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MBA (Marketing) – III Semester**Paper Code: MBMM 3004**

PAPER XIV

Logistics and Supply Chain Management

Objectives

- To introduce process and functions of physical distribution system
- To introduce major building blocks, functions, business process, performance metrics and decision making in supply chain network, and
- To provide an insight into the role of Internet Technologies and electronic commerce in supply chain management

Unit – I

Physical distribution: Participation in the physical distribution functions – The environment of physical distribution – Channel design strategies and structure – electing channel members – Setting distribution objectives and tasks – Target markets and channel design strategies.

Unit – II

Managing the marketing channel – Product, Pricing and Promotion issues in channel Management and Physical Distribution – Motivating channel members – Evaluating channel member performance – Vertical marketing systems – Retail co-operatives, Franchise systems and corporate marketing systems.

Unit – III

Supply Chain: Building Blocks of Supply Chain Network – Performance Measures in Decisions in the Supply chain World – Models for Supply Chain Decision Making.

Unit – IV

Supply Chain Inventory Management: Economic Order quantity Models – Recorder Point Models – Multichannel Inventory systems – Supply chain Facilities Layout – Capacity Planning – Inventory optimization – Dynamic Routing and Scheduling.

Unit – V

Relation to ERP: E-procurement – E-Logistics – Internet Auctions – E-markets – Electronic Business Process – Optimization Business Object in SCM.

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UNIT – I

Unit Structure

Lesson 1.1 - Physical Distribution

Lesson 1.2 - Marketing Channels

Lesson 1.3 - Channel Members

Lesson 1.4 - Market Segmentation

Lesson 1.1 - Physical Distribution

Learning Objectives

After reading this lesson you should be able to

- Understand the concept of Physical Distribution and its importance
- Identify the functions and principle components of physical distribution
- Analyze and Understand the distribution strategy
- Know the importance of fast changing distribution environment

Physical Distribution

1. Physical Distribution System Introduction

Physical distribution is the movement of materials from the producer to the consumer. This movement of materials is divided into two functions: **Physical supply** is the movement and storage of goods from suppliers to manufacturing. **Physical distribution** is the movement and storage of finished goods from the end of production to the customer. The particular path in which the goods move – through distribution centres, wholesalers, and retailers – is called the channel of distribution.

Top Logistics Companies of India

Name of the company	Position in the industry
CTC Freight Carriers Private Limited	1
Transocean Express Logistics	2
Velocity Logistics	3
Atlas Logistics	4
DHL	5
Global Express Service	6
Royal Logistics	7
Blue Dart	8
Gati	9
Safe Express	10

Source: <http://www.bestindiansites.com/top-companies/logistics/>

A channel of distribution is one or more companies or individuals who participate in the flow of goods and/or services from the producer to the final user or consumer. The **transaction channel** is concerned with the transfer of ownership. Its function is to negotiate, sell, and contract. The **distribution channel** is concerned with the transfer or delivery of the goods or services.

To extend markets requires a well-run distribution system. Distribution adds place value and time value by placing goods in markets where they are available to the consumer at the time the consumer wants them.

The specific way in which materials move depends upon many factors, some of which are the channels of distribution that the firm is using, the types of markets served, the characteristics of the product, and the type of transportation available to move the material.

The objective of distribution management is to design and operate a distribution system that attains the required level of customer service and does so at least cost. To reach this objective, all activities involved in the movement and storage of goods must be organized into an integrated system.

In a distribution system, four interrelated activities affect customer service and cost of providing it:

- Transportation,
- Distribution inventory,
- Warehouses (distribution centres), and
- Order processing.

Physical distribution is the set of activities concerned with efficient movement of finished goods from the end of the production operation to the consumer. Physical distribution takes place within numerous wholesaling and retailing distribution channels, and includes such important decision areas as customer service, inventory control, materials handling, protective packaging, order procession, transportation, warehouse site selection, and warehousing.

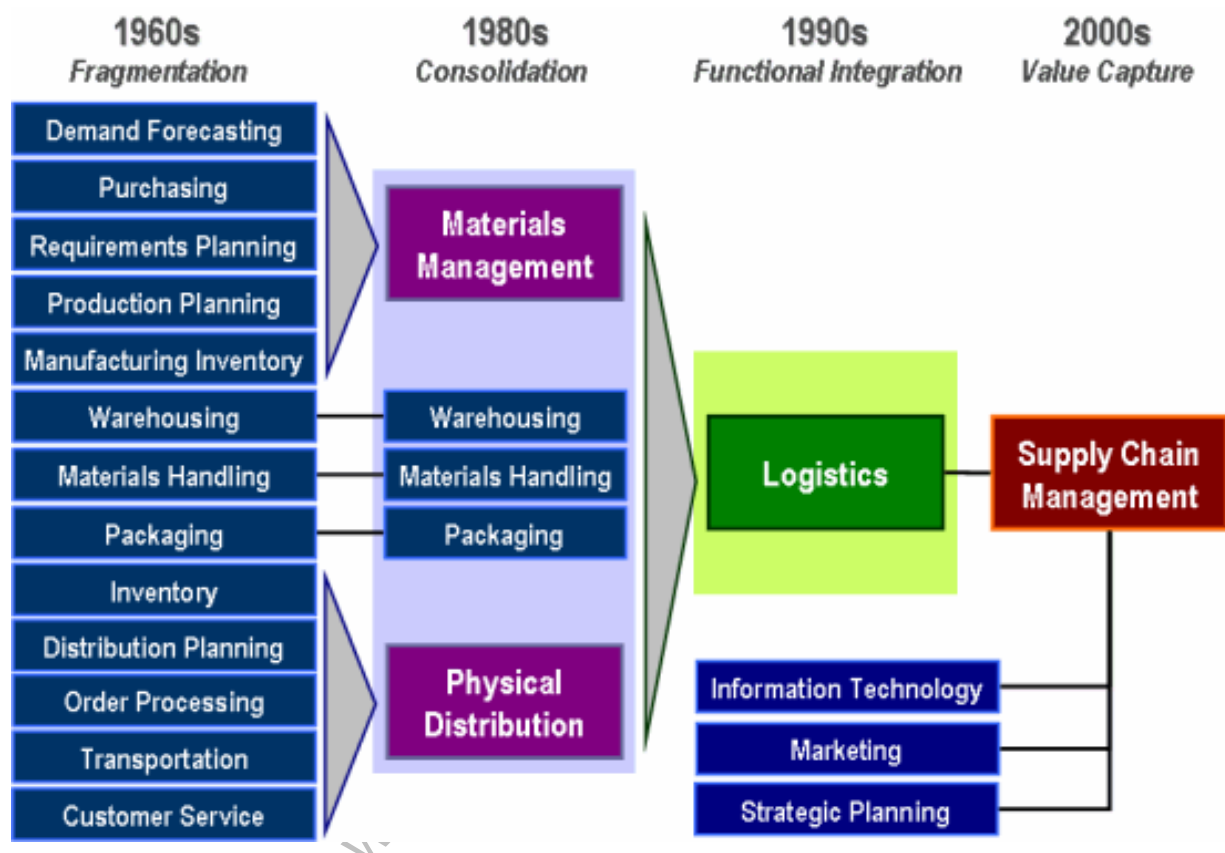
Physical distribution is part of a larger process called “distribution,” which includes wholesale and retail marketing, as well the physical movement of products. Physical distribution activities have recently received increasing attention from business managers, including small business owners.

This is due in large part to the fact that these functions often represent almost half of the total marketing costs of a product. In fact, research studies indicate that physical distribution costs nationally amount to approximately 20 percent of the country’s total gross national product (GNP).

These findings have led many small businesses to expand their cost-cutting efforts beyond their historical focus on production to encompass physical distribution activities. The importance of physical distribution is also based on its relevance to customer satisfaction. By storing goods in convenient locations for shipment to wholesalers and retailers, and by creating fast, reliable means of moving the goods, small business owners can help assure continued success in a rapidly changing, competitive global market.

An earlier resource pack described the decisions that must be taken when a company organises a channel or network of intermediaries who take responsibility for the management of goods as they move from the producer to the consumer.

Each channel member must be carefully selected and the company must decide what type of relationship it seeks with each of its intermediate partners. Having established such a network, the organisation must next consider how these goods can be efficiently transferred, in the physical sense, from the place of manufacture to the place of consumption.



Evolution of Supply Chain Management

Physical distribution management (PDM) is concerned with *ensuring the product is in the right place at the right time.*

‘Place’ has always been thought of as being the least dynamic of the ‘4Ps’. Marketing practitioners and academics have tended to concentrate on the more conspicuous aspects of marketing. It is now recognised that PDM is a critical area of overall marketing management. Much of its expertise is ‘borrowed’ from military practice.

During the Second World War and the Korean and Vietnam wars, supplies officers had to perform extraordinary feats of PDM, in terms of food, clothing, ammunition, weapons and a whole range of support equipment having to be transported across the world. The military skill that marketing has adopted and applied to PDM is that of logistics. Marketing management realised that distribution could be organised in a scientific way so the concept of business logistics developed, focusing attention on and increasing the importance of PDM.

As marketing analysis became increasingly sophisticated, managers became more aware of the costs of physical distribution. Whilst the military must win battles, the primary aim of business is to provide customer satisfaction in a manner that result in profit for the company. Business logistical techniques can be applied to PDM so that costs and customer satisfaction are optimised.

There is little point in making large savings in the cost of distribution if, in the long run, sales are lost because of customer dissatisfaction. Similarly, it does not make economic sense to provide a level of service that is not really required by the customer and leads to an erosion of profits. This cost/service balance is a basic dilemma that faces physical distribution managers.

A final reason for the growing importance of PDM as a marketing function is the increasingly demanding nature of the business environment. In the past it was not uncommon for companies to hold large inventories of raw materials and components. Although industries and individual firms differ widely in their stockholding policies, nowadays, stock levels are kept to a minimum wherever possible. Holding stock is wasting working capital for it is not earning money for the company.

A more financially analytical approach by management has combined to move the responsibility for carrying stock onto the supplier and away from the customer. Gilbert and Strebel (1989) pointed out that this has a 'domino' effect throughout the marketing channel, with each member putting pressure on the next to provide higher levels of service.

Logistical issues facing physical distribution managers today is the increasing application by customers of just-in-time management

techniques or lean manufacturing. Hutchins (1988) stresses that companies who demand 'JIT' service from their suppliers carry only a few hours' stock of material and components and rely totally on supplier service to keep their production running.

This demanding distribution system is supported by company expeditors whose task it is to 'chase' the progress of orders and deliveries, not only with immediate suppliers, but right along the chain of supply (called 'supply chain integration').

Lean manufacturing has been widely adopted throughout the automotive industry where companies possess the necessary purchasing power to impose such delivery conditions on their suppliers. Their large purchasing power also necessitates stringent financial controls, and huge financial savings can be made in the reduction or even elimination of stockholding costs where this method of manufacturing is employed.

To think of the logistical process merely in terms of transportation is much too narrow a view. Physical distribution management (PDM) is concerned with the flow of goods from the receipt of an order until the goods are delivered to the customer.

In addition to transportation, PDM involves close liaison with production planning, purchasing, order processing, material control and warehousing. All these areas must be managed so that they interact efficiently with each other to provide the level of service that the customer demands and at a cost that the company can afford.

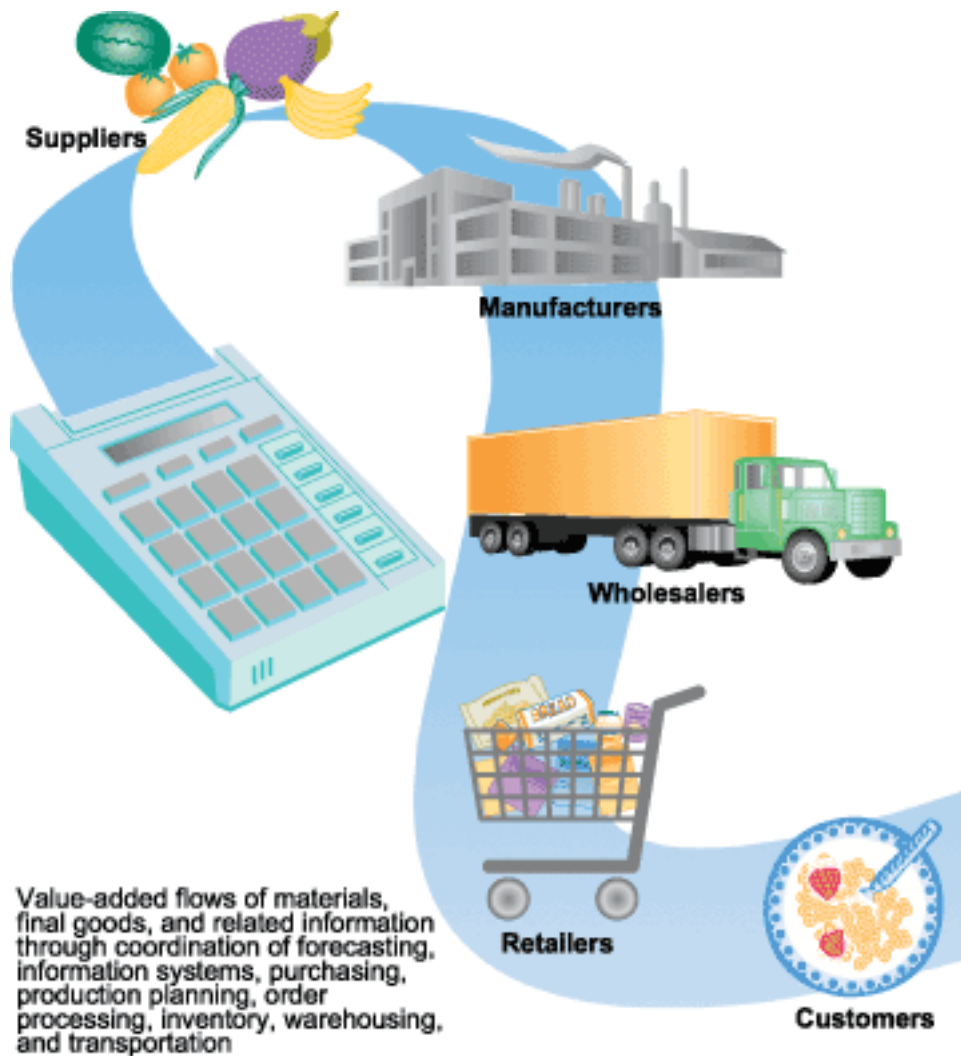
Importance of Physical Distribution

Buying a computer in the post, petrol at a supermarket, mortgages over the phone and phones themselves from vending machines are just some innovations in distribution which create competitive advantage as customers are offered newer, faster, cheaper, safer and easier ways of buying products and services.

Without distribution even the best product or service fails. Author Jean-Jacques Lambin believes a marketer has two roles:

- (1) To organise exchange through distribution and
- (2) To organise communication.

Physical distribution, or Place, must integrate with the other 'P's in the marketing mix. For example, the design of product packaging must fit onto a pallet, into a truck and onto a shelf; prices are often determined by distribution channels; and the image of the channel must fit in with the supplier's required 'positioning'. You can see how Coca Cola further integrate the timing of distribution and promotion in the Hall Of Fame later. In fact, they see distribution as one of their "core competencies".



Marketing Logistics: Managing Supply Chains

Distribution is Important Because

Firstly, it affects sales - if it's not available it can't be sold. Most customers won't wait.

Secondly, distribution affects profits and competitiveness since it can contribute up to 50 percent of the final selling price of some goods. This affects cost competitiveness as well as profits since margins are squeezed by distribution costs.

Thirdly, delivery is seen as part of the product influencing customer satisfaction. Distribution and its associated customer service play a big part in relationship marketing.

Decisions about physical distribution are key strategic decisions. They are not short term. Increasingly it involves strategic alliances and partnerships which are founded on trust and mutual benefits. We are seeing the birth of strategic distribution alliances. You can see Cavinkare as a marketing and distribution company how it is providing solutions for its customers.

Channels change throughout a product's life cycle. Changing lifestyles, aspirations and expectations along with the IT explosion offer new opportunities of using distribution to create a competitive edge.

Controlling the flow of products and services from producer to customer requires careful consideration. It can determine success or failure in the market place.

The choice of channel includes choosing among and between distributors, agents, retailers, franchisees, direct marketing and a sales force.

Deciding between blanket coverage or selective distribution, vertical systems or multi-channel networks, strategic alliances or solo sales forces, requires strong strategic thinking. Decisions about levels of stock, minimum order quantities, delivery methods, delivery frequency and warehouse locations have major cash flow implications as well as customer satisfaction implications.

Functions of Distribution Channels

Distribution channels perform a number of functions that make possible the flow of goods from the producer to the customer. These functions must be handled by someone in the channel. Though the type of organization that performs the different functions can vary from channel to channel, the functions themselves cannot be eliminated. Channels provide time, place, and ownership utility. They make products available when, where, and in the sizes and quantities that customers want. Distribution channels provide a number of logistics or physical distribution functions that increase the efficiency of the flow of goods from producer to customer. Distribution channels create efficiencies by **reducing the number of transactions** necessary for goods to flow from many different manufacturers to large numbers of customers. This occurs in two ways. The first is called **breaking bulk**.

Wholesalers and retailers purchase large quantities of goods from manufacturers but sell only one or a few at a time to many different customers. Second, channel intermediaries reduce the number of transactions by **creating assortments**—providing a variety of products in one location—so that customers can conveniently buy many different items from one seller at one time.

Channels are efficient. The *transportation and storage of goods* is another type of physical distribution function. Retailers and other channel members move the goods from the production site to other locations where they are held until they are wanted by customers. Channel intermediaries also perform a number of **facilitating functions**, functions that make the purchase process easier for customers and manufacturers. Intermediaries often provide **customer services** such as offering credit to buyers and accepting customer returns. Customer services are oftentimes more important in B2B markets in which customers purchase larger quantities of higher-priced products.

Distribution channels are not limited to products only even the services provided by a producer may pass through this channel and reach the customer. Both direct and indirect channels come into use in this case. For instance, the hotel industry provides facility for lodging to its customers, which is a non-physical commodity or a service.

The hotel may provide rooms on direct booking as well as through indirect channels like tour operators, travel agents, airlines etc. Distribution chain has seen several improvements in the form of franchising. Also there has been link ups between two service sectors like travel and tourism which has made services available more accessible to the customer. For instance hotels also provide cars on rent.

- The primary function of a distribution channel is to bridge the gap between production and consumption.
- A close study of the market is extremely essential. A sound marketing plan depends upon thorough market study.
- The distribution channel is also responsible for promoting the product. Awareness regarding products and other offers should be created among the consumers.
- Creating contacts or prospective buyers and maintaining liaison with existing ones.
- Understanding the customer's needs and adjusting the offer accordingly.
- Negotiate price and other offers related to the product as per the customer demand.
- Storage and distribution of goods
- Catering to the financial requirements for the smooth working of the distribution chain.
- Risk taking for example by stock holding

Some wholesalers and retailers assist the manufacturer by providing **repair and maintenance service** for products they handle. Channel members also perform a **risk-taking** function. If a retailer buys a product from a manufacturer and it doesn't sell, it is "stuck" with the item and will lose money. Last, channel members perform a variety of **communication** and **transaction** functions.

Wholesalers buy products to make them available for retailers and sell products to other channel members. Retailers handle transactions with final consumers. Channel members can provide two-way communication for manufacturers.

They may supply the sales force, advertising, and other marketing communications necessary to inform consumers and persuade them to buy. And the channel members can be invaluable sources of information on consumer complaints, changing tastes, and new competitors in the market.

Principal Components of the Distribution Process

This consists of four principal components of PDM:

- Order processing;
- Stock levels or inventory;
- Warehousing;
- Transportation.

PDM is concerned with ensuring that the individual efforts that go to make up the distributive function are optimised so that a common objective is realised. This is called the 'systems approach' to distribution management and a major feature of PDM is that these functions be integrated.

Because PDM has a well-defined scientific basis, this chapter presents some of the analytical methods which management uses to assist in the development of an efficient logistics system.

There are two central themes that should be taken into account:

1. The success of an efficient distribution system relies on integration of effort. An overall service objective can be achieved, even though it may appear that some individual components of the system are not performing at maximum efficiency.
2. It is never possible to provide maximum service at a minimum cost. The higher the level of service required by the customer, the higher the cost. Having decided on the necessary level of service, a company must then consider ways of minimising costs, which should never be at the expense of, or result in, a reduction of the predetermined service level.

The distribution process begins when a supplier receives an order from a customer. The customer is not too concerned with the design of the supplier's distributive system, nor in any supply problems. In practical terms, the customer is only concerned with the efficiency of the supplier's distribution.

That is, the likelihood of receiving goods at the time requested. **Lead-time** is the period of time that elapses between the placing of an order and receipt of the goods. This can vary according to the type of product and the type of market and industry being considered.

Lead-time in the shipbuilding industry can be measured in fractions or multiples of years, whilst in the retail sector, days and hours are common measures. Customers make production plans based on the lead-time agreed when the order was placed. Customers now expect that the quotation will be adhered to and a late delivery is no longer acceptable in most purchasing situations.

1 Order processing

Order processing is the first of the four stages in the logistical process. The efficiency of order processing has a direct effect on lead times. Orders are received from the sales team through the sales department. Many companies establish regular supply routes that remain relatively stable over a period of time providing that the supplier performs satisfactorily. Very often contracts are drawn up and repeat orders (forming part of the initial contract) are made at regular intervals during the contract period.

Taken to its logical conclusion this effectively does away with ordering and leads to what is called '**partnership sourcing**'. This is an agreement between the buyer and seller to supply a particular product or commodity as and when required without the necessity of negotiating a new contract every time an order is placed.

Order-processing systems should function quickly and accurately. Other departments in the company need to know as quickly as possible that an order has been placed and the customer must have rapid confirmation of the order's receipt and the precise delivery time.

Even before products are manufactured and sold the level of office efficiency is a major contributor to a company's image. Incorrect 'paperwork' and slow reactions by the sales office are often an unrecognised source of ill-will between buyers and sellers. When buyers review their suppliers, efficiency of order processing is an important factor in their evaluation.

A good computer system for order processing allows stock levels and delivery schedules to be automatically updated so management can rapidly obtain an accurate view of the sales position. Accuracy is an important objective of order processing as are procedures that are designed to shorten the order processing cycle.

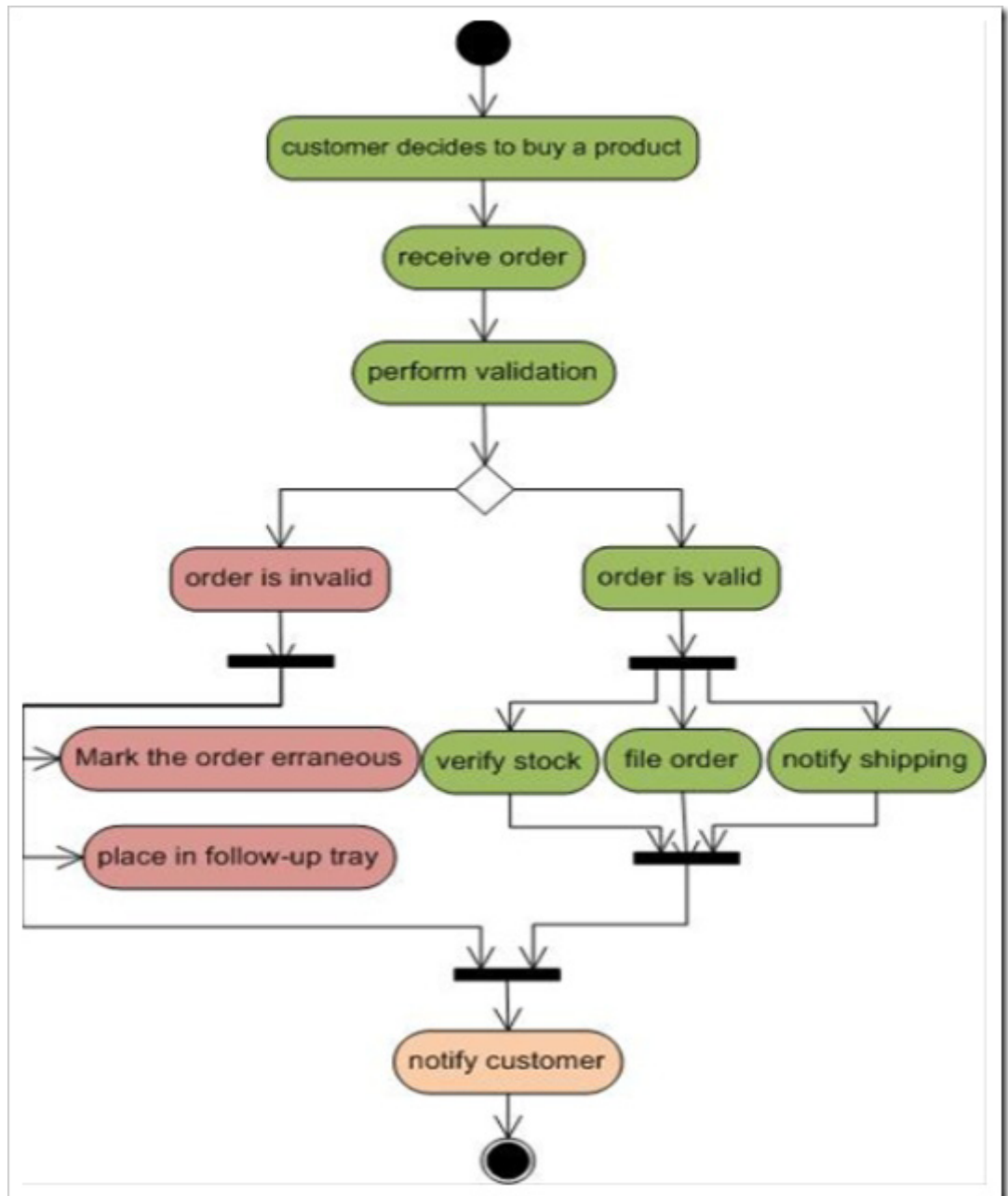
The small business owner is concerned with order processing another physical distribution function because it directly affects the ability to meet the customer service standards defined by the owner. If the order processing system is efficient, the owner can avoid the costs of premium transportation or high inventory levels.

Order processing varies by industry, but often consists of four major activities: a credit check; recording of the sale, such as crediting a sales representative's commission account; making the appropriate accounting entries; and locating the item, shipping, and adjusting inventory records.

Technological innovations, such as increased use of the Universal Product Code, are contributing to greater efficiency in order processing. Bar code systems give small businesses the ability to route customer orders efficiently and reduce the need for manual handling. The coded information includes all the data necessary to generate customer invoices, thus eliminating the need for repeated keypunching.

Another technological innovation affecting order processing is Electronic Data Interchange. EDI allows computers at two different locations to exchange business documents in machine-readable format, employing strictly-defined industry standards.

Purchase orders, invoices, remittance slips, and the like are exchanged electronically, thereby eliminating duplication of data entry, dramatic reductions in data entry errors, and increased speed in procurement cycles.



Order Processing

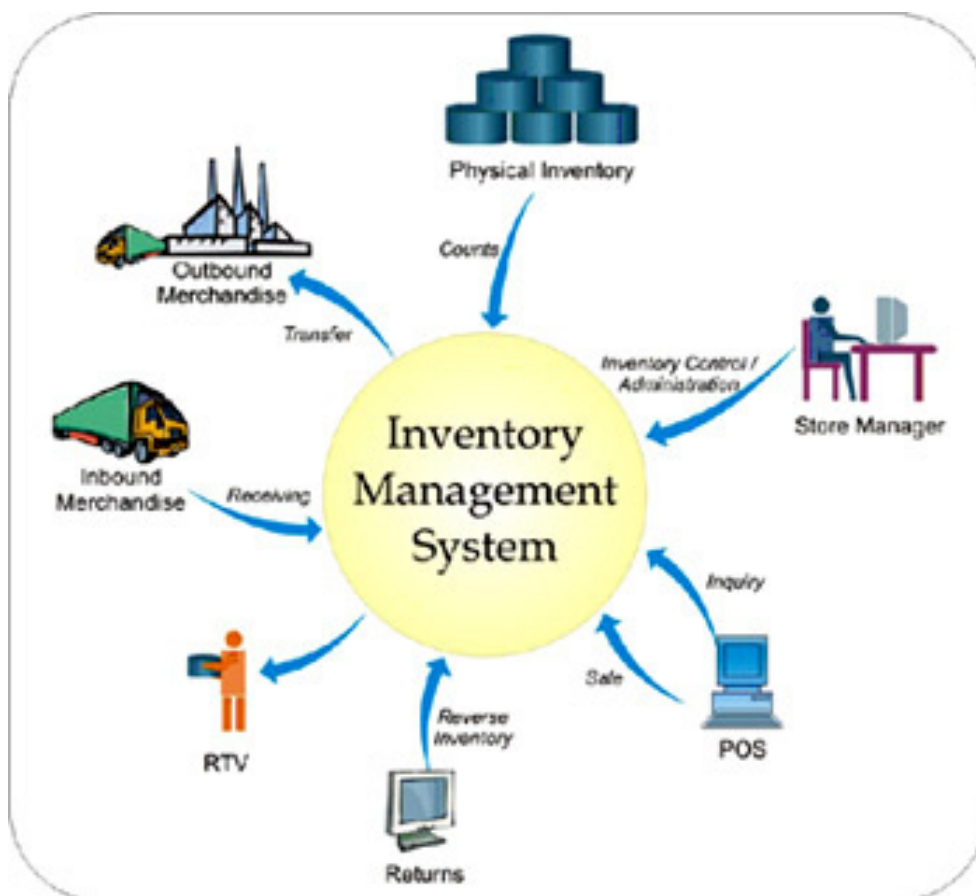
2 Inventory

Inventory, or stock management, is a critical area of PDM because stock levels have a direct effect on levels of service and customer satisfaction. The optimum stock level is a function of the type of market in which the company operates. Few companies can say that they never run out of stock, but if stock-outs happen regularly then market share will be lost to more efficient competitors.

The key lies in ascertaining the re-order point. Carrying stock at levels below the re-order point might ultimately mean a stock-out, whereas too high stock levels are unnecessary and expensive to maintain. The stock/cost dilemma is clearly illustrated by the systems approach to PDM that is dealt with later.

Stocks represent **opportunity costs** that occur because of constant competition for the company's limited resources. If the company's marketing strategy requires that high stock levels be maintained, this should be justified by a profit contribution that will exceed the extra stock carrying costs. Sometimes a company may be obliged to support high stock levels because the lead-times prevalent in a given market are particularly short. In such a case, the company must seek to reduce costs in other areas of the PDM 'mix'.

Inventory control can be a major component of a small business physical distribution system. Costs include funds invested in inventory, depreciation, and possible obsolescence of the goods. Experts agree that small business inventory costs have dropped dramatically due to



Inventory Management System

Inventory control analysts have developed a number of techniques which can help small businesses control inventory effectively. The most basic is the Economic Order Quantity (EOQ) model. This involves a trade-off between the two fundamental components of an inventory control cost: inventory-carrying cost (which increases with the addition of more inventory), and order-processing cost (which decreases as the quantity ordered increases).

These two cost items are traded off in determining the optimal warehouse inventory quantity to maintain for each product. The EOQ point is the one at which total cost is minimized. By maintaining product inventories as close to the EOQ point as possible, small business owners can minimize their inventory costs.

3 Warehousing

Currently, many companies function adequately with their own on-site warehouses from where goods are despatched direct to customers. When a firm markets goods that are ordered regularly, but in small quantities, it becomes more logical to locate warehouses strategically around the country.

Transportation can be carried out in bulk from the place of manufacture to respective warehouses where stocks wait ready for further distribution to the customers. This system is used by large retail chains, except that the warehouses and transportation are owned and operated for them by logistics experts (e.g. GATI Logistics, BOC Distribution, Excel Logistics and Rowntree Distribution).

Levels of service will of course increase when numbers of warehouse locations increase, but cost will increase accordingly. Again, an optimum strategy must be established that reflects the desired level of service.

Small business owners who require warehousing facilities must decide whether to maintain their own strategically located depot(s), or resort to holding their goods in public warehouses. And those entrepreneurs who go with non-public warehousing must further decide between storage or distribution facilities.

Computer technology for automating warehouses is dropping in price, and thus is increasingly available for small business applications. Sophisticated software translates orders into bar codes and determines the most efficient inventory picking sequence. Order information is keyboarded only once, while labels, bills, and shipping documents are generated automatically. Information reaches hand-held scanners, which warehouse staff members use to fill orders. The advantages of automation include low inventory error rates and high processing speeds.

To summarise, factors that must be considered in the warehouse equation are:

- Location of customers;
- Size of orders;
- Frequency of deliveries;
- Lead times.

4 Transportation

Transportation usually represents the greatest distribution cost. It is usually easy to calculate because it can be related directly to weight or numbers of units. Costs must be carefully controlled through the mode of transport selected amongst alternatives, and these must be constantly reviewed. During the past 50 years, road transport has become the dominant transportation mode in India. It has the advantage of speed coupled with door-to-door delivery.

The patterns of retailing that have developed, and the pressure caused by low stock holding and short lead times, have made road transport indispensable. When the volume of goods being transported reaches a certain level some companies purchase their own vehicles, rather than use the services of haulage contractors. However, some large retail chains like Marks and Spencer, Tesco and Sainsbury's have now entrusted all their warehousing and transport to specialist logistics companies as mentioned earlier.



Transportation modes

For some types of goods, transport by rail still has advantages. When lead-time is a less critical element of marketing effort, or when lowering transport costs is a major objective, this mode of transport becomes viable. Similarly, when goods are hazardous or bulky in relation to value, and produced in large volumes then rail transport is advantageous. Rail transport is also suitable for light goods that require speedy delivery (e.g. letter and parcel post).

Exporting poses particular transportation problems and challenges. The need for the exporter's services needs to be such that the customer is scarcely aware that the goods purchased have been imported. Therefore, above all, export transportation must be reliable.

The chosen transportation mode should adequately protect goods from damage in transit (a factor just mentioned makes air freight popular over longer routes as less packaging is needed than for long sea voyages). Not only do damaged goods erode profits, but frequent claims increase insurance premiums and inconvenience customers, endangering future business.

The Systems or 'Total' Approach to PDM

One of the central themes of this text has been to highlight the need to integrate marketing activities so they combine into a single marketing effort. Because PDM has been neglected in the past, this function has been late in adopting an integrated approach towards its activities. Managers have now become more conscious of the potential of PDM, and recognise that logistical systems should be designed with the total function in mind. A fragmented or disjointed approach to PDM is a principal cause of failure to provide satisfactory service, and causes excessive costs.

Within any PDM structure there is potential for conflict. Individual managers striving to achieve their personal goals can frustrate overall PDM objectives. Sales and marketing management will favour high stock levels, special products and short production runs coupled with frequent deliveries.

Against this, the transport manager attempts to reduce costs by selecting more economical, but slower transportation methods, or by waiting until a load is full before making a delivery. Financial management will exercise pressure to reduce inventory wherever possible and discourage extended warehousing networks.

Production managers will favour long production runs and standard products. It is possible for all these management areas to 'appear' efficient if they succeed in realising their individual objectives, but this might well be at the cost of the chosen marketing strategy not being implemented effectively. Burbidge (1987) has provided guidelines to how levels of service to customers can be provided at optimal cost.

Senior management must communicate overall distribution objectives to all company management and ensure that they are understood. Ideally, the systems approach to PDM should encompass production and production planning, purchasing and sales forecasting. Included in the systems approach is the concept of total cost, because individual costs are less important than the total cost.

The cost of holding high stocks may appear unreasonable, but if high stocks provide a service that leads to higher sales and profits, then

the total cost of all the PDM activities will have been effective. Costs are a reflection of distribution strategy, and maximum service cannot be provided at minimum cost.

PDM as a cost centre is worth extensive analysis as this function is now recognised as a valuable marketing tool in its own right. In homogeneous product markets, where differences in competitive prices may be negligible, service is often the major competitive weapon. Indeed, many buyers pay a premium for products that are consistently delivered on time. Similarly, the salesperson whose company provides a comprehensive spare parts and service facility, has a valuable negotiating tool when discussing prices.

Distribution is not, therefore, an adjunct to marketing; it has a full place in the marketing mix and can be an essential component of marketing strategy. In terms of marketing planning, a well-organised business logistics system can help to identify opportunities as well as supplying quantitative data that can be used to optimise the marketing mix as a whole.

Monitoring and Control of PDM

The objective of PDM is: **Getting the right goods to the right place at the right time for the least cost'.**

The objective seems reasonable, although it gives little guidance on specific measures of operational effectiveness. Management needs objectives or criteria that, in turn, allow meaningful evaluation of performance. This is the basis of monitoring and control.

Basic Output of Physical Distribution Systems

The output from any system of physical distribution is the level of customer service. This is a key competitive benefit that companies can offer existing and potential customers to retain or attract business. From a policy point of view, the desired level of service should be at least equivalent to that of major competitors.

The level of service is often viewed as the time it takes to deliver an order to a customer or the percentage of orders that can be met from stock. Other service elements include technical assistance, training and after-sales services. The two most important service elements to the majority of firms are:

- Delivery - reliability and frequency;
- Stock availability - the ability to meet orders quickly.

Distribution Strategy

Distribution strategy is influenced by the market structure, the firm's objectives, its resources and of course it's overall marketing strategy. All these factors are addressed in the section on selecting Distribution Channels.

The first strategic decision is whether the distribution is to be: Intensive (with mass distribution into all outlets as in the case of confectionery); Selective (with carefully chosen distributors e.g. speciality goods such as car repair kits); or Exclusive (with distribution restricted to upmarket outlets, as in the case of Gucci clothes).

The next strategic decision clarifies the number of levels within a channel such as agents, distributors, wholesalers, retailers. In some Japanese markets there are many, many intermediaries involved. Two common strategies are Vertical Marketing Systems and Horizontal Marketing Systems.

Vertical Marketing Systems involve suppliers and intermediaries working closely together instead of against each other. They plan production and delivery schedules, quality levels, promotions and sometimes prices. Resources, like information, equipment and expertise, are shared. The system is usually managed by a dominant member, or 'channel captain'. VMS is more flexible than vertical integration where the manufacturer actually owns the distribution channel, for example, Doctor Martens boot manufacturers own their own retail store.

Horizontal Marketing Systems occur where organisations operating on the same channel level (e.g. two suppliers or two retailers)

co-operate. They then share their distribution expertise and distribution channels. This can speed up the time taken to penetrate the market. There is room for creative alliances here.

Resources available affect distribution strategy. Who can handle outbound logistics, marketing and sales, and servicing? Can the supplier afford to deliver small quantities, can it provide more trucks, can its sales force 'push' products into national retail chains? Can the organisation deal with thousands, maybe even millions of customers - can it cope? Does it want to devote huge resources here or would it prefer to utilise someone else's resources in return for a slice of the profits?

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Lesson 1.2 - Marketing Channels

Learning Objectives

After reading this lesson you will be able to

- Define and understand the concept of Distribution Channel
- Identify various channels of distribution
- Understand the various channel design decisions
- Identify the channel objectives & channel alternatives
- Understand various issues in channel relations

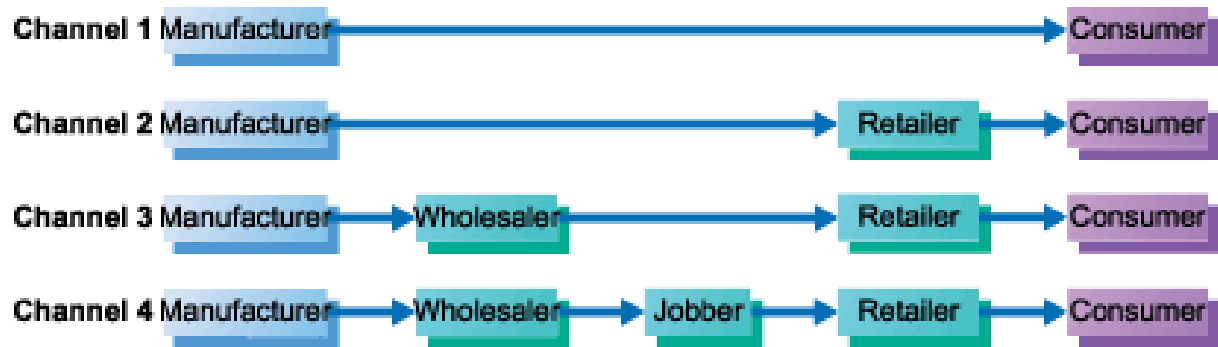
Marketing Channels

Sets of interdependent organizations involved in the process of making a product or service available for use or consumption.

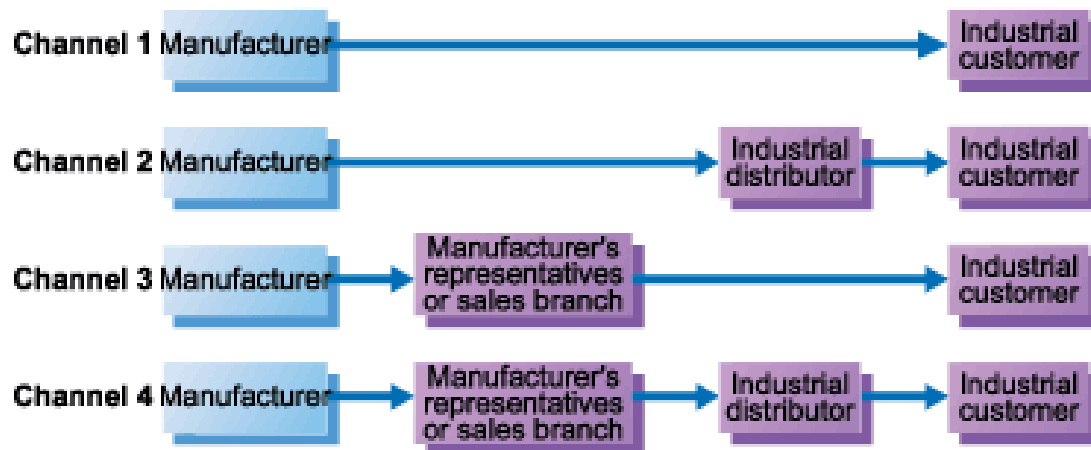
Distribution Channels

Distribution channels move products and services from businesses to consumers and to other businesses. Also known as marketing channels, channels of distribution consist of a set of interdependent organizations—such as wholesalers, retailers, and sales agents—involved in making a product or service available for use or consumption. Distribution channels are just one component of the overall concept of distribution networks, which are the real, tangible systems of interconnected sources and destinations through which products pass on their way to final consumers.

As Howard J. Weiss and Mark E. Gershon noted in ***Production and Operations Management***, a basic distribution network consists of two parts: 1) a set of locations that store, ship, or receive materials (such as factories, warehouses, retail outlets); and 2) a set of routes (land, sea, air, satellite, cable, Internet) that connect these locations.



A. Customer marketing channels



B. Business marketing channels

Consumer and Business Marketing Channels

Distribution networks may be classified as either simple or complex. A simple distribution network is one that consists of only a single source of supply, a single source of demand, or both, along with fixed transportation routes connecting that source with other parts of the network. In a simple distribution network, the major decisions for managers to make include when and how much to order and ship, based on internal purchasing and inventory considerations.

In short, distribution describes all the logistics involved in delivering a company's products or services to the right place, at the right time, for the lowest cost. In the unending efforts to realize these goals, the channels of distribution selected by a business play a vital role in this process. Well-chosen channels constitute a significant competitive advantage, while poorly conceived or chosen channels can doom even a superior product or service to failure in the market.

Multiple Channels of Distribution

For many products and services, their manufacturers or providers use multiple channels of distribution. A personal computer, for example, might be bought directly from the manufacturer, either over the telephone, direct mail, or the Internet, or through several kinds of retailers, including independent computer stores, franchised computer stores, and department stores. In addition, large and small businesses may make their purchases through other outlets.

Channel structures range from two to five levels. The simplest is a two-level structure in which goods and services move directly from the manufacturer or provider to the consumer. Two-level structures occur in some industries where consumers are able to order products directly from the manufacturer and the manufacturer fulfills those orders through its own physical distribution system.

In a three-level channel structure retailers serve as intermediaries between consumers and manufacturers. Retailers order products directly from the manufacturer, then sell those products directly to the consumer. A fourth level is added when manufacturers sell to wholesalers rather than to retailers. In a four-level structure, retailers order goods from wholesalers rather than manufacturers.

Finally, a manufacturer's agent can serve as an intermediary between the manufacturer and its wholesalers, creating a five-level channel structure consisting of the manufacturer, agent, wholesale, retail, and consumer levels. A five-level channel structure might also consist of the manufacturer, wholesale, jobber, retail, and consumer levels, whereby jobbers service smaller retailers not covered by the large wholesalers in the industry.

Why are they used?

- Because producers lack resources to carry out direct marketing.
- Because direct marketing is not feasible.
- Because rate of return on manufacturing increases rate of return on retailing.
- Because they reduce the amount of work that must be done.

Channel Functions & Flows

Info-Promotion-Negotiation-Ordering-Financing-Risk taking-
Physical possession-Payment-Title

All of the functions have 3 things in common:

1. They use up scarce resources.
2. Can be performed better through specialization.
3. They are shift able among channel members.

Channel Levels

Each intermediary that performs work in bringing the product & its title closer is a channel level.

- Zero-channel level (direct-marketing channel) consists of a manufacturer selling directly to the final customer (i.e. door-to-door sales, mail order. Telemarketing, TV selling)
- One level channel contains one selling intermediary (i.e. retailer)
- Two level...(wholesalers, retailers)
- Three level...(wholesalers, jobbers, retailers)
- The longer the channel, the more difficult it is to exercise control.

Channel-Design Decisions

Designing a channel system calls for analyzing customer needs, establishing channel objectives, & identifying & evaluating the major channel alternatives.

Analyzing Customers' desired service output levels

Channels produce 5 service output levels:

1. **Lot size:** # of units that the marketing channel permits a typical customer to purchase on a purchase occasion
2. **Waiting time:** Average time that customers of that channel wait for receipt of the goods.

3. **Spatial convenience:** Degree to which the marketing channel makes it easy for customers to purchase the product.
4. **Product variety:** assortment breadth.
5. **Service backup:** add-on services provided by the channel (installation, repairs, credit).

Establishing the Channel Objectives & Constraints

The channel objectives should be stated in terms of targeted services output level. Under competitive conditions, channel institutions should arrange their functional tasks so as to minimize total channel costs with respect to tasks desired levels of service output.

Effective channel planning requires manufactures to determine which market segment to serve and the best channels to use in each case. Each producer develops its channel objectives in the face of constraints stemming from products, intermediaries, competitors, company policy, environment and the level of service output desired by target customers.

Product characteristics:- Perishable products require more direct marketing because of the dangers associated with delays and repeated handling. Bulky products require channels that minimize the shipping distance.

Custom-built machinery and specialized business forms are sold directly by company sales representatives because middlemen lack the requisite knowledge. Products requiring installation and/or maintenance services are usually sold and maintained by the company or exclusively branches dealers.

Competitive characteristics:- Channel design is influenced by the competitor's channels. The producer may want to compete in or near the same outlets carrying the competitor's products. In some other industries, producers may want to avoid the channels used by competitors.

- Channels objectives vary with product characteristics.
- Channel design must take into account the strengths & weaknesses of different types of intermediaries.

- Channel design is also influenced by the competitors' channels.
- Channel design must also adapt to the larger environment.
- Legal regulations & restrictions also affect channel design.

Identifying the Major Channel Alternatives

A channel alternative is described by three elements:

1. Types of Intermediaries.

Depends on the service outputs desired by the target mkt & the channel's transactions costs. The company must search for the channel alternative that promises the most long-run profitability.

2. Number of Intermediaries.

Company has to decide on the number of middlemen to use at each channel level. Three strategies are available

- Intensive Distribution:- Producers of convenience goods etc. typically seek intensive distribution that is stocking their product in numerous outlets. These goods must have place utility.
- Exclusive Distribution:- Some producers limit the number of intermediaries handling their products. Through exclusive distribution the manufacturer hopes to obtain more aggressive and knowledgeable selling and more control over intermediaries policies on prices, promotion, credit and various activities.
- Exclusive distribution
- Selective
- Intensive

3. Terms & Responsibilities of Channel Members

The producer must determine the rights & responsibilities of the participating channel members, making sure that each channel member is treated respectfully & given the opportunity to be profitable.

Evaluating the Major Channel Alternatives

Each alternative needs to be evaluated against three criteria.

1. Economic Criteria

- The first step is to determine whether a company sales force or a sales agency will produce more sales.
- The next step is to estimate the costs of selling different volumes through each channel.
- The final step is comparing sales & costs.

Each channel will produce a different level of sales & costs.

2. Control Criteria

The agents may concentrate on other customers' products or they may lack the skills to handle our products.

3. Adaptive Criteria

The channel members must make some degree of commitment to each other for a Specified period of time.

Channel-Management Decisions

After a company has chosen a channel alternative, individual intermediaries must be selected, motivated & evaluated.

Selecting Channel Members

For some producers this is easy; for others it's a pain in the ass. Anyway, in order to select them, producers should determine what characteristics distinguish the better intermediaries (years in business, other lines carried, solvency, reputation, etc.)

Legal & Ethical Issues in Channel Relations

- Exclusive dealing
- Exclusive territories

- Tying agreements
- Dealers' rights

Buying a computer in the post, petrol at a supermarket, mortgages over the phone and phones themselves from vending machines are just some innovations in distribution which create competitive advantage as customers are offered newer, faster, cheaper, safer and easier ways of buying products and services.

Without distribution even the best product or service fails. Author Jean-Jacques Lambin believes a marketer has two roles:

- (1) To organize exchange through distribution and
- (2) To organize communication.

Physical distribution, or Place, must integrate with the other 'P's in the marketing mix. For example, the design of product packaging must fit onto a pallet, into a truck and onto a shelf; prices are often determined by distribution channels; and the image of the channel must fit in with the supplier's required 'positioning'. You can see how Coca Cola further integrate the timing of distribution and promotion in the Hall Of Fame later. In fact, they see distribution as one of their "core competencies".

Distribution is Important Because

Firstly, it affects sales - if it's not available it can't be sold. Most customers won't wait.

Secondly, distribution affects profits and competitiveness since it can contribute up to 50 percent of the final selling price of some goods. This affects cost competitiveness as well as profits since margins are squeezed by distribution costs. Thirdly, delivery is seen as part of the product influencing customer satisfaction. Distribution and its associated customer service play a big part in relationship marketing.

Decisions about physical distribution are key strategic decisions. They are not short term. Increasingly it involves strategic alliances and partnerships which are founded on trust and mutual benefits. We are seeing the birth of strategic distribution alliances. Channels change

throughout a product's life cycle. Changing lifestyles, aspirations and expectations along with the IT explosion offer new opportunities of using distribution to create a competitive edge. Controlling the flow of products and services from producer to customer requires careful consideration. It can determine success or failure in the market place. The choice of channel includes choosing among and between distributors, agents, retailers, franchisees, direct marketing and a sales force. Deciding between blanket coverage or selective distribution, vertical systems or multi-channel networks, strategic alliances or solo sales forces, requires strong strategic thinking. Decisions about levels of stock, minimum order quantities, delivery methods, delivery frequency and warehouse locations have major cash flow implications as well as customer satisfaction implications.

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Lesson 1.3 - Channel Members

Learning Objectives

After reading this lesson you will be able to

- Identify and understand how to elect channel members
- Examine channel structure
- Understand various membership issues
- Understand how the channel design takes place
- Understand Managing Channel Design decisions

Electing Members Within a Channel

Having decided to go through intermediaries the next question is whether to use agents or distributors and also how many. Unlike distributors, agents don't hold stocks - they only act as sales agents finding customers, collecting orders and passing them on to the supplier in return for a percentage commission.

Selection of a Distributor or an Agent an Assessment

1. Market Coverage,
2. Sales Forecast,
3. Cost,
4. Other Resources,
5. Profitability,
6. Control,
7. Motivation,
8. Reputation,
9. Competition,
10. Contracts

1. Market Coverage: - does the profile of existing customers match your target market profile? - is the number of customers big enough to meet the required distribution penetration? - is the existing sales force big enough to cover the territory? - are they dependant on a single individual? - are the existing delivery fleet and warehouse facilities adequate?
2. Sales Forecast: How many can they sell? What are their forecasts based upon? Do they give a 'best, worst and average' forecast? Will they invest in large stock commitment? Do they have budgets to run promotions? Some suppliers even ask their distributors for a marketing plan showing how they intend to market the supplier's products.
3. Cost: What will it cost in terms of discounts, commissions, stock investment and marketing support?
4. Other Resources: Does the target market require anything special such as technical advice, installation, quick deliveries, instant availability? If so can the distributor provide it?
5. Profitability: How much profit will the distributor generate for the supplier?
6. Control: Do they have a reporting system in place? How do they deal with problems? How often are review meetings scheduled? Can you influence the way they present your products?
7. Motivation: Does the agent or distributor convey a sense of excitement and enthusiasm about the product? What about its sales force - what's their reaction?
8. Reputation: Has it got a good track record? This includes the number of years in business, growth and profit record, solvency, general stability and overall reliability. Is it dependant on one key player?
9. Competition: Do they distribute any competitor's products?
10. Contracts: Some distributors demand exclusivity. Some agreements tie the supplier in for certain periods of time. Check for flexibility in case things go wrong.

The bottom line is: Can the agent or distributor be motivated, controlled and trusted? Motivated to sell your product among a range of others. Controlled to feed back results or change strategy if requested. And trusted to act as a reliable ambassador of your product?

Channel Structure and Membership Issues

Paths to the Customer

For most products and situations, it is generally more efficient for a manufacturer to go through a distributor rather than selling directly to the customer. This is especially the case when consumers need to have **variety and assortment** (e.g., consumer would like to buy not just toothpaste but also other personal hygiene products, and even other grocery products at the same place), when products are bought in **small volumes** or at low value (e.g., a chocolate sells for less than ₹ 1.00), or even intermediaries have **skills or resources** that the manufacturer does not (a sales force, warehousing, and financing).

Nevertheless, there are situations when these conditions are not met—most typically in industrial settings. As an extreme case, most airlines are perfectly happy only being able to buy aircraft and accessories from Boeing and would prefer not to go through a retailer—particularly since the planes are often highly customized.

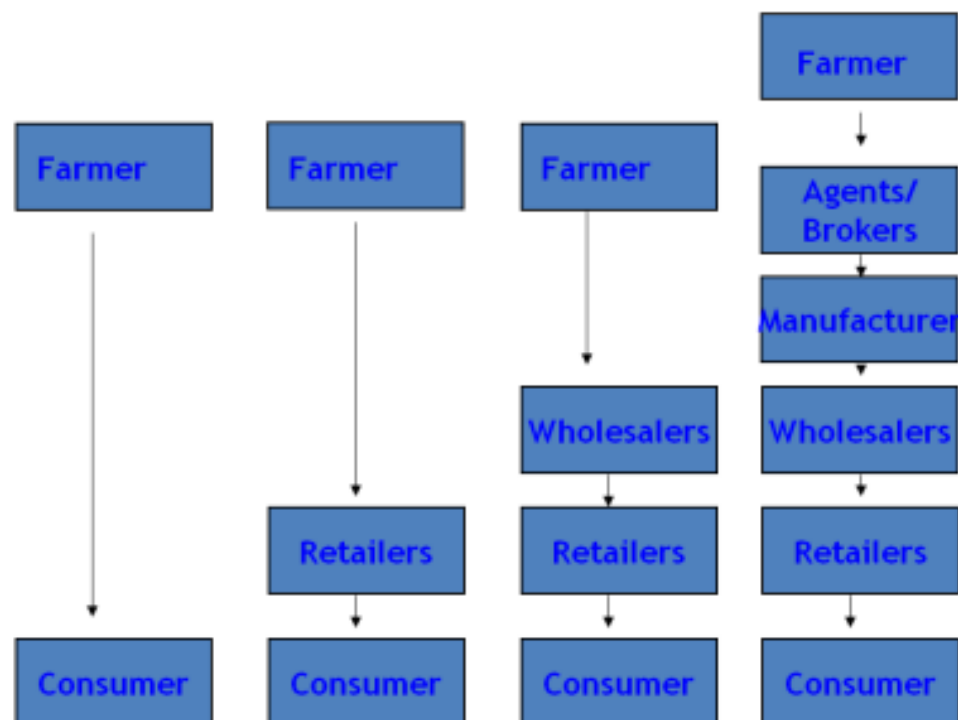
More in the “gray” area, it may or may not be appropriate to sell microcomputers directly to consumers rather than going through a distributor—the costs of providing those costs may be roughly comparable to the margin that a distributor would take.

Potential Channel Structures

Channel structures can assume a variety of forms. In the extreme case of Boeing aircraft or commercial satellites, the product is made by the manufacturer and sent directly to the customer’s preferred delivery site. The manufacturer, may, however, involve a broker or agent who handles negotiations but does not take physical possession of the property.

When deals take on a smaller magnitude, however, it may be appropriate to involve retailer--but no other intermediary. For example, automobiles, small planes, and yachts are frequently sold by the manufacturer to a dealer who then sends directly to the customer.

It does not make sense to deliver these bulky products to a wholesaler only to move them again. As the need for variety increases, a wholesaler may then be introduced. For example, an office supply store needs to sell more merchandise than any one manufacturer can produce.



Channel Structure

Therefore, a wholesaler will buy a very large quantity of binders, file folders, staplers, reams of paper, glue sticks, and similar products and sell this in smaller quantities—say 200 staplers at a time—to the office supply store, which, in turn, may go to another wholesaler who has acquired telephones, typewriters, and photocopiers.

Note that more than one wholesaler level may be involved—a local wholesaler serving the Inland Empire may buy from each of the two wholesalers listed above and then sell all, or most, of the products needed by local office supply stores.

Finally, even in longer channels, agents or brokers may be involved. This, in particular, will happen when the owner of a small, entrepreneurial company has more experience with technology than with businesses negotiations. Here, the manufacturer can be freed, in return for paying the agent, from such tasks, allowing him or her to focus on what he or she does well

Criteria in Selecting Channel Members

Typically, the most important consideration whether to include a potential channel member is the cost at which he or she can perform the required functions at the needed level of service. For example, it will be much less expensive for a specialty foods manufacturer to have a wholesaler get its products to the retailer.

On the other hand, it would not be cost effective for Procter & Gamble and Wal-Mart to involve a third party to move their merchandise—Wal-Mart has been able to develop, based on its information systems and huge demand volumes, a more efficient distribution system.

Note the Important Caveat that Cost Alone is not the only Consideration

Premium furniture must arrive in the store on time in perfect condition, so paying more for a more dependable distributor would be indicated. Further, channels for perishable products are often inefficiently short, but the additional cost is needed in order to ensure that the merchandise moves quickly. Note also that image is important—Wal-Mart could very efficiently carry Rolex watches, but this would destroy value from the brand.

“Piggy-Backing”

A special opportunity to gain distribution that a manufacturer would otherwise lack involves “piggy-backing.” Here, a manufacturer enlists another manufacturer that already has a channel to a desired customer base, to pick up products into an existing channel. For example, a manufacturer of rhinoseros and hippopotamus shampoo might be able to reach zoos by approaching a manufacturer of crocodile teeth cleaning supplies that already reaches this target. In the case of ***reciprocal***

piggy-backing, the shampoo manufacturer might then, in turn, bring the teeth cleaning supplies through its existing channel to exotic animal veterinarians.

Parallel Distribution

Most manufacturers find it useful to go through at least one wholesaler in order to reach the retailer, and it is simply not efficient for Colgate to sell directly to pathetic little “mom and pop” neighborhood stores. However, large retail chains such as K-Mart and Ralph’s buy toothpaste and other Colgate products in such large volumes that it may be efficient to sell directly to those chains.

Thus, we have a “parallel” distribution network whereby some retailers buy through a distributor and others do not. Note that we may also be tempted to add a direct channel—e.g., many clothing manufacturers have factory outlet stores. However, note that the full service retailers will likely object to being “undercut” in this manner and may decide to drop or give less emphasis to the brand. It may be possible to minimize this contract by precautions such as:

- (1) Having outlet stores located in vacation areas not within easy access of most people,
- (2) Presenting the merchandise as being slightly irregular, and/or
- (3) Emphasizing discontinued brands and merchandise not sold in regular stores.

Evaluating Channel Performance

The performance of channel members should be periodically monitored—a channel member may have looked attractive earlier but may not, in practice be able to live up to promises. (This can be either because of complacency or because the channel member simply did not realize the skills and resources needed to perform to standards). Thus, performance level (service outputs) and costs should be evaluated.

Further, changes in technology or in the market place may make it worthwhile to shift certain functions to another channel member

(e.g., a distributor has expanded its coverage into another region or may have gained or lost access to certain retail chains). Finally, the extent to which compensation is awarded in proportion to performance should be reassessed—e.g., a distributor that ends up holding inventory longer or taking on more returns may need additional compensation.

Channel Design

A firm must become involved in the channel design process when it is considering entering the market with a new product or when existing supply chains are falling short of performance objectives.

The design process consists of the following steps:

1. Establish objectives.
2. Formulate a strategy.
3. Determine structure alternatives.
4. Evaluate structure alternatives.
5. Select structure.
6. Determine alternatives for individual channel members.
7. Evaluate and select individual members.
8. Measure and evaluate channel performance.
9. Evaluate alternatives when performance objectives are not met, or attractive new options become available.

Development of the Channels of Distribution

The emergence of channels of distribution has been explained in terms of the following factors:

1. Intermediaries evolve in the process of exchange because they can increase the efficiency of the process by creating time, place, and possession utility.
2. Channel intermediaries enable the adjustment of the discrepancy of assortment by performing the functions of sorting and assorting. Discrepancy of assortment will be described shortly.
3. Marketing agencies form channel arrangements to make transactions routine.

4. Channels facilitate the searching process by consumers.

Marketing channels develop because intermediaries (e.g., wholesalers and retailers) make the marketing process more efficient by reducing the number of market contacts. In primitive cultures, for example, most household needs are met by family members.

By many household needs can be met more efficiently by exchange. Specialization in production creates efficiency for this reason; it has become a way of life. A household must exchange goods and services to provide for all of its needs.

The advantage of an intermediary is greater as the number of specialized producers increases.

Intermediaries provide possession, time, and place utility. They create possession utility through the process of exchange, the result of the buying and selling functions. They provide time utility by holding inventory available for sale.

And they provide place utility by physically moving goods to the market. The assortment of goods and services held by a producer and the assortment demanded by the customer often differ. The primary function of channel intermediaries is to adjust this discrepancy by performing the following “sorting” processes:

1. Sorting out.
2. Accumulating.
3. Allocation.
4. Assorting.

Channel Structure

Channel structure may be viewed as a function of product life cycle, logistics systems, effective communication networks, product characteristics, or firm. However, the most detailed theory of channel structure was developed by Louis P. Bucklin, who stated that the purpose of the channel is to provide consumers with the desired combination of its outputs (i.e., lot size, delivery time, and market decentralization) at

minimal cost. Consumers determine channel structure by purchasing combinations of service outputs.

The best channel forms when no other group of institutions generates more profits or more consumer satisfaction per dollar of product cost. Bucklin concluded that functions will be shifted from one channel member to another in order to achieve the most efficient and effective channel structure.

The Factors that Might Influence Channel Structure Include

1. Outsourcing.
2. Postponement and speculation.
3. Speed.
4. Technological, cultural, physical, social, and political factors.
5. Physical factors - geography, size of market area, location of production centers, and concentration of population.
6. Local, state, and federal laws.
7. Social and behavioural variables.

Flows in the Channel of Distribution

Channel of Distribution

An example of the various channels of distribution that a manufacturer of grocery products might use. The manufacturer sells its products to wholesalers, chain stores, cooperatives, and the military. The wholesalers and coops service retail accounts. Accounts are serviced by a national sales force.

Product and Information Flows

Illustrates the product and information flows that take place in a channel. Remember the product flows take place only after information flows are initiated. In addition to product and information flows, payments for the merchandise and promotional inventories back in the channel. The quality and speed of the information flows determine the safety stock held at each level of the channel.

Types of Distribution

Three types of distribution can be used to make product available to consumers:

- (1) Intensive distribution,
- (2) Selective distribution and
- (3) Exclusive distribution.

In intensive distribution, the product is sold to as many appropriate retailers or wholesalers as possible. Intensive distribution is appropriate for products such as chewing gum, candy bars, soft drinks, bread, film, and cigarettes where the primary factor influencing the purchase decision is convenience.

Industrial products that may require intensive distribution include pencils, paperclips, transparent tape, file folders, typing paper, transparency masters, screws, and nails. In selective distribution, the number of outlets that may carry a product is limited, but not to the extent of exclusive dealing.

By carefully selecting wholesalers or retailers, the manufacturer can concentrate on potentially profitable accounts and develop solid working relationships to ensure that the product is properly merchandised. The producer also may restrict the number of retail outlets if the product requires specialized servicing or sales support. Selective distribution may be used for product categories such as clothing, appliances, televisions, stereo equipment, home furnishings, and sports equipment.

When a single outlet is given an exclusive franchise to sell the product in a geographic area, the arrangement is referred to as exclusive distribution. Products such as specially automobiles, some major appliances, certain brands of furniture, and lines of clothing that enjoy a high degree of brand loyalty are likely to be distributed on an exclusive basis.

This is particularly true if the consumer is willing to overcome the inconvenience of travelling some distance to obtain the product. Usually, exclusive distribution is undertaken when the manufacturer desires more

aggressive selling on the part of the wholesaler or retailer, or when channel control is important, exclusive distribution may enhance the product's image and enable the firm to charge higher retail prices.

Sometimes manufacturers use multiple brands in order to offer exclusive distribution to more than one retailer or distributor. Exclusive distribution occurs more frequently at the wholesale level than at the retail level. In general, exclusive distribution lends itself to direct channels (manufacturer to retailer). Intensive distribution is more likely to involve indirect channels with two or more intermediaries.

Channel Design and the Customer

Channel selection and deployment is one of the most critical issues facing companies today. Customers are in the drivers' seats, as they should be, when it comes to the buying relationship. Powerful products and, to some degree, great brands no longer provide sustainable differentiation to customers. Customers are looking for superior value in all the solutions they consider. Increasingly, the sales channel creates the most powerful and sustainable differentiation in delivering superior value to customers.

However, much of what companies do today in deploying sales channels keeps them from establishing the highest performance, most effective channels. Many companies are not getting the sales growth, market penetration and customer share they should because of ineffective channel design and deployment.

In assessing the channel effectiveness of dozens of organizations worldwide, we find companies doing things backwards. They are designing their sales channels from inside-out, that is, based on a company focused strategy. Our work has shown the easiest and most effective means of designing and deploying high performance sales channels start with the customer.

Traditional Approaches

Unfortunately, many great companies are prisoners of their heritage. Their sales channel design and deployment is driven by their heritage. They continue to do the same thing, only more and faster, not

necessarily better. Those organizations that had a strong focus on company owned field sales channels continue to expand that organization, often losing productivity, effectiveness, and profitability.

Other companies try to do everything, exploiting multiple channels to reach the same customers, confusing the customer, creating channel conflict, eroding margins, losing share and opportunity. These companies have all the traditional channels in place and are adding all the new and fashionable channels (internet, direct marketing, and others) without rationalizing the strategy and approach.

Others drive their channel strategies based solely on financial criteria, namely cost of selling, not treating their sales channels as investments which are expected to produce a reasonable return. We see companies downsizing, shifting from a high fixed cost for their own organization to the lower or variable costs of an indirect channel structure (distributors, resellers, representatives, outsourced telesales). Their decisions are driven by expense criteria, not the ability of the channel to effectively reach the right customers at the right time with the right solutions.

Then there are those that can't decide, every year changing their sales strategy to something different than before. Shifting from indirect sales to company owned sales forces. Moving to inside sales. Moving to direct marketing. Moving to the internet. Then starting the whole process again when each move fails to achieve the results needed.

All of these activities are driven by dozens of task forces, studies, organizational assessments and other research efforts to look at the right channel design.

These efforts all miss the point! Moreover, they make channel design and deployment more complicated than it really is. The easiest way to design high performance sales channels is to start with the customer! Once you know who your customers are and how they want to buy, then you can design the channel that most effectively reaches those customers in the way that is most effective.

Channel Design Is Not Rocket Science!

Customer focused channel design and deployment is not rocket science. Effective design, however, requires a disciplined approach to understanding who your customers are and how they buy. Designing a customer-focused channel involves several simple steps:

- Start with the customer. Who are the customers we want to serve? Do we want to expand our relationships with our current customers? Do we want to acquire new customers? What share of customer objectives do we have?
- How do we segment these customers and characterize each segment? What markets do we serve, which products and services are directed to which customers or markets? Remember that customers in similar segments but different geographies may behave very differently (i.e. are your French customers the same as your Chinese and Chilean customers?). What goals or objectives do we have with each segment?
- How do these customers/segments buy solutions like those that we offer? What is involved in their buying process? What steps does the customer go through in defining requirements and specifications, evaluating, selecting, and implementing a solution? Does it require close and frequent interaction? Is it complex, with many people involved in the buying decisions? Does the buying process require close involvement and contact with the “factory?” Is there a lot of customization and integration required? Are there complementary services or products required to provide a complete solution?
- Who do they buy those solutions from? How do they buy the solutions? Direct field sales organization (hunters, farmers?), inside sales, distribution, resellers, reps, Internet, catalog, OEM, integrator, retail, supplier chain relationship?
- What are their expectations of those solution providers? What level of service and support is important in the buying and implementation process?
- How do these solution providers complement and add value to the offerings of the suppliers? They are part of the value delivery chain and need to add value not cost.

- What is the profile of these solution providers, what are their characteristics? How are they organized to support the customers? What programs and capabilities do they need to have? What relationship do they have with the manufacturer?
- What do those solution providers expect of their suppliers? What is the value proposition for channel partner (internal or external)? How do we motivate them to wake up every morning excited about selling our products and services over those of any one else (including other divisions within our organization)?
- How do we map our products and services into the channels that most effectively reach these customers? Which products and services are we going to sell to which customers through which channel?
- What channel programs do we need to put in place to support the channels? What marketing programs are we going to direct to the customer/segment and channel to drive sales growth in the desired area? What programs, policies, processes are needed by segment/channel?

Exploring these issues in the sequence outlined will help establish the design and the deployment of the correct sales resources to achieve your objectives. The “right” channel design and structure becomes will start to become obvious with this analysis. Usually, a couple of alternatives that emerge and a variety of criteria can be used in selecting the best alternative.

In addition to making the channel design and deployment process much easier, the tremendous power to this approach is that since it is customer driven, it will become immediately obvious and easy for your customer to buy your products and solutions in a manner that is most closely tailored to how they want to acquire solutions. This means you sell more stuff to more people more effectively and efficiently!

Critical Success Factors

Based on our experience, few companies can achieve their objectives with a single channel strategy approach. Most organizations must establish

a variety of different channels to reach their customers most effectively. Leading companies will have a combination of many different channels. However, from the customer view, the sales channel should be very clear and easy to understand!

Rule 1: Don't confuse the customer about how he acquires your solutions; keep it simple, intuitive and obvious!

There are too many alternatives for your customers to choose from. Their job is not to sort through how to buy your product, which channel to work with, what price to pay, who is good, who is bad. They just want to procure a solution in the easiest manner possible.

If the customer is in any way confused about who they should buy from, the channel has been defined incorrectly. We need to make it very clear and simple about how to buy our products. If the customer cannot easily understand who they should purchase the product from, they will go somewhere else. Part of what we need to do is make our products and services easy to buy or acquire.

Rule 2: There will be overlap in channels, but this should be minimized and managed effectively. Focus your channels on competing against the competition, not against each other.

The real world is not black and white, there are many shades of gray. It is impossible to define the channel structure cleanly. Design your channel strategy in a way that your channels spend more time fighting the competition than they do fighting each other. The latter case will only produce dissatisfaction with customer and the channels. Ultimately it leads to pricing/margin erosion and share erosion.

Rule 3: Don't over-distribute your products. Over-distribution means that you will compete against yourself not your competition. You will lose the loyalty of your channel and lose customers.

We like to recommend sufficient coverage of the market with your channels, not over-saturation. Too many outlets, ultimately, is a losing proposition for all. Make sure there is a reasonable business proposition for

your channel partners. Are the markets they address with your solutions sufficient to support their investments and to provide an adequate return?

Rule 4: Remember your channel partners are your customers as well. What's your value proposition to them?

Often we are very good at defining our value proposition to our end customers. However, we forget that we need to define the value proposition for our channel partners, as well. How do we create excitement, awareness, and a high desire to sell our products, over other products that the sales channel has to sell (This applies to field sales, as well.)? We need to think of how do we make our products and services compelling to for them to sell.

Rule 5: Mindshare in the channel is based on how important your products and services are to their success. If you aren't in the top five, you won't get sufficient attention.

Most sales organizations have a range of products and services on which they choose to spend their time. They will tend to focus on a few areas, in which they can maximize the return on their investment in time. If your products and services will not be one of the top one's in which they focus, you will not get the attention that you need to achieve your goals.

You will want to re-assess your channel strategy and programs to assure that you get the right attention on your products. With a field-oriented channel, you may want to put in place special emphasis programs or even an overlay, specialized sales organization. With indirect organizations, you may want to choose different partners. Web-based channels will require other action.

Rule 6: Consider your customer and product life cycles in your channel design. Different channels are required depending on where your customers are in their growth and maturity. Likewise, your product life cycles impact channel decisions.

Many companies make the mistake of determining the channel strategy at product launch, then never changing it as the product matures

in the market. Likewise, our customers will change their buying process over time.

For example, as products get more commoditized, in the customer's mind, they will change how they procure these solutions. If we have not adopted our channel strategy to support this change, we may not be reaching the right customers, with the right message. This impacts both the top and bottom line.

Rule 6A: Channel strategies cannot be cast in concrete. They must evolve, or sometimes, go through revolutionary change!

We must continue to reassess and tune our channel strategies based on how our customers and markets change. Not doing this will cause us to be left in the dust, losing share, revenue and profits. Many industries are undergoing profound and radical change, which requires new thinking.

Designing The Channel Is Just The Start!

Designing the channel is just the start, what counts is execution! The best channel design in the world, does not mean anything until we start implementing it and tuning the strategy for reality. This includes putting the channel in place, putting the programs in place to support the channel, and putting the measurements in place to assure they are accomplishing what we expected. Continually monitoring performance and tuning the organization in their execution of the strategy is critical to achieving the business results we want.

Marketing Channel Design Decisions

Marketing channel (also termed channels of distribution) design decisions are critical for successful product distribution. Marketing channels consist of intermediaries who contribute to the product distribution process according to consumer demand. They consist of merchant middlemen, agent middlemen, and facilitators.

Companies rely on market intermediaries because of their effectiveness in distributing products as well as their capitalization. A company's chosen channel members develop long-term relationships

built on trust, and directly affect the marketing process including price. Marketing channels always have a producer and a final consumer.

Merchant Middlemen

Merchant middlemen consist of wholesalers and retailers who actually purchase the product and resell it. Wholesalers buy in large lots and sell in smaller quantities to retailers who in turn sell individual units to the consumer. Wholesalers and retailers assume the risk of ownership in return for a profit markup when selling the merchandise to others.

Agent Middlemen

Agent middlemen are sales intermediaries such as brokers, product representatives and sales representatives who seek others to purchase merchandise. They do not actually purchase any merchandise and are compensated on the basis of a percentage of sales and/or salary depending on whether they are independent business people or employees of companies wishing to sell products.

Facilitators

Facilitators are intermediaries who directly assist in the distribution function without taking title to the goods. They consist of a range of organizations including advertising agencies, financial lending organizations, shipping companies, and storage warehouses.

Channel Length

Channel length describes the number of intermediary levels existing between the producer and the consumer. A direct, or zero, channel is one where there is a direct relationship between the producer and the consumer (e.g., a neighborhood bakery may be considered a direct channel since the retail consumer purchases the finished baked goods directly with no intermediaries). A one-level channel has one intermediary which is usually a retailer (e.g., a regional bakery goods operation utilizes local food stores to distribute the product to the consumer).

A two-level channel has two intermediaries to distribute products to the consumer (e.g., a candy manufacturer sells the product to a wholesaler who in turn sells to the retailer). A three-level channel has three intermediaries normally consisting of an agent middleman who sells to a wholesaler who then sells to a retailer.

How are Channels Developed?

Developing channels of distribution requires many decisions. Channel distribution needs grow and develop as companies grow and markets change. Increased channel utilization increases costs which are passed on to the consumer. The design of channel development begins by studying the buying patterns of the target customers.

Consumer buying patterns affect a channel's characteristics and are classified in the following ways:

- *Units purchased.* Different customers have different purchasing needs. Commercial customers normally purchase larger lot sizes than do the household consumer. Channel modifications have to be made to meet these different needs.
- *Turnaround times.* Some industries, such as fast foods, use rapid turnaround times as an inherent part of the business, while other businesses may have longer turnaround times. Industries having customers needing rapid turnaround times require more direct channels of distribution than those with slower turnaround times.
- *Product assortment.* Industries, particularly retail, offering large product assortments have a need for deeper channels of distribution in order to provide product variety.
- *Services.* High levels of services, including repair, delivery, installation and others, require more intensive channel utilization.

Determining the number of intermediaries will affect the marketing of a product. Longer channels have more intermediaries and higher costs. On the other hand, intermediary expertise may be essential for successfully marketing a particular product. Thus, a manufacturer may try and limit the number of intermediaries in order to contain costs. The tradeoff in having fewer intermediaries is limited distribution.

As manufacturers continue to penetrate markets, greater distribution is desired involving more intermediaries. While this will increase distribution, it will also increase costs while sacrificing some degree of marketing control. This may result in having the product incorrectly positioned.

Finally, not all intermediaries are the same. The marketer wants only those intermediaries who most effectively work with the company to distribute the product.

Generally, the companies having the largest array of retail products, particularly product consumables, have the least need for intermediaries. They are well-enough positioned in the market to deal directly with retail outlets. Smaller companies with smaller product lines have a greater need for the market distribution strengths of intermediaries.

Products that are perishable, time sensitive (such as fashions), heavy and bulky, or are highly unique in nature (such as those requiring specialized training) generally have short channels of distribution. On the other hand, standardized products often move through several intermediaries in the distribution process.

There are several issues in evaluating channel alternatives. One issue is choosing the most economically effective channel alternative. Companies must evaluate channel intermediaries based on those that have the largest level of sales per unit of selling cost.

Other issues concern the extent to which marketing management control will be lost by including a sales agency or other sales broker in the marketing channel. A final variable is choosing a channel intermediary that will still allow the producer to maintain maximum marketing flexibility in fast moving markets.

Several Issues are Important in Channel Management

- *Choosing the most effective channel alternatives.* Management must determine what the characteristics are the most effective channel intermediaries. Having done this, management must develop strategies for attracting these channel intermediaries to the marketing channel.

- *Maximizing channel member effectiveness.* Management must motivate channel members to create the most cost-effective market distribution system for the company.
- *Evaluating the effectiveness of intermediaries.* Management must develop channel member evaluation systems. While seeking the cooperation of channel members, it is still essential to determine what profit standards must be used as the basis for evaluation.

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Lesson 1.4 - Market Segmentation

Learning Objectives

After reading this lesson you will be able to

- Understand what is marketing Segmentation
- Indentify need for marketing segmentation
- Understand requirements of marketing segmentation
- Understand various distribution systems
- Understand target market selection

Market Segmentation

Market segmentation is the identification of portions of the market that are different from one another. Segmentation allows the firm to better satisfy the needs of its potential customers.

The Need for Market Segmentation

The marketing concept calls for understanding customers and satisfying their needs better than the competition. But different customers have different needs, and it rarely is possible to satisfy all customers by treating them alike.

Mass marketing refers to treatment of the market as a homogenous group and offering the same marketing mix to all customers. Mass marketing allows economies of scale to be realized through mass production, mass distribution, and mass communication. The drawback of mass marketing is that customer needs and preferences differ and the same offering is unlikely to be viewed as optimal by all customers. If firms ignored the differing customer needs, another firm likely would enter the market with a product that serves a specific group, and the incumbent firms would lose those customers.

Target marketing on the other hand recognizes the diversity of customers and does not try to please all of them with the same offering. The first step in target marketing is to identify different market segments and their needs.

Requirements of Market Segments

In addition to having different needs, for segments to be practical they should be evaluated against the following criteria:

- **Identifiable:** the differentiating attributes of the segments must be measurable so that they can be identified.
- **Accessible:** the segments must be reachable through communication and distribution channels.
- **Substantial:** the segments should be sufficiently large to justify the resources required to target them.
- **Unique needs:** to justify separate offerings, the segments must respond differently to the different marketing mixes.
- **Durable:** the segments should be relatively stable to minimize the cost of frequent changes.

A good market segmentation will result in segment members that are internally homogenous and externally heterogeneous; that is, as similar as possible within the segment, and as different as possible between segments.

Bases for Segmentation in Consumer Markets

Consumer markets can be segmented on the following customer characteristics.

- Geographic
- Demographic
- Psychographic
- Behavioralistic

Geographic Segmentation

The following are some examples of geographic variables often used in segmentation.

- Region: by continent, country, state, or even neighborhood
- Size of metropolitan area: segmented according to size of population
- Population density: often classified as urban, suburban, or rural
- Climate: according to weather patterns common to certain geographic regions

Demographic Segmentation

Some demographic segmentation variables include:

- Age
- Gender
- Family size
- Family lifecycle
- Generation: baby-boomers, Generation X, etc.
- Income
- Occupation
- Education
- Ethnicity
- Nationality
- Religion
- Social class

Many of these variables have standard categories for their values. For example, family lifecycle often is expressed as bachelor, married with no children (DINKS: Double Income, No Kids), full-nest, empty-nest, or solitary survivor. Some of these categories have several stages, for example, full-nest I, II, or III depending on the age of the children.

Psychographic Segmentation

Psychographic segmentation groups customers according to their lifestyle. Activities, interests, and opinions (AIO) surveys are one tool for measuring lifestyle. Some psychographic variables include:

- Activities
- Interests
- Opinions
- Attitudes
- Values

Behavioralistic Segmentation

Behavioral segmentation is based on actual customer behavior toward products. Some behavioralistic variables include:

- Benefits sought
- Usage rate
- Brand loyalty
- User status: potential, first-time, regular, etc.
- Readiness to buy
- Occasions: holidays and events that stimulate purchases

Behavioral segmentation has the advantage of using variables that are closely related to the product itself. It is a fairly direct starting point for market segmentation.

Bases for Segmentation in Industrial Markets

In contrast to consumers, industrial customers tend to be fewer in number and purchase larger quantities. They evaluate offerings in more detail, and the decision process usually involves more than one person. These characteristics apply to organizations such as manufacturers and service providers, as well as resellers, governments, and institutions.

Many of the consumer market segmentation variables can be applied to industrial markets. Industrial markets might be segmented on characteristics such as:

- Location
- Company type
- Behavioral characteristics

Location

In industrial markets, customer location may be important in some cases. Shipping costs may be a purchase factor for vendor selection for products having a high bulk to value ratio, so distance from the vendor may be critical. In some industries firms tend to cluster together geographically and therefore may have similar needs within a region.

Company Type

Business customers can be classified according to type as follows:

- Company size
- Industry
- Decision making unit
- Purchase Criteria

Behavioral Characteristics

In industrial markets, patterns of purchase behavior can be a basis for segmentation. Such behavioral characteristics may include:

- Usage rate
- Buying status: potential, first-time, regular, etc.
- Purchase procedure: sealed bids, negotiations, etc.

Distribution Systems

Mindful of the factors affecting distribution decisions (i.e., marketing decision issues and relationship issues), the marketer has several options to choose from when settling on a design for their distribution network. We stress the word “may” since while in theory an option would appear to be available, marketing decision factors (e.g., product, promotion, pricing, target markets) or the nature of distribution channel relationships may not permit the marketer to pursue a particular option. For example, selling through a desired retailer may not be feasible if the retailer refuses to handle a product.

For marketers the choice of distribution design comes down to the following options:

1. Direct Distribution Systems
2. Indirect Distribution Systems
3. Multi-Channel or Hybrid Distribution Systems

Distribution Systems: Direct

With a direct distribution system the marketer reaches the intended final user of their product by distributing the product directly to the customer. That is, there are no other parties involved in the distribution process that take ownership of the product. The direct system can be further divided by the method of communication that takes place when a sale occurs. These methods are:

- Direct Marketing Systems – With this system the customer places the order either through information gained from non-personal contact with the marketer, such as by visiting the marketer's website or ordering from the marketer's catalog, or through personal communication with a customer representative who is not a salesperson, such as through toll-free telephone ordering.
- Direct Retail Systems – This type of system exists when a product marketer also operates their own retail outlets. As previously discussed, Starbucks would fall into this category.
- Personal Selling Systems – The key to this direct distribution system is that a person whose main responsibility involves creating and managing sales (e.g., salesperson) is involved in the distribution process, generally by persuading the buyer to place an order. While the order itself may not be handled by the salesperson (e.g., buyer physically places the order online or by phone) the salesperson plays a role in generating the sales.
- Assisted Marketing Systems – Under the assisted marketing system, the marketer relies on others to help communicate the marketer's products but handles distribution directly to the customer. The classic example of assisted marketing systems is eBay which helps bring buyers and sellers together for a fee. Other agents and brokers would also fall into this category.

Distribution Systems: Indirect

With an indirect distribution system the marketer reaches the intended final user with the help of others. These resellers generally take ownership of the product, though in some cases they may sell products on a consignment basis (i.e., only pay the supplying company if the product is sold). Under this system intermediaries may be expected to assume many responsibilities to help sell the product.

Indirect methods include:

- **Single-Party Selling System** - Under this system the marketer engages another party who then sells and distributes directly to the final customer. This is most likely to occur when the product is sold through large store-based retail chains or through online retailers, in which case it is often referred to as a trade selling system.
- **Multiple-Party Selling System** - This indirect distribution system has the product passing through two or more distributors before reaching the final customer. The most likely scenario is when a wholesaler purchases from the manufacturer and sells the product to retailers.

Distribution Systems: Multi-Channel (Hybrid)

In cases where a marketer utilizes more than one distribution design the marketer is following a multi-channel or hybrid distribution system.

As we discussed, Starbucks follows this approach as their distribution design includes using a direct retail system by selling in company-owned stores, a direct marketing system by selling via direct mail, and a single-party selling system by selling through grocery stores (they also use other distribution systems).

The multi-channel approach expands distribution and allows the marketer to reach a wider market, however, as we discussed under Channel Relationships, the marketer must be careful with this approach due to the potential for channel conflict.

Target Market Selection

Target marketing tailors a marketing mix for one or more segments identified by market segmentation. Target marketing contrasts with mass marketing, which offers a single product to the entire market.

Two important factors to consider when selecting a target market segment are the attractiveness of the segment and the fit between the segment and the firm's objectives, resources, and capabilities.

Attractiveness of a Market Segment

The following are some examples of aspects that should be considered when evaluating the attractiveness of a market segment:

- Size of the segment (number of customers and/or number of units)
- Growth rate of the segment
- Competition in the segment
- Brand loyalty of existing customers in the segment
- Attainable market share given promotional budget and competitors' expenditures
- Required market share to break even
- Sales potential for the firm in the segment
- Expected profit margins in the segment

Market research and analysis is instrumental in obtaining this information. For example, buyer intentions, sales force estimates, test marketing, and statistical demand analysis are useful for determining sales potential. The impact of applicable micro-environmental and macro-environmental variables on the market segment should be considered.

Note that larger segments are not necessarily the most profitable to target since they likely will have more competition. It may be more profitable to serve one or more smaller segments that have little competition. On the other hand, if the firm can develop a competitive advantage, for example, via patent protection, it may find it profitable to pursue a larger market segment.

Suitability of Market Segments to the Firm

Market segments also should be evaluated according to how they fit the firm's objectives, resources, and capabilities. Some aspects of fit include:

- Whether the firm can offer superior value to the customers in the segment
- The impact of serving the segment on the firm's image
- Access to distribution channels required to serve the segment
- The firm's resources vs. capital investment required to serve the segment

The better the firm's fit to a market segment and the more attractive the market segment, the greater the profit potential to the firm.

Target Market Strategies

There are several different target-market strategies that may be followed. Targeting strategies usually can be categorized as one of the following:

- **Single-segment strategy** - also known as a concentrated strategy. One market segment (not the entire market) is served with one marketing mix. A single-segment approach often is the strategy of choice for smaller companies with limited resources.
- **Selective specialization** - this is a multiple-segment strategy, also known as a differentiated strategy. Different marketing mixes are offered to different segments. The product itself may or may not be different - in many cases only the promotional message or distribution channels vary.
- **Product specialization** - the firm specializes in a particular product and tailors it to different market segments.
- **Market specialization** - the firm specializes in serving a particular market segment and offers that segment an array of different products.

- **Full market coverage** - the firm attempts to serve the entire market. This coverage can be achieved by means of either a mass market strategy in which a single undifferentiated marketing mix is offered to the entire market, or by a differentiated strategy in which a separate marketing mix is offered to each segment.

The following diagrams show examples of the five market selection patterns given three market segments S_1 , S_2 , and S_3 , and three products P_1 , P_2 , and P_3 .

Single Segment	Selective Specialization	Product Specialization	Market Specialization	Full Market Coverage
S₁ S₂ S₃ P₁ P₂ P₃	S₁ S₂ S₃ P₁ P₂ P₃	S₁ S₂ S₃ P₁ P₂ P₃	S₁ S₂ S₃ P₁ P₂ P₃	S₁ S₂ S₃ P₁ P₂ P₃

A firm that is seeking to enter a market and grow should first target the most attractive segment that matches its capabilities. Once it gains a foothold, it can expand by pursuing a product specialization strategy, tailoring the product for different segments, or by pursuing a market specialization strategy and offering new products to its existing market segment.

Another strategy whose use is increasing is **individual marketing**, in which the marketing mix is tailored on an individual consumer basis. While in the past impractical, individual marketing is becoming more viable thanks to advances in technology.

The Benefits of Targeted Marketing

Targeted marketing enables you to get to appropriate prospective customers more efficiently than any other marketing strategy. Here's some of the benefits of targeted marketing.

Batch targeting: This is where you break your overall target market down into manageable segments - such as one specific industry,

or a geographical area, or a demographic profile. The segments should not just be ones which are convenient to you, but ones which allow you to direct, to one specific target market, promotional messages which:

- Are highly relevant to the prospects in that sector
- Convince them that you are a specialist in *their* own activity / interest area
- Show them that you can meet their own *specific* needs.

If, for example, you sell office equipment or consumables, you obviously have a vast market - almost every type of business. But, instead of sending out thousands of mailings to every type of business, pick out, say, stone quarries (to pick an unusual example!) You could focus on dust covers for equipment and the more rugged end of office equipment ranges.

You can demonstrate that you understand the needs of the quarrying industry. If you've got a few customers in that type of industry, you will already understand their requirements. If not, pick up the phone and ***without trying to sell***, do a little market research amongst two or three prospects in that sector.

By showing that you are a specialist supplier, you'll stand out from all your other 'me too' competitors. This must be a significant competitive advantage. We know of an insurance broker who was just your average broker until he started to focus on selling insurance to dentists. Within two years, he was the UK's leading broker to the dental profession.

To summarise, the advantages of targeted marketing are:

- Your attention is focused on one specific market area, which is likely to result in your marketing campaigns being far more cost- and time-efficient.
- You appear to be a specialist in the prospective customer's own field, and you can increasingly build up a reputation as being just that.
- Your promotion material is highly relevant to their needs, and is less likely to be junked

- By differentiating yourself from your competitors, prospective customers are less likely to focus on price as the key issue, thus enhancing your profit margins

When is targeted marketing useful?

Here's a detailed description of how to carry out a low-cost targeted marketing campaign, using telephone selling and direct mail. The end result is to get sales appointments to gain new customers.

When can this targeted marketing approach be used?

This particular approach works when:

- You are selling into one market sector or into a wide number of sectors (a 'market sector' is best defined here as a particular industry or type of business).
- You are selling to businesses (B2B) rather than to retail consumers.
- You are prepared to experiment a little, trying different approaches.
- You don't mind using the telephone (or have got a volunteer to phone for you!) and you have got some way of sending out 20 - 50 letters per week (say, a simple mailmerge program on a word processor).
- You need new customers!

Self Assessment Questions

1. Discuss the importance of Physical distribution?
2. List out the functions of physical distribution in the fast changing economies?
3. Describe about the Principal components of the distribution process.
4. Illustrate "total approach" to Physical distribution concept.
5. Describe Basic output of physical distribution systems
6. Analyze Cost – trade off model
7. Illustrate and explain about distribution environment
8. Discuss Distribution strategy

9. Discuss multiple channels are used for distribution?
10. Elaborate on the functions of a channel?
11. Identify various channel levels?
12. Analyze Customers' desired service output levels
13. Describe how to identify channel alternatives?
14. List out the legal & ethical issues involved in channel management?
15. Discuss the criteria to select a distributor or agent?
16. Explain about channel structure?
17. Explain channel design process?
18. List out the factors that might affect channel structure.
19. Discuss about types of distribution.
20. Channel design is not a rocket science. Discuss.
21. What are the critical success factors in channel strategy?
22. Discuss the issues in marketing channel design decisions.
23. *What are the challenges in managing market channel intermediaries?*
24. What is the need for market segmentation?
25. What are the requirements of market segments?
26. What are the bases for segmentation in consumer markets?
27. What are bases for segmentation in industrial markets?
28. Explain various types of distribution systems?
29. What are the aspects that attract a market segment?
30. Explain the market strategies?
31. What is Batch targeting?
32. When target marketing is useful and what approaches can be followed?
33. Discuss seven stages of target marketing.

CASE STUDY

Supply Chain Success: Dell Computers

Michael Dell the man behind Dell Computers started in 1984 with the exceptional idea of selling PCs through a mail-order approach. It offered customers a customised configuration. The approach enabled Dell to cut down the price of a computer by saving on the margins of distributors and retailers. Also, this approach enabled Dell to deliver PCs at short notice.

Dell upgraded its supply chain by making small changes in the path a computer earlier used to travel to reach the customer. The web was used to offer online visibility of components, configurations, costs and delivery. Customers could choose from various options and arrive at a configuration that suited them.

Once the order was received the computer was built using just in time (JIT) manufacturing. This resulted in many benefits like lower costs and quick deliveries. There was no need of maintaining higher inventories. Dell positioned its warehouses at locations close to their factories so that components could be easily and swiftly called for. Dell started their innovation process by taking the customers views on various aspects of the deal.

Dell did well because of its competitive strategies like identifying and taking advantage of opportunities that existed but was still untouched. They made the customers the focal point of their activities and tried to provide the best service to them. They maintained the quality of their products so that so that the customers achieved two advantages: a customised computer and a high performing machine at that.

Dell was also successful because it created an IT-based manufacturing system along the entire supply chain. It used the web, computerised manufacturing systems, EDI, videoconferencing, electronic procurement, intranets, Decision Support System (DSS) and a web-based call centre.

As part of the company's continual efforts to improve its supply chain process, recently, Dell positioned a supply chain tool named 'i2' 'TradeMatrix' to forecast global views on product demand and materials requirements and to improve factory scheduling and inventory management. Dell suppliers and Supply Logistics Centres (SLCs) were able to view short and long-term materials requirements in each Dell factory globally due to these new supply chain tools.

Optimising delivery and inventory use in Dell factories was one of the primary goals of i2 implementation. The i2 implementation. The i2 solution thus has increased the efficiency of Dell, which has already been a leader in innovation in SCM.

Source:: Anurag Saxena and Kaaushik Sircar (2008), Logistics & Supply Chain Management.

CASE STUDY

Supply Chain Success: Mumbai Dabbawalas

The Dabbawalas of Mumbai are unique case in logistics. Neatly stacked dabbas (tiffins or lunch boxes) are a common sight at most of the rail way stations, late every morning in Mumbai, India. A man is who is illiterate or semi-literate delivers hot lunch at the doorstep of the subscriber. It is an error-free and there are virtually no mismatches.

The Mumbai Tiffin Box Suppliers Association is a 38-year-old organization with 4,500 members and a huge, loyalty customer base. Their customer base include office goers, students, shopkeepers, etc. Instead of carrying their own lunch at an early hour in the morning, they prefer to subscribe this dabba service.

For a small fee, the dabbawala picks up the freshly packed lunch from the subscribers house and deliver it to his/her office at lunch time. Once lunch is over, the empty dabba is again collected by the dabbawala. This is done with the help of Mumbai's extremely efficient railway system called th Mumbai locals.

There are special trains known as dabbawala specials. The dabbas change many hands and are loaded and offloaded in many trains before their final delivery.

There is a scientific method of putting an identification mark on each dabba. Each dabba lid is marked a particular code. The code format is 'DBOF' where D denotes the dabbawala's number (assigned by the association), BO is a combination indicating the building/office and F is the floor number of that building where the tiffin box has to be delivered.

The lid is also marked with a number denoting the railway station where the box has to be off-loaded, followed by an alphabet indicating the station where it is to be picked up. Can you imagine what the fee for all of this is? The service charges vary between ₹ 150 (US\$3) to ₹ 300 (US\$6) per month, depending on the customer's location and the distance covered.

This service was started by a Parsi banker when he enjoyed a carrier to fetch his lunch every afternoon. The idea caught on and this inspired many unemployed people to become dabba carriers. Soon, each dabbawala had a handful of customers. To ensure that each carrier worked only in a particular district and didn't interfere with other dabbawalas, a union called the 'Mumbai Tiffin Box Carriers Association' was formed in 1968.

Today, there are more than 5000 semi-literate dabbawallas who transport 1,75,000 boxes in a 3-hour period, traversing 25 km using public transportation, involving multiple transfer points. In 1998, Forbes Global magazine conducted an analysis of the service and gave the dabbawalas a six sigma efficiency rating.

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UNIT - II

Unit Structure

Lesson 2.1 - Managing the Marketing Channel

Lesson 2.2 - Channel Members

Lesson 2.3 - Channel Flows

Lesson 2.4 - Product Issues in Channel Management

Lesson 2.1 - Managing the Marketing Channel

Learning Objectives

After reading this lesson you will be able to

- Understand how to manage the marketing channel
- Identify various channel intermediaries
- Identify various methods to motivate channel members
- Know channel arrangements modification
- Understand channel conflicts and managing channel conflicts

Managing the Marketing Channel

Sales channels (being the conduits by which we distribute our products to the end-user) come in many shapes—from direct, to the web, to the traditional retail environment. And, we're just doing whatever we can to get any business from any of them! But is that the most efficient and effective approach?

That's where Channel Management comes in. Channel management, as a process by which a company creates formalized programs for selling and servicing customers within a specific channel, can really impact your

business—and in a positive way! To get started, first segment your channels by like characteristics (their needs, buying patterns, success factors, etc.) and then customize a channel management program that includes:

1. **Goals.** Define the specific goals you have for each channel segment. Consider your goals for the channel as whole as well as individual accounts. And, remember to consider your goals for both acquisition and retention.
2. **Policies.** Construct well-defined policies for administering the accounts within this channel. Be sure to keep the unique characteristics of each segment in mind when defining policies for account set up, order management, product fulfillment, etc.
3. **Products.** Identify which products in your offering are most suited for each segment and create appropriate messaging. Also, determine where your upsell opportunities lie.
4. **Sales/Marketing Programs.** Design support programs for your channel that meet their needs, not what your idea of their needs are. To do this, you should start by asking your customers within this segment, “how can we best support you in the selling and marketing of our products?” That being said, the standard considerations are product training, co-op advertising, seasonal promotions, and merchandising. Again, this is not a one-size fits all, so be diligent about addressing this segment’s SPECIFIC needs in these areas.

Defining a channel management strategy for each segment allows you to be more effective within each segment, while gaining efficiency at the same time. Still, maintaining brand consistency across all channel segments is critical to your long-term success. So find a good balance between customization and brand consistency and you’ll be on your way to successful channel management.

Channel Intermediaries

Channels of Distribution are Essential for Getting Products to Consumers

Most companies would encounter administrative and logistical problems in trying to deliver their goods and services to each of their end-

consumers. Instead, companies more often than not use intermediaries to distribute their products. This chapter aims to develop an understanding of the “place” element of the marketing mix and the role of intermediaries in marketing channels. Approaches to designing a channel of distribution and issues in the management and control of intermediaries are discussed.

Definition of a Channel Intermediary

A **marketing channel** has been defined as “a system of relationships existing among businesses that participate in the process of buying and selling products and services”. Channel **intermediaries** are those organisations which facilitate the distribution of goods to the ultimate customer. The complex roles of intermediaries may include taking physical ownership of products, collecting payment, and offering after-sales service.

Marketing channel management refers to the choice and control of these intermediaries. As more and more tasks are passed onto intermediaries, the producing company starts to lose control and power over its products and how they are sold. A key part of channel management therefore involves the recognition that networks of intermediaries represent social systems as well as economic ones.

The Role of Intermediaries in a Value Chain

The generic **Value Chain** of an organisation describes the activities involved in the manufacture, marketing and delivery of a product or service by the firm.

In order to decide whether a firm should undertake its own distribution direct to consumers or whether it would be more efficient and effective to use intermediaries, it is necessary to understand the functions of these intermediaries. Consumers often want only a limited quantity of a wide range of goods, goods that are conveniently made available under one roof (i.e. in a retail supermarket). Intermediaries can help overcome this **discrepancy of assortment** by reducing dramatically the number of contacts required between suppliers and the end customers

In many cases, intermediaries can have **superior knowledge** of a target market compared to manufacturers. Retailers can therefore add

value to the producer's goods by tailoring their offerings more closely to the specific requirements of consumers.

Intermediaries help to overcome two types of gap:

- A *location gap* occurs due to the geographic separation of producers and the consumers of their goods.
- A *time gap* takes place between when consumers want to actually purchase products and when manufacturers produce them (e.g. manufacturers may prefer to produce on Monday to Friday, but consumers may prefer to buy at weekends). Intermediaries help to reconcile this gap.

Types of Intermediary

A variety of types of intermediary can participate in the value chain. Wholesalers and retailers take title to products, typically building up stocks and thereby assuming risk. Other intermediaries such as agents and brokers do not take title to goods. Instead they arrange exchanges between buyers and sellers and in return receive commissions or fees.

A number of different types of retailer may be identified:

- *Department stores*, e.g. Debenhams.
- *Supermarkets*, e.g. Reliance.
- *Discount sheds or "category killers"*, e.g. Toys 'R' Us
- *Speciality shops*, e.g. clothing (Next), music (HMV),
- *Convenience or "c" stores*, e.g. 7-Eleven
- *Markets and cash and carry warehouses*, e.g. Makro.
- *Catalogue showrooms*, e.g. Argos.

Multiples are usually defined as retailers with over ten outlets. They have tended to grow at the expense of independent retailers, but have also eroded the market share of the cooperatives. Retailers have their own set of strategic choices. **Location** is usually the most critical issue since it is central to attracting the right kind of customer in sufficient volume to make trade viable. Retailers are using increasingly sophisticated geo-demographic methods to determine the optimum locations for their outlets. Strategic decisions need to be made about what product assortment

to provide and market segments should be served. As East (1997) has pointed out, retailers spend large sums of money in attracting customers, but despite offering factors such as value, choice, friendly service and quality, the main reason cited by supermarket users for patronage is close location.

Designing a Channel of Distribution

Channel objectives will be determined by the organisation's positioning strategy. The "place" element of the marketing mix must be consistent with the remaining marketing tools used by the marketing manager to gain a sustainable competitive advantage.

Three options can be identified

- *Intensive distribution.* Generally used for FMCGs and other relatively low-priced or impulse purchases.
- *Exclusive distribution.* Here, distribution may be limited to a small number of intermediaries who gain better margins and exclusivity.
- *Selective distribution.* This represents a compromise between intensive and selective distribution. The manufacturer is looking for adequate market coverage, but still hopes to select supportive dealers.

There are a number of key influences on channel selection strategies:

- Buyer behaviour (what do customers expect in terms of location and assortment etc.),
- Producer's needs, (an important constraint is the resources that are available to the manufacturer to bring the product to market. Some companies will lack the finances to recruit and reward a salesforce and so will use a wholesaler instead.
- Product type (e.g. fresh produce that is highly perishable requires fairly short channels)
- Competition (e.g. if competitors have exclusive deals with certain intermediaries, then the support of other channel members with similar marketplace penetration may be sought)

A systematic process for *design of a channel* is important. An “end-user” analysis will result in the creation of an “ideal” channel system which offers a multi-channel format catering for the service level demands of each customer segment. This should be evaluated in terms of the company’s objectives and its positioning relative to the competition. A constraints analysis is needed to identify limits which have to be built into any proposed channel structure.

Managers can choose from among three generic marketing channels:

- *Direct marketing.* This involves reaching customers via communications media such as telesales, mailshots, catalogues or advertisements with tear-off reply slips
- *Salesforce.* Here a company might build its own team of salespeople, or perhaps hire an
- *Independent contract sales force.*
- *Channel intermediary.* This alternative is the chief concerned of this chapter.

In general, these channels are shorter than those for consumer goods.

In the case of services, it is not possible to “own” a service and their delivery cannot be easily separated from the service provider. These factors, and the inability to hold an “inventory” of unsold services, means that the role of channel intermediary can be very different for services compared to goods. Companies in both consumer and business-to-business markets use a variety of channels to distribute their products.

Motivating Intermediaries

It is frequently necessary to motivate channel members. This is so because of the differing needs of intermediaries and producers: these needs do not necessarily coincide (e.g., a manufacturer may seek exclusive distribution of its products at high prices, whereas a retailer may be pursuing a strategy of market penetration through budget pricing of a wide range of goods). The situation is further complicated by the fact that intermediaries and producers often have *different perceptions* about their own roles in the supply chain.

Doyle suggests *two levels of motivator*: promotional and partnership. Promotional channel motivators are usually short-term inducements to support the supplier's goods (e.g. trade discounts for large order volumes or providing point-of-sale display materials). Partnership motivators, on the other hand, seek to build a longer-term relationship between suppliers and channel participants (e.g. through sharing of market research information and providing training to a distributor's sales staff).

Evaluation and Control of Intermediaries

Evaluation of channel performance is necessary to decide which intermediaries to retain and which to motivate, or even, where necessary, to discard. Criteria for evaluation are obviously similar to those used in the initial selection decision (see above). Once the relationship between organisations has been established, criteria can include: the sales volume and value of the producer's goods that are generated through the intermediary's outlets, the profitability of servicing that intermediary, the stock levels the intermediary is prepared to hold, the quality of customer service offered, feedback provided about the marketplace and the intermediary's attitude to inter-channel co-operation. However, the scope for evaluation may be severely limited if power lies with the channel member rather than the producer.

Power in Marketing Channels

Using power ultimately means getting other channel members to do something they might otherwise not have done. Since members are inter-dependent, the potential for using power lies with all channel participants. Usually, however, a channel leader emerges. This organisation can derive its power from a number of sources, both economic and non-economic.

If power is used in a manner believed to be unfair by one or more channel members, then *conflict* may arise. Conflict need not necessarily be destructive, since it can encourage managers to question the status quo and find ways of improving their distribution systems. Sometimes, however, strategies employed by firms can create unstable, adversarial relationships between producers and intermediaries.

A strong focus should be placed by marketing departments on relationship management with channel participants. A possible way forward for manufacturers is **Category Management**. This is described by Harlow (1995) as “joint strategic planning with retailers to build total category sales and profit for mutual benefit” and is based on the fact that the retailer wishes to maximise the profits from an overall category rather than from a specific brand.

A category is seen as a group of products all satisfying the same consumer need, e.g. toothpaste as opposed to, say, Crest. Category management is an advance on the “push” policies of trade marketing (i.e. to the retailer) and provides “pull” by sharing the ownership of brand strategy with the intermediary.

Partnerships between producers and intermediaries are also evident in the **Efficient Consumer Response** (ECR) initiative. ECR involves members of the total supply chain working together to respond to customers’ purchasing patterns, thereby ensuring the right products are delivered to store shelves on time.

Franchising Systems

In a franchise system a seller (the franchisor) gives an intermediary (the franchisee) specific services (such as marketing support) and rights to market the seller’s product or service within an agreed territory. In return, the franchisee agrees to follow certain procedures and not to buy from unauthorised sellers.

The franchisor also typically offers assistance in management and staff training, merchandising and operating systems. This support is usually provided in exchange for a specified fee or royalties on sales from the franchisee. Examples of businesses which are predominantly franchised include McDonald’s, Body Shop, Benetton etc.

Motivating Channel Members

Constant training, supervision & encouragement. Producers can draw on the following types of power to elicit cooperation:

- **Coercive power.** Manufacturer threatens to withdraw a resource or terminate a relationship if intermediaries fail to cooperate. Produces resentment.
- **Reward power.** Manufacturer offers intermediaries extra benefits for performing specific acts.
- **Legitimate power.** Manufacturer requests a behavior that is warranted by the contract.
- **Expert power.** Manufacturer has special knowledge that the intermediaries value.
- **Referent power.** Intermediaries are proud to be identified with the manufacturer.
- A customer asks a retailer, who stocks your pen, for another brand called 'Bad Pens'. The retailer recommends and offers your pen as superior.
- A retailer actively solicits business for you by asking customers buying other products to come and have a look at the exquisite 'Grand Pen'.
- This retailer is obviously very motivated. 'Mindshare', as it is called in the USA, has to do with how important your product is in the distributor's mind relative to the other lines they carry. Winning the battle for the distributor's share of mind can be more important than many other marketing strategies. It applies in industrial markets and consumer markets where intermediaries play important roles in the distribution channel.
- In reality, maintaining continually high levels of motivation among intermediaries presents a challenge. It requires a reasonable quality product, creative promotions, product training, joint visits between producer and distributor, co-operative advertising, merchandising and display.
- Most of these apply to agents as much as distributors and retailers.
- Keeping the intermediary stimulated is important. Positive motivators, like sales contests are preferred to negative motivators like sanctions such as reduced discounts and the threat of terminating the relationship.

- A positive reward works better than a negative punishment. Ideally there should be a shared sense of responsibility - a partnership - a strategic partnership. The supplier and intermediary are there to help each other. Vertical Marketing Systems are a good example.
- Clear communications, covering sales goals, review meetings, reporting procedures, marketing strategy, training, market information required, suggestions for improvements, all help. Regular contact through visits, review meetings, dinners, competitions, newsletters, thank you letters, congratulatory awards all help to keep everyone working closely together.
- These are all non-financial incentives which provide a form of psychic income as opposed to financial income. That's not to say that financial incentives aren't useful motivators, it just means that there are other motivations there too. In fact the money spent on financial incentives is often spent more effectively when the sales person is rewarded with a plaque, a gold pen or a holiday in the Bahamas rather than just the cash which tends to get soaked up and lost in a sea of ordinary household daily expenditure.
- Non cash rewards appeal to the higher levels of Maslow's Hierarchy of Needs - belonging, esteem and self actualization.
- Despite this, conflict can occur when too many distributors are appointed within close proximity of each other, or the producer engages in a multiple channel strategy of direct marketing as well as marketing through intermediaries.
- Carefully motivating distributors is vital if goods are to flow smoothly through the channel and reach satisfied customers.

Modifying Channel Arrangements

Periodic modification to meet new conditions in the marketplace. Modification is necessary when:

- Distribution channel is not working as planned.
- Consumer buying patterns change.
- Market expands.
- New competition arises.

- Innovative channels emerge.
- Product moves into later stages in the product life cycle.

3 levels of channel adaptation can be distinguished:

1. Adding or dropping individual channel members.
2. Adding or dropping particular mkt channels.
3. Developing a totally new way to sell goods in all markets.

Conventional Marketing Channel

- Comprises an independent producer, wholesaler(s) & retailer(s).
- Each is a separate entity.
- No channel member has complete or substantial control over the other members.

Roles of Individual Firms in the Channel

- **Insiders.** Members of the dominant channel.
- **Strivers.** Firms seeking to become insiders.
- **Complementers.** Not part of the dominant channel
- **Transients.** Outside the dominant channel & do not seek membership. Short-run expectations.
- **Outside innovators.** Real challengers & disrupters of the dominant channels.

Channel Cooperation, Conflict & Competition

Types of Conflict & Competition

- **Vertical** channel conflict exists when there is conflict between different levels within the same channel.
- **Horizontal** channel conflict exists when there is conflict between members at the same level within the channel.

- **Multichannel** conflict exists when the manufacturer has established two or more channels that compete with each other in selling to the same mkt.

Causes of Channel Conflict

- Goal incompatibility
- Unclear roles & rights
- Differences in perception
- Intermediaries' great dependence on the manufacturer

Managing Channel Conflict

- Some channel conflict can be constructive. It can lead to more dynamic adaptation to a changing environment. But too much is dysfunctional.
- Perhaps the most important mechanism is the adoption of super ordinate goals. Working closely together might help them eliminate or neutralize the threat.
- Exchange of persons between two or more channel levels is useful.
- Cooptation is an effort by one organization to win support of the leaders of another organization by including them in advisory councils, boards of directors, etc.
- Encouraging joint membership in & between trade associations.

Lesson 2.2 - Channel Members

Learning Objectives

After reading this lesson you will be able to

- Understand benefits offered to channel members
- Identify and understand evaluating channel members and their performance
- Understand the criteria for channel member evaluation
- Understand various issues in channels
- Understand channel conflicts and to overcome them

Benefits Offered by Channel Members

When choosing a distribution strategy a marketer must determine what value a channel member adds to the firm's products. Remember, as we discussed in the Product Decisions tutorial, customers assess a product's value by looking at many factors including those that surround the product (i.e., augmented product). Several surrounding features can be directly influenced by channel members, such as customer service, delivery, and availability. Consequently, for the marketer selecting a channel partner involves a value analysis in the same way customers make purchase decisions. That is, the marketer must assess the benefits received from utilizing a channel partner versus the cost incurred for using the services. These benefits include:

- **Cost Savings in Specialization** – Members of the distribution channel are specialists in what they do and can often perform tasks better and at lower cost than companies who do not have distribution experience. Marketers attempting to handle too many aspects of distribution may end up exhausting company resources as they learn how to distribute, resulting in the company being “a jack of all trades but master of none.”

- **Reduce Exchange Time** – Not only are channel members able to reduce distribution costs by being experienced at what they do, they often perform their job more rapidly resulting in faster product delivery. For instance, consider what would happen if a grocery store received direct shipment from EVERY manufacturer that sells products in the store. This delivery system would be chaotic as hundreds of trucks line up each day to make deliveries, many of which would consist of only a few boxes. On a busy day a truck may sit for hours waiting for space so they can unload their products. Instead, a better distribution scheme may have the grocery store purchasing its supplies from a grocery wholesaler that has its own warehouse for handling simultaneous shipments from a large number of suppliers. The wholesaler will distribute to the store in the quantities the store needs, on a schedule that works for the store, and often in a single truck, all of which speeds up the time it takes to get the product on the store's shelves.
- **Customers Want to Conveniently Shop for Variety** – Marketers have to understand what customers want in their shopping experience. Referring back to our grocery store example, consider a world without grocery stores and instead each marketer of grocery products sells through their own stores. As it is now, shopping is time consuming, but consider what would happen if customers had to visit multiple retailers each week to satisfy their grocery needs. Hence, resellers within the channel of distribution serve two very important needs: 1) they give customers the products they want by purchasing from many suppliers (termed accumulating and assortment services), and 2) they make it convenient to purchase by making products available in single location.
- **Resellers Sell Smaller Quantities** – Not only do resellers allow customers to purchase products from a variety of suppliers, they also allow customers to purchase in quantities that work for them. Suppliers though like to ship products they produce in large quantities since this is more cost effective than shipping smaller amounts. For instance, consider what it costs to drive a truck a long distance. In terms of operational expenses for the truck (e.g., fuel, truck driver's cost) let's assume it costs ₹ 1,000 to go from point A to point B. Yet in most cases, with the exception of a little decrease in fuel efficiency, it does not cost that much more to drive the

truck whether it is filled with 1000 boxes containing the product or whether it only has 100 boxes. But when transportation costs are considered on a per product basis (₹ 1 per box vs. ₹ 10 per box) the cost is much less for a full truck. The ability of intermediaries to purchase large quantities but to resell them in smaller quantities (referred to as bulk breaking) not only makes these products available to those wanting smaller quantities but the reseller is able to pass along to their customers a significant portion of the cost savings gained by purchasing in large volume.

- **Create Sales** – Resellers are at the front line when it comes to creating demand for the marketer's product. In some cases resellers perform an active selling role using persuasive techniques to encourage customers to purchase a marketer's product. In other cases they encourage sales of the product through their own advertising efforts and using other promotional means such as special product displays.
- **Offer Financial Support** – Resellers often provide programs that enable customers to more easily purchase products by offering financial programs that ease payment requirements. These programs include allowing customers to: purchase on credit; purchase using a payment plan; delay the start of payments; and allowing trade-in or exchange options.
- **Provide Information** – Companies utilizing resellers for selling their products depend on distributors to provide information that can help improve the product. High-level intermediaries may offer their suppliers real-time access to sales data including information showing how products are selling by such characteristics as geographic location, type of customer, and product location (e.g., where located within a store, where found on a website). If high-level information is not available, marketers can often count on resellers to provide feedback as to how customers are responding to products. This feedback can occur either through surveys or interviews with reseller's employees or by requesting the reseller allow the marketer to survey customers.

Evaluating Potential Channel Members

Once a pool of potential channel members has been identified, it is necessary to determine whether they would be suitable. The first step in the evaluation process is to identify appropriate evaluation criteria. These criteria will reflect the distribution objectives and tasks set by the manufacturer earlier in the channel design process. Some typical evaluation criteria include:

- Credit worthiness and financial condition
 - Sales strength - quality, skill and number of sales people
 - Product lines - competitive products, compatible products, complementary products, quality of lines carried
 - Reputation and image
 - Markets served - geographic coverage, target markets, market contacts
 - Sales performance - volume, profitability, call conversion rate
 - Management succession - longevity and continuity of the firm
 - Management ability - managing the business and the sales force
 - Attitude - enthusiasm, motivation, initiative
 - Size - larger intermediaries are normally preferred
- Costs of Utilizing Channel Members

Loss of Revenue – Resellers are not likely to offer services to a marketer unless they see financial gain in doing so. They obtain payment for their services as either direct payment (e.g., marketer pays for shipping costs) or, in the case of resellers, by charging their customers more than what they paid the marketer for acquiring the product (termed markup).

For the latter, marketers have a good idea of what the final customer will pay for their product which means the marketer must charge less when selling the product to resellers. In these situations marketers are not reaping the full sale price by using resellers, which they may be able to do if they sold directly to the customer.

- **Loss of Communication Control** – Marketers not only give up revenue when using resellers, they may also give up control of the message being conveyed to customers. If the reseller engages

in communication activities, such as personal selling in order to get customers to purchase the product, the marketer is no longer controlling what is being said about the product. This can lead to miscommunication problems with customers, especially if the reseller embellishes the benefits the product provides to the customer. While marketers can influence what is being said by training reseller's salespeople, they lack ultimate control of the message.

- Loss of Product Importance – Once a product is out of the marketer's hands the -importance of that product is left up to channel members. If there are pressing issues in the channel, such as transportation problems, or if a competitor is using promotional incentives in an effort to push their product through resellers, the marketer's product may not get the attention the marketer feels it should receive.

Evaluating Channel Member Performance

1. Degree of manufacturer control
2. Relative importance of channel member
3. Nature of the product
4. Number of channel members involved

Criteria for Evaluation

- Sales performance
- Inventory maintenance
- Selling capabilities
- How competitive product lines and competitors are handled
- Attitudes
- General growth prospects
- Other

Channel Arrangements

The distribution channel consists of many parties each seeking to meet their own business objectives. Clearly for the channel to work

well, relationships between channel members must be strong with each member understanding and trusting others on whom they depend for product distribution to flow smoothly.

For instance, a small sporting goods retailer that purchases products from a wholesaler trusts the wholesaler to deliver required items on-time in order to meet customer demand, while the wholesaler counts on the retailer to place regular orders and to make on-time payments.

Relationships in a channel are in large part a function of the arrangement that occurs between the members. These arrangements can be divided in two main categories:

1. Independent Channel Arrangements
2. Dependent Channel Arrangement

Channel Arrangements: Independent

Under this arrangement a channel member negotiates deals with others that do not result in binding relationships. In other words, a channel member is free to make whatever arrangements they feel is in their best interest. This so-called “conventional” distribution arrangement often leads to significant conflict as individual members decide what is best for them and not necessarily for the entire channel.

On the other hand, an independent channel arrangement is less restrictive than dependent arrangements and makes it easier for a channel members to move away from relationships they feel are not working to their benefit.

Channel Arrangements: Dependent

Under this arrangement a channel member feels tied to one or more members of the distribution channel. Sometimes referred to as “vertical marketing systems” this approach makes it more difficult for an individual member to make changes to how products are distributed. However, the dependent approach provides much more stability and consistency since members are united in their goals. The dependent channel arrangement can be broken down into three types:

- **Corporate** – Under this arrangement a supplier operates its own distribution system in a manner that produces an integrated channel. This occurs most frequently in the retail industry where a supplier operates a chain of retail stores. Starbucks is a company that does this. They import and process coffee and then sell it under their own brand name in their own stores. It should be mentioned that Starbucks also distributes their products in other ways, such as through grocery stores and mail order. As we will see in more detail later, Starbucks is using a multi-channel structure to market their products.
- **Contractual** – Under this arrangement a legal document obligates members to agree on how a product is distributed. Often times the agreement specifically spells out which activities each member is permitted to perform or not perform. This type of arrangement can occur in several formats including:
 - **Wholesaler-sponsored** – where a wholesaler brings together and manages many independent retailers including having the retailers use the same name
 - **Retailer-sponsored** – this format also brings together retailers but the retailers are responsible for managing the relationship
 - **Franchised** – where a central organization controls nearly all activities of other members
 - **Administrative** – In certain channel arrangements a single member may dominate the decisions that occur within the channel. These situations occur when one channel member has achieved a significant power position. This most likely occurs if a manufacturer has significant power due to brands in strong demand by target markets (e.g., Procter & Gamble) or if a retailer has significant power due to size and market coverage (e.g., Wal-Mart). In most cases the arrangement is understood to occur and is not bound by legal or financial arrangements. (More discussion on channel power can be found below.)

Issues in Establishing Distribution Channels

Like most marketing decisions, a great deal of research and thought must go into determining how to carry out distribution activities in a way

that meets a marketer's objectives. The marketer must consider many factors when establishing a distribution system. Some factors are directly related to marketing decisions while others are affected by relationships that exist with members of the channel.

Next we examine the key factors to consider when designing a distribution strategy. We group these into two main categories:

1. Marketing Decision Issues
2. Channel Relationship Issues

In turn, each of these categories contains several topics of concern to marketers.

Level of Distribution Coverage

As we will see the marketer must take into consideration many factors when choosing the right level of distribution coverage. However, all marketers should understand that distribution creates costs to the organization. Some of these expenses can be passed along to customers (e.g., shipping costs) but others cannot (e.g., need for additional salespeople to handle more distributors). Thus, the process for determining the right level of distribution coverage often comes down to an analysis of the benefits (e.g., more sales) versus the cost associated with gain the benefits.

Additionally, it is worth noting that for the most part distribution coverage decisions are of most concern to consumer products companies, though there are many industrial products that also must decide how much coverage to give their products.

There are three main levels of distribution coverage - mass coverage, selective and exclusive.

- **Mass Coverage** - The mass coverage (also known as intensive distribution) strategy attempts to distribute products widely in nearly all locations in which that type of product is sold. This level of distribution is only feasible for relatively low priced products that appeal to very large target markets (e.g., see consumer convenience products). A product such as Coca-Cola is a classic example since

it is available in a wide variety of locations including grocery stores, convenience stores, vending machines, hotels and many, many more. With such a large number of locations selling the product the cost of distribution is extremely high and must be offset with very high sales volume.

- **Selective Coverage** - Under selective coverage the marketer deliberately seeks to limit the locations in which this type of product is sold. To the non-marketer it may seem strange for a marketer to not want to distribute their product in every possible location. However, the logic of this strategy is tied to the size and nature of the product's target market. Products with selective coverage appeal to smaller, more focused target markets (e.g., see consumer shopping products) compared to the size of target markets for mass marketed products. Consequently, because the market size is smaller, the number of locations needed to support the distribution of the product is fewer.
- **Exclusive Coverage** - Some high-end products target very narrow markets that have a relatively small number of customers. These customers are often characterized as "discriminating" in their taste for products and seek to satisfy some of their needs with high-quality, though expensive products. Additionally, many buyers of high-end products require a high level of customer service from the channel member from whom they purchase. These characteristics of the target market may lead the marketer to sell their products through a very select or exclusive group of resellers. Another type of exclusive distribution may not involve high-end products but rather products only available in selected locations such as company-owned stores. While these products may or may not be higher priced compared to competitive products, the fact these are only available in company outlets give exclusivity to the distribution.

We conclude this section by noting that while the three distribution coverage options just discussed serve as a useful guide for envisioning how distribution intensity works, the advent of the Internet has brought into question the effectiveness of these schemes.

For all intents and purposes all products available for purchase over the Internet are distributed in the same way - mass coverage. So a

better way to look at the three levels is to consider these as options for distribution coverage of products that are physically purchased by a customer (i.e., walk-in to purchase).

Relationship Issues in Channels

Since channel members must be convinced to handle a marketer's product it makes sense to consider channel partner's needs in the same way the marketer considers the final user's needs. However, the needs of channel members are much different than those of the final customer. As we noted in the

Delivery – Resellers want the product delivered on-time and in good condition in order to meet customer demand and avoid inventory out-of-stocks.

- **Profit Margin** – Resellers are in business to make money so a key factor in their decision to handle a product is how much money they will make on each product sold. They expect that the difference (i.e., margin) between their cost for acquiring the product from a supplier and the price they charge to sell the product to their customers will be sufficient to meet their profit objectives.
- **Other Incentives** – Besides profit margin, resellers may want other incentives to entice them especially if they are required to give extra effort selling the product. These incentives may be in the form of additional free products or even bonuses (e.g., bonus, free trips) for achieving sales goals.
- **Packaging** – Resellers want to handle products as easily as possible and want their suppliers to ship and sell products in packages that fit within their system. For example, products may need to be a certain size or design in order to fit on a store's shelf, or the shipping package must fit within the reseller's warehouse or receiving dock space. Also, many resellers are now requiring marketers to consider adding identification tags to products (e.g., RFID tags) to allow for easier inventory tracking when the product is received and also when it is sold.

- **Training** – Some products require the reseller to have strong knowledge of the product including demonstrating the product to customers. Marketers must consider offering training to resellers to insure the reseller has the knowledge to present the product accurately.
- **Promotional Help** – Resellers often seek additional help from the product supplier to promote the product to customers. Such help may come in the form of funding for advertisements, point-of-purchase product materials, or in-store demonstrations.

We will continue our discussion of distribution decision in the next tutorial as we discuss in greater detail the reseller network – retailers and wholesalers - and the processes involved in physically handling product flow through the channel.

A good distribution strategy takes into account not only marketing decisions, but also considers how relationships within the channel of distribution can impact the marketer's product. In this section we examine three such issues:

Channel Power

A channel can be made up of many parties each adding value to the product purchased by customers. However, some parties within the channel may carry greater weight than others. In marketing terms this is called channel power, which refers to the influence one party within a channel has over other channel members.

When power is exerted by a channel member they are often in the position to make demands of others. For instance, they may demand better financial terms (e.g., will only buy if prices are lowered, will only sell if price is higher) or demand other members perform certain tasks (e.g., do more marketing to customers, perform more product services). Channel power can be seen in several ways:

- **Backend or Product Power** – Occurs when a product manufacturer or service provider markets a brand that has a high level of customer demand. The marketer of the brand is often in a power position

since other channel members have little choice but to carry the brand or risk losing customers.

- **Middle or Wholesale Power** – Occurs when an intermediary, such as a wholesaler, services a large number of smaller retailers with products obtained from a large number of manufacturers. In this situation the wholesaler can exert power since the small retailers are often not in the position to purchase products cost-effectively and in as much variety as what is offered by the wholesaler.
- **Front or Retailer Power** – As the name suggests, the power in this situation rests with the retailer who can command major concessions from their suppliers. This type of power is most prevalent when the retailer commands a significant percentage of sales in the market they serve and others in the channel are dependent on the sales generated by the retailer.

Channel Conflict

In an effort to increase product sales, marketers are often attracted by the notion that sales can grow if the marketer expands distribution by adding additional resellers. Such decisions must be handled carefully, however, so that existing dealers do not feel threatened by the new distributors who they may feel are encroaching on their customers and siphoning potential business.

For marketers, channel strategy designed to expand product distribution may in fact do the opposite if existing members feel there is a conflict in the decisions made by the marketer. If existing members sense a conflict and feel the marketer is not sensitive to their needs they may choose to stop handling the marketer's products.

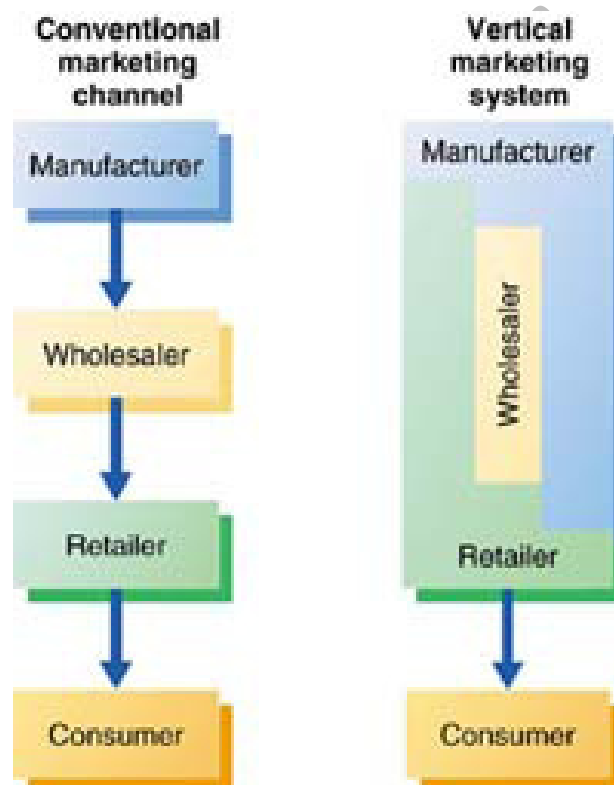
Need for Long-Term Commitments

Channel decisions have long-term consequences for marketers since efforts to establish new relationships can take an extensive period of time while ending existing relationships can prove difficult. For instance, Company A, a marketer of kitchen cabinets that wants to change distribution strategy, may decide to stop selling their product line through industrial supply companies that distribute cabinets to building

contractors and instead sell through large retail home centers. If in the future Company A decides to once again enter the industrial supply market they may run into resistance since supply companies may have replaced Company A's product line with other products and, given what happened to the previous relationship, may be reluctant to deal with Company A.

As another example of problems with long-term commitments, building contractors may be comfortable purchasing kitchen cabinets from industrial suppliers. If Company A decides to change their reseller network they may find it difficult to regain the building contractor customer base, who may continue to purchase from the industrial suppliers but are now purchasing products from Company A's competitors. In this case, Company A may have to give serious thought to whether breaking their long-term relationship with industrial suppliers is in the company's best interest.

Vertical Marketing Systems



A **vertical marketing system (VMS)** is a distribution channel structure in which producers, wholesalers, and retailers act as a unified system. One channel member owns the others, has contracts with them, or has so much power that they all cooperate.

A **conventional distribution channel** consists of one or more *independent* producers, wholesalers, and retailers. A vertical marketing system, on the other hand, provides a way to resolve the channel conflict that can occur in a conventional distribution channel where channel members are separate businesses seeking to maximize their own profits—even at the expense sometimes of the system as a whole.

A conventional marketing channel versus a vertical marketing system

The VMS can be dominated by the producer, wholesaler, or retailer. There are three major types of vertical marketing systems: *corporate*, *contractual*, and *administered*.

Types of VMS

1. Corporate VMS Combines successive stages of production & distribution under single ownership. (Sears).
2. Administered VMS Coordinates successive stages of production & distribution through the size & power of one of members (Kodak, Gillette, P&G).
3. Contractual VMS
 - a. Wholesaler-sponsored voluntary chains
 - b. Retailer cooperatives
 - c. Franchise organizations

A **corporate VMS** is a vertical marketing system that combines successive stages of production and distribution under single ownership—channel leadership is established through common ownership. A little-known Italian eyewear maker, Luxottica, sells its many famous eyewear brands—including Giorgio Armani, Yves Saint Laurent, and Ray-Ban—through the world's largest optical chain, LensCrafters, which it also owns.

A **contractual VMS** is a vertical marketing system in which independent firms at different levels of production and distribution join together through contracts to obtain more economies or sales impact than they could achieve alone. Coordination and conflict management are attained through contractual agreements among channel members.

The franchise organization is the most common type of contractual relationship. There are three types of franchises: **manufacturer-sponsored retailer franchise system** (Ford Motor Co.), **manufacturer-sponsored wholesaler franchise system** (Coca-Cola bottlers), and **service-firm-sponsored retailer franchise system** (McDonald's).

The fact that most consumers cannot tell the difference between contractual and corporate VMSs shows how successfully the contractual organizations compete with corporate chains.

An **administered VMS** is a vertical marketing system that coordinates successive stages of production and distribution, not through common ownership or contractual ties, but through the size and power of one of the parties. Manufacturers of a top brand can obtain strong trade cooperation and support from resellers (P&G). Large retailers such as Wal-Mart can exert strong influence on the manufacturers that supply the products they sell.

1. Producer, wholesaler(s) & retailer(s) act as a unified system.
2. They all cooperate.
3. Can be dominated by any of the three members of the system.
4. It arose as a result of strong channel members' attempts to control channel behaviour & eliminate the conflict that results when independent channel members pursue their own objectives.
5. Has become the dominant mode of distribution
6. Independent firms at different levels of production & distribution integrating their programs on a contractual basis to obtain more economies &/or sales impact than they could achieve alone.

Horizontal Marketing Systems

Two or more unrelated companies put together resources or programs to exploit an emerging marketing opportunity.

Multichannel Marketing Systems

A single firm uses two or more marketing channels to reach one or more customer segments. By adding more channels, companies can gain 3 important benefits: increased mkt coverage, lower channel cost, more customized selling.

Benefits of Intermediaries

If selling directly from the manufacturer to the consumer was always the most efficient methodology for doing business, the need for channels of distribution would be obviated. Intermediaries, however, provide several benefits to both manufacturers and consumers: improved efficiency, a better assortment of products, reutilization of transactions, and easier searching for goods as well as customers.

The improved efficiency that results from adding intermediaries in the channels of distribution can easily be grasped with the help of a few examples. Take five manufacturers and 20 retailers, for instance. If each manufacturer sells directly to each retailer, there are 100 contact lines—one line from each manufacturer to each retailer. The complexity of this distribution arrangement can be reduced by adding wholesalers as intermediaries between manufacturers and retailers.

If a single wholesaler serves as the intermediary, the number of contacts is reduced from 100 to 25: five contact lines between the manufacturers and the wholesaler, and 20 contact lines between the wholesaler and the retailers. Reducing the number of necessary contacts brings more efficiency into the distribution system by eliminating duplicate efforts in ordering, processing, shipping, etc.

In terms of efficiency there is an effect of diminishing returns as more intermediaries are added to the channels of distribution. If, in the example above, there were three wholesalers instead of only one, the num-

ber of essential contacts increases to 75: 15 contacts between five manufacturers and three wholesalers, plus 60 contacts between three wholesalers and 20 retailers. Of course this example assumes that each retailer would order from each wholesaler and that each manufacturer would supply each wholesaler. In fact geographic and other constraints typically eliminate some lines of contact, making the channels of distribution more efficient.

Intermediaries provide a second benefit by bridging the gap between the assortment of goods and services generated by producers and those in demand from consumers. Manufacturers typically produce large quantities of a few similar products, while consumers want small quantities of many different products.

In order to smooth the flow of goods and services, intermediaries perform such functions as sorting, accumulation, allocation, and creating assortments. In sorting, intermediaries take a supply of different items and sort them into similar groupings, as exemplified by graded agricultural products.

Accumulation means that intermediaries bring together items from a number of different sources to create a larger supply for their customers. Intermediaries allocate products by breaking down a homogeneous supply into smaller units for resale. Finally, they build up an assortment of products to give their customers a wider selection.

A third benefit provided by intermediaries is that they help reduce the cost of distribution by making transactions routine. Exchange relationships can be standardized in terms of lot size, frequency of delivery and payment, and communications. Seller and buyer no longer have to bargain over every transaction. As transactions become more routine, the costs associated with those transactions are reduced.

The use of intermediaries also aids the search processes of both buyers and sellers. Producers are searching to determine their customers' needs, while customers are searching for certain products and services. A degree of uncertainty in both search processes can be reduced by using channels of distribution. For example, consumers are more likely to find what they are looking for when they shop at wholesale or retail

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institutions organized by separate lines of trade, such as grocery, hardware, and clothing stores. In addition, producers can make some of their commonly used products more widely available by placing them in many different retail outlets, so that consumers are more likely to find them at the right time.

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Lesson 2.3 - Channel Flows

Learning Objectives

After reading this lesson you will be able to

- Understand how to select channel members
- Understand how to secure channel members and evaluation of channel members
- Define and understand the Retail co-operatives and Franchise system
- Understand the concept of vertical management system

What Flows Through the Channels

Members of channels of distribution typically buy, sell, and transfer title to goods. There are, however, many other flows between channel members in addition to physical possession and ownership of goods. These include promotion flows, negotiation flows, financing, assuming risk, ordering, and payment. In some cases the flow is in one direction, from the manufacturer to the consumer.

Physical possession, ownership, and promotion flow in one direction through the channels of distribution from the manufacturer to the consumer. In other cases there is a two-way flow. Negotiation, financing, and the assumption of risk flow in both directions between the manufacturer and the consumer. Ordering and payment are channel flows that go in one direction from the consumer to the manufacturer.

There are also a number of support functions that help channel members perform their distribution tasks. Transportation, storage, insurance, financing, and advertising are tasks that can be performed by facilitating agencies that may or may not be considered part of the marketing channel. From a channel management point of view, it may be

more effective to consider only those institutions and agencies that are involved in the transfer of title as channel members. The other agencies involved in supporting tasks can then be described as an ancillary or support structure. The rationale for separating these two types of organizations is that they each require different types of management decisions and have different levels of involvement in channel membership.

Effective management of the channels of distribution involves forging better relationships among channel members. With respect to the task of distribution, all of the channel members are interdependent. Relationships between channel members can be influenced by how the channels are structured. Improved performance of the overall distribution system is achieved through managing such variables as channel structure and channel flows.

Procedure for Selecting Channels for Small Business

Given the importance of distribution channels—along with the limited resources generally available to small businesses—it is particularly important for entrepreneurs to make a careful assessment of their channel alternatives. In evaluating possible channels, it may be helpful first to analyze the distribution channels used by competitors.

This analysis may reveal that using the same channels would provide the best option, or it may show that choosing an alternative channel structure would give the small business a competitive advantage. Other factors to consider include the company's pricing strategy and internal resources. As a general rule, as the number of intermediaries included in a channel increase, producers lose a greater percentage of their control over the product and pay more to compensate each participating channel level. At the same time, however, more intermediaries can also provide greater market coverage.

Among the many channels a small business owner can choose from are: direct sales (which provides the advantage of direct contact with the consumer); original equipment manufacturer (OEM) sales (in which a small business's product is sold to another company that incorporates it into a finished product); manufacturer's representatives (salespeople operating out of agencies that handle an assortment of complimentary

products); wholesalers (which generally buy goods in large quantities, warehouse them, then break them down into smaller shipments for their customers—usually retailers); brokers (who act as intermediaries between producers and wholesalers or retailers); retailers (which include independent stores as well as regional and national chains); and direct mail. Ideally, the distribution channels selected by a small business owner should be close to the desired market, able to provide necessary services to buyers, able to handle local advertising and promotion, experienced in selling compatible product lines, solid financially, cooperative, and reputable.

Since many small businesses lack the resources to hire, train, and supervise their own sales forces, sales agents and brokers are a common distribution channel. Many small businesses consign their output to an agent, who might sell it to various wholesalers, one large distributor, or a number of retail outlets.

In this way, an agent might provide the small business with access to channels it would not otherwise have had. Moreover, since most agents work on a commission basis, the cost of sales drops when the level of sales drops, which provides small businesses with some measure of protection against economic downturns. When selecting an agent, an entrepreneur should look for one who has experience with desired channels as well as with closely related—but not competitive—products.

Other channel alternatives can also offer benefits to small businesses. For example, by warehousing goods, wholesalers can reduce the amount of storage space needed by small manufacturers. They can also provide national distribution that might otherwise be out of reach for an entrepreneur. Selling directly to retailers can be a challenge for small business owners.

Independent retailers tend to be the easiest market for entrepreneurs to penetrate. The merchandise buyers for independent retailers are most likely to get their supplies from local distributors, can order new items on the spot, and can make adjustments to inventory themselves.

Likewise, buyers for small groups of retail stores also tend to hold decision-making power, and they are able to try out new items by writing

small orders. However, these buyers are more likely to seek discounts, advertising allowances, and return guarantees.

Medium-sized retail chains often do their buying through a central office. In order to convince the chain to carry a new product, an entrepreneur must usually make a formal sales presentation with brochures and samples. Once an item makes it onto the shelf, it is required to produce a certain amount of revenue to justify the space it occupies, or else it will be dropped in favor of a more profitable item.

National retail chains, too, handle their merchandise buying out of centralized offices and are unlikely to see entrepreneurs making cold sales calls. Instead, they usually request a complete marketing program, with anticipated returns, before they will consider carrying a new product. Once an item becomes successful, however, these larger chains often establish direct computer links with producers for replenishment.

Securing Channel Members

Unless the manufacturer has a product and a reputation that sells itself, then they may need to use some type of inducement or incentive to attract desired channel members. The main aim is to communicate to the prospective channel member that the manufacturer will provide them with good support and that the partnership will be mutually beneficial. Specific inducements that will attract channel members include:

- A quality, profitable product line
- Promotional support - advertising, cooperative advertising, promotional allowances, promotional materials
- Management support and assistance - training, financial analysis, market analysis, business planning etc.
- Fair dealing policies and good relationship - cooperation, fairness, trust and goodwill.

Developing a marketing channel comprised of quality intermediaries and characterized by good relationships is critical to distribution success.

Evaluating Channel Performance

The producer must continuously evaluate each channel member's performance against standards such as sales quotas, average inventory levels, customer delivery time, and treatment of damaged and lost goods. Cooperation in company promotion and training programs, and service to the customer, Intermediaries having excellent performance should be recognized and rewarded by the company. Intermediaries having unsatisfactory performance should be helped, if not possible, replaced.

While channel efficiency emphasizes controlling costs incurred by intermediaries while performing channel functions, channel productivity is concerned with maximizing outputs for a given level of inputs. Channel effectiveness deals with the intermediary's proficiency in satisfying customer needs and channel equity measures the distribution of accessibility of the channel among customers.

While performance at a macro- level is evaluated through societal contributions of intermediaries, a micro- level evaluation involves assessing the performance of individual intermediaries in terms of achieving the manufacturer's objectives of goal attainment, integration, adaptation and pattern maintenance. The performance of intermediaries is measured on three scales, namely facet, global and composite scales.

In addition to an intermediary's performance in meeting supplier aims, his or her channel profitability that is concerned with his or her financial performance is also evaluated. Thus, the success of a channel and its efficiency are determined by the efficiency of channel intermediaries in delivering goods and services to customers and the quality of services offered in the process. An effective distribution channel can provide channel services demanded by customers and extend its capacity within the constraints of the market environment.

A company may, from time to time, set new qualification for its intermediaries and trim the weaker ones. For example, when IBM first introduced its PS/2 personal computers, it re-evaluated its dealers and allowed only the best ones to carry the new models.

Each IBM dealer had to submit a business plan, send a sales and service employee to IBM training classes and meet new sales quotas. Only about two-thirds of IBM's 2,200 dealers qualified to carry the PS/2 models,

Finally, manufacturers need to be attentive to their channel members. Treating channel members lightly may result in loss of their cooperation or may even invite legal problems.

Beat plan: This plan is generated for the various product categories i.e. dairy dry, dairy wet, Dhara and ice cream. A weekly schedule is prepared for various markets and the retailers the turnover for each of the product is calculated for the wholesale dealers.

Cumulative performance: The performance of the dealers is averaged out over a period of three years where a comparison is made of the present performance vis-à-vis the previous ones.

Target versus achievement: The performance and the targets are compared and therefore the gaps are identified which help in evaluating the WD and planning for the next year as well. This is done for each of the product category.

Other Criterion

- a) Details of the bank guaranty
- b) Photographs of the offices
- c) Details of the WD salesmen and the product lines he deals in
- d) The computerisation facility available
- e) The storage space
- f) Refrigeration facility with photograph
- g) Details of the delivery vehicle with photograph
- h) Summary of the monthly potential sales of markets
- i) Summary of the product wise monthly sales potential of institutions

Retail Cooperatives

Retailers who cut costs by purchasing collectively an organization for the collective purchase and sale of goods by a group who share profits or benefits. Retail cooperatives were the first offshoot of the cooperative

movement and profits were originally shared among members through dividend payments proportionate to a member's purchases.

The Co-operative Retailing System (CRS) began in 1928 when locally owned retail co-operatives worked together to form provincial wholesales in order to expand their buying power. These co-operative wholesales in the four western provinces, along with Consumers' Co-operative Refineries Limited (CCRL), in Regina, joined together to form Federated Co-operatives Limited (FCL).

Today, approximately 240 retail co-operatives own FCL, which provides central wholesaling, manufacturing and administrative services to its member-owners. Combined sales of more than \$6.9 billion in 2010 make retail co-ops among the largest providers of retail goods and agricultural inputs in Western Canada.

Retail Co-Operatives Serve Canadian Communities

Retail co-operatives serve more than 500 communities and more than 1.5 million active co-op members across Western Canada. They employ more than 16,000 people and provide their members with a variety of goods and services, including:

- Petroleum
- Food
- General merchandise
- Soft goods
- Building materials
- Crop supplies
- Feed

Co-Ops are Committed to their Communities

In addition to returning cash to their members, retail co-ops are continually demonstrating their commitment to, and confidence in, their communities by improving their facilities.

These facilities include:

- Food stores
- Agro centres
- Home centres
- Bulk petroleum/cardlock facilities
- Gas bar/convenience store/car wash complexes

Last year, retail co-ops spent approximately \$150 million on new facilities and upgrading or expanding existing facilities. Over the last ten years, retail co-ops have spent in excess of \$1 billion on similar projects.

Retail Cooperatives

Retail cooperatives sell consumer goods to members and non-members. Members enjoy discounts, patronage refunds, or both. Patronage refunds are a percentage of the total amount of money a member has spent on purchases over a specific period of time.

Retail cooperatives also offer control. Because the members elect representatives to the board of directors and can participate in general membership meetings, consumers control the operation and policies of the cooperative.

Franchise Systems

What is a franchise? A franchise is a right granted to an individual or group to market a company's goods or services within a certain territory or location. Some examples of today's popular franchises are McDonald's, Subway, Domino's Pizza, and the UPS Store.

There are many different types of franchises. Many people associate only fast food businesses with franchising. In fact, there are over 120 different types of franchise businesses available today, including automotive, cleaning & maintenance, health & fitness, financial services, and pet-related franchises, just to name a few.

How Franchising Works

If you are thinking about buying into a franchise system, it is important that you understand exactly how franchising works, what fees are involved, and what is expected of you from the franchise company.

An individual who purchases and runs a franchise is called a “franchisee.” The franchisee purchases a franchise from the “franchisor.” The franchisee must follow certain rules and guidelines already established by the franchisor, and in most cases the franchisee must pay an ongoing franchise royalty fee, as well as an up-front, one-time franchise fee to the franchisor.

Franchising has become one of the most popular ways of doing business in today’s marketplace. In most states you cannot drive three blocks without seeing a nationally recognized franchise company.

Advantages of Buying a Franchise

There are many advantages to buying a franchise. Some of these advantages are:

- **Corporate image** - The corporate image and brand awareness of the company is already established. Consumers are always more comfortable purchasing items from a familiar name or company they trust.
- **Training** - The franchisor usually provides extensive training and support to the franchise owner.
- **Savings in time** - Since the franchise company already has the business model in place you can focus on running a successful business.

There is a reason why franchising has been around for decades. It is a great way for individuals to own and operate their own business. If you are thinking about buying a franchise, do your homework, research the company, and you should consult with a franchise consultant or franchise attorney before making a final commitment.

Corporate Vertical Marketing System

Corporate Vertical Marketing System - a system of distribution channel organization in which the orderly flow of products from producer to end-user is controlled by common ownership of the different levels of the system.

Corporate

- A corporate vertical marketing system involves the ownership of all levels of the production or distribution chain by a single company. An example of a corporate vertical marketing system would be a company such as Apple, which has its own retail stores as well as designing and creating the products to be sold in those retail stores.

“Cooperative marketing” can mean many things to many people depending upon your background. I like to ask people if they are using the word “cooperative” as a noun or an adjective. In the context of this fact sheet, we will be exploring “cooperative” as both a noun referring to a legal business structure and as an adjective to describe the agreement of people to cooperate with each other related to marketing efforts.

Benefits of Cooperative Marketing

Economies of Scale

There are economies of scale that can be obtained from the collective effort of joining forces and marketing as a group. It would be cheaper for beef producers to come together and assemble a semi-load of feeder calves for shipping to Kansas than it would be for each individual to get their calves to Kansas. When you are buying supplies, a consolidated order that contains pallets or bulk orders is cheaper than individually buying a small amount of supplies.

Bargaining Power

A group effort can combine available supply of product or consolidate services offered that allow bargaining power for the group. If you have 2 bushels of tomatoes, you have little power to negotiate a price with a retailer, but if as a group you have 140 bushels of tomatoes, you can bargain for a better price because of the quantity that can be supplied by

the group. This bargain force can be used to gain additional economies of scale with bulk purchasing arrangements.

Flow of Product

Retail markets require some consistency in flow of product to their establishments. As an individual with 12 doe goats, you can in no way guarantee more than 2 kid goats per month for the year. Retailers are looking for a business that can provide them a set amount of product on a daily, weekly, or monthly basis. If you get together with 20 other producers and as a group you have 240 doe goats, you could guarantee up to 40 kid goats per month to the retailer. You will now have their attention and be able to negotiate a price that the group needs for the kid goats.

Preserving Markets

Many markets are looking to reduce the costs of obtaining products or services. These markets are looking at buying their products or services but dealing with less people and having the same amount of product to sell through their establishments. If you are trying to market your 10 finished hogs to a processor and the cooperative down the road has members with 120 hogs ready for slaughter, the buyer will stop at the cooperative to make his purchase.

He can obtain 120 hogs in one contact versus the contact with 12 producers your size to end up with the same end result. A cooperative marketing arrangement will preserve many of the markets you use for the future as businesses move to cutting costs associated with procuring products and services.

Access to Professional Assistance/Expertise (Hire Support)

Many producers can benefit from professional services in marketing and sales of their products. If you are an apple producer, you are probably in the business because you are good at producing apples, but you have to sell them to make any profit. If marketing and sales are not your “cup of tea,” you are a member of the majority of today’s agricultural producers.

If you join a cooperative marketing group that hired a marketing manager and all you had to do was raise a top quality apple for the person to market, your life would be much easier. You individually could not afford to hire that marketing manager, but as a group of 15 orchard owners you can consolidate your product and finances to increase the price you will receive for your product.

Maintaining more of the Retail Dollar

This benefit has been addressed in several of the previous discussions, but increasing the financial income for your operation is a huge driver in the reason to participate in a cooperative marketing effort. This can be achieved through reducing costs of supplies by bulk purchasing or increasing the income by tapping new markets, keeping existing markets or negotiating a higher price in new and existing markets.

Challenges of Cooperative Marketing

Agreeing on One Common Mission

The first step in moving towards a cooperative marketing arrangement is to make sure all individuals are on the same page. This is achieved by making sure that all members are onboard to operate for the same purpose. Most of the time, this is not present among the members, even though most groups or steering committee members think that they all want the same end result. Again, a facilitator can help the group move through this process, because a common vision is essential for moving any further on the marketing venture.

Trust and Sharing of Information

Many agricultural producers have operated individually for years and are skeptical about the idea of a cooperative marketing venture. There is a time and process for building a sense of trust among the members and generating an open sharing of information in relation to the cooperative marketing venture.

This trust must occur among members to keep members loyal and make the effort function successfully in the future. You are going into business with all members of the effort and if you have trust issues,

why would you ever agree to run a business with these people? This is a major roadblock for many groups but some facilitated discussions can be held with professionals who are experienced in dealing with the human components of cooperative marketing organizations.

Group Dynamics (Democratic Group Decision Making and Costs)

The group dynamic aspect of an organization depends somewhat on the size of the organization. A large cooperative marketing effort would have a board of directors that govern the long-range planning and decision making for the cooperative, but in a case where the group only consists of 20 or 25 members all members might participate in making decisions.

Most understand that a democratic process for making decisions ensures that the members are involved and their opinions are addressed, but the fact is that this process can take more time to reach the end goal of a decision. Some organizations operate on a basis that consensus has to be reached by all for the decisions to go forward. This is different than a democratic majority vote system and can take much more time for plans to move forward.

Lack of Commitment From Members

Members can become disloyal members in the blink of an eye. This behavior exhibits why it is important that members “buy into” the vision for the group, have a developed trust for all members, and understand the need for sharing information and managing the group dynamics in the cooperative marketing organization.

This issue is sometimes addressed by signing a marketing agreement or contract with the organization that outlines the repercussions that will occur should you, as a member, breach your contract/agreement with the organization. If you are not agreeable to signing the agreement, then I contend that one of the three above challenges has not been resolved for you as a member.

Take a step back, readdress the situation, and let members know what your hesitations are before signing an agreement to market through

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the organization. This is necessary for the success of the organization. Human nature tells us that a member will sell outside the organization if he or she can make a dollar more. A large majority of producers would choose to market only with the organization when it can benefit the member.

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Lesson 2.4 - Product Issues in Channel Management

Learning Objectives

After reading this lesson you will be able to

- Understand product issues in channel management
- Understand the concept of product life cycle and product planning
- Identify pricing issues in channel management
- Understand the concept of push and pull strategies

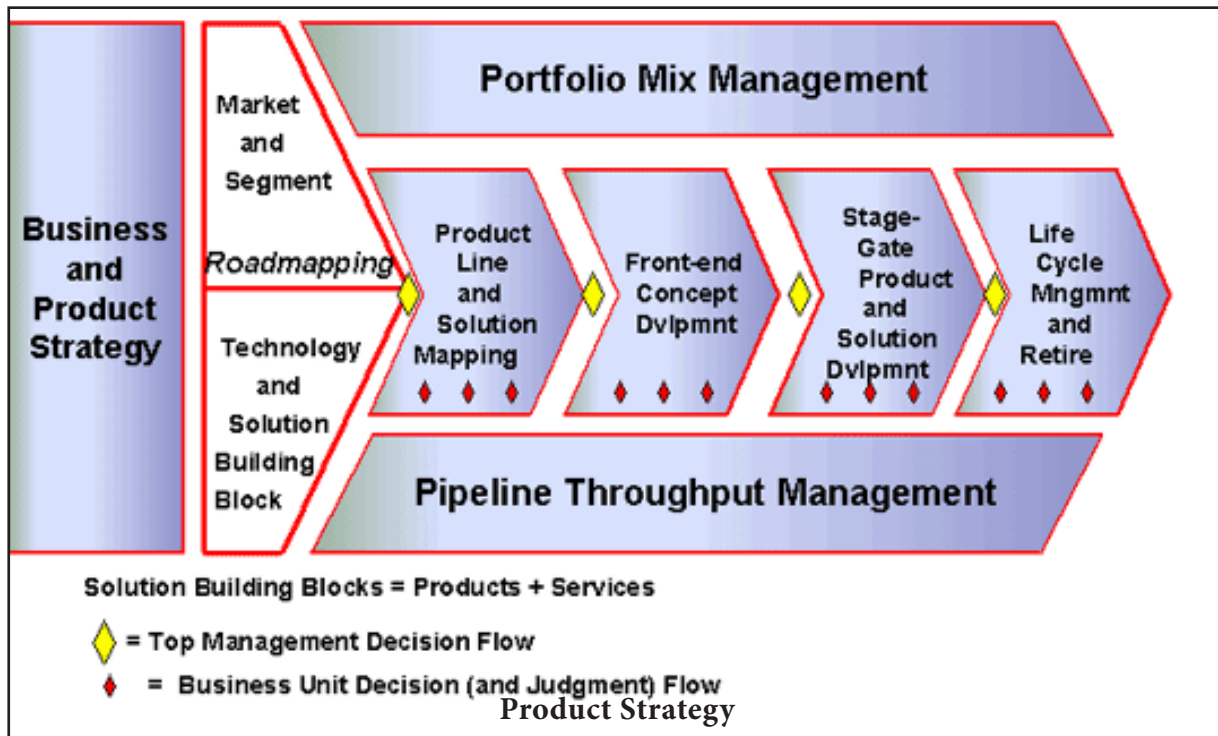
Product Issues in Channel Management

A key question is whether the producer has the resources to perform the functions of the channel? For example a producer may not have the resources to recruit, train and equip a sales team. If so, the only option may be to use agents and/or other distributors.

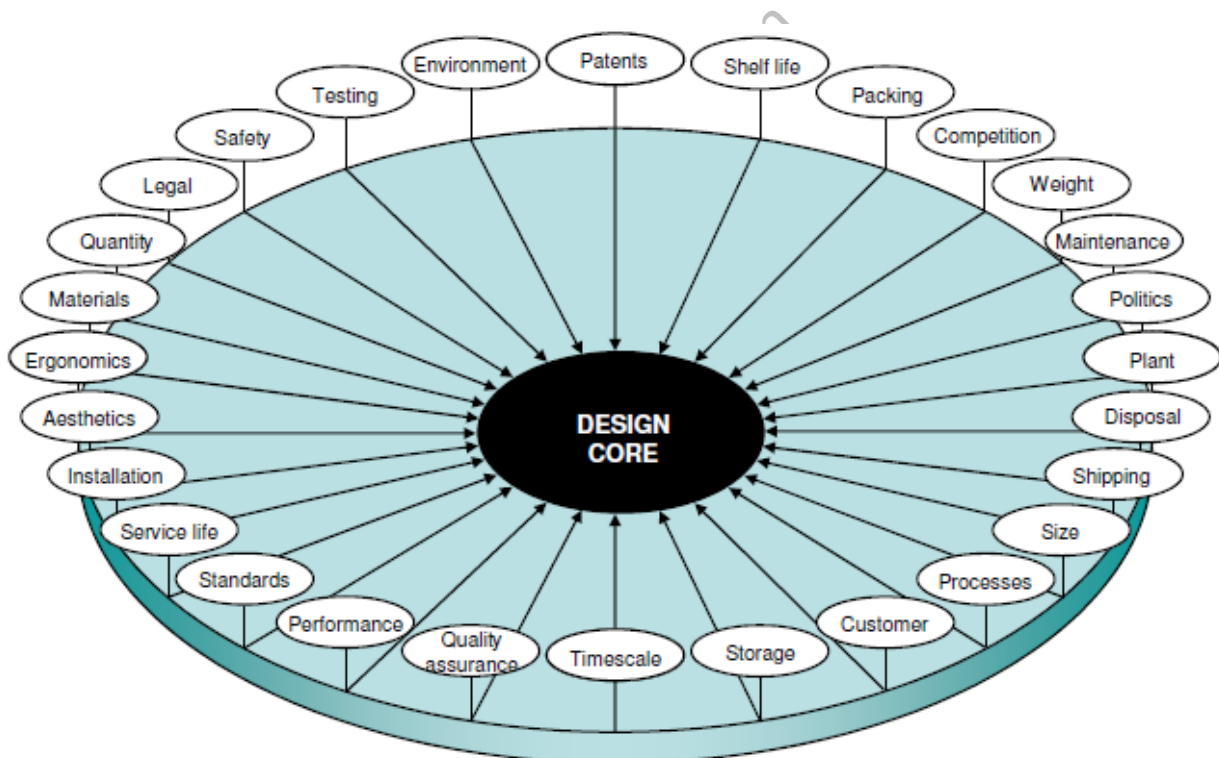
The nature of the product often dictates the distribution options available especially if the product requires special handling. For instance, companies selling delicate or fragile products, such as flowers, look for shipping arrangements that are different than those sought for companies selling extremely tough or durable products, such as steel beams.

Producers may also feel that they do not possess the customer-based skills to distribute their products. Many channel intermediaries focus heavily on the customer interface as a way of creating competitive advantage and cementing the relationship with their supplying producers.

Another factor is the extent to which producers want to maintain control over how, to whom and at what price a product is sold. If a manufacturer sells via a retailer, they effectively lose control over the final consumer price, since the retailer sets the price and any relevant discounts or promotional offers.



Similarly, there is no guarantee for a producer that their product/(s) are actually been stocked by the retailer. Direct distribution gives a producer much more control over these issues



New Product Development Design

Three major areas of product management

- New product planning and development
- The product life cycle
- Strategic product management

New Product Planning in Channel Management

- Encouraging channel member input into new product planning
- Fostering channel member acceptance of new products
- Fitting the new product into channel member assortments
- Educating channel members about new products

12 Steps for New Product Development

The following steps briefly summarize the major dimensions of new product development.

1. Clarify the Organization's Goals and the Strategic Role of New Product Development for Competitive Advantage

New product development can play a variety of roles in defining corporate strategy to gain competitive advantage. This variability makes the process of new product development subject to the emerging organizational issues of the day. In general, a long-run, focused, and ongoing strategic commitment to attractive market opportunities should define the role of new product development. New product development should be integrated into an organization's strategy and significantly contribute to its perpetual renewal.

2. Build Flexibility to Cope with and Mediate Environmental Turbulence

Turbulent global business environments are the source of new product opportunities and problems for an organization. Consequently, the critical factors defining the organization's market environment for new products must be scanned on a regular basis. In particular, the effects of technology that reduce the life cycles of a firm's products and services must be carefully monitored. For example, the effects of changing information

technology will continue to alter the way organizations innovate, design, manufacture, and market new products, as well as the way consumers and other stakeholders respond to those products. They may even redefine markets from traditional channel-dependent institutions to direct, interactive exchanges between buyers and sellers. Consumers may dial up a manufacturer's electronic catalog, send in specifications, and receive a customized product (from flexible manufacturing processes) through an express delivery service in days.

3. Anticipate Market Acceptance of New Products

The crux of new product development is identifying the unmet needs of potential buyers and other key market stakeholders as the basis for defining market opportunities and translating them into core new product concepts. Potential buyers who are affected by turbulent global environments respond largely to their own needs and problems. Identifying the needs of potential buyers and segmenting markets according to those needs is a challenging prospect, but one that enhances new product acceptance.

It requires a variety of research approaches that should bring the innovating organization as close to potential buyers as possible. In fact, for many situations, new product development should be viewed as an interactive relationship between the innovating organization and potential buyers (and other key stakeholders) to jointly define and develop the new product. The best way to anticipate market response for a new product is to jointly create it with potential buyers, then estimate when and how many consumers might enter the market to buy.

4. Prepare the Organization for the Change Needed to Develop New Products on a Regular Basis

The new product development paradox suggests that organizations respond to the demands of a new product in ways that often create organizational resistance and slow development time. To overcome this resistance, strong leadership, good management, cross-functional teams, and new product champions are crucial. Although the prescription for success may be clear, implementation can be difficult. How does the interruption of organizational processes by new products affect individual

career patterns? What are the incentive systems that will motivate highly qualified individuals to join high-risk new product development teams? Where in the organization should the new product development team be located—internally or externally?

5. Operationalize an Ongoing Process of New Product Development

How the organization decides to respond to environmental forces, organizational resistance, and market stakeholder needs defines its new product development process. This process has been observed to be sequential, overlapping, holistic, or chaotic. However, because business situations vary, each organization should craft a process that enables it to:

- (1) Maintain a strategic focus,
- (2) Remain flexible to cope with varying degrees of environmental turbulence,
- (3) Interact with the market to anticipate and/or overcome friction in formulating the new product,
- (4) Integrate organizational efforts and resource commitments to motivate the process through cross-functional new product development teams, and
- (5) Commit to new product development as an ongoing process of organizational renewal.

The process should encompass different levels of product concept refinement (ideas, concepts, prototypes, products, and launch programs) and critical management activities (diagnosis, search, design, evaluation, decision making, implementation, and monitoring).

6. Build a New Product Decision Support System

Viewing new product development as an ongoing organizational process requires a decision support system to provide timely information. Key elements are identifying new product decision problems, modeling those problems, establishing a data base of the important variables and relations in the model, collecting and analyzing the data through marketing research methods, and using optimization procedures to find the best decision. The design and implementation of new product decision

support systems should be linked to an organization wide system to build a useful historical database, yet provide a capability for off-line analysis to support rapid retrieval and manipulation of data. Further, the role of decision-maker judgment in data collection and modeling activities should be integrated into the new product decision support system, albeit with care and scrutiny in order to continually learn from its use.

7. Estimate the New Product Market Opportunity

The objective of market opportunity forecasting is to clarify the nature of a market opportunity and to estimate its market potential and market penetration. To accomplish this objective, a model of critical factors that drive the new product opportunity should be formulated, data should be collected to operationalize the model, and the resulting forecasts should be updated throughout development. Estimates of year-to-year growth, possibly obtained from a data base of analogical diffusion models, are critical for rapidly deciding the value of a new product idea.

Unfortunately, the procedures for quickly screening new product ideas with such information rely heavily on judgment. Future research on expert systems and industry-based product analogy data bases may help to improve the speed and reliability of market opportunity forecasting.

In addition, the use of enhanced scenarios employing advanced multimedia technology to further define a core concept in the context of rapidly shifting environments is a promising way to better understand the possible evolution of and response to new products.

8. Formulate a Sales Forecasting Process that Captures Market Response to New Product Alternatives

In developing models for any of the forecasting processes, but especially sales forecasting, several guidelines should be considered:

- Develop a system of conceptual models that includes relevant variables.
- Develop a managerial decision model that is simple, intuitive, and logical; if after very careful study it is not understood, revise it or don't use it.

- To the extent possible, develop rigorous submodels of selected variables in the spreadsheet model to improve estimation and link decisions to market response.
- Use a variety of data sources (market studies, expert judgment, secondary data) and methods (such as perceptual mapping, positioning, conjoint analysis of preferences and simulations) to operationalize the models and submodels.
- Submit the model to sensitivity tests with different values and check for robustness (for example, using the “what-if” tool on computer spreadsheets).
- Check assumptions carefully.
- Use multiple, different, and independent approaches and reconcile estimates when they are divergent.
- Formulate alternative scenarios using variation in the values and assumptions of the model—and consider contingencies.

9. Establish a Financial Forecasting Capability that Provides a New Product Control Chart

Combining market opportunity and sales forecasts with estimates of new product costs, investments, risks, and development cycle time provides a financial control capability that can be summarized in a control chart. The format of this control chart should be agreed upon by the new product team at the outset of the project and followed thereafter.

It should include the key measures of performance that guide the pre-launch development and post-launch tracking of the new product. Continual updating of all major forecasting processes to reflect changes in the shape of the new product and in the organization and market environment is the basis for realizing a capacity for control throughout new product development.

10. Consider Test Marketing as a First Step to Implementation

Prior to launching a new product, it is strongly recommended that a market entry strategy and launch marketing program be orchestrated and tested. This process should involve the use of simulated, controlled, and/

or conventional test marketing to evaluate, decide, and refine the product and its launch program. Designing and implementing test marketing approaches should consider the nature of the implementation problems, the new product, its importance to the organization, and the amount of uncertainty in the market environment. In some cases, test marketing can be bypassed in favor of immediate market entry. This approach can succeed with careful attention to tracking the new product launch and modifying accordingly.

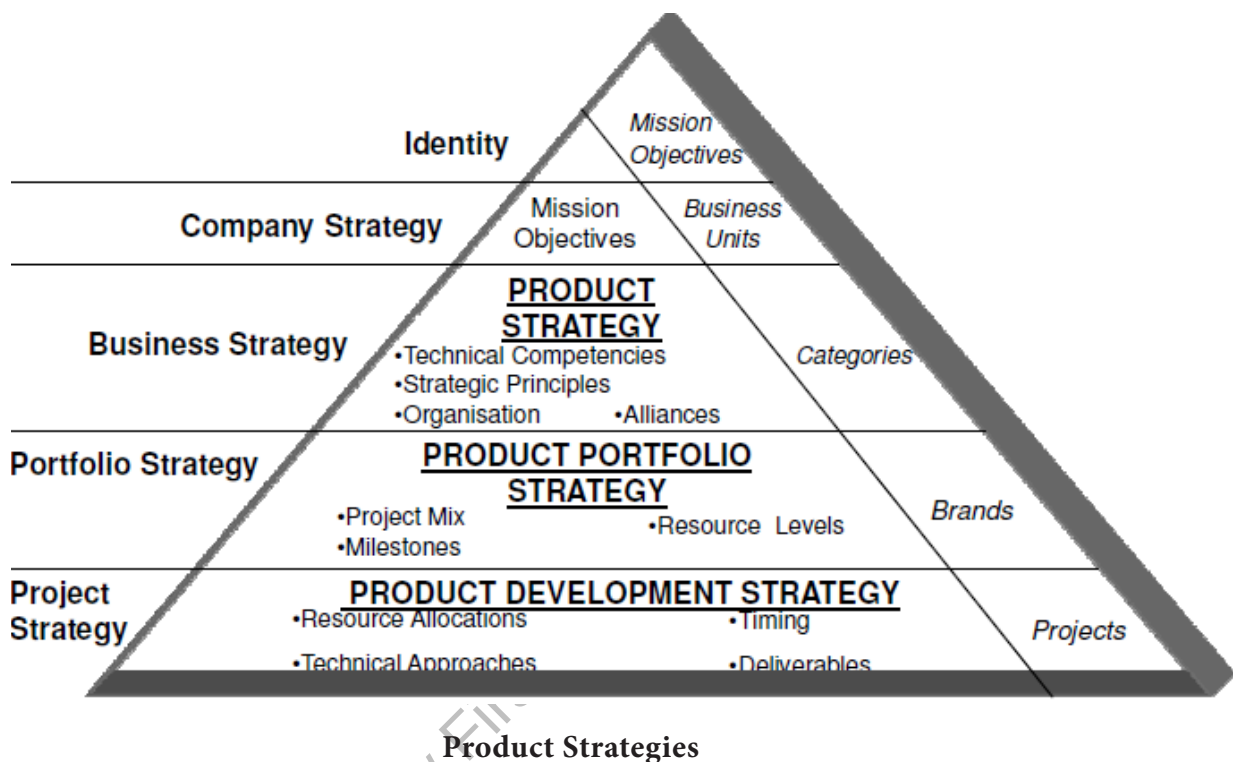
11. Develop a Market Entry Approach that Capitalizes on the Current Market Situation and Complements the Strategic Role of the New Product

Market entry for new products is highly situational—being first does not always pay. The market entry approach should reflect environmental, organizational, and market factors (potential buyers, competitors, trade, stakeholders) that define the situation. A market entry approach should be based on the timing, scale, and resonance of the launch marketing program. Using market opportunity, sales, and financial forecasts can provide input to an approach for modeling market entry decisions. In particular, launch timing is critical when cycle time and/or competitive factors can make a difference in performance. Recognizing time as a key variable, and making it the focus of a special decision model, may be the best way to handle this market entry decision.

12. Launch and Track New Product Programs to Implement Needed Modifications for Success

Once a new product is launched, the use of various data collection procedures and forecasting models to track performance, modify, and otherwise control the new product can lead to product and program improvements or to a comfortable decision to terminate the product. One issue related to how much effort an organization is willing to invest in post-launch tracking is problem diagnosis. Quick fixes and program changes that are based on impressions of market problems rather than diagnosis can lead to a product's early demise or the extension of mediocre performance. Finding early launch marketing problems may lead not only to quick modifications, but also to the next-generation new product.

Experience has shown that although it will not be used often, diagnosis can be helpful in all pre- and post-launch circumstances, even in a postmortem sense. The ultimate value of new product development may be the learning it makes possible—learning how to adjust the marketing program to consumer needs; learning how to educate the potential buyer on the benefits of the new product; learning why the product won't succeed in the market and why it should be abandoned now; learning that complete withdrawal is not necessary, but that a next-generation product can overcome the diagnosed difficulties; and, perhaps most importantly, learning to have the patience to learn



Product Life Cycle in Channel Management

A new product progresses through a sequence of stages from introduction to growth, maturity, and decline. This sequence is known as the product life cycle and is associated with changes in the marketing situation, thus impacting the marketing strategy and the marketing mix.

The product revenue and profits can be plotted as a function of the life-cycle stages as shown in the graph below:

Introduction Stage

In the introduction stage, the firm seeks to build product awareness and develop a market for the product. The impact on the marketing mix is as follows:

- **Product** branding and quality level is established, and intellectual property protection such as patents and trademarks are obtained.
- **Pricing** may be low penetration pricing to build market share rapidly, or high skim pricing to recover development costs.
- **Distribution** is selective until consumers show acceptance of the product.
- **Promotion** is aimed at innovators and early adopters. Marketing communications seeks to build product awareness and to educate potential consumers about the product.

Growth Stage

In the growth stage, the firm seeks to build brand preference and increase market share.

- **Product** quality is maintained and additional features and support services may be added.
- **Pricing** is maintained as the firm enjoys increasing demand with little competition.
- **Distribution** channels are added as demand increases and customers accept the product.
- **Promotion** is aimed at a broader audience.

Maturity Stage

At maturity, the strong growth in sales diminishes. Competition may appear with similar products. The primary objective at this point is to defend market share while maximizing profit.

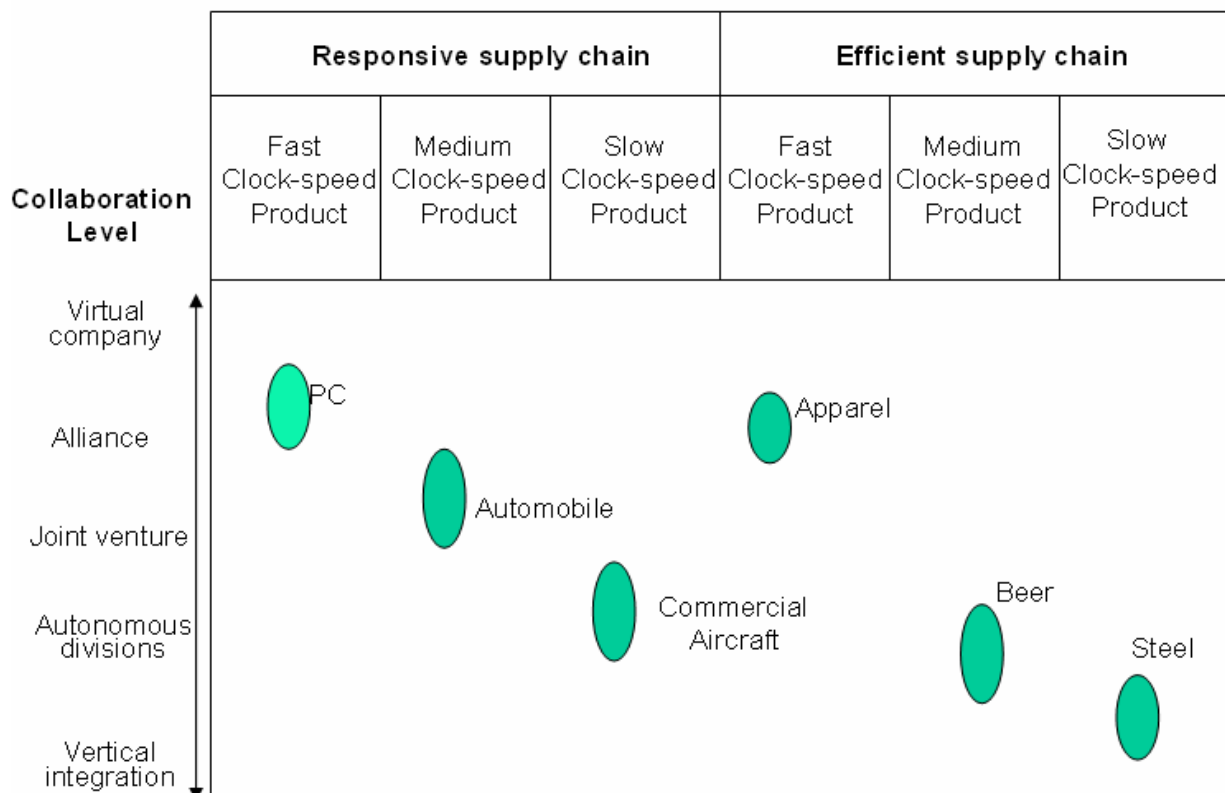
- **Product** features may be enhanced to differentiate the product from that of competitors.

- **Pricing** may be lower because of the new competition.
- **Distribution** becomes more intensive and incentives may be offered to encourage preference over competing products.
- **Promotion** emphasizes product differentiation.

Decline Stage

As sales decline, the firm has several options:

- Maintain the product, possibly rejuvenating it by adding new features and finding new uses.
- Harvest the product - reduce costs and continue to offer it, possibly to a loyal niche segment.
- Discontinue the product, liquidating remaining inventory or selling it to another firm that is willing to continue the product.



Product life cycle and supply chain design

The level of collaboration in a supply chain is closely associated with

the product clock-speed. The collaboration spectrum on the left-hand side in Figure indicates, on one end, virtual companies in that they outsource much of their business activities through the market place. At the other end of the spectrum, vertical integration companies manage almost everything in-house from raw material production to the distribution channel and to the final users. In the middle of the collaborative spectrum is strategic alliances and joint venture. At this level, companies share benefits, risks, and responsibilities. A number of supply chain models are introduced in the following section.

The marketing mix decisions in the decline phase will depend on the selected strategy. For example, the product may be changed if it is being rejuvenated, or left unchanged if it is being harvested or liquidated. The price may be maintained if the product is harvested, or reduced drastically if liquidated.

- Introductory stage: Ensure that a sufficient number of channel members are available for adequate market coverage.
- Growth stage: Reinforce the adequacy of channel member coverage and monitor the effects of competitive products on channel member support
- Maturity stage: Motivate channel members to mitigate competitive impacts and investigate possibility for changes in channel structure
- Decline stage: Phase out marginal channel members and investigate impact of product deletion on channel members

Strategic product management and channel management

- Product differentiation
- Product positioning
- Product line extension/contraction
- Trading up/ trading down
- Product brand strategy
- Product service strategy

Product Differentiation

Significance

Offered under different brands by competing firms, products fulfilling the same need typically do not have identical features. **The differentiation of goods along key features and minor details** is an important strategy for firms to defend their price from levelling down to the bottom part of the price spectrum.

Within firms, product differentiation is the way multi-product firms build their own supplied products' range. At market level, differentiation is the way through which the quality of goods is improved over time thanks to innovation. Launching new goods with entirely new performances is a radical change, often leading to changes in market shares and industry structures. In an **evolutionary** sense, differentiation is a strategy to **adapt to a moving environment** and its social groups.

Three Elements of Product Differentiation

Being unique in the marketplace provides distinct advantages. In fact, if you do not provide something unique, your business will be severely challenged. So, what are the three elements of product differentiation?

1. Convenience (or timing)
2. Customization.
3. Cost Recovery

Convenience

People don't want to wait these days. In order to differentiate your product from your competitors', consider how you can deliver your goods and services precisely when they are needed. Often, this means being faster than your competitor — but not always! If I order drapes as part of a renovation project, for example, I don't necessarily want them immediately. I may not need them for six weeks. If I get them too soon, they might get damaged waiting to be hung.

However, I do want them when the time is right for me. The company that can deliver what I need when I need it will certainly be better positioned to earn my continued business.

Customization

When I order those drapes, I don't want just any old size or pattern. They need to fit perfectly to my windows, and I want them in the style and color pattern that goes best in my house. Customization is an element of product differentiation that cannot be over-emphasized. The more you know about your customers' needs — and the better you do in serving those needs to your customers' satisfaction — the stronger your competitive position will be in the market.

Service-based businesses are particularly capable of customization.

Even with a product-based business, there are still techniques available for individualizing your firm, such as customizing your billings, or special packaging for your best customers. Product customization is a rapidly growing field for clothing, footwear (ex. sports shoes in school colors), backpacks in the color you want, cosmetics, automobiles, motorcycles, etc.

Cost Recovery

Cost recovery does not mean paying the cheapest price. It **does** mean gaining the highest leverage per dollar spent. Often, in fact, it makes more sense to spend a little more to obtain a product or service that most closely aligns with your needs and brings satisfaction. Too frequently, «I got it cheap» is the consolation prize when you end up with something that really doesn't properly serve your needs

(a) Vertical Differentiation

Vertical differentiation occurs in a market where the several goods that are present can be ordered according to their objective quality from the highest to the lowest. It's possible to say in this case that one good is "better" than another.

Vertical differentiation can be obtained:

1. Along **one decisive feature**;
2. Along a few features, each of which has a **wide possible range** of (continuous or discrete) values;
3. Across a large number of features, each of which has only a **presence/absence** "flag".

In the second and third cases, it is possible to find out a product that is better than another one according to one criteria but worse than it in respect to another feature.

Vertical differentiation is a property of the supplied goods but, as it is maybe needless to say, the **perceived difference in quality** by different consumer will play a crucial role in the purchase decisions. When evaluating a real market, a good starting point is a top-down grid of interpretation, we shall present first in 3 segments.

Class	Price	Crucial feature
Low	Low	The price is low, the product simply works
Middle	Middle	Use of the good is comfortable. Most people use it. Mass market brand.
High	High	Quality, exclusivity, durability (= low life-long price),

To this basic classification, one should add two intermediate classes:

Class	Price	Crucial feature
Middle-low	Low	The cheapest nation-wide brand
Middle-high	Middle	The cheapest product of high quality

Two extreme classes should finally be added:

Class	Price	Crucial feature
Extremely low	Very Low	It usually does not work, it does not last, and it has important defects
Extremely High	Very high	Exclusivity, non practical, status symbol

In this way, you can vertically position different brands and product versions, also using clues from advertising campaigns.

If you compare widely different goods fulfilling the same (highly-relevant) need, you may distinguish at the extreme of your spectrum **necessity goods** and at the other **luxury goods**. In other cases, what makes this difference is, instead, the nature of the need fulfilled.

As a general rule, **better products have a higher price**, both because of **higher production costs** (more noble materials, longer production, more selective tests for throughput,...) and **bigger expected advantages for clients**, partly reflected in **higher margins**.

Thus, the quality-price relationship is typically upwards sloped. This means that consumers without their own opinion nor the capability of directly judging quality may rely on the price to infer quality. **They will prefer to pay a higher price because they expect quality to be better.**

This important flaw in knowledge and information processing capability - an instance of **bounded rationality** - can be purposefully exploited by the seller, with the result that not all highly priced products are of good quality.

Through this mechanism, the demand curve - that in the neoclassical model - is always downward sloped, can instead turn out to be in the opposite direction, with higher sales for versions having higher prices.

(b) Horizontal Differentiation

When products are different according to features that can't be ordered in an objective way, a horizontal differentiation emerges in the market.

Horizontal differentiation can be linked to differentiation in colours (different colour version for the same good), in styles (e.g. modern / antique), in tastes.

A typical example is the ice-cream offered in different tastes. Chocolate is not "better" than lemon.

This does not prevent specific consumers to have a stable preference for one or the other version, since you should always distinguish what belongs to the supply structure and what is due to consumers' subjectivity. Some consumers would prefer lemon to chocolate, others the opposite, but this relates to them, not to the product line structure.

It is quite common that, in horizontal differentiation, the supplier of many versions decide a unique price for all of them. Chocolate ice-creams cost as much as lemon ones.

Another example of horizontal differentiation is represented by films: each film is different from the others, while the price of entry to cinema is always the same. This example shows that the internal organization of the differentiation space can be structured around "genres" and several similarity measures can be taken (e.g. two films having in common the film-maker, an actor, etc.), without being linear and continuous (nor too precise!).

When consumers don't have strong stable preferences, a rule of behaviour can be to change often the chosen good, looking for variety itself. An example is when you go to a fast food and ask for what you haven't eaten the previous time. Fashion waves often emerge in horizontally-differentiated markets with imitation behaviours among consumers and specific styles going "in" and "out". However, more in general, horizontal differentiated versions may not be ordered along axes, but merely juxtaposed.

(c) Mixed Differentiation

Certain complex markets are characterised both by horizontal and vertical differentiation. For instance, apparel, garments and shoes have an amazingly rich combination of shapes, colours, materials, complementarities, seasonal and territorial specificities, appropriateness to social events, relative distance to ideals promoted by media, stylists and the showbusiness. The quality of the materials can often be seen as a vertical differentiation but some other elements are clearly horizontal, like shapes.

In such an environment, consumers can develop fairly different styles of comparison, with some spending large amount of time getting exposed and evaluating versions, talking with others and sharing judgments, while others drastically reducing the difficulty of the comparison through repurchase of very classical items.

(d) Determinants

How a product rates according to different measures of quality or taste depends on both its **physical and immaterial characteristics**. The **raw material** from which it has been built, the share of high/low quality ingredients / components, its engineered **design**, its **production process** are typical determinants of product specificity, whose complexity might be reduced by consumers looking at its **brand**.

Producers can deliberately choose to share certain “**standards**” (i.e. not to differentiate along those features) in order to offer a critical mass of users for complementary devices as well as to pool consumer experience, reducing the difficulty of use the product. The lawmakers can encourage or mandate such behaviours, also in the interest of competition along other axes (e.g. price).

An important selective role of the width of the product differentiation available to final consumers is played by **retailers** (and distribution channels in general). If inventory and storage costs are high, retailers might try to limit this range that instead grows exponentially in the case of particularly low inventory and storage costs (as it happens with many e-commerce sites). More in general, the width of offer (number of

varieties on sales) depend on the strategies of category management at retailers (embedded in “formats” but with some degree of freedom inside).

Impact on Other Variables

Differentiated versions of a good can have widely different costs of production. Upstream, they may be produced using different raw materials and semi-manufactured parts, thus referring to diverse suppliers and their relative market power. Import of exotic substances can be the effect of the attempt to introduce new goods on the market (think for instance to cosmetics).

Downstream, the supply of different and better goods allows for deeper fulfillment of consumption needs, for production processes at higher productivity as well as for the opening of export opportunities to other countries.

For the firms introducing the new version of the product, the expected results are mainly improvements of profits (thanks to lower elasticity of consumption to price and higher mark-up on costs), sales, and market shares.

Retailers usually love premium products. The advantage of credibly sustain a higher price over competitors can in fact translate into larger margins to retailers per each unit sold. If the retailers think that the consumer will buy one unit for that class of products, it will select for its shelves products that maximise the absolute margin it gets. Conversely, a cheap product can have an enemy in the distribution channel, as they feel to suffer reduced margins from sales because of “cannibalisation” of existing brands.

For the consumer, product differentiation can increase the satisfaction from her/his consumption, as the product better fit her/his needs, conditions of use and special purposes. At the same time, (s)he will be confronted with a wider spectrum of prices. Test whether how much quality is expensive by playing this business game.

When faced with the burgeoning choice spectrum at supermarket premises among product varieties of the same category, the consumer

can react with several rules of selection; retailers take them into account to assure profits and profitability, as you can experiment with this spreadsheet.

At the same time, product differentiation can lead to the exploration of the product space by un-loyal customers, who use the repurchase occasions to try new versions.

Consumers skills in evaluating goods across versions and prices are nurtured by a sufficiently rich environment of social interaction and product differentiation. In particular, in contrast to neoclassical claims that “preferences are given”, tastes evolve over time due to experiences (both personal and indirect, e.g. by looking at others).

Personal experience can be a process leading to getting to like certain previously unacceptable versions, as the following instruction by the producer of a high cocoa percentage chocolate.

Another important dimension of consumer behaviour that is influenced by the width of product differentiation is the **time length of search** for the purchase, that can be increased if differentiation is wider and opaque (e.g. requires visits to many points-of-sale, hidden features, etc.).

Long-Term Trends

The ever growing product differentiation process due to new emergent firms/countries and the innovation efforts of incumbents has encountered in the last decades some form of brake due to the pressure of **globalized, standardized homogeneous goods** with a dominant design.

Behaviour During the Industry Life-Cycle

High product differentiation with radically different proposals is typical of the early stage of an infant industry, until a dominant design will replace technically imperfect or simply unlucky models.

Afterwards, when the industry reaches the maturity stage with few main competitors, differentiation re-emerge (often due to minor external

changes) as an attempt to soften price competition and to reach new niches of consumers.

Policies

Most experimentation with product differentiation is spontaneous in the market economy. However, there may be specific features of products that touch the public interest. For instance the safety of product can be forced to be high by the policymaker, to avoid cheap and dangerous versions be offered to customers.

For the transition to a low-carbon economy, standards of **energy efficiency** might also be imposed by the policymaker. More in general, to get **technologically and socially close substitutes to brown products** is the goal of an innovative economic policy for climate change mitigation, underlining that green products risk often to be considered inferior to polluting ones under certain axes of differentiation, so their sales be still confined to a niche of green consumers. In this case a mere tax on CO₂ emissions, raising the price of brown products, would not be enough for large majorities of consumers to shift towards the green substitutes.

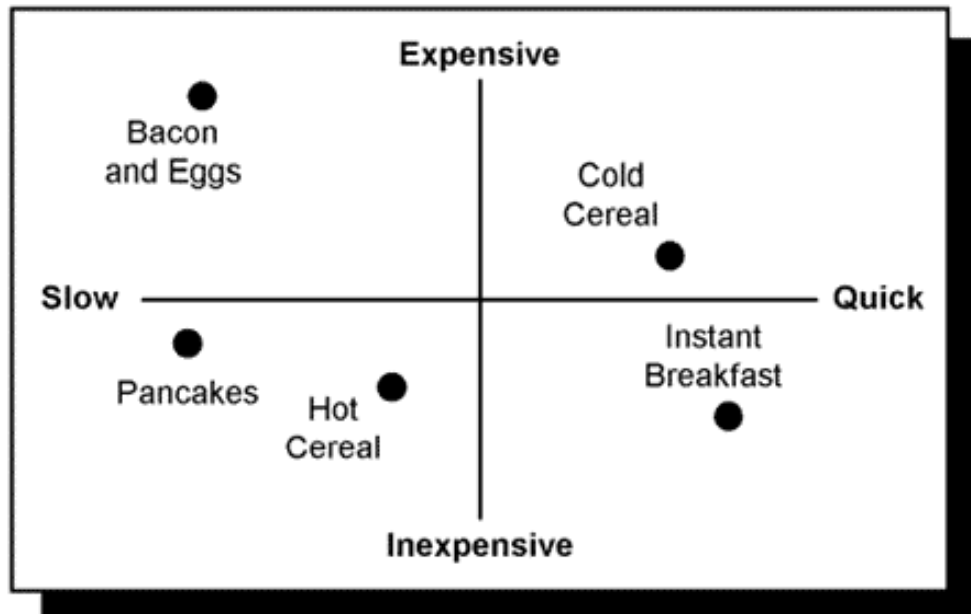
Product Positioning

Product positioning is closely related to market segment focus. Product positioning involves creating a unique, consistent, and recognized customer perception about a firm's offering and image. A product or service may be positioned on the basis of an attitude or benefit, use or application, user, class, price, or level of quality. It targets a product for specific market segments and product needs at specific prices. The same product can be positioned in many different ways.

The illustration below shows an example taken from Philip Kotler's book, *Marketing Management* published by Prentice Hall. This two-dimensional perception map shows how Kotler analyses the positioning of an instant breakfast drink relative to variables of the price of the product and speed of preparation. Another common framework for product positioning is taken from a series of questions. You can position a product using a positioning statement that answers these important questions:

Notes

- For whom is the product designed?
- What kind of product is it?
- What is the single most important benefit it offers?
- What is its most important competitor?



Product Positioning

- Marketing Plan Pro For business owners and managers who oversee their company's marketing programs, Marketing Plan Pro is software that creates and helps manage professional marketing plans. Unlike our most aggressive competitor, Marketing Plan Pro provides a system for scheduling and tracking the entire marketing process from plan to action.

Some positioning strategies will work better than others. The best positioning plays to your company's strengths and the product's strengths, and away from weaknesses. Position your product to reach the buyers whose profiles most closely match needs you serve, in the channels you can reach, at the prices you set.

Product Line Extension/Contraction

A **product line extension** is the use of an established product's brand name for a new item in the same product category.

Line Extensions occur when a company introduces additional items in the same product category under the same brand name such as new flavors, forms, colors, added ingredients, package sizes. This is as opposed to brand extension which is a new product in a totally different product category. Line extension occurs when the company lengthens its product line beyond its current range. The company can extend its product line down-market stretch, up-market stretch, or both ways.

Down-Market Stretch

A company positioned in the middle market may want to introduce a lower-priced line for any of the three reasons:

1. The company may notice strong growth opportunities as mass retailers such as Wal-Mart, Best Buy, and others attract a growing number of shoppers who want value-priced goods.
2. The company may wish to tie up lower-end competitors who might otherwise try to move up-market. If the company has been attacked by a low-end competitor, it often decides to counterattack by entering the low end of the market.
3. The company may find that the middle market is stagnating or declining.

Up-Market Stretch

Companies may wish to enter the high end of the market for more growth, higher margins, or simply to position themselves as full-line manufacturers. Many markets have spawned surprising upscale segments: Starbucks in coffee, Haagen-Dazs in ice cream and Evian in bottled water. Leading Japanese auto companies have each introduced an upscale automobile: Toyota's Lexus, Nissan's Infiniti, and Honda's Acura.

Two-Way Stretch

Companies serving the middle market might decide to stretch their line in both directions. Texas Instruments (TI) introduced its first calculators in the medium-price-medium-quality end of the market. Gradually, it added calculators at the lower end taking the share from

Bowmar, and at the higher end to compete with Hewlett-Packard. This two-way stretch won Texas Instruments (TI) an early market leadership in the hand-calculator market.

Trading Up/ Trading Down

Introduction of more expensive products than the original line is “trading up”. Introduction of cheaper products than the original line is “trading down.” Both may give an imbalance between the new and old lines but for different reasons.

Trading Up

When trading up, the biggest hurdle to overcome is the gaining of acceptance for a higher-priced product identified with a low-price-line image. Watchmakers like Timex, and certain camera manufacturers have tried unsuccessfully to penetrate the higher-priced end of their markets. Sometimes higher-priced products are introduced mainly to pull up the prestige of the lower-priced goods.

Trading Down

When trading down, sales of the new product often are not great enough to offset reduced sales of the original higher-priced line. Mustang cut heavily into Fairlane sales but fortunately obtained enough volume to overcome the loss, plus contributing more total profits. Few new products manage to accomplish this.

Product Brand Strategy

Brand Strategy

Successfully out-branding your competitors is a continuous battle for the hearts and minds of your customers. The proposition your brand strategy makes must be very compelling, attractive and unique among competitive offerings. The proposition must also be consistently reinforced throughout all phases of an organization, from senior executives to customer service, research and development, business development and even your business partners.

What entails a comprehensive and effective “Brand Strategy process?” That’s a much longer answer than what we have space for here, plus it varies from industry to industry, but here are some very basic guidelines about what makes a good Brand Strategy.

Brand Strategy—what’s the big deal?

Brand Strategy is nothing new. Yet, the expectations consumers have for a product or service they buy is stronger than it’s ever been. This is why companies interested in long-term success must create the most promising, targeted brand experience possible.

Whether you know it or not, you already have a brand, and your customers are having a “brand experience” when they interact with you, whether it be with your products and services or the people in your company. In order to craft this “brand experience” in a calculated way that is beneficial for your company, you must have a strong understanding about what exactly a brand is.

Brand is the Alpha and Omega

In other words, brand is the totality of your company and its business.

“A brand is the sum of the good, the bad, the ugly and the off-strategy,” says Scott White, one of the nation’s leading branding consultants and a valued expert companies like Sun Life Financial and Franklin Sports rely on. “It is your best and worst product. It is your best and worst employee. It is communicated through award-winning advertising as well as those ads that somehow slipped through the approval cracks and sank anything riding on them.”

It is your on-hold music and the demeanor of the receptionist who puts that valued client or prospect on hold. It is the carefully crafted comments by a CEO as well as negative buzz by the water cooler or in chat rooms on the Internet. Brand is expressed through written, audio and visual content. It is interpreted through emotional filters every human being has—where anything can happen. Ultimately, you can’t control your brand. You can only hope to guide it.”

The Road to Branding Success

Building on the inherent values of a brand should be the core of any branding strategy. If they're not clear, get a good grip on them first. Is the brand about honesty or integrity? Quality? How about excellent communication and customer satisfaction?

Knowledge of a company's values, at least in a literal context, is typically an internal matter; yet, those values become evident to everyone in contact with the company, from customers and prospective customers to business-to-business relationships and employee relations. Consistency is the key here. If members of the organization aren't accurately representing the values of the brand, steps must be taken to rectify the chink in the armor. And unlike a brand's key business proposition, values should never change even though the landscape in which the company operates and even its products may.

Winning Brand Strategies Starts with Top-Notch Research

With values set, a brand proposition is ready to be established. Objective and comprehensive branding research are the keys here. At a minimum, both must be done to establish clarity on the brand's strengths and weaknesses, the target audience and the competition. If possible, branding research should also be done on the brand's industry, its history, the status of the market and possibilities for future expansion.

Your Target Customer will Determine your Success

If it's only possible to do one body of brand research, discover as much as possible about your target customer. Find out who they are and what their needs and desires are. Make it your mission to get as detailed information as possible on their age, gender, income, shopping habits (online and off) and anything else of relevance you can determine. If you're targeting a business market, these criteria will differ, depending on the industry. Understanding your target market and what they want is key to developing a winning brand. Knowing these things should also give you an idea for what communication medium and content would work to engage your market.

Other research you might want to do is find out what your competitors' offerings are like. How do your offerings stack up? What can a customer get from your product that they can't get from anyone else? Find out these things, and you have the seeds for a winning branding strategy, not to mention great fodder for an ad campaign.

What does your Brand Promise?

The brand statement, often called the brand promise or proposition, is a derivative of branding research. It states the benefit of buying and using your company's products or services. For clothing, it could be about style or comfort. For a car, it could be about safety or reliability. Whatever it is, it must be clear, engaging and presented in a context relevant to the customer. One example of an effective brand promise is that of BMW's. It's stated right in the company's tagline: The Ultimate Driving Machine.

Your Promise Should be Golden

If your company's products and service don't live up to their brand promise, new customers will become lost customers and loyal customers might leave, too. Simply put, your deliverable, whatever that is, must follow through on the promise—in fact, it would be best if it actually over-delivered.

Your Promise Should be Unexpected, but Welcome

Don't reuse something a competitor has already promised even if it works for your product or service, and don't be vague in trying to position your company favorably against your competitors (such as saying you're "the best pizza in town."). Be specific because specific is exponentially more memorable. Besides, people expect you to be good. Otherwise, they wouldn't give you their business.

Hearts and Minds First, Wallets Later

Creating a positive emotional association in your market for your product or service is key. It can create want and desire by the mere mention of your brand, product or service name. Needless to say, that's

powerful. For instance, the mere mention of Ben & Jerry's conjures up images of numerous unique premium ice cream flavors and with the anticipation for your favorite (in my case, Cherry Garcia). Such positive emotional associations are built over time through good branding practice and a time-tested relationship between you and your customer based on intrigue, trust, understanding and support.

To create a brand promise that creates such emotional connections, it should be:

1. Grounded in the brand's core values
2. Clearly relevant and engaging to your target market
3. Able to create some sort of positive emotional attachment beyond just being "good"
4. Repeated internally and externally within your organization
5. Adaptable to the business climate
6. Continually reinforced
7. Consistent across advertising and marketing mediums
8. Known and echoed by business partners

Pricing in Channel Management

The desired price at which a marketer seeks to sell their product can impact how they choose to distribute. As previously mentioned, the inclusion of resellers in a marketer's distribution strategy may affect a product's pricing since each member of the channel seeks to make a profit for their contribution to the sale of the product. If too many channel members are involved the eventual selling price may be too high to meet sales targets in which case the marketer may explore other distribution options.

The one element of marketing strategy that is malleable, but is least understood and hence constantly feared by many managers is pricing. This is because pricing is a very complex issue. On one hand, it is supposed to reflect all the strategic steps the company has taken to bring the product to the consumer and convince him/her to buy it as well. On the other hand, it is supposed to reflect what the consumer would get out of the product by paying that price to acquire it. Will there be a match between the two?

Perhaps and perhaps not! This dilemma makes it imperative for a manager to understand and analyze the various factors before deciding at an appropriate pricing strategy. And, pricing does not operate in vacuum. It has to be married with other elements of the marketing strategy, including the channel management. Thus, understanding the broader picture of the various elements of pricing, and building a scientific framework on pricing will always be reliable and better in the long run.

- Cost
- Market
- Competition
- Channels

Promotion through the Channel

- Pull Promotional Strategy
- Push Promotional Strategy

Pull Strategy for Sales Promotion

Sales promotion decisions are significantly affected by whether the company decides to do “**pull or push strategies**” to accomplish its objectives. Such a decision may require a little or a lot of cooperation from resellers. The requirements to implement one strategy might be little more than to just stock the product by the retailers.

The other strategy may demand more participation from resellers such as the ability to explain to the consumers as to how a product works.

In case of using a pull strategy, marketing efforts are directed at the ultimate consumer and consumer promotions such as consumer contests and sweepstakes, rebates, coupons, free samples, consumer premiums, etc are used. If this strategy is also chosen to include advertising, then, there are large advertising expenditures.

The objective of such promotional efforts would be to create sufficient consumer demand to pull the product through the channels, that is the consumers are encouraged to demand the product from retailers

who in turn place orders with wholesaler or manufacturer to meet the consumer demand.

Bajaj Auto Ltd. offered a scheme of taking home a scooter at ` 999 was a sales promotional offer communicated through effective advertising and was essentially a pull strategy.

This strategy may require little promotional efforts from the resellers except to stock input the product on shelves.

A pull strategy is appropriate when

- The product demand is high.
- It is possible to differentiate the product on the basis of real or emotional features.
- Brand consumers show high degree of involvement in the product purchase,
- There is reasonably high brand loyalty and
- Consumers make brand choice decision before they go to the store.

Push Strategy for Sales Promotion

If a firm decides to use push strategy, its efforts are directed at resellers and the manufacturer becomes very dependent on their personal selling abilities and efforts. The promotional efforts are focused at pushing the product through the distribution channels; the resellers may be required to display, demonstrate and offer discounts, to sell the product. Product categories where there is low brand loyalty.

- Where many acceptable substitutes are available in the market.
- Relatively new products are to be launched
- When the brand choice is often made in response to displays in the stores,
- The product purchase is unplanned or on impulse and
- The consumer is familiar and has reasonably adequate knowledge about the product.

Manufacturers, who cannot afford to engage in sustained mass advertising, often use push strategy and offer effective incentives to

dealers. **Retailer promotion:** Buy Cadbury's products worth ₹ 3000/- and get any 30 chocolates worth ₹ 5 each free.

Through this offer the company is pushing its product to the retailers and now that the retailer has enough incentive the retailer stocks more and thus it becomes essential for the retailer to push the product to the consumers.

Classic Push Promotional Strategies

- Cooperative advertising
- Promotional allowances
- Displays and selling aids
- In-store promotions
- Contests and incentives
- Special promotional deals and merchandise campaigns

Kinder and Gentler" Push Promotional Strategies

- Training
- Quotas
- Missionary selling
- Trade shows

Besides issues related to physical handling of products, distribution decisions are affected by the type of promotional activities needed to sell the product to customers. For products needing extensive salesperson-to-customer contact (e.g., automobile purchases) the distribution options are different than for products where customers typically require no sales assistance (i.e., bread purchases).

Self Assessment Questions

1. What are the issues involved in channel management?
2. Discuss about types of channel intermediaries.
3. How to motivate the channel intermediaries?
4. Explain the evaluation of channel members' performance?

5. Explain how one can control channel intermediaries.
6. Discuss types of channel conflicts and causes for that.
7. Elaborate the criteria for evaluating channel members?
8. Highlight the marketing issues involved in establishing distribution channels?
9. Discuss the relationship issues involved in channels?
10. Discuss about VMS?
11. How to select channels for small business?
12. Highlight about retail cooperatives.
13. Define Franchise system?
14. What are the advantages of buying a Franchise?
15. What is cooperative Vertical Marketing System?
16. Discuss the benefits of cooperative Marketing?
17. Explain about new product planning in channel management?
18. What is strategic product management?
19. Explain about different types of product differentiation?
20. Explain about product positioning?
21. Discuss about product line extension.
22. Explain about pricing in channel management?
23. Discuss pull and push strategies of sales promotion.

CASE STUDY

Channel Management at Maxwell

The President of Maxwell Corporation is considering whether the company should set up its own distribution system or whether it should outsource the entire distribution and logistics function to third party service provider. The company has set up a manufacturing plant at Vizag where wide range of orthopedic equipments, viz., crutches, wheel chairs, walkers, back braces, heating pads, elastic bandages, canes, knee braces, shoulder braces and so forth are manufactured.

Presently the finished goods is located at Vizag itself and the products are sent to all major towns in India as a point-to-point dispatch. The company is supplying these equipments directly to retail stores at all these locations. Marketing activity is headed by General Manager Marketing based at Vishakhapatnam who is supported by a sales team comprising of Sales Officers.

The company is not restoring to advertisements and publicity though the products of the company are fairly well known. But, it is felt that all the customers quick response to their orders as the products are catered to emergency patients. But, these retail outlets carry only very limited inventories.

This is due to the fact that most of the products come in a variety of styles, shapes and sizes and the requirements is more customers driven and keeping even a moderate inventory of all types is economically not viable and leads to development of dead stocks in the long run. The company is looking at various options which include:

1. Setting up of hub and spoke of a distribution network wherein it proposes to set up a stock point or mother warehouse in each zone, viz., East, West, North and south and respective retail which are to be fed from the mother warehouse located in that zone.
2. Setting up of a central warehouse anywhere in Central India and feeding retail outlets from this location.

Notes

3. Changing the distribution channel from the present numerous retail outlet systems to a more efficient system.
4. Outsourcing the entire distribution and logistics to a third party wherein the entire activity of transportation and distribution till the ultimate retail outlet will be taken care of by this service provider so that the company can focus more on activities related to marketing and sales.

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UNIT – III

Unit Structure

Lesson 3.1 - Building Blocks of Supply Chain Network

Lesson 3.2 - Performance Measurement and Controls

Lesson 3.3 - Models for Decision Making

Lesson 3.1 - Building Blocks of Supply Chain Network

Learning Objectives

After reading this lesson you should be able to:

- Comprehend the basics of supply chain management
- Acquire knowledge on building blocks of supply chain strategy
- Understand and take decisions on the nuances of manufacturing, channel and service strategies.

Introduction

A quick research carried out in a local grocery store will reveal that, on an average, it takes 3-4 months for goods to reach the end customer. Sometimes, it takes as much as a year for goods to reach the end customer in the chain. It is indeed an amazing realization that there is very complicated chain in place to ensure that one can buy the denims of one's choice at a retail store.

Companies have managed supply chain for decades, but never in history did they have the variety of the kind they handle now, or the kind of competitive pressure that they face now. Companies all over the world have realized that the difference between good and bad supply

chain management can affect their profitability significantly. Firms like Dell Computers and Wal-Mart have demonstrated the impact of supply chain management on business performance. Due to its superior supply chain systems, Dell Computers managed a profitability of 8.6 per cent (operating profit as percentage of scales), compared to less than 1 percent profitability earned by HP and IBM in the PC business.

Similarly, Wal-Mart has emerged as the largest American corporation with profitability close to 5.8 per cent, which is considerably higher than that of its competitors in the retailing business. Within India, firms like Asian Paints and Marico Industries have maintained significantly higher levels of profitability and growth compared to competitors in their respective industries because of their superior supply chain capabilities.

The aim of this chapter is to introduce the concept of supply chain management, trace the evolution of supply chain concepts over the past century and identify major trends that have made supply chain performance critical to success.

We briefly look at the performance of the Indian economy and firms across various sectors, focusing on the supply chain dimension. We also identify key supply chain challenges for Indian firms. As the Indian economy is growing at 9 percent annually, despite the infrastructure bottlenecks, we have to look at the challenges in supply chain management that are unique to the Indian scenario.

The goal is not only to understand and apply the concepts that have already evolved but also to continue to look for innovations and solutions customized to meet the requirements of companies operating in the Indian scenario. It is obvious that significant improvements will come only from innovative solutions that can resolve supply chain problems that are specific to the Indian context.

Supply Chain Management

The supply chain encompasses all activities involved in the transformation of goods from the raw material stage to the final stage, when the goods and services reach the end customer. Supply chain management involves planning, design and control of flow of material,

information and finance along the supply chain to deliver superior value to the end customer in an effective and efficient manner. A typical supply chain is represented in Figure

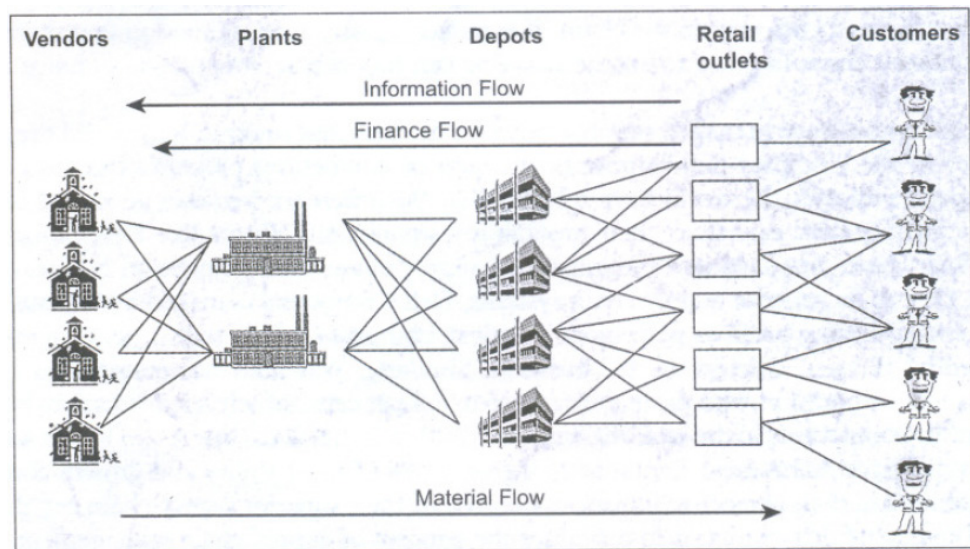
As can be seen from the definition, the supply chain not only includes manufacturers, suppliers and distributors but also transporters, warehouses and customers themselves. Of late, firms have realized that it is not the firms themselves but their supply chains that vie with each other in the marketplace.

Thus, it is not Hindustan Unilever (HUL) versus Procter & Gamble (P&G). Rather, the supply chains of both these firms compete against each other. The customer is interested only in the price, availability and quality of the product at the neighborhood retail outlet, where they actually come into contact with products supplied by HUL and P&G. If customers observe inefficiency on account of non-availability, damaged packaging, etc.

At the retail end with regard to HUL's products, they attribute inefficiency to HUL and not to its chain partner. The customer is only interested in getting the desired product at the right place, at the right time and at the right price. For a simple product like soap, the HUL supply chain involves ingredient suppliers, transporters, the company's manufacturing plants, Carrying and forwarding agents, wholesalers, distributors and retailers.

Obviously, HUL does not own all these entities, but the HUL brand name is at stake and it has to be ensured that the entire chain delivers value to the end customer. HUL cannot afford to focus only on those parts of the chain that are owned by it and ignore the other parts of chain. Firms need to realize that the performance of the chain is determined by its weakest link.

The supply chains of automobile companies (Maruthi, Tata Motors and TVS) and other companies like BPL, LG and Whirlpool, dealing in consumer durables, will be very similar to the one depicted in table. On the other hand, companies in the consumer non-durable business-for example, HUL, P&G, Godrej Soaps and Nestle –have to work with supply chains that likely to be much longer and more complex.



A supply chain network.

The term chain is a little misleading because it gives the impression that there is only one entity at each stage of the supply chain. In reality, as seen in Table, multiple entities are involved at each stage: a manufacturer distributor. The more appropriate term probably will be either supply networks or supply web. However, the term supply chain has been widely accepted by both practitioners and academicians: hence, we will continue to use the same throughout the book.

Supply Chain Strategy Building Blocks

A supply chain strategy consists of five building blocks.

1. Manufacturing strategy.
2. Outsourcing strategy.
3. Channel Strategy.
4. Customer service strategy.
5. Asset network.

Manufacturing Strategy

It means deciding, how to produce products or service. Will products be made to stock, to orders or some combination of it? Will some of the manufacturing be outsourced or production moved to low cost countries?

Will final configuration be completed outside the manufacturing plant, closer to customer?

Changing the manufacturing strategy can be a key source of competitive advantage. Sometimes, it can also be an advantage to choose different manufacturing strategies for different products or different markets. The key drives of manufacturing strategy are product life cycle, demand changes and the number of product variants. Types of manufacturing strategies appropriate for different products are shown in below table.

Strategy	When to choose this strategy	Benefits
Make to stock	For standardized high volume products	Low manufacturing cost, meeting customer demands quickly.
Configure to order	For products requiring in many variations	Customization, reduced inventory, improved service levels.
Make to order	For customized products with infrequent demand	Low inventory levels, wide range of product options, simplified planning.
Engineer to order	For complex products that meet unique customer needs	Enables response to specific customer requirements.

Types of Manufacturing Strategy

Channel Strategy

It defines how products or services will be delivered to buyers or end users. It needs to answer questions such as: Will the product be sold via distributors? Which market and market segments will be served, which channel will be used, priorities in case of material shortage? Will dedicated inventories for strategic partner be kept?

The decisions regarding company's assets and cost performance must be part of the channel strategy, including pricing, promotions, financing and other terms and conditions.

Anderson suggests the set of strategies that deal more with tighter collaboration with the channel, the customer, and/or the end consumer:

- **Consumer Customizer:** Uses mass customization to build and maintain close relationships with end consumers through direct sales.
- **Trade Focused:** Like logistics optimization, this strategy puts a priority on "Low price, Best-Value" for the consumer, but it focuses less on brand than on dedicated service to trade customers.
- **Logistics Optimizer:** Emphasizes a balance of supply chain efficiency and effectiveness.

The decisions regarding **outsourcing** are an important source of flexibility. Through outsourcing, the company can focus on core competences and enhance their competitive positioning. Outsourcing of activities, with low strategic importance, or activities that outsourcing partners can do: Better, faster, or cheaper, are the areas to be considered. If the product, process, or technology is the source of a company's differentiation, it should not be outsourced. Nevertheless, before any final decision is made, risks and strategic implication should be evaluated.

Customer Service Strategy

Customer service strategy should be based on two things: the overall customer volume and profitability, and understanding, what customers really want. Should the company aim for different service levels depending on customer importance? Tailoring customer service strategy to deliver the best cost/service performance by customer segment can have a high yield.

The final decision concerns the supply chain network, factories, warehouses, production equipment, order desks, and service centers. Location, size, and mission of these assets have a major impact on performance. Depending on business size, customer service requirements,

tax advantages, supplier base, labor cost companies can choose among: global, regional, or country manufacturing model. The company can chose different models depending on the type of demand for their products. High volume products can be produced in low cost countries for a global demand.

Another option is also with use of different “in market” postponement strategies. This means that the standard product is produced in a low cost production center but final configuration and packing are done at distribution point, close to customer. Another aspect is the product life cycle. In the beginning of the life cycle a global model can be used to develop manufacturing processes, later on a regional model should be used to improve customer service.

Key strategy building blocks	Strengths	Weaknesses
Manufacturing strategy	➤ Manufacturing strategy make to order is defined and it is used as recommended in literature. ➤ Decoupling points have been mapped and documented.	➤ Strategies for further optimization of lead time are not clearly defined.
Channel Strategy	➤ Channel Strategy is defined and documented, direct distribution is used for customized products and indirect distribution channel for standard products. ➤ It is systematically reviewed.	➤ Strategy is focused mainly on European markets and must be deployed to Global markets where future growth is expected.
Outsourcing strategy	➤ Outsourcing strategy is for machined parts is defined, depending on volume and suppliers competences.	➤ Outsourcing strategy for other processes and activities is not clearly defined.

Customer service strategy	➤ Clear overall service level is defined as well as specific service offering for key accounts.	➤ Customer service strategy is not clearly documented. ➤ Service levels according to customer importance are not defined.
Asset network	➤ Warehouse consolidation strategy for Europe is defined.	➤ Asset network strategy is not documented in terms of regional, global or local manufacturing facilities, order desks, production equipment.

Strengths and Weaknesses of Supply Chain Strategy Building Blocks

CASE STUDY

DEP DILEMMA

Tom Lippet, sales representative for DuPont Engineering Polymers (DEP), felt uneasy as he drove to his appointment at Grad Automotive Manufacturing (GARD). In the past, sales deals with GARD had proceeded smoothly. Oftentimes competitors were not even invited to bid on the GARD business. Mike O'Leary, purchasing agent at GARD, claimed that was because no competitor could match DEP's product quality.

But this contract negotiation was different. Several weeks before the contract renewal talks began, O'Leary had announced his plan to retire in six months. GARD management quickly promoted Richard Binish as O'Leary's successor. Although Binish had been relatively quiet at the previous two meetings, Lippet sensed that it would not be "business as usual" with Binish. While the contract decision ultimately depended on O'Leary's recommendation, Lippet felt that Binish might pose a problem.

Binish, thirty-five, had worked for a Fortune 500 firm following completion of his undergraduate degree in operations management. While with the Fortune 500 firm Binish had become extensively involved with JIT and quality programs. He had returned to school and earned an

M.B.A with a concentration in purchasing and logistics. Eager to make his mark, Binish had rejected offers to return to large corporations and instead accepted GARD's offer in inventory management.

GARD, an original equipment manufacturer (OEM) for United States auto producers and aftermarket retailers, makes a wide variety of plastic products for automobiles and light trucks. Examples of GARD products are dashboards, door and window handles, and assorted control knobs. When Binish began working with GARD's inventory management, he applied the 80/20 rule, illustrating to management that 80 percent of GARD's business was related to 20 percent of its product line.

Over the next three years, as contacts expired with customers and suppliers, Binish trimmed GARD's product line. GARD management was impressed with the positive impact on GARD's profits as unprofitable contracts and products were discarded. A trimmer product line composed primarily of faster-moving products also resulted in higher inventory velocity.

Thus, when O'Leary announced his retirement plans, management immediately offered Binish the position. After taking a few days to review GARD's purchasing practices Binish felt that he could make an impact. He accepted management's offer. As he learned his way around the purchasing department, Binish tried to stay in the background. But he found himself soon questioning many of O'Leary's practices.

He particularly disdained O'Leary's frequent "business lunches" with long-time associated from GARD's suppliers. Despite these feelings, Binish made an effort not to be openly critical of O'Leary. Such efforts did not, however, prevent him from asking more and more questions about GARD's purchasing process.

O'Leary, for his part, felt that his style had served GARD well. Prices were kept low, and quality was generally within established parameters. Although O'Leary typically maintained a wide network of suppliers, critical materials were sourced from a limited number of them. In those cases contract bids were a ritual, with the winner known well in advance.

DEP was one such winner. Its polymers were a critical feedstock material in GARD's manufacturing process. When O'Leary began sourcing from DEP nearly fifteen years ago, there was no question that DEP polymers were the best on the market. GARD's production managers rarely complained about problems caused by substandard polymers. O'Leary reasoned that the fewer complaints from manufacturing, the better.

"Hi, Tom! Come on in! Good to see you. You remember Richard Binish, don't you?" Lippet's spirits were buoyed by O'Leary's cheery greeting.

"Absolutely! How are you, Richard? Coming out from the old horse's shadow a bit now?"

Binish politely smiled and nodded affirmatively. Light banter continued as the three moved down the hallway to a small conference room.

"well, great news, Tom! DEP has the contract again!" O'Leary paused and then continued. "But there's going to be a sight modification. Instead of the traditional two-year contract we're only going to offer a one-year deal. Nothing personal, just that management feels it's only fair to Richard that these last contracts I negotiate be limited to a year. That way he doesn't get locked into any deals that might make him look bad!" O'Leary roared with laughter at his last comment.

"It is certainly no reflection on DEP," Richard interjected. "It simply gives me a chance to evaluate suppliers in the coming year without being locked into a long-term contract. If my evaluation concurs with what Mr. O'Leary has told me about DEP, I see no reason that our successful relationship won't continue."

"Entirely understandable," replied Tom as his mind pondered the meaning of Binish's evaluation. "I'm confident you'll find DEP's service and product every bit as good as Mike has told you."

Following the meeting O'Leary invited Lippet to join him for a cup of coffee in FARD's lunchroom. Binish excused himself, saying that he had other matters to attend to.

As they enjoyed their coffee, O'Leary sighed. "you'll be seeing some changes coming, Tom. The best I could do was get you year."

"I'm not sure I understand. As far as I know, GARD's never had a major problem with DEP's products."

"We haven't," O'Leary replied. "At least not under the guidelines I hammered out with management. But there will be some changes by next year."

"Such as?"

Well, you remember when I started buying from EDP? You were the leaders, no question about it. Now I knew some other suppliers had moved up since then, but I figured, hey, if it ain't broke, don't fix it! As long as DEP's price was in line, I knew I wouldn't have any troubles with manufacturing. Less headaches for me.

Now it turns out that Binish has some other ideas about purchasing. I can tell you for a fact that he's sampled several lots of DEP feedstock. He's also invited other potential suppliers to submit samples. The long and short of it is that there's not much difference between DEP and the competition in terms of product."

"I still don't clearly understand the problem, Mike."

"In Binish's terms, product merely becomes a 'qualifying criteria.' If everyone's product is comparable, especially in something such as polymer feedstock, how do you distinguish yourself? Binish claims that companies will need to demonstrate something called 'order winning criteria' to get our business in the future."

"I still don't see a problem. We have our reviews with GARD every year. Our service performance has always been found to be acceptable."

"True. But acceptable according to my guidelines. Let me throw a number at you. On average GARD schedules delivery ten days from date of order. I count on-time delivery as plus or minus two days from scheduled delivery date.

That's a five-day service window. GARD's minimum service threshold within this five-day window is 95 percent. DEP had a 96.2 percent record last year using my window. Do you know what Binish is talking?"

"Probably three?"

"Exactly. And do you know what DEP's performance is if we use a three-day service window?"

"No, Mike, I really don't."

"Well, Tom. Sorry to tell you but it's 59.7 percent. Worse yet, with Binish, not only will the window decline but the threshold level will be bumped up to 96 percent. And that's only going to be for the first three years after I retire. After that Binish is shooting for same-day delivery with only 96.5 percent service capability. Right now using same-day delivery DEP has only 80 percent flat. You aren't even close to being in the game."

"So we've got a one-year contract essentially to demonstrate that we can deliver service as well as product?"

"You understand the problem now."

Polymer feedback production requires a mixture of chemical compounds. DEP's manufacturing process relies heavily on six principal compounds (A_F). DEP's current procurement policy is to source each of these compounds from three suppliers determined through an annual bidding process.

Typically the firm with the lowest price is considered the best bid. The top bid receives 60 percent of DEP's business, while the other two firms receive 25 and 15 percent, respectively. Management feels that this policy protects DEP from material shortages and unreasonable price increases. Table indicates the current compound suppliers and their performance statistics (percentage of business/delivery time from order date/fill rate).

Supplier	"A"	"B"	"C"	"D"	"E"	"F"
Company 1	60% 3-8 days 93%	60% 2-9 days 94.5%			15% 5-8 days 92%	15% 6-9days 94%
Company 2	25% 4-6days 95%	25% 3-4days 96%	15% 2-4days 98%	15% 2-4days 98.7%		
Company 3	15% 2-5days 95.5	15% 2-4days 98%			25% 5-9days 97.5%	25% 4-6days 98.7%
Company 4			60% 4-9days 96.5%	60% 2-9days 97%		
Company 5					60% 4-7days 98.3%	60% 4-6days 97%
Company 6			25% 3-6days 98.4%	25% 3-5days 96%		

DEP currently uses the following performance criteria:

- 1 *Delivery of "A."* On-time considered 4 days from date of order $\pm$ 2 days.
- 2 *Delivery of "B."* On-time considered 4 days from date of order $\pm$ 2 days.
- 3 *Delivery of "C."* On-time considered 4 days from date of order $\pm$ 2 days.
- 4 *Delivery of "D."* On-time considered 5 days from date of order $\pm$ 2 days.
- 5 *Delivery of "E."* On-time considered 6 days from date of order $\pm$ 2 days.
- 6 *Delivery of "A."* On-time considered 6 days from date of order $\pm$ 2 days.

- 7 Minimum acceptable fill rate on all compounds is 92 percent.

The manufacture of polymer feedstock is highly standardized. DEP has continually invested in technologically advanced manufacturing equipment. As a result, DEP can quickly change processes to manufacture different polymers.

In order to avoid material shortages and thereby maximize production, DEP normally maintains a seven-days supply of each compound. An earlier attempt at JIT manufacturing was abandoned after DEP experienced material shortage and production shutdowns. As a result, the manufacturing department is opposed to any reimplementation of JIT – type concepts.

The manufacturing department is electronically linked to the procurement and marketing/sales departments. Marketing/sales receives customer orders by phone or facsimile. The orders are then entered into the information system. This allows manufacturing to monitor incoming materials shipments as well as schedule production runs. Under this system most customer orders are produced within six to eight days of order.

Following production, orders are immediately sent to a warehouse a short distance from DEP. At the warehouse shipping personnel verify manufacturing tickets, match the manufacturing ticket with the purchase order, and prepare shipping documents. Once the shipping documents are completed, the order is prepared for shipment (e.g., palletized, shrink-wrapped, etc.) and labeled. Once a shipment is labeled, delivery is scheduled. Three to six days normally elapse from the time an order leaves manufacturing until it is shipped from the warehouse.

Physical distribution is divided between the private DEP truck fleet and common carriers. The majority of DEP's customers are within a 200-mile radius. DEP trucks service these customers via twice-a-week delivery routes. Customers beyond this delivery zone are serviced through common carriers; delivery time fluctuates according to location and distance but rarely exceeds six days from time of shipment.

Lesson 3.2 - Performance Measurement and Controls

Learning Objectives

After reading this lesson you should be able to:

- Understand different measurement and controls in supply chain management
- Analyse the benchmarking forms
- Acquire knowledge on benefits of benchmarking
- Execute key actions for success of supply chain.

Introduction

Performance measurement and controls in decision making in Supply Chain Management happens through proper benchmarking. Organizations that accomplish a particular activity at the highest value, i.e. at the lowest cost and/or quality or efficiency are considered best-in-class. In determining what qualifies as world class, benchmarking asks the question: “who are we now, and who do we want to be?” The best benchmarking efforts not only match the performance of others but also motivate to exceed it.

Performance Standard

A benchmark is a standard of performance. Benchmarking helps organizations identify standards of performance in other organizations and to import them successfully to their own. It allows organizations to discover where they stand in relation to other. By identifying, understanding, comparing, and adapting one's own organization with the outstanding practices and processes of others, an organization can target problem area, set levels of performance, and identify solution to improve results. A public sector organization can borrow the best practices of the private sector, and vice versa.

Typically performed by internal personnel who already have a thorough knowledge of the process under review, benchmarking looks beyond performance measures and cost ratios. It considers the total organizational impact.

In benchmarking with compare to others, an organization:

- Determines how leading organizations perform specific processes
- Compares their methods to its own uses the information to improve upon or completely change its processes

Forms of Benchmarking

Benchmarking can take several forms, some of which are as follows:

- Internal benchmarking studies the practices and performance within the organization itself.
- External benchmarking determines the performance of others, preferably worldclass companies.
- Quantitative benchmarking allows organizations to measure progress toward goals and to set improvement objectives in terms of specific performance measures or metrics. An example of a metric benchmark might be “cycle time is less than 25 hours,” or “order fulfillment is less than 14 days” these metrics are very precise and based on detailed and careful analysis gleaned from surveys of interviews.
- Process benchmarking examines how top performing companies accomplish a specific process. These studies are undertaken through research, surveys, interviews, and site visits. Process benchmarking studies often look at organizations that have recently and successfully implemented reengineering or improvement efforts.

It is important when benchmarking with these stellar organizations that you gain a clear understanding of the scope of their project, the methodology they used, the critical success factors they were able to identify, the challenges and opportunities they faced in implementation and, finally, the important lessons they learned.

Gap Analysis

When examining the best practices of others and drawing comparisons, an organization will often perform what is called a gap analysis. This is method that helps identify the performance or operational differences between the organization's process and that of its benchmarking partners, and to understand why the differences are there. One way to identify these gaps is through a technique called Activity modeling, a useful method for understanding how a business process really works by first describing how things are ("As-Is" modeling), and then by how you want them to be ("As-Be" modeling).

Each activity, usually diagrammed, shows the inputs to that activity, the outputs of that activity, the controls or constraints on the way the activity is performed, and the mechanisms or factors of production consumed by the activity in transforming inputs to outputs.

Achieving Maximum Value

Benchmarking may sound a bit like industrial tourism, whereby inferior organizations simply "skim the cream from the top," spying and copying on their superiors. In fact, benchmarking is an ongoing process that generally doesn't yield quick fixes or panaceas. It's much more than "copycatting." Primarily a people-to-people interaction, benchmarking requires curiosity, creativity, and an eagerness to build upon what others have learned.

A common mistake organizations make in their benchmarking Endeavours is to only benchmark someone within their own industry, or worse yet, their competition. Your competition may not be best-in-class, even if they are more profitable or successful than you. It may ultimately be more beneficial to look at similar processes rather than industries-to seek out companies that serve as excellent models for a particular business process or function.

Benefits of Benchmarking:

- Helps organizations to make better informed decisions;
- Exposes organizations to innovations and breakthroughs;

- Allows organizations to see beyond the barriers, to embrace change, to think “outside the box”; and
- Provides organizations with a methodology and a game plan for accelerating, implementing, and managing change.

Key Actions in Benchmarking for Best Practices:

- a. **Understanding the Government Process to Improve:** Choosing an optimal benchmarking partner requires a deep understanding of the process being studied and of the benchmarking process itself. By thoroughly grasping the process you are reviewing, you establish a reliable baseline of comparison. Your interview questions will have more focus this way, and you also will feel confident that you have selected appropriate comparison companies or organizations. A great way to facilitate data gathering is by discussing the process in detail with agency officials and then depicting the process in a flowchart.
- b. **Research to Plan the Review:** Before selecting comparison organizations, you should research not only the organizations themselves, but also current industry trends and developments. There are many avenues of research at your disposal:
 - Literature-government documents, newsletters, and previously published performance reports:
 - Internet and library searches: and
 - Conversations, surveys, or interviews with consultants, academics, and industry experts (this includes watchdog organizations, professional associations, oversight commissions, etc.)

These sources can provide you with the background information you need to make the most effective use of your time, as well as your best practice organization's time.

- c. **Select Appropriate Organizations:** Your research should yield a list of best practice organizations. Now you must determine how many and which ones to visit. Experts suggest you keep the list to manageable number, which can be as low as five. You will need to

establish your own selection criteria. For instance, if you decided to benchmark your organization's snow removal process, you might determine that hilly terrain is significant criterion in selecting a best practices partner. If you were going to benchmark DoD's inventory system, you might decide that geographical diversity is an essential evaluation criterion. In any case, what is most important is that you find companies that are considered by experts to be among the best at the process you are reviewing.

- d. **Collect Data from Selected Organizations:** Develop a standard list of questions that will structure the interview process and guide your discussions. This list may need to be revised after you obtain feedback from the first interview. Remember, your questions should be geared to discovering common practices and characteristics among the organizations you have identified for benchmarking. Site visits are often a part of this process, and can give you first hand opportunities to observe a process in action. This is where synergy between organizations can occur-a mutual sharing of ideas and innovations.
- e. **Identify Barriers to Change:** With your solid list of best practices in hand, you are almost ready to make your recommendations. But first, you should identify the barriers to implementation within your organization, whether real or perceived. Some of these barriers may be beyond your ability to control, such as regulatory and statutory requirements. Others may be more deep seated, residing within the organizational culture itself. You should be aware of some of the difficulties these barriers may pose to implementation. You should also consider the impact certain changes might have on the organization itself. For example, what will be the effect of a particular recommendation on the agency's ability to deliver a service?
- f. **Make Recommendations for Change-Constructive and Convincing:** It is recommended that you give your agency a "basket of ideas" from which to choose. Flexibility should be built into the recommendations, as your agency will need to adapt them to its unique needs and functions. It also helps to outline the benefits as well as the key steps that should be taken in order for implementation to be successful. A pilot project can be an excellent way for your agency

Notes

to work through any obstacles or concerns, and to develop reliable cost estimates for full implementation. Finally it is important to remember that in any benchmarking process you must ensure that your organization is in a position-both technically and psychologically-to implement change recommendations.

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Lesson 3.3 - Models for Decision Making

Learning Objectives

After reading this lesson you should be able to:

- Know the set of decision phases in a supply chain system
- Comprehend the intricacies of supply chain models
- Analyse the different modeling systems
- Strategically decide upon the suitable system

Introduction

Successful supply chain management requires many decisions relating many decisions relating to the flow of information, product and funds. These decisions fall into three categories or phases, depending on the frequency of each decision and the time frame over which a decision phase has an impact.

Decision Phases in a Supply Chain

1. **Supply chain strategy or Design:** During this phase, a company decides how to structure the supply chain over the next several years. It decides what the chain's configuration will be, how resources will be allocated, and what processes each stage will perform. Strategic decisions made by companies include the location and capacities of production and warehousing facilities, the products to be manufactured or stored at various locations, the modes of transportation to be made available along different shipping legs, and the type of information system to be utilized. A firm must ensure that the supply chain configuration supports its strategic objectives during the phase. Dell's decisions regarding the location and capacity of its manufacturing facilities, warehouses, and supply sources are all supply chain design or strategic decisions. Supply

chain design decisions are typically made for the long term (a matter of years) and are very expensive to alter on short notice. Consequently when companies make these decisions, they must take into account uncertainty in anticipated market conditions over the next few years.

2. **Supply chain planning:** For decisions made during this phase, the time frame considered is a quarter to year. Therefore, the supply chain's configuration determined in the strategic phase is fixed. This configuration establishes constraints within which planning must be done. Companies start the planning phase with a forecast for the coming year (or a comparable time frame) of demand in different markets. Planning includes decisions regarding which markets will be supplied from which locations, the subcontracting of manufacturing, the inventory policies to be followed, and the timing and size of marketing promotions. Dell's decisions regarding markets a given production facility will supply and target production quantities at different locations are classified as planning decision. Planning establishes parameters within which a supply chain will function over a specified period of time. In the planning phase, companies must include uncertainty in demand, exchange rates, and competition over this time horizon in their decisions. Given a shorter time horizon and better forecasts than the design phase, companies in the planning phase, companies in the planning phase try to incorporate any flexibility built into the supply chain in the design phase and exploit it to optimize performance. As a result of the planning phase, companies define a set of operating policies that govern short-term operations.
3. **Supply chain operation:** the time horizon here is weekly or daily, and during this phase companies make decisions regarding individual customer orders. At the operational level, supply chain configuration is considered fixed and planning policies are already defined. The goal of supply chain operations is to handle incoming customer orders in the best possible manner. During this phase, firms allocate inventory or production to individual orders, set a date that an order is to be filled, generate pick lists at a warehouse, allocate an order to a particular shipping mode and shipment, set delivery schedules of trucks, and place replenishment orders. Because oper-

ational decisions are being made in the short term (minutes, hours, or days), there is less uncertainty about demand information. Given the constraints established by the configuration and planning policies, the goal during the operation phase is to exploit the reduction of uncertainty and optimize performance.

The design, planning, and operation of a supply chain have a strong impact on overall profitability and success. Continuing with our example, consider Dell Computer. In the early 1990s, Dell management began to focus on improving the design, planning, and operation of the supply chain, with the result of significantly improved performance. Both profitability and the stock price have soared and Dell stock has had outstanding returns over this period.

In later chapters, we develop concepts and present methodologies that can be used at each of the three decision phases described earlier. Most of our discussion addresses the supply chain design and planning phases.

Overview of Supply Chain Models

We have highlighted the need to augment Transactional IT Analytical IT for the purposes of integrated supply chain planning. Analytical IT involves the implementation and application of two types of mathematical models. First, there are descriptive models that modeling practitioners develop to better understand functional relationships in the company and the outside world. Descriptive models include the following:

- **Forecasting models** that predict demand for the company's finished products, the cost of raw materials, or other factors, based on historical data
- **Cost relationships** that describe how direct and indirect costs vary as functions of cost drivers
- **Resource utilization relationships** that describe how manufacturing activities consume scarce resources
- **Simulation models** that describe how all or parts of the company's supply chain will operate over time as a function of parameters and policies.

This list is representative of the wide range of descriptive models that the modeling practitioner might create to better understand a company's supply chain.

Modeling Systems

Second, there are **normative models** that modeling practitioners develop to help managers make better decisions. The term normative refers to processes for identifying norms that the company should strive to achieve. Our viewpoint is that *normative models and optimization models* are synonyms. Further, we view optimization models as a synonym for *mathematical programming models*, a venerable class of mathematical models that have been studied by researchers and practitioners in the field of operations research for over 50 years.⁷ Henceforth, we will use the term *optimization models* to refer to models that might otherwise be termed normative or *mathematical programming*.

The construction of optimization models requires descriptive data and models as inputs. Clearly, the supply chain plan suggested by an optimization model will be no better than the inputs it receives, which is the familiar “garbage-in, garbage-out” problem. In many applications, however, the modeling practitioner is faced with the reality that although some data are not yet as accurate as they might be, using approximate data is better than abandoning the analysis. In other words, many model implementation projects pass through several stages of data and model validation until sufficient accuracy is achieved.

Supply chain managers should also realize that the development of accurate descriptive models is necessary but not sufficient for realizing effective decision making. For example, accurate demand forecasts must be combined with other data in constructing a global optimization model to determine which plants should make met at minimal supply chain cost. Similarly, an accurate management accounting model of manufacturing process costs is necessary but not sufficient to identify an optimal production schedule.

Of course, to be applied, a model conceptualized on paper must be realized by programs for generating a computer readable representation of it from input data. In addition, this representation must be optimized

using a numerical algorithm, and the results gleaned from the output of the algorithm must be reported in managerial terms. Programs for viewing and managing input data and reports must be implemented. Depending on the application, the modeling system must also be integrated with other systems that collect data, disseminate reports, or optimize other aspects of the company's supply chain. In short, an optimization model provides the inspiration for implementing, validating, and applying a modeling system, but the great bulk of the work is required by subsequent tasks.

Mathematical programming methods provide powerful and comprehensive tools for crunching large quantities of numerical data describing the supply chains of many companies. Experienced practitioners generally agree about what is, or is not, an accurate and complete model for a particular class of applications. Unfortunately, because most managers are not modeling experts, they can easily be taken in by systems that translate input data into supply chain plans using ad hoc, mediocre models and methods.

The opportunity loss incurred by applying a mediocre modeling system is not simply one of mathematical or scientific purity. Although a mediocre system may identify plans that improve a company's supply chain operations, a superior system will often identify much better plans, as measured by improvements to the company's bottom line. For a company with annual sales of hundreds of millions of dollars, rigorous analysis with a superior modeling system can add tens of millions of dollars to the company's net revenue, whereas analysis with a mediocre system may identify only a small portion of this amount. Such returns justify the time and effort required to develop and apply a superior system.

Brief Summary

Thus, with the goal of converting nonexperts to more knowledgeable consumers of models and modeling systems, we provide in later chapters a detailed introduction to mathematical modeling of supply chain decision problems. We also provide a brief exposure to algorithms for optimizing these models. The mathematical development uses algebraic methods that are taught in high school, which should render it no more painful to readers than their experiences during a typical algebra class in years gone by.

A more subtle, related point is that good models and modeling systems expand the consciousness of managers and analysts regarding decision options and methods for improving supply chain design and operations. Their expanded consciousness relies on translations of qualitative and quantitative concepts from diverse management disciplines into modeling constructs employed by a modeling system. These disciplines and the relevant concepts are discussed briefly in the following section and in greater detail throughout the book.

Many of the ideas presented in this book stem from our experience in projects where optimization models were applied. Of particular relevance are applications of an off-shelf modeling system, called SLIM/2006, for analyzing strategic and tactical supply chain problems. The principles used in constructing and applying this system and the connections between its optimization models and diverse management disciplines provided a cornerstone to our thinking.

Self Assessment Questions

1. Diagram the DEP-GARD supply chain. What stages are adding value? What stages are not?
2. Using the primary DEP suppliers (60 percent of business) what is the minimum performance cycle for the supply chain diagrammed above? What is the maximum?
3. Can the performance cycle be improved through use of the 25 and 15 percent suppliers?
4. If you were Tom Lippet, what changes would you make in DEP's operations? Why? What problems do you foresee as you try to implement these changes?
5. Assuming you can make the changes mentioned in question 4, how would you "sell" Richard Binish on DEP's next bid? What will likely be "qualifying criteria" and "order winning criteria"? Will these change over time? What does this suggest about supply chain management?
6. What should be the role of Supply Chain Management?
7. What do you mean by supply chain management?
8. What are the components involved in supply chain network?

9. Explain Supply Chain Strategy Building Blocks
10. Explain the types of Manufacturing Strategy in supply chain building Blocks.
11. What do you mean by channel strategy in supply chain building Blocks?
12. Explain the Strengths and Weaknesses of Supply Chain Strategy Building Blocks.
13. What do you mean by Bench Marking?
14. Explain the advantages of Bench Marking.
15. What are the forms of Bench Marking?
16. What do you mean by Gap analysis?
17. Write down the Key Actions involved in Benchmarking.
18. Describe the Performance Measurement in Supply Chain Management.
19. What are the decision phases in a supply chain?
20. Explain Supply Chain Models and Modeling Systems.
21. List out the types of descriptive models.
22. Briefly explain forecasting models.
23. What do you mean by simulation models?
24. Explain the concepts of normative models.

CASE STUDY

Zwick Electrical: Developing a Global Logistics Strategy

“Did the consultants come up with anything?” asked Wilton Zwick.

His brother, Carlton, nodded affirmatively. “There are several possible alternatives. In terms of alliances it looks like they have identified two potential partners. Here, take a look for yourself.” Wilton quickly scanned the report’s front page. “Hmm, Asea Brown Boveri and Siemens?”

Carlton and Wilton Zwick are, respectively, president and vice president of Zwick Electrical Incorporated (ZEI), a privately held company. Carlton joined (ZEI), a privately held company. Carlton joined ZEI in 1973 after earning a marketing degree. After receiving an engineering degree in 1975 Wilton spent four years with an electrical – products division of a major firm in Pittsburgh. He then joined ZEI in late 1979.

ZEI began operations in 1952 when Gunter Zwick, Carlton and Wilton’s father, opened for business in Clevelenland, Ohio. In the early years ZEI’s product line was limited to electric motors and parts. The company gradually expanded its product line to include power transformers, high-voltage switchgear, and metering devices. By the mid-1960s ZEI had added production facilities in Cincinnati, Ohio, and Louisville, Kentucky.

In 1968 gaps in ZEI’s product line prompted the elder Zwick to purchase EL Transmission and Power (ELTP), a Memphis-based power transmission equipment company. Although ELTP’s Memphis headquarters was closed, ZEI retained the Memphis distribution center and engineering department. ELTP’s manufacturing plants in Chattanooga (Tennessee), Springfield (Missouri), and Shreveport (Louisiana) continued operations under ZEI. During the 1970s no further acquisitions were made. The plants in Cincinnati and Chattanooga were significantly expanded to handle ZEI’s increasing business. Minor renovations were made in the Cleveland and Springfield facilities.

Although business took a sharp downturn in the early 1980s, ZEI management remained optimistic about the future. At Wilton’s urging, the engineering staffs were increased and plans were made to build a

modern facility in the Southeast. In 1984 ZEI opened a new plant and distribution center in Greenville, South Carolina. This plant specializes in power transformers and high voltage switchgear.

In 1987 Gunther retired from ZEI. At that time he appointed Carlton as president and Wilton as executive vice president. In reality Carlton is in charge of everything except product design. Wilton oversees product design and consequently works closely with the engineering and production departments.

Following the downturn of the early 1980s ZEI enjoyed modest growth until 1988. At that time it became apparent that the American power business, plagued by overcapacity, had stagnated. It became obvious that ZEI's Cleveland, Louisville, and Shreveport plants were seriously outdated. A decision was made in 1990 to renovate Shreveport and close production facilities in Cleveland and Louisville.

This decision was particularly difficult for Carlton to accept. Carlton believed that ZEI could not expect loyalty from its workers unless it demonstrated concern for their welfare in difficult times. Wilton, although sympathetic to the plight of the workers, had been watching European and Japanese firms erode America's market share in the power business. He felt that ZEI must remain competitive. If that meant closing noncompetitive facilities, so be it.

At this time the Zwick brothers also decided that ZEI needed to aggressively pursue international markets. ZEI had sporadically exported in the past – but only if a foreign customer initiated the contact. Electing for a more proactive posture, ZEI entered into an agreement with an export management company, Overseas Venture Management (OVM).

OVM acts primarily as a manufacturer's representative for ZEI in Western Europe. OVM receives a commission on each sale of ZEI product plus a fixed rate for representing ZEI at European trade fairs. In 1989, the first year of the agreement, OVM sales represented less than one-half of 1 percent of total ZEI sales. That figure improved to slightly more than 1 percent in 1990.

The Zwick brothers were generally pleased with OVM's performance. Although OVM sales in 1991 and 1992 represented less than 3

percent of total ZEI sales, trade fair appearances had generated considerable interest in ZEI's line of power semiconductors (electronic switching devices for high-voltage transmission). In fact, power semiconductors represented 70 percent of ZEI's European sales in 1991 and 1992. In particular, the rebuilding of Eastern Europe offered a potentially lucrative power semiconductor market. OVM sales were expected to increase modestly in 1993.

Future growth in Europe was threatened, however, by stagnant economies and the fear of "Fortress Europe." In 1987 European leaders agreed, through the Single European Act, to create a single, integrated market. This borderless Europe opened protected markets, creating a large regional trading bloc. Some business analysts predicted that this trading bloc will erect trade barriers designed to protect European-domiciled companies, thus leading to a "fortress" mentality.

Troubled by such predictions abroad and eroding market share at home, ZEI sought the advice of an international consulting firm. In initial discussion with the consultants the Zwick brothers had underscored three primary objectives:

1. Maintain SEI's access to international markets as regional trading blocs develop. The Zwick brothers believe that several of their products could attain substantial success abroad.
2. Increase international sales of SEI products at a greater pace than OVM had attained. SEI would like international sales to be 15 to 20 percent of company sales by the year 2000. The Zwick brothers doubt a manufacturer's representative will be able to produce that level of sales.
3. Find complementary product lines from overseas suppliers to add to ZEI's United States product line. Product development costs hamper ZEI's efforts to develop complete product lines in-house. Evidence suggests that ZEI is losing business to domestics and foreign competitors that offer more complete product lines. Many of those competitors enjoy substantially lower product development and production costs by developing and sourcing products from lower-cost countries.

As the dialogue with ZEI continued, the consultants identified several areas of concern. First, despite ZEI's nearly five-year relationship with OVM, the level of international business "savvy" with SEI was quite low. Second, neither Zwick brother indicated any desire to relocate outside the United States. Third, the Zwick brothers were so accustomed to making their own decisions that consultants wondered how effectively they would work with an outside organization. Of course, the consultants also realized that foreign competition and sliding profits had convinced many⁷ American companies to reexamine the way they did business. With that in mind, the consulting firm has suggested that SEI consider, as one alternative, entering into a business relationship with either ABB Asea Brown Boveri (ABB) or Siemens AG.

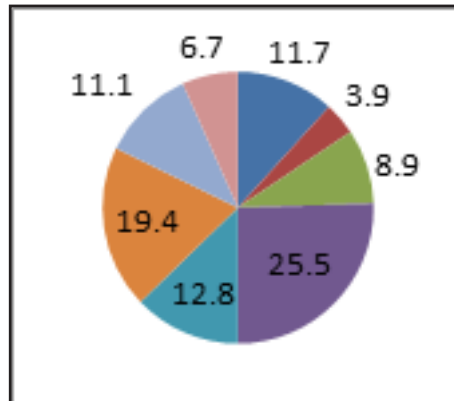
ABB Asea Brown Boveri Ltd.

I'd rather be roughly right and fast than exactly right and slow. The cost of delay is greater than the cost of an occasional mistake. [Percy Barnevik, president and chief executive, ABB Asea Brown Boveri Ltd.]

Guided by that kind of thinking, Percy Barnevik, in 1987, fashioned a merger between two prominent European firms: Asea AB (Sweden) and BBC Brown Boveri Ltd. (Switzerland). In typical Barnevik style the merger was quietly initiated and quickly concluded, deftly avoiding possible delays from government, union, or shareholder opposition. The result of this Swedish-Swiss merger, ABB, found itself with 180,000 employees and annual sales of about \$18 billion (Figure).

Effective October 1, 1993, ABB reorganized into four business segments (power plants, power transmission and distribution, industrial and building systems and transportation) and three economic regions (Europe, the Americas, and six business segments: power plants, power transmission, power distribution, industry transportation, and various activities).

Each business segment is composed of distinct business areas (BAs). Under the new alignment ABB has fifty BAs. The bulk of its revenues is still generated by the power-related business segments (Figure). Chief competitors – GE (U.S.), Siemens (Germany), Hitachi and Mitsubishi (Japan) – have all diversified away from the power industry.



Power Plants	11.7
Transportation	3.9
Industry	8.9
Others	25.5
Power Distribution	12.8
Power transmission	19.4
Environmental controls	11.1
Financial Services	6.7

ABB annual sales percentage by segment (1987)

Power Plants	20.5
Transportation	7.8
Industry	13.1
Others	29.5
Power Distribution	9.9
Power transmission	16.8
Financial Services	2.4

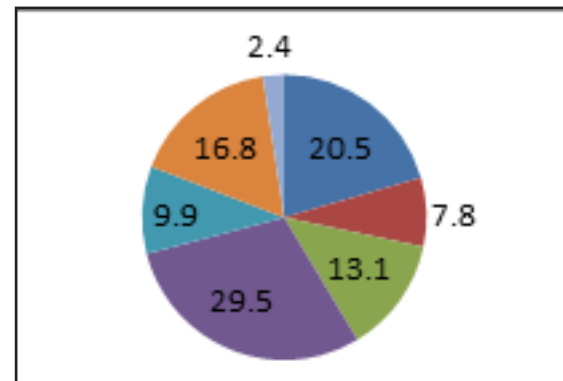


ABB annual sales percentage by segment (1991)

History

Prior to the merger, Asea AB and BBC Brown Boveri Ltd. Were widely regarded as national industrial treasures in their respective countries. Each firm had earned that respect by developing and supplying products for nearly a century.

Brown Boveri, primarily a manufacturer of heavy-duty transformer and generators, had large customer bases in Germany and the United States. But the engineer-led firm had been experiencing declining profits since the late 1970s. An analyst's report identified "empire-building" subsidiaries as a major problem. Lacking a clear corporate strategy, many Brown Boveri subsidiaries independently engaged in R&D, marketing, and production. Such duplicative costs contributed to "dividend-free" years in 1986 and 1987.

In the late 1970s Asea AB was slowly growing, a dominant force in the Swedish electrical engineering and power plant market. That changed in 1980. Barnevik took over the firm and began to behave in a very un-Swedish manner. First order of business? Slash overhead at Asea headquarters. In the first 100 days Barnevik reduced Asea's main office staff from 1,700 to 200. (This was to become a Barnevik trademark. In subsequent acquisitions the first order of business was always the severe reduction of headquarters personnel.) Responsibility was shifted downward as numerous profit centers, with specific target goals, were established. Throughout the 1980s other Scandinavian firms were acquired (Stromberg-Finland, Flotech-Denmark, Elektrisk Bureau-Norway) in an effort to widen Asea's electromechanical product line as well as its distribution channels. Further expansion took Asea beyond Europe to Asia and North America. In eight years Barnevik tripled Asea's sales and increased earnings fivefold.

While on this acquisition growth binge Barnevik was contemplating the future European landscape. A borderless Europe would open protected markets. For Asea that meant an opportunity to wrest part of the power plant market away from domestic firms. This realization eventually led Barnevik to approach Brown Boveri. The Asea/Brown Boveri merger, domiciled in Zurich, Switzerland, became official January 5, 1988.

After the merger Barnevik rationalized, or streamlined, the ABB workforce and then launched a series of acquisitions. In 1989 ABB entered a joint venture with Italy's state-owned Finmeccanica and completed a buyout of Westinghouse Electric Corporation's United States power transmission and distribution business. The following year saw ABB:

- (1) Assume control of Combustion Engineering, an American boiler and nuclear plant builder;
- (2) Move into Eastern Europe with a majority position in Zamech, a Polish turbine maker; and
- (3) Establish links with an East German electrical-equipment supplier, Bergmann-Borsig.

In 1991 ABB acquired Bergmann-Borsig and continued its aggressive investment in Central and Eastern Europe by entering into approximately thirty joint ventures. By 1992 ABB held roughly 1,300

subsidiaries spread across Europe, Asia, North America, Latin America, Africa, Australia, and New Zealand. In 1993 it was reported that ABB would expand further into Asia and Eastern Europe.

Organization

In order to control this far-flung network ABB employs a matrix organization, divided by products and geography.

The four major product lines are subdivided into Bas. Each BA manager is responsible for setting global strategy for that product line. That responsibility includes setting and monitoring factory cost and quality standards, allocating export markets among the BA factories, and personnel management and development. Within each of the three primary geographical regions ABB is divided by country. Country managers deal with national and local governments, unions, laws, and regulations. They operate traditional national companies. But the country managers also work across Bas by coordinating all operations within their assigned country. It is this latter role that links business segments and attempts to create an efficient distribution and service network across product lines.

At a still lower level is the company manager. This person is responsible for a single facility and its products. The company manager reports to two bosses: the BA manager and country manager. This matrix organization creates what Barnevik prefers to call a “multi domestic” rather than a multinational company. It is, in Barnevik’s opinion, the multi domestic firm that can truly “think global, act local.” Company managers are usually nationals of the country in which they are employed. Naturally they are familiar with local customs and marketplace. But they are also forced to think globally because of the BA manager’s global strategy (i.e., export markets) for the domestically produced goods. As a consequence, ABB plants typically produce a variety of products for the local market and a narrower line for export. The narrower line reflects the particular specialty or core product of that plant. Barnevik notes that this strategy forces a plant to be flexible to meet specific local needs while still producing internationally competitive products for export.

In order for the matrix system to work Barnevik tries to “over inform.” Information is continually disseminated in face-to-face meetings

between executive committee members and business area, country, and company managers.

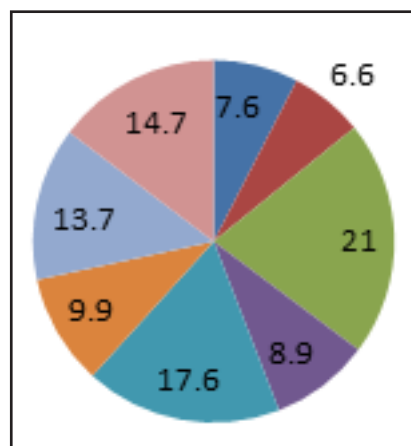
But it is Abacus, ABB's management information system, that ties the highly decentralized company together. Abacus provides centralized reporting to ABB's 1,300 subsidiaries and 5,000-plus profit centers.

In addition to traditional financial performance measures Barnevik reviews aggregated and disaggregated results by business segments, country, and companies. It is within this latter information that Barnevik discerns trends and problems. With little fanfare, the situation is discussed with appropriate ABB personnel. A course of action is quickly planned and implemented.

Siemens AG

Siemens, a German company, has fifteen business segments: power generation, power transmission and distribution, industrial and building systems, drives and standard products, automation, private communication systems, public communication networks, defense electronics, automotive systems, semiconductors, medical engineering, passive components and electron tubes, transportation systems, audio and video systems, a 1990 merger with Nixdorf resulted in the formation of Siemens

Drives/ Standard Products	7.6
Automation	6.6
Communication	21
Medical Engineering	8.9
Others	17.6
Industrial/ Building Systems	9.9
Power Sectors	13.7
SNI	14.7



Siemens annual sales percentage by segment (1992)

Nixdorf Information's system AG (SNI). SNI, second largest computer company in Europe after IBM, is a separate legal entity. Figure indicates the relative importance of the various business segments.

History

In 1847 Werner Siemens and J.G. Halske formed Siemens & Halske (S&H) to manufacture and install telegraphic systems. The company was successful and within ten years found itself constructing an extensive telegraph system in Russia as well as developing the first successful deep-sea telegraphic cable.

Spurred by such accomplishments S&H diversified into other products. By the late 1800s S&H had become involved in telephones, electrical lighting, X-ray tubes, and power-generating equipment.

Growth continued into the 1900s until the outbreak of World War I. With civilian demand dampened, S&H sought military contracts. During the war the company supplied the German military with communication devices, explosives, rifle components, and aircraft engines.

Defeat of the German state carried a penalty for S&H. Its assets in England and Russia were seized by the respective governments. Despite such losses S&H continued operations, concentrating on electrical manufacturing. In 1923 S&H began producing radio receivers. Soon thereafter the firm once again moved into international markets, setting up an electrical subsidiary in Japan and developing hydro projects in Ireland and the Soviet Union. War again interrupted S&H's Business. During World War II S&H devoted the majority of its manufacturing capacity to military orders. The company's electrical skills were utilized in the development of an automatic-pilot system for airplanes and the German V-2 rocket. As a result, S&H factories were frequently targeted for Allied bombing raids. After the Soviet army gained control of Berlin in 1945, S&H's corporate headquarters was destroyed.

Following World War II S&H relocated to Munich. By the early 1950s S&H was again producing a variety of products for consumer electronics, railroad, medical, telephone, and power-generating equipment markets. S&H established an American subsidiary in 1954. By the end of the 1950s S&H had broadened into data processing and nuclear power.

In 1966 S&H underwent a major reorganization. All subsidiaries were brought under the direct control of the parent company. In turn,

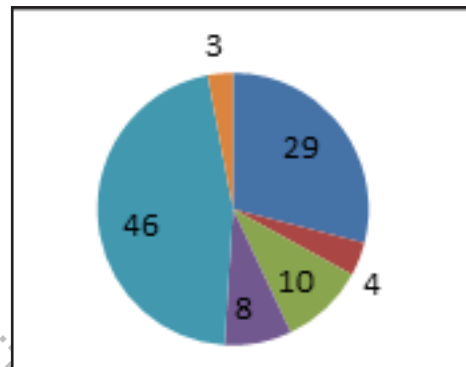
the parent company reincorporated and emerged with a new name, Siemens AG.

By the 1970s Siemens had once again become a respected international competitor in electrical manufacturing. Siemens displaced Westinghouse as the world's number two electrical manufacturer. This pitted Siemens against number one General Electric in numerous markets in the 1970s and 1980s. Despite a series of acquisitions and mergers in the 1980s Siemens remained a Euro-centered organization for the next decade. Sales in 1992 show that 75 percent of Siemens' sales occur in Europe, with 46 percent of that amount in Germany alone (Figure).

Organization

From 1847 until 19811 a Siemens family member controlled the day-to-day operations. That changed with the retirement of Peter von Siemens in 1981. Since that time the company has been directed by non-Siemens family members.

Rest of Europe	29
Other region	4
North America	10
Asia	8
Germany	46
America	3



Siemens sales percentage by region

Siemens corporate structure is based on the concept of decentralized responsibility. This philosophy is supported by a flat hierarchy and, consequently, short decision-making paths. Management believes that decentralized organization guarantees maximum market responsiveness in today's competitive environment.

The corporate structure is characterized by three primary divisions: groups, regional units, and corporate divisions and centralized services. The groups are the previously mentioned fifteen business segments as well as several legally independent business entities (e.g., SNI). Headed by a

group president, the group has worldwide responsibility for its business activity. The groups are intended to act as “stand-alone” businesses, resembling an independent company.

The role of the regional units is to implement the business goals of the groups. The regional units must encourage maximum local units understand each group’s overall strategy. In most cases the regional unit deals directly with local subsidiaries.

The utilization of corporate divisions and centralized services is intended to separate staff functions from service units. Within the corporate divisions there are five main corporate departments: finance, research and development, human resources, production and logistics, and planning and development. These departments provide general guidelines and serve as a coordinating function in their particular area. This coordinating function supports each group’s business while keeping Siemens’ overall strategic goals in mind.

Having finished the consultants’ report Wilton Zwick leaned back in his chair and wondered about ZEI’s future. He realized that ZEI’s decision would, in large measure, determine the company’s future. A misstep at this juncture might be disastrous. A correct decision, however, could launch a new era of growth and prosperity.

UNIT – IV

Unit Structure

Lesson 4.1 - Supply Chain Inventory Management

Lesson 4.2 - Multichannel Inventory System

Lesson 4.3 - Supply Chain Facility Layout

Lesson 4.4 - Capacity Planning

Lesson 4.5 - Inventory Optimisation

Lesson 4.6 - Routing and Scheduling

Lesson 4.1 - Supply Chain Inventory Management

Learning Objectives

After reading this lesson you should be able to:

- Understand the basic tenets of the Supply chain Inventory Management System
- Discern the underlying concept of Economic Order Quantity (EOQ)
- Analyse the assumptions and derive the EOQ
- Acquire knowledge on Reorder Point Models

Introduction

One of the most paramount factors in supply chain management's success is squarely dependent on Supply Chain Inventory Management. The two primary attributes which determine the vitality of this are Economic Order Quantity (EOQ) and Reorder Point System. In this chapter we can envisage the basic tenets of these concepts by delving a bit on the applications of the same in practice.

The Economic Order Quantity Model

The Economic Order Quantity (EOQ) model is classic independent demand inventory system that provides many useful ordering decisions. The basic order decision is “What is the correct order size to minimize total inventory costs?” This issue revolves around the trade-off between annual inventory holding costs and annual order costs. When order sizes for an item are small, orders have to be placed on frequent basis, causing high annual ordering cost. However, the firm has a low average inventory level for this item, resulting in low annual inventory holding cost. When order sizes for an item are large, orders are placed less frequently, causing lower annual order costs. Unfortunately, this also causes the average inventory level for this item to be high, resulting in higher expenses to hold the inventory. The EOQ model seeks to determine an optimal order quantity, where the sum of the annual order cost and the annual inventory holding cost is minimized.

Order cost is the direct variable cost associated with placing an order with the supplier, whereas holding cost or carrying cost is the cost incurred for holding inventory in storage. Order costs include managerial and clerical costs for preparing the purchase, as well as other incidental expenses that can be traced directly to the purchase. Examples of holding costs include warehousing expense, handling charge, insurance, pilferage, shrinkage, taxes, and the cost of capital.

Assumptions of the Economic Order Quantity Model

Users must carefully consider several assumptions when determining the economic order quantity:

1. The demand must be known and constant. For example, if there are 360 days per year and the annual demand is known to be 720 units, then daily usage must be exactly two units throughout the entire year.
2. Delivery time is known and constant. For example, if the delivery time is known to ten days, each and every delivery will arrive exactly ten days after the order is placed.
3. Replenishment is instantaneous. The entire order is delivered at one time, and partial shipments are not allowed.

4. Price is constant. Quantity or price discounts are not allowed
5. The holding cost is known and constant. The cost or rate to hold inventory must be known and constant.
6. Ordering cost is known and constant. The cost of placing an order must be known and remains constant for all orders.
7. Stock-outs are not allowed. Inventory must be available at all times.

Deriving the Economic Order Quantity

The economic order quantity can be derived easily from the total annual inventory cost formula using simple calculus. The total annual inventory cost is the sum of the annual purchase cost, the annual holding cost, and the annual order cost.

The formula can be shown as:

$$TAIC = APC + AHC + AOC = (R \cdot C) + (Q/2 \cdot K \cdot C) + (R/Q \cdot S)$$

Where

TAIC = total annual inventory cost

APC = purchase cost

AHC = annual holding cost

AOC = annual ordering cost

R = annual requirement or demand

C = purchase cost per unit

S = cost of placing one order

K = holding cost rate, where annual holding cost per unit $k \cdot c$

Q = order quantity

Since R, C, K and S are assumed to be constant, Q is the only unknown variable in the TAIC equation. The optimum Q (the EOQ) can be obtained by taking the first derivative of TAIC with respect to Q and then setting it equal to zero. A second derivative of TAIC can also be taken with respect to Q to prove that the TAIC is at the minimum.

$$\Rightarrow dTAIC/dQ = 0 + (1/2 \cdot k \cdot c) + (-1 \cdot R \cdot S \cdot 1/Q^2)$$

$$= kC/2 - RS/Q^2$$

then setting equal to zero,

$$(kC/2 - RS/Q^2) = 0$$

or $kC/2 = RS/Q^2$

or $Q^2 = 2RS/kC$

then $EOQ = \sqrt{2RS/kC}$

The second derivative of TAIC is;

$$(d^2 ATC/dQ^2) = 0 - (-2 * (RS/Q^3)) = (2RS/Q^3) \geq 0$$

Implying the TAIC is at its minimum.

The annual purchase cost drops off after the first derivative is taken. The managerial implication here is that purchase cost does not affect the order decision if there is no quantity discount (the annual purchase cost remains constant as long as the same annual quantity is purchase). Thus, the annual purchase cost is ignored in the classic EOQ model.

Reorder Point Models

A reorder point system is a widely used way to identify purchase needs. Such system uses information regarding order quantity and demand forecast that are unique to each item or part number maintained in inventory. Each item in a reorder point system, which is usually computerized, has a predetermined order point and order quantity. When inventory is depleted to given level, the system notifies the material control department (or the buyer in some organizations) to issue a request to a supplier for inventory replenishment. This signal might be a blinking light on a screen, a message sent to the material control department's e-mail address, or computer report. Most reorder point systems are automated using predetermined ordering parameters (such as an economic order quantity, which considers inventory holding and ordering costs). Computer-based systems can instantly calculate reorder point parameters. Most systems can also calculate the cost tradeoffs between inventory holding costs, ordering costs, and forecast demand requirements. Reorder point systems are used for production and nonproduction items.

An automated reorder point system efficiently identifies purchase requirements. This type of system can routinely provide visibility to current inventory levels and requirements of thousands of part numbers. The reorder point system is the most common method for transmitting routine material order requests today, particularly for companies that maintain spare part distribution centers. Students interested in learning more about reorder point systems should consult an inventory management textbook.

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Lesson 4.2 - Multichannel Inventory System

Learning Objectives

After reading this lesson you should be able to:

- Understand the tenets of multichannel inventory system
- Manage a basic form of multichannel inventory system
- Ascertain and assess the determinants of the system

Introduction

In our discussions so far we have considered lot sizing decisions to be localized at a single stage of a supply chain. In multi-echelon supply chains there are multiple stages, with possibly many players at each stage and one stage supplying another. Each participant in a multi-echelon system must decide on their lot size. One simple approach is for each participant in a multi-echelon system to aggregate its demand and solve for the appropriate EOQ to obtain the lot size.

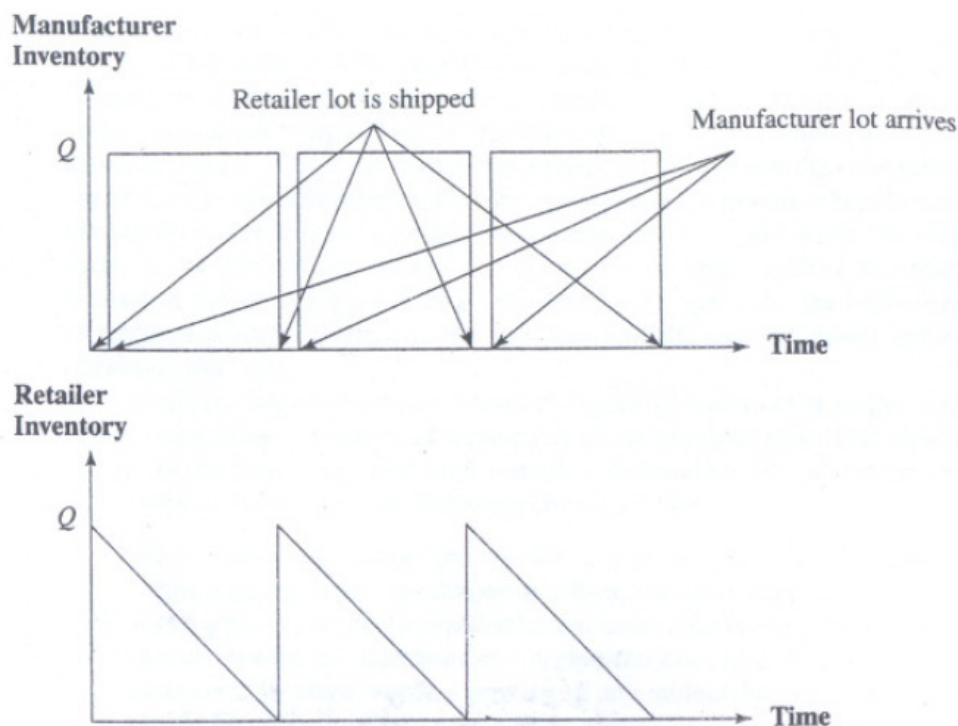
One problem with this approach is that it may result in replenishment orders not being coordinated and the supply chain holding more cycle inventory than required. Another problem with this approach is that it may lead to an unnecessarily large number of orders, resulting in a high order cost in the supply chain. In both cases, the goal is to find ordering policies that coordinate orders across the supply chain.

Multichannel Inventory System

First consider a simple multi-echelon system with one manufacturer supplying one retailer. Assume that production is instantaneous so the manufacturer can produce a lot when needed. If they have the same optimal lot size Q but are not synchronized, the manufacturer may produce a new lot of size Q right after shipping a lot of size Q to the retailer. Inventory at the two stages is as shown in Figure In this case the retailer will carry

an average inventory of $Q/2$ and the manufacturer will carry an average inventory of about Q .

In contrast, if the manufacturer synchronizes his production to match shipment to the retailer, he can arrange for his lot to be produced just when the retailer order is to be shipped. In this case, the manufacturer will carry no inventory and the retailer will carry an average inventory of $Q/2$ as before. Synchronization of replenishment orders allows the supply chain to lower total cycle inventory from about $3Q/2$ to $Q/2$ in this case.



Inventory profile at Retailer and Manufacturer with No Synchronization

Management of Multichannel Inventory System

When a supply chain has a series or stages, the goal is to synchronize lot sizes at different stages in a way that no unnecessary cycle inventory is carried at any stage. One method of achieving synchronization in a supply chain with a single series of stages is to devise inventory policies that are nested and have stationary intervals.

An inventory policy is nested if a particular stage S and its customers' orders are synchronized such that the replenishment order arrives at stage S just in time for the replenishment order to be shipped to

a customer of stage S . stage S , however, may replenish less frequently than its immediate customer stage. A policy has stationary intervals if every stage reorders after a fixed interval of time. Following a nested policy is equivalent to stating that each stage has the opportunity to cross-dock at least a part of its replenishment order because cross-docking can occur when both stages are to be replenished in coordinated manner.

For a supply chain with stages in a single series, ordering policies where the lot size at each stage is an integer multiple of the lot size at its immediate customer (a nested policy) have been shown to be quite close to optimal. Such an ordering policy is equivalent to having lot sizes at each stage be an integer multiple of the amount cross-docked on to the next stage; that is, one out of every k orders from the customer stage is cross-docked where k is an integer. The extent of cross-docking will depend upon the ratio is between two stage, the higher the optimal percentage of cross-docked product.

A slightly different issue arises when one party in a supply chain supplies multiple parties at the next stage of the supply chain, such as when a distributor supplies many retailers. In this case, a nested policy is not very effective if some retailers have very low demand and others have high demand. Here it may be better for retailers with low demand to order less frequently than the distributor because ordering more frequently will increase the order cost in the supply chain. In this setting,

Roundy (1995) has shown that retailers should be grouped such that all retailers in one group order together and for any retailer, either the ordering frequency is an integer multiple of the ordering frequency at the distributor or the ordering frequency is an integer multiple of the ordering frequency at the distributor or the ordering frequency at the distributor is an integer multiple of the frequency at the retailer. An example of such a policy is shown in Figure.

Under this policy the distributor places a replenishment order every two weeks. Some retailers place replenishment orders every week and others place replenishment orders every two or four weeks. Observe that for retailers ordering more frequently than the distributor, the retailers' ordering frequency is an integer multiple of the distributor's frequency.

For retailers ordering less frequently than the distributor, the distributor's ordering frequency is an integer multiple of the retailers' frequency.

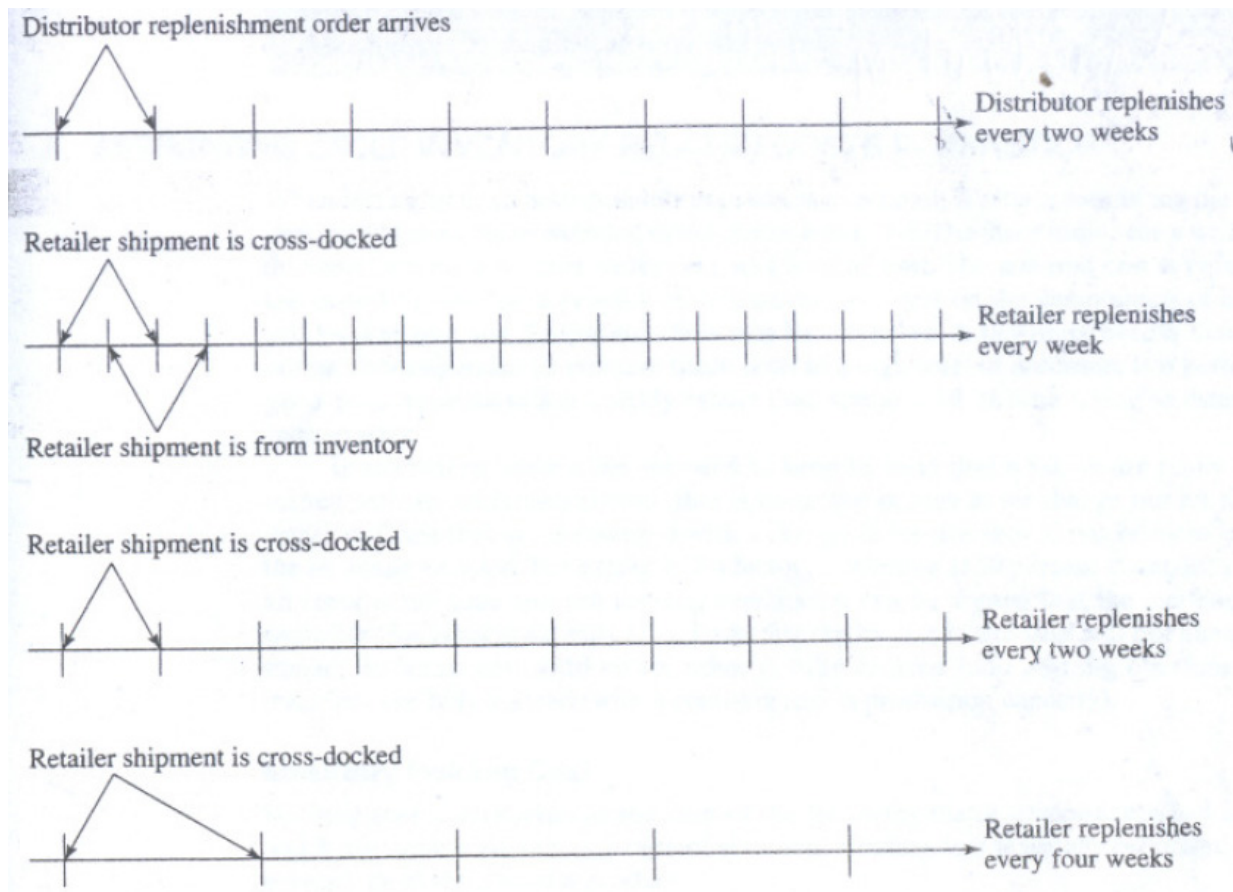


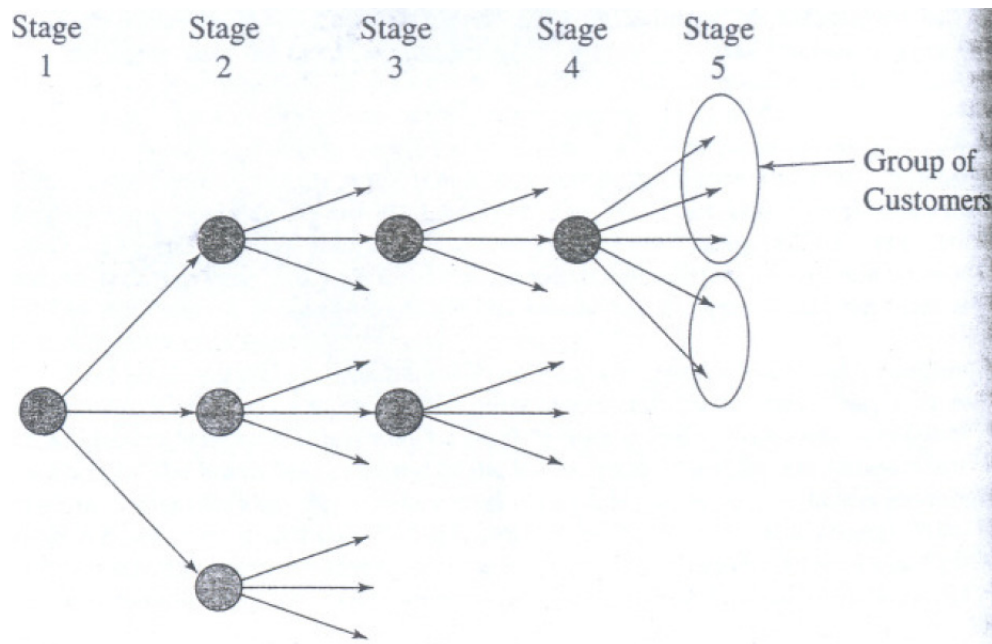
Illustration of an Integer Replenishment Policy

If the distributor orders more frequently than the retailer, all shipments to the retailer are cross-docked as shown in Figure. For retailers ordering every four weeks, replenishment at the distributor can be synchronized with shipment to retailers. Thus, every four weeks, the distributor's replenishment order arrives just in time to be cross-docked and shipped to the retailers placing orders once every four weeks as shown in Figure. If the distributor orders less frequently than the retailer, some of the retailer's replenishment ordering every week, every second week the replenishment order at the distributor arrives just in time to be cross-docked and shipped to the retailer as shown in Figure. Every other week, however, the replenishment order to retailers is shipped from inventory. Thus, half the replenishment orders are cross-docked in this case.

Determinants

Considering the supply chain shown in Figure as a set of stages with all parties at a one stage being customers of some party at the previous stage and suppliers to other parties at the next stage. For such a multi-echelon distribution supply chain, a good replenishment policy has the following characteristics:

- All parties within a stage are divided into groups such that all parties within a group order simultaneously from the same supplier.
- When a party receives a replenishment order, the receipt should be synchronized with the shipment of a replenishment order to at least one of its customers. In other words, a portion of any replenishment order at a stage should be cross-docked on to the next stage.



A Multi-Echelon Distribution Supply Chain

- If a customer replenishes less frequently than its supplier, the supplier replenishment frequency should be an integer multiple of the customer replenishment frequency and replenishment at both stages should be synchronized to facilitate cross-docking. In other words, a supplier should cross-dock all orders from customers who reorder less frequently than the supplier himself.

- If a customer replenishes more frequently than its supplier, the customer's replenishment frequency should be an integer multiple of the supplier's replenishment frequency and replenishment at both stages should be synchronized to facilitate cross-docking. In other words, a supplier should cross-dock one out of every k shipments to a customer who orders more frequently than himself, where k is an integer.
- Thus, the relative frequency of reordering will depend upon the setup cost, holding cost and demand at different parties.

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Lesson 4.3 - Supply Chain Facility Layout

Learning Objectives

After completing this chapter, you should be able to:

- Ascertain the knowledge on criteria for the layout decision and flow process
- Analyse the batch processing and finding the pattern of layouts
- Take calls on systematic layout planning
- Understand techniques of relationship diagram
- Explain the role of computers in determining a job shop layout.

Introduction

Facility layout is the arrangement of the work space. Broadly defined, it can involve questions at three levels of detail.

1. At the highest level, how should the departments or work groups be arranged? Which departments or groups should be adjacent, and which can be placed far there apart? For example, in a hospital, how close should the pediatrics department be to the X-ray department?
2. Next, within the departments or work groups, how should people, equipment, and storage be arranged? How large should the department be? Within an X-ray department, how much equipment should there be, and how should it be arranged? The department may need more than one machine, space for viewing X-rays, and storage.
3. Finally, how can the arrangement of each work space within a department be designed so that assigned tasks can be efficiently and effectively carried out? How should the workstation where the technician operates the machine be arranged? How should the space for viewing X-rays be designed for easy use by doctors and technicians?

These layout issues are all related. For example, the size of the facility is dependent on the size of each department, which, in turn, is dependent on the number of people, the amount of equipment, and the amount of storage space. The amount of space each person needs is a function of how well the individual's work space has been designed. It should be clear from this description that capacity and layout are related because the capacity a company is seeking to achieve determines the number of people and the amount of equipment used in its operations.

Criteria for the Layout Decision

The objectives of facility layout are similar, regardless of whether the layout is for an office building, a steel mill, a hospital, or a ship. One objective is to provide convenient access between two groups or departments that interact heavily. It costs money to move people, information, and materials around a facility management would like to minimize that cost without reducing the organization's overall effectiveness.

In some cases, departments that depend on the same resource may have to be located physically close together even though they interact very little. This arrangement allows them to share expensive resources. For example, both shipping and receiving may require use of an overhead crane to load and unload heavy parts to railcars. Because both departments require access to the crane and the railcars, they are likely to be located close together even if they interact very little. In an office layout, two departments that interact very little may require access to expensive copying and printing capabilities that would be too expensive to duplicate.

In other cases, departments or functions that are potentially detrimental to one another should be separated to the extent possible. A sanding operation and a painting operation are not compatible because the grit from sanding may travel through the air and land on the fresh paint. These operations are likely to be physically separated unless special are built for painting.

In retail services operations, another dimension, the impact of layout on the customer, often dominates the layout decision. While layout cost and floor space utilization are important for discount retailers, customer access and convenience dominate the layout decision. Retailers

like Wal-Mart, Meijer, and Kroger lay out their stores to make it easy for customers to find products they need. For upscale retailers like Victoria's Secret, layouts are conceived to entice customers to purchase high-profit margin items. These elements of the layout question are typically discussed in marketing textbooks and courses.

Overview of the Layout Question

The techniques and methods used to determine facility layout depend upon the process used in operations. Product-oriented layouts are used in continuous flow shops, assembly lines, batch operations, manufacturing cells, and flexible manufacturing systems to take advantage of an dominant product flow.

In most cases, the layout is obvious once the production sequence is determined. Basing the facility layout on this flow allows the firm to reduce the cost of moving materials and people around the facility. In process-oriented layouts, products and people move around the facility in many different paths.

Finding the layout that serves these different paths requires a different, more detailed, approach to facility layout. The methods and techniques for facility layout for each process type are discussed in the remainder of the chapter. A fixed-position layout, which is used for projects that make large one-or-a kind products, is discussed in the project management chapter.

The following list provides some examples of companies for each process type.

Continuous Flow Shop

- **Sorting mail**—The U.S. Postal Services sorts millions of pieces of bulk mail daily.
- **Making paper**—Longview Fibre transforms trees into wood pulp, continuously.
- **Transaction processing**—Citibank processes checks, Amazon.com processes customer orders, the federal government processes FAFSA (financial aid forms).

Assembly lines

- **Automobiles**—DaimlerChrysler assembles automobiles.
- **Food preparation**—DiGiorno assembles frozen pizza for your supermarkets.
- **Microcomputers**—Gateway assembles personal computers.

Batch

- **Medicine**—Merck creates a variety of medicines in large batches using the ssamd equipment.
- **Surgery**—Shouldice Hospital specializes in hernia surgery.
- **Lumber**—Weyerhaeuser cures lumber in specially design kilns (furnaces).

Manufacturing Cells and Flexible Manufacturing Systems

- **Metal forming operations**—Wyman-Gordon forges many different parts for the automotive industry.
- **Hospitals services**—Hospital wards group together patients with similar needs to improve service and lower costs.

Job Shop

- **Offices**—Colleges of business strive to achieve a layout that locates colleagues with similar fields close together.
- **Medical services**—emergency room layouts cope with a wide variety of medical problems.

Continuous Flow Processes

The layout for a continuous flow operation builds directly on the concept of minimizing the distance that people, information, and material move. An activity matrix for a continuous flow process is shown in Exhibit This matrix organizes and displays the movement of people, parts, or other things between departments. The zeros in Exhibit indicate no movements between those pairs of departments.

The number ten represents ten items moving from one department to another. The items could be pieces of wood used to make furniture, stock purchase transactions, or even people moving from one point to another.

The matrix does not consider movements from department 1 to department 1, 2 to 2, and so on. These interdependent moves would be considered as part of the layout within the department. As shown in the matrix in Exhibit, product movement follows the same sequence through the departments: 1-2-3-4-5. The flows between any other pair of departments or in any other sequence are zero. As a result, the layout that minimizes the costs of moving between departments is simple—it follows the product's sequence of operations. This is why a continuous flow process and assembly lines are said to have product-oriented layouts.

Even in cases where other minor product movement exists, the dominant flow will govern the layout. It is only when these other flows become significant that the process is no longer a continuous flow or an assembly line. When many different paths or sequences occur, the process takes on characteristics typical of a job shop.

Because the layout for continuous flow processes follows the product's sequence of operations, the technical aspects of the process selection ultimately dictate the layout. For example when crude oil is refined to make various products, including gasoline, diesel fuel, kerosene, and heating oil, the process follows a sequence of steps.

In the first step, distillation, crude oil is heated to 700 degrees F. A mixture of vapor and unvaporized oil passes from the heating furnace into a fractioning column that contains perforated trays. The vapor condenses at different trays, which means that different products come out of the column at different levels. Gasoline is lighter than heating oil and therefore condenses at a different (higher) level.

In the next step, alteration, the remaining heavy oils, which have little economic value, are processed so their chemical structure is altered. These elements are recombined to make high-value products such as gasoline. In the final step, impurities, such as sulfur, are removed from the products. The layout of the oil refinery should follow the processing

requirements so the equipment for distillation is close to the equipment for alteration, which, in turn, is close to the equipment for purification. In this way, material-handling costs are reduced.

	1	2	3	4	5
1		10	0	0	0
2	0		10	0	0
3	0	0		10	10
4	0	0	0		10
5	0	0	0	0	

Activity Matrix for Continuous Flow Process

Continuous Flow Processes and Service Industries

Many continuous flow operations are found in the production of goods because many service operations lack the volume required to support the large fixed investment in facilities necessary for continuous flow operations.

There are some notable exceptions, however. The U.S. Postal Service handles billions of pieces of correspondence with thousands of expensive and sophisticated sorting machines and handling systems. FedEx handles packages and mail in the same way.

Large banks also have continuous flow processes. Most customers see only the small branch operations, which tend to be tailored to the individual customer's needs and thus are more like job shop operations. But the central processing area is a continuous flow operation that can handle hundreds or thousands of transaction each day. Here, checks written against deposits in the bank are processed and the information entered into the computer system.

The approach to facility layout for handling mail or processing checks is similar to the approach to facility layout for making steel or refining oil. Once the sequence of operations is determined, the layout will follow.

Assembly Lines

As assembly line is designed to arrange various components into a final product that conforms to standards set in product design. The purpose of an assembly line is to divide complex tasks into small, easy-to-learn segments that can be repeated over and over. An assembly line usually consists of a series of workstations or work centers at which individuals perform these tasks on each product. Most assembly lines are designed to produce large volumes of one product that have limited options.

Facility Layout - Objectives

For an organization to have an effective and efficient manufacturing unit, it is important that special attention is given to facility layout. Facility layout is an arrangement of different aspects of manufacturing in an appropriate manner as to achieve desired production results. Facility layout considers available space, final product, safety of users and facility and convenience of operations.

An effective facility layout ensures that there is a smooth and steady flow of production material, equipment and manpower at minimum cost. Facility layout looks at physical allocation of space for economic activity in the plant. Therefore, main objective of the facility layout planning is to design effective workflow as to make equipment and workers more productive.

A model facility layout should be able to provide an ideal relationship between raw material, equipment, manpower and final product at minimal cost under safe and comfortable environment. An efficient and effective facility layout can cover following objectives:

- To provide optimum space to organize equipment and facilitate movement of goods and to create safe and comfortable work environment.
- To promote order in production towards a single objective
- To reduce movement of workers, raw material and equipment
- To promote safety of plant as well as its workers
- To facilitate extension or change in the layout to accommodate new product line or technology upgradation

- To increase production capacity of the organization

An organization can achieve the above-mentioned objective by ensuring the following:

- Better training of the workers and supervisors.
- Creating awareness about of health hazard and safety standards
- Optimum utilization of workforce and equipment
- Encouraging empowerment and reducing administrative and other indirect work

Factors Affecting Facility Layout

Facility layout designing and implementation is influenced by various factors. These factors vary from industry to industry but influence facility layout. These factors are as follows:

- The design of the facility layout should consider overall objectives set by the organization.
- Optimum space needs to be allocated for process and technology.
- A proper safety measure as to avoid mishaps.
- Overall management policies and future direction of the organization

Design of Facility Layout

Principles which drive design of the facility layout need to take into the consideration objective of facility layout, factors influencing facility layout and constraints of facility layout. These principles are as follows:

- **Flexibility:** Facility layout should provide flexibility for expansion or modification.
- **Space Utilization:** Optimum space utilization reduces the time in material and people movement and promotes safety.
- **Capital:** Capital investment should be minimal when finalizing different models of facility layout.

Design Layout Techniques

There are three techniques of design layout, and they are as follows:

1. **Two or Three Dimensional Templates:** This technique utilizes development of a scaled-down model based on approved drawings.
2. **Sequence Analysis:** This technique utilizes computer technology in designing the facility layout by sequencing out all activities and then arranging them in circular or in a straight line.
3. **Line Balancing:** This kind of technique is used for assembly line.

Types of Facility Layout

There are six types of facility layout, and they are as follows:

- Line Layout
- Functional Layout
- Fixed Position Layout
- Cellular Technology Layout
- Combined Layout, and
- Computerized Relative Allocation of Facility Technique

The Role of Computers in Job Shop Layout

Solving the job shop layout problem can be time-consuming and tedious. Several computer procedures exist for assisting with the layout. Computerized Relative Allocation of Facilities Technique (CRAFT) was developed by Buffa and Armour. It works much like the procedure described in the previous section. The user supplies an initial layout, an activity level matrix, and cost information. If certain departments must be located together to share a key resource, this can be specified. If departments cannot be adjacent, this can also be specified.

These computer procedures can calculate many alternatives very quickly. CRAFT reduces the cost by switching all department pairs and calculating values for (A)(C)(D) for each alternative. The lowest-cost alternative is selected for further analysis, and the switching of pairs continues.

Although the stopping rules for computer-based procedures are still somewhat arbitrary, they are easier to implement than those for a manual procedure. The brute power and speed of the computer allow it to investigate quickly far more alternatives than can be reasonably done by hand. The following approaches can be considered:

1. Specify a certain amount of computer time, and use the best solution found.
2. Allow the model to perform the switching of pairs only a certain number of times.
3. Specify an increment of improvement to be achieved with each evaluation. If this is not achieved, the procedure will end. For example, one could specify that at least a 2 percent reduction from the last solution must be achieved or the search ends.
4. Combine some of these rules. For example, the procedure can stop after a certain amount of time or after a specified number of switches, whichever is lower.

Other computer-based procedures, such as computerized Facility Design (COCAD), Plant Layout Analysis and Evaluation Technique (PLANET), Computerized Relationship Layout Planning (CORELAP), and Automated Layout Design Programs (ALDEP), are also available. These procedures attempt to maximize nearness ratings. However, solutions Generated by these computer models are not guaranteed to be optimal.

Systematic Layout Planning

In some cases, managers may want to summarize nearness on a subjective scale with factors other than activity levels and costs. **Systematic layout planning (SLP)** involves using the codes and matrix shown in Exhibit to arrive at an appropriate layout.

We begin the solution procedure by procedure by positioning department pairs that are categorized as absolutely necessary and those that are categorized as undesirable. Once these pairs are positioned, it is possible to work on the very important, important, and somewhat important categories to locate the remaining departments in the layout.

Exhibit displays the layout using this approach. Departments R and F are positioned first. Then, A and T are positioned. Because T and D are undesirable, they are put at opposite ends of the facility. This gives the location of department W by default.

We can use a simple evaluation procedure to judge the effectiveness of this solution. First, we count the number of times each code appears in the matrix in Exhibit. Next, we count the number of times each condition is satisfied. For codes a, e, I, and o to be satisfied, the departments must be adjacent, as departments A and R are, or diagonally opposite, as A and Ware. Any location satisfies code u because the relative location of that pair of departments is unimportant. Separation by one or more departments satisfies code x.

Matrix	Codes
Receiving (R)	a
Fabrication (F)	i e o u i
Wiring (W)	u i o i i
Drilling (D)	o e o i i
Assembly (A)	o x u
Testing (T)	a

Information for Systematic Layout Planning for a Machine Shop

Solution and Valuation of Machine Layout

The percentage satisfied column in Exhibit indicates that the proposed solution is effective at meeting the nearness codes. This approach works well on problems with relatively few departments.

A	R	F
T	W	D

Evaluation Codes	Number of Appearances in Matrix	Number of Times Satisfied in Layout	Percentage Satisfied
A	2	2	100%
e	2	2	100
i	4	3	75
o	3	1	83
u	3	3	100
x	1	1	100

Single Layout for Competitive Advantage

The impact of a good layout on an organization's performance may not be as obvious as good product design skills or superior capacity planning. The effects of layout are subtle, yet important. Efficient layouts reduce unnecessary material handling.

Good layouts help to maintain low costs, which is a critical part of building and maintaining market share in a global environment. Good layouts also keep product flowing through the facility, which is important for providing good customer service. A facility choked with inventory is more likely to damage products and lose customers' orders.

Layout decisions should be made only after consideration of the long-term impact on the overall facility. Managers should ask themselves how organizational performance will be affected by a proposed change in layout. How will costs, as well as quality and delivery time to the customers, be affected?

For example, an inefficient layout with many material movements may cause delays in processing because the transport system is overloaded. This problem can cause unnecessary idle time for equipment as departments wait for the next batch or products. It could also delay customer shipments.

If a change is made in layout, how will future options be affected? Will this change increase opportunities for making layout improvements,

or will some opportunities be lost? Individual layout decisions may not seem important, but when added together over time, these decisions can be powerful determinants of an organization's success in the global marketplace.

Example

In manufacturing, the inefficiencies of poor layouts surface as many other problems. The most obvious of these is a dramatic increase in inventory and material-handling costs because product flows are jumbled and discontinuous. Dell Computer has carefully organized its facility layout so that it can quickly and efficiently assemble personal computers.

In service operations like Pacific Bell, management costs are a substantial part of total costs. By paying careful attention to office layout, the company is able to get the most from its employees. In addition to office layout, the use of telecommunication technology helps to speed the flow of information and ideas between people.

CASE STUDY

Weld Well's Quantity Quandary

Weld Well, a leading company, has been buying its office supplies from the same supplier for some time. Jayanta, a salesman of the office supply company, has been calling on WW for over three years. Much to Jayanta's dismay, it always been the practice of WW to buy the smallest size available of a particular for-part preprinted billing form at a cost of ₹ 615 for 10,000 forms. These forms contain the WW logo and standard information printed on them. The rationale for the particular buying policy was to spend the least amount of money possible on office stationary items.

Recently, Mr Thakkar of WW attended a training programme on SCM arranged by a local business school, which dealt with inventory systems and materials management. Thakkar was anxious to save WW money by applying the techniques he learned in the class. When Jayanta contacted Thakkar he was 30,000 forms at ₹ 1750. Jayanta could not

believe the sudden change in policy. Upon questioning Thakkar, he found that he used a quantitative model by which the cost of inventory holding and the ordering costs can be balanced, yet maintaining adequate office supplies. Thakkar explained that analyzing all the relevant variable costs, he could save substantially (on an annual basis) by purchasing the large quantity of pre-printed billing forms.

Questions for Discussion

1. Explain the rationale of Mr. Thakkar of buying in large quantity.
2. What is the annual cost saving of the large order quantity?

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Lesson 4.4 - Capacity Planning

Learning Objectives

- To understand the difficulties in managing capacities
- To identify strategies for enhancing capacities
- To understand the concept of outsourcing and option contracts

Introduction

In today's competitive economic environment, customers do not just prefer but demand manufacturers to provide quality products in a timely fashion at competitive prices. To satisfy this requirement, manufacturers need to plan necessary and sufficient capacity to meet market demands. However, capacity planning is a very challenging task for many manufacturers.

Demand Uncertainty

For most industries, it is very difficult to accurately forecast the demand for new products. In an emerging industry, manufacturers devote substantial efforts to studying the applications and benefits of new technologies. However, when a technology is new, firms have little information on the commercial uptake of new products and, therefore, have poor forecasts of the product demand.

For example, GlobalStar, one of the key players in the emerging mobile satellite services industry during the 1990s, expected between 500,000 and 1,000,000 users in 1999, the first year of its operation; these numbers were confirmed by many other independent analysts. However, the actual number of users was only 100,000, which is significantly lower than the expectation.

Demand forecasts for new products can also be inaccurate in existing industries. Customers' tastes and preferences are hard to predict

and will change over time. Therefore, the historical demand patterns for an existing product might not always be a good reference for the next generation of products. For example, when Mercedes-Benz first introduced its M-class cars in 1997, it forecasted its annual demand to be about 65,000 vehicles. This forecast was, in fact, too low and the firm expanded its capacity to 80,000 vehicles during 1998-1999, which was also insufficient to meet demand.

Cost of Mis-Planning

The cost of mis-planning capacity can be very high for manufacturers. In the case of GlobalStar, because the demand forecast was overly optimistic, the company filed for bankruptcy protection with a debt of 3.34 billion dollars in 2002 after three years of operations. Therefore, it is important for the manufacturers to take demand uncertainties into consideration when they are planning their capacity.

Planning of Large Scale Manufacturing of Multiple Products

Large Scale Manufacturers face the difficulty of planning resources for multiple products at the same time. Due to competition and the wide range of applications of a new technology, the manufacturer needs to produce a variety of generic or custommade products to meet the requirements of its customers. Such variety in products adds complexity to a manufacturer's supply chain. Different products might share common manufacturing processes or use common components. Because of the linkage between the products, the manufacturer needs to plan its capacity for producing multiple products together. However, finding the right level of capacity for all products at the same time is a large scale problem. A manufacturer, therefore, would benefit from efficient and practical algorithms for solving large scale capacity planning problems.

Alternative Planning Strategies

Outsourcing Contracts

A manufacturer needs to incorporate outsourcing into its capacity planning strategy. Traditionally, a manufacturer acquires capacity by building in-house manufacturing facilities. However, this approach has several drawbacks.

First, a manufacturer needs to bear the risk of the high fixed cost associated with building the facilities. Second, a manufacturer needs to manage the in-house facilities itself. Third, a manufacturer cannot take advantage of the technology developed by the contract suppliers. Fourth, the contract suppliers can usually provide the capacity at a lower cost by leveraging the benefits of economies of scale.

Therefore, instead of building the capacity themselves, firms have started to outsource their manufacturing processes and "rent" capacity from the suppliers through capacity contracts. Currently, outsourcing manufacturing is a common practice in some industries and expected to play an increasing role in providing capacity and expertise to manufacturers.

For example, in the biopharmaceutical industry, a manufacturer can develop the formulation of a drug in-house, use a supplier to test the drug, and outsource the mass production of the drug to another supplier. In an example, the electronic industry, a manufacturer can outsource the design and fabrication of the different components of a product to different suppliers and perform the final assembly and testing by itself. The top 10 electronic contract manufacturers in 2006 clocked a total revenue is 148,255 million dollars.

When a manufacturer outsources its manufacturing processes, it is important for the firm to secure the availability and price of the capacity. Some of the major manufacturers, such as Hewlett-Packard, Ford, Cisco, and Dell, have suffered serious consequences from lack of supply and volatile prices.

To assure the supply of capacity, a manufacturer can establish contracts with its suppliers to specify the price and amount of capacity that it will need. However, when the demand is uncertain and the structure of the supply chain is complex, it is not obvious how the manufacturer should specify these capacity contracts.

Moreover, planning capacity with outsourcing contracts has a different structure from that of traditional capacity planning. In the traditional approach, after the manufacturer acquires the capacity, it is a sunk cost and cannot be reserved. On the other hand, under outsourcing

capacity contracts, the manufacturer can rent or reserve the capacity from its suppliers for certain time periods.

Therefore, a manufacturer can temporarily increase or decrease its capacity by signing contracts with the right durations. For example, we can look at Li & Fung Limited, an export trading company in Hong Kong that manages supply chains and capacity for major brands and retailers worldwide.

The company owns just a few production facilities, but has a network of nearly 10,000 international suppliers. To fulfill an order from its customer, Li & Fung reserves capacity beforehand from selected suppliers. The agreements between Li & Fung and its suppliers specify the starting time of the use of the capacity, the amount of capacity that is required, and the time to deliver.

The capacity planning problem with flexible outsourcing contracts like the ones used by Li & Fung has not received much attention in the literature.

Option Contracts

In addition to demand uncertainty, large problem size, and outsourcing contracts, manufacturers can also benefit from models and tools that can incorporate option contracts into capacity planning. A manufacturer might establish a fixed-price capacity contract with its suppliers to rent a fixed amount of capacity.

The manufacturer needs to pay for the capacity whether or not it uses the capacity. In practice, the supplier's cost of capacity might have two components: a fixed cost and a variable cost. For example, equipment costs and the monthly salaries of workers are fixed costs, while power consumption and employee overtime payments are variable costs.

An option contract separates these two types of costs. With option contracts, the manufacturer buys the rights to use a fixed amount of capacity with an upfront fixed payment. If it decides to execute its rights and use these capacities, it needs to pay an exercise price for each unit of capacity that it actually uses.

Lesson 4.5 - Inventory Optimisation

Learning Objectives

After reading this lesson you should be able to:

- Explain the processes of classical optimisation
- Explain the tenets of optimisation
- Describe the optimization of simple lot size formula
- Describe the rationalization of the optimized lot.

Introduction

In this supplement we briefly present several optimization concepts from calculus and relate them to inventory control. If you have never studied calculus, you may not thoroughly understand these concepts; they are stated to provide a brief review for those who understand the basics of classical optimization.

The only inventory case derived here is the simple lot size formula, the first inventory model presented in the chapter. The derivation is started where the chapter stopped; development of the model terms are not repeated.

Classical Optimisation

The Derivative To find a derivative of a function is to differentiate with respect to a variable. Properties of derivatives we use in this supplement are:

$$\begin{aligned}\frac{d(a)}{dx} &= 0 \\ \frac{d(ax)}{dx} &= a \\ \frac{d(y+z)}{dx} &= \frac{dy}{dx} + \frac{dz}{dx} \\ \frac{d(x^n)}{dx} &= nx^{n-1}\end{aligned}$$

Where a represents a constant and x , y , and z are variables.

Let's find the first derivative of the function $y = 3x^2 + x - 3$ with respect to the variable x :

$$\begin{aligned}\frac{d(y)}{dx} &= \frac{d}{dx} (3x^2) + \frac{d}{dx} (x) - \frac{d}{dx} (3) \\ &= 6x + 1\end{aligned}$$

In this example, the first derivative of each term is used to find the first derivative $d(y)/dx$. The second derivative is found by taking the derivative of the first derivative:

$$\begin{aligned}\frac{d^2(y)}{dx^2} &= \frac{d}{dx} (6x) + \frac{d}{dx} (1) \\ &= 6\end{aligned}$$

Optimization

In the calculus, the derivative is taken to find the value of the decision variable that gives the largest or smallest value of a criterion function. The general procedure is to take the first derivative of a function with respect to a decision variable and set the result equal to zero. The equation is then solved for the decision variable in terms of the other parameters in the equation. To determine whether the optimal point is a maximum, the second derivative is taken. If the second derivative is positive, the optimal point is a minimum. If the second derivative is negative, the optimal point is a maximum. If the second derivative is zero, the point is an inflection point.

In the previous example,

$$\frac{d(y)}{dx} = 6x + 1$$

The optimal value of x is found by setting this equation equal to zero and solving for x :

$$0 = 6x + 1$$

$$x = - (1/6)$$

When the second derivative was found, it was $+6$. Therefore $x = -1/6$ is a minimum point.

Partial Derivatives in finding a partial derivative, we hold all variables constant except one. Then we differentiate with respect to that one variable, treating all other variables as constants.

For example, if $y = zx^3 - x^2 + 2x$, let's find the first partial derivative of y with respect to x . to do this, we treat z as though it were a constant and differentiate:

$$\begin{aligned}\frac{\partial y}{\partial x} &= \frac{\partial}{\partial x} (z x^3) - \frac{\partial}{\partial x} (x^2) + \frac{\partial}{\partial x} (2x) \\ &= z \frac{\partial}{\partial x} (x^3) - \frac{\partial}{\partial x} (x^2) + 2 \frac{\partial}{\partial x} (x) \\ &= 3zx^2 - 2x + 2\end{aligned}$$

Optimizing the Simple Lot Size Formula

The total cost equation for the simple lot size formula was developed to be:

$$\begin{aligned}TC &= CD + S \frac{D}{Q} + IC \frac{Q}{2} \\ &= CD + SDQ^{-1} + \frac{IC}{2} Q\end{aligned}$$

Taking the first partial derivative of total cost with respect to order quantity, Q :

$$\frac{\partial(TC)}{\partial Q} = 0 + (-SDQ^{-2}) + \frac{IC}{2}$$

Setting the first partial derivative equal to zero, and solving for Q :

$$\begin{aligned}0 &= \frac{-SD}{Q^2} + \frac{IC}{2} \\ \frac{SD}{Q^2} &= \frac{IC}{2} \\ Q^* &= \sqrt{\frac{2DS}{IC}}\end{aligned}$$

Taking the second partial derivative to ensure a minimum of the cost function:

$$\begin{aligned}\frac{\delta^2(TC)}{\delta Q^2} &= \frac{\delta}{\delta Q} \left(-\frac{SD}{Q^2} \right) + \frac{\delta}{\delta Q} \left(\frac{IC}{2} \right) = -(-2) \frac{SD}{Q^3} + 0 \\ &= \frac{2DS}{Q^3}\end{aligned}$$

A positive value results, thus ensuring a minimum. Notice that the term **CD**, the total cost of the items, dropped out when we found the first derivative. This illustrates that this cost component is constant with regard to changes in order quantity.

Rationalisation

Again, we can see the power of the logic in calculus, but you need not be overwhelmed if you cannot follow all the mathematics. Clearly, the logic of mathematics is useful when applied to the many rational problems in productions / operations.

SCM Inventory Management

- Manufacturers would like to produce in large lot sizes because it is more cost effective to do so. The problem, however, is that producing in large lots does not allow for flexibility in terms of product mix.
- Retailers find benefits in ordering large lots such as quantity discounts and more than enough safety stock.
- The downside is that ordering/producing large lots can result in large inventories of products that are currently not in demand while being out of stock for items that are in demand.
- Ordering/producing in large lots can also increase the safety stock of suppliers and its corresponding carrying cost. It can also create what's called the **bullwhip effect**.

The Bullwhip Effect

The *bullwhip effect* is the phenomenon of orders and inventories getting progressively larger (more variable) moving backwards through the supply chain.

Some of the causes of variability that leads to the **bullwhip effect** includes:

- **Demand forecasting** Many firms use the *min-max inventory policy*. This means that when the inventory level falls to the reorder point (*min*) an order is placed to bring the level back to the *max*, or the *order-up-to-level*. As more data are observed, estimates of the mean and standard deviation of customer demand are updated. This leads to changes in the safety stock and order-up-to level, and hence, the order quantity. This leads to variability.
- **Lead time** As lead time increases, safety stocks are increased, and order quantities are increased. More variability.
- **Batch ordering.** Many firms use batch ordering as with a min-max inventory policy. Their suppliers then see a large order followed by periods of no orders followed by another large order. This pattern is repeated such that suppliers see a highly variable pattern of orders.
- **Price fluctuation.** If prices to retailers fluctuate, then they may try to stock up when prices are lower, again leading to variability.
- **Inflated orders.** When retailers expect that a product will be in short supply, they will tend to inflate orders to insure that they will have ample supply to meet customer demand. When the shortage period comes to an end, the retailer goes back to the smaller orders, thus causing more variability.

Cope with the Bullwhip Effect

- Centralizing demand information occurs when customer demand information is available to all members of the supply chain. This information can be used to better predict what products and volumes are needed and when they are needed such that manufacturers can better plan for production. However, even though centralizing demand information can reduce the **bullwhip effect**, it will not eliminate it. Therefore, other methods are needed to cope with the **bullwhip effect**.

Methods for Coping with the Bullwhip Effect: It include:

- **Reducing uncertainty.** This can be accomplished by centralizing information.
- **Reducing variability.** This can be accomplished by using a technique made popular by *WalMart* and then *Home Depot* called *everyday low pricing* (EDLP). EDLP eliminates promotions as well as the shifts in demand that accompany them.
- **Reducing lead time.** Order times can be reduced by using EDI (electronic data interchange).
- **Strategic partnerships.** The use of strategic partnerships can change how information is shared and how inventory is managed within the supply chain. These will be discussed later.
- **Direct shipping.** This allows a firm to ship directly to customers rather than through retailers. This approach eliminates steps in the supply chain and reduces lead time. Reducing one or more steps in the supply chain is known as *disintermediation*. Companies such as *Dell* use this approach.

Lesson 4.6 - Routing and Scheduling

Learning Objectives

After reading this lesson you should be able to:

- Understand the processes of transportation network
- Explain the tenets of direct shipment network
- Describe the intricacies of Direct Shipments via Distribution Centre

Introduction

In most of the cases, transportation cost is generally a major component of total logistical cost ranging between one-third and two-third. That is why, it is a major concern to logistics managers to improve its efficiency through the maximization of transportation resources and system. The transit time of goods determines the number of shipments that can be made with a vehicle within a given period of time as well as total transportation costs for the shipment. The reduction of transportation costs and improvement of customer service depend upon the quality of routing and scheduling of transportation vehicle which comes under the preview of the design of transportation network. In other words, the design of a transportation network affects the performance of a supply chain by establishing the infrastructure within which operational transportation decisions regarding scheduling and routing are made. A well-designed transportation network allows its supply chain to achieve the desired degree of responsiveness at a low cost (Chopra and Meindl, 2001).

Transportation Network

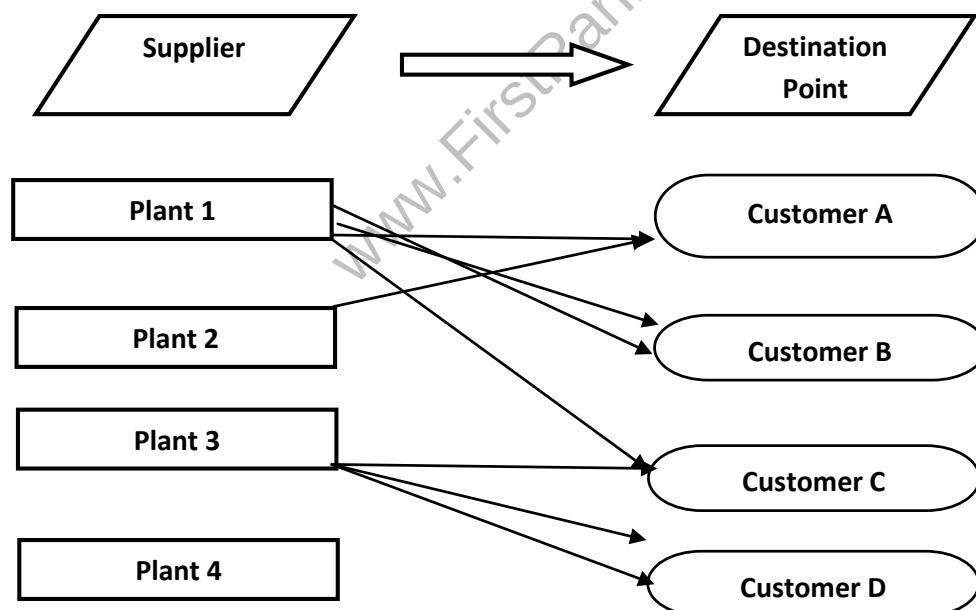
The designs of transportation network vary from industry to industry, company to company and product to product due to diversity in the requirements of industry, company as well as the product. For a better understanding about design options for transportation networks,

an example of a company has been taken which has many production plants, products and destination points (stockiest/customers).

Direct Shipment Network

In this transportation network design, all shipments come directly from different plants of the supplier to stockiest or customers as shown in Fig. In this design option, the routing of each shipment is specified and the logistics and supply chain managers have to decide the quantity to be shipped and mode of transport preferred so as to bring a trade-off between transportation and inventory costs.

One of the major advantages of this transportation network design is the elimination of warehousing infrastructural facilities. The operation of this network design is very simple as well as necessitating high degree of coordination due to the direct interface between suppliers and customers. On the other hand, the major setback of direct shipment network design is the high cost when the quantity to be shipped is not equal to the load capacity of the vehicle. It is also not suitable to ensure better customer service in the case of replenishment lot sizes. This network design is widely used by cement, fertilizer and petroleum companies for those customers who are near to their production plants.

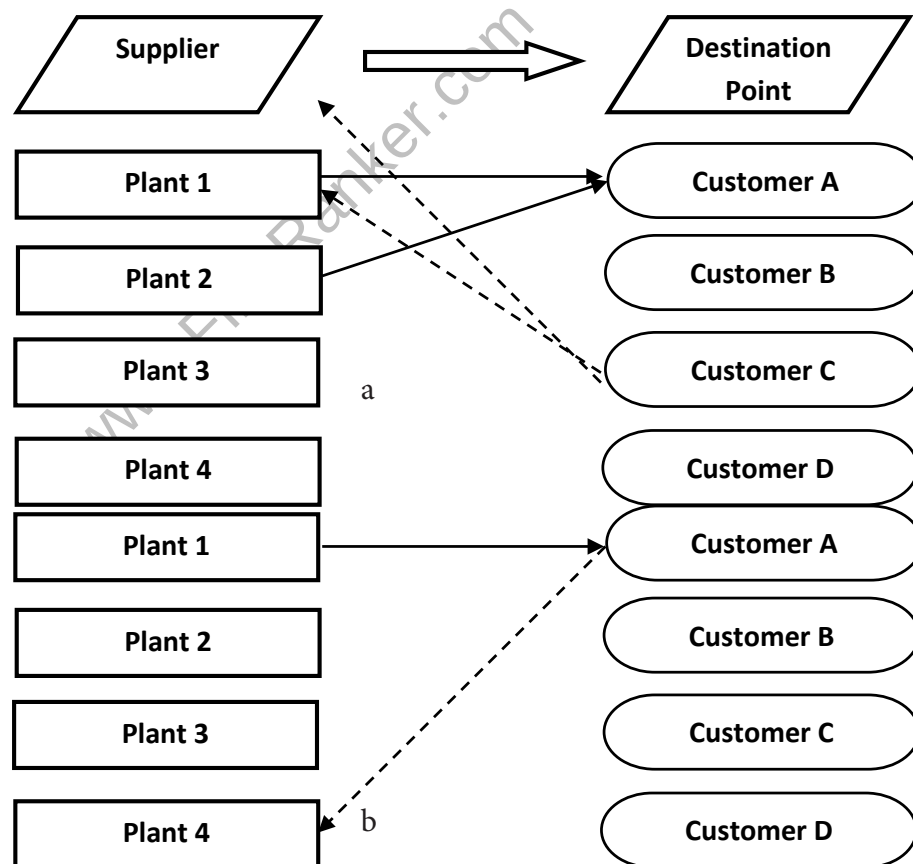


Direct Shipping with Milk Runs

Direct Shipping with Milk Runs

In a milk-run transportation network design, a truck collects goods from various plants of the shipper/supplier and delivers them to a customer or collects goods from one plant and delivers them to many customers as shown in Fig. In the milk-run transportation network, a logistics and supply chain manager has to decide on the routing of each milk run so as to meet the requirement of the customer service.

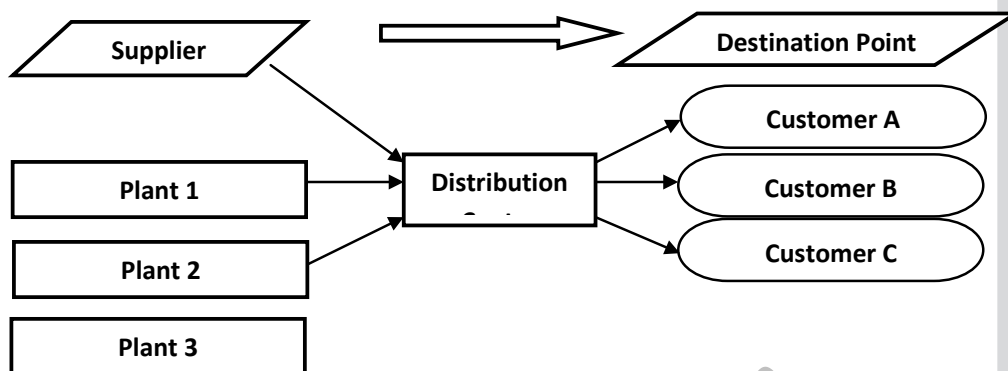
This network design overcomes the problem of first design relating to small replenishment lot size as they are accumulated to fill the load capacity of the vehicle/truck, resulting into lower transportation costs and better customer service, also eliminating warehousing infrastructural facilities. But the major limitation of this design is in its scope, i.e. this design is only suitable in the case of cluster of customers/plants. For instance this system is widely used by MUL in India whose most of the component suppliers are within the 50 km radius of the manufacturing plant at Gurgaon, supporting the JIT manufacturing system. This network needs a high degree of coordination among all the concerns.



Direct Shipments via Distribution Centre

Direct Shipments via Distribution Centre

This transportation network is the modification of direct shipment network, in which goods are delivered to customers via a central distribution centre. In other words, first goods from various plants of the supplier are consolidated at a central distribution centre/warehouse and then delivered to individual customer individually as shown in Fig. For instance, Mahindra & Mahindra Ltd., ships its tractors from Mumbai and Nasik plants to various stock-yards all over the country by railways normally and from the stock-yards to dealers directly by road to achieve economies of scale in transportation costs.

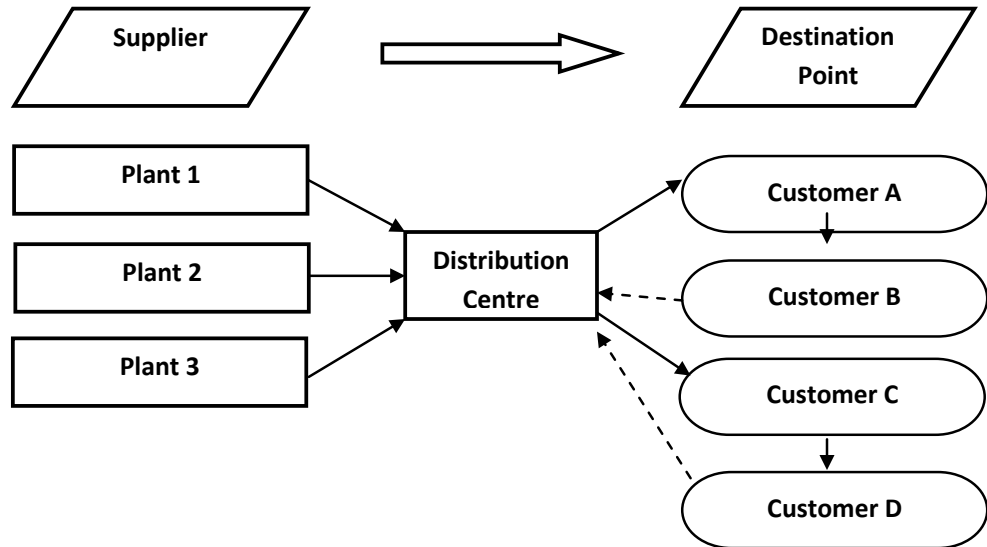


Direct Shipment via Distribution Centre

The main advantage of this design is lower plant-to-warehouse transportation cost by bulk transportation and consolidation as well as ensures better customer service by lowering inventory requirement at customer's end resulting into better return to them. On the other hand, it also results into higher logistical costs due to increased inventory cost and warehousing infrastructure and facility costs to the company.

Shipping via Distribution Centre Using Milk Runs

As the name itself says, this transportation network design is the extension of direct shipping with milk runs, where there is inclusion of a distribution centre in between supplier and customer as shown in Fig. For instance, Pepsi and Coca-Cola distribute their soft drinks as per this network design.



Shipping via Distribution Centre Using Milk Runs.

This design ensures lower plant-to-warehouse as well as warehouse-to-customer transportation costs for small lots suiting small customers, whereas there are increases in inventory and warehousing costs along with complexity of coordination.

Summary

Apart from economic and non-economic benefits, transportation is the main artery of logistics and supply chain management for the movement of goods from the point of inception to the point of consumption. At the advent of growing awareness about the overwhelming contribution of logistics and supply chain management, transportation services have become more imperative for speedier and timely delivery goods, economies in operation, minimum in-route handling and documentation to minimize transportation costs which include tariff of transport mode, transit time cost, obsolescence cost, protective packaging cost, transit insurance cost, etc.

There are five basic modes of transportation, namely; airways, seaways, roadways and pipeline having contradictory characteristics. Earlier, these modes were competing with each other. But after realizing their own strengths and weaknesses followed by scope coordination for better prospects, nowadays, they are coordinating with each other, which

has given impetus to the concept of multi-modal transportation in the form of piggyback, fishy back, trans-ship, and air truck.

The current transport infrastructure of India is major bottleneck in the achievement of logistical objectives, mainly due to poor government policy, networks, road/rail track conditions, vehicle quantity, and coordination between various agencies and transport organizations.

The determination of transport rate and prices are normally based on economic, shipper and carrier factors, followed by alternative pricing strategies. The design of the transportation network refers to routing and scheduling of transportation vehicles for the purpose of minimization of transportation cost and maximization of customer service which vary from industry to industry, company, and product to product due to diversity of requirements of industry, company as well as product.

Self Assessment Questions

1. What do you mean by EOQ?
2. What are the assumptions of EOQ?
3. Why EOQ is important in inventory management?
4. Explain Reorder Point Models.
5. Write down the advantages of Reorder Point Models.
6. Reorder Point Models are cost effective. How?
7. Explain Multichannel Inventory system.
8. What do you mean by Integer Replacement Policy?
9. Explain the concept of Multi-Echelon Distribution Supply Chain.
10. What do you mean by Facility Layout?
11. Discuss the criteria for layout decision.
12. Based on the insight learned through your course in respect of types of layout, outline the relevant types, applicability, merits and demerits of each for the following products:
 - Automobile
 - Aircraft
 - Air Conditioners
13. For each of the following, determine whether the layout would be

a product, a process, or affixed-position layout:

- a. The location of departments within a college or university
- b. A hospital emergency room
- c. A self-service cafeteria
- d. Building a custom-designed home
- e. A prefabricated factory-built home

14. Write a short note on job shop.
15. Explain the concept of capacity planning.
16. Depict the reasons behind capacity planning.
17. Write down alternative capacity planning techniques.
18. What do you mean by optimization?
19. Write a short note on inventory optimization.
20. Explain classical optimization.
21. Explain the bullwhip effect and causes.
22. Explain the methods for coping with the bullwhip effect
23. What do you mean by routing?
24. Briefly explain scheduling.
25. Discuss the position of transportation in L&SCM.
26. Describe the role of transportation in the success of logistics system, and coordinated and efficient supply chain performance.
27. Write a note on the various elements of transportation cost.
28. Discuss the nature and relative characteristics of various modes of transport.
29. What issues should a logistics manager consider in trying to select a mode of transport?
30. In the present day's scenario of global competitive environment, discuss the role of multi-modal transportation.
31. Write a note on the various alternative transportation networks with suitable examples.
32. What do you mean by containerization? Why it has become popular at the advent of L&SCM?

CASE STUDY

Whirlpool Corporation – Giving the Strategy a Spin

Whirlpool Corporation is one of the world's leading manufacturers and marketers of major home appliances. The company has principal manufacturing operations and marketing activities in North and South America, Europe, and Asia. Whirlpool's primary brand names—KitchenAid, Roper, Bauknecht, Ignis, Brastemp, Consul, and its global Whirlpool brand—are marketed in more than 170 countries worldwide.

In North America, Whirlpool is the largest supplier of major appliances to Sears, under the Kenmore brand. This accounts for nearly 20 percent of Whirlpool's sales. Whirlpool, which manufactures its products in thirteen countries, makes about 25 percent of its sales in Europe and is concentrating on emerging markets in Asia and Latin America.

Regional Operation Summary

North America Whirlpool operations in the United States, Canada, and Mexico together form the North American Region. The combined operations work with a unified strategy for manufacturing and marketing appliances in the three countries.

Latin America Whirlpool includes Central and South America and the Caribbean. The Latin American Appliance Group of Whirlpool and its affiliates have the largest market share and one-third of the manufacturing capacity of the region. The Latin American home appliance market is expected to expand more rapidly than that of either North America or Europe.

Asia Whirlpool has been exporting home appliances to Asia for over thirty years. From 1993 to 1995, Whirlpool moved aggressively to increase its presence throughout the region by establishing marketing and manufacturing joint ventures. In Asia, Whirlpool focuses on four key products: clothes washers, refrigerators, air conditioners, and microwave ovens. Today, the company enjoys the number one position among non-Asian competitors in the region.

With a staff of approximately 11,000 and eleven factories in six countries, Whirlpool Europe ranks as the third-largest producer and marketer in Western Europe. It commands the leading position in Central and Eastern Europe and is growing steadily in the Middle East and Africa. A strong focus on the needs of customers in each of Europe's various markets, combined with a coordinated, [an-European approach to many common operations and activities, provides Whirlpool Europe with a strong foundation to build for the future.

Company Vision, Values, and Social Responsibility

- The Whirlpool vision: Every Home.... Everywhere with Pride, Passion, performance. We create the world's best home appliances that make life a little easier and more enjoyable for all people. Our goal is a Whirlpool product in every home, everywhere. We will achieve this by creating: Pride ... in our work and each other; Passion ... for creating unmatched customer loyalty for our brands; and performance... results that excite and reward global investors with superior returns.
- Values: Five fundamental values – Respect, Integrity, Teamwork, Learning to Lead, and Sprit of Winning – represent the essence of who we are as a company. They provide a framework of expectations for how we behave and relate with others. The power of these values and the behaviors that support them lies in how they help us achieve a consist4ently high level of performance, regardless of business or economic cycles.
- Social responsibility: Whirlpool Corporation meets its societal obligations by extensive commitments to Habitat for Humanity International. It is donating a Whirlpool brand refrigerator and freestanding range for homes built in the United States and Canada under Habitat's new More Than Houses Program, a campaign to build 100,000 new homes by the year 2005. The company previously announced that it would donate up to \$5 million in appliances for homes built by Habitat. "We are truly grateful to Whirlpool for making such a generous pledge of support," said Millard Fuller, president and CEO, Habitat for Humanity. "Literally, thousands of families will benefit from this exciting partnership."

ERP at Whirlpool

The following portions of the ERP at Whirlpool are provided for analyses: dispatcher assignment, centralized pricing, vendor interfaces, the Internet application decision, the Internet application problems, response time monitoring, and application integration.

Dispatcher Assignment

Sophisticated geographic routing software is helping Whirlpool Corp. consolidate twenty-two field service offices into a single hub operation, slashing millions of dollars in real estate costs in the process. The \$200,000 Resources in Motion Management System (RIMMS) from Light stone Group in Mineola, New York, is expected to help Whirlpool manage and coordinate its 440 appliance technicians across the United States from one service hub in Knoxville, Tennessee.

The Benton Harbor, Michigan-based appliance maker has already consolidated seven of its twenty-two field locations. The remainder will be brought into the fold by year's end. Whirlpool is replacing the colored pins and giant wall maps that have been used in its regional service centers for years. Automation will mean dispatchers may lose the intimate knowledge they had of local routed and traffic trouble spots. (With the manual system, it sometimes took dispatchers a full day to plot a daily service route for a single technician.) Using RIMMS, Whirlpool dispatchers can lay out each technician's route within an hour.

The consolidation has presented Whirlpool with some tricky personnel problems. Under the service overhaul, technicians are being asked to cover new territories and squeeze in extra work in the same amount of time. Whirlpool's technicians typically handle ten customer calls per day. The hope is that by utilizing the most efficient routes from one customer call to another, each service technician will be able to squeeze in an extra customer job each day, said Tom Mender, a senior analyst at Whirlpool's LaPorte, Indiana, parts distribution center. "Even if we can get an extra half a job a day, the [full-year] benefits are staggering," said Mender. "Our biggest challenge has been managing the expectations of our technicians," Mender said.

Whirlpool's service center consolidation also means it will probably need only five or six dispatchers, not the twenty-four it once used to support its field service centers. Downsizing "is something we've wrestled with from the beginning," Mender said. By centralizing and automating its service centers, Whirlpool loses "the quirks of knowing your hometowns," he said. Mender said the fate of its dispatchers has not been decided.

Centralized Pricing

When Frigidaire Co. drops freezer prices, a flurry of faxes and FedExes fly from Whirlpool Corps.' Offices in fight to match those prices. But soon Whirlpool will be able to match competitors' pricing with a few keystrokes, allowing the company to react quickly to market changes or launch a special promotion for a single product.

Whirlpool is implementing a centralized pricing configuration system from Trilogy Development Group, Inc., in Austin, Texas. The pricing software will allow Whirlpool to cut by more than half the 110 days it now takes to reprice its entire product line of more than 2,000 models each quarter.

Most important, the application will give Whirlpool a centralized pricing structure. Previously, the company used separate pricing models and order entry systems for each Whirlpool division, from small appliances to large goods to spare parts. "The big driver for all of this is to make Whirlpool easier to do business with," said Bill Hester, a senior information systems project manager at Whirlpool.

Whirlpool's technology overhaul, which also includes implementing SAP AG's R/3 and a massive operational reorganization, is necessary to prime Whirlpool for the dishwasher wars in years to come. The entire IT overhaul is estimated to cut \$160 million from Whirlpool's operational budget over five years.

Hester said the company expects the new pricing system will pay for itself within a few years. Historically, Whirlpool's customer claims usually resulted from pricing discrepancies. "We would tell trading partners we were going to sell them something at 'x' price, but the system was

charging them 'y'," said Kathleen Descamps, business project manager for Whirlpool's new pricing system. "So we would have to issue them a credit. It creates dissatisfied customers. It's much easier to say we are charging them 'x' and that is what is on the invoice."

With one centralized pricing system, sales agents will be able to meet that goal. The same information will be replicated in sales agents' laptops or quick reference when making field calls to trading partners. "They will have the same sales history information that is used to make [production] forecasts," Descamps said, so they will have the same information to help meet the forecasts. Whirlpool's current pricing system is highly dependent on spreadsheets, a laborious and time-consuming system.

Bill Hester, project manager at the appliance giant, said the quarterly job of revamping the pricing of every product takes 110 days and is prone to errors.

Pricing has to be entered for every product under eleven different brand names. "It took roughly 180,000 cells in the spreadsheet," Hester said. "Since pricing is formula driven, if someone changed a formula, you wouldn't know the effects somewhere else in the spreadsheet. It took a lot of work to get the pricing masters printed."

If a marketing manager needs to change the price of dishwashers to match General Electric's pricing, that person can now enter the information; do a profitability analysis on the change; and then, if acceptable, enter the new price.

"Then a message is automatically sent to the pricing administrator, who sets up any rules for the pricing, and as soon as they hit 'enter,' if the pricing is effective today, the next person that places an order gets that new price," Hester said.

Vendor Interfaces

A warehouse automation system has propelled Whirlpool Corporation's Parts Distribution Center in LaPorte, Indiana, into a new era of customer satisfaction. The system, comprised of an elaborate configuration of computers and automatic conveyors, reduces the order-

processing cycle time for customers around the world. “It helps us better manage our inventories with the ultimate improvement being customer satisfaction,” says Tom Harrow, customer service supervisor.

Whirlpool Corp. hopes a new e-commerce initiative, Easy EDI, will cut down supply chain expenses and enhance efficiencies. Easy EDI’s goal is twofold: to eliminate the paper process used by Whirlpool’s 300 smaller suppliers and to save Whirlpool up to \$600,000 a year in operational costs for the electronic data interchange network used by Whirlpool’s 300 largest suppliers, says David Tibbitts, manager of strategy and planning in global procurement at Whirlpool.

Initially, Easy EDI will involve four small and midsize suppliers that rely on paper transactions to conduct business with Whirlpool’s fourteen North American manufacturing facilities. Four to six weeks later, the service will expand to about thirty suppliers; all small and midsize suppliers should be on-line by year’s end.

Whirlpool then expects to gradually roll out Easy EDI to its largest suppliers, which use a public value-added network (VAN) for EDI transactions. The company hopes to phase out VAN-based EDI, Tibbitts says, along with the \$40,000 to \$50,000 a month it pays for the service.

Easy EDI is an example of how the consumer-goods manufacturing industry is moving in the same direction as the automotive industry, says Susan Cournoyer, an analyst at Dataquest. “Angile, just-in-time manufacturing and its use of the Internet will cut costs and improve communications and responsiveness to customers,” she says.

Whirlpool is working with integrator Litton Enterprise Solutions, a division of government contractor Litton Industries, to develop Easy EDI.

Internet Application Problems

Late this year, Whirlpool Corp. plans to turn on SAP R/3 and link it to the Internet so retailers can place and track orders on-line. But that does not mean the call-center workers who take orders over the phone will go away. In fact, their jobs will become more important—and more

complex—said senior project manager Bob Briggs. He said Whirlpool plans to use SAP AG's R/3 applications to give call-center employees access to all the information they need to answer questions about pricing, promotions, and billing from retailers that sell its appliances.

Those data currently are split into stand-alone mainframe system, forcing retailers to get answers from multiple departments, Briggs said. Whirlpool is not the only company that is still depending on its call center while moving more routine business transactions to the Web. But the call center is still vital "because the most complex problems are going to go there," he added. "The nature of the work has changed, but I think its importance goes up."

But change will not be easy. At Whirlpool, for example, call-center workers will be fielding "bigger and more sophisticated questions" on matters such as credit and pricing promotions, Briggs said. That will require them to learn both R/3 and a new set of business processes before the combination of SAP's software and Whirlpool's retailer Extranet goes into use in the fourth quarter.

Whirlpool made a risky and ultimately damaging business decision by going live with its SAP R/3 implementation over the Labor Day weekend knowing that "red flags" had been raised, according to Sap AG officials. Fixing the problem would have delayed Whirlpool's to-live date by a week, SAP said. But pressure to take advantage of the long holiday weekend and to get off of its legacy system well before 2000 pushed Whirlpool ahead.

The decision resulted in a botched shipping system that, until it was fixed November 1, left appliances sitting in warehouses. Some stores experienced six-eight week delays before receiving their orders. "We suspected there would be problems, but the customer made a decision to go live despite warning signals," said Jeff Zimmerman, senior vice president of customer support services at SAP.

Officials at Benton Harbor, Michigan-based Whirlpool would not discuss details of the snafu. "We have had some delays, partially due to the new [SAP] implementation and also due to record levels of orders," said Christopher Wyse, a Whirlpool spokesman.

Things seemed to be running smoothly days after the launch when 1,000 system users processed appliance orders. But by September 18, with 4,000 users placing orders, performance started to disintegrate, Zimmerman said. That was when stores selling Whirlpool appliances started feeling the pinch.

Foremost Appliance in Chantilly, Virginia, which gets one-third of its revenue from Whirlpool sales, had shipments from Whirlpool's Carlisle, Pennsylvania, distribution center delayed six to eight weeks. "Some people are ordering four or five appliances, and we get one this week, none for them the next week. Then one more the week after. It's been a dilemma," said Bill Brennan, store manager. Brennan said he has been steering customers who do not want the long wait to other brands.

Whirlpool is the latest in a recent spate of enterprise resource planning (ERP) implementations in which user companies have grossly underestimated the complexity. "These implementations are like doing open-heart surgery. There was an expectation on the part of the companies that was completely unreasonable," said Chris Selland, an analyst at

The Yankee Group in Boston. Selland said that SAP has recovered more implementation success than failures and that it is common to find "a hundred little problems and ten that are major" when going live-not just two like Whirlpool had. SAP has been under pressure to change its image from that of company whose software requires multiyear, multi-million dollar implementations to one that offers shorter, easier projects,

Boulanger said. SAP's plan to bring in project overseers ninety days before going live is relatively new, he said, but users would be better served if SAP were present at the project from beginning to end. Regardless of who is fueling the impression that companies can launch an ERP application quickly, "companies have to realize that the onus is on you and the consulting firm to make it work," Selland said.

Questions for Discussion

1. How was the organization prepared for the change?
2. Was the problem with employees whose jobs had changed dealt with properly?
3. How were the customers and vendors communicated to about the changed procedures for interfacing in various transactions with Whirlpool?
4. How were it employees prepared for interfacing with external consultants?
5. Evaluate the steps that were taken in the ERP activities. Which were done well and which could be improved?
6. Do you think SAP should be held accountable for any of the problems faced by Whirlpool? Why or why not?

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UNIT – V

Unit Structure

Lesson 5.1 - E Business & Logistics

Lesson 5.2 - Business Process Management

Lesson 5.3 - Customer Relationship Management

Lesson 5.1 - E Business & Logistics

Learning Objectives

After reading this lesson you will be able to

- Understand the concept of e – business
- Understand the key security issues in e – business
- Indentify the Common Security Measures for E-Business Systems
- Develop and understand the concept of e – logistics
- Analyze the challenges in e – logistics
- Identify the concept of e – procurement
- Understand the concept of e - fulfillment

Introduction to E-Business

It is widely acknowledged today that new technologies, in particular access to the Internet, tend to modify communication between the different players in the professional world, notably:

- Relationships between the enterprise and its clients,
- The internal functioning of the enterprise, including enterprise-employee relationships,

- The relationship of the enterprise with its different partners and suppliers.

The term “e-Business” therefore refers to the integration, within the company, of tools based on information and communication technologies (generally referred to as business software) to improve their functioning in order to create value for the enterprise, its clients, and its partners.

E-Business no longer only applies to virtual companies (called click and mortar) all of whose activities are based on the Net, but also to traditional companies (called brick and mortar).

The term e-Commerce (also called Electronic commerce), which is frequently mixed up with the term e-Business, as a matter of fact, only covers one aspect of e-Business, i.e. the use of an electronic support for the commercial relationship between a company and individuals. The purpose of this document is to present the different underlying “technologies” (in reality, organizational modes based on information and communication technologies) and their associated acronyms.

Creation of Value

The goal of any e-Business project is to create value. Value can be created in different manners:

- As a result of an increase in margins, i.e. a reduction in production costs or an increase in profits. E-Business makes it possible to achieve this in a number of different ways:
 - Positioning on new markets
 - Increasing the quality of products or services
 - Prospecting new clients
 - Increasing customer loyalty
 - Increasing the efficiency of internal functioning
- As a result of increased staff motivation. The transition from a traditional activity to an e-Business activity ideally makes it possible to motivate associates to the extent that:
- The overall strategy is more visible for the employees and favors a common culture

- The mode of functioning implies that the players assume responsibilities
- Teamwork favors improvement of competences
- As a result of customer satisfaction. As a matter of fact, e-Business favors:
 - a drop in prices in connection with an increase in productivity
 - improved listening to clients
 - Products and services that are suitable for the clients' needs
 - A mode of functioning that is transparent for the user
- As a result of privileged relationships with the partners. The creation of communication channels with the suppliers permits:
 - Increased familiarity with each other
 - Increased responsiveness
 - Improved anticipation capacities
 - Sharing of resources that is beneficial for both parties

An e-Business project can therefore only work as soon as it adds value to the company, but also to its staff, its clients, and partners.

Key Security Concerns within E-Business

- **Privacy and confidentiality:** Confidentiality is the extent to which businesses makes personal information available to other businesses and individuals. With any business, confidential information must remain secure and only be accessible to the intended recipient. However, this becomes even more difficult when dealing with e-businesses specifically. To keep such information secure means protecting any electronic records and files from unauthorized access, as well as ensuring safe transmission and data storage of such information. Tools such as encryption and firewalls manage this specific concern within e-business.
- **Authenticity:** E-business transactions pose greater challenges for establishing authenticity due to the ease with which electronic information may be altered and copied. Both parties in an e-business transaction want to have the assurance that the other party is who they claim to be, especially when a customer places an order and then submits a payment electronically. One common way to en-

sure this is to limit access to a network or trusted parties by using a virtual private network (VPN) technology. The establishment of authenticity is even greater when a combination of techniques are used, and such techniques involve checking “something you know” (i.e. password or PIN), “something you have” (i.e. credit card), or “something you are” (i.e. digital signatures or voice recognition methods). Many times in e-business, however, “something you are” is pretty strongly verified by checking the purchaser’s “something you have” (i.e. credit card) and “something you know” (i.e. card number).

- **Data integrity:** Data integrity answers the question “Can the information be changed or corrupted in any way?” This leads to the assurance that the message received is identical to the message sent. A business needs to be confident that data is not changed in transit, whether deliberately or by accident. To help with data integrity, firewalls protect stored data against unauthorized access, while simply backing up data allows recovery should the data or equipment be damaged.
- **Non-repudiation:** This concern deals with the existence of proof in a transaction. A business must have assurance that the receiving party or purchaser cannot deny that a transaction has occurred, and this means having sufficient evidence to prove the transaction. One way to address non-repudiation is using digital signatures. A digital signature not only ensures that a message or document has been electronically signed by the person, but since a digital signature can only be created by one person, it also ensures that this person cannot later deny that they provided their signature.
- **Access control:** When certain electronic resources and information is limited to only a few authorized individuals, a business and its customers must have the assurance that no one else can access the systems or information. Fortunately, there are a variety of techniques to address this concern including firewalls, access privileges, user identification and authentication techniques (such as passwords and digital certificates), Virtual Private Networks (VPN), and much more.
- **Availability:** This concern is specifically pertinent to a business’ customers as certain information must be available when customers

need it. Messages must be delivered in a reliable and timely fashion, and information must be stored and retrieved as required. Because availability of service is important for all e-business websites, steps must be taken to prevent disruption of service by events such as power outages and damage to physical infrastructure. Examples to address this include data backup, fire-suppression systems, Uninterrupted Power Supply (UPS) systems, virus protection, as well as making sure that there is sufficient capacity to handle the demands posed by heavy network traffic.

Common Security Measures for E-Business Systems

Many different forms of security exist for e-businesses. Some general security guidelines include areas in physical security, data storage, data transmission, application development, and system administration.

a) Physical Security

Despite e-business being business done online, there are still physical security measures that can be taken to protect the business as a whole. Even though business is done online, the building that houses the servers and computers must be protected and have limited access to employees and other persons. For example, this room should only allow authorized users to enter, and should ensure that “windows, dropped ceilings, large air ducts, and raised floors” do not allow easy access to unauthorized persons. Preferably these important items would be kept in an air-conditioned room without any windows.

Protecting against the environment is equally important in physical security as protecting against unauthorized users. The room may protect the equipment against flooding by keeping all equipment raised off of the floor. In addition, the room should contain a fire extinguisher in case of fire. The organization should have a fire plan in case this situation arises.

In addition to keeping the servers and computers safe, physical security of confidential information is important. This includes client information such as credit card numbers, checks, phone numbers, etc. It also includes any of the organization’s private information. Locking physical and electronic copies of this data in a drawer or cabinet is one

additional measure of security. Doors and windows leading into this area should also be securely locked. Only employees that need to use this information as part of their job should be given keys.

Important information can also be kept secure by keeping backups of files and updating them on a regular basis. It is best to keep these backups in a separate secure location in case there is a natural disaster or breach of security at the main location.

“Failover sites” can be built in case there is a problem with the main location. This site should be just like the main location in terms of hardware, software, and security features. This site can be used in case of fire or natural disaster at the original site. It is also important to test the “failover site” to ensure it will actually work if the need arises.

State of the art security systems, such as the one used at Tidepoint’s headquarters, might include access control, alarm systems, and closed-circuit television. One form of access control is face (or another feature) recognition systems.

This allows only authorized personnel to enter, and also serves the purpose of convenience for employees who don’t have to carry keys or cards. Cameras can also be placed throughout the building and at all points of entry. Alarm systems also serve as an added measure of protection against theft.

b) Data Storage

Storing data in a secure manner is very important to all businesses, but especially to e-businesses where most of the data is stored in an electronic manner. Data that is confidential should not be stored on the e-business’ server, but instead moved to another physical machine to be stored. If possible this machine should not be directly connected to the internet, and should also be stored in a safe location. The information should be stored in an encrypted format.

Any highly sensitive information should not be stored if it is possible. If it does need to be stored, it should be kept on only a few reliable machines to prevent easy access. Extra security measures should be taken

to protect this information (such as private keys) if possible. Additionally, information should only be kept for a short period of time, and once it is no longer necessary it should be deleted to prevent it from falling into the wrong hands. Similarly, backups and copies of information should be kept secure with the same security measures as the original information. Once a backup is no longer needed, it should be carefully but thoroughly destroyed.

c) *Data transmission and application development:*

All sensitive information being transmitted should be encrypted. Businesses can opt to refuse clients who can't accept this level of encryption. Confidential and sensitive information should also never be sent through e-mail. If it must be, then it should also be encrypted.

Transferring and displaying secure information should be kept to a minimum. This can be done by never displaying a full credit card number for example. Only a few of the numbers may be shown, and changes to this information can be done without displaying the full number. It should also be impossible to retrieve this information online.

Source code should also be kept in a secure location. It should not be visible to the public.

Applications and changes should be tested before they are placed online for reliability and compatibility.

d) *System administration:*

Security on default operating systems should be increased immediately. Patches and software updates should be applied in a timely manner. All system configuration changes should be kept in a log and promptly updated.

System administrators should keep watch for suspicious activity within the business by inspecting log files and researching repeated logon failures. They can also audit their e-business system and look for any holes in the security measures. It is important to make sure plans for security are in place but also to test the security measures to make sure they actually

work. With the use of social engineering, the wrong people can get a hold of confidential information. To protect against this, staff can be made aware of social engineering and trained to properly deal with sensitive information.

E-businesses may use passwords for employee logons, accessing secure information, or by customers. Passwords should be made impossible to guess. They should consist of both letters and numbers, and be at least seven to eight digits long. They should not contain any names, birth dates, etc. Passwords should be changed frequently and should be unique each time. Only the password's user should know the password and it should never be written down or stored anywhere. Users should also be locked out of the system after a certain number of failed logon attempts to prevent guessing of passwords.

Security Solutions

When it comes to security solutions, there are some main goals that are to be met. These goals are data integrity, strong authentication, and privacy.

a) Access and Data Integrity

There are several different ways to prevent access to the data that is kept online. One way is to use anti-virus software. This is something that most people use to protect their networks regardless of the data they have. E-businesses should use this because they can then be sure that the information sent and received to their system is clean. A second way to protect the data is to use firewalls and network protection. A firewall is used to restrict access to private networks, as well as public networks that a company may use. The firewall also has the ability to log attempts into the network and provide warnings as it is happening. They are very beneficial to keep third-parties out of the network. Businesses that use Wi-Fi need to consider different forms of protection because these networks are easier for someone to access. They should look into protected access, virtual private networks, or internet protocol security. Another option they have is an intrusion detection system. This system alerts when there are possible intrusions. Some companies set up traps or "hot spots" to attract people and are then able to know when someone is trying to hack into that area.

b) Encryption

Encryption, which is actually a part of cryptography, involves transforming texts or messages into a code which is unreadable. These messages have to be decrypted in order to be understandable or usable for someone. There is a key that identifies the data to a certain person or company. With public key encryption, there are actually two keys used. One is public and one is private. The public one is used for encryption, and the private for decryption. The level of the actual encryption can be adjusted and should be based on the information. The key can be just a simple slide of letters or a completely random mix-up of letters. This is relatively easy to implement because there is software that a company can purchase. A company needs to be sure that their keys are registered with a certificate authority.

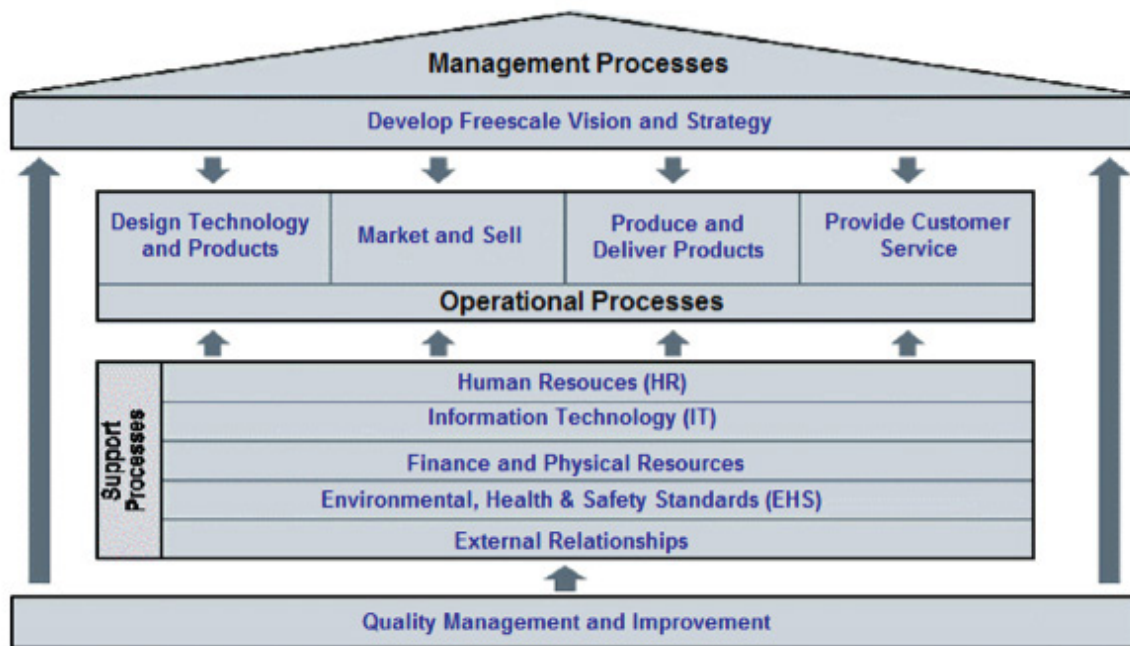
c) Digital Certificates

The point of a digital certificate is to identify the owner of a document. This way the receiver knows that it is an authentic document. Companies can use these certificates in several different ways. They can be used as a replacement for user names and passwords. Each employee can be given these to access the documents that they need from wherever they are. These certificates also use encryption. They are a little more complicated than normal encryption however. They actually used important information within the code. They do this in order to assure authenticity of the documents as well as confidentiality and data integrity which always accompany encryption. Digital certificates are not commonly used because they are confusing for people to implement. There can be complications when using different browsers, which means they need to use multiple certificates. The process is being adjusted so that it is easier to use.

d Digital Signatures

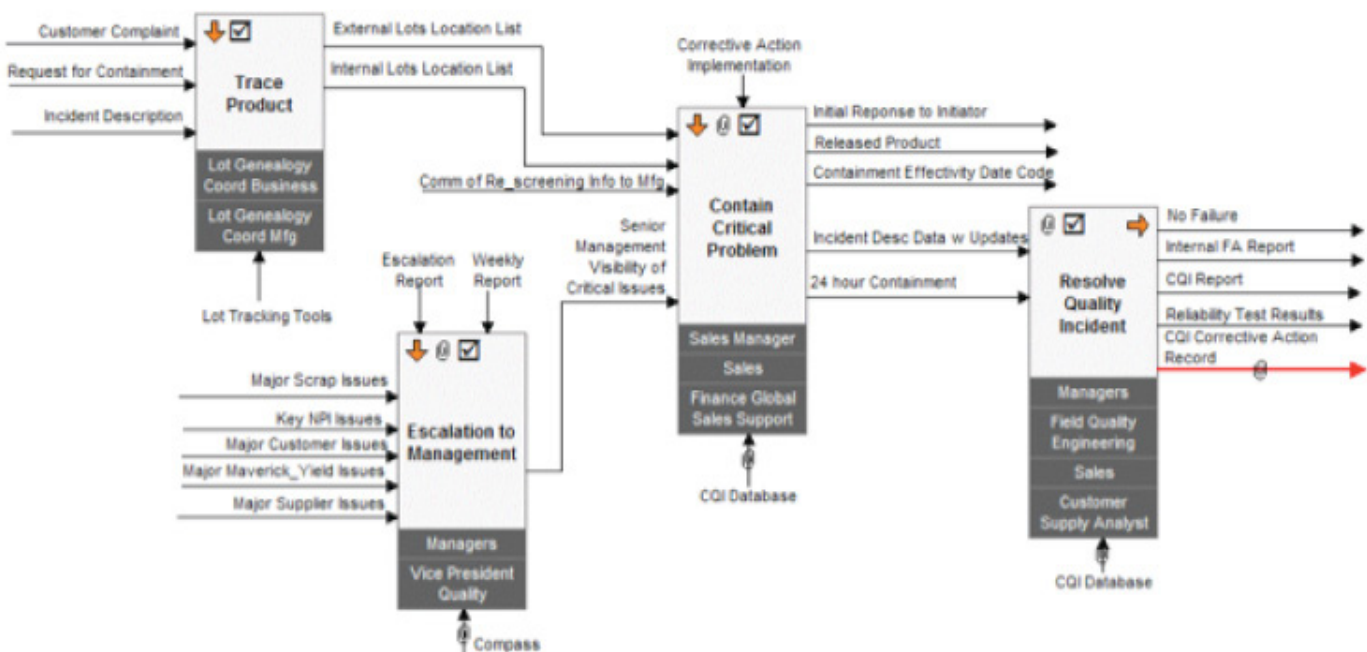
A final way to secure information online would be to use a digital signature. If a document has a digital signature on it, no one else is able to edit the information without being detected. That way if it is edited, it may be adjusted for reliability after the fact. In order to use a digital signature, one must use a combination of cryptography and a message digest. A message digest is used to give the document a unique value. That value is then encrypted with the sender's private key.

Process Mapping



Process Mapping

Process Map Example



Process Map Example

e) Time to Market

“Time To Market” is the time that is necessary to bring a product on the market from a time an idea was put forward. Worldwide, new technologies provide an incredible source of inspiration to formalize ideas while making Time-To-Market even more critical because of the rapid flow of information and speedy competition.

f) Reduction of Costs and ROI

The use of new technologies for the functioning of an enterprise makes it possible to reduce the costs on the different levels of its organization in time. Nonetheless, implementation of such a project is generally very costly and necessarily leads to organizational changes, which may cause upheaval in the practices of its employees. It is therefore essential to determine the return on investment (ROI) of such a project, i.e. the difference between the expected profits and the required overall investment, taking into account the cost of human resources mobilized.

Characterization of the e-Business

A company can be viewed as an entity providing products or services to clients with the support of products or services of partners in a constantly changing environment. The functioning of an enterprise can be roughly modeled in accordance with a set of interacting functions, which are commonly classified in three categories:

- Performance functions, which represent the core of its activity (core business), i.e. the production of goods or services. They pertain to activities of production, stock management, and purchasing (purchasing function);
- The management functions, which cover all strategic functions of management of the company; they cover general management of the company, the human resources (HR) management functions as well as the financial and accounting management functions;
- The support functions, which support the performance functions to ensure proper functioning of the enterprise. Support functions cover all activities related with sales (in certain cases, they are part

of the core business) as well as all activities that are transversal to the organization, such as management of technological infrastructures (IT, Information Technology function).

- Enterprises are generally characterized by the type of commercial relationships they maintain. Dedicated terms therefore exist to qualify this type of relationship:
- B To B (Business To Business, sometimes written B2B) means a commercial relationship business to business based on the use of a numerical support for the exchange of information.
- B To C (Business To Consumer, sometimes written B2C) means a relationship between a company and the public at large (individuals). This is called electronic commerce, whose definition is not limited to sales, but rather covers all possible exchanges between a company and its clients, from the request for an estimate to after-sales service;
- B To A (Business To Administration, sometimes written B2A) means a relationship between a company and the public sector (tax administration, etc.) based on numerical exchange mechanisms (teleprocedures, electronic forms, etc.).

As an extension of these concepts, the term B To E (Business To Employees, sometimes written B2E) has also emerged to refer to the relationship between a company and its employees, in particular through the provision of forms directed at them for managing their career, vacation, or their relationship with the company committee.

E-Logistics

Introduction

E-commerce logistics and e-fulfillment represent the myriad activities that are needed to ensure the customer gets what the customer wants when the customer wants it. They are the least glamorous but most critical functions in electronic commerce. They can also be the most expensive. E-businesses fail to recognize that often up to 40 percent of their cost of goods sold is buried in fulfillment and back-end logistics.

In fact, most online merchants are unaware of what their total costs are. This lack of knowledge is directly responsible for the failure of many ecommerce businesses during the past two years.

The Importance of E-Logistics and E-Fulfillment

Electronic commerce not only revolutionized the way goods are sold, but how they are delivered. The tenets of one-to-one marketing that online firms are adopting must be carried over to their fulfillment operations, and this is creating mass-scale chaos.

Customers demand customized products delivered at very high speed with complete order flexibility and convenience. Today's online customers want to be able to track their orders instantly from the moment they click the Buy button until the moment the package arrives on their doorstep, and be able to reroute packages, determine delivery costs and time-in-transit, and break up their orders for multiple ship-to addresses.

The shift of power from the seller to the buyer is creating a new era of expectations, and buyers - whether they are consumers or businesses - say they will not tolerate experiences such as partial shipments of goods on an "installment" basis, poor product return policies, or surprise backorders.

Options for Handling E-Fulfillment and E-Logistics

Online businesses have three options for handling e-logistics and e-fulfillment: they can perform the functions themselves in-house, they can outsource the functions to a third-party, or they can use drop-shipping. There are some definite arguments in favor of outsourcing.

When distribution is not a company's core competency, outsourcing the function can help a company grow by allowing it to focus on its mission-critical activities. Businesses that outsource e-fulfillment can also deploy sites quickly, with minimal capital investment, while maintaining the confidence that customers will receive the level of service they expect.

If an e-business is successful, the ability to handle large volumes very quickly becomes of paramount importance. By outsourcing, an

e-business is able to plug into the third-party's infrastructure, which should be robust enough to handle the increased activity.

Outsourcing also alleviates the need to hire internal logistics and fulfillment staff, and to build and equip expensive warehouses. Third-party providers have the advantage of capturing and processing the details of thousands of transactions.

The sheer quantity of data can be very useful for trending and improving sales and customer service. In fact, a new type of third-party providers, Logistics Visibility Providers (LVPs), specialize in capturing, cleansing, verifying and analyzing the data from all other logistics service providers in order to facilitate supply chain visibility.

There are also some distinct disadvantages to outsourcing, chief among them being the loss of control. Regardless of whom an e-business outsources to, it is still responsible for the quality of the customer relationship, and it is liable if anything goes awry. The truth is, few logistics outsourcers have figured out how to do ecommerce fulfillment well.

Qualified e-logistics providers must depend on integrated IT systems and complex software to manage the dynamic flow of products. The quality of information must be much better than that of traditional outsourcers, so that companies can have visibility into their supply chains. Better information also reduces inventory throughout the supply chain, enabling companies to react quickly to market changes.

But better supply chain visibility changes the face of physical distribution. Since companies do not need to stock as much inventory, e-logistics providers must store and transport unit-sized shipments rather than traditional pallet-sized shipments. This requires a complete overhaul of business processes.

Performing E-Logistics and E-Fulfillment In-House

Some firms consider overhauling their own businesses and doing the logistics and fulfillment themselves. If a business has an existing infrastructure, warehouses and customer service center, it can probably retool itself for in-house e-logistics, but it should hire outside expertise to

determine how robust its existing logistics platform is and what revisions need to be made. Although orders may be initiated via a website, unless the firm has done an extensive amount of systems integration, much of that data must be manually input into other supply chain management, planning, warehouse-management, and logistics systems.

The logistics platform will also have to address content management, application development, cross-function integration, business intelligence, and mobile Internet access. The platform must also enable suppliers and customers to retrieve information about the demand picture, forecasts, delivery dates, shipment tracking, and other necessary data.

Software Applications that Support E-Logistics and E-Fulfillment

In e-logistics, the movement of data is the precursor to moving funds and physical goods. A company that cannot move data instantly, easily and without errors, is doomed to failure. How a company handles data should be such a high priority that it should determine everything from the software packages a company buys to the database systems it uses.

Systems integration must be made a priority from the beginning. Too often, a company will buy systems in a haphazard way, based upon isolated functions within a company. Often the same data is manually input multiple times into multiple systems, creating multiple chances for errors. In e-commerce, trying to piece together a group of “point solutions” does not work – the old way of operating in isolated information silos must be completely dismantled.

This usually requires outside expertise to analyze the business processes in each department in an organization, and to start creating communications amongst the various functions. Once a company has its database and integration issues settled it needs to deal with another key issue of e-logistics: the movement of data and conveying of instructions between the many different entities involved in buying, selling and shipping goods. This is why XML—the Extensible Markup Language—was invented.

Representative functions in e-logistics and e-fulfillment software***Order Entry and Management***

- Order entry systems
- Authentication services
- Anti-fraud screening
- Credit card pre-authorization and processing
- Local currency billing
- Export control screening (Denied Parties Lists in the U.S.)
- Sales tax and VAT calculations

Logistics Services

- Integrated distribution and warehousing
- Reverse logistics/returns management
- Package tracking and tracing
- Warehouse management systems
- Multi-modal transportation management
- Supply chain management
- Routing and scheduling
- Requisitioning and procurement
- Partnership relationship management
- Inventory accounting
- Inventory management
- Billing and invoicing
- Trade planning
- Trade compliance
- Materials compliance
- Customs clearance applications
- Carrier contract and shipment management
- Logistics documentation
- In-transit and receipt of goods management

Landed Cost Engines

- Exchange calculators
- Duty calculators
- Tax calculators
- Shipping cost engines
- Exception handling

Customer Service Suites

- Email handling
- Call routing and tracking
- Customer relationship management
- Fulfillment house messaging
- Help desk applications
- Workflow management

Major Characteristics of E-Commerce that Impose New Requirements on Logistics Services

- Larger number of small parcels or packages due to a larger number of buyers making direct orders and a larger number of sellers than in traditional trade;
- Large numbers of on-line customers, mostly unknown to the sellers;
- Demand for shipments is much more unpredictable and unstable since it originates from more numerous customers;
- Origins and destinations of shipments are more widely dispersed, given that more buyers place direct orders with producers and distributors and more sellers access buyers globally;
- Accountability for shipments extends through the entire supply chain, compared with traditional logistics in which accountability is limited to single links of the supply chain;
- Customers have high expectations about quality of services and demand fast delivery of shipments;

- Higher incidence of cargoes returned to the supplier than in traditional trade;
- Greater demand for and availability of information covering transactions over entire supply chain, thus allowing on-line shipment tracking and other supply chain management functions;
- Greater focus on one-to-one marketing, which creates demand for customized delivery and post-transaction customer services;
- Greater complexity in fulfilling international orders than in traditional trade, thus preventing some retailers and service providers from being involved in international e-commerce;
- The emergence of demand for on-line processing of shipments, including cargo booking, bills of lading/airway bills, freight payment, rate quotation, landed price calculations and tariff management;
- Substantial increase in the volume of small shipments, leading to growth of demand for warehousing transport and other logistics infrastructure that can handle larger volumes of small shipments;
- Greater scope for customer self-service.

As defined by the Council of Logistics Management in 2004, logistics is that part of supply chain management that plans, implements and controls the efficient, effective forward and reverse flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customer requirements

In the second phase, e-commerce stage, opportunities are opened for transactions. Transactions are the core elements in commercial activities. A transaction consists of two major parts: transaction creation and transaction fulfillment. In the digital economy transaction creation is done over the Internet which usually leads to reduced transaction costs. E-commerce can be divided into two separate areas: B2C and B2B with different e-logistics requirements.

The key words of the digital economy can be summarized to contain the following key-words: speed, flexibility, connectivity, interactivity, and intangibles. The advent of this new digital economy has triggered a new

type of logistics, which we will denote e-logistics. We will define e-logistics as holistic solutions integrating information- and communication technology (ICT) and logistics in the new strategic landscape opening up.

E-logistics can also be seen as the physical fulfillment of the new transaction possibilities created through e-business. The agile and flexible logistics designed for the digital economy, the e-logistics, can be regarded as the third phase in the evolution of logistics, following military and business logistics (Ericsson, 2000)

According to Linster, there are seven key steps to implementing a successful e-logistics strategy. A synthesis of those steps is below:

1. Understand the potential of your partner network.
2. Identify core competencies.
3. Integrate internal business applications.
4. Implement a trading partner portal/extranet
5. Create complete and coherent processes with your partners
6. Implement “visibility applications.” By “visibility applications”
7. Focus on “command and control” after implementing the eLogistic strategy. A successful system is continuously monitored and modified as business demands.

The challenge confronting e-logistics include the need to overcome

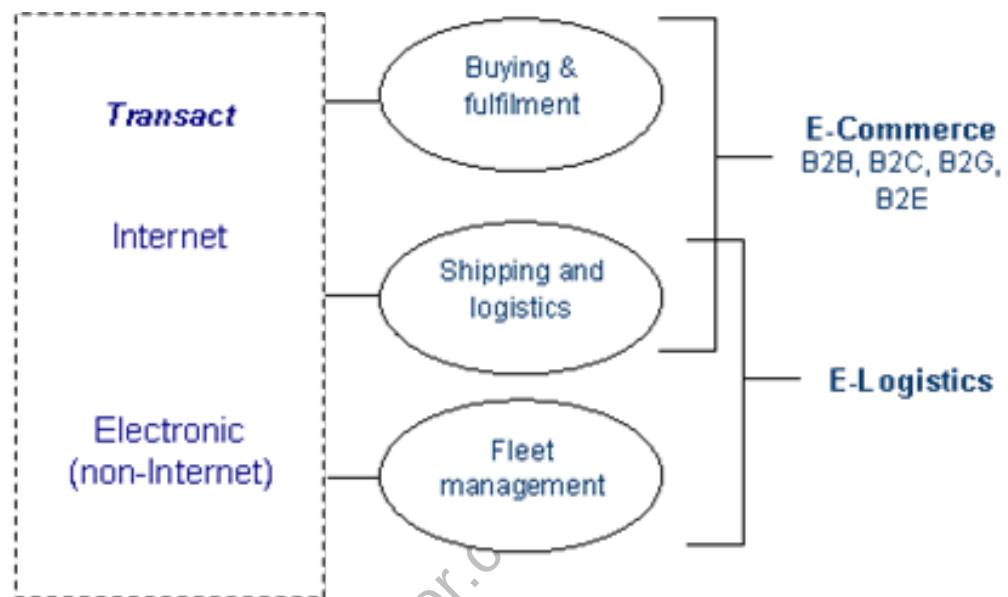
- Poor transaction management
- Persistent overcapacity in inventory that result in low returns, markdowns, shrinkage and write offs
- Demand imbalances that can cause frequent out-of-stocks
- Slow fulfilment cycle times that when coupled with poor revenue management systems cause unsatisfactory variations between income and expenditure patterns
- On-time delivery problems
- Lack of differentiation between logistics service providers
- Obsolete technologies that can no longer be incrementally improved
- Inter-operability problems between online and back-end systems

within and between different companies

- Overcoming fragmentation of shipping management
- Declining service quality and customer satisfaction levels

Are e-logistics and e-commerce the same thing?

Some researchers and experts have endeavored to distance e-logistics from e-commerce. This is similar to how some authors separate e-business from e-commerce.



Domains of e-commerce and e-logistics

As depicted above, some writers distinguish e-commerce from e-logistics by suggesting e-commerce does not extend beyond the purchase transaction. This view has not been explored or supported in depth in these course notes, mainly because once one looks to fulfilment of an order, one has to involve shipping and supply chain management issues related to logistics. This is not to say there is no value in distinguishing e-logistics from e-commerce and this debate assists in refining boundaries and fields of analysis.

It is clear e-commerce and logistics separate where ICTs, and especially the Internet, are not directly involved in goods and services being promoted, selected, ordered and paid for. It is debatable whether e-logistics needs to be considered as a sub-component of e-commerce, but it is unarguable that e-commerce and e-logistics overlap and should be

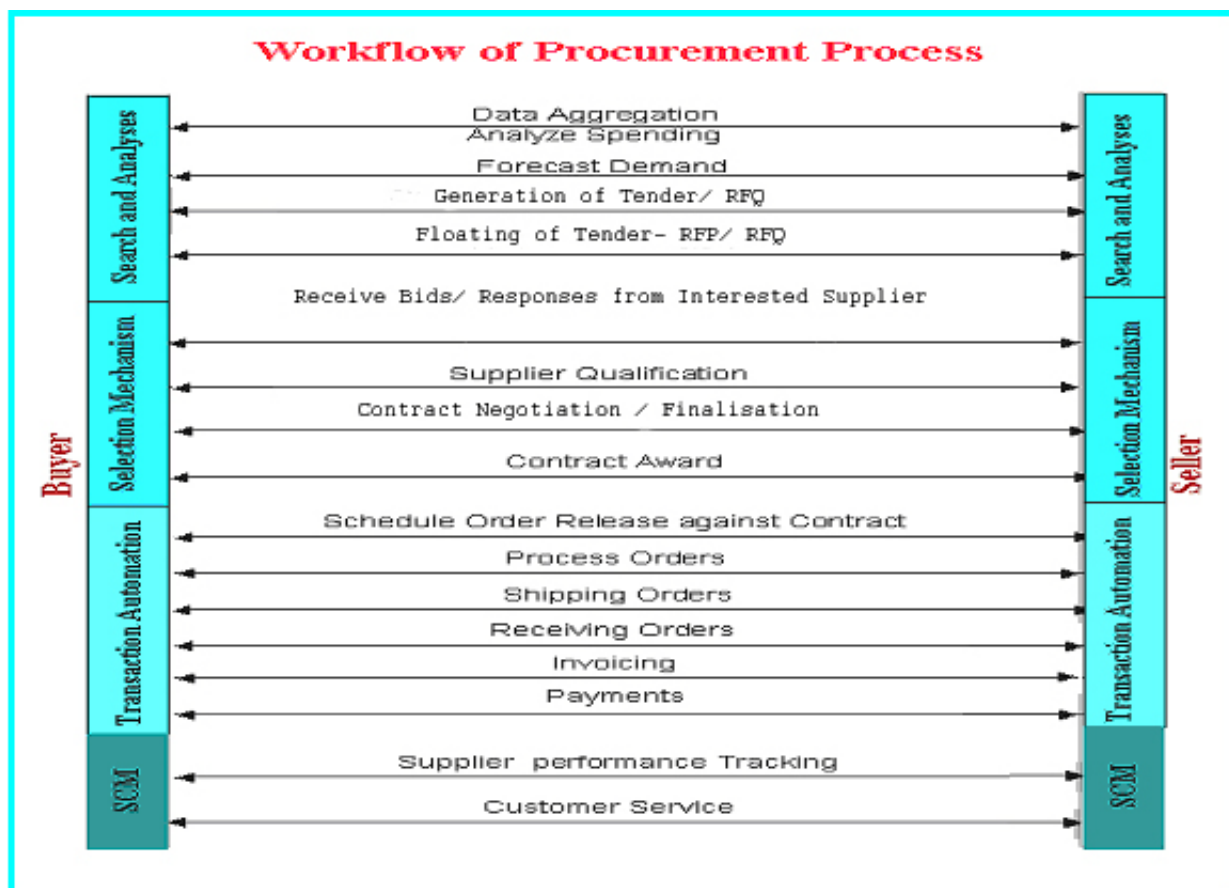
examined together when developing an e-business strategy or reviewing supply chain management.

E - Procurement

The basic tenet of our exercise is that e-government and, in particular, e-procurement programs result into an improvement of the labour productivity of the public sector and, as a consequence, contribute to a number of intermediate outcomes (better services, cost savings, time savings, transparency), to economic rationality (organisational efficiency, simplification) and to GDP growth.

E-procurement Definition

- Is the term used to describe the use of electronic methods, typically over the Internet to conduct transactions between awarding authorities and suppliers.
- The process of e-procurement covers every stage of purchasing, from the initial identification of a requirement, through the tendering process, to the payment and potentially the contract management.



Workflow of Procurement Process

E-procurement Challenges

Organizational

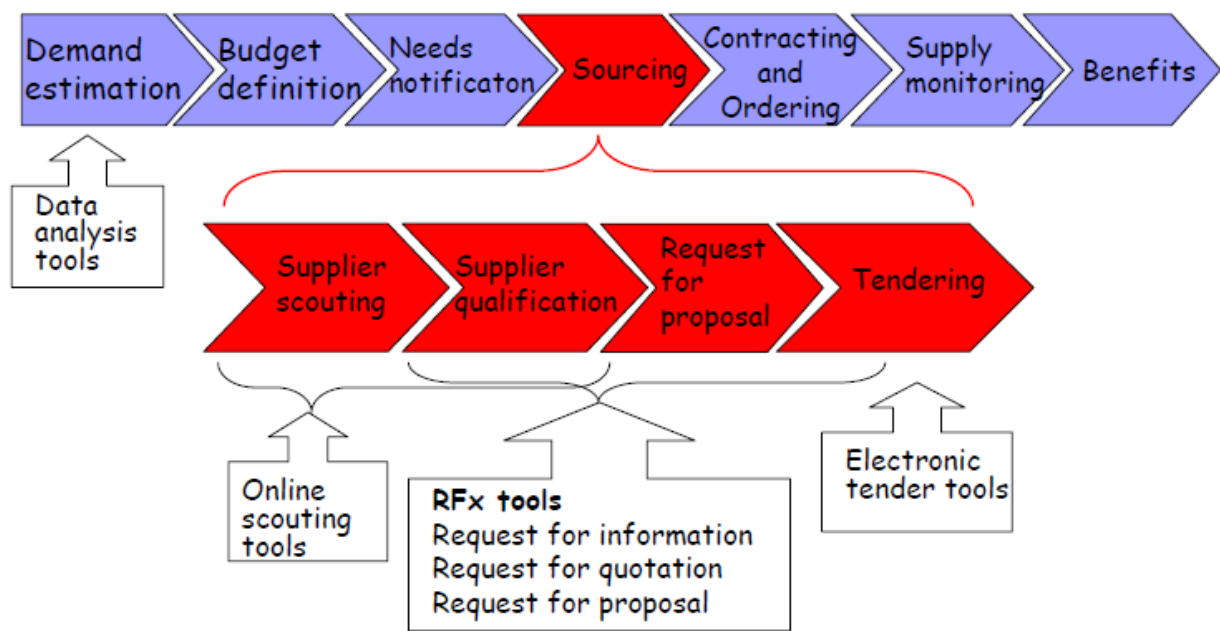
- Many users are resistant to change, simply due to human nature and habit
- Users may believe that e-procurement will make their job more difficult or cumbersome
- Current roles will change due to the impact of e-procurement

Economic-Legal

- Level of economic development
- Regulatory framework
- Technological scenario
- Existence of private competitor services
- General Education level

Objectives of E-Procurement

- Reduce cycle times of procurement
- Increase supplier access to ensure wider participation
- Reduce costs of procurement through competitive bidding and Reverse Auctioning
- Remove cartelisation by supplier groups (Reverse Auctioning)
- Increase visibility of procurement spend, for effective decision making
- Increase transparency in the procurement process
- Almost complete elimination of paper work, for speedy and efficient functioning



E-procurement process and ICT Supporting Tools

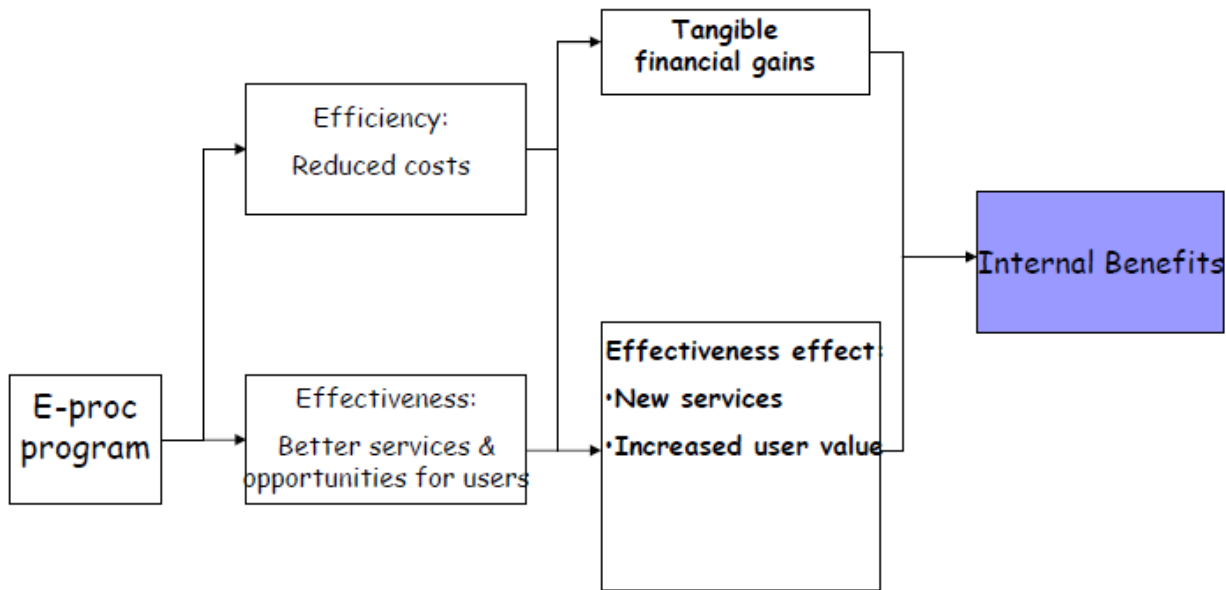
E-Procurement Models

Activity Based Model

- Indirect Procurement System (IPS) - Contracting subject do not coincide with the ordering administration
- Direct Procurement System (DPS) - Contracting subject coincides with the ordering administration

Organization Based Model

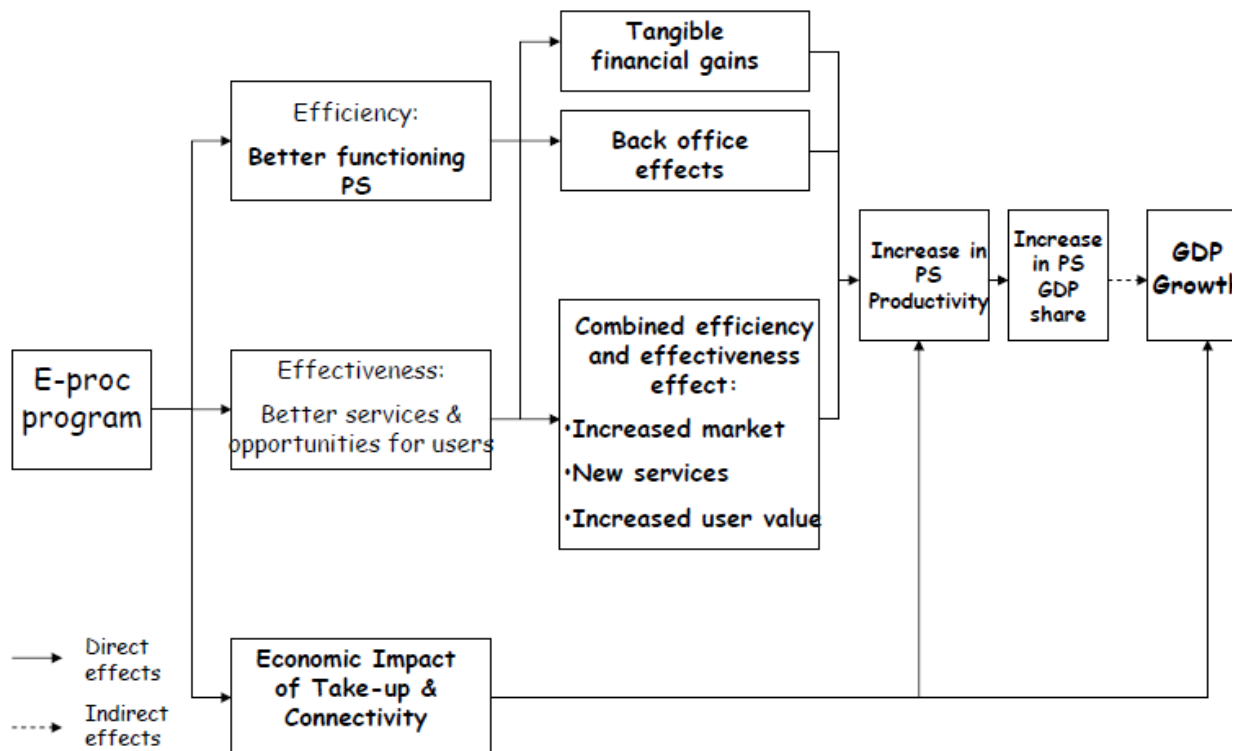
- Centralized Model - Purchasing procedures are centralized
- Decentralized Model - purchasing procedures depend on each administration unit



Old Generation E-procurement: Direct Effects

As a critical part of eSCM, the inefficiencies of old procurement practices have had to be abandoned by companies seeking to be competitive. As global markets emerge and efficiencies of e-commerce eventuate, e-procurement has become an essential subset of eSCM.

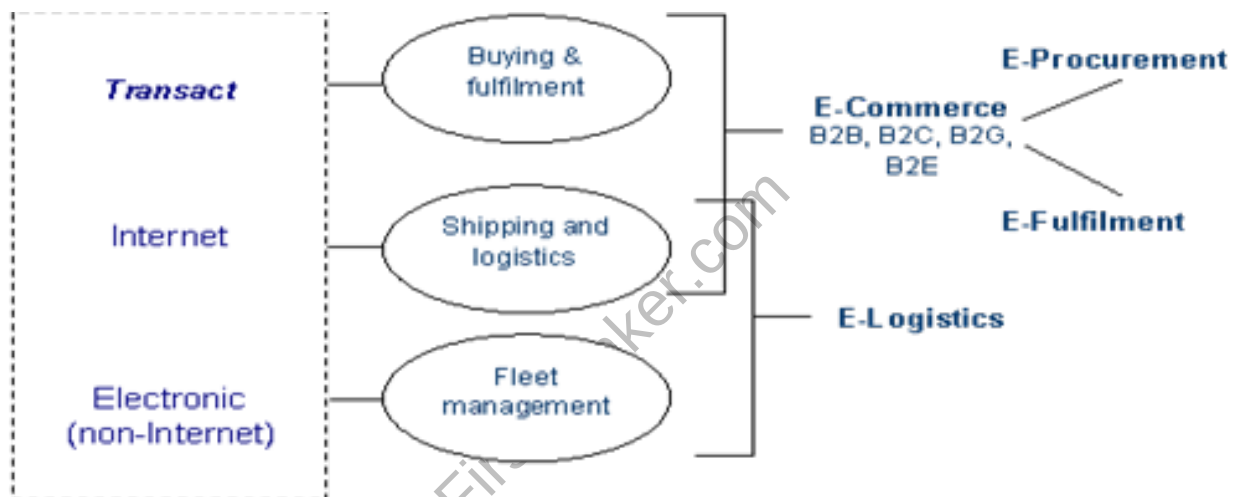
E-procurement is dealt with here, before e-fulfilment, because it sits on the 'buy side' of a business's supply chain. E-procurement confirms how supply chain integration is influencing businesses.



New Generation E-procurement: Direct and Indirect effects

At the e-procurement stage relational databases, internet protocol (IP) and transmission control protocol (TCP) networks and new innovations such as wireless technologies all make it essential that customer facing activities know goods and services are available to meet current and future demand. Failure of non-customer facing activities such as purchasing, procurement, manufacturing and such like can result in a failure to fulfill customer orders.

As depicted in Figure, e-procurement may be considered a subset of e-commerce and eSCM. Resolving inefficiencies and reducing costs associated with the purchasing and procurement process have resulted in the implementation by businesses, particularly those engaging in B2B transactions, of e-procurement processes. The development and implementation of e-procurement strategies has in turn gone on to become a cornerstone for successful supply chain management.



E-procurement, an essential component of eSCM

E-procurement permits the Internet and other data networks to address a number of challenges confronting overall eSCM strategies. Benefits include:

- Preventing unauthorised purchasing and procurement activities
- Accelerating transaction times
- Reducing costs
- More rapid collection of payments
- Improving classification and categorisation of all goods and services

- More accurate processing
- Integrating procurement processes with tracking and fulfilment processes
- Tracking in real-time all expenses and variations
- Improving supply side arrangements
- Reporting variations in quality or performance against agreed standards

E-procurement Outcomes

- **Intermediate Outcomes**
 - Better services;
 - Cost savings;
 - Time savings.
- **Final Outcomes**
 - Improvement of the labour productivity of the public sector;
 - Economic rationality (organizational efficiency), simplification, transparency and accountability;
 - GDP growth.

Targets Models	<i>Economic Rationality</i>	<i>Competition</i>	<i>Simplification</i>	<i>Accountability</i>
IPS	<i>Pros:</i> ■ Inventory coordination ■ Cost control <i>Cons:</i> ■ Cost of coordination	<i>Cons:</i> ■ Loss of competition (in case of preselection)	<i>Cons:</i> ■ Lack of flexibility	<i>Pros:</i> ■ Standard decision making process ■ More control due to the reduction number of decision maker units
DPS	<i>Pros:</i> ■ High autonomy of single Administrations <i>Cons:</i> ■ No budget and procedures coordination ■ No uniform solutions for standard problems	<i>Pros:</i> ■ Access for new suppliers (no pre selection)	<i>Pros:</i> ■ Procedures flexibility	<i>Cons:</i> ■ Loss of control due to the improved number of decision maker units, <i>Pros:</i> ■ Potential higher control over corruption ■ More Corporate Social Responsibility

E-procurement Models & Targets Matrix: Pros and Cons

	E-Procurement
➤ Minimized contract management staff ➤ Support commodity specialisation ➤ Reduce unit prices (buy side) ➤ Plan supply ➤ Reduce selling costs ➤ Increased margin ➤ Reduce costs for services/supply of existing customers	➤ Reduce procurement transaction and automate processes ➤ Support client account/ category specialisation ➤ Plan and forecast demand ➤ Reduce inventories and off-contract buying ➤ Improve asset disposal options ➤ Secure new customers ➤ Reduce distribution costs

Differences

E-procurement Advantages

E-procurement advantages are becoming more evident as the wider understanding of its many uses become apparent. The main reason companies have embraced e-procurement is to increase productivity, provide visibility into day-to-day transactions and make it easier for users to get the supplies that they need.

It has not been an easy road for e-procurement as implementation has its challenges and it has taken time for business managers and procurement departments to fully accept it. The advantages of e-procurement are slowly being understood.

Reducing costs: Costs can be reduced by leveraging volume, having structured supplier relationships and by using system improvements to reduce external spend while improving quality and supplier performance. E-procurement eliminates paperwork, rework and errors.

Visibility of spend: Centralized tracking of transactions enables full reporting on requisitions, items purchased, orders processes and payments made. E-procurement advantages extend to ensuring compliance with existing and established contracts.

Productivity: Internal customers can obtain the items they want from a catalogue of approved items through an on-line requisition and ordering system. Procurement staff can be released from processing orders and handling low value transactions to concentrate on strategic sourcing and improving supplier relationships.

Controls: Standardized approval processes and formal workflows ensure that the correct level of authorization is applied to each transaction and that spend is directed to draw off existing contracts. Compliance to policy is improved as users can quickly locate products and services from preferred suppliers and are unable to create maverick purchases.

Using technology: E-procurement advantages can only be fully realized when the systems and processes to manage it are in place. Software tools are needed to create the standard procurement documentation: electronic requests for information (e-RFI), requests for proposal (e-RFP) and requests for quotation (e-RFQ). These are proven methods to source goods and make the framework agreements that offer the best prices.

An adequate, fully integrated e-procurement approach is needed for overall success. Additional programs provide the framework for the supplier databases and spend management as well as holding key vendor information and being an electronic repository for contracts. All these facilities cost money and a clear business case must be made for e-procurement. In most cases this is fairly clear that cost savings are possible.

It pays for companies to spend money on e-procurement technology, this investment will boost efficiency. The longer term reduction in costs will enable companies to direct their resources to more strategic initiatives. E-procurement advantages are significant bottom-line benefits, including cost reduction, process efficiencies, spending controls and compliance.

E Procurement - Challenges and Opportunities

E procurement is an automation tool for corporate purchasing process. The core definition is a business to business sale using the internet as the medium for order processing. E procurement is more than

the simple shortening of the supply chain with the Internet closing time and distance obstacles between suppliers and users of products.

Instead, it is a comprehensive integrated IT network that encourages purchasing discipline and leverages group buying power for all procurement responsible people in an organization.

E procurement systems consist of a number of different tools. These include automation of internal ordering processes, online catalogs from approved vendors, and an electronic Request for Proposal (e-RFP) process that leverages online auctions (e-auctions) to accumulate bids on providing goods and services for a specific project.

The reasons for implementing e procurement systems all boil down to one critical metric: ROI. According to the Aberdeen Group study in 2004, companies that move to electronic procurement experience the following benefits:

- Reduced off contract spend by 64%.
- Reduced prices by 7.3% for spend brought back onto contract.
- Reduced requisition-to-order cycles by 66%.
- Reduced requisition-to-order costs by 58%.
- Increased total spend under management of procurement group by 20%

Other challenges to implementation include, as with any other new system fielding, push-back from users. Both internal users and even some vendors can create friction and resist the change. For leaders in organizations, it is critical to prepare both internal customers and actively communicate with vendors to ensure they are on-board with the program.

E-procurement Trends in the Global Marketplace

Following the e-procurement trends over the past 20 years highlights some successes but some challenges too. There is no doubt that the Internet is drastically changing the way purchasing is done globally. It has grown and evolved into a complex marketplace with many players offering a variety of e-procurement and business-to-business services.

E-procurement is a catch-all term incorporating many aspects of electronically-assisted buying. It can include services such as hosting of databases, catalogue management, managing tenders and auctions on behalf of clients through to a complete outsourced procurement service. One example, it eliminates tedious manual work associated with preparing and submitting large tenders using customized software.

E-procurement Trends in the Private Sector

Externally hosted e-procurement services are clearly part of a growing trend. Some specialize by industry sector, like those serving the oil and gas, pharmaceutical and mining industries all of which have embraced e-procurement more than some other sectors. Some e-procurement service companies provide the full range of supply network services to support global procurement transactions.

Another e-procurement trend is where large corporations elect to manage their e-procurement in-house. Successful implementations of e-procurement are considered as one of the measures of a world-class purchasing organisation. To do this they need to install enterprise-wide software to manage the database and transactions but the big investment in time and money sometimes means that there is not a compelling business case.

E-Procurement Trends in the Government Sector

Some governments in mature economies are adopting e-procurement more extensively as it provides structure, audit trails and transparency of transactions. However, governments in emerging markets are often unaware of the benefits that e-procurement can provide. World Bank research has also found some reluctance by governments in adopting a system that is so fully transparent.

Certain basic requirements need to be fulfilled before an e-procurement system can achieve maximum potential in government. These are recommendations by the World Bank which include expanding ICT services, guaranteeing a secure online environment, development of standards and processes, and most importantly, for purchasers to be trained.

Sourcing E-Procurement Services

Sourcing e-procurement services requires much prior forethought and planning and a clearly defined strategy. A basic explanation of *e-procurement* is that it is the business-to-business purchase and sale of supplies and services over the Internet. External service providers who are experienced in operating an e-procurement business can provide economies of scale resulting in cost savings for the client.

The definition: However, e-Procurement is more than just a system for making purchases online. A true e-procurement system can connect companies and their business processes directly with suppliers, managing all interactions between them. This traditionally includes the management of bids, supplier correspondence, pricing history and an electronic communication system.

The services: Outsource companies provide services covering the design of the strategy through to implementation, hosting and maintenance of the on-going operations. The selection of the right service for a company's requirements is the key to success. Some e-procurement service providers only provide e-sourcing services, others may only provide the hosting services and some specialize by industry.



E-sourcing: The whole process from identifying suitable vendors, to obtaining competitive terms and managing the on-going supply relationship constitutes e-sourcing. This process, illustrated below, is the central hub of e-procurement.

Reverse auctions, where suppliers offer their goods for the best price, is one of the services most offered by e-procurement specialists. The management of the whole sourcing process using a Request for Information or Proposal (e-RFx) through to the finalization of the contract is a popular service that shows the process to be fully transparent as it is managed by a third party.

E-procurement services also include doing an analysis of the client's spend profile, hosting and maintaining a database of suppliers whilst recording their performance history for future negotiations. The more developed and established e-procurement services include supplier and market intelligence, knowledge management and the full range of staff training modules.

There is a lot of choice in the level, extent and quality of the services offered in this field. Research is needed and references should be taken from existing clients to ensure that the right supplier is engaged. The selection of suitable e-procurement services depends on the maturity of the client and his intended strategy.

E-Fulfilment

It is not the purpose of this section to overview fulfillment in its entirety. Our aim is purely to illustrate the impact of e-commerce on fulfillment; i.e. uncover the current state of play for e-fulfillment.

E-fulfillment is broadly defined to mean:

The electronic integration and enablement of processes chartered with efficiently and effectively managing activities revolving around presenting, modeling, completing orders and delivering the products to the customer.

It is important to reiterate that, just as the Internet has transformed selling and sales to customers and businesses, so it has transformed supply side activities. This includes integration of fulfilment activities with order management, warehousing and logistics. For instance e-fulfilment data is increasingly integrated with back-end systems or information systems to ensure it informs not only logistics (right product and service, on time accurately to the customers' order) but also e-procurement activities (supplies meet demand).

Businesses also expect e-fulfilment to:

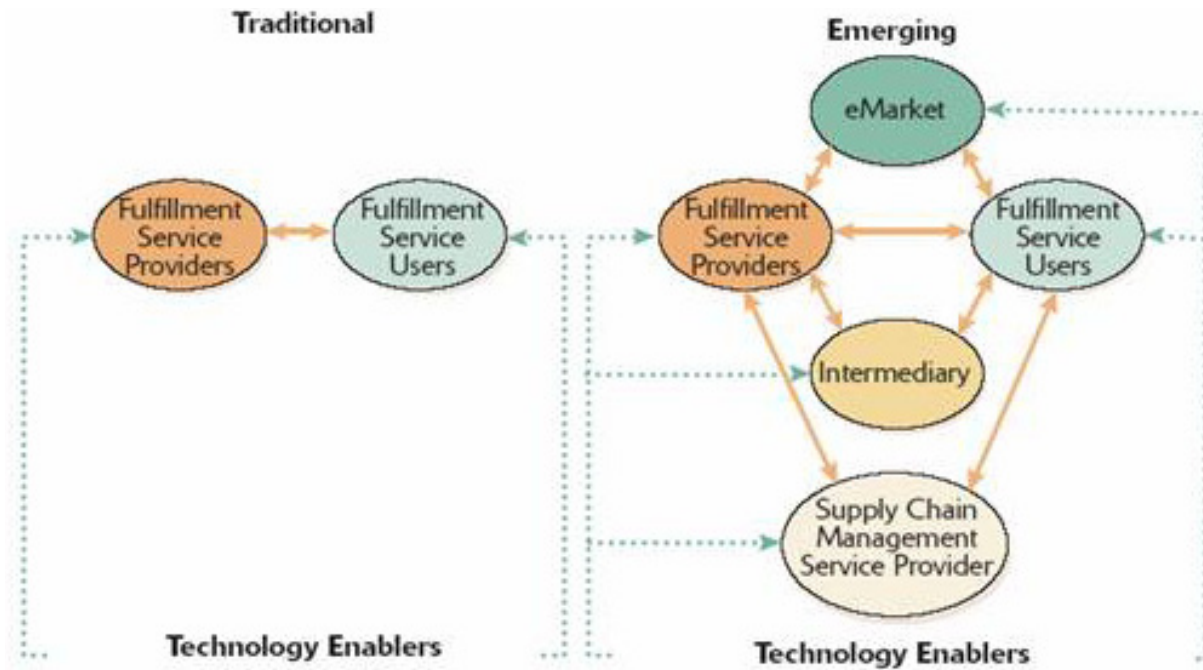
- Make every customer action visible
- Synchronise supply-side data with data on customer actions, needs, preferences and trends
- Integrate data and reporting across all stages of the supply chain

For the end customer e-fulfilment is not at all like previous fulfilment strategies such as direct order or catalogue sales. Electronic enablement means customers expect:

- A high level of performance, speed, and precision
- Access to vast amounts of information that can be personalised
- Traceability and status updates on any order

As stated by Hintlian, Mann and Churchman e-fulfilment revolves around e-business models that address three fundamental challenges:

1. Merging operational excellence with e-commerce opportunities.
2. Realising integrated fulfilment relies on creating new kinds of relationships and services.
3. Integrating fulfilment with strategies focused on capabilities required to support B2B/B2C and to better compete among emerging marketplaces.



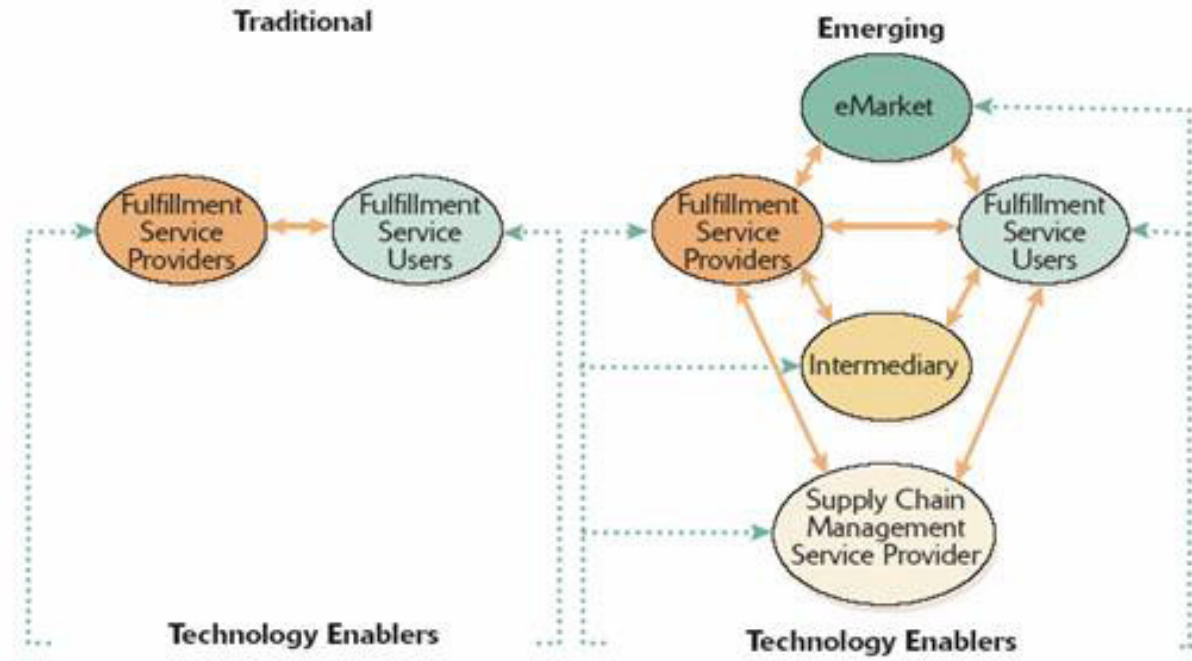
The Changing Fulfilment Solution Landscape

The detail importance of carefully aligning e-commerce opportunities with an integrated fulfilment vision by:

- Segmenting customers according to needs
- Customising the logistics network
- Integrating demand and supply planning
- Integrating product, information and financial flows through the supply chain
- Differentiating the product closer to the customer
- Sourcing strategically
- Using supply chain spanning performance metrics

Hintlian, Mann and Churchman also suggest the integration must come with collaboration and relationships with other businesses that reflect:

- Collaboration between service providers and users
- Win-win commercial arrangements
- A true understanding of core competencies and re-assessment of activities that can be outsourced



The Changing Fulfilment Solution Landscape (Hintlian et al. 2002:3)

Lesson 5.2 - Business Process Management

Learning Objectives

After reading this lesson you will be able to

- Understand about internet and intranet
- Understand about Internet auctions
- Understand the concept of Business Process Management
- Understand the concept of E-Marketing
- Understand the concept of E- Commerce

Front Office/Back Office

The terms Front Office and Back Office are generally used to describe the parts of the company (or of its information system) that are dedicated, respectively, to the direct relationship with the client and proper management of the company. The Front-Office (sometimes also called Front line) refers to the front part of the enterprise that is visible to the clients.

In turn, Back Office refers to all parts of the information system to which the final user does not have access. The term therefore covers all internal processes within the enterprise (production, logistics, warehousing, sales, accounting, human resources management, etc.)

Presentation of the Different Concepts

Implementing an e-Business project necessarily involves the deployment of an enterprise network through which enterprise-specific services are accessible in client-server mode, generally via a web interface which can be queried by using a simple navigator. Nonetheless, the implementation of computer tools is not sufficient. It is therefore believed that an enterprise only actually implements an e-Business project as soon as it implements a new organization based on new technologies. The

concept of e-Business is nonetheless very flexible and covers all possible uses of information and communication technologies (ICT) for any and all of the following activities:

- Making the relationships between the enterprise and its clients and different partners (suppliers, authorities, etc.) more efficient
- Developing new business opportunities
- Facilitating the internal flow of information
- Controlling the different processes of the enterprise (production, warehousing, purchasing, sales, human resources, etc.)

The goal is therefore to create privileged communication channels between the enterprise and its environment and link them with its internal processes to better control internal and external costs. In reality, Back Office and Front office are not entirely separate since the teams in charge of the customer relationship must know a minimum of information regarding the process of producing the product or providing the service of the company. In turn, the sectors that are dedicated to product design must be kept informed of problems that are encountered by the users or, in turn, their needs, in order to re enter a circle of continuous improvement.

Intranet & Extranet

An intranet is a set of Internet services (for example a web server) inside a local network, i.e. only accessible from workstations of a local network, or rather a set of well-defined networks that are invisible (or inaccessible) from the outside. It involves the use of Internet client-server standards (using TCP/IP) protocols such as, for example, the use of Web browsers (HTTP protocol-based client) and Web servers (HTTP protocol), to create an information system inside of an organization or enterprise.

An intranet is generally based on a three-tier architecture, comprising:

- Clients (generally Web browsers);
- One or several application servers (middleware): a web server which makes it possible to interpret CGI, PHP, ASP or other scripts and translate them into SQL queries to query a database;
- A database server.

In this manner, the client machines handle the graphical interface while the different servers handle the data. The network makes it possible to exchange queries and the responses between clients and servers. An intranet naturally has several clients (the computers of the local network) and may also comprise several servers. A large enterprise may, for example, have a web server for each service to provide an Intranet comprising a federator web server linking the different servers that are managed for each service.

Usefulness of an Intranet

An intranet within an enterprise makes it easy to make a wide variety of different documents available to employees, which provides centralized and coherent access to the enterprise's knowledge, which is referred to as capitalization of knowledge. In this manner, it is generally necessary to define the access rights of the users of the Intranet to the documents located thereon, and consequently authentication of such access rights to provide them with personalized access to certain documents.

Documents of any kind (text, images, videos, sounds, etc.) can be made available on an Intranet. In addition, an Intranet may provide a very interesting groupware function, i.e. allow groupwork. Here are some of the functions which may be provided by an Intranet:

- Access to information regarding the enterprise (bulletin board)
- Access to technical documents
- Search engine for documentations
- Exchange of data among coworkers
- Staff roster
- Project management, decision-making aid, agenda, computer-aided engineering
- Electronic messaging
- Discussion forum, distribution list, direct chat
- Videoconference
- Internet portal

An Intranet therefore favors communication within the enterprise and limits errors as a result of poor flow of information. Information available on the Intranet must be updated to prevent version conflicts.

Advantages of an Intranet

An Intranet makes it possible to create an information system at a low cost (specifically, the cost of an Intranet may very well be limited to the cost of the material, its maintenance and updating, with client workstations operating with free navigators, a server running under Linux with the Apache web serve, and the database server MySQL). On the other hand, considering the “universal” nature of the means in play, any type of machine can be connected to the local network, i.e. the Intranet.

Implementation of the Intranet

An Intranet must be designed in accordance with the needs of the enterprise or of the organization (at the level of the services to be implemented). The Intranet must therefore not only be designed by the computer engineers of the enterprise, but within the scope of a project which takes into account the needs of all the parties interacting with the company.

Insofar as physical setup is concerned, it is sufficient to set up a web server (for example a machine running under Linux with the Apache web server and the database server MySQL or rather a server under Windows with the web server Microsoft Internet Information Server). It is then sufficient to configure a domain name for the server.

Extranet

An extranet is an extension of the information system of the company to its partners located outside of the network. Access to the extranet must be secured to the extent that the same provides access to the information system for persons located outside of the enterprise. This might involve simple authentication (authentication via user name and password) or strong authentication (authentication via a certificate).

It is recommended to use HTTPS for all web pages that are consulted from the outside to secure the transport of HTTP queries and answers and to prevent, in particular, the open transfer of the password on the network. An extranet is therefore neither an Intranet nor an Internet site. It is rather a supplementary system providing, for example, the clients

of an enterprise, its partners or its subsidiaries with privileged access to certain computer resources of the enterprise via a Web interface.

Groupware

The term “Groupware” refers to the methods and software tools which allow users to carry out joint work across networks. The term GroupWare therefore refers to miscellaneous and varied applications which contribute to one and the same goal: allowing users that are geographically apart to work in a team.

Teamwork can be conducted through sharing information or rather creating and exchanging computerized data. In most cases, groupware refers to messaging tools (whether instantaneous or not) as well as miscellaneous applications such as:

- Shared agenda
- Shared document workspace
- Information exchange tools (electronic forums)
- Contact management tool
- Workflow tools
- Electronic conferencing (videoconferencing, chat, etc.)

Internet Auctions

The **online auction business model** (internet auction, electronic auction, e-auction) is one in which participants bid for products and services over the Internet. The functionality of buying and selling in an auction format is made possible through auction software which regulates the various processes involved.

Several types of online auctions are possible. In an English auction the initial price starts low and is bid up by successive bidders. In a Dutch auction, multiple identical items are offered in one auction, with all winning bidders paying the same price—the highest price at which all items will be sold (treasury bills, for example, are auctioned this way). Currently almost all online auctions use the English auction method.

Complete Auction Process

A complete auction-based trading process comprises six basic activities:

- **Initial buyer and seller registration:** This step deals with the issues relating to authentication of trading parties, exchange of cryptography keys, and perhaps creation of a profile for each trader that reflects his interest in products of different kinds and possibly his authorized spending limits.
- **Setting up a particular auction event:** This step deals with describing the item being sold or acquired and setting up the rules of the auction. The auction rules explain the type of auction being conducted (open cry, sealed bid, Dutch), parameters negotiated (price, delivery dates, terms of payment, etc.), starting date and time of the auction, auction closing rules, etc.
- **Scheduling and advertising:** To attract potential buyers, items of the same category (art, jewelry, rare coins) should be auctioned together at a regular schedule. Popular auctions can be mixed with less popular ones to force people to be present in the less popular auctions. Items to be auctioned in upcoming auctions are advertised, and potential buyers are notified in this step.
- **Bidding:** The bidding step handles the collection of bids from the buyers and implements the bid control rules of the auction (minimum bid, bid increment, deposits required with bids) and for open cry auctions notifies the participants when new high bids are submitted.
- **Evaluation of bids and closing the auction:** This step implements the auction closing rules and notifies the winners and losers of the auction.
- **Trade settlement:** This final step handles the payment to the seller, the transfer of goods to the buyer, and if the seller is not the auctioneer, payment of fees to the auctioneer and other agents (appraisers, consignment agents, etc).

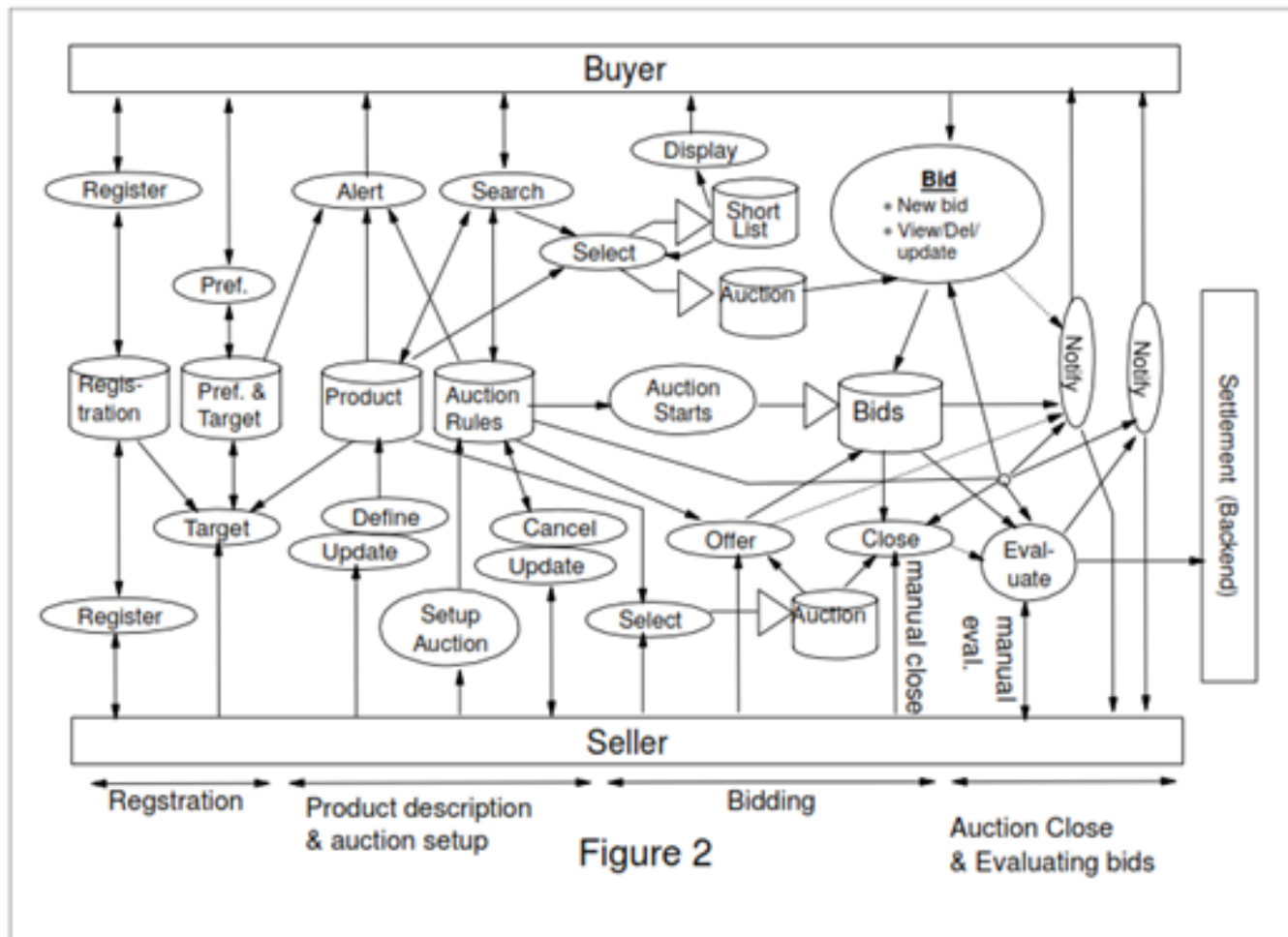


Figure 2

Online Auctions

Online auctions can be fun and a great way to grab a bargain, but you need to be careful - not all auctions are the same and there are risks involved. Before you join or register to participate in an online auction, make sure you know what sort of auction you are looking at and what rights and responsibilities you have. You should also take steps to minimise the risks of something going wrong.

Types of Online Auctions

- **Marketplace online auctions:** Online marketplace auctions are now a popular way of buying, with a well known example being eBay. In these 'virtual' markets, a business sets up the website and provides a set of rules and guidelines, but it is mostly left to the individual buyers and sellers to deal directly with each other and make the market work. It is important to note that the business

running the website is not directly involved in the auction process and is not an agent for the seller.

- **Traditional auctions:** Traditional auctions have been around a long time - just think of an auctioneer banging down the hammer with a cry of 'sold' and pointing to the highest bidder. In this case, the auctioneer has acted on behalf of the seller of the goods. Traditional online auctions operate in the same way, but instead of interested buyers gathering together in person, an online auction house uses a website to create a virtual auction.

Auctions Conducted by Businesses

There are many forms of this auction, in which the business running the website offers their own products for sale:

- **Low bid auctions:** the lowest unique bid received is the successful bid
- **High bid auctions:** the highest unique bid received is the successful bid
- **Beat the clock auctions:** each new bid increases the auction duration, with the highest bidder at the end of the auction winning
- **Reverse auctions:** the role of the buyer and seller are reversed and the sellers compete for your business.

Don't participate unless you understand exactly how the auction works. The auction website should provide important information such as terms and conditions or safe trading guidelines. See if the auction site has any processes in place for dealing with problems such as dispute resolution procedures, buyer protection policies or complaints handling policies - and whether you are eligible.

Don't get Caught with Unexpected Fees and Charges

Before you join an online auction, know all the costs involved with registering, bidding and winning. With some of the newer or more novel types of auctions, you may be charged to bid, even if you don't win. You may also have to pay administrative fees and subscription costs and you

will nearly always have to pay for delivery if you do win. If the terms and conditions look tricky or confusing, you may be safer to shop elsewhere.

Your Rights when Buying from an Online Auction

Whether online or in person, you need to be particularly careful when you buy from an auction – most auctions are a case of ‘buyer-beware’ and there are normally no returns or refunds if something goes wrong with your purchase. When you buy at auction, you are still entitled to expect that the seller will provide the product as it was advertised: they cannot mislead you about the product or its attributes. For example, if you bought a green leather couch, they cannot send you a red one. Whether you buy from a business or private individual, the seller must have the right to sell you the goods. It is unlawful for someone to sell you something which was stolen or that they didn’t own.

If there are any restrictions on ownership, these should be made clear to you before you buy. If you are having problems with a purchase from an overseas-based business or website, it may be more difficult for you to resolve any issues that arise. Visit our webpages [Buying from overseas](#), [Buying from overseas](#) and [Online shopping](#) – when things go wrong for more information.

Workflow

The term “Workflow” refers to the modeling and computerized management of all tasks to be accomplished and of the different players involved in carrying out a business process (also called operational process). A business process represents interactions in the form of an exchange of information between different players such as:

- People,
- Applications or services,
- Third-party processes,

Practically, a Workflow may Describe

- The validation circuit,
- The tasks to be accomplished among the different parties of a process,
- The deadlines to be met,
- The validation modes

Additionally, it provides each player with the information that is necessary to complete his or her task. For an online publication process, for example, it involves modeling the tasks of the entire editing chain, from the editor's proposal to validation by the person in charge of publication.

The example above is a very schematic representation of how the workflow could look like for the publication of a document on an Intranet with the help of a publication interface:

1. The editor proposes an article to the section head
2. The section head takes a look at the document and validates it
3. The editor-in-chief believes that the document contains elements that are non-current and returns the document to the editor
4. The editor revises the copy and submits it to the section head
5. The section head corrects some typos and forwards the article to the editor-in-chief
6. The editor-in-chief validates the document for online publication

Workflow Typologies

Generally, we distinguish two types of Workflow:

- Procedural workflow (also called production workflow or managing workflow), which corresponds to known business processes of the enterprise and which is subject to pre established procedures: The direction of the workflow is more or less fixed;
- Ad hoc workflow based on a groupwork model where the players are involved in the decision of where to direct the workflow: The direction of the workflow is dynamic.

Workflow Engine

The workflow engine is a tool which makes it possible to model and automate the business processes of the enterprise. This type of tool makes it possible to formalize the business rules of the enterprise in order to automate the decision-making process, i.e. the branch of the workflow to chose, depending on a given context.

BPM

The term “BPM” (Business Process Management) refers to an approach in terms of creating a computer-model of the business processes of the enterprise, both in terms of their application-related and human aspects.

The purpose of this measure is to achieve an improved overview of all business processes of the enterprise and their interactions in order to be able to optimize them and, as much as this is possible, maximize their automation with the help of business applications.

A “bottom-up” Approach

The BPM step presents a bottom-up approach which consists in analyzing the actual functioning of the enterprise to create a computer model thereof. This step represents a break from the so-called “top-down” general schemes where the functioning of the enterprise must match the model proposed by the managing team.

Life Cycle of a Business Process

Generally speaking, the life cycle of a BPM step can be broken down as follows:

- Study of the company by analyzing its objectives and its organization in order to be able to break down its entire activity into business processes.
- Modelling of business processes, i.e. computerized representation of a model which comes as close to the reality as possible,
- Implementation of the solution: implementation of a BPM solution,

linked to an information system of the company (applications and databases)

- Execution: refers to the operational phase during which the BPM solution is implemented.
- Piloting, consisting in analyzing the status of the processes by means of border tables representing the process performances
- Optimization, i.e. proposing solutions which make it possible to improve the performances of the business processes

Integral Elements

A BPM solution usually comprises the following elements:

- A process modelling tool, which makes it possible to create a model of the enterprise's business processes by using a graphical interface.
- Implementation-aiding tools, i.e. interfaces (API) and connectors which make it possible to integrate the BPM solution with the information system.
- An execution engine (workflow engine) in charge of instantiating the processes and to store the context and their status in a relational database;
- Piloting and reporting tools based on precise and pertinent indicators to create border tables which make it possible to quickly take proper decisions. The term BAM (Business Activity Monitoring) refers to the concept of monitoring the processes of the company step by step.

BPM Standardization

One of the goals of BMP is reusability, i.e. preventing having to reinvent the wheel for every change. Most tools, however, are proprietary, i.e. they have their own data model and a non-transparent mode of functioning, which makes them hardly interoperable.

Standardizing the representation of processes is therefore a major challenge to facilitate integration among BPM tools. Standardization occurs at different levels:

- At the process modeling level
- At the process execution level
- At the level of communication with the IS

BPMN

BPMN (Business Process Modelling Notation) is an initiative of the BPMI (Business Process Management Initiative, a consortium of enterprises) whose goal is to define a common graphical notation which makes it possible to model business processes.

The BPMN notation makes it possible, in particular, to disconnect the business information from the technical information (technical elements of the information system) to maximize its portability from one company to another one. BPMN may be considered a UML notation applied to the management of business processes.

BPEL

BPEL (Business Process Execution Language) is an initiative of the BPMI whose goal is to provide an XML representation of the activities linked with the execution of a process. Where the BPMN notation is attached to statically describe the processes, the BPEL language describes the overall dynamics.

Enterprise Portals

The term “enterprise portal” refers to an intranet platform which provides access to enterprise data as well as resources of the information system within a single interface.

The enterprise portal is therefore the point of entry to the data of the information system of the enterprise for all personnel and, possibly, partners. The purpose of a portal is to provide a starting point for the user within the information system.

Types of Enterprise Portals

Generally speaking, we distinguish three large groups of portals:

- An enterprise information portal (EIP) sometimes called a corporate information portal, provides access to multiple sources of information (documents, reports, messages, press articles, etc) in a single location;
- An enterprise application portal (EAP), also called an application portal, provides access to different applications of the enterprise and to the corresponding data depending on a user profile;
- An enterprise expertise portal (EEP), sometimes called a supervisory portal, makes it possible to capitalize on and analyze the information used by the users to improve access to the knowledge of the enterprise.

User Profile Concept

The portal concept is generally closely linked to the user profile concept. As a matter of fact, ideally, each user has access to the resources of the information system based on his or her profile, in accordance with the security policy defined by the enterprise.

On the other hand, the user profile may also be used for visual and functional (look & feel) customization, in which case the terms online “workspace” or “Virtual office” are used. In this case, the environment consists of modular elements (usually called portlets or webparts) which the user may select and organize in his or her workspace.

E Marketing

Very simply put, **eMarketing** or electronic marketing refers to the application of marketing principles and techniques **via electronic media** and more specifically the Internet. The terms **eMarketing**, **Internet marketing** and **online marketing**, are frequently interchanged, and can often be considered synonymous.

eMarketing is the process of **marketing a brand using the Internet**. It includes both direct response marketing and indirect marketing

elements and uses a range of technologies to help connect businesses to their customers.

By such a definition, eMarketing encompasses all the activities a business **conducts via the worldwide web** with the aim of attracting new business, retaining current business and developing its brand identity.

Why is it important?

When implemented correctly, the **return on investment** (ROI) from eMarketing can far exceed that of traditional marketing strategies.

Whether you're a "bricks and mortar" business or a concern operating purely online, the Internet is a force that cannot be ignored. It can be a means to reach literally millions of people every year. It's **at the forefront of a redefinition** of way businesses interact with their customers.

Types of Internet Marketing

Internet marketing is broadly divided in to the following types:

- **Display Advertising:** the use of web banners or banner ads placed on a third-party website to drive traffic to a company's own website and increase product awareness.
- **Search Engine Marketing (SEM):** a form of marketing that seeks to promote websites by increasing their visibility in search engine result pages (SERPs) through the use of either paid placement, contextual advertising, and paid inclusion, or through the use of free search engine optimization techniques.
- **Search Engine Optimization (SEO):** the process of improving the visibility of a website or a web page in search engines via the "natural" or un-paid ("organic" or "algorithmic") search results.
- **Social Media Marketing:** the process of gaining traffic or attention through social media sites.
- **Email Marketing:** involves directly marketing a commercial message to a group of people using electronic mail.
- **Referral Marketing:** a method of promoting products or services

to new customers through referrals, usually word of mouth.

- **Affiliate Marketing:** a marketing practice in which a business rewards one or more affiliates for each visitor or customer brought about by the affiliate's own marketing efforts.
- **Content Marketing:** involves creating and freely sharing informative content as a means of converting prospects into customers and customers into repeat buyers.

Advantages of E-Marketing

Internet marketing is inexpensive when examining the ratio of cost to the reach of the target audience. Companies can reach a wide audience for a small fraction of traditional advertising budgets. The nature of the medium allows consumers to research and to purchase products and services conveniently. Therefore, businesses have the advantage of appealing to consumers in a medium that can bring results quickly. The strategy and overall effectiveness of marketing campaigns depend on business goals and cost-volume-profit (CVP) analysis.

Internet marketers also have the advantage of measuring statistics easily and inexpensively; almost all aspects of an Internet marketing campaign can be traced, measured, and tested, in many cases through the use of an ad server. The advertisers can use a variety of methods, such as pay per impression, pay per click, pay per play, and pay per action. Therefore, marketers can determine which messages or offerings are more appealing to the audience. The results of campaigns can be measured and tracked immediately because online marketing initiatives usually require users to click on an advertisement, to visit a website, and to perform a targeted action.

Limitations of E-Marketing

However, from the buyer's perspective, the inability of shoppers to touch, to smell, to taste, and "to try on" tangible goods before making an online purchase can be limiting. However, there is an industry standard for e-commerce vendors to reassure customers by having liberal return policies as well as providing in-store pick-up services.

E-Commerce

The term “Electronic commerce” (or e-Commerce) refers to the use of an electronic medium to carry out commercial transactions. Most of the time, it refers to the sale of products via Internet, but the term E Commerce also covers purchasing mechanisms via Internet (for B-To-B).

A client who purchases on the Internet is called a cyberconsumer. E-Commerce is not only limited to online sales, but also covers:

- Preparation of estimates online
- Consulting of users
- Provision of an electronic catalogue
- Access plan to point of sales
- Real-time management of product availability (stock)
- Online payment
- Delivery tracking
- After-sales service

In certain cases, electronic commerce makes it possible to highly customize products, in particular when the electronic commerce site is linked with the production system of the enterprise (e.g. business cards, customized items such as T-shirts, cups, caps, etc.)

Finally, insofar as electronic services and products are concerned (MP3 files, software programs, e-books, etc.), electronic commerce makes it possible to receive the purchase in a very short time, if not immediately.

Online Stores

Most electronic commerce sites are online stores which have at least the following elements at the front-office level:

- An online electronic catalogue listing all products for sale, their price and sometimes their availability (product in stock or number of days before delivery);

- A search engine which makes it possible to easily locate a product via search criteria (brand, price range, key word, etc.);
- A virtual caddy system (sometimes called virtual cart): This is the heart of the e-commerce system. The virtual caddy makes it possible to trace the purchases of the client along the way and modify the quantities for each reference;
- Secure online payment (accounting) is often ensured by a trusted third party (a bank) via a secure transaction;
- An order tracking system, which allows tracking of order processing and sometimes provides information on pickup of the package by the shipper.

A back office system allows the online dealer to organize its offerings online, modify prices, add or remove product references as well as manage and handle client orders.

www.FirstRanker.com

Lesson 5.3 - Customer Relationship Management

Learning Objectives

After reading this lesson you will be able to

- Define and understand the concept of CRM
- Understand the concept of SCM
- Understand the overview of ERP
- Understand the concept of ILM

Customer Relationship Management (CRM)

The client is generally the main source of income for enterprises. However, as business is changing, in particular as a result of the integration of new technologies in client-enterprise relations, competition is becoming increasingly stiffer, and clients may therefore choose their suppliers or change them with a simple click. Client's criteria of choice are, in particular, financial criteria, responsiveness of the enterprise, but also purely affective criteria (need for recognition, need to be heard, etc.) In an increasingly competitive world, enterprises who wish to increase their profits therefore have several alternatives:

- Increase the margin for each client,
- Increase the number of clients,
- Increase the life cycle of the client, i.e. increase client loyalty.

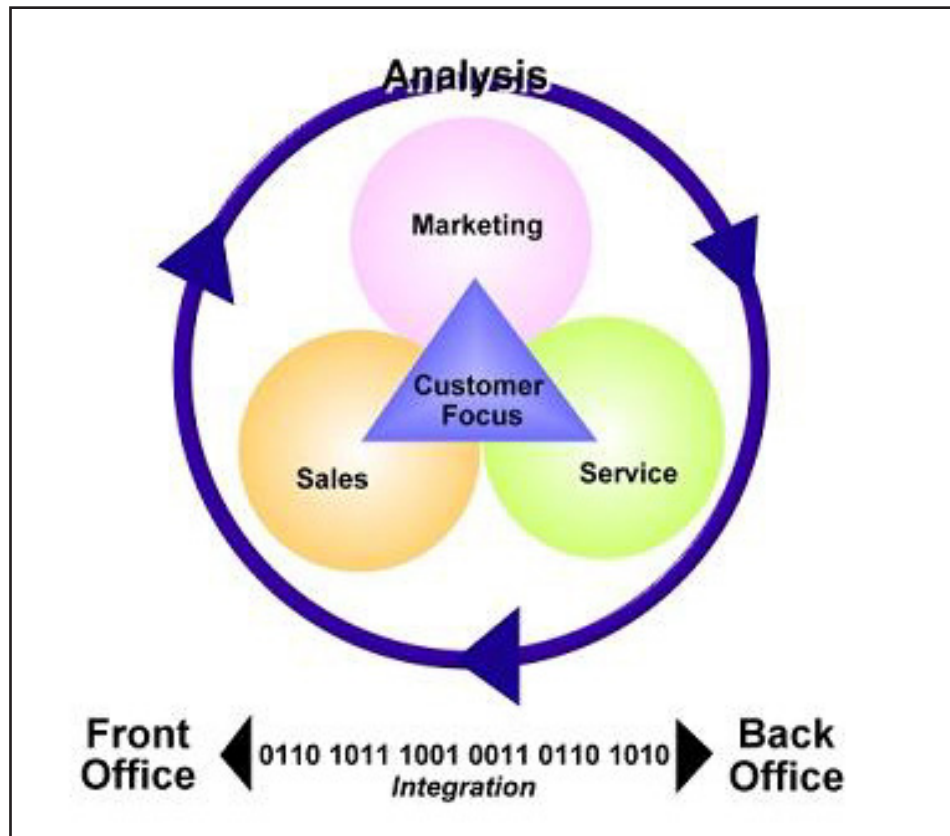
New technologies allow enterprises to better know their clientele and to gain their loyalty by using pertinent information in such a manner as to better gauge their needs and therefore better respond to them. It has been found that turning a client into a loyal client costs five times less than recruiting new clients. For that reason, a large number of enterprises design their strategy around services proposed to their clients.

Defining CRM?

CRM (Customer Relationship Management) intends to provide technological solutions which make it possible to strengthen the communication between the company and its clients in order to improve the relationship with the clientele through atomization of the different components of the client relationship:

- **Pre-sales:** Refers to marketing, consisting in studying the market, i.e. the needs of clients and identifying prospects. Analyzing the client information collected allow the enterprise to revise its product selection to more closely match expectations. Enterprise Marketing Automation (EMA) consists in automating marketing campaigns.
- **Sales:** Sales forces automation (SFA), consists in providing piloting tools to businesses to assist them in their prospecting measures (contact management, sales meeting management, relaunch management, but also assistance with the preparation of business proposals, etc).
- **Client service management:** clients loved to feel known to and acknowledged by the enterprise and cannot stand having to recount, upon every contact, the history of its relationship with the enterprise.
- **After-sales,** consisting in providing assistance to the client, in particular through the implementation of call centers (also Help Desk or Hot-Line) and the online provision of technical support information.

The purpose of CRM is improved proximity to clients to respond to their needs and turn them into loyal customers. A CRM project therefore includes providing each sector of the company with access to the information system to get to know the client better and provide him with products and services which meet his expectations in the best possible way.



CRM overview

Integration of CRM in the Company

Implementation of CRM solutions in an enterprise not only consists in ad-hoc installation of software, but rather in modifying the organization of the enterprise as a whole, which involves the necessary implementation of a behavioural change project. As a matter of fact, implementation of a CRM strategy requires structural, competitive, and behavioural changes.

Call Centers

The term Call center refers to a platform, either hosted by the company or outsourced, that is in charge of assisting users. Call centers make it possible to assist clients within the scope of after-sales service (ASS), technical support, telesales or staff of an enterprise within the scope of the use of a tool or with their daily tasks. In the case of a call center dedicated to providing technical support, the term Support center (in English Help Desk or Hot Line) is generally used.

Functioning of a Call Center

A call center is, first and foremost, a human organization in charge of responding to user questions. Most of the time, the privileged channel is the telephone, but assistance via the Internet through groupware applications is also possible. Certain devices feature a so-called “Web Call Back” (or “Call Through”) tool, which allows the user to be called back by the company through simple capture of the phone number and clicking on the capture button.

At first, operators are responsible for identifying the parties on the line. Computer telephony integration (acronym CTI) is increasingly used to link the phone system of the enterprise to its information system and allow the operators automatic access to files regarding the clients based on the calling number.

As soon as the user has been identified and its identity verified through a number of questions (client number, address, phone number, etc), the operator opens an incident ticket and can access the record via the Help Desk software interface. The client record contains the history of the client’s calls and all measures that have already been undertaken, to prevent diagnosis from scratch. Opening an incident tick starts a timer, and the operator must therefore provide the user with an answer within the shortest time possible.

Supply Chain Concept

In a production enterprise, the time required to complete a product is largely dependent on the supply of raw materials, assembly elements or single pices on all levesl of the production chain. The term “supply chain” therefore refers to all links of the supply chain.

- Purchasing,
- Supply,
- Stock management,
- Transportation,
- Maintenance,

The term “supply chain” is comprehensive, i.e., in particular within the enterprise, but also includes all suppliers and their subcontractors.

The term SCM (Supply Chain Management) refers to the tools and methods whose purpose is to improve and automate the supply through the reduction of stock and delivery times. The term “just-in-time” production characterizes the concept of minimizing stock throughout the entire production chain.

SCM tools are based on production capacity information that is present in the information system of the enterprise to automatically place orders. SCM tools are therefore strongly correlated with Enterprise Resource Planning (ERP) of the enterprise.

Ideally, a SCM tool makes it possible to track the passage of pieces (traceability) between the different parties of the supply chain.

The supply chain consists of a set of processes associated with the flow of goods, information, and money among firms, from the raw materials supply stage, through production and consumption stage, and finally to the recycling stage. A tool to optimize the supply chain through integrated management is called Supply Chain Management (SCM).

SCM resembles Efficient Customer Response (ECR) and Quick Response (QR) in the sense that these tools aim to efficiently coordinate the firms in the total supply chain in a Just-In-Time (JIT) manner. However, these two tools are targeted for specific industries. ECR is developed for the food processing industry, while QR is for the clothing industry. SCM is not necessarily targeted for any specific industry. All these tools generally aim to maximize total value within the supply chain.

Definitions

More common and accepted definitions of supply chain management are:

- Managing upstream and downstream value added flow of materials, final goods and related information among suppliers; company; resellers; final consumers are supply chain management.
- Supply chain management is the systematic, strategic coordination of the traditional business functions and the tactics across these

business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole (Mentzer *et al.*, 2001).

- A customer focused definition is given by Hines “Supply chain strategies require a total systems view of the linkages in the chain that work together efficiently to create customer satisfaction at the end point of delivery to the consumer. As a consequence costs must be lowered throughout the chain by driving out unnecessary costs and focusing attention on adding value. Throughout efficiency must be increased, bottlenecks removed and performance measurement must focus on total systems efficiency and equitable reward distribution to those in the supply chain adding value. The supply chain system must be responsive to customer requirements.”
- Global supply chain forum - supply chain management is the integration of key business processes across the supply chain for the purpose of creating value for customers and stakeholders (Lambert, 2008).
- According to the Council of Supply Chain Management Professionals (CSCMP), supply chain management encompasses the planning and management of all activities involved in sourcing, procurement, conversion, and logistics management. It also includes the crucial components of coordination and collaboration with channel partners, which can be suppliers, intermediaries, 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 cooperate to provide product and service offerings has been called the *Extended Enterprise*

Problems Addressed by Supply Chain Management

Supply chain management must address the following problems:

- **Distribution Network Configuration:** number, location and network missions of suppliers, production facilities, distribution centers, warehouses, cross-docks and customers.

- **Distribution Strategy:** questions of operating control (centralized, decentralized or shared); delivery scheme, e.g., direct shipment, pool point shipping, cross docking, DSD (direct store delivery), closed loop shipping; mode of transportation, e.g., motor carrier, including truckload, LTL, parcel; railroad; intermodal transport, including TOFC (trailer on flatcar) and COFC (container on flatcar); ocean freight; airfreight; replenishment strategy (e.g., pull, push or hybrid); and transportation control (e.g., owner-operated, private carrier, common carrier, contract carrier, or 3PL).
- **Trade-Offs in Logistical Activities:** The above activities must be well coordinated in order to achieve the lowest total logistics cost. Trade-offs may increase the total cost if only one of the activities is optimized. For example, full truckload (FTL) rates are more economical on a cost per pallet basis than less than truckload (LTL) shipments. If, however, a full truckload of a product is ordered to reduce transportation costs, there will be an increase in inventory holding costs which may increase total logistics costs. It is therefore imperative to take a systems approach when planning logistical activities. These trade-offs are key to developing the most efficient and effective Logistics and SCM strategy.
- **Information:** Integration of processes through the supply chain to share valuable information, including demand signals, forecasts, inventory, transportation, potential collaboration, etc.
- **Inventory Management:** Quantity and location of inventory, including raw materials, work-in-process (WIP) and finished goods.
- **Cash-Flow:** Arranging the payment terms and methodologies for exchanging funds across entities within the supply chain.

Supply chain execution means managing and coordinating the movement of materials, information and funds across the supply chain. The flow is bi-directional.

Activities / Functions

Supply chain management is a cross-function approach including managing the movement of raw materials into an organization, certain

aspects of the internal processing of materials into finished goods, and the movement of finished goods out of the organization and toward the end-consumer. As organizations strive to focus on core competencies and becoming more flexible, they reduce 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. The effect is to increase the number of organizations involved in satisfying customer demand, while reducing management control of daily logistics operations. Less control and more supply chain partners led to the creation of supply chain management concepts. The purpose of supply chain management is to improve trust and collaboration among supply chain partners, thus improving inventory visibility and the velocity of inventory movement.

Several models have been proposed for understanding the activities required to manage material movements across organizational and functional boundaries. SCOR is a supply chain management model promoted by the Supply Chain Council. Another model is the SCM Model proposed by the Global Supply Chain Forum (GSCF). Supply chain activities can be grouped into strategic, tactical, and operational levels. The CSCMP has adopted The American Productivity & Quality Center (APQC) Process Classification FrameworkSM a high-level, industry-neutral enterprise process model that allows organizations to see their business processes from a cross-industry viewpoint.

Strategic Level

- Strategic network optimization, including the number, location, and size of warehousing, distribution centers, and facilities.
- Strategic partnerships with suppliers, distributors, and customers, creating communication channels for critical information and operational improvements such as cross docking, direct shipping, and third-party logistics.
- Product life cycle management, so that new and existing products can be optimally integrated into the supply chain and capacity management activities.
- Information technology chain operations.

- Where-to-make and make-buy decisions.
- Aligning overall organizational strategy with supply strategy.
- It is for long term and needs resource commitment.

Tactical Level

- Sourcing contracts and other purchasing decisions.
- Production decisions, including contracting, scheduling, and planning process definition.
- 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.
- Milestone payments.
- Focus on customer demand and Habits.

Operational Level

- 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 inventory.
- Production operations, 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 facilities, distribution centers, and other customers.
- From production level to supply level accounting all transit damage cases & arrange to settlement at customer level by maintaining company loss through insurance company.
- Managing non-moving, short-dated inventory and avoiding more products to go short-dated.

Importance of Supply Chain Management

Organizations increasingly find that they must rely on effective supply chains, or networks, to compete in the global market and networked economy. In Peter Drucker's (1998) new management paradigms, this concept of business relationships extends beyond traditional enterprise boundaries and seeks to organize entire business processes throughout a value chain of multiple companies.

During the past decades, globalization, outsourcing and information technology have enabled many organizations, such as Dell and Hewlett Packard, to successfully operate solid collaborative supply networks in which each specialized business partner focuses on only a few key strategic activities (Scott, 1993).

This inter-organizational supply network can be acknowledged as a new form of organization. However, with the complicated interactions among the players, the network structure fits neither "market" nor "hierarchy" categories (Powell, 1990). It is not clear what kind of performance impacts different supply network structures could have on firms, and little is known about the coordination conditions and trade-offs that may exist among the players.

From a systems perspective, a complex network structure can be decomposed into individual component firms (Zhang and Dilts, 2004). Traditionally, companies in a supply network concentrate on the inputs and outputs of the processes, with little concern for the internal management working of other individual players.

Therefore, the choice of an internal management control structure is known to impact local firm performance (Mintzberg, 1979). In the 21st century, changes in the business environment have contributed to the development of supply chain networks.

First, as an outcome of globalization and the proliferation of multinational companies, joint ventures, strategic alliances and business partnerships, significant success factors were identified, complementing the earlier “Just-In-Time”, “Lean Manufacturing” and “Agile Manufacturing” practices.

Second, technological changes, particularly the dramatic fall in information communication costs, which are a significant component of transaction costs, have led to changes in coordination among the members of the supply chain network (Coase, 1998).

Many researchers have recognized these kinds of supply network structures as a new organization form, using terms such as “Keiretsu”, “Extended Enterprise”, “Virtual Corporation”, “Global Production Network”, and “Next Generation Manufacturing System”.

In general, such a structure can be defined as “a group of semi-independent organizations, each with their capabilities, which collaborate in ever-changing constellations to serve one or more markets in order to achieve some business goal specific to that collaboration” (Akkermans, 2001).

The security management system for supply chains is described in ISO/IEC 28000 and ISO/IEC 28001 and related standards published jointly by ISO and IEC

Historical Developments in Supply Chain Management

Six major movements can be observed in the evolution of supply chain management studies: Creation, Integration, and Globalization (Movahedi et al., 2009), Specialization Phases One and Two, and SCM 2.0.

1. Creation Era

The term **supply chain management** was first coined by a U.S. industry consultant in the early 1980s. However, the concept of a supply chain in management was of great importance long before, in the early 20th century, especially with the creation of the assembly line. The characteristics of this era of supply chain management include the need for large-scale changes, re-engineering, downsizing driven by cost reduction programs, and widespread attention to the Japanese practice of management.

2. Integration Era

This era of supply chain management studies was highlighted with the development of Electronic Data Interchange (EDI) systems in the 1960s and developed through the 1990s by the introduction of Enterprise Resource Planning (ERP) systems. This era has continued to develop into the 21st century with the expansion of internet-based collaborative systems. This era of supply chain evolution is characterized by both increasing value-adding and cost reductions through integration.

In fact a supply chain can be classified as a Stage 1, 2 or 3 network. In stage 1 type supply chain, various systems such as Make, Storage, Distribution, Material control, etc. are not linked and are independent of each other. In a stage 2 supply chain, these are integrated under one plan and is ERP enabled. A stage 3 supply chain is one in which vertical integration with the suppliers in upstream direction and customers in downstream direction is achieved. An example of this kind of supply chain is Tesco.

3. Globalization Era

The third movement of supply chain management development, the globalization era, can be characterized by the attention given to global systems of supplier relationships and the expansion of supply chains over national boundaries and into other continents. Although the use of global sources in the supply chain of organizations can be traced back several decades (e.g., in the oil industry), it was not until the late 1980s that a considerable number of organizations started to integrate global sources into their core business. This era is characterized by the globalization of

supply chain management in organizations with the goal of increasing their competitive advantage, value-adding, and reducing costs through global sourcing.

4. Specialization Era (Phase I): Outsourced Manufacturing and Distribution

In the 1990s, industries began to focus on “core competencies” and adopted a specialization model. Companies abandoned vertical integration, sold off non-core operations, and outsourced those functions to other companies. This changed management requirements by extending the supply chain well beyond company walls and distributing management across specialized supply chain partnerships.

This transition also re-focused the fundamental perspectives of each respective organization. OEMs became brand owners that needed deep visibility into their supply base. They had to control the entire supply chain from above instead of from within. Contract manufacturers had to manage bills of material with different part numbering schemes from multiple OEMs and support customer requests for work -in-process visibility and vendor-managed inventory (VMI).

The specialization model creates manufacturing and distribution networks composed of multiple, individual supply chains specific to products, suppliers, and customers who work together to design, manufacture, distribute, market, sell, and service a product. The set of partners may change according to a given market, region, or channel, resulting in a proliferation of trading partner environments, each with its own unique characteristics and demands.

5. Specialization Era (Phase II): Supply Chain Management as a Service

Specialization within the supply chain began in the 1980s with the inception of transportation brokerages, warehouse management, and non-asset-based carriers and has matured beyond transportation and logistics into aspects of supply planning, collaboration, execution and performance management.

At any given moment, market forces could demand changes from suppliers, logistics providers, locations and customers, and from any number of these specialized participants as components of supply chain networks. This variability has significant effects on the supply chain infrastructure, from the foundation layers of establishing and managing the electronic communication between the trading partners to more complex requirements including the configuration of the processes and work flows that are essential to the management of the network itself.

Supply chain specialization enables companies to improve their overall competencies in the same way that outsourced manufacturing and distribution has done; it allows them to focus on their core competencies and assemble networks of specific, best-in-class partners to contribute to the overall value chain itself, thereby increasing overall performance and efficiency. The ability to quickly obtain and deploy this domain-specific supply chain expertise without developing and maintaining an entirely unique and complex competency in house is the leading reason why supply chain specialization is gaining popularity.

Outsourced technology hosting for supply chain solutions debuted in the late 1990s and has taken root primarily in transportation and collaboration categories. This has progressed from the Application Service Provider (ASP) model from approximately 1998 through 2003 to the On-Demand model from approximately 2003-2006 to the Software as a Service (SaaS) model currently in focus today.

6. Supply Chain Management 2.0 (SCM 2.0)

Building on globalization and specialization, the term SCM 2.0 has been coined to describe both the changes within the supply chain itself as well as the evolution of the processes, methods and tools that manage it in this new “era”.

Web 2.0 is defined as a trend in the use of the World Wide Web that is meant to increase creativity, information sharing, and collaboration among users. At its core, the common attribute that Web 2.0 brings is to help navigate the vast amount of information available on the Web in order to find what is being sought. It is the notion of a usable pathway. SCM 2.0 follows this notion into supply chain operations. It is the

pathway to SCM results, a combination of the processes, methodologies, tools and delivery options to guide companies to their results quickly as the complexity and speed of the supply chain increase due to the effects of global competition, rapid price fluctuations, surging oil prices, short product life cycles, expanded specialization, near-/far- and off-shoring, and talent scarcity.

Supply Chain Business Process Integration

Successful SCM requires a change from managing individual functions to integrating activities into key supply chain processes. An example scenario: the purchasing department places orders as requirements become known. The marketing department, responding to customer demand, communicates with several distributors and retailers as it attempts to determine ways to satisfy this demand. Information shared between supply chain partners can only be fully leveraged through process integration.

Supply chain business process integration involves collaborative work between buyers and suppliers, joint product development, common systems and shared information. According to Lambert and Cooper (2000), operating an integrated supply chain requires a continuous information flow. However, in many companies, management has reached the conclusion that optimizing the product flows cannot be accomplished without implementing a process approach to the business. The key supply chain processes stated by Lambert (2004) are:

- Customer relationship management
- Customer service management
- Demand management style
- Order fulfilment
- Manufacturing flow management
- Supplier relationship management
- Product development and commercialization
- Returns management

Much has been written about demand management. Best-in-Class companies have similar characteristics, which include the following:

- a) Internal and external collaboration
- b) Lead time reduction initiatives
- c) Tighter feedback from customer and market demand
- d) Customer level forecasting

One could suggest other key critical supply business processes which combine these processes stated by Lambert such as:

- a. Customer service management
- b. Procurement
- c. Product development and commercialization
- d. Manufacturing flow management/support
- e. Physical distribution
- f. Outsourcing/partnerships
- g. Performance measurement
- h. Warehousing management

Advantage and Disadvantage of SCM

Thus, a well-designed SCM yields positive net value by creating benefit, reducing cost, and improving financial viability (such as profitability.) The firms in the well-designed supply chain could share gains reasonably, resulting in what is called a “win-win” relationship.

First, the sources of creating benefits include lead-time compression or flexible response for customers, which reduce total cost (e.g. inventory cost) from upstream to downstream and enhance service levels for customers. Such improvements can make supply chain firms competitive. These advantages are derived from concentrating firm's resources to their core-competence and creating value by having flexibility and adaptability against changing market environment.

Second, the cost can also be reduced in relation to the integrated advantage. There are economies of scale and scope in vertical integration of process; for example, avoiding redundant investment in warehousing, and reducing inventory level by information sharing.

However, in order to maximize such net value by SCM, “inter-firm alliance reliable partnership” is needed. In practice, making a reliable inter-firm alliance entails high transaction cost, and requires three conditions. First, the period of relationship should be long enough to make good partnership and commitment.

Second, the firms in the supply chain should have the necessary abilities and should share reasonable responsibilities (risk sharing). Third, various information, such as ordering, inventory or customer demand, among others, should be shared and processed properly. With regards to the third point, the recent IT development can contribute to SCM.

Logistics Management in SCM

As mentioned above, SCM encompasses flow of goods, information and money from the raw materials supply stage, through production and consumption stage, and finally to the recycling stage. SCM is composed of several management tools. Different approaches in accounting, production management, information processing, marketing, etc. have been developed to solve the problems in SCM. For example, accounting approach to SCM mainly focuses on cash flow in the supply chain, while information processing approach focuses on the flow of information.

In this paper, we will take our attention to logistics in SCM, which is strategic management of goods flow in the supply chain. According to the CLM (Council of Logistics Management), logistics is that part of supply chain process that plans, implements and controls the effective flow and storage of goods, services and related information from the point of origin to the point of consumption in order to meet customers' requirements.

Logistics management includes inventory control, material handling, order control, transportation, warehousing, etc. Although the concept of logistics mainly focuses on goods flow, other flows such as information and money flows are also given attention. In particular, information management has close relation and then cannot be ignored.

Coordinating Logistics in SCM

The general idea of logistics is to strategically manage the total flow of goods. Thus, logistics optimization is not only accomplished from the viewpoint of one firm, and therefore, total optimization of the flow of goods including firms in the supply chain is required.

When trying to optimize the total flows within the supply chain, it must be pointed out that the interests of firms in the supply chain may conflict due to the partial distribution of cost and benefit among the firms. Thus, coordinating the interests of the firms is necessary for logistics management in SCM. They likewise have different skills or competencies, which are complementary and require further coordination.

For example, coordination is needed between the firms in the areas of production and transportation planning. In fact, it is not easy to coordinate many firms with different profiles. If a parts supplier and a manufacture like to synchronize their production, they have to share their production schedules and coordinate transportation of parts between the factories.

In order to realize this, they are required to have IT abilities and to fulfill their responsibilities correctly.

A firm, which possesses logistics know-how on coordinating economic resources, may have opportunities to make advises. Such a logistics coordinator, also called Third Party Logistics (3PL), has been gaining attention. 3PL is a new type of industry where the firm's logistics activity can be outsourced. It came into existence during the deregulation of freight transport industry in the 1980's, and has progressed in the 1990's along with the development of IT.

Supply chain management flows can be divided into three main flows:

- The product flow
- The information flow
- The finances flow

Supplier Relationship Management

The term “Supplier Relationship Management” (SRM) refers to the use of technologies by an enterprise to improve the supply mechanism at its suppliers. Just like employee relationship management, this concept is based on customer relationship management.

The goal of SRM is to allow an enterprise to improve communication with its different suppliers, share a methodology, business terms and information with them and improve familiarity with each other to optimize the supply process. In turn, SRM is also intended to ensure that suppliers familiarize themselves better with the core business of the enterprise and its different products to ensure a customized supply.

SRM Processes

SRM solution editors generally define a process comprising four large stages:

- Cooperative design, consisting in integrating the supply problems from the time a product is designed by involving suppliers via a cooperative design tool while ensuring a minimum cost at all levels;
- Identification of suppliers (sourcing), whose purpose is to identify potential suppliers and to prepare a scorecard by qualifying them in accordance with their cost, production capacity, delivery deadlines, and their quality guaranties. At the end of this stage, the best suppliers can be invited to submit bids;
- Selection of suppliers, via a reverse auction mechanism, where the roles of the buyer and of the seller are reversed. The SRM tools generally have a bidding interface which makes it possible to make three types of requests (commonly called “Request for x” and written RFx):
 - RFQ (Request For Quotation), i.e. a simple request to quote prices for relatively common products. The supplier who submits the lowest bid is generally selected;
 - RFP (Request For Proposal), i.e. a request directed to suppliers to submit a commercial proposal, specifying a price, but also

information on the company, its solvency, production capacities, stock and delivery deadlines, etc. A supplier is selected in accordance with a selection system which makes it possible to evaluate the proposals in accordance with different criteria.

- RFI (Request For Information), which consists in issuing a simple request for information regarding the products and services offered by the suppliers, which does not necessarily imply any bidding.
- Negotiation, whose purpose is to formalize the contract between the enterprise and the selected supplier, possibly including specific clauses regarding logistics, terms of payment, service quality, or any other special duties.

Employee Relationship Management (ERM)

The term “Employee Relationship Management” (acronym ERM), translate as “management of the relationship with the employees” refers to the use of technologies in the management of human resources. This concept is based on client relationship management, with the employee at its center.

This involves implementing a dedicated information system for the management of human resources (generally referred to as HRIS), which makes it possible to cover all problems that are related with the relationship between a company and its employees, in particular:

- Training, i.e. the preparation of an overall training plan of the company which makes it possible to handle a catalog of compulsory or optional internships, requests by employees, and tracking of training actions;
- Pay, to prepare a statement of payments and mailing of salary bulletins;
- Recruiting, in particular follow-up on recruiting interviews and new recruits;
- Competence and career management, consisting in the implementation of a competence reference standard which permits improved management of jobs within the enterprise and in-house transfers. The goal is to value human assets by prioritizing the

competences, knowledge, and know-how of the employees;

- Time management, i.e. the management and quantification of the activity of the employees of the company, in particular with a view to compliance with existing laws (reduction of working hours, payment of overtime, accounting of vacation, work breaks and absences);
- Internal communication, which permits sensitization and transversal information, which makes it possible to break the isolation of the different sectors of the enterprise.

Knowledge Management

“Knowledge Management” (KM) refers to the methods and software tools which make it possible to identify and capitalize on the knowledge of the enterprise to organize and distribute them, in particular. We generally distinguish between tangible knowledge (also called explicit knowledge) of the enterprise, contained in databases or rather in all the hardcopy or electronic documents, and tacit knowledge (also called intangible knowledge) consisting of knowledge, know-how and competences of the entire staff (therefore referred to as “intangible assets”). The performance of an enterprise depends directly on the individual business competences, experience and knowledge, although it is rarely shared by all persons.

As a matter of fact, it is the human resources of an enterprise which determine the force, responsiveness, and the dynamics, or more precisely the synergetic work of these different persons. The term collective intelligence, which has become increasingly common in the literature, clearly illustrates the fact that proper functioning of the enterprise largely depends on having good information available at the right time.

In addition, with the development of information and communication technologies, the downside may be excessive information (sometimes called information pollution even textual harassment): “too much information kills information”! The purpose of a knowledge management project is therefore to identify, capitalize on and value the intellectual assets of the enterprise by involving the entire staff.

The Knowledge Management Project

The knowledge management project is structured by 5 stages, which are frequently known by the term “virtuous circle of knowledge management”:

- Obtaining knowledge;
- Preserving knowledge;
- Valuing knowledge;
- Creating and sharing knowledge;
- Updating knowledge.

ERP

ERP (in English Enterprise Resource Planning), also called Integrated Management Software (PGI), are applications whose purpose consists in coordinating all activities of a company (so-called vertical activities such as production, procurement, or rather horizontal activities such as marketing, sales forces, management of human resources, etc.) around the same information system.

Integrated Management Software generally provide Groupware and Workflow tools to ensure transversality and flow of information between the different services of the company. The term “ERP” comes from the name of the MRP (Manufacturing Resource Planning) method used during the 70s for managing the planning of industrial production.

Implementation of ERP

Much more than just software, ERP is a true project requiring full integration of a software tool within an organization and a specific structure and therefore involves significant engineering costs. On the other hand, its implementation in an enterprise requires significant changes in the working habits of a significant part of the employees. It is therefore believed that the cost of the software tool accounts for less than 20% of the total cost of implementing such a system.

EAI

The purpose of EAI (Enterprise Application Integration) is the interoperability and organization of the flow of information between heterogeneous applications, i.e. ensure communication between the different applications making up the information system of the company, even those of clients, partners, or suppliers.

An EAI project therefore involves, in the first place, implementing an architecture under which the different applications communicate with each other. This therefore involves the development of connectors (middleware) which make it possible to interface applications by using different communication protocols (generally proprietary).

However, the EAI project goes beyond interoperability between the applications: it makes it possible to define a workflow between the applications and therefore represents an alternative to ERP with a more modular approach. Nonetheless, EAI still has the limits related with the rigidity of the legacy, since it is necessary to modify the middleware in the case of significant changes of the applications.

PLM

Whereas Customer Relationship Management (CRM) tries to collect all information regarding clients, PLM (Product Lifecycle Management) consists in capitalizing on all information regarding an industrial product. PLM is an approach similar to Knowledge Management, but revolving around the product. The goal of PLM is to allow the different entities of the company, from production to sales, to share knowledge of the different stages of the life cycle of a product (design, manufacturing, storage, transportation, sales, after-sales service, recycling).

Implementation of PLM

The PLM approach necessarily involves close cooperation with the ERP of the enterprise to gather information related with the manufacturing stages of the product as well as with Customer Relationship Management tools to take into account returns by clients.

ILM (Information LifeCycle Management)

As enterprises are opening their information system to their partners and the performance of means of telecommunication increases, the volume of enterprise data increases exponentially. Considering the strategic value of the information assets of the enterprise, it therefore becomes necessary to implement warehousing means to preserve these data. Nonetheless, the speed at which warehousing technologies develop may render a tape or optical disk-based storage system obsolete very quickly.

In addition, the constraints imposed by laws regarding the individual liberties or the legal obligations of enterprises must also be taken into account. All of these criteria therefore make it necessary to implement an overall storage and warehousing strategy for enterprise data. ILM (Information Lifecycle Management) consists in using a comprehensive approach in terms of efficient management of the information assets of the company depending on the value of the information and the cost of storing it.

ILM is a comprehensive approach whose goal is, on one hand, the efficient use of the means for the storage of information to take into account the most suitable technical, regulatory, and legal requirements for storing information and making it available and, on the other hand, to ensure tracking the life cycle of documents.

ILM therefore covers the concepts of availability and speed of access to information depending on the development of its value over time, from the time it is created until it is destroyed.

ILM makes it possible to apply different storage rules depending on the value of the data to be stored to better meet the following criteria:

- Usefulness of the data
- Security requirements: integrity, confidentiality, and availability of data
- Regulatory requirements regarding the data
- Access time to the data
- Cost of storage

Self Assessment Questions

1. Write about e- business?
2. How to create value in e – business?
3. What are the key security concerns in e – business?
4. What are the common security measures for e – business?
5. What type of security solutions available for e- business?
6. What is the importance of e-logistics?
7. What is the importance of e- fulfillment?
8. What are the major characteristics of e- commerce in logistic services?
9. Why do we need e-Logistics and Technology Management?
10. Are e-logistics and e-commerce the same thing?
11. Explain about e-procurement?
12. What are the objectives of e- procurement?
13. What are the different types of e- procurement models?
14. What are the differences between procurement and e-procurement?
15. What are the advantages of e- procurement?
16. Discuss what is back office and its applications?
17. Define Intranet and Extranet?
18. Explain Groupware?
19. How an internet auction takes place?
20. Write short notes about BPM & EAP?
21. Discuss about e- marketing & e- commerce?
22. Explain about CRM?
23. Write about SCM?
24. What is SRM?
25. Discuss about ERM?
26. Write about KM?
27. Explain about ERP?
28. Discuss about EAI?
29. Explain PLM?
30. Explain ILM?

CASE STUDY

Keiretsu and Supply Chain Management (SCM)

Supply chain management (SCM) aims at managing supply and demand optimizing resources, reducing cost and providing efficient customer service. 'Keiretsu' is a Japanese word that refers to powerful business group. It depicts how businesses share each other's resources. Keiretsu is a relationship among suppliers, partners and customers who do business with each other. It is basically a vertically related group with sound manufacturing and a large network of suppliers and subcontractors.

Under the Keiretsu arrangement, major suppliers and subcontractors do business with only one of the producers. Keiretsu shares many of the goals of the SCM as the latter is based on the management of relationships both between corporate functions and across companies. SCM offers an opportunity for firms to enjoy many of the benefits of Keiretsu, such as stability and efficiency. In Japan, large companies act as the centre of Keiretsu.

In Japan, there are six main business groups: Mitsui, Mitsubishi, Sumitomo, Fuyo, Sanwa and Dai-Ichi Kangyo. Toyota is a member of Mitsui group and has such as extensive network of suppliers and subcontractors that it has become a core company of its own Keiretsu. This ensures that there is no overlap between similar companies. Major suppliers do business with only one of the producers.

A major Japanese manufacturer also uses a single source for its material requirement. This makes the supplier more responsive. As global competition continues to grow, firms need to re-examine their channel alternatives and assess which forms of channel relationships will fit best with their long term objectives.

Source: Anurag Saxena and Kaaushik Sircar (2008), Logistics and Supply Chain Management.

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