

International Business

(For B. Com Sem VI)

International Production and Supply Chain Operations (Part 2)

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Importance of supply chain management-

- Traditionally, marketing, distribution, planning, manufacturing, and the purchasing organizations along the supply chain operated independently.
- These organizations have their own objectives and these are often conflicting.
- For example- Marketing's objective of high customer service and maximum sales dollars conflict with manufacturing and distribution goals. Many manufacturing operations are designed to maximize output and lower costs with little consideration for the impact on inventory levels and distribution capabilities. Purchasing contracts are often negotiated with very little information beyond historical buying patterns.
- The result of these factors is that there is not a single, integrated plan for the organization- there were as many plans as businesses. Clearly, there is a need for a mechanism through which these different functions can be integrated together. **Supply chain management is a strategy through which such an integration can be achieved.**

Supply chain management is typically viewed to lie between fully vertically integrated firms, where the entire material flow is owned by a single firm, and those where each channel member operates independently. Therefore, coordination between the various players in the chain is key in its effective management.

Cooper and Ellram [1993] compare supply chain management to a well-balanced and well-practiced relay team. Such a team is more competitive when each player knows how to be positioned for the hand-off. The relationships are the strongest between players who directly pass the baton, but the entire team needs to make a coordinated effort to win the race.

Supply Chain Decisions

There are four major decision areas in supply chain management:

1. Location
2. Production

3. Inventory
4. Transportation (distribution).

The decisions for supply chain management are classified into two broad categories- strategic and operational.

As the term implies, strategic decisions are made typically over a longer time horizon. These are closely linked to the corporate strategy and guide supply chain policies from a design perspective.

On the other hand, operational decisions are short term, and focus on activities over a day-to-day basis. The effort in these types of decisions is to effectively and efficiently manage the product flow in the "strategically" planned supply chain.

The four decision areas in supply chain management: 1) location, 2) production, 3) inventory, and 4) transportation (distribution) have both strategic and operational elements.

All of the 4 decisions discussed below are equally important for domestic as well as international firms. International firms, however, have greater choices when it comes to choosing suppliers (national and/or foreign)- see how many countries does the material for Wimbledon ball come from, location of production (geographically dispersed or concentrated), and setting up distribution centres, as well as being exposed to unique factors such as foreign exchange rate, risks due to its fluctuations, multiple business environments.

Location Decisions

The location decision involves decisions relating to where to undertake production (production facilities), where to source raw materials from (sourcing points), and where to store (stocking points). The geographic placement of production facilities, stocking points, and sourcing points is the natural first step in creating a supply chain. The location decisions are important as they entail a long-term commitment of large amount of resources. The size, number, and geographic location of production, procurement, and stocking facilities determine the pathway through which the product flows to the final customer. These decisions are of great significance to a firm since they represent the basic strategy for accessing customer markets, and will have a considerable impact on revenue, cost, and level of service. These decisions are taken keeping into consideration various factors such as production costs, taxes, duties and duty drawback, tariffs, local content, distribution costs, production limitations, etc. Although location decisions are primarily strategic, they also have implications on an operational level.

Production Decisions

Production is a primary activity of a firm's value chain and is concerned with the creation of a good or service.

The strategic decisions relating to production includes-

- What products to produce, such as computers, automobiles, sports equipment etc.
- Which plants (geographic location) to produce them in, allocation of suppliers (raw material and other essentials) to production plants, allocation of plants to distribution centres, and distribution centres to customer markets.

As before, these decisions have a big impact on the revenues, costs and customer service levels of the firm. These decisions assume the existence of the facilities, but determine the exact path(s) through which a product flows to and from these facilities.

Another critical issue is the capacity of the production facilities and this largely depends on the degree of vertical integration within the firm. Operational decisions focus on detailed production scheduling. These decisions include the construction of the master production schedules, scheduling production on machines, and equipment maintenance. Other considerations include workload balancing, and quality control measures at a production facility.

Inventory Decisions

Inventories exist at every stage of the supply chain as either raw materials, semi-finished or finished goods. They can also be in-process between locations. Their primary purpose to buffer against any uncertainty that might exist in the supply chain. Since holding of inventories can cost anywhere between 20 to 40 percent of their value, their efficient management is critical in supply chain operations. Inventory decisions are strategic in the sense that top management sets goals, but are generally viewed from an operations perspective.

The operational elements of inventory decisions include deployment strategies (push versus pull), control policies -the determination of the optimal levels of order quantities (known as economic order quantity) and reorder points, and setting safety stock levels, at each stocking location. These levels are critical, since they are primary determinants of customer service levels and have a bearing on the cost of material of the firm.

Inventory decisions are important as inventories tie up a major proportion of firms' funds. Capital used for inventory is not available for other corporate opportunities. Annual inventory carrying costs (the expense of maintaining inventories), though heavily influenced by other factors also such as cost of capital and industry specific conditions, can account for 15 percent or more of the value of the inventories themselves.

Therefore, proper inventory policy is a major concern to the firms. Firms endeavour to avoid the situation of overstocking (which increases the carrying cost of inventory) as well as understocking (that can halt production and initiates rush purchases at higher costs). More and

more firms are now using just-in-time inventory policies, which minimizes the volume of inventory by making it available only when it is needed.

It is important to note that the purpose of establishing proper inventory system- to maintain product movement in the delivery pipeline and to have a cushion to absorb demand fluctuations- is the same for domestic and international firms. However, international firms have to deal with unique factors involved in international operations such as currency exchange rates, multiple environments, duty structures, greater distance etc.

Transportation Decisions

The choice of mode of transportation has huge strategic implications as the best choice of mode is often found by trading-off the cost of using the particular mode of transport with the indirect cost of inventory associated with that mode. This indirect cost of inventory associated with the mode of transport depends on the speed of that mode. The slower the transportation, higher the cost.

While air shipments may be fast, reliable, and warrant lesser safety stocks, they are expensive. Meanwhile shipping by sea or rail may be much cheaper, but they necessitate holding relatively large amounts of inventory to buffer against the inherent uncertainty associated with them. Therefore, customer service levels, and geographic location play vital roles in such decisions. Since transportation is more than 30 percent of the logistics costs, operating efficiently makes good economic sense. Shipment sizes (consolidated bulk shipments versus Lot-for-Lot), routing and scheduling of equipment are key in effective management of the firm's transport strategy.

Read more about modes of transport from Chapter 16, International Production and Supply Chain Operations (Page 273-274) of the prescribed book- Fundamentals of International Business, Sumati Varma.

Considerations in selecting a mode of transport

An international business manager must consider the performance of each mode (airline and shipping) on following four dimensions before making a decision-

1. **Transit time:** The period between departure and arrival of the carrier varies significantly between ocean freight and airfreight. For example, the 45-day transit time of an ocean shipment can be reduced to 24 hours if the firm chooses airfreight. The length of transit time can have a major impact on the overall operations of the firm. As an example, a short transit time may reduce or even eliminate the need for an overseas depot. Also, inventories can be significantly reduced if they are replenished frequently. As a result, capital can be freed up and used to finance other corporate opportunities.
2. **Predictability:** Providers of both ocean freight and air freight service wrestle with the issue of reliability. Both modes are subject to the vagaries of nature, which may impose

delays. Yet, because reliability is a relative measure, the delay of one day for airfreight tends to be seen much more severe and unreliable than the same delay for Ocean freight. However, delays to be shorter in absolute time for air shipments. As a result, arrival time via air is more predictable. This has a major influence on corporate strategy. For example, because of the higher predictability of air freight, inventory safety stock can be kept at lower levels. Greater predictability also can serve as a useful sales tool, as it permits more precise delivery promises customers. If inadequate port facilities exist, airfreight may again be the better alternative. Unloading operations for oceangoing vessels are more cumbersome and time consuming than for planes. Merchandise shipped via air is likely to suffer less loss and damage from exposure of the cargo to movement. Therefore, once the merchandise arrives, it is more likely to be ready for immediate delivery- a fact that also enhances predictability.

An important aspect of predictability is also the capability of a shipper to track goods at any point during the shipment. Tracking becomes particularly important as corporations increasingly obtain products from and send them to multiple locations around the world. Being able to coordinate the smooth flow of a multitude of interdependent shipments can make a vast difference in corporation's performance. Tracking allows the shipper to check on the functioning of the supply chain and to take remedial action if problems occur. Cargo also can be redirected if sudden demand surges so require. However, such enhanced corporate response to the predictability issue only possible if an appropriate information system is developed by the shipper and the carrier and it is easily accessible to the user. Due to rapid advances in information technology, the ability to know where a shipment is has increased dramatically, while the cost of this critical knowledge has declined.

3. **Cost of transportation:** International transportation services are usually priced on the basis of both cost of the service provided and value of the service to the shipper. Due to the high value of the products shipped by air, airfreight is often priced according to the value of the service. In this instance, of course, price becomes a function of market demand and the monopolistic power of the carrier. The manager must decide whether the clearly higher cost of air freight can be justified. In part, this will depend on the cargo's properties. The physical density and the value of the cargo will affect the decision. Bulky products may be too expensive to be transported by air, whereas very compact products may be more appropriate for airfreight transportation. High-priced items can absorb transportation costs more easily than low-priced goods because the cost of transportation as a percentage of total product cost will be lower. As a result, sending diamonds by air freight is easy to justify than sending coal. Alternatively, a shipper may decide to mix modes of transportation in order to reduce overall cost and time delays. For example, part of the shipment route can be covered by air, while another portion can be covered by truck or ship.
4. **Transportation Infrastructure:** Often non-economic factors such as transportation infrastructure will enter into the selection process for a proper form of transportation. The

transportation sector, nationally and internationally, both benefits and suffers from government involvement. Carriers may be owned or heavily subsidized by governments. As a result, governmental pressure is exerted on shippers to use national carriers, even if more economical alternatives exist. Such preferential policies are most often enforced when government cargo is being transported.

References:

1. An introduction to supply chain management by Ram Ganeshan and Terry P. Harrison
http://lcm.csa.iisc.ernet.in/scm/supply_chain_intro.html
2. Fundamentals of International Business, Sumati Varma.
3. International Marketing, Michael Czinkota, Ilkka Ronkainen.