Component, Supply Chain Management*

## 1.0 INTRODUCTION

If you go to a Supermarket and pick up a few items off the shelf from electronics and white goods or even clothes and look at the labels, the chances are that you will find them having been manufactured in China or Mexico. The coffee pods you buy to use for your everyday use comes from Africa. Computers have been shipped out of South American Factories and Soft furnishings on the shelves are from India and Hong Kong. Global markets are expanding beyond borders and re-defining the way demand and supplies are managed. Global companies are driven by markets across continents. To keep the cost of manufacturing down, they are forced to keep looking to set up production centers where the cost of raw materials and labor is cheap. Sourcing of raw materials and vendors to supply the right quality, quantity and at right price calls for dynamic procurement strategy spanning across countries.

With the above scenario you find companies procuring materials globally from various vendors to supply raw materials to their factories situated in different continents. The finished goods out of these different factory locations then pass through various chains of distribution network involving warehouses, exports to different countries or local markets, distributors, retailers and finally to the end customer. In simple language, managing all of the above activities in tandem to manage demand and supply on a global scale is Supply Chain Management. As per definition SCM is the management of a network of all business processes and activities involving procurement of raw materials, manufacturing and distribution management of Finished Goods. SCM is also called the art of management of providing the Right Product, At the Right Time, Right Place and at the Right Cost to the Customer.

### 1.1 Why SCM strategy is important for an Organization

Supply Chain Strategies are the critical backbone to Business Organizations today. Effective Market coverage, Availability of Products at locations that hold the key to revenue recognition depends upon the effectiveness of Supply Chain Strategy rolled out. Very simply stated, when a product is introduced in the market and advertised, the entire market in the country and all the sales counters need to have the product where the customer can buy and take delivery. Any glitch in the product not being available at the right time can result in the drop in customer interest and demand which can be disastrous.

Transportation network design and management assume importance to support sales and marketing strategy.

Inventory control and inventory visibility are two very critical elements in any operations for these are the cost drivers and directly impact the bottom lines on the balance sheet. Inventory means value and is an asset to the company. Every business has a standard for inventory turnaround that is optimum for the business. Inventory turnaround refers to the number of times the inventory is sold and replaced over a period of twelve months. The health of the inventory turn relates to the health of business. In a global scenario, the finished goods inventory is held at many locations and distribution centers, managed by third parties. A lot of inventory would also be in the pipeline in transportation, besides the inventory with distributors and retail stocking points. Since any loss of inventory anywhere in the supply chain would result in loss of value, effective control of inventory and visibility of inventory gains importance as a key factor of Supply Chain Management function.

## 2.0 INFORMATION TECHNOLOGY

Supply Chain Management is a broad-based function that encompasses all business and operational processes involved in but not limited to Procurement, Manufacturing, and Finished Goods Transportation, warehousing & Distribution and Inventory Management. In a globalized business scenario characterized by Geographically spread markets, raw material procurement sources across the world and cheaper manufacturing and labor markets being available in developing world, the business of meeting demand with supply is constantly changing and evolving. Global business has been fuelled and enabled by the IT Technology which has redefined all aspects of business today. All businesses today are run on ERP - Enterprise Resource Planning which provides the organizations with tools to manage all the functions including procurement, production, sales, and finance management in seamless and integrated manner. These software systems like SAP, Oracle, People soft, etc., have taken over and enhanced the business processes that were traditionally being managed manually.

Demand planning, Forecasting, Global procurement management are some of the enabling tools on which the Global procurement strategies are built and managed. The availability of these sophisticated systems has further enabled companies to implement good and cost effective manufacturing practices like JIT, Kanban, VMI, etc. Finished goods distribution, transportation, and inventory management, besides sales process is again driven by the various ERP modules combined with additional specific applications as required. ERP has enabled companies to manage their business processes in different markets and countries under one common business process thus providing standardization and control. The complex network of various processes, software platforms and applications and different software tools used by various vendors and agents in the entire chain drive the supply chain of the companies.

E commerce has further redefined the way business is carried on. Online purchase has impacted the way supply chains are organized and markets are driven. Customer behavior and preferences are changing as online marketing is establishing a one to one contact with the customer and can offer a personalized experience. The instant delivery of the information through internet elicits immediate response and action from the customer. The sales lead time is rapidly decreasing. The demanding customer, therefore, needs to be serviced immediately at the same speed. The internet technology has further opened up the geographical boundaries for the companies. Any person sitting in any corner of the globe can purchase a product online at the click of a button. The companies have to be well equipped with the logistics and supply chain network to be able to service the customer.

When in a global scenario, goods and services move through multiple chains involving very many agents including transporters, forwarders, customs, distribution centers, distributors and lastly the retail outlets, availability of data, documentation and information becomes the lifeline for the organization to be able to take decisions and ensure seamless processes and control the supply chain.

## 3.0 LOGISTICS OPERATIONS IN SUPPLY CHAIN NETWORK

Logistics has aided and contributed to enabling global trade. Third Party Logistics Service Providers both at global levels and local levels form major partners to manage and offer Supply Chain services and the second major factor being the Internet and IT technology that helps manage information and data ahead of or along with flow of materials and goods.

Supply Chain Consultants and professionals find it very essential to have knowledge of the operational field and how things work on the ground. Theoretical models can be effectively deployed only when realities on the ground are understood and adapted to. Take an example of DELL which has successfully implemented its Supply Chain strategy built around the concept of JIT manufacturing and Direct Marketing. Dell has manufacturing facilities located in Austin-Texas, North Carolina, Miami, Florida that service US Markets. European Markets are serviced from its plants in Ireland and Poland. Asia and other sub-continent are supported by its manufacturing facilities in Penang in Malaysia and Xiamen in China along with the latest factory set up in Chennai in India. South America is serviced from its Eldora do plant while the new plant in Brazil supports the African continent.

One can imagine the complexities involved in designing procurement systems. Dell does not buy raw materials and components and maintains inventory. Dell's vendors use third party service providers to set up logistics parks and distribution warehouses close to Dell's plants and deliver materials just in time to the plant against an order for production that is triggered based on an order confirmed by the customer on the internet. Under procurement logistics, in this case, some logistics service providers play a major part in ensuring smooth operations. Vendors are based out of Europe, Taiwan, China, Singapore, Hong Kong, Korea, and Japan, etc.

Though the raw materials belong to the vendors until the time they are supplied to production shop floor, the design, planning and selection of logistics service provider are initiated and managed by Dell. Dell has appointed freight forwarders such as DHL, CEVA, Panalpina, UPS etc sector wise to pick up shipments from vendor locations, transport the collected shipments by road and consolidate inventories of all providers in the freight forwarders consolidation warehouses situated at the gateways in each country and ship out cargo by ships to the port of destination or airfreight shipments to the plant locations after completing exports and customs clearance formalities on behalf of vendors. While the shipments are in transit, the freight forwarders electronically transfer shipment information and documentations to their overseas offices or agents at the destination and keep Dell and vendors informed of the status of shipments.

Freight forwarders at the destination ports file advance shipment documents with customs and on arrival of cargo, complete customs formalities and custom cleared cargo is then transported to freight forwarders warehouse or customs bonded warehouse or to another designated third party warehouse that houses all inventories meant for Dell. The third party service provider who manages the inventories in his warehouse receives the cargo, unpacks the shipments from bulk skids to individual carton level and completes inbound formalities including updating of inventories in its system and stocks the materials in designated rack locations. Both vendors and Dell are continuously kept informed of the data regarding shipments and stocks. The warehouse stocks inventory in the name of various vendors at SKU level. Most of the times these warehouses are situated adjacent to the plant or at proximity.

Upon receiving a production order from Dell, as per Bill of Material received through DELL ERP system, items are picked up, loaded into the supply cages and trays as per predetermined design and delivered to the plant after completing documentation and system entries to remove inventory from its system held in vendor's name, invoice raised and physical delivery accompanied with documents completes the supply chain cycle of Raw material supply. The revenue recognition happens when the material is transferred out of the warehouse and its system and invoiced to Dell.

### 3.1 Logistics Service Providers keeps Supply Chain Moving

Procurement Logistics, Manufacturing Logistics and Finished Goods Logistics functions are managed by different independent departments in a company. Though the duties of the departments involve common activities like transportation etc., however, the processes and nature of logistics functions are specific to each function besides the requirements and sensitivities of delivery times, schedules, etc. With the emerging trends and availability of third party logistics providers has pushed the companies to adapt the practice of outsourcing all supply chain components and logistics functions termed as noncore functions to their logistics providers. In this topic I shall examine the role and functions of Third Party Service Providers a little closely to understand how they make a difference to the supply chain activities.

Third Party Logistics field is a multi-layer or multi-tier integration of various players who have the niche segment expertise to manage any one or many functions of Logistics. In any Logistics Contract or Supply Chain Network, you will not find one single service provider being able to manage the entire chain of activities. You can have a lead logistics service provider who will further tie up with and manage other service providers to provide a single window service to the client organization. At all levels, a lot of components of logistics get outsourced by these service providers to contractors and local players. Like for example in a contract logistics facility, the third party logistics provider who has secured the contract may not own and operate the facility himself. Labor is often outsourced along with other operations like Loading/ Unloading, Yard Management, Fleet Management, etc.

Logistics further also works with the concept of the 4Party Logistics providers in the market who take up large projects spanning huge volumes and multiple locations and services as the lead service providers. They draw up the operating plans, requirements, and specifications for the services and, in turn, choose the best service provider in each segment or function for each of the locations and thus manage to provide the entire gamut of logistics services to the customer. Normally in Logistics, the lead players front ending the businesses would be the Freight Forwarders, Transport Companies (generally in long haul segment only) and Warehousing Service Providers. In many cases Freight Forwards own and manage warehousing facilities too.

Freight forwarders are those agencies who consolidate the cargo and book the cargo for onward freight using an airline or a shipping line or use ground transportation network including rail services wherever required. Freight forwarders do not own any mode of transportation services. They book the space with airlines and shipping lines and negotiate the freight. They play the key role of providing origin and destination services coupled with single window client services using other third party service providers. Most of them also have in-house customs clearance division to support ground logistics operations. Without the support of the freight forwarders who are multinational companies capable of managing your supply chain with ability to provide services in any country, any location across the globe, supply chain would not be able to function efficiently, for it is impossible for companies to coordinate and manage each leg and every activity in so many locations and manage so many vendors and interfaces.

#### 4.0 INTERNATIONAL LOGISTICS

Supply Chains ride on Logistics Networks and IT Applications / Internet. In this topic a brief introduction to each of the Logistics Function/Industry is attempted. The foundation of logistics function is based mainly on Transportation by Road, Rail, and Air & Sea. Maritime trade has existed since times immemorial. History is replete with the major maritime routes that connected continents across the globe and enabled trade between them. Harbors and waterways have flourished in strategic locations in all countries attracting trade and commerce. Global trade is dependant 80% on sea route than air route, simply for the fact that air route is far more expensive and is used only in case of light weight cargo, perishable cargo, and priority shipments or in other conditions where shipping would not be possible.

Shipping trade is characterized by shipping companies who own vessels and specialize in the transportation of certain types of cargo like General Cargo, Containerized cargo, bulk commodities carriers, oil tankers, gas tankers, OD cargo carriers, etc. Normally the so called mother vessels ply on the main shipping route across the continents traveling through Pacific or Atlantic oceans and calling on countries from point to point. Mother vessels are bigger vessels with higher cargo carrying capacity. Some of the main routes normally traversed by mother vessels are the Far East to Europe and Mediterranean, Europe to America East Coast and the Gulf of Mexico, Far East Australia to South Africa, Intra Asia, Asia to the Middle East, and Europe to South Africa, etc. The schedules in detail are announced in advance for each of the vessels. The feeder vessels carry cargo from individual ports in nearby countries which discharge the cargo at the port of calling to be transshipped on to the main vessel.

Thus for example, a cargo originating in India bound for South Africa may follow the route where cargo reaches one of the ports in Ceylon or Dubai even Singapore in some cases and travels right up to Europe where in is further transshipped on another vessel bound to South Africa. Likewise the global shipping trade lanes have certain gateways and lanes which they operate and in turn are fed and supported by feeder lanes and vessels.

Shipping liner announces schedules of the vessels a few months in advance. Freight forwarding agents book space on the vessels either based on estimates or based on their pipeline orders. Depending upon the volume that the forwarder is able to give and patronize shipping lines, they get to bargain and negotiate for better rates. In general cargo, the shipments are made in FCL Containers. FCL stands for Full Container Load. FCLs come in two sizes called 20 feet and 40 feet containers which refers to the length of the container. Each container has fixed dimension and weight carrying capacity. FCL Containers are provided by shipping lines to the freight forwarders who stuff the cargo and get the cargo sealed after customs inspection which is then picked up and loaded on the ship at the port.

#### 4.1 Freight Forwarding & Logistics Companies in Supply Chain Management

Global Logistics Scene is dominated by a handful of ten to twelve multinational Companies followed by smaller companies altogether numbering below fifty. Entire global trade is facilitated by these service providers. Major players in the field are led by DHL, Kuehne + Nagel, Schenker/BAX, UPS, Geodis, Expeditors, Agility, CEVA Logistics, Hellman worldwide logistics, etc. The last two decades have seen the emergence of multinational companies having acquired and bought out local and smaller players to acquire the multinational status coupled with the global network. The entire logistics field is filled with mergers and acquisitions in quick succession in the recent past.

Most of the logistics players have been traditionally freight forwarders dealing with cargo bookings coupled with origin and destination services. However, as the global business practices changed, and supply chain managements started gaining ground, these companies realized the potential of being able to offer multiple services including ground transportation, warehousing, and contract logistics under one umbrella as the future trend and quickly turned themselves to acquire the required capabilities and have managed to become single window service providers on global scale. In any supply chain, these 3PL Service Providers further outsource certain functions and segments to many other local service providers. Any SCM expert would naturally wonder if it is possible to deal directly with the other service providers and cut out the 3PL Lead provider and thereby save some cost. In a global scenario, this would not be possible for many reasons.

3PL Service Providers can offer you standard operating processes and procedures across all locations and countries. If you are dealing with a 3PL office in Europe and another in Japan besides your local office in Houston for example, all three offices will follow the same methodology, documentation, and processes. Secondly, 3PL providers know the local situations and can adapt international processes to suit local situations better. A principle company may not be able to get into the local situation be it with transportation or customs or legal compliance and is better left to the 3PL to deal with it effectively. By the size of these companies 3PL logistics providers have built core competencies and capabilities in all of the functions namely Freight, Customs Clearance and Contract Logistics and are equipped with cutting edge technology to support international operations and provide visibility to the customers at all time. 3PL companies rely heavily on electronic exchange of data and information in their businesses. Today 3PL companies not only provide highly specialized inventory management and warehousing operations, but they also offer another value adds like Purchase Order Management, Semi, and Light Manufacturing, other value added services designed for niche segments called as Integrated Logistics Services.

3PL service providers are today investing in building distribution networks and facilities to cater to the client's requirements wherever required. They are building in-house capabilities with employing SCM Experts to specialize in Automotive Logistics, Aero Spares, Medical & Environmental Logistics and other specific segments. SCM strategy of the company today aims at converting logistics cost to transactional cost and thus avoids any investments into managing Supply Chain. It would not be possible for a principal company to invest in setting up and managing logistics services and facilities in origin and destination locations for its Supply Chain and manage local regulations etc. It is best left to the best Service Provider as the partner and leverage on his competencies and skill sets as is being done today.

#### 5.0 CONCLUSION

Logistics therefore is an integral component of Supply Chain Management. Origin of Logistics as a recognized discipline is attributed to military and defense organizations. Defense departments make use of detailed and extensive planning to gather supplies and move men and materials to various locations



and bases. The success of any military exercise depends upon the ability of the establishment to be able to gather information, analyze, assimilate and take appropriate logistical measures to support their units continuously. Similarly, in any business organization, the successful operations depend upon visibility and control over the logistics process managed through and with excellent logistics service provider backbone and network.

In many cases Supply chain is often referred to as Logistics and vice e versa. Though logistics and supply chain are intricately linked, both do not mean the same. Logistics is a sub-component and extension of Supply Chain. Supply chain design in an organization would detail, plan and strategize the procurement strategy, manufacturing location selection, design and develop distribution network and strategy for finished goods, etc. While logistics planning would deal with the details of procurement logistics, finished goods distribution, sales order fulfillment, and inventory management, etc. Logistics planning drives the strategic direction and framework for its design planning from SCM Strategy.

Take the case of production procurement, SCM strategy will define the process, selection of vendors, procurement strategy and the mode of order fulfillment coupled with cycle time and lead time to supply to the production floor. Logistics in this case details out the mode of transportation from the vendor, the consignment planning, process for order trigger, consolidation of shipments, detailing transportation modes and vendors, defines transit times, documentation process and implements the plan, controls and monitors the flow of goods from point of origin up to the point of delivery to the plant for production.

In the case of Finished Goods distribution, SCM strategy will define overall network design for stock holding and other channels of distribution. Logistics deals with the entire gamut of designing transportation network, partnering with 3rd party logistics providers to establish distribution centers and warehouses, planning inventory management and operations process including packing, promotional bundling, etc., primary, secondary distribution network and vendors and at the end the complete documentation and information process for the entire chain of activities.

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