**Topic 7: The Supply Chain Management**

Overview

In the globalised world, the supply chain plays a vital role in the success of organisations. Organisations become dependent on the supply-chain to achieve their competitive advantage. The supply chain starts from the supply-end to the manufacturing part of the organisation and ends at the consumers.

Learning Outcomes

By the end of this topic, you will be able to:

1. explain the effects of the supply chain on the strategies of a firm; the risks involved on reliance of it in terms of quality, sustainability and costs.
2. decide whether to make or buy components from the suppliers based on factors that are advantageous to the company and the ability to manage the supply chain
3. take appropriate actions to resolve problems faced in an integrated supply chain .
4. decide on matters involving logistics management in dealing with transportation matters and storage facilities; so as to reduce costs and improve customer services by using third party logistics.

Introduction

7.1 The supply chain refers to the entire activities involved from the supply of resources for

 the production (upstream activities) to the manufacturing of the products and to the

 distribution of products to end users (downstream activities).

7.2 The objective of the supply chain management is to build a chain of suppliers that

 focuses on maximizing value to the ultimate consumer.

7.3 The supply chain risks.in terms of being more reliance on the supply chain; the

 globalised world is becoming more complex and challenging; and more complicated in

 information flow, political and currency risks.

7.4 The supply chain economics, though costly to maintain but it provides a major

 opportunity to reduce costs and to increase the contributing margins to improve the

 profit.

7.5 Managing the supply chain and issues and opportunities in an integrated supply chain.

7.6 Vendor selection and logistics management.

**Lecture Notes**

**7. Managing the Supply Chain**

Supply-chain management is about the integration of the activities that procure materials and services, transform them into intermediate goods and finished products and deliver them to customers.

\*Supply chain refers to the entire activities involved from the supply of resources for production to the manufacturing of the products, and to the distribution of products to end users. In an industry the whole process of the supply of resources for the production of products is also known as the *upstream activities* of the supply chain management. On the other hand, the process from the distribution of finished goods to the manufacturers’ resellers to the delivery of products to the end users is known as the *downstream activities*.

The objective of the supply-chain management is to build a chain of suppliers that focuses on maximizing value to the ultimate customer.

\*The competitive advantage of a firm is dependent on a close long-term relationship with a few suppliers. A firm’s strategic position does not confine to product customization, high quality, cost reduction and speed to the market but also ***dependent on the supply chain***. As a consequence, the operations managers have to pay attention to the supply-chain issues as shown in the table below.

How supply-chain Decisions affect Strategy

|  |  |  |  |
| --- | --- | --- | --- |
|  | Low-Cost Strategy | Response Strategy | Differentiation Strategy |
| Supplier’s goal | Supply demand at lowest possible cost  | Respond quickly to changing requirements and demand to minimize stockouts | Share market research, jointly develop products and options |
| Primary selection criteria | Select primarily for cost | Select primarily for capacity, speed and flexibility | Select primarily for product development skills |
| Process characteristics | Maintain high average utilization | Invest in excess capacity and flexible processes | Use modular processes that lend themselves to mass customization |
| Inventory characteristics | Minimize inventory throughout the chain to hold down costs | Develop responsive system, with buffer stocks positioned to ensure supply | Minimize inventory in the chain to avoid obsolescence |
| Lead-time characteristics | Shorten lead time so long as it does not increase costs | Invest aggressively to reduce production lead time | Invest aggressively to reduce development lead time |
| Product-design characteristics | Maximize performance and minimize cost | Use product designs that lead to low setup time and rapid production ramp-up | Use modular design to postpone product differentiation for as long as possible. |

Activities of supply chain managers run through many areas - accounting, finance, marketing and the operations. The supply-chain must support the OM strategy. The requirements for the three different strategies (low cost, response and differentiation) are not the same. Low-cost strategy requires suppliers to be selected based on cost. Such suppliers should have the ability to design low-cost products that meet the functional requirements, minimize inventory and drive down lead times. On the response strategy the requirement should be the ability to make quick response to changing environment e.g. if you want a fresh rose, you must have a supplier who can make quick response. As with regard to the differentiation strategy, the supplier must be able to add value to the product in terms of benefits to the customers.

Therefore firms must be able to integrate the strategies of up and down the supply-chain and to change as products move through their life cycle.

*\*Supply-Chain Risks*

In this age of increasing specialization, low communication cost and fast transportation, companies are making less and buying more. This means that companies are relying more on the supply-chains and facing more risk. This risk is compounded by globalization and logistical complexity. Therefore, depending on the suppliers for reliability and quality may be challenging especially when the suppliers are from other countries the risk is even greater. This is because international supply chain may face complication in information flow, political and currency risks.

Thus, for a successful strategic development of a supply-chain management requires first a careful research of the suppliers, the understanding of the risk involved and the ability to come out with an innovative plan to mitigate disruptions in the supply-chain.

**\*Ethics and Sustainability**

Looking from three aspects in the supply-chain:

1. Personal ethics - this relates to the ethical decisions made by the people in the supply-

 chain. Ethical decisions are critical for maintaining long-term relationships. As a

 consequence, firms develop strict rules and codes of conduct to ensure acceptable

 behaviours among their employees. As the supply-chain becomes international,

 operations managers need to expect an additional set of ethical issues to enable them to

 deal with new cultural values.

2. Ethics within the supply-chain - as firms are becoming more reliable on obtaining their

 resources from outside sources, they are facing more issues on ethics in the supply-chain.

 To overcome many of the ethical issues with suppliers, firms must also establish standards

 for their suppliers.

3. Ethical Behaviour regarding the Environment - good ethics extend to doing business in a

 way that supports conservation and renewal of resources. The impact on the environment

 must start from the raw material to manufacture, through use and final disposal. Standards

 must be set and followed by the suppliers if they want to maintain the business

 relationship. Operations managers have this responsibility to enforce the standards being

 practised.

**\*Supply-Chain Economics**

Much attention is given to the supply-chain because of its strategic and economic importance to the firms. The supply-chain is the most costly activity and it therefore provides a major opportunity to reduce costs and to increase the contributing margins (to improve the profit).

*Make-or-buy Decisions and Outsourcing*

A wholesaler or retailer buys everything that it sells; a manufacturing operation does not do that. Manufacturers, restaurants and assemblers of products buy components and then assemble them into final products. If it is more advantage to buy the components from outside sources than to make them in terms of cost savings, quality maintenance and delivery dependability than the firm should not make them. Fundamentally if the firm does not have the core competencies to make the components better than others, it is strategically logical to outsource them from more competent suppliers.

\*Supply-Chain Strategies

If a firm wants to outsource goods or services, it must have a supply-chain strategy to enable it to have the competitive advantage.

1. It must be able to negotiate with many suppliers so that it can have the advantage all the

 time in terms of getting the best price, quality, quantity and delivery.

2. It establishes a long-term partnership with a few suppliers in order to satisfy the end

 customer.

3. It is able to develop vertical integration (forward and backward) with few suppliers

 through acquisition of shares.

4. It is able to get two or more firms to combine their resources (joint-venture) to produce a

 component.

5. It is able to get a few suppliers and vertical integration to form a coalition (keiretsu) for

 mutual benefits.

6. It is able to develop virtual companies (network companies) that use suppliers on an as-

 needed basis.

Managing the Supply Chain

The cycle of materials - from the suppliers to production, warehousing and distribution to customers takes place among separate and often very independent organisations. Many issues can arise that affect the efficient integration of the activities.

The successful management of the supply chain depends on:

1. By establishing a mutual agreement on goals among the participating organisations. The

 fundamental goals would involve the addition of economic value and maximisation of

 total content of the product.

2. There must be the existence of “trust” among the members in the supply chain. Supplier

 relationships are more likely to be successful if risk and cost savings are shared and

 activities such as end-customer research, sales analysis, forecasting and production

 planning are joint activities. Such relationships are built on mutual trust.

3. The cultures among the organisations must be compatible. It helps to bring about a

 positive relationship among the partners/members in the supply chain. A champion within

 the supply chain can further strengthen the relationship.

*Issues in an Integrated Supply Chain*

Three issues are identified that complicate the development of an efficient, integrated supply chain:

1. Local Optimization - members of the chain tend to focus on maximizing on their profits or minimizing immediate cost based on what they know. If there is a fluctuation in demand, they tend to get panic. It is also possible that a slight change may be over magnified. Such a development can complicated the implementation of efficient functioning of the supply chain.
2. Incentives (sales incentives, quantity discounts, quotas and promotions) tend to push merchandise into the chain for sales that have not occurred. These are things that generate fluctuations that are ultimately expensive to all members of the chain.
3. Large lots - the marketers and distributors in the supply chain are biased towards large lots because of slower sales and increasing holding costs. On the other hand the operations managers want to purchase raw materials in large volumes and produce large batches of products in order to reduce cost. There is therefore a conflict of interests at both ends of the supply chain.
4. The bullwhip effect - it is about the increasing fluctuation in orders that often occurs as orders moves through the supply chain. It starts from the retailer end. As orders are relayed from retailers, to distributors, to wholesalers and to the manufacturers, fluctuations increasing in each step of the way. This ‘bullwhip effect’ actually increases the costs associated with inventory, transportation, shipping and receiving, while decreasing customer service and profitability. This bullwhip effect occurs when orders decrease as well as when they increase.

*Opportunities in an integrated Supply Chain*

A number of opportunities exist for reducing the bullwhip effect and improving the opportunities in the supply chain.

1. Accurate “pull” data - such data are generated at the point-of-sales (POS) and the computer-assisted ordering (CAO). Using the POS system that collects the sales data and then adjusting that data for ordering, the inventory at hand and outstanding orders. Then a net order is sent directly to the supplier who is responsible for maintaining the fished goods inventory.
2. Lot size reduction - (1) work out the cost for economical shipment of less than truckload lots; (2) providing discounts based on annual volume rather on individual shipments and (3) reducing the cost of ordering.
3. Single-stage control of replenishment - selecting a member in the chain to be responsible for monitoring and managing inventory in the supply chain based on the “pull” from the end user. This approach allows control to be exercised in the hands of:
* A sophisticated retailer who knows about demand patterns.
* A distributor who manages the inventory for a particular distribution area.
* A manufacturer who has a well-managed forecasting, manufacturing and distribution system.
1. Vendor-managed inventory - using a local supplier to maintain inventory for the manufacturer or retailer. The supplier delivers directly to the purchaser.
2. Collaborative planning, forecasting and replenishment (CPFR) - a joint effort of members of a supply chain to share information in order to reduce supply-chain costs.
3. Blanket orders - a long-term purchase commitment to a supplier for items that are to be delivered against short-term releases to ship.
4. Standardization - using standard means to obtain the supplies e.g. labelling, colouring, packaging or slightly different engineering specifications.
5. Postponement - try to withhold any modifications or customization to the product as long as possible. The concept is to minimize internal variety while maximizing external variety.
6. Drop shipping and special packaging - drop shipping means the supplier will ship directly to the end consumer rather than to the seller, saving both time and reshipping cost. Other cost savings: use of special packaging, labels and optimal placement of labels and bar codes on containers.

10. Pass-through facility - means expedites shipment by holding merchandise and delivering

 form shipping hubs.

11. Channel assembly - send individual components and modules, rather than finished

 products, to the distributor. The distributor then assembles, tests and ships.

**Vendor Selection**

Firms must select the sellers (vendors) from whom they buy the goods and service. There are three stages at which vendors are selected.

*Stage 1: Vendor evaluation*

This involves finding the vendors and determining the likelihood of their becoming good suppliers. Evaluation criteria are developed for this purpose. The criteria and the weight developed depend on the supply-chain strategy.

Selection of the competent suppliers is critical. The suppliers must have the financial strength, quality, management, research, technical ability and potential for a close long term relationship.

*Stage 2: Vendor development*

The vendor must have the interest in quality requirements, product specifications, schedules and delivery, the purchaser’s payment system and procurement policies. Vendor development may include everything from training, to engineering an production help, to procedures for information transfer. The vendor development is necessary to enable it to be integrated into the supply chain for the long run.

*Stage 3: Negotiation*

Negotiation for the critical elements to establish a contractual relationship must take place. The important focus will be on the quality, delivery, payment and cost. The classic types of negotiation strategy are:

1. Cost-based price model - the supplier opens its books to the purchaser. The price can be based on time and materials or on a fixed cost with an escalation clause to accommodate changes in the vendor’s labour and materials cost.

2. Market-based price model - the price is based on a published, auction or index price.

3. Competitive bidding - bidding for the goods in the market. The disadvantage of such an approach to buy goods in the market is the hindering of the development of long term relationship with the vendors.

The fourth approach would be a combination of one or more of the above three methods.

Whichever case is accepted, a good supplier relationship is one in which both partners have established a degree of mutual trust, and a belief in each other’s competence, honesty and fair dealing.

**Logistics Management**

Procurement activities may be combined with various shipping, warehousing and inventory activities to form a logistic system.

***The purpose of logistic management is to obtain efficiency of operations through the integration of all material acquisition, movement and storage activities.***

When the transportation and inventory costs are substantial on the input and output sides of the production process, an emphasis on logistics may be appropriate. Many firms would opt for outsourcing the logistic function. This is because reduced cost and improved custom service have the potential for competitive advantage.

Firms recognised that the distribution of goods to and from their facilities can add up to 25% of their cost of products. Because of this high cost, firms constantly evaluate teir means of distribution. The five major means of distribution are trucking, railroads, airfreight, waterways and pipelines.

Third party logistics

Supply-chain managers may find that outsourcing logistics is advantageous in driving down inventory investment and costs while improving delivery reliability and speed. Specialized logistics forms support this goal by coordinating the supplier’s inventory system with the service capabilities of the delivery firm.

Measuring Supply-Chain Performance

Evaluation of the supply chain is critical because most of the organisation’s money is spent here. Besides, assets are committed to inventory.

1. ***The supply-chain performance*** is focused on procurement and vendor performance issues. The world-class benchmarks are the result of well-managed supply-chains that drive down costs, lead times, late deliveries and shortages while improving quality.

2. ***The assets committed to inventory*** is focused on three specific measures:

 (a) The amount invested in inventory (expressed in percentage of assets.

 (b) Annual inventory turnover = cost of goods sold /Inventory investment

 (c) Weeks of supply = Inventory investment/(Annual cost of goods sold/52 weeks)

Brief Note on Supply Chain

The Supply Chain in an organisation

 Supply Chain Management

 Procurement of inputs (involves logistics management - to

 efficiency of operations in the material acquisition, movement

 and storage activities (logistics system)

 Upstream Activities

 (Inputs end)

 Production of the goods and services

 (Porter’s value chain analysis)

 Distribution of products to end users Downstream Activities

 (Porter’s value chain analysis) (Marketing end)

The objective of the supply-chain management is to build a chain of with certain suppliers to focus on maximizing value to the ultimate customers.

The firm is dependent on the supply chain to establish longer term relationships with certain suppliers to gain competitive advantage. This is necessary if the supply chain is to support the strategies (low cost, differentiation and response) of operations management.

Today companies are depending more and more on the supply chains and facing more risks than before. Companies are depending on the suppliers for reliability and quality and lower costs of parts. The attributable causes are the increasing specialization and improved technological capabilities and many companies have difficulties to cope with these advances. The companies have to develop innovative plan to mitigate disruptions with the selected suppliers. Ethical behaviour and principles become important issues for sustainability of the relationships between the suppliers and the managers of the companies.

The supply chain is the most expensive activity a company has to face but it also provides an opportunity to reduce costs to improve the profit margins. It is cheaper to buy parts from the suppliers i.e. outside sources than to make them. This is an opportunity for the company to gain CA to link up with some suppliers through vertical integration to form coalition (keiretus) for mutual benefits.

However there are difficulties to establish such an integrated supply chain:

1. Members in the supply chain tend to focus on their profits than in maintain the efficient functioning of the supply chain.
2. Incentives are the means to get the sales of merchandise through the supply chain and these tend to push the costs up.
3. Supply chain members prefer small lots of merchandise but companies preferred large batches to reduce costs. This creates conflict of interest between the two parties. This could be due to “bullwhipped effect” coming from the retailer end and moving up the supply chain to the manufacturers.

The operations manager has tremendous tasks to capitalise on the supply chain to gain competitive advantage for the company.