MARKETING, FINANCE AND PRODUCTION MANAGEMENT

M.B.A (HRM) First Year

Semester – I, Paper-IV

Director, I/c

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M.B.A (HRM) – MARKETING, FINANCE AND PRODUCTION MANAGEMENT

First Edition2025

No. of Copies :

Published by:

Prof. V. VENKATESWARLU,

Director, I/C

Centre for Distance Education, Acharya Nagarjuna University

Printed at:

FOREWORD

Since its establishment in 1976, Acharya Nagarjuna University has been forging ahead in the path of progress and dynamism, offering a variety of courses and research contributions. I am extremely happy that by gaining 'A^{+}' grade from the NAAC in the year2024, Acharya Nagarjuna University is offering educational opportunities at the UG, PG levels apart from research degrees to students from over221 affiliated colleges spread over the two districts of Guntur and Prakasam.

The University has also started the Centre for Distance Education in 2003-04 with the aim of taking higher education to the doorstep of all the sectors of the society. The centre will be a great help to those who cannot join in colleges, those who cannot afford the exorbitant fees as regular students, and even to housewives desirous of pursuing higher studies. Acharya Nagarjuna University has started offering B.Sc., B.A., B.B.A., and B.Com courses at the Degree level and M.A., M.Com., M.Sc., M.B.A., and L.L.M., courses at the PG level from the academic year 2003-2004 onwards.

To facilitate easier understanding by students studying through the distance mode, these self-instruction materials have been prepared by eminent and experienced teachers. The lessons have been drafted with great care and expertise in the stipulated time by these teachers. Constructive ideas and scholarly suggestions are welcome from students and teachers involved respectively. Such ideas will be incorporated for the greater efficacy of this distance mode of education. For clarification of doubts and feedback, weekly classes and contact classes will be arranged at the UG and PG levels respectively.

It is my aim that students getting higher education through the Centre for Distance Education should improve their qualification, have better employment opportunities and in turn be part of country's progress. It is my fond desire that in the years to come, the Centre for Distance Education will go from strength to strength in the form of new courses and by catering to larger number of people. My congratulations to all the Directors, Academic Coordinators, Editors and Lesson-writers of the Centre who have helped in these endeavors.

Prof .K. Gangadhara Rao
M.Tech., Ph.D.,
Vice-Chancellor I/c
Acharya Nagarjuna University

104HR26: MARKETING, FINANCE AND PRODUCTION MANAGEMENT

UNIT -I

Introduction to Marketing, Concept, scope, Importance, Approaches of Marketing, Segmentation, Targeting, Positioning, Marketing Information system.

UNIT -II

Marketing Mix Product- Product Life Cycle, New Product Development-
Packaging, Branding, Pricing- Channel of Distribution , Promotion.

UNIT -III

Financial Management : An Overview Introduction – Meaning of Financial Management – Significance – Scope- Objectives- Functions; Methods and Tools of Financial Management; Role of Finance Manager; The Changing Scenario of Financial Management in India; Financial Management under Resource Constraints, Time value of Money.

UNIT- IV

Introduction- Financial Needs and Source of finances of a business- Long term source of finance- Venture Capital- Long term Source of Finance- Venture Capital Finance- Debt Securitization- Lease Finance, Short term source of finance- Other Source of Finance- New Instruments- International Financing .

UNIT -V

Introduction to Production & Operations Management, Types of Production Process, Process Analysis, Layout planning, Types of Production Lay out Planning, Facilities Location Analysis,

Case Analysis: There shall be a compulsory question on case analysis in the subject

REFERENCE BOOKS:

1) Philip Kotler, Marketing Management, Analysis Planning, Implementation and control, Pearson Publications
2) William J Stanton, Fundamentals of Marketing, McGraw-Hill, New Delhi.
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4) I.M.Pandey Financial Management, 12th Edition, Pearson Publications.
5) M.K Khan and P.K Jain, Financial Management,8th Edition, Mc Graw Hill, 2018
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7) K.Ashwatappa, Production and operations Management, Himalaya Publications, 2021
8) K.Sudarshan Reddy, Production and Operations Managment Himalaya Publications,
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CONTENTS

Lesson - I

MARKETING MANAGEMENT : AN INTRODUCTION

OBJECTIVES

After studying this lesson, you should be able to :

- explain the meaning of Market and Marketing.
- differences between Marketing and Selling.
- functions of Marketing.
- definitions of Marketing.
- concepts of Marketing.

STRUCTURE

1.1 INTRODUCTION

Market provides a mechanism for the sale of goods. According to Prof. Philip Kotler market is an area or atmosphere for a potential exchange. Marketing includes all activities involved in the production and distribution of goods and services. Marketing concept refers to the philosophy of an organisation in relation to marketing of a product of service.

1.2 MEANING OF MARKET

The term market is derived from the Latin word 'Marcatus' which means merchandise, trade i.e. purchasing and seling of gods. It is a place where buyers and sellers meet together for the exchange of title to goods. i.e. it is a place where business is conducted. The market provides a mechanism for the sale of goods, but the actual delivery of goods may not take place in all the cases. However, for the students of marketing market refers to any region in which buyers and sellers are brought in contact with one another, and by means of which the prices of goods and services are finalised easily and quickly. According to Prof. Mitchel market is not a geographical meeting place but as any getting together of buyers and sellers, in person, by mail, telephone, telegraph and internet or any other means of communication. Prof. Philip Kotler expressed in his famous book 'Marketing Management', the term 'market' as area or atmosphere for a potential exchange.

Market is an arrangement that provides opportunity of exchanging goods and services for money or money's worth. Thus in market there are two groups of persons, one group holding the goods which they want to sell and another group of prospective buyers who want to pay for the goods they are going to buy. It means that three points are interlinked namely place, atmosphere, and demand. Place stands for a convenient place for the buyers and sellers to come together for the exchange of goods and sevices; atmosphere stands for the contact between the buyers and sellers; demand stands for the people with needs and wants to satisfy and purchasing power.

1.2.1. CLASSIFICATION OF MARKETS : Markets can be classfied in several ways from different approaches.

I. On Geographic or Area Basis : From the stand point of geographical area, markets are divided into (a) Local Markets, (b) National Market and (c) International Market.

- **a) Local Market :** These markets relate to a partiular locality. In the case of these markets, commodities sold within geographical limits. Such commodities are difficult to be sold outside local limits. Generally, commodities which are heavy and perishable have local markets. For example bricks, vegetables, fruits, milk etc have local markets.
- **b) National Market :** The growth of industries has widened the scope of market on national level. Wiht the growth of transporation and communication, most of the goods are marketed at national level.
- **c) International Market :** These are known as foreign markets where goods are sold beyond national boundaries. With the growth of transportation and communication systems, a number of products have acquired and international level.

II. On the Basis of Importance : On the basis of importance markets may be divided into

- (d) Primary Market.
- (e) Secondary Market.

(f) Terminal Market.

(a) Primary Markets : In primary markets, primary producers of agricultural products or manufactured goods sell to wholesalers, who assemble the goods from different sources of production. These markets are generally found in villages.

(b) Secondary Markets : In the secondary markets, wholesalers sell the goods to retailers for further selling. Semi - processed and Semi - manufactured goods are generally sold and purchased in secondary markets E.g. Yarn market.

(c) Terminal Market : It is the market where final products are sold to final consumers i.e. consumers purchase goods in the terminal markets from the retailers.

III. On The Basis Of Business : On the basis of volume of business, the market may be divided into

(a) Wholesale Market.

(b) Retail Market.

(a) Wholesale Market : In wholesale market goods are bought and sold in huge quantities. In these markets sellers are wholesalers and the buyers are retailers. Wholesalers purchase goods in bulk quantities and sell the same to retailers in small quantities.

(b) Retail Market : In this market retailers who puchase goods from wholesalers, sell to ultimate consumers in individual units i.e. very small quantities.

IV. On Economic Basis : In economics markets are classified into

(a) Perfect Market

(b) Imperfect Market.

(a) Perfect Market : In perfect market there will be perfect competition between buyers and sellers who have full knowledge of other buyers and sellers. Due to this only one price will prevail in the market for the commodity. The following are the essential features of perfect market.

(i) Group of buyers and sellers.

(ii) Effective competition between buyers and sellers.

(iii) One price for the commodity throughout the market.

(b) Imperfect Market : Imperfect market is a market which is not a perfect market. In this market we find some kind of maladjustment in demand and supply; buyers and sellers have no knowledge of other buyers and sellers.

V On Time Basis : On the basis of time markets may be classfied into

(a) Very Short Period Markets.

(b) Short Period Markets and

(c) Long Period Markets.

(a) Very Short Period Markets : It refers to markets which exist for a very short period normally a day. Such markets generally sell fruits, flowers, vegetables, milk etc.

(b) Short Period Markets : These markets include weekly markets held in villages. Fairs are also included in this category.

(c) Long Period Markets : Durable goods are purchased and sold in long period markets. In these markets goods may be held for a long period without any deterioration in quality.

VI On The Basis Of Nature Of Goods : On the basis of the nature of goods that are purchased and sold, markets may be divided into

(a) Commodity Markets.

(b) Capital Markets.

(c) Foreign Exchange Markets.

(a) Commodity Markets : These markets deal in different commodities. Consumer goods are purchased by ultimate consumers and industrial goods are purchased by manufacturers.

(b) Capital Markets : These include money markets, stock markets etc. In money markets borrowing and lending take place. In stock market shares, debentures, bonds etc are brought and sold.

(c) Foreign Exchange Markets : Foreign exchange markets deal in currencies of different foreign countries. These markets arrange foreign currencies to make payments for the imports from other countries. They convert home currency into currencies of foreign countries.

1.2.1. MEANING OF MARKETING : In the ordinary sense, marketing and selling are used in the same sense but strictly speaking they are not synonymous, they differ in their meaning. There is a line of demarcation between marketing and selling.

Meaning of Marketing : Marketing includes all activities involved in the production and distribution of goods and sevices desired by the consumers. Marketing occupies an important place in all business activities. According to modern marketing concept, marketing is essentially consumer oriented and it starts with product idea and ends with customer satisfaction. Acoording to William Stanton "Marketing is a total system of interacting business activities designed to plan, price, promote and distribute want satisfying products and services to present and potential customers". Thus the main idea of modern marketing concept is customer - satisfaction.

1.2.3. MEANING OF SELLING : Selling is concerned with the transfer of goods and services to the consumers. It is mainly concerned with the plans to get the customers to exchage his money to goods and services. It is primarily concerned with the seller's interest.

1.2.4. DIFFERENCES BETWEEN MARKETING AND SELLING : The main difference between marketing and selling lies in their approach. Marketing is basically consumer - oriented. Selling on the other hand is product-oriented.

1. **Scope :** The scope of the term 'marketing' is much wider than that of the term "selling". Selling is one of the activities performed in marketing. Marketing includes all activities starting with the idea of producing a commodity in accordance with the needs of the customers and ending with the satisfaction of customers even after selling the commod-

ity. On the other hand selling refers to distribution of products already manufactured by the firm. Selling focuses on Sellers needs of converting his goods into cash.

2. **Object of Profit :** The object of marketing is to earn profits through satisfaction of customer's needs and desires. The profitability of a marketing oriented firm mainly depends on production of qualitative products to win the appreciation of consumers. Selling concentrates on earning profit on sale of more quantity of products.

3. **Orientation :** Marketing is consumer oriented and therefore it includes pre - production and post sale activities. Selling is basically production oriented and concentrates much on production.

4. **Emphasis :** Emphasis is given on product planning and development to match products with markets. It emphasises as introducing new technology. Whereas in selling, emphasis is placed on sale of goods already produced. It emphasizes on reducing cost of production with a view to maximize profits.

5. **Principle :** In marketing the principle of caveat vendor (let the seller beware) is followed, whereas in selling the principle of caveat emptor (let buyer beware) is followed.

6. **Importance :** The consumer occupies the prime of place in marketing process. He is given supreme importance by treating customer as a king. Product occupies pride of place in selling i.e. product enjoys supreme importance.

1.2.5. DEFINITIONS OF MARKETING :

- "Marketing includes all the activities involved in the creation of place, time and possession utilities" Professor Converses, Huegye and Mitchell.
- "Marketing is that phase of business activity through which human wants are satisfied by exchange of goods and services" - Pyle . J.F
- "Marketing is the business process by which products are matched with market and through which transfers of ownership are effected" - Prof. Cumdiff and Still.
- "Marketing is the process of getting the right goods to the right consumes at the right place and time and at the right price" - Prof. Benerjee.
- "Maketing in the creation and delivery of a standard of living" Malcom Menair.
- "Marketing is concerned with all the resources and acitvities involved in the flow of goods and services from producer to consumer" - Wheeler.

1.3. FUNCTIONS OF MARKETING

Prosperity of every business depends on the efficiency with which its products are marketed. To shift goods from a producer to an ultimate consumer a number of activities are performed which are called marketing functions. A marketing function is an act or operation or service by which the original producer and final sonsumer are linked together. If marketing functions are not properly carried out, the business unit may not be in a position to dispose off its products and all the efforts made for production may not bear fruits. The prime objective of marketing is to take the goods from the producer and perform all functions necessary to make them available to the ultimate consumers. In the process of marketing place, utility is created when goods and services are available at the places where they are needed, time utility when they are needed and possession utility when they are transferred to those people who need them.

All the marketing functions can be divided into two types viz (i) Concentration and (ii) Dispersion. The process of concentration is concerned with gathering raw materials, manufactured goods at a central place namely market. Dispersion means distribution of goods to final consumers. Concentration involves a number of marketing functions like (a) Buying (b) Trading (c) Storing (d) Grading (e) Financing etc.

The process of distribution may include the following.

(a) Selling (b) Transportation (c) Grading, (d) Risk bearing etc.

Another classfication of marketing functions is given by Professors Clark and Clark, which is widely accepted by one and all.

Marketing functions

- Functions Exchange
  - a. Buying and Assembling
  - b. Selling
- Functions Physical Supply
  - a. Transportation
  - b. Storage and warehousing
- Facilitating Functions
  - a. Financing
  - b. Risk Trading
  - c. Market information
  - d. Standardization etc...

1.3.1. FUNCTIONS OF EXCHANGE : Exchange refers to transfer of goods and services form money's worth. This process can be divided into (a) Buying and assembling and (b) Selling.

A. Buying And Assembling : Buying is the first step in the ladder of marketing functions. A manufacturer has to buy raw materials for production, wholesaler has to buy finished goods for the purpose of sale to the retailers, a retailer has to buy goods for resale to the consumers. Efficient buying is essenttial for successful selling. Large sized business concerns maintain a separate department namely purchasing department for the purpose of buying.

Modes Of Buying : Goods may be purchased in any of the ways given below.

i) By inspection : Under this method goods are bought after examining the goods by the buyer in the seller's premises.

ii) By Sample : A purchase by sample is made after the buyer examines the sample of goods supplied by the seller.

iii) By Description : Some sellers issue catalogues containing description of goods offered for sale. The intending buyer places an order specifying a particular number mentioned in the catalogue.

iv) By Grading : This refers to standard quality of goods. Under this method purchase can be made by telegram, telephone, or mail.

Assembling begins after the goods have been purchased. It refers to gathering of goods already purchased form different places at one central place. Assembling facilitates transporatation and storage, It is significant in case of seasonal goods and agricultural products.

2. **Selling :** The ultimate aim of every business is to earn profits and in realising this aim selling plays an important role. Nothing really happens until somebody sells something. Selling enables a firm to satisfy the needs of consumers. It is the process through which ownership of goods is tranferred from the seller to the buyer. Sales are the source of income for the manfacturers, wholesalers and retailers.

   The importance of selling has increased significantly with an increase in the number of articles offered for sale by a large number of producers. When the production was on a small basis the producers had no problem to dispose off their products. But now, with the increase in the volume of production, selling has become a problem and the producer has to induce people to sell his products.

1.3.2. FUNCTIONS OF PHYSICAL SUPPLY : There are two important functions under this classification (a) Transpotation and (b) Storage and ware housing.

A. **Transportation :** Trasport means carrying of goods, materials and men from one place to another. It plays an important role in marketing. It creates place utility by moving goods from the place where they are available in plenty, to places where they are needed. Both assembling and distribution of goods are done by using transport. Transportation facilitates not only movement of goods from the places of production to the places of consumption but it also enables the consumers to go to marketing areas where there is wide choice of goods than in the places where they like. Transporatation is also useful in stabilizing the prices of various commodities by moving them from the areas where they are in surplus to the areas where they are scarce. Various types of transport are used for carrying goods like (a) Land transport, (b) Water transport and (c) Air transport.

B. **Storage And Ware Housing :** Storage is another function of marketing process and it involves the holding and preservation of goods from the time they are produced to the time they are consumed. Generally, there is a time gap between the production and consumption of goods. Therefore, there is need for storing so as to make the goods available to the consumers as and when they are required. By bridging the gap between production and consumption, storage creates time utility. It also creates place utility by holding goods at different places.

   The importance of storage can be studied as follows.

   (i) Generally, goods are produced in anticipation of demand of the product in future market. All the goods are not sold immediately after production. For the unsold stock of goods storage is indispensable.

   (ii) Some goods are produced throughout the year but demad for them is only in a particular season. For example rain coats, umbrellas, diwali crakers etc. These commodities are to be stored till the arrival of the season.

   (iii) Many commodities are produced during a particular season but they are used throughout the year. Such goods have to be stored so as to make them available throughout the year. For example agricultural products.

(iv) Certain products which can get higher prices in future market are stored for a longer period. For example, tobacco, liquor, rice, chillies etc.

Warehouse is a place for storage of goods. The function of storage can be carried successfully with the help of warehouses. Warehouses create time utility by storing the goods throughout the year and releasing them as and when they are needed. Several types of warehouses are used for storage of goods, which are as follows.

(i) Private Warehouses : Private warehouses are owned by big business units for the storage of their own goods. Only big business houses can afford to have such type of ware houses.

(ii) Public Warehouses : These are the business concerns which offer storage space on rent. These ware houses are licenced by the Govt. They are helpful to businessmen who cannot afford to maintain their own warehouses. These warehouses are generally located near railway lines and main roads.

(iii) Bonded Warehouses : These are located near the ports for the storage of imported goods. When the importer cannot pay customs duties immediately on the goods imported by him, he can store them in bonded houses. Importer can remove the goods in parts after paying import duty.

1.3.3 Facilitating Functions :

There are the functions which help or facilitate in the transfer of goods and services from the producer to the consumer. They are not directly connected with the transfer of goods. Under this category the following functions are included.

a. Financing : Finance is the life blood of every business. It is needed for marketing of goods and services. The goods produced or purchased cannot be sold immediately to the ultimate consumers and much time is involved in marketing process. Hence there is need for finance for the purchase of raw materials, meeting transportation, storage costs, insurance etc. Further, generally goods are passed on from manufacturer to wholesaler and from wholesaler to retailer on credit basis. Ultimate consumers also prefer to purchase goods on credit. Therefore, all agencies engaged in marketing have to make some arragement for finance. Prof J.F. Pile has rightly stated that "finance is the lubricant of marketing machinery".

There are three main sources of finance. They are as follows.

(i) Long - Term Finance : It is needed for puchasing fixed assets like land, building, Plant & machinery, furniture etc. The main sources of this finance are shares, debentures, financial institutions.

(ii) Medium - Term Finance : It is needed for raising working capital. The main sources are financial institutions and commercial banks.

(iii) Short - Term Finance : It is mainly required for meeting short term payment normally for less than one year. It can be raised from commercial banks and trade creditors.

b. Risk Bearing : Risk means the possibility of loss due to some unforeseen circumstances in future. Marketing process is confronted with risks of many kinds at every stage. Risk may arise due to changes in demand, a fall in price, bad debts, natural calamities like earthquakes, rains etc. The marketing risks may be classified under the following heads.

(i) **Time Risk :** Goods are bought by the business with a view to sell them at a profit out of anticipated rise in prices in future. During the time lag conditions might change and the price my fall. Thus time risk is involved in marketing.

(ii) **Place Risk :** Place risk arises when the prices of the same product are different in different places. The businessmen may purchase goods in market where prices are low with a view to sell them at other places where the prices are high. But the price in the other market may come down causing loss.

(iii) **Competition Risk :** Businessmen have to face risk arising from the forces of competition. The competing firms may introduce modern methods of production due to which quality may be improved or cost of production may be reduced. Under such circumstances, a firm may be forced to sell at a loss which is called risk of competition.

(iv) **Risk of Change in Demand :** The manufacturers produce goods on large scale in anticipation of demand in future. But, sometimes the demand of the product may not come to expectations resulting in losses.

(v) **Risk Arising from Natural Calamities :** Risks from natural causes are beyond human control. These include rains, earthquake, floods, heat and cold. These risks cause heavy loss.

(vi) **Human Risks :** These risks arise due to adverse behaviour of human beings like theft, strikes, lockouts, bad debts etc.

(vii) **Political Risks :** Political risks arise due to change in political factors such as changes of government / changes in government policies etc.

c. **Market Information :** According to Clark and Clark market information means "all the facts, estimates, opinions, and other information used in marketing of goods". The main object of any business is to create and maintain demand for the product produced. For this purpose market information is useful. On the basis of information the seller can know what type of goods are needed by the consumer, when and where they are needed and in what quantity.

d. **Standardisation :** Standardisation means establishment of certain standards based on intrinsic qualities of a commodity. The quality may be determined on the basis of various factors like size, colours, taste, appearance etc. It is helpful to the consumers as they can safely rely on the quality of the standardised products.

e. **Grading :** Grading means classification of standardised products in to certain well defined classes. In the words of Clark and Clark "It involves the division of products into classes made up of units possessing similar characteristics of size and quality". Grading is very important for agricultural products like Wheat, Cotton etc.

Grading is of two types, fixed and variable. Fixed grading refers to the grading of goods according to fixed standards whereas variable grading refers to the application of varying standards.

f. **Branding :** Branding means giving a name or symbol to a product in order to differentiate it from cmpetitive products. It helps the consumers in identifying their products. Branding may be done by selecting symbols and marks such as Charminar cigarettes, Camel inks, Binny textiles, or by using the name of manufactures such Ford cars, Godrej steel furnniture. A good brand should be brief, simple, easy to spell and remember.

g. **Packing :** Packing means wrapping and crating of goods before distribution. Goods are packed in packages or containers in order to protect them against breakage, leakage, spoilage and damage of any kind. It consists of placing the goods in boxes, tins, bottles, cans, bags, barrels of convenient size to the buyers.

1.4. MARKETING CONCEPT

'Concept' refers to philosophy, an idea, an attitude or a not on relating to any aspect. Marketing concept means the philosophy of an organisation in relation to marketing of a product or service. According to Prof. Robert F Hartley marketing concept is "an integration of marketing activites directed towards customer satisfaction". Prof Philip Kother defines it as "a customer orientation backed by integrated marketing aimed at - generating customer satisfaction, as the key to satisfying organisational goals".

The marketing concept greatly influences the management of marketing efforts. The management of an undertaking can adjust its ways of selling as per the marketing philosophy. The traditional objective of marketing is to make the goods available at the places where they are needed. This idea was later on changed by shifting the emphasis from 'exchange' to satisfaction of human wants.

1.4.1 EVOLUTION OF MARKETING CONCEPT : There are various stages in the evolution of marketing concept, which are as follows.

1) **Self - Sufficient stage :** In the olden days each family was a self - sufficient unit as far as production and consumption functions are concerned. They produced as per their requirements i.e, practically there was no surplus for exchange. Therefore, the concept of marketing was absent in this stage.

1.4.2. EXCHANGE ORIENTED STAGE : In this stage the families produced more than their requirements leaving some surplus. This necessitaited exchange of surplus products with others. For exchanges 'Barter System' came into existance. Under barter system goods are exchanged for goods. The greatest draw back of barter system is absence of double coincidence of wants. To over come this defect - goods are brought to a central location so that exchange will take place smoothly. Thus 'Markets' came into existance.

1.4.3. PRODUCTION - ORIENTED STAGE : Under production oriented stage there is no need of any marketing effort if the product is good and its price is reasonable. This marketing concept was built on "Good wine needs no bush". That is if the product is of good quality and the price in reasonable there is no need of any special marketing efforts. It implies for good products, customer response is bound to be favourable. It appears that producers gave more emphasis to production than consumption. Under this concept, production is the starting point.

1.4.4. SALES - ORIENTED STAGE : Industial revolution brought technological changes in industrial activites. Cosequently drastic changes were reflected in the buying patterns and behaviour of consumers. There were revolutionary changes in the growth of transport and communications. All these changes compelled the manufacturers to realise the importance of marketing.

According to this marketing concept mere making available the best product in not enough. High pressure salesmanship and heavy doses of advertising are essential to move the products in the market. Even the best product can not be sold out in the market with out the help of sales promotion and aggressive salesmanship. The essense of this concept is "Goods are not bought but sold". This concept states that goods are not bought but they have to be sold with the help of salesmanship, advertising and publicity. This philosophy has been prevailing since 1940. It is popular in selling all kinds of insurance policies, durable products, automobiles etc.

1.4.5. (5) CONSUMER ORIENTED STAGE : It is also called customer oriented stage. This philosophy was introduced after 1950. According to this the main task of any business unit is to study the needs, desires, wants of the consumers and produce goods accordingly. Here the starting point is consumer or customer than the product. All Business operations revolve around customer satisfaction and service. Marketing research provides information relating to wants, desires, aspirations etc of the consumers.

Two radical changes were brought about when this marketing concept was introduced.

(1) Move from production to market orientation.

(2) Gradual shift from caveat emptor (buyer beware) to caveat vendor (seller beware)

1.4.6. (6) SOCIAL ORIENTED STAGE : It is the broadest marketing concept. It takes into consideration not only consumer satisfaction but also social welfare. Social welfare speaks of pollution - free environment and quality of human life. Every organisation should adopt socially responsible marketing policies and plans in order to assure social welfare in addition to consumer welfare.

The socially responsible marketing concept is based on the following assumptions.

(1) The manufacturer is to produce, those goods which are wanted by the consumers.

(2) The manufacturer shall not offer a product to the consumer if it is not in the best interest of consumer.

(3) He should offer long - run public welfare.

(4) The firm should discharge its social resoponsibilities.

1.5. SUMMARY :

Market is a place where buyers and sellers meet together for the exchange title to goods.

Marketing includes all activities involved in the production and distribution of goods and services desired by the consumers. Marketing occupies an important place in all business activities.

The activities performed to shift goods from produce to ultimate consumers are called marketing functions.

Marketing concept refers to an idea or philosophy of an organisation in relation to marketing of a product or service.

According to consumer oriented stage of marketing concept, a business unit should sell those products which are actually neeeded by the consumers.

1.6. KEY WORDS

1. **Market :** Market refers to a place where goods are purchased and sold, e.g. Cotton market, Fruit market, cloth market etc. It is a place where buyers and sellers meet to effect purchases and sales.
2. **Marketing :** Marketing in a process which carries goods from orginal producer to ultimate consumer. It bridges gap between producer and consumer. Marketing is concerned with handling and transportation of goods from the point of production to the point of consumtion.
3. **Selling :** Selling refers to transfer fo goods services to the consumers. It is mainly concerned with the plans to get the customers to exchange their money to goods and services.
4. **Marketing Functions :** The activities or operations which are mainly concerned with taking the goods from producer to ultimate consumer are called marketing functions. These are necessary to make the goods and services available to the consumers.
5. **Marketing Concept :** It refers to an idea or philosophy or attitude of an organisation in relation to marketing of a product or service. It influences the management of marketing efforts.
6. **Self - Sufficient Stage :** Under this stage each family produces as per its requirements i.e. there cannot be any surplus for exchange.
7. **Exchange Oriented Stage :** In this stage the families produce more than requirements. There will be some surplus meant for exchange.
8. **Product Oriented Stage :** Here producers give more emphasis to production than consumption.
9. **Sales Oriented Stage :** Accoriding to this concept products cannot be sold automatically immediately after production. High pressure salesmanship and heavy doses of advertisement are essential to sell the goods in the market.
10. **Consumer Oriented Stage :** The main task of any business unit is to know the needs, wants, desires and fashions of the people and produce goods accordingly.
11. **Social Oriented Stage :** It is based on the assumption that a business unit should offer long run public welfare. It should discharge its social responsibilities.

1.7. SELF ASSESSMENT QUESTIONS

(1) What's 'market' and 'marketing' ?

(2) Define 'marketing' and distinguish from selling.

(3) Explain briefly various functions of marketing.

(4) What is 'marketing concept' ? Outline the evolution of 'marketing concept' from early days to date.

(5) Explain the importance of 'branding', 'grading' and packing as marketing functions.

(6) Write short notes on the following

(a) Market

(b) Branding

(c) Importance of transport in marketing

(d) Kinds of business risks

(e) National market

(f) Commodity markets

(g) Exchange markets

(h) Capital markets

(i) Perfect markets

(j) Time and Place utiilties.

1.8. FURTHER READINGS

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Lesson - II

SEGMENTING, TARGETING AND POSITIONING

OBJECTIVES

After going through this lesson, you should be able to :

- appreciate the need for segmentation.
- understand the bases for segmenting consumer markets.
- know how the firm can select one or more market segments to enter (market targeting)
- understand how to establish the product's key distinctive benefits in the market (market positioning).

STRUCTURE

2.1 INTRODUCTION

The decade of 1980 must have been a memorable one for Hindustan Levers Ltd., (HLL). For, in a typical David and Goliath war, the giant and an undisputed market leader in consumer non-durables in India suffered a humiliating defeat at the hands of a new and small firm, Nirma Chemicals. Nirma Washing Powder became a national brand soon after 1982, when the Indian television went commercial and started colour telecast. The product immediately caught the fancy of the middle-income customer; who was finding it difficult to make both ends meet with a limited monthly income. Nirma was the lowest priced branded washing powder available in the grocery and co-operative stores. The middle class housewife was more than satisfied, as she could now choose a lower priced washing powder rather than the high priced Surf detergent powder from HLL. Nirma also had an impact on upper middle income and higher income families who used it for washing their inexpensive clothes and linen. Initially, HLL responded by launching sales promotion campaign on Surf - by offering a bucket at subsidised price for every 1 kg of Surf, or by trading premium brands of toilet soap with every kilogram of Surf. These schemes, however, did not halt the decline of Surf. HLL then launched a head-on attack on Nirma. Without naming it (though it was obvious) they came up with an advertising commercial comparing 1 kg of Surf with 1 kg of low-priced yellow washing powder and showed that Surf washed more clothes than the low-priced yellow washing powder - and hence it was economical to buy Surf.

The commercial did not bring in any substantial results. It was at this time (around 1984). that HLL decided to take a fresh look at the market. Research was conducted throughout the country which revealed that different income groups of consumers, had varying expectations from detergents or washing powders. It also showed that different colours of washing or detergent powders were associated with different types of fabrics. For example, yellow coloured washing or detergent powder was mainly bought by middle and lower middle or lower income people. They washed all their fabrics and associated whiteness in clothes to a yellow coloured powder. Also, middle class families used the blue coloured Rin bar for washing their expensive clothes. The research further indicated that blue or white coloured detergent powders were bought by middle to higher income group people, and then colours were also associated with washing clothes clean. In fact, the housewife was known to add "blue" to her laundry to give that extra whiteness to the white clothes. Interestingly, green was also the colour that was perceived to clean extra - dirty clothes. Armed with this research on colour perceptions and income groups, HLL launched the Sunlight (yellow), Wheel (green), Rin (blue) and Surf Ultra (white) detergent powder for different market segments. This strategy of segmenting the markets, understanding its needs and thus evolving a marketing mix to suit segments' needs helped HLL win back part of its lost market. In fact, Nirma made all other consumer product companies sit up and take a fresh look at their markets. It announced, for many, a beginning of an era of low-priced products for a highly price sensitive Indian market, and, to others, an end of mass marketing era. The market was indeed changing, demanding new responses from companies. The latter part of 1980s or early 1990s has taught the firms a lesson - "One cannot be everything to everyone; but one can be everything to a select few." This is the basis of segmentation (Adopted from Rajan Saxena, *Marketing Management*, Tata McGraw-Hill, New Delhi, 1997).

From the above case discussion, it is clear that a company cannot serve all customers in a total market. The customers are different in terms of their buying requirements. The company has to identify the market segments that it can serve more effectively.

In **target marketing**, the company distinguishes the major market segments, target the most attractive segment(s), and develop products and marketing programmes tailored to each.

According to Philip Kotler, target marketing requires marketers to take three major steps:

- Identify and profile distinct groups of buyers who might require separate products or marketing mixes (market segmentation).
- Select one or more market segments to enter (market targeting).
- Establish and communicate the products' key distinctive benefits in the market (market positioning).

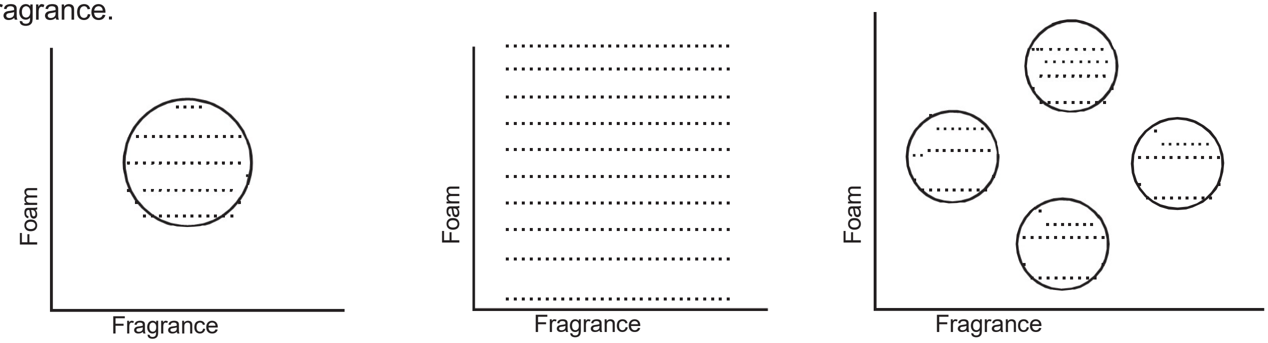
2.2 MARKET SEGMENTATION

The Concept : Mass marketing is the starting of any discussion on segmentation. In *mass marketing*, the firm engages in the mass production, mass distribution, and mass promotion of one product for all buyers. The sellers practising mass marketing assume that all buyers are alike. At the other extreme, *individual marketing* leads to 'customised marketing'. In individual marketing, the seller will customise the offer, logistics, communications, and pricing for each customer. New technologies such as computers, databases, internet and fax enabled the marketers to adopt customised marketing.

Market segmentation is an approach midway between mass marketing and individual marketing. The buyers of each segment are assumed to be similar in wants, purchasing power, geographical location, or buying attitudes. *Market segmentation* is the process of dividing a total, heterogeneous market into homogeneous segments. It offers several benefits over mass marketing. It is a customer - oriented philosopy. The firm's marketing programme is tailored to the specific needs of a segment. It helps matching of market opportunities to the company's resources. To be able to overcome a threat of competition, the marketers attempt to segment their markets, position themselves in a segment they perceive they will be able to defend against competitive attacks. As Michael Porter puts it, the competitive advantage of a firm lies in being everything to select few. To be everything to everyone is a sure recipe for a strategic failure.

Patterns of Market Segmentation : Market segments can be created in many ways. Philip Kotler suggested a way to identify *Preferences segment.* For instance, the buyers of shampoo may be asked as to how much they want of two attributes: foam and fragrance. Three different patterens of preferences can emerge as shown in Figure 2.1.

*** Homogeneous Preferences :** Figure 2.1 (a) exhibits a market where there are no natural segments. All the consumers have more or less the same preference with regard to foam and fragrance.



2.2.1 Homogeneous Preferences

2.2.2 Diffused Preferences

2.2.3 Clustered Preferences

Figure 2.1 Basic Market - Preference patterns

*** Diffused Preferences :** This is the other extreme (Figure 2.1 [b]). Consumers differ greately in their preferences. A brand is likely to be positioned in the centre so that it may be able to appeal to the majority of the customers. A second competition could locate a corner to attract a customer segment that was not satisfied with the centre brand.

Clustered Preferences : Figure 2.1 (c) shows a market which reveals natural market segments. Three options are normally available to the first marketer. It might position itself in the centre with a view to appealing to all the customer groups *(Undifferentiated marketing)*. It might positon itself in the largest market segment *(Concentrated marketing)*. It might offer many brands, each positioned in a different segment *(Differentiated marketing)*.

2.3 BASES FOR SEGMENTING CONSUMER MARKETS

Marketers segment consumer markets by using two broad groups of variables. The market segments can be formed by looking at consumer characteristics, viz., geographic, demographic and psychographic. On the other hand, the marketers attempt to form segments by understanding consumer responses to the market offerings. For example, the marketers try to know whether customers who want "picture quality" versus "easy to use" in buying a camera differ in their geographic, demographic and psychographic makeup. The bases for segmenting the markets - geographic, demographic, psychographic and behavioural - are discussed hereunder:

Geographic Segmentation :

This involves dividing the market into different geographical areas such as nations, states, regions, cities, or villages. A very common base is the rural and urban divide. Geographic segmentation assumes that people in a particular geographic area have similar preferences and consumption behaviour.

Demographic Segmentation :

Demography is the study of population. Demographic variables are the most popular bases for segmenting consumer markets. Some of the demographic bases are: age, family size, family life cycle, gender, income, occupation, education, religion and social class.

Age : Based on age, one can have the (i) infants market (newly born -upto 1 year); (ii) child market (1 year - 12 years); (iii) teens market (13 years - 19 years); (iv) adolescent market (16 years - 19 years); (v) youth market (20 years - 35 years); (vi) middle aged market (36 years - 50 years); and (vii) elders market (50 years and above).

Family size and structure : With the spread of the family planning programmes, the average family size has been declining in India. Further, we can witness the splitting up of joint families. Nuclear families are on the rise. Marketers use family size and structure for evolving marketing programmes. For instance, a 360 litre refrigerator is normally meant for large families and a 165 litre refrigerator is suited for smaller families.

Gender : On the basis of gender, the consumer market may be classified into male market and a female market. A shoe company will have to take a decision whether it wants to offer shoes for men or women or for both.

Social class : Companion design their products and services for particular social classes. Broadly, there are three social classes - upper class, middle class and lower class. A person's social class depends on type of income, type of occupation and place of residence.

Psychographic Segmentation :

Many marketers are turning to psychographic variables to segment their markets. According to Philip Kotler, buyers are divided into different groups on the basis of lifestyle, personality and values.

Lifestyle: The products and services used by the customers exhibit their lifestyles. The marketers of textiles, cosmetics, cigarettes, beer and furniture generally attempt to segment their market on the basis of lifestyle. The Titan watch company has segmented its market for Timex and Titan watches on the basis of lifestyle.

Personality : Marketers try to develop brand personalities that match to consumer personalities. For example, Femina magazine earlier targetted at an older, more traditional and middle class woman. Later, the magazine is repositioned "for the woman of substance". Another women's magazine Savvy is targetted at the highly liberated, independent and strong woman.

Values : Companies that segment by core values try to appeal to people's inner selves in order to influence their outer selves - their purchase behaviour.

Behavioural Segmentation :

The customers can also be divided into certain segments on the basis of their knowledge, attitude, use, or response to a product. Such behavioural variables are discussed below.

Occasions : Marketers attempt to create certain occasions is order to make customers feel to buy a product or service. For instance, many people buy ornaments and clothes at the time of the marriage of a family member and on the festive occasions. Certain occasions such as Mother's Day, Friendship Day and Valentines Day were established partly to increase the sale of certain products.

Benefits sought : The customers can be divided into certain groups on the basis of the benefits sought from a product. For example, in case of toothpastes in India, Colgate and Close-up offers cosmetic benefit (i.e., white teeth stops bad breath); Forhans and Cibaca provides Therapeutic benefit (i.e. protects gums); and Vicco Vajradanti and Neem gives ayurvedic benefit (i.e. without side effects).

User Status : Buyers can be segmented into non-users, ex-users, potential users, first-time users and regular users of a product.

Usage rate : Marketers segment the market into light, medium and heavy user segments on the basis of usage rate. Marketers normally try to attract a few heavy users rather than many light users.

Loyalty Status : The marketers should examine the loyalty patterns of its customers in order to retain the loyal customers or to attract new customers. According to brand loyalty status, customers can be divided into:

Hard-core loyals : Buyers who buy one brand all the time.

Split loyals : Buyers who are loyal to two or three brands.

Shifting loyals : Buyers who shift from one brand to another.

Switchers : Buyer's who show no loyalty to any brand.

Buyer Readiness : Buyers are at different stages of readiness. There may be buyers who are unaware of the product, some are aware, some are informed, some are interested, some desire the product and some interested to buy.

Attitude: Marketers can classify the customers into five attitude groups, viz., enthusiastic, positive, indifferent, negative and hostile.

EFFECTIVE MARKET SEGMENTATION

To be effective, the size of market segments must be large enough. The requisites for successful market segmentation are :

1. Measurability : The segments must be measurable in terms of their size and purchasing power.

2. Accessibility : The market segments should be reached and served through suitable means of distribution and promotion.

3. Substantiality : The segments must be large and profitable enough. It may not be commercially viable to design cars exclusively for Indian women.

4. Differentiability : The segments must be clearly distinguishable. They must respond differently to different marketing programmes. If men and women react similarly to a brand of toilet soap, they do not constitute different segments.

5. Actionability : To be effective, marker of segmentation should be compatible with the manpower, financial and managerial resources.

2.4 MARKET TARGETING

As observed earlier, target marketing requires marketers to take three major steps: market segmentation, market targeting, and market positioning. In market segmentation, the marketer identifies the distinct groups of buyers who might require separate marketing mixes. Having identified the market segments, the firm has to evaluate the attractiveness of each segment and decide how many of them to target.

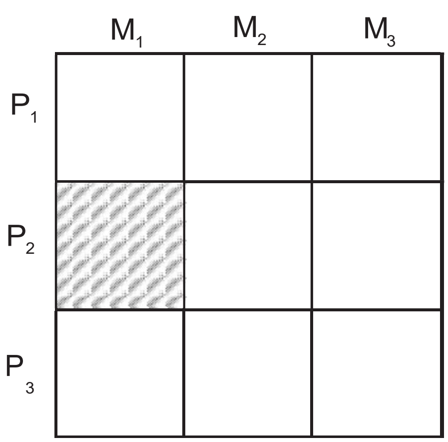
EVALUATING THE SEGMENTS :

The selection of market segments depends on the segment's attractiveness and the firm's objectives and resources. The company should forecast the sales, growth, profitability and scale economies of each segment. Certain segments could be dismissed if the company lacks resources

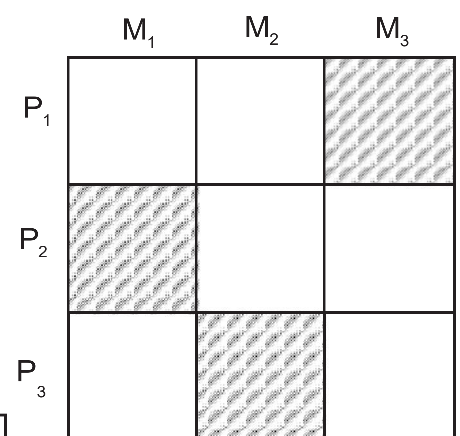
SELECTING THE MARKET SEGMENTS :

Abell identified five patterns of target market selection. They are shown in figure 2.2.

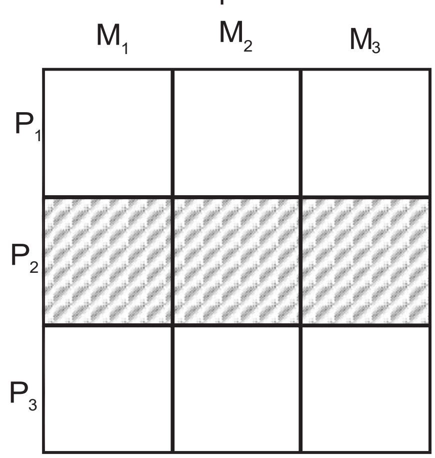
Single - segment concentration



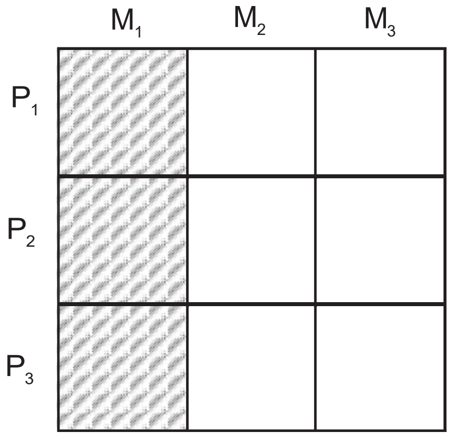
Selective specialisation



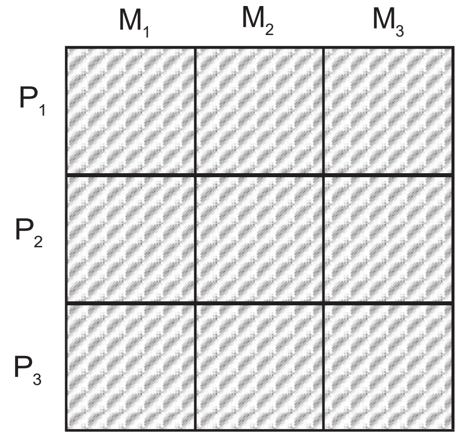
Product specialisation



Market specialisation



Full market coverage



P = Product M = Market

Figure 2.2 Five Patterns of Target Market Selection

Single-segment Concentration : Here the company selects a single segment. For example, Nirma Chemicals selected a price sensitive segment for its washing powder. Through concentrated marketing, the firm can derive operating economies in production, distribution and promotion.

Selective specialisation : The firm can select many attractive segments. This is also known as the multisegment coverage strategy. This strategy will enable the firm to deversify its risk.

Product specialisation : Here the firm specialises in offering its products to serveral segments. For example, a computer manufacturer can sell PCs to educational institutions, government offices and individual customers.

Market specialisation : The firm can specialise in serving many needs of a specific group of customers. For example, a software company can concentrate in developing suitable software required by banks.

Full market coverage : If the firm tries to serve all segments with different marketing mixes, it is called full market coverage strategy. This strategy is normally adopted by very big companies Marketers attempt to cover the market through undifferentiated marketing or differentiated marketing.

The firm, in **undifferentiated marketing,** ignores the differences among market segments and attempts to cover the whole market with one market offer. It minimises the costs of production, inventory, distribution and promotion. For instance, Hindustan Motors practised undifferentiated marketing, when it was marketing only one car (Ambassador) to suit all the consumers in one big market. When several firms attempt to practise undifferentiated marketing, it will lead to undersatisfaction of smaller segments. Appealing to the largest market results in what is known as 'majority fallacy'.

Under **differentiated marketing,** a firm operates in several segments and develops different marketing programmes for each segment. BPL offers many models of television sets for different segments. Similarly, Hindustan Lever Limited offers several toilet soaps for different customer groups. By adopting differentiated marketing, the firm hopes to attain higher sales within each market segment. Coca Cola and Pepsi, for instance, could increase the size of soft drinks market as they are being sold in different bottle sizes as well as in cans. However, differentiated marketing increases the costs of: product modification, production, administrative, inventory and promotion.

2.5 MARKET POSITIONING

Positioning is the third step required to be taken for target marketing. Al Ries and Jack Trout popularised the concept of positioning. They said, "Positioning starts with a product. A piece of merchandise, a service, a company, an institution, or even a person... But positioning is not what you do to a product. Positioning is what you do to the mind of the prospect. That is, you position the product in the mind of the prospect.' According to Philip Kotler, "Positioning is the act of designing the company's offering and image to occupy a distinctive place in the target market's mind." In the words of David A. Aaker and Gary Shansby, "marketing programme positioning consists of integrating strategies for products, distribution price, and promotion. The terms 'position' designates how a company's marketing programme is perceived by the buyer in relation to the programmes of key competitors; in other words, how a firm's brand is positioned against its competition with respect to the product offering, distribution approach, prices, advertising, and personal selling. All elements of the marketing programme can potentially affect the position."

Target market and positioning strategies are like the two sides of a coin. They are inseprable; each depends upon the other. Aaker and Shansby identified several positioning approaches. They are:

Attribute : Use of one or more attributes, product features, or customer benefits associated with the firm's product. For example, Garden Varelli offers to the woman the benefit of looking pretty and fascinating the opposite sex ("You fascinate me").

Price/Quality: Various positions on the price/quality scale may be selected depending upon the positioning objective. Examples range from Surf Ultra at the high end and to Nirma at the low end.

Use or Application : This strategy positions the brand according to how the product is used or applied. For instance, Rasna, the soft drink concentrate, offers convenience (that is so simple to make that even a child can do it).

Product user : This type of positioning focusses on the person using the product. Bikes, textiles and watches are positioned in accordance with the lifestyle of target customers.

Product class : This positioning approach involves association with a product-class, such as mobile phone compared to land line phone.

Competitior : This strategy explicitly positions a firm's brand against the competition. For instance, Hindustan Lever's Wheel detergent powder took a head on position with Nirma and claimed that it was better as it washed whiter and was gentle on the hands, a claim which Nirma fights by showing the user using a spoon to take the washing powder from the bag.

Philip Kotler says that a firm must avoid few major positioning errors:

1. **Under positioning:** This occurs when buyers know much less about the brand or do not know anything special about the brand.
2. **Over positioning:** When buyers have too narrow a view of the brand, e.g., buyers may perceive Titan watches as high priced products, when in reality the company now offers affordable watches standing at Rs.400.
3. **Confussed positioning :** Buyers may have a confused image of the brand due to frequent changes in positioning statement.
4. **Doubtful positioning :** This occurs when buyers doubt the credibility of the claims made by the firm.

HOW TO POSITION THE BRAND

To position their brands, marketers use a technique called **perceptual mapping.** It involves understanding the customer perceptions of the competitive brands and identifying vacant slots. To be more specific, perceptual mapping involves:

1. Studying the ideal product perception: The marketer has to identify both tangible and intangible attributes that a customer looks for in a product. The tangible product features include size, colour and packaging. Examples for intangible attributes are: service, quality and manufacturer's prestige.
2. Get the customers' to rank these attributes in order of importance to them.
3. Customers knowledge of the competitors' brands.
4. How do the competitive brands fare on the ideal product map? The customers will assess how close the brands are on each attribute to the ideal product.
5. Marketers identify vacant slots based on the customer's assessment of competitive brands on the ideal product map. Figure 2.3 exhibits the perceptual map of a beer market.

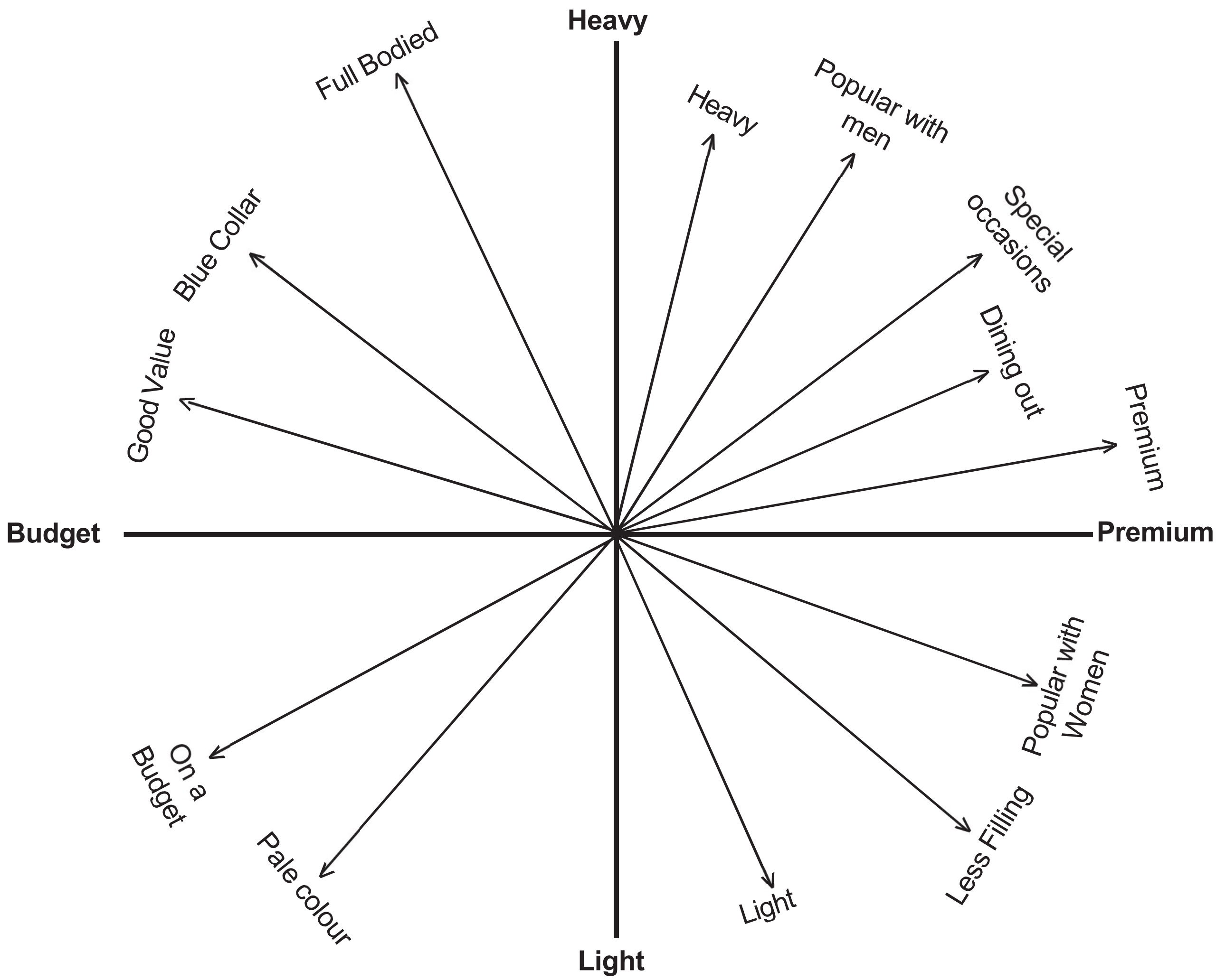


Figure 2.3 Perceptual Map of Beer Market.

Source: Adopted from Rajan Saxena, Marketing Management, Tata McGraw - Hill, New Delhi - p. 202.

2.6 SUMMARY

Target marketing requires marketers to take three major steps: market segmentation, market targeting, and market positioning. Market segmentation is the process of dividing a total, heterogeneous market into homogeneous segments. It offers several benefits over mass marketing. The consumer markets can be broadly segmented on the bases of geographic, demographic, psychographic and behavioural variables.

Having identified the market segments, the firm has to evaluate the attractiveness of each segment and decide how many of them to target. There are five patterns of target market selection: Single-segment concentration, selective specialisation, product specialisation, market specialisation, and full market coverage.

Positioning is the third step required to be taken for target marketing. It is the act of designing the company's offering and image to occupy a distinctive place in the target customer's mind. To position their brands, marketers use a technique called perceptual mapping. It involves understanding the customer perceptions of the competitive brands and identifying vacant slots.

2.7 KEY WORDS

Differentiated marketing : In differentiated marketing, a firm operates in several segments and develops different marketing programmes for each segment.

Market positioning : It is the act of designing the company's offering and image to occupy a distinctive place in the target market's mind.

Market segmentation : It is the process of dividing a total, heterogeneous market into homogeneous segments.

Market targeting: It involves selecting one or more market segments to enter.

Mass marketing : In mass marketing, the firm engages in the mass production, mass distribution, and mass promotion of one product for all buyers.

Perceptual mapping : It involves understanding the customer perceptions of the competitive brands and identifying vacant slots.

Target marketing : In target marketing, the company distinguishes the major market segments, target the most attractive segment(s), and develop products and marketing programmes tailored to each.

Undifferentiated marketing : In undifferentiated marketing, the firm ignores the differences among market segments and attempts to cover the whole market with one market offer.

2.8 SELF ASSESSMENT QUESTIONS

1. What is market segmentation? Explain the bases for segmenting consumer markets.
2. Critically evaluate Hindustan Levers' segmentation strategy with regard to their toilet soaps.
3. What are the different patterns of target market selection? Distinguish between undifferentiated marketing and differentiated marketing.

4. Explain the concept of positioning. What are different positioning approaches? Give suitable examples.

2.9 FURTHER READINGS

1. David W. Cravens, Strategic Marketing, Richard D. Irviwn, Illinois, 1987
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Lesson - III

MARKETING INFORMATION SYSTEM

OBJECTIVES

The objectives of this lesson are to :

- explain the importance of information to the company
- define the marketing information system and discuss its components
- outline the process of Marketing Research

STRUCTURE

3.1 INTRODUCTION

This is an era of information revolution. Information is of central importance for any organisation. The quality of the decisions made will be influenced by the quality of information. The managers are particularly concerned with having complete and high quality information available since their job of planning and controlling the organisation's activities involves a steady stream of complex choice situations. Success of any organisation is dependant on sound decisions and sound decisions are the outcome of relevant, clear, complete, accurate, timely, objective and authentic information.

3.2 IMPORTANCE OF INFORMATION

The term 'information' consists of evaluated data, data being expressed in words, symbols, numbers, graphs and other form of presentation. It stands for the cues or the guidelines which have the potential of influencing the decisions Information is any perceived fact, opinion, or thought Information means relevant data that help managers to reduce uncertainity. Organisations also nead information on competitors, consumers, suppliers, Government and other groups for appropriate decision making. During the century, many factors have necessitated the need for more and more information. As organisations became national or international, in scope, they need more information on larger, more distant markets. Fortunately, increasing information requirements have been met by an exploision of information technologies. During the last twenty years, the emergence of computers, fax machines, video conferencing, Internet etc., have revolutionized information handling and processing.

3.3 NEED FOR MARKETING INFORMATION

Marketing of today operates in a dynamic and highly competitive environment. The ever changing environmental forces do affect the internal situation and such an adaptive system can survive successfully when it takes warranted decisions on the basis of marketing information. The need for marketing information can be out lined as under :

a) **Consumer expectations :** The consumer expectations are ever changing and no marketer can afford to succeed without the perfect knowledge of consumer's needs, tastes, likes and dislikes, actions and reactions which are constantly changing. Whetever, the marketer decides for the consumers should be based on facts, and not on guesswork.

b) **Conplexity in marketing :** With the growth and expansion of marketing activities, the marketing system has become complicated. The complexities require more marketing intelligence Marketing Intelligence is an organised feed back process of marketing communication regarding the marketing environment. The organisations need census data, trade associations data, data from news papers and other media, trade fairs and exhibitions etc.

c) **Changes in economic Parameters :** The forces of demand and supply determine the price of inputs and outputs and hence the general market and marketing conditions. Hence a study of changes in economic conditions by observing changes in the economic parameters like national income, population, price level, money flow, growth rate changes and so on. This is possible when the relevant and up-to-date economic data is available.

d) **Changes in competetive conditions :** Modern marketing efforts and activities are not only on mass scale but are highly sensitive to the changing forces of keen competetion. A successful manketer is one who estimates the nature, extent and size of competition. Such exercise is based on relevant, authentic and latent market information regarding competition.

e) **Growing Consumerism :** Mass marketing efforts have widened the gap between the marketers and consumers. The marketers are not able to understand the consumers and the consumers have not been able to understand the marketers. This gap has led to Consumer dissatisfaction resulting in consumer movement. The consumerism also necessitated the marketers to establish an information system.

f) **Improvements in science and technology :** The impronents in science and technology have led the marketers to introduce new products, services with the help of changes in science and technology, keeping pace with the technological change is a challege to which all firms will have to respond in shaping the availability, cost and consumption of goods.

g) **Improve credibility :** Any organisation expects to impress their image in the market and to improve credibility in the society. This requires collection of latest information so as to plan and implement necessary strategies to boost their goodwill in the sonety.

3.4 MARKETING INFORMATION SYSTEM - DEFINED

Marketing Information system is an internal arragement designed to support management - decision making and action. Marketing Information system is to provide management with current or conditional future states of the marketing environment and the marketers responses to company and or competetions. It is an interacting, an going and future oriented structure of persons, machines and procedures designed to generate an orderly flow of evaluated data from internal and external sources for the use of managerial decision making in the dynamic area of marketing. It collects, roots out, classifies, analysis and evaluates the data and stores for using in the future for decision making. In the words of Prof. Alder Lee "marketing information system is an interacting, continuing, future oriented structure of people, equipment and procedure designed to generate and process an information flow which can aid business executives in the management of their marketing programmes."

3.5 COMPONENTS OF MARKETING INFORMATION SYSTEM

The different components of marketing information system will have the following four :

3.5.1 Internal marketing information

3.5.2 Marketing Intelligence.

3.5.3 Marketing Research

3.5.4 Management Science

There components will help in planning and implementing an effective marketing information system. These can be out lined as under :

1) **Internal Marketing Information system :** The internal marketing information can be designed with the help of information collected from internal sources. The internal sources include accountants, sales force, production staff, human resource division etc, forms the basis for internal marketing information system. The internal accounting system involves using marketing data available from within the company as a means of indicating cost effectiveness of the firm. The internal forces and their relationship influences the decision making of marketers . The details on intenal sales, cost, inventories, accounts receivables and payables. The data from sales force indicates the sales according to area, region, products, marketer, and consumers. Both cash sales and credit sales are also observed.

2) **Marketing Intelligence system :** Marketing Intelligence system involves the collection of qualitative and quantitative data on changing conditions in the marketing and projects the charges in the macro enviornment variables. The infomation relating to competetion, customers, demographic, socio -cultural factors which influence the marketing decisions. In addition to these, an estimation of national and international political and legal environments will also be judged by the experts in the marketing field. The intelligence system acts as the

mirror of marketing environment which reflects the changes that will take place in the marketing. It is a systematic and organised effort in the marketing process which provides a projected information on the marketing system.

3) **Marketing Research :** Marketing Research is a very important component of the marketing information system. Marketing Research offers special indepth information on the problems relating to marketing of goods and services. The marketing reserch covers a wide range of marketing decisions which include markets, products, pricing, promotion, distribution,, competetion and the consumers etc., A systematic survey is organised to collect information on the problems releting to marketing. The data so collected, is analysed, tabulated and interpreted with the help of statistical tools and techinques and a structured report is prepared and presented.

4) **Management Science system :** The management Science involves use of latest quantitative techniques like operations Research, game theory, queueing theory etc. Operations Research is the application of scientific methodology and quantitative techniques to business problems. The marketing executives are assisted in the various complex decisions like new product devolopment, selection of locations for warehouses, allocation of marketing expenses etc.

Thus marketing information system provides a link between the variables of the marketing environment and the marketing managers in decision - making. The objective of marketing information system is to provide a reliable and accurate information to find solutions to the problems in the decision - making process. In addition to these, it provides an opportunity to reduce uncertainities in the marketing environment.

3.6 ESSENTIALS OF GOOD MARKETING INFORMATION SYSTEM

A good and an effective marketing information system must have some features which makes it an effective :

1) The marketing information system should be organised into an unified and centralised system. These components are to be integrated into a single agency. The chief executive of the system should co-ordinate the various components of the marketing information system.

2) The present marketing information is viewed as a decision support system. It is not only a system which provides the data, but also helps in decision making.

3) Any marketing information system should be viewed as a part of the organisation and designed to match the mission, objectives, policies, and strategies. The marketing information system is to establish the relationship with marketing organisation to outside groups on the society.

4) The marketing information system should be purpose - orented and user defined. It must provide relevant information to suit to the purpose of the user groups.

5) The marketing information system must provide fast and quick decision making. The decisions which are taken fast will provide better results .

6) The system should provide future direction to the organisation and help to lay a strong foundation for decision making.

3.7 MARKETING RESEARCH - DEFINED

With ever increasing complexity of marketing and business activities, the collection,analysis and interpretation of information has become much more intricated requiring the services of speciasized skills and refined techiques. This has given to another important function of marketing called Marketing Research. Marketing Research refers to the finding and analysing facts to assist managers in making rational marketing decisions. In the words of American Marketing Association Marketing Research is the systematic gathering, recording, and analysing of data about the problems relating to the marketing of goods and services".

3.8 SCOPE OF MARKETING RESEARCH

The scope of Marketing Research includes the following :

a) **Product Research :** The areas of product research are product changes, development of new products, testing and evaluation of new competetive products. This also includes product modifications; as to their quality, design, variety, analysis of product diversification plans etc.

b) **Market Research :** The aspects to be covered in market research include ascertaining the size and nature of customers, estimation of sales and demand, analysis of strengths and weeknesses of competetiors, impact of Governmental policies etc.

c) **Consumer Research :** The research deals with understanding the demographic features of consumers of both actual and potential, identifing consumer needs, ascertaining the levels of consumer satisfaction, locating the factors which influence purchase decision etc.

d) **Promotion Research :** The promotion research covers the areas of identifying the consumer motives, attitudes, and the reasons influencing buying decision, to find out ways and means of motivating people, determining the advertising massages and their effectiveness etc.,

e) **Pricing Research :** The research in pricing include ascertainining the price expectations of the consumers in different markets, studying the price policies and strategies, measuring consumer reactions and responses to the price offers etc.,.

f) **Distribution Research :** The distribution research to cover the aspects like study the existing and potential channels with evaluation of channel performance, deciding dealer needs, to determine optimum inventory levels, modes of tranport and their suitability etc.

3.9 MARKETING RESEARCH PROCESS

Marketing Research is a systematic process of collection, analysis and interpretation of data related to marketing problems of goods and services. As it is stated as a process, it consists of a series of steps which include :

a) Identification of the problem

b) Formulation of Research Design

c) Collection of data

d) Analysis and interpretation of data

e) Presentation of report.

These steps are closely interlinked and inter dependant. Each of these steps has to be carefully planned and implemented. Each of these steps may be explained as under :

a) **Identification of the Problem :** Identification of the problem is the first step in the research process. If the problem is properly identified, the research process will yield most suitable results. If the problem is wrongly defined, the cost, time and effort of the total research results in waste. A research problem is one in respect of which the data is to be collected to find a solution. For ex., the research problem may be "decrease in sales", low perfermance of sales force" low impact of advertising" etc., For these problems, the solutions are to be find out with the help of research problem.

b) **Formulation of Research Design :** A research design is a master plan or a model for the conduct of investigation. It is a blue print of research action which provides a framework within which the researcher has to work. This design keeps the study right on the track to keep pace with the problem requirements and makes possible to get best result with minimum possible resources. The Research Design may be in three different, forms viz., explorative, experimental and descriptive. Explorative in the design to explore the discovery of ideas and insights. Descriptive Design in the one that simply describes something such as demographic characteristics of consumers who use the product. Experimentation design is used to find out the result of experiments in the markets.

   The Research Design is to provide answers to the questions :

   i) What are the objectives of research ?

   ii) What is the scope of research ?

   iii) What are the methods of collection of data ?

   iv) How the data will be analysed and interpreted ?

   v) What is the estimated time and resources ?

   vi) How the data is to be reported ?

c) **Collection of data :** A comprehensive research requires two types of data viz primary and secondary. Primary data is one which is collected by reseachers based on sampling. Primary data is a time consuming and money spending activity. It may be collected by any one of the methods like survey, observation and experimentation. It is an unpublished but latest and relevant to the problem and most accurate. Secondary data is both published or unpublished which is readily available, The sources of secondary data are published surveys of industries, Government publications, publications of trade associations, chambers of commerce, general libraries, umiversities and surveys and reports of voluntary research organisations.

d) **Analysis and interpretation of data :** Analysis and interpretation of data in done with the help of editing, tabulating, analysis and interpretation. Editing is an activity related to verifications of data as per the instructions given so that the answers are consistent and logical. Coding is also done to feed data into electronic processing units. Tabulation implies arrangement of data into classes and weights. To analyses the data, mathematical and statistical tools like percentages, averages, rank correlation co - efficients etc., are used. The data also may be interpreted with the help of charts, graphs etc,. Intepretation of data is a careful activity which uses sound judgment and clear vision to reach the objectives.

e) **Presentation of Report :** The researcher has to present his findings in the form of a report. The findings are to be communicated effectively, clearly and accurately to decision makers. The reports may be written or oral. The report should contain the objectives or purpose of the study, tools and techniques employed, sampling methods used and assumptions or limitations of the study. The contents of a research report may be as under :

i) Title Page

ii) Contents

iii) List of Tables and graphs

iv) Statement of the problem

v) Objectives of the study

vi) Methodology employed

vi) Findings and recommendations.

At the end of the report, a copy of appendixes, copy of the questionaire, bibliography and other information necessary for a report are to be included.

3.10 ROLE OF MARKETING RESEARCH

The importance of marketing research can be understood from the benefits it offers :

3.10.1 The Marketing Research is very much useful in producing new products, and in providing new uses of the existing products.

3.10.2 The most important benefit of marketing researchs is that it provides valuable information about the buying habits, motives, likes and dislikes of consumers. This information is very much useful to decide various marketing policies, strategies programmes.

3.10.3 Marketing Research helps to project the future demand based on past demand. The study of demand is very much useful to decide goods and services at the right time and right place.

3.10.4 A systematic marketing research is useful for planning advertising messages, selection of channels of distribution for better marketing of goods and services.

3.10.5 A planned marketing research helps to reduce wasteful expenditure on the marketing programmes. Since the marketers know the information about products and services which are required for the market, unnecessary expenditure can be avoided.

3.10.6 Since the marketing research collects the data on competetive environment, it helps to evaluate the effectiveness of competetion and to make suitable marketing strategies.

3.10.7 Marketing Research is useful in establishing priorities amongst categories of behaviour and understanding psychological variables like beliefs, opinions and attitudes.

3.10.8 Marketing Research is useful for obtaining sufficient background information where nothing is known about the problem area or products.

3.10.9 It is also useful in obtaining large amount of data about beliefs, attitudes etc., which is useful for multivariate analysis.

3.10.10 Since the universe or total population can not be studied, a sample which represents the universe is to be studied and generalisations can be drawn.

Limitations of Marketing Research :

The marketing research also suffers from certain limitations which can be as under :

1) Marketing Research uses the techniques of science but it itself is not an exact science, therefore the results obtained may not be accurate as compared to physical sciences.

2) Marketing Research is conducted on consumers, dealers, wholesalers, retailers etc., who are human beings. The responses of these people are subjected to verification and change according to situations.

3) Lack of appropriate training to researchers leads to misinterpretation of data anlysed. They may not be able to collect the data and present it in a systematic manner.

4) The Marketing Research projects generally take longer periods and results in waste of time and resources.

3.11 SUMMARY

The term marketing information system play a dominant role in solving the problem of marketing relating to goods and services. The marketing research is a systematic process of collection, analysis and interpretation of data. The research uses a number of techniques from mathematics and statistics to report the findings of the study. If properly used, marketing research will provide a number of benefits to the marketing organisations.

3.12 KEY WORDS

3.13 SELF ASSESSNMENT QUESTIONS

1. Define Marketing Information system.Explain the need for Marketing Information system.
2. Write an essay on the components of the marketing information system.
3. Define Marketing Research. Explain the steps involved in marketing research.
4. What are the advantages and limitations of marketing rerearch ?

15.14 FURTHER READINGS

1) D D Sharma : " Marketing Research - Principles, applications and cases" Sultan Chand & Sons, New Delhi.

2) GC Beri : "Marketing Research "Tata Mc Graw Hill Pub, New Delhi

3) Ramanuj Majmudar : "Marketing Research - Text Application and case studies" Willey Eastern Ltd.

4) Philip Kotler : "Marketing Management" 11th Edition Pearson Education Asia Ltd., New Delhi.

5) Rama Swamy, Nama Kumari : "Marketing Management Planning, implemenlation and control" 3rd edition 2002, Mac millian, India Ltd, New Delhi.

Lesson - IV

PRODUCT CONCEPT AND STRATEGY

OBJECTIVES

After studying this lesson you should be able to :

- To understand the meaning of product and levels of product
- To know the various product-mix strategy dimensions
- To study product line decisions
- To define a product life cycle, and describe the appropriate marketing strategies at each stage of the product life cycle
- To study the stages of new product development and understanding the problems involved in it.

STRUCTURE

4.1 INTRODUCTION

Once a company has carefully segmented the market, chosen its target customer groups, and determined the desired market positioning, it is ready to launch appropriate products. Product is the first and most important element of the marketing mix. Other elements of marketing mix are price, promotion and place. Marketers have recognized the need for differentiation of products and services. To the buyer, a product is a complex cluster of value satisfactions. One must enhance value of the offer to be successful in this competitive market situation.

4.2 MEANING OF PRODUCT AND LEVELS OF PRODUCT

A **product** is anything that can be offered to a market for attention, acquisition, use, or consumption that might satisfy a want or need. Products include more than just tangible goods. Broadly defined, products include physical objects, services, experiences, events, persons, places, properties, organisations, information, and ideas, or mixes of these entities.

Services:

Because of their importance in the world economy, we should understand services. **Services** are a form of product that consist of activities, benefits, or satisfactions offered for sale that are essentially intangible and do not result in the ownership of anything. Examples are banking, tax preparation, hotel, travel and tourism, hospital, house repair services.

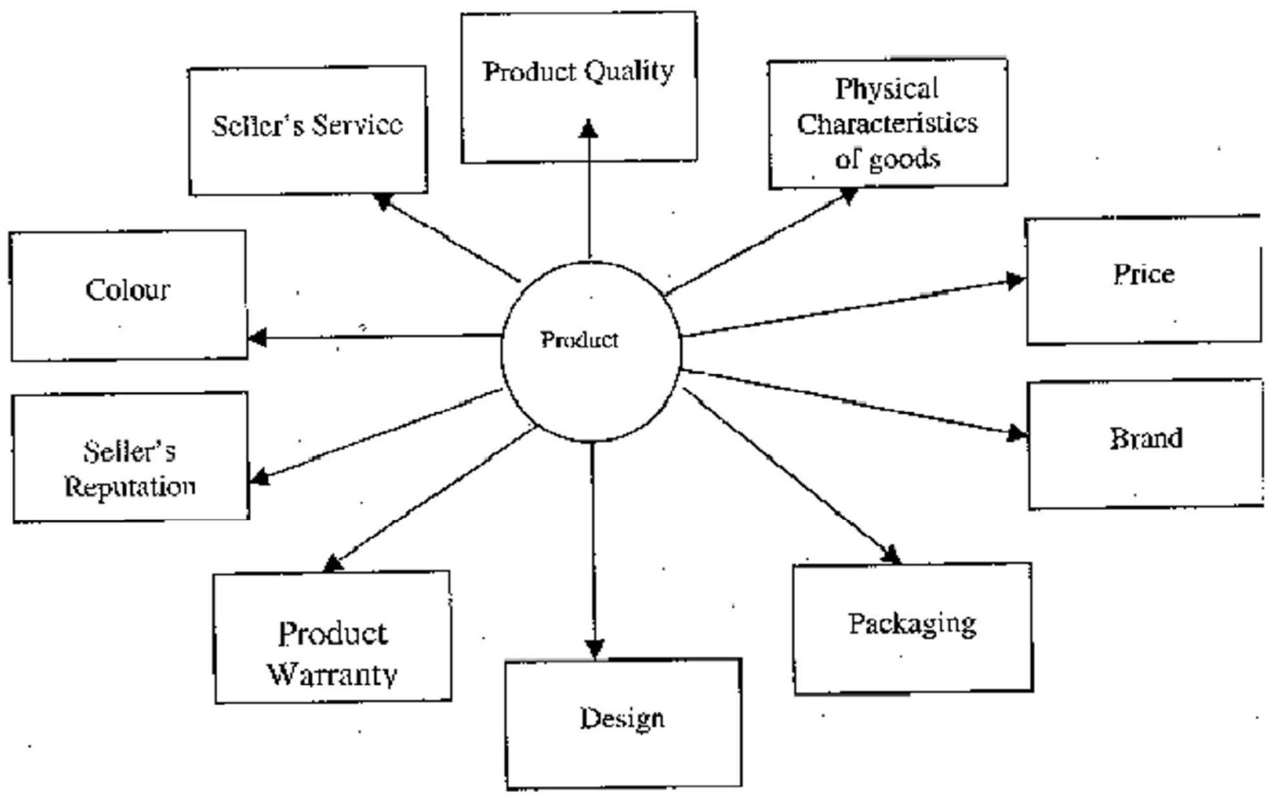

Figure 4.1 A product is more than just a product.

4.2.1 Levels of Product :

According to Theodore Levitt the new competition is not between what companies produce in their factories, but between what they add to their factory output in the form of packaging, services, advertising, customer advice, financing, delivery arrangements, warehousing, and other things that people value.

Product planners need to think about products and services on three levels. The most basic level is the core product, which addresses the question: What is the buyer really buying? As illustrated in **Figure 4.2,** the core product stands at the center of the total product. It consists of the core, problem-solving benefits that consumers seek when they buy a product or service. A woman buying a lipstick buys more than a lip colour. When designing products, marketers must first define the important benefits the product will provide to customers.

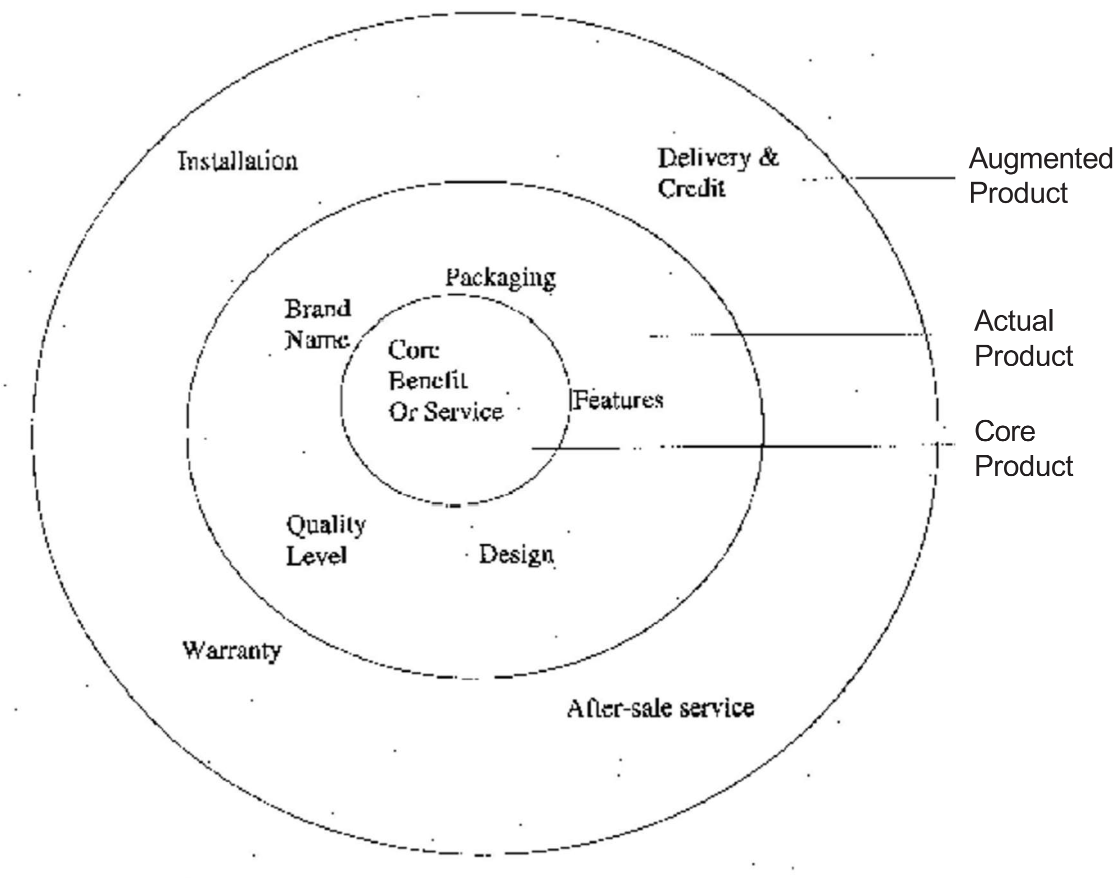

Figure 4.2 Levels of Product

The product planner must next build an actual product around the core product. Actual products may have characteristics like quality, features, design, a brand name, and packaging. For example, Sony television is an actual product. Its name, parts, styling, features, packaging and other attributes have all been combined carefully to deliver the core benefit - a convenient, high quality entertainment.

Finally, the product planners must build an augmented product around the core and actual products by offering additional consumer services and benefits. Sony must offer more than a television. It must provide consumers with complete solutions to their television viewing. Thus, when consumers buy a Sony product, Sony and its dealers also might give buyers a warranty on parts and workmanship, instructions on how to use the product, quick repair services when needed.

Therefore, a product is more than a simple set of tangible features. Consumers look to see products as complex bundles of benefits that satisfy their needs. Consumers want solutions not simply products. When developing products, marketers first must identify the core consumer needs the product will satisfy. They must design the actual product and find ways to augment it in order to create the bundle of benefits that will best satisfy consumers.

4.3 PRODUCT MIX - DIMENSIONS

Product Mix: A product mix (or product assortment) is the set of all products and items that a particular seller offers for sale to buyers.

Product-mix Dimensions:

A company's product mix has a certain width, length, depth, and consistency.

- The **width** of a product mix refers to how many different product lines the company carries.
- The **length** of a product mix refers to the total number of items in the mix.
- The **depth** of a product mix refers to how many variants are offered of each product in the line.
- The **consistency** of the product mix refers to how closely related the various product lines are in end use, production requirements, distribution channels, or some other way.

These four product-mix dimensions permit the company to expand its business in four ways. It can add new product lines, thus widening its product mix. It can lengthen each product line. It can add more product variants to each product and deepen its product mix. At the end, a company can pursue more product-line consistency.

4.4 PRODUCT LINE DECISION

A product mix consists of various product lines. Product-line managers need to know the sales and profits of each item in their line in order to determine which items to build, maintain, harvest, or divest. Some products contribute more to the entire product line's sales and profits. Every company's product portfolio contains products with different margins. The company management has to make a decision whether a product has to be continued or deleted from the product line.

They also need to understand each product line's market profile. The product-line manager must review how the line is positioned against competitors' lines. The management can use techniques like product mapping, which shows how competitors' products are competing against company products. This product mapping also identifies market segments. After performing product-line analysis, the product-line manager has to consider decisions on product-line length, line modernization, line featuring, and line pruning.

Product-line length:

A product line is too short if adding some more items can increase profits; and one can consider the line is too long if dropping some of the items can increase the profits. Company objectives influence product-line length. One objective is to create a product line to induce customers to go for higher end models. Fox example Hyundai company introduces Santro Zing a higher version compared to Santro Zip model. A different objective is to create a product line that facilitates cross selling, for example Hewlett-Packard sells printers as well as computers. Another objective is to create a product line that protects against Economic ups and downs.

Companies seeking high market share and market growth will generally carry longer product lines. Companies that emphasize high profitability will carry shorter lines consisting of carefully chosen items. Product lines tend to lengthen over time. Excess manufacturing capacity puts pressure on the product-line manager to develop new items. The sales people and distributors also pressure the company for a more complete product line to satisfy customers.

A company lengthens its product line in two ways: by line stretching and line filling.

1) **Line Stretching:** Every company's product line covers a certain part of the total possible range. Line stretching takes place when a company lengthens its product line beyond its current range. The company can stretch its line downmarket, upmarket, or both ways.

   A company positioned in the middle market may want to introduce a lower-priced line for different reasons such as the company may notice strong growth potential as mass-retailer, where customers want more value for money products. To counter attack the competitors who are in lower-end of the market for otherwise they may move Upmarket, or if the middle market is stagnant or declining. This is known as Downmarket 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. This is known as Upmarket stretch. Sometimes companies serving in the middle market might decide to stretch their line in both directions, which is known as Two-Way Stretch.

2) **Line Filling:** A product line can also be lengthened by adding more items within the present range. The reasons for line filling are:

   - Reaching for incremental profits
   - Trying to utilize excess capacity
   - Trying to be the leading full-line company
   - Trying to plug holes to keep out the competitors
   - To satisfy dealers who complain about missing items in the line

   Line filling is overdone if it is results in self-cannibalization and customer confusion. Introducing more and more products in the line may lead to killing their other items. The company needs to differentiate each item in the customer's mind. Each item should possess a just-noticeable difference.

   Other important product-line decisions are line modernization, featuring and line pruning.

a) **Line Modernization**: Product lines are to be modernized. The managers have to take decision whether to overhaul the line piecemeal or all at once. In rapidly, changing product markets, modernization is carried on continuously.

b) **Line Featuring**: The product-line managers typically select one or a few items in the line to feature. For example, Videocon will announce a special low-priced washing machine to attract customers. At other times, managers will feature a high-end item to lend prestige to product line. Some special emphasis will be made on some items to prop up their sales, these items are called featured items.

c) **Line Pruning:** Product-line managers must periodically review the line for finding slow items, considered as deadwood, which are affecting profits. The weak items can be identified though sales and cost analysis. Pruning is also done when the company is short of production capacity. Companies normally shorten their lines in periods of high demand and lengthen their lines in periods of slow demand.

4.5 PRODUCT LIFE CYCLE

A product passes through certain distinct stages during its life, and this is called the Product Life Cycle (PLC). A Company's positioning and differentiation strategy must change as the product, market, and competitors change over time. The PLC concept is used to understand the market behaviour at different stages of life cycle and to apply different marketing strategies to get better results.

To believe that a product has a life cycle one has to assume the following things:

1. Products have a limited life.

2. Product sales pass through distinct stages, each posing different challenges, opportunities, and problems to the seller.

3. Profits rise and fall at different stages of the product life cycle.

4. Product
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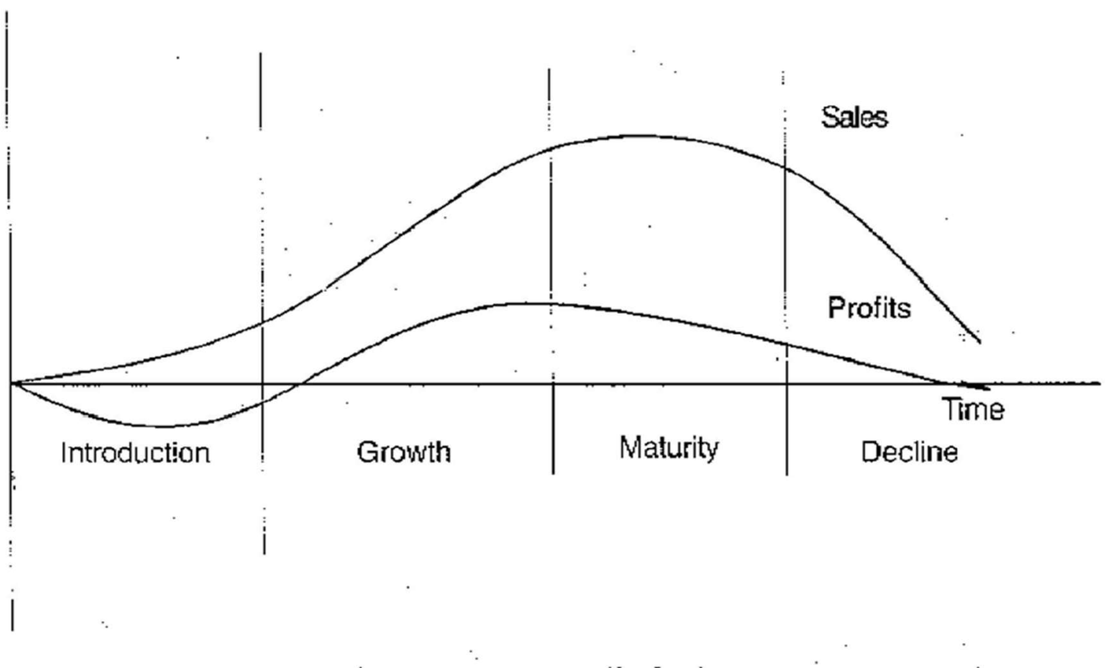

Figure 4.3 Stages in Product Life Cycle

1. **Introduction:** A period of slow sales growth as the product is introduced in the market. Profits are nonexistent because of the heavy expenses incurred with product introduction.

2. **Growth:** A period of rapid market acceptance and substantial profit improvement.
3. **Maturity:** A period of slowdown in a sales growth because the product has achieved acceptance by most potential buyers. Profits stabilize or decline because of increased competition.
4. **Decline:** The period when sales show a downward drift and profits erode.

Table 4.1
Summary of product Life-Cycle Characteristics, Objectives, and Strategies

	Introduction	**Growth**	**Maturity**	**Decline**
Characteristics				
Sales	Low sales	Rapidly rising sales	Peak sales	Declining sales
Costs	High cost per customer	Average cost per customer	Low cost per customer	Low cost per customer
Profits	Negative	Rising profits	High profits	Declining profits
Customers	Innovators	Early adopters	Middle majority	Laggards
Competitors	Few	Growing Number	Stable number beginning to decline	Declining number
Marketing objectives				
	Create product awareness and trail	Maximize market Share	Maximize profit while defending market share	Reduce expenditure and milk the brand
Strategies				
Product	Offer a basic product	Offer product extensions, service, warranty	Diversify brand and models	Phase out weak items
Price	Use cost-plus	Price to penetrate market	Price to match or best competitors	Cut price
Distribution	Build selective distribution	Build intensive distribution	Build more intensive distribution	Go selective: phase out unprofitable outlets
Advertising	Build product awareness among early adopters and dealers	Build awareness and interest in the mass market	Stress brand differences and benefits	Reduce to level needed to retain hard-core loyals
Sales Promotion	Use heavy sales promotion to entice trial	Reduce to take advantage of heavy consumer demand	Increase to encourage brand switching	Reduce to minimal level

(Adapted from Philip Kotler, Marketing Management: Analysis, Planning, Implementation, and Control, 8th ed., Prentice Hall of India, New Delhi, 1988).

4.6 INTRODUCING NEW PRODUCTS

Every company must develop new products. New-product development determines the company's future. For higher level of growth, a firm has to look beyond its existing products. Customers want new products, and competitors will do their best to supply them. In the year 2000, consumer product firms developed 31,000 new products including line extensions and new brands. Today a big supermarket in United States stocks 40,000 items.

New products become necessary from the profit angle too. It is necessary for the business firms to bring in new products to replace old, declining and losing products. New products become part and parcel of the growth requirements of the firm and in many cases, new profits come only through new products.

A company can add new products through acquisition or development. The acquisition route can take three forms. The company can buy other companies, it can acquire patents from other companies, or it can buy a license or franchise from another company.

The development route can take two forms. The company can develop new products in its own laboratories, or it can contract with independent researches or new-product development firms to develop specific new product.

4.6.1 Categories of New Products:

1. **New-to-the world products**: New products that created an entirely new market.
2. **New Product Lines:** New Products that allow a company to enter an established market for the first time.
3. **Additions to existing product lines:** New products that supplement a company's established product lines (package sizes, flavours, and so on).
4. **Improvements and revisions of existing products:** New products that provide improved performance or greater perceived value and replace existing products.
5. **Repositioning :** Existing products that are targeted to new markets or market segments.
6. **Cost Reductions:** New products that provide similar performance at lower cost.

   Less than 10 percent of all new products are truly innovative and new to the world. These products involve the greatest cost and risk because they are new to both the company and the market place. Most new product activity is devoted to improving existing products.

4.6.2 Why do products fail?

Success requires many factors. Even one reason is good enough for a product failure. The following points give some idea regarding why products fail to get support from the customers.

1) **Market size overestimated**: The product idea is good, but the market size is overestimated. Many of the multinational companies overestimated the size of the market in India in the early stages of liberalisation programme and were not able to get enough support.
2) **Poor product design:** If the product is not well designed it may not attract the customers. Some designs that are appealing to customers in one country may not be appealing in another country.
3) **Top management exuberance:** A high-level executive pushes a favourite idea through in spite of negative market research findings.
4) **Marketing Mix:** The company is unable to strike the right marketing mix to reach the target customers. The product is in correctly positioned in the market, not advertised effectively, or over priced.

5) **Insufficient distribution:** The product fails to gain sufficient distribution coverage or support from channel members. Customers want to buy the product but it is not available because distribution coverage is inadequate.

6) **High product development costs:** Development costs are higher than expected. This requires lot of financial support for introducing the product. For example, in pharmaceuticals industry huge amounts have to be invested to develop products.

7) **Competition:** Markets are highly competitive nowadays. Competitors fight back harder than expected. If the products of the competitor are delivering better value to the customers, naturally customers support those products.

4.6.3. Factors affecting growth of new product development:

1) **Shortage of important ideas in certain areas:** There may be few ways left to improve some basic products.

2) **Fragmented markets:** Companies have to aim their new products at smaller market segments, and this can mean lower sales and profits for each product.

3) **Social and governmental constraints:** New products have to satisfy consumer safety and environmental concerns.

4) **Cost of development:** A company typically has to generate many ideas to find just one worthy of development, and often faces high R&D, manufacturing and market costs.

5) **Capital shortages:** Some companies with good ideas cannot raise the funds needed to research and launch them.

6) **Faster required development time:** Companies must learn how to compress development time by using new techniques, strategic partners, early concept tests, and advanced marketing planning.

7) **Shorter product life cycles:** When a new product is successful, rivals are quick to copy it.

New-Product Development Process:

By new products we mean original products, product improvements, product modifications, and new brands that the firm develops through its own research and development efforts. Many of the new products fail, companies are very anxious to learn to reduce the failure rate. A new product success depends on whether it offers higher value than the existing products. It should be a unique superior product, one with higher quality, new features, and higher value in use. Prior to the development of a new product a company should carefully define and assesses the target market, the product requirements, and the benefits. In all, to create successful new products, a company must understands its consumers, markets, and competitors and develop products that deliver superior value to consumers.

The following steps are involved in development of a new product:

1. **Idea Generation:** New-product development starts with idea generation. This is nothing but the systematic search for new-product ideas. A company has to develop as many ideas as possible to find few good ones. Many new-product ideas come from internal sources within the company. The company can find new ideas through formal research and development. Companies get ideas from employees, customers, sales people, competitors, distributors and suppliers.

2. **Idea Screening**: The ideas generated through the above step are to be screened to identify the good ones and drop poor ones as soon as possible. Companies want to proceed with only the product ideas that are most likely to turn into profitable products.

3. **Concept Development and testing:** An attractive idea must be developed into a product concept. A product concept is a detailed version of the idea stated in meaningful consumer terms. Concept testing is testing new-product concepts with a group of target consumers to find out if the concepts have strong consumer appeal.

4. **Marketing Strategy:** Marketing strategy development involves designing an initial marketing strategy for a new product based on the product concept.

5. **Business Analysis:** Business analysis involves a review of the sales, costs, and profit projections for a new product to find out whether they satisfy the company's objectives. If they are in line with the company objectives, the product can move to the product development stage. To estimate sales, the company might look at the sales history of similar products and conduct surveys of market opinion.

6. **Product Development**: Developing the product concept into a physical product in order to assure that the product idea can be turned into a workable product. Here, R&D or engineering develops the product concept into a physical product. In this product development stage company has to invest large amount of money. The R&D department will develop and test one or more physical versions of the product concept.

7. **Test Marketing:** The stage of new-product development in which the product and marketing program are tested in more realistic market settings. Test marketing gives the company the experience with marketing of the product before going to launch fully. The amount of test marketing needed varies from one product to the other. If the new product development costs are low and if they are confined to simple line extensions or copies of successful competitor products, the companies do little test marketing.

8. **Commercialization:** Test marketing gives management the information needed to make a final decision about to launch the new product. If the company goes ahead with commercialization - introducing the new product into the market - it will face high costs.

   Out of eight stages at any stage the idea of launching a new-product may be dropped.

4.7 SUMMARY

A product is more than just product. Product is the first of the four P's of marketing mix. A product means something more than a physical commodity. Products have an identity or a personality of their own. The starting point of successful marketing is a satisfactory product. The set of all products offered for sale by a company is called a product mix. A broad group of products intended for essentially similar uses and having similar physical characteristics constitute a product line.

Products have life cycles that require different marketing strategies. The sales history of many products follows an S-shaped curve consisting of four stages: Introduction, Growth, and Maturity, Decline. Companies are recognizing the necessity and advantages of regularly developing new products and services. The new-product development process consists of eight stages: idea generation, idea screening, concept development and testing, marketing-strategy development, business analysis, product development, market testing, and commercialization. The purpose of each stage is to decide whether the idea should be further developed or dropped.

4.8 KEY WORDS

Product is anything that can be offered to a market for attention, acquisition, use, or consumption that might satisfy a want or need.

Services are a form of product that consists of activities, benefits, or satisfactions offered for sales that are essentially intangible and do not result in the ownership of anything.

Product Mix is the set of all products and items that a particular seller offers for sale to buyers.

Product Line refers to group of products, which are closely related as satisfying a class of need.

4.9 SELF ASSESSMENT QUESTIONS

1. "People do not buy a product. They buy benefits" Explain the statement.
2. What is product mix? Explain the dimensions of product mix.
3. What are the important product-line decisions?
4. Discuss the stages in the product life cycle. What is the significance of product life cycle in the marketing mix and in product planning and development?
5. What is a new product? Outline the various stages in new product development.
6. What factors contribute to the success or failure of a new product?

4.10 FURTHER READINGS

1) Philip Kotler, Marketing Management (New Delhi: Prentice-Hall India, 2002);

2) V S Ramaswamy, S Namakumari. Marketing Management Planning, Implementation & Control (New Delhi: Macmillan India Ltd, Third edition, 2002);

3) S A Chunawalla, Marketing Principles and Practice (Mumbai: Himalaya Publishing House, 1997);

Lesson - v

PRODUCT PLANNING PROCESS

OBJECTIVES

After studying this lesson, you should be able to :

- know the importance of product planning process
- know how to manage existing products
- understand the importance of branding
- explore the implications of branding related decisions
- understand the importance of packaging and its functions

STRUCTURE

5.1 INTRODUCTION

Markets are dynamic in nature. Customers needs and wants are changing over time. Product life cycles are becoming shorter in duration. It has therefore become necessary for firms to review their product mix on a continuous basis. Customers' awareness levels are high. Technology is also changing very fast and companies, which are more adaptive for change, are surviving in this cutthroat competition.

Companies must be focused and should deliver better value to the customers. In product management branding is becoming a key strategic tool. Majority of the products sold in the market place are branded. Branding decisions are very critical for the success of products. Building global brands is becoming necessary for survival of companies. Revolution in packaging technology has a greater influence on the product strategy. With the developments in packaging companies are offering the products in small quantities thereby reaching larger group of customers. The companies are able to target new segments in the market. One has to consider other elements in marketing mix like price, promotion, and placement while formulating product strategy.

5.2 PRODUCT PLANNING PROCESS

Product planning is important and is one of the most critical issues of a company's product management function. In designing such strategies companies should have accurate information on the existing products and as well as anticipated performance of its existing products. The product portfolio approach is one of the tools used for product planning. This growth-share matrix popularly known as Boston Consulting Group (BCG) concept explained earlier helps the companies to form the basis for product planning. Market growth rate of the business of which the product belongs and relative market share of the firm in that product category gives idea regarding whether the business is to be continued or discontinued. This analysis helps the product manager to decide about the optimum product mix. Always companies want to have a balanced product portfolio.

Ansoff has proposed a useful framework for detecting new growth opportunities for companies called a 'product-market expansion grid'. The company first considers whether it could gain more market share with its current products in their current markets known as market-penetration strategy. Here with current products the company wants to penetrate more into current markets. Next it considers whether it can find or develop new markets for its current products known as market-development strategy. This is searching for new markets and developing them with the existing products.

Then it considers whether it can develop new products of potential interest to its current markets known as product-development strategy. With new products the current markets should be concentrated. Later it will also review opportunities to develop new products for new markets known as diversification strategy. Product mix decision, product modification / modernization decision, product line pruning / product elimination decision, new product decision, and branding and packaging decision are the important decisions in overall product strategy.

5.3 MANAGING EXISTING PRODUCTS

Once the product is introduced to the market, the product is going to experience various stages. During a product's life, a company will normally reformulate its marketing strategies. Not only products have life cycles but also markets have life cycles. This demands the companies to reformulate their marketing strategies over time. The company must go with stage specific marketing strategies to maintain the sustainability of the existing product in the market place. The various stages include introduction, growth, maturity and decline.

I. Introduction Stage:

In introduction stage sales growth is slow. Delays in expansion of production capacity, technical problems, delays in obtaining adequate distribution through retail outlets, and customers reluctance to change established behaviour are the reasons for slow growth in the introduction stage. In this stage profits are also very low or negative because of the low sales and more promotion and distribution expenses. Promotion expenditures are high in relation with sales, as high level of promotional effort is required inform potential consumers of the new and unknown product. Prices are also on high side because costs are high due to relatively low output rates, technology problems may not be fully rectified, and high margins are required to support the promotional expenditure which is necessary to achieve growth. While launching product, organizations can emphasize more on any one of the marketing variables, such as product, price, promotion, and distribution. Considering price and promotion, firms can pursue one of the four strategies shown in the Figure 9.1.

Strategies in the introductory stage:

- **Rapid skimming strategy:** Introducing the product at a high price and a high promotion level. The firm charges a high price in order to recover as much gross profit per unit as possible. A firm spends large amounts on promotion to convince the market even at the high price. This high spending on promotion speeds up the rate of market penetration.
- **Slow skimming strategy:** Introducing the product at a high price and low promotion. The high price makes firm to realise high gross profit per unit, and low level of promotion keeps firms' marketing expenditure down. When the market size and potential competition is low, this particular strategy works.
- **Rapid penetration strategy:** Launching the product at low price spending high amount on promotion. This strategy brings us fastest market share and market penetration. This strategy is suitable for large markets particularly when buyers are price sensitive, when there is a strong potential competition, and the market is unaware of the product.

		Promotion High	**Promotion** Low
Price	High	Rapid Skimming Strategy	Slow Skimming Strategy
Price	Low	Rapid Penetration Strategy	Slow Penetration Strategy

Figure 9.1 Introductory Marketing Strategies

- **Slow penetration strategy:** Launching a product at low price and low level of promotion. Low price may encourage high product acceptance, and low level of promotion helps firms to realize more net profit. This approach is suitable for large markets, price sensitive and with some potential competition.

  The pioneer, who introduces the product in the market, must choose a launch strategy that is consistent with its intended product positioning. This is the first step in a grand plan of life-cycle marketing.

II. Growth Stage:

The growth stage in which a product's sales start climbing quickly. The early buyers who have shown interest in product will continue to buy, and the new buyers also support the product especially if they hear favourable news about the product. Here word of mouth communication plays an important role. At this stage new competitors will enter into market. Profits starts increasing with sales raise. With experience gained in production procedure, cost of manufacturing falls. Promotional expenditure is distributed over more number of units. However the growth rate may not be sustained forever, companies must watch the downtrend in this growth rate to prepare for the new strategies.

Strategies in the growth stage: Following steps are going to help the firm to sustain market growth as long as possible.

1. **Improve product quality:** Companies has to focus on improving product quality to sustain in the market.
2. **Adding new product features:** New features for the existing products should be added to make the product more appealing and contemporary to attract and retain customers.
3. **Adding new models:** New models must be added continuously to make the existing product portfolio look attractive. This will make company to occupy more shelf space at retailer's outlet.
4. **Entering new market segments:** As the product fared well in one particular market segment, to sustain its growth, companies have to enter into new markets.
5. **Decreasing price to attract lower segment:** The price of the product is to be decreased to attract lower class segment. In this segment majority of the customers are price sensitive. This helps the company to enter into new markets.
6. **Distribution channels:** Company has to increase distribution coverage and look for new distribution channels to make the product easily available to its target customers.

III. Maturity Stage:

The stage in the product life cycle in which sales growth slows or levels off and the product will enter a maturity stage. This stage normally stays longer than the previous stage and it throws serious challenge to marketing management. The company seeks innovative strategies to renew sales growth including market, product, and marketing mix modification.

Strategies in the maturity stage:

1. **Market modification:** The company has to increase sales volume for their matured brands by expanding the number of brand users as well as usage rate per user. The company has to convert nonuser into user, enter new market segments, and winning competitors' customers. Making the current customers to increase their annual usage of the brand can also increase sales. The company can try to make customers to use the product more frequently, more usage per occasion, and identify the new uses for the product and convince the customer to use the product in more varied ways.
2. **Product modifications:** By modifying the product's characteristics marketers try to increase the sales. Improving product quality aims at increasing the functional performance of the product like its durability, reliability, and taste. This makes buyers to accept the new and improved version of the product and they might be ready to pay more prices for it. Feature improvement of the product for example, size, weight and other accessories also make product more attractive. Style improvement of the product makes it more aesthetic and novel.
3. **Marketing mix modification:** Product managers might also try to stimulate sales by changing one or more marketing-mix elements. Change in the composition of the marketing mix may help company to reach the target customers. However, these changes are easily imitated by the

competitors. For instance, if a company decrease the price of the product, the competitors may also propose for price decrease. This leads to price war among the companies and none of them will get any benefit out of this situation.

IV. Decline stage

It's a stage in which a product sales decline. The sales decline might be slow. Sales decline for a number of reasons. When a product enters into a decline stage in which little can be done to stop the deterioration of sales and profits. The company has to identify the weak products, develop for each one a strategy of continuation, focussing, milking, and finally phase out weak products in a way that minimizes the problems for the company as a whole.

Strategies during decline stage:

1. **Identifying the weak products:** The company has to identify the weak products and if possible company should try to modify them if not discontinue them. Appointing product review committee with representatives from marketing, R&D, manufacturing, and finance. This committee has to identify weak products with the help of data regarding market size, market share, prices, costs, and profits. The review committee examines this information and makes recommendation for each doubtful product whether to continue it, change marketing strategy, or drop it.

2. **Determining Marketing Strategies:** In declining markets some firms withdraw their products earlier than other. There are some exit barriers which make the product withdrawal a little difficult. If there are few exit barriers, it is easy for the firms to leave the market. The remaining firms in the market try to attract the customers of the withdrawing firms. Harrigan distinguished five decline strategies available to firm:
    - increasing the firm's investment to strengthen its competitive position,
    - maintaining the firm's investment level until the uncertainties about the industry are resolved,
    - decreasing the firm's investment level selectively,
    - harvesting the firm's investment to recover cash quickly, and
    - divesting the business quickly by disposing of its assets as advantageously as possible.

3. **Product withdrawal:** When a company decides to drop a product, it has to take several other decisions. If the product has residual goodwill and strong distribution, the company can sell it to a smaller firm. If the company can't find buyers, it must decide whether to liquidate the brand slowly or quickly. It also should take a decision how to service the past customers, how much stock of spare parts to be maintained to support the past customers.

5.4 IMPORTANCE OF BRANDING

In marketing the term, branding occupies a significant role. A brand is defined as 'a name, term, sign, symbol, or design or a combination of these intended to identify the goods or services of one seller or groups of sellers and to differentiate them from those of competitors'. The skill of the marketer will be revealed through the ability to create, maintain, and protect brands of their products and services.

Branding helps both consumers and sellers. Consumers get confidence that the branded goods and services are high in quality. Majority of the products sold in the market are branded products.

Even water, salt, rice, fruits, vegetables, poultry products are branded nowadays. Customers feel some sense of security when they buy branded products. They feel that the entire company is backing the branded products. Companies' plan their promotional strategy around the brand name and customers can easily identify the products. Branding gives the product some respectability in the market place.

Brand Equity:

Brand equity is the value of a brand, based on the extent to which it has high brand loyalty, name awareness, perceived quality, strong brand associations, and other assets such as patents, trademarks, and channel relationships. A brand with high brand equity is an asset to the company. The valuation of brand equity is difficult but companies are respected if they have powerful brands.

5.5 BRANDING DECISIONS

Branding decisions are very important and they are challenging in nature. The branding decisions include brand name selection, brand sponsor, and brand strategy.

5.5.1 **Brand Name Selection:** The company has to select suitable brand name and it should pro- tect it. One has consider cultural, social, and religious factors before fixing a brand name. The brand name should consist of the qualities like distinctiveness, product benefits and most importantly easy to pronounce, recognize, and remember. When the product is associated with brand names, psy- chologically customers attribute value to their purchase. For example, Raymond, Godrej, Zodiac etc. If brand name is easy to spell, with words in common use brand remembering is easy. For example, Sony, Usha, Vimal, Nirma are very easy to remember. Brands describe about the product and its characteristic features. For example, Fair & Lovely, Glucose, Protinex, Fair Glow, Fair Ever. The brand name when translated into a foreign language, should not give a wrong meaning. For ex- ample, the brand name Nova goes well with Indian car buyers but not with Spanish customers be- cause meaning of the word Nova in Spanish language is 'it doesn't go'. Brand name should not infringe with the existing brands.

5.5.2 **Brand Sponsor:** The product may be introduced as manufacturers brand, private brand, licensed brand, and co brand. The company's name itself acts as a brand name, for example, Godrej, BPL, Tata. A brand created and owned by distributors or retailers is known as private brand. For example, Spencer's at Chennai, Nilgiris at Bangalore have become popular private brands in south India. The practice of using the established brand name of two different companies on the same product is known as co-branding. For example, Thomas Cook- Master Card International, ECIL- BDPS, Indian Oil Corporation-Citi Bank International. In co-branding both the brands will get the ben- efit of each other.

5.5.3 **Brand Strategy:** There are four different brand strategies. They are Line Extension, Brand Extension, Multi brands, and New brands.

- **Line Extension:** When a company introduces additional items in a related product category with the same brand name it is called line extension. Products with new flavours, sizes, colours, shapes, ingredients in the same category with the same brand name will be introduced.
- **Brand Extensions:** A brand extension is using a successful brand name to launch new or modified products in a new category. Here the brand name is same but the product category is new. A brand extension gives a new product immediate recognition and faster acceptance. As the brand awareness is already there, the costs of advertising to build a new brand can be

saved. However the brand extension is risky when the failure of a new product will dilute the image of an existing brand.

- **Multibrands:** This strategy is about introducing additional brands in the same category. P&G, HLL, Godrej follows multibranding strategy in soaps and detergents category. It helps companies to occupy more shelf space at retail level. The same company may launch separate brands in different countries. P&G dominates in US detergent market with Tide brand and it leads in other countries with Ariel brand. This multibranding strategy is costly because each brand has to be promoted by the firm separately. Each brand might obtain only a small market share.
- **New Brands:** A company may go in for a new brand when it enters a new product category for which none of the company's current brand names are suitable. If a company wants to enter into a new product category and the existing brands may not be suitable, then the company has to go in for a new brand. Sometimes the company may acquire new brands through acquisitions.

5.6 IMPORTANCE OF PACKAGING - PACKAGING DECISIONS

Packaging is another important element in product strategy. Packaging involves designing and producing the container or wrapper for a product. It provides basically the convenience and adds value to the product. The main function of package is to contain and protect the product. It will enhance the sales appeal of the product. Packaging is becoming a powerful promotional tool in this competitive marketing environment.

In the last decade, India is witnessing the packaging revolution in the form of sachets, pouch packaging, it has changed the market dynamics. More over than this the customers are looking at decent packaging with aesthetic appeal. Due to the media explosion, changing life styles, attitudes, tastes, and needs packaging occupied a prominent role. For that matter Froot's, success can be attributed to packaging. It was the first of its kind in India to introduce tetra pack technology. Even today Frooti is enjoying its exclusivity value and is the market leader. Packaging provides handling convenience to the customers and provides operational flexibility to the company.

With proper packaging the firm achieves the following functions:

1. **Creating customer satisfaction:** A good packaging provides the customer convenience and in turn it leads to customer satisfaction. For example, edible oil offered in poly packs provides greater convenience to customers to carry the product.
2. **Protecting the contents:** Packaging protects the product and enhances its longevity. It prevents contamination of products like medicines, cosmetics, and other food products.
3. **Knowing about the product attributes and ingredients:** It provides product information, advantages, instructions, contents, and statutory warnings.
4. **Promoting the product:** Packaging can be effectively used by the marketers to promote the products. Labeling will provide an opportunity to the seller to influence the buyer.
5. **Provides differentiation:** Marketers can use the packaging to differentiate their product. Novel packaging designs, styles create perceptual differentiation in the mind of the customers.
6. **Building image:** Quality packaging enhances the product's image to position it as premium product. In the process, the firm can charge high prices.

Labeling:

Labeling, the printed information appearing on or with the package is also part of packaging. Label provides the information regarding place of manufacture, date of manufacture, contents, producer's name, and instructions on usage and warnings. Labels may vary from simple tags to complex designs. Labels can be designed with attractive colours and different typographical styles.

Other Product Related Strategies:

A) Product Positioning:

According to Al Ries and Jack Trout marketing is the battle of perceptions not products. They popularized the concept of positioning. A product's position is the way the product is defined by consumers on important attributes - the place the product occupies in consumers' minds is relative to competitor products. Well-known Products generally hold a distinctive position in consumer's minds. It is difficult for the competitors to occupy the same space in the mind of the customer.

Companies have to strengthen their own position in the consumer's mind rather than trying to occupy the competitor's space. Companies can try to occupy the unoccupied space. Sometimes the companies may try to re-position the competitor products by their promotional efforts. Positioning is done through communication. Here advertising plays an important role in positioning the product. The tangible aspects of product, place, price, and promotion should support the positioning strategy of the firm.

Michael Treacy and Fred Wiersema, proposed a positioning model known as value disciplines. According to them, a firm could aspire to be the product leader, operationally excellent firm, or the customer intimate firm. A firm should become best at one of the three value disciplines and should achieve an adequate performance level in the other two disciplines. Generally companies must promote only one central benefit of the product to the customer through positioning strategy. According to Rooser Reeves a company should develop a unique selling proposition for each brand and promote it continuously on that count.

B) Product differentiation:

The process of adding a set of meaningful and valued differences to distinguish the company's product from competitors' product. Product differentiation helps the company to gain competitive advantage. A market offering can be differentiated in the following ways:

a) **Product differentiation:** The product differentiation can be offered by the seller by changing parameters including form, features, performance quality, durability, reliability, repairability, style, and design.

b) **Service differentiation:** When the physical product cannot easily be differentiated, companies look towards service differentiation. The main service differentiators are ordering ease, delivery, installation, customer training, customer consulting, and maintenance and repair.

c) **Personnel differentiation:** Companies gain advantage through having better-trained people who have the skills like competence, courtesy, reliability, responsiveness, and communication.

d) **Channel differentiation:** By designing their distribution channels in a better way companies want to achieve competitive advantage. Channel members can add value to the product.

e) **Image differentiation:** Image is the way the public perceives the company or its products. A company can build its brand image through creating or sponsoring various events. The seller's space with its ambience and good-looking atmosphere also creates some image.

5.7 SUMMARY

Product is the first and most important element of the marketing mix. Product strategy calls for making coordinated decisions on product mixes, product lines, brands, and packaging and labelling. Product life cycles are becoming shorter in duration. It has therefore become necessary for firms to review their product strategy on a continuous basis. Product planning is important and is one of the most critical elements of a company's product management function. In designing such strategies companies should have accurate information on the existing products, as well as anticipated performance of its existing products. During a product's life, a company will normally reformulate its marketing strategies. Not only do products have life cycles, but markets also have life cycles. This demands the companies to reformulate their marketing strategies over time. The company must go with stage specific marketing strategies to maintain the sustainability of the existing product in the market place.

5.8 KEY WORDS

Brand A name, term, sign, symbol, or design or a combination of these intended to identify the goods or services of one seller or groups of sellers and to differentiate them from those of competitors.

Co-branding The practice of using the established brand name of two different companies on the same product is known as co-branding.

Packaging involves designing and producing the container or wrapper for a product.

Labeling the printed information appearing on or with the package. It is also part of packaging.

5.9 SELF ASSESSMENT QUESTIONS

1. Explain in detail the stage specific marketing strategies to maintain the sustainability of the existing product in the market place.

2. What is brand equity? Discuss various branding strategies.

3. Discuss the importance of packaging as a tool of market cultivation.

4. Briefly explain the following concepts.

   a)Product positioning   b) Product differentiation

5.10 FURTHER READINGS

a) Philip Kotler, Marketing Management (New Delhi: Prentice-Hall India, 2002);

b) V S Ramaswamy, S Namakumari. Marketing Management Planning, Implementation & Control (New Delhi: Macmillan India Ltd, Third edition, 2002);

c) S A Chunawalla, Marketing Principles and Practice (Mumbai: Himalaya Publishing House, 1997);

d) R S N Pillai, Bagavathi, Modern Marketing Principles and Practices (New Delhi: S.Chand & Company Ltd, 1998);

Lesson - VI

PRICING DECISIONS

OBJECTIVES

After studying this lesson, you should be able to :

- explain the meaning and significance of pricing in marketing decisions.
- identify the pricing objectives of different firms.
- analyse the factors influencing pricing decision.
- understand different pricing policies and strategies adopted by marketers.
- learn the concepts of price Vs non-price competition and resale price maintenance.

STRUCTURE

6.1 INTRODUCTION

Pricing constitutes one of the four Ps of marketing. The marketing process cannot be consummated without the mechanism of pricing. The right pricing strategy can optimise the revenue and thus maximise the profits. Pricing is the only element in marketing mix that generates revenue. Other elements namely, product, distribution and promotion are cost factors.

Till now, many firms had no problem in getting their products accepted at their price levels. It is because they were in protected market and the customers had no choice except to buy from very limited number of sellers. But in the post liberalisation era, most firms find themselves caught in a price war. The marketing war between Hindustan Lever and Nirma also brings to the fore dilemmas that marketers confront in pricing their products.

Economists define price as the exchange value of a product or service expressed in money. From the customer's point of view, it represents sacrifice and hence it is the perceived value of the product. From the marketer's view point, price is the amount charged for the product including any guarantees, delivery, discounts, services or other items that are part of the conditions of sale and are not paid separately.

Unlike product and distribution decisions, the pricing decisions can be changed quickly. According to Philip Kotler, "..... price competition is the number-one problem facing companies. Yet many companies do not handle pricing well. The most common mistakes are these; Pricing is too cost oriented; price is not revised often enough to capitalise on market changes; price is set independent of the rest of the marketing mix rather than as an intrinsic element of market-positioning strategy; and price is not varied enough for different product items, market segments, and purchase occasions."

6.2 FACTORS INFLUENCING PRICING

The marketer has to consider many factors in setting the pricing policy. Philip Kotler described it as a six-step procedure consisting of the following steps (Figure 10.1) :

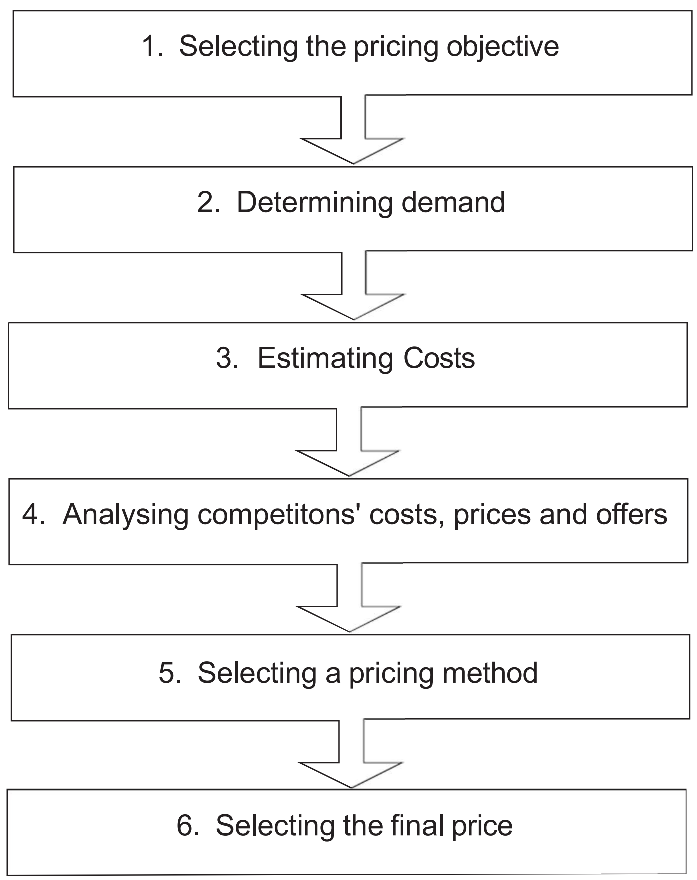

Figure 10. Factors Influencing Pricing

6.2.1 selecting the pricing objective;

6.2.2 determining demand;

6.2.3 estimating costs;

6.2.4 analysing competitiors' costs, prices, and offers;

6.2.5 selecting a pricing method; and

6.2.6 selecting the final price.

Selecting the Pricing Objective

Some of the objectives are long-run, while others are short-run. In fact, pricing strategies emanate from the pricing objectives. A firm can pursue any of the five major objectives through pricing; survival, maximum current profit, maximum market share, maximum market skimming, or product-quality leadership.

But no firm can remain satisfied with a single objective in pricing. V. S. Ramaswamy and S. Namakumari listed the following objectives which the firms sought to achieve through pricing:

- Profit maximisation in the short term,
- Profit optimisation in the long term,
- A minimum return on investment,
- A minimum return on sales turnover,
- Target sales volume,
- Target market share,
- Deeper penetration of the market and finding new markets,
- Target profit on the entire product line irrespective of profit level in individual products,
- Keeping competition out, or keeping it under check,
- Keeping parity with competition,
- Fast turn around and early cash recovery,
- Stabilising prices and margins in the market,
- Providing the commodities at prices affordable by weaker sections,
- Providing the commodities/services at prices that will stimulate economic development in the country,

Determining Demand

The marketer has to estimate demand at different price levels. For some products the demand is inelastic to price changes. For example, food and other essential commodities belong to this product group. But, for most of the branded products, the demand is elastic. The marketer has to examine what affects price sensitivity. Nagle has idetified nine factors that contribute to price sensitivity. They are:

Unique Value Effect: More unique the product, lower is the price sensitivity.

Substitute Awareness Effect : Buyers' price sensitivity will be high, if they are aware of substitutes.

Difficult Comparison Effect : Price sensitivity will be low if the buyer has difficulty comparing two alternatives.

Total Expenditure Effect: If the expenditure on the product represents a low proportion of the consumer income, then the price sensitivity will be less visible for such a product.

End-Benefit Effect : Buyers are less price sensitive where the expenditure on the product is low compared to the total cost of the end product.

Shared Cost Effect : If the cost of the product is shared by another party, the buyer will be less prone to price sensitivity.

Sunk Investment Effect : Price sensitivity is low in products which are used along with assets previously bought.

Price Quality Effect : Higher the perceived quality of the product, lower the price sensitivity.

Inventory Effect: If the product cannot be stored, the buyer will be less price sensitive.

Estimating Costs

It is important to estimate the costs of manufacturing and marketing the product. Different firms, within the same industry, operate at different levels of efficiency reflecting their cost structure. More the quantity produced, lower is the cost. The firm can pass this benefit to the customers in the form of lower prices. Many market leaders use this strategy.

Some costs do not change over the production volumes (e.g. rents, salaries, depreciation, R & D cost). These costs are called fixed costs. Certain costs vary directly in proportion to the volume of the product produced. These are raw material and wages. Such costs are called variable costs.

Analysing Competitors' Costs, Prices, and Offers

Competition affects price decisions. The firm has to examine competitors' costs, prices and competitive reactions to a price change.

Philip Kotler summarises the three Cs - the customers' demand schedule, the cost function, and competitors' prices in the form of three Cs model for price setting. Costs set a floor to the price. Competitors' prices and the price of substitutes provide an orienting point. Customers' assessment of unique product features establishes the ceiling price. (Figure 10.2)

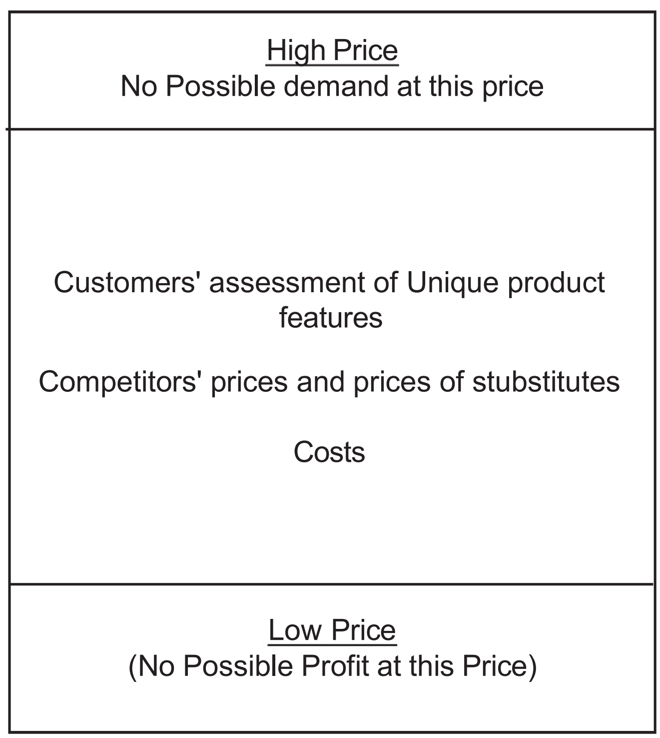

Figure 10.2. The three Cs Model for Price Setting.

Selecting a Pricing Method

Marketing managers follow certain techniques of setting price. We will examine these techniques in brief :

Full Cost or Mark Up Pricing : The marketer estimates the total cost of producing the product and then adds to it a mark up that the firm wants. This is the most elementary pricing method. This method ensures the firm to make a profit. But, it does not consider the value perception of the customer and the competitors' reaction.

Marginal Cost Pricing : In this method, the company works on the premise of recovering its marginal cost and getting a contribution towards its overheads. As long as the firm is able to recover this cost and get a contribution towards its overheads, it is an acceptable pricing method.

Going-Rate Pricing : This method is competition-oriented. This method is generally used in an oligopolistic market. Despite its advantage of preventing price wars, the method suffers from certain limitations. It is not always true that a decision taken in collective wisdom is the best.

Sealed - Bid Pricing : This is another form of competitive-oriented pricing. Here, the suppliers are asked to submit their quotations, as a part of a tender.

Perceived-value Pricing : Many marketers price their offerings on the basis of customers' perception of their value. This method takes into account the overall marketing strategy and the positioning strategy. Marketing research will play an important role here.

SELECTING THE FINAL PRICE

While selecting the price, the marketer must consider the following additional factors :

- The final price is influenced by other marketing mix variables such as quality of the product, product features (e.g., packaging, size, guarantee, service), promotion effort, distribution channels used and margins offered to distributors.
- The product's price must be consistent with the pricing policies of the firm.
- The company should also consider the reactions of certain groups such as distributors, suppliers, salesmen, competitors and government to the contemplated price.

6.3 PRICING POLICIES AND STRATEGIES

Having considered the factors affecting the pricing decisions, let us now examine different pricing policies and strategies adopted by the marketers.

Skimming Pricing

This involves setting up of high initial price for the new product. In other words, it is a premium price strategy. This pricing delivers results under the following situations:

i) When the target market associates quality of the product with its price;

ii) When the product is intended for high-income customer group;

iii) When the product is a really innovative one for which competition is weak.

Here, the firm's objective is to achieve an early break even point.

Penetration Pricing

As the name suggests, penetration pricing seeks to achieve greater market penetration through relatively low prices. This is an effective pricing strategy:

i) When the product is an imitative one for which there is a strong competition.

ii) When the market is very price sensitive,

iii) When the size of the market is large and a growing one.

Nirma Chemicals adopted penetration pricing stragegy in the case of its washing powder. Of late, Anchor toothpaste employed this strategy as an entry strategy.

Skimming Vs penetration pricing strategies are often known as new product pricing strategies.

Geographical Pricing

Here, the company has to decide how to price its products to different customers in different locations. For instance, should the company charge higher prices to distant customers to cover the additional transportation costs. In geographic pricing, a firm may charge a premium in one market and penetration price in another. Pricing policies may be evolved whereby the buyer pays all the freight, the seller bears the entire costs, or the two parties share the expense.

Discounts

Discount is an allowance made to the buyers. Discount can be of three types: trade, quantity and cash. The purpose of trade discount is to compensate the distributors for their services rendered. A quantity discount is a price reduction to those buyers who buy large volumes. A cash discount is a price reduction to buyers who pay their bills promptly.

Jack Trout provided the following directives to the marketers known as commandments of discounting:

- You should not offer discounts because everyone else does.
- You should be creative with your discounting
- You should use discounts to clear stocks or generate extra business.
- You should put time limits on the deal.
- You should make sure the ultimate customer gets the deal
- You should discount only to survive in a mature market.
- You should stop discounting as soon as you can.

Product -Line Pricing

A multi-product company can evolve a set of pricing strategies in order to manage its product line effectively. They are :

Price Bundling : This strategy is used by a firm to even out the demand for its product or service. For example, stereo music equipment like the disc player, equaliser, speakers and amplifiers may be sold at different prices individually which taken together may amount more than what a customer has to pay if he were to buy it as a composite music system.

Optional -Feature Pricing: Certain companies offer optional products and services along with the main products. For example, a car company has to decide which items to include in the price and which to offer as options.

Captive-Product Pricing : Marketers of razors and cameras normally offer them at a low price and set high markups on razor blades and film. For instance, Gillette offered two twin blades free with its razor to make the buyer purchases its blades. Similarly Kodak offered a film roll free to all buyers who bought its camera.

Two - Part Pricing : Here, the product can be divided into two distinct parts. Telephone companies charge a minimum monthly fee and charge for calls beyond a certain limit.

6.4 PRICE Vs NON-PRICE COMPETITION

The marketer has to decide whether to engage in price competition or in non-price competition. Companies initiate price cuts to meet or prevent competition. Of late, many English newspapers in India reduced their cover price in order to boost up their circulations. But according to Philip Kotler, price cuts involve possible traps:

- Low-quality trap: Consumers will assume that the quality is low.
- Fragile-market-share trap: A low price buys market share but not market loyalty.
- Shallow-pockets trap:The higher-priced competitors may cut their prices and may have longer staying power because of deeper cash reserves.

In non-price competition, marketers maintain stable prices. But they attempt to compete by highlighting non-pricing elements of thir marketing-mix. Promotion and product differentiation are two principal methods of non-price competition.

6.5 CHANGING PRICES AND RESPONDING TO COMPETITIONS

When competitors make price changes, there is often little time for careful research on competitors actions or on likely customer responses. Knowing why the competitor made the price change is more critical in determining the most appropriate response. Other questions are :

How will customers interpret and respond to the price change? The marketer has to understand the price elasticity in a particular market. Just as the marketer can misperceive a pricing move by competitors, so can customers. This can be to a firm's advantage or disadvantage. How will other competitors respond to the price change? An extreme response is "following the leader." Other responses include no change, a limited change, or a move to match or exceed the change made by the competitor sometimes, the price response may be combined with nonprice factors, such as an increase in advertising or improving product quality and features. How will customers and competitors respond to our response? The marketers must assess the impact of price changes on customers and competitors. Will a price increase benefit the industry? If the demand is high and buyers are not price sensitive, a hike in prices may be beneficial to all producers.

6.6 RESALE PRICE MAINTENANCE

The discussion on pricing would be incomplete without reference to the concept of resale price maintenance. It is the policy of establishing the minimum resale price below which the middlemen may not sell the products. The purpose of resale price maintenance is to prevent excessive price reduction by wholesalers and retailers.

Resale price maintenance will enable the firm to gain the co-operation and merchandising support of the retailers. The consumers are protected against over-charges by the retailers. However, the arguments against resale price maintenance are: i) it creates higher prices; ii) It protects inefficient retailers; iii) it retards the much warranted free competition.

Generally, resale price maintenance is practised in case of products such as drugs, liquor, cosmetics, cigarettes and books. The legal position of resale price maintenance is totally different. The MRTP Act of 1969 has declared the contracts of RPM as void, subject to certain exceptions. As it subsidises inefficiency, its abolition is justified on economic and social grounds in the Indian context.

6.7 SUMMARY

Pricing is the only element in marketing mix that generates revenue. Other elements are cost factors. In the post liberalisation era, most firms find themselves caught in a price war. Price-setting as a six-step procedure consists of the following steps: selecting the pricing objective; determining demand; estimating costs; analysing competitors' costs, prices and offers; selecting a pricing method; and selecting the final price.

Some of the pricing policies and strategies adopted by the marketers are: Skimming pricing; penetration pricing; geographical pricing; discounts; and product-line pricing. The marketer has to decide whether to engage in price competiton or in non-price competition. Companies initiate price cuts to meet or prevent competition. In non-price competition, the marketers attempt to compete by highlighting non-pricing elements of their marketing mix.

Resale price maintanance is the policy of establishing the minimum resale price below which the middlemen may not sell the products. The MRTP Act of 1969 has declared the contracts of RPM as void, subject to certain exceptions.

6.8 KEY WORDS

Discount: Discount is an allowance made to the buyers.

Fixed Costs: These costs do not change over the production volumes (e.g., rents, salaries, depreciation, R & D cost).

Non-Price Competition: Here, the marketers maintain stable prices and attempt to compete by highlighting non-pricing elements of their marketing-mix.

Penetration pricing : It seeks to achieve greater market penetration through relatively low prices.

Price: It is the exchange value of a product or service expressed in money.

Resale price maintenance : It is the policy of establishing the minimum resale price below which the middlemen may not sell the products.

Skimming pricing: This involves setting-up of high initial price for the new product.

Variable Costs : These costs vary directly is proportion to the volume of the product produced (e.g. raw material costs and wages).

6.9 SELF ASSESSMENT QUESTIONS

1. "Pricing is the only element in marketing mix that generates revenue. Other elements are cost factors." Elucidate the statement. Briefly discuss the pricing objectives.
2. What are the factors that should be considered while making pricing decisions? Would these change in the case of a new product? Why?
3. Distinguish between skimming pricing and penetration pricing with suitable examples.
4. Discuss various pricing policies and strategies.

6.10 FURTHER READINGS

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Lesson - VII

PROMOTION OF PRODUCTS

OBJECTIVES

After studying this lesson, you are able to :

- understanding meaning, and importance of advertising
- knowing the specific objectives of advertising
- learn different methods of setting advertising budget
- describing the important decisions related with message and media
- observing the various parameters for measuring advertising effectiveness

STRUCTURE

7.1 INTRODUCTION

Advertising and other elements of promotion are an integral part of the marketing process in most organizations. Promotion is best viewed as the communication function of marketing. It is accomplished through a promotional mix that includes advertising, personal selling, publicity, public relations, sales promotion, direct marketing, and interactive marketing. Over the years, the promotional function in most companies was dominated by mass-media advertising. However, more and more companies are recognizing the importance of integrated marketing communications, coordinating the various marketing and promotional elements to achieve more efficient and effective communication programs.

7.2 MEANING AND IMPORTANCE OF ADVERTISING

Advertising is defined as any paid form of non personal presentation and promotion of ideas, goods, or services by an identified sponsor. Business firms, charitable organisations, and government agencies use advertising to promote their products, services, ideas, and concepts. The types of advertising includes, brand, retail, political, business - to - business (B2B), institutional, public service, interactive, etc.,. Advertising plays four different roles in business and in society. They are Marketing, Communication, Economic and Societal in nature.

Figure 12. 1 Major Advertising Decisions

The important decisions to be made in developing an advertising program are depicted in the Figure 12.1 and described in the following sections. The major advertising decisions are:

1. Setting advertising objectives (Mission)
2. Setting advertising budgets (Money)
3. Message decisions (Message)
4. Media decisions (Media)
5. Evaluating advertising campaigns (Measurement)

7.3 OBJECTIVES OF ADVERTISING

An advertising goal or objective is a specific communication task and an achievement level to be accomplished with a specific audience in a specific period of time. Advertising objectives like, organizational objectives, should be operational. They should provide standards with which results can be compared. Operational objectives provide criteria for decision-making, and serve as a communication tool.

Russell Colley lists 52 possible advertising objectives in his book titled Defining Advertising Goals for Measured Advertising Results, popularly known as DAGMAR in which he outlines a method for turning objectives into specific measurable goals.

Advertising objectives can be classified into four categories. They are:

1. **Informative advertising:** This type of advertising aims to create awareness and information of new products or new features of existing products. Repeatedly the name of the product will be promoted. These ads include informing the market about price changes, explaining the customers how the product works, describing available services, correcting false impressions, reducing buyers' fears, building a company image.
2. **Persuasive advertising:** Aims to create liking, preference, conviction, and purchase of a product or service. These types of ads will persuade the customers to purchase now, building brand preferences, encouraging switching to their brands, changing customer perceptions of product attributes. Some persuasive advertisers use comparative advertising, which makes comparison of attributes of two or more brands.
3. **Reminder advertising:** This type of advertising aims to stimulate repeat purchase of products and services. Reminding customers that the product may be needed in the near future, reminding customers where to buy the product, keeping the product in customers' minds during off seasons, maintaining top-of-mind product awareness are some of the objectives of reminder advertising. For example, Pepsi and Coca-Cola ads on television are designed primarily to remind people about their brands, not to inform about the brand.
4. **Reinforcement adverting:** Aims to convince current purchasers that they made the right choice. These ads will reduce post purchase dissonance in the minds of customers. Hero Honda has recently issued ads in newspapers that it's Hero Honda CD Dawn vehicles sold 1,00,000 in 100 days. This will reinforce the existing owners as well as prospective customers.

7.4 ADVERTISING BUDGET

After determining its advertising objectives, the company thinks about the advertising budget. There are five specific factors to consider when setting the advertising budget:

1. **Stage in the product life cycle:** Products, which are in their initial stage of their life cycle, requires large amounts of advertising budget. New products generally require more budgetary support. Mature brands require less advertising budget.
2. **Market Share:** Brands with high market share require less advertising expenditure as a percentage of sales. Usually more advertising budget is required to build market as well as improving the market share.

3. **Competition and clutter:** If in the market there are many competitors and advertising spending is more, a brand must be advertised more heavily to be noticed.

4. **Advertising Frequency:** If the number of repetitions to convey the message is more the budget requirement is more.

5. **Product substitutability:** If the brand belongs to commodity class like soft drinks, detergent, cigarettes, etc., it requires more advertising spending. If the product offers unique physical benefits then there is a scope for more advertising.

Many advertisers implement a number of budgeting methods developed through practice and experience. Many firms employ more than one method, and budgeting approaches vary according to the size and nature of the firm. There are basically two approaches in setting the budget for advertising. They are Top-Down Budgeting and Bottom-Up Budgeting. They are illustrated in Figure 12.2.

Top-Down Budgeting **Bottom-Up Budgeting**

Top-down versus bottom-up approaches to budget setting
Figure 12.2

I. Top-Down approach:

In Top-Down approach budgetary amount is established at top management level and the money will be allotted to various departments. These budgets are predetermined and have no theoretical basis. The methods in this approach are:

- Affordable method
- Arbitrary Allocation method
- Percentage of sales method
- Competitive Parity method
- Return on Investment (ROI) method

II. Bottom-Up approach:

Bottom-Up Budgeting also known as Build-Up Approach budget appropriation is linked to the objectives and strategies designed to accomplish them. In this approach first the companies consider the firm's communications objectives and then allocate the budget to achieve these objectives. The methods in this approach are:

- Objective and Task Method
- Quantitative models

Now we examine these methods in detail.

A. Top-down approach:

a) **Affordable Method:** In the affordable method (also known as "all-you-can-afford method"), the firm determines the amount to be spent in various areas such as production and operations. Then it allocates left over amount to advertising and promotion, considering this to be the amount it can afford. The task to be performed by the advertising is not considered. There is every chance that the firms may over- or underspend on advertising. The firms, which are not marketing driven and do not understand the importance of advertising, will follow this method.

b) **Arbitrary method:** In this method management determines the budget solely on the basis of what is felt to be necessary. In this method no theoretical basis is considered and the budgetary amount is set by fiat. The arbitrary allocation approach has no obvious advantages. The concept and purpose of advertising is ignored in this approach.

c) **Percentage of Sales Method:** This is a very popular method used by the large firms to set their budgets. The advertising and promotions budget is based on sales of the product. In this method the management determines the amount either by taking a percentage of sales value or assigning a fixed amount of the unit product cost to promotion and multiplying this amount by the number of units sold. A variation of the percentage-of-sales method is using projected future sales of the coming year as a base instead of sales of completed year.

d) **Competitive parity Method:** In this method, managers establish advertising budget amounts by matching the competition's percentage-of-sales expenditures. It is always an advantage to know what competitors are doing and how much they are spending. In a market with many competitors and high advertising spending, one should compete with them on similar lines. However this method has limitations, even though spending similar amounts does not have the same results. Creative presentation and media choice play an important role. There is no guarantee that the competitors will continue the same policy and strategies.

e) **Return on Investment (ROI):** In the ROI budgeting method, advertising and promotions are considered investments, like plant and equipment. The investment should result in generation of return. The basis for this method is incremental investments in advertising and promotions leading to increase in sales. However it is very difficult to assess the returns provided by the promotional effort. This is the less popular method used in setting advertising budgets.

B. Bottom-UP approach:

The major limitation of Top-Down methods is that these judgmental approaches lead to predetermined budget appropriations often not linked to objectives and the strategies designed to accomplish them. In Bottom-Up approach the idea is to make objective setting and budgeting go hand in hand.

a) **Objective and task method:** The objective and task method of budget setting uses a buildup approach consisting of three steps: (1) defining the communications objectives to be accomplished, (2) determining the specific strategies and tasks needed to attain them, and (3) estimating the costs associated with performance of these strategies and tasks. The total budget is based on the accumulation of these costs. It is important that objective setting and budgeting go hand in hand rather than sequentially.

b) **Payout Planning**: Payout determines the investment value of the advertising and promotion appropriation. The basic idea is to project the revenues the product will generate, as well as the costs it will incur, over two to three years. Based on an expected rate of return, the payout plan will assist in determining how much advertising and promotion expenditure will be necessary.

c) **Quantitative Models:** These methods employ computer simulation models involving statistical techniques such as multiple regression analysis to determine the relative contribution of the advertising to sales. Because of the problems associated with these methods, their acceptance has been limited.

There is no universally accepted method of setting advertising budget. Limitations in each method may make it unfeasible or inappropriate. Each firm has to decide its own advertising budget by considering pros and cons of each method.

7.5 ADVERTISING MESSAGE

Advertising strategy consists of two major elements: creating advertising messages and selecting advertising media. The message decision involves generating messages, evaluating and selecting among them, and executing them effectively. Advertising effectiveness to a very large extent is dependent on the type of message and copy selected for communication, and the way it is executed. Well conceived advertising objectives guide in the development of effective message and copy.

The creative people develop advertising messages. Advertising agencies get reputation for their creative ability. It is the job of creative people to turn all of the information regarding the product features and benefits, marketing plans, consumer research, and communication objectives into a creative concept that will bring the advertising message to life. Advertising creativity is the ability to generate fresh, unique, and appropriate ideas that can be used as solutions to communications problems. Some people argue that advertising is creative only if it sells the product. Some others judge the creativity of an ad in terms of its artistic or aesthetic value and originality.

7.5.1 Advertising Campaigns:

Majority of ads are part of a series of messages that belongs to a particular advertising campaign. Advertising campaign, which is a set of interrelated and coordinated marketing communication activities that center on a single theme or idea that appears in different media across a specified time period. A campaign theme should be a strong idea, as it is the central message that will be communicated in all the advertising and other promotional activities. Some of the examples of successful long-running advertising campaigns themes are listed down in Table 12.1. A creative strategy that focuses on what must be communicated will guide the selection of the campaign theme and the development of all messages used in the ad campaign.

An important part of creative strategy is determining the central theme that will become the **major selling idea** of the ad campaign. There are different creative approaches that have emerged over the years and widely used by ad agencies throughout the world. They are:

- Using a unique selling proposition.
- Creating a brand image.
- Finding the inherent drama.
- Positioning.

Table 12.1 Examples of successful long-running advertising campaigns

Company or Brand	Campaign Theme
Hero Honda	"Fill it, shut it and Forget it"
Intel	"Intel inside"
Nike	"Just do it"
DHL	"We move the world"
De Beers	"A diamond is forever"
BMW	"Ultimate driving machine"
Pepsi	"Generation Next"

1. **Unique Selling Proposition (USP):** The concept of USP was developed by Rosser Reeves and is described in his influential book 'Reality in Advertising'. He noted three characteristics of unique selling proposition;

   a) the proposition must involve a specific product benefit

   b) the proposition must be unique

   c) the proposition must sell

   There must be a truly unique product or service attribute, benefit, or inherent advantage that can be claimed as unique selling proposition. The USP should dominate the ad and be emphasized through repetitive advertising.

2. **Brand Image:** David Ogilvy popularized the idea of brand image in his famous book 'Confessions of an Advertising Man'. He believes in developing prestige image of the brand. Image advertising has become increasingly popular and is used as the main selling idea for a variety of products and services, including soft drinks, liquour, cars, airlines, perfumes, and clothing.

3. **Inherent Drama:** Leo Burnett proposed this approach and he said "inherent drama is often hard to find but it is always there, and once found it is the most interesting and believable of all advertising appeals." He believed advertising should be based on a foundation of consumer benefits with an emphasis on the dramatic element in expressing those benefits.

4. **Positioning:** Jack Trout and Al Ries introduced the concept of positioning as a basis for advertising strategy in the early 1970s and has become a popular basis of creative development. The basic idea is that advertising is used to establish or position the product or service in a particular place in the consumer's mind. Positioning is often the basis of a firm's creative strategy when it has multiple brands competing in the same market. For example, HLL markets more than 10 brands of toilet soaps and positions each one differently.

The USP, brand image, inherent drama, and positioning approaches are often used as a basis of the creative strategy for ad campaigns. An advertising message can be presented or executed in the following ways:

- Straight sell or factual message
- Scientific/ technical evidence
- Demonstration
- Comparison
- Testimonial
- Humour
- Dramatizations
- Fantasy
- Personality symbol
- Animation

7.5.2 Ad Copy:

The verbal or written material of an advertisement including the headline, illustration, name and address of the advertiser and his signature. It refers to every single element that appears in an advertisement. Message and source are the basic elements of ad copy. The basic components of a print ad are the headline, the body copy, the visual or illustrations, and the layout. The copywriter has to write the message in such a way that it holds the interest of reader. Some of the David Ogilvy's principles of good ad copy are:

- "Never write an advertisement you wouldn't want your own family to read."
- "Big ideas are usually simple ideas."
- "Every word in the copy must count."

7.5.3 Media Planning & Strategy:

Media planning is the series of decisions involved in delivering the promotional message to the prospective purchasers and/or users of the product or brand. The media plan acts like a guide for media selection. It requires development of specific media objectives and specific media strategies designed to attain these objectives. The media strategy must be designed to supplement and support the overall marketing and communications objectives. The media strategy is to determine the best matching of media to the target market, within the budget.

The advertising message is communicated through the medium, which includes broadcast media like TV and radio, print media like newspapers and magazines, direct mail, outdoor advertising, and other support media. Internet is becoming a new media and is slowly getting acceptance from market participants.

Media selection is finding the most cost-effective media to deliver the desired number and type of exposures to the target audience. The effect of exposures on audience depends on the exposures' reach, coverage, frequency, and impact.

Reach is a measure of the number of different audience members exposed at least once to a media in a given period of time. **Coverage** refers to the potential audience that might receive the message through a vehicle. Coverage relates to potential audience; reach refers to the actual audience delivered. **Frequency** refers to the number of times the receiver is exposed to the message in a specified time. **Impact** is the qualitative value of an exposure through a given medium.

Major Media Types:

Media planners should have knowledge about the capacity of the major media types to deliver reach, frequency, and impact. Different media available now for promoting products, services, and concepts like, newspapers, television, direct mail, radio, magazines, outdoor, yellow pages, newsletters, telephone, internet, etc., are having their own advantages and disadvantages.

One has to consider the target audience media habits, product or service characteristics, message characteristics, and cost to select appropriate medium to reach the consumers.

7.5.4 Cost of Advertising:

One of the important decisions in the development of media strategy is cost estimating. Advertising and promotional costs can be categorized in two ways.

1. **Absolute cost:** The absolute cost of the medium is the actual total cost required to place the message.
2. **Relative cost:** The relative cost refers to the relationship between the price paid for advertising time or space and the size of the audience delivered. It is used to compare different media to optimize audience delivery within budget constraints.

Advertisers must compare the relative costs of media as well as vehicles within these media to evaluate various alternatives for promoting their products and services. The following cost bases are used to calculate advertising costs.

- **Cost per thousand (CPM):** Over the years the magazine industry has provided cost breakdowns on the basis of cost per thousand people reached. The formula to calculate CPM is

$$\text{CPM} = \frac{\text{Cost of ad space (absolute cost)}}{\text{Circulation}} \text{ X } 1{,}000$$

- **Cost per ratings point (CPRP):** The broadcast media provided a different comparative cost figure, known as cost per ratings point or cost per point. The formula to calculate CPRP is

$$\text{CPRP} = \frac{\text{Cost of commercial time}}{\text{Program Rating}}$$

- **Daily inch rate:** For newspapers, cost effectiveness is based on the daily inch rate, which is the cost per column centimeter of the paper. Normally a newspaper consists of 8 columns. Depending on the number of columns and centimeters booked in the newspaper the cost will be calculated. Nowadays like magazines, newspapers now use the cost-per thousand formula to determine relative costs.

It is difficult for the media planners to make comparisons across various media, as there is no standardized relative costing procedure. The broadcast and newspaper media have begun to provide costs per thousand, using the following formulas:

$$\text{Television} = \frac{\text{Costs of 1 unit of time} \times 1{,}000}{\text{Program rating}}$$

$$\text{Newspapers} = \frac{\text{Cost of ad space} \times 1{,}000}{\text{Circulation}}$$

The comparison of media on a CPM basis is important. However inter media comparisons can be misleading as different media have different advantages and disadvantages. Now we see the profiles of various media types to understand their advantages and limitations.

12.5.5. Media Profiles:

A) Television:

Television and radio comes under broadcast media category. The ability of TV to combine visual images, sound, motion, and colour presents the advertiser with the opportunity to develop the most creative appeals than in any other medium.

Advantages:

1. **Creativity and impact:** The interaction of sight and sound offers tremendous creative flexibility. Television is an excellent medium for demonstrating a product or service. Emotions, moods can also be depicted.
2. **Coverage and cost effectiveness:** Television advertising makes it possible to reach large audiences. Companies selling mass - consumption products are benefited by TV coverage. The cost of reaching large sections of the mass market is relatively low.
3. **Captivity and attention**: Television ads impose themselves on viewers as they watch their favorite programs. TV ads have an effect on consumers simply through heavy repetition and exposure to catchy slogans and jingles.
4. **Selectivity and Flexibility:** Television is basically a nonselective medium because through TV it is difficult to reach a specific market segment. But nowadays some selectivity is possible due to variations in the composition of audiences as a result of program content, broadcast time, and geographic coverage. Growth of Cable TV and regional channels is offering wide opportunity to the advertisers.

Limitations:

1. **Costs:** Absolute costs are very high. Despite the efficiency of TV in reaching large audiences, it is an expensive medium in which to advertise. Producing quality commercial is also quite expensive.
2. **Lack of Selectivity:** Some selectivity is possible in television through variations in programs and cable TV. But television still does not offer as much audience selectivity as radio, magazines, newspapers, or direct mail for reaching precise segments of markets.

3. **Fleeting Message:** TV ads usually of 30 seconds or less duration does not leave tangible evidence for viewer to consider. Ads are becoming shorter and shorter as the demand for limited amount of broadcast time has increased and advertisers try to get more impressions from their media budget.
4. **Clutter:** Advertiser's message is only one of many spots along with other non programming material seen during a commercial break; So it may not be noticed by viewers.
5. **Limited Viewer Attention:** The size of the viewing audience is geting reduced during commercial breaks. The increased usage of remote control has led to the problems of zipping and zapping. Zipping occurs when customers fast forward through the commercials of recorded programs. Zapping refers to changing channels to avoid commercials. With remote control on hand viewers surf channels when the advertisements are telecasted.

B) Newspaper

Newspapers are one of the major forms of print media and are the largest of all advertising media in terms of total money spent.

Advantages:

1. **Extensive Penetration:** Newspapers provide high degree of market coverage or penetration. The extensive penetration makes newspaper a truly mass medium and provides advertisers with an excellent opportunity for reaching all segments of the market with their message.
2. **Flexibility:** Newspaper ads can be written, and prepared in short time. These ads can be produced in various sizes, shapes, and formats. Scheduling can be done in many ways.
3. **Geographic Selectivity:** Newspapers offer advertisers more geographic selectivity. For example, Malayalam Manorama in Kerala, Eenadu in Andhra Pradesh with their local supplements offer more selectivity to the advertisers.
4. **Involvement and Acceptance:** Consumers generally read newspapers to make some consumption decisions. Consumers use newspapers as a source of information.
5. **Services Offered:** The services offered by newspapers in the form of consumer surveys, readership studies, free copy writing and art services, merchandising services makes this medium more popular.

Limitations:

1. **Poor Reproduction:** The newsprint used to publish newspapers is generally of poor quality and may not be suitable for producing good effect.
2. **Short Life Span:** Daily newspaper life span is very short and is less than a day. Beyond the day of publication it may not have any impact. Repeat exposure is very unlikely. Some sections of the newspapers may not be opened by the readers.
3. **Clutter:** like most other advertising media, newspapers suffer from clutter. More than 50% of the newspaper is devoted to advertising the advertiser's message and must compete with other ads for getting consumers' attention.
4. **Lack of selectivity:** Newspapers can offer geographic selectivity, but they are not a selective medium in terms of demographics or lifestyle characteristics.

C) Magazines

Magazines have a number of characteristics that make them attractive as an advertising medium.

Advantages:

1. **Selectivity:** Magazines are the most selective of all media except direct mail. Different magazines are published for different groups. For example in India Woman's Era and Femina are for women, Gentleman for men, Business World, Business Today offers selective reach.
2. **Reproduction Quality:** Magazines offer high reproduction quality. The magazines are generally printed on high quality paper with latest printing technology and provide excellent reproduction.
3. **Creative Flexibility:** Magazines offer advertisers a great deal of flexibility in terms of type, size, and placement of advertising material.
4. **Permanence:** Magazines offer another advantage in the form of long life span. Magazines are generally read over several days and can be referred back.
5. **Prestige:** The product or service may gain from advertising in publications with certain image. By seeing ads in prestigious magazines, consumer's confidence in a particular brand may increase.
6. **Consumer Receptivity and involvement:** Magazines are generally purchased because the information they contain and ads provide additional information that may be of value in making a purchase decision.

Disadvantages:

1. **Costs:** The absolute costs of advertising in magazines are high. Advertisers with limited budgets may not consider relative costs.
2. **Long Lead Time:** One of the important limitations of magazines is the long lead time needed to place an ad. Space must be purchased and the ad must be prepared well in advance of the actual publication date.
3. **Clutter and Competition:** The more successful a magazine becomes, the more advertising pages it attracts, and this leads to clutter.

Other media types include direct mail, radio, outdoor, internet, yellow pages have their own advantages and limitations.

7.6 METHODS OF ADVERTISING EVALUATION

The measurement of advertising effectiveness is done to test both the communication effects and sales effects of an ad. The fundamental research on effectiveness is very little.

Communications-Effect:

Communication-effects of an ad tell whether the ad is communicating well. Copy testing is the method used to test this effect. This can be done before an ad is put into media and after it is printed or broadcast. These are known as pre testing and post testing of an ad.

Consumer Feedback: The consumer feedback method asks consumers certain questions for their reactions on a proposed ad.

Portfolio Tests: Consumers are exposed to a number of advertisements, and are then asked to recall all the ads and the content, aided or unaided by the interviewer. Recall level indicates the ad's effectiveness.

Laboratory Tests: These tests use equipment to measure physiological reactions like heart-beat, blood pressure, pupil dilation, galvanic skin response, perspiration to an ad. These tests measure attention power but reveal nothing about impact on beliefs, attitudes, or intentions.

Post-testing the communication impact of a completed ad campaign is also useful to advertisers. The advertiser can measure how the ad affected consumers recall or product awareness, knowledge, and preference.

Sales-Effect:

Measuring the sales effect of an ad is more difficult than the measuring the ad's communication effect. There are many factors which influence the sales other than advertising at the same time, such as, price, product's features, availability, competition, etc., One method of measuring the sales effect is the **historical approach** which involves correlating past sales with past advertising expenditures using statistical techniques. Another method is **experimental approach**. By altering ad spending in similar markets the advertiser tries to measure the impact on sales by advertising.

7.7 SUMMARY

Advertising is one of the important elements in promotional mix of a firm. Advertising is any paid form of non personal presentation and promotion of ideas, goods, or services by an identified sponsor. The major objectives of advertising are communication and sales. The important players in developing the advertising program are advertiser, advertising agency, media, and audience. With the development of technology different media options are available to the advertiser. Internet is fast becoming one of the important media vehicles especially in business-to-business model. Companies are recognizing the importance of integrating their marketing communications and following integrated marketing communications (IMC). Advertising along with direct mail, personal selling, publicity, and sales promotion plays a crucial role in achieving the promotional objectives.

7.8 KEY WORDS

Advertising goal is a specific communication task and achievement level to be accomplished with a specific audience in a specific period of time.

DAGMAR Defining Advertising Goals for Measured Advertising Results, is a model developed by Russell Colley in 1950. According to DAGMAR, advertising has to perform a specific communication task; the task has to be accomplished among a well-defined audience within a specified time period.

Ad Copy The verbal or written material of an advertisement including the headline, illustration, name and address of the advertiser and his signature.

Advertising agency: A marketing services firm that assists companies in planning, preparing, implementing, and evaluating all or portions of their advertising programs.

AIDA The letters in the acronym denotes Attention Interest Desire Action. The model suggest that any effective impersonal sales presentation should attract attention, gain interest, arouse a desire and result in action.

CPM Cost per reaching thousand

7.9 SELF ASSESSMENT QUESTIONS

1. It is said that advertising is a waste of scarce resources in a developing country like India. Do you agree?
2. Classify the different advertising objectives and explain DAGMAR method.
3. Describe the methods of setting up of advertising budget.
4. Describe the important advertising media and mention their advantages and limitations.
5. Explain how advertising messages are created?
6. What are the different methods of advertising evaluation?

7.10 FURTHER READINGS

1. George E. Belch & Michael A. Belch., Advertising and Promotion An integrated communications perspective (2001), Tata McGraw-Hill Publishing Company Limited, New Delhi.
2. William Wells, John Burnett, Sandra Moriarty, Advertising Principles & Practice (2002), Prentice-Hall of India Private Limited, New Delhi.
3. Rajeev Batra, John G. Myers, David A.Aaker, Advertising Management (1996), Pearson Education Inc, New Delhi.
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5. S A Chunawalla, K C Sethia, Foundations of Advertising Theory & Practice (1997), Himalaya Publishing House, Mumbai.

LESSON - 1

FINANCIAL MANAGEMENT : AN OVERVIEW

Objectives

After studying this lesson, you should be able to :

- ☆ know the meaning of Finance and scope of Financial Management
- ☆ discuss the various financial objectives of a company
- ☆ analyse the Financial goals of a company
- ☆ familiarise the major decisions involved in Finance Function
- ☆ explain the concept of time value of money

Structure :

1.1. Introduction

Business is an economic activity which involves the use of economic resources (machine, material, money,men, etc) for the production of goods (refrigerator, tooth paste, soap, truck etc) and services (insurance, banking, communication, transport, etc). These goods and services are expected to be sold at a price which is more than the cost of producing them, resulting in a surplus or profit.

When a business enterprise plans to do any activity, it has to make a market survey to estimate the demand for the product and to estimate the life of the business.

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When a business enterprise plans to do any activity, it has to make a market survey to estimate the demand for the product and to estimate the life of the business.

The demand estimate helps in the finalisation of plant capacity (i.e; number of units a plant can manufacture in a specific period of time) or scale of operations. Once the plant capacity is finalised, the area of the site required to construct the business premises (consisting factory buildings, godowns, office building etc); number or personnel (human resource) required, raw material requirement are estimated. The enterprise finanlises its scale of operations and based on it, the capital (both permanent and working capital) requirement is estimated.

Depending upon the nature of business, the size of capital varies. A business with manufacturing activity requires more capital than what is required for a trading business or service organisations. Business of providing services like transportation, communication, banking, insurance, warehousing, etc. Involves the need for estimating the capital requirement (i.e; amount of money that is required for investment in various assets)

Once capital requirement is estimated, the enterprise has to find sources of mobilising these funds. It has to identify sources for meeting the permanent capital requirement (i.e; to acquire plant, machinery buildings, technical know-how, patents etc,) and short-term capital requirement (i.e; to buy raw material, to pay for labour etc). From among the various sources that provide long term or short term funds an enterprise has to choose.

A business enterprise strives to achieve a surplus. To achieve this goal, an enterprise invests funds in various income earning assets by obtaining funds from various sources. Thus, the financial function is all about the following activities.

- ☆ to determine the funds requirement
- ☆ to determine the assets to be acquired
- ☆ to determine the pattern of financing the assets.

1.2. Meaning of Finance

No activity of business can be performed without the involvement of finance. That is why 'financc' is cosidcrcd as "Life blood of busincss". Financc holds the key to all busincss activities.

The Envyclopaedia of Britannica defines finance as "the act of providing the means of payment". According to Paul G. Hasings 'finance' is the management of the monetary affairs of a company. Howard and Upton defines 'finance' as the management of the flow of cash so that the organisation will have the means to carry out its objectives and at the same time meet its obligations as they become due. Their emphasis is on the liquidity aspect of finance. John Hampton interprets finance as the management of the flow of money. In a modern money economy finance may be defined as the provision of money at the time it is needed. Therefore, finance is concerned with every activity, which involves the use of money.

Meaning of 'financial management':

Financial management study about the process of procuring and judicious use financial resources with a view to maximise the value of a business enterprise thereby the value to the owners is maximised. Guthmann and Dougall defines financial management as "the activity concerned with the planning, raising, controlling of firm's finacial resources".

In a company form of organisation, according to James ~~C.~~Van horne, financial management 'endeacours to make optimal in vestment, financing and dividend decisions'.

I.M.Pande defines financial management as "that managerial activity that is concerned with the planning and controlling of the firm's financial resources. According to him managing funds most wisely with a view to maximise the wealth of the share holders is financial management.

'Business activities concerned with the acwuisition and conservation of capital funds in meeting the financial needs and overall objectives of business enterprise come under funancial management', according Wheeler.

1.3 Scope of financial management

As wr understood from the previous section, financial management is concerned with all decisions involving finance. There fore the scope financial management encompasses all the financial decisions taken by a business enterprise. A business enterprise is established for earming income. Major decisions in any business are related to acquisition of assets for business purpose and funancing these assets bu tapping various sources of finance. The first decision is known as 'investment' decision and second decision is known as 'financing' decision.

Assets' requirements are two types:

(1) Fixed assets like land, buildings, plant, machinery, furniture, technical know-how, patcnt rights, copy rights crc

(2) Current assets like inventory (raw materials, working in progress, finished goods), receivables, debtors cash etc.

Expanding the scale of operations, enteringh a new market, introduction of new products ect are some of investment decisions that involve the acwuisition of fixed assets. They provide returns for a long period. There fore these are also called long term investment decisions.

Current assets afre poerating asets, which are rewuired for smooth conduct of business. What should be the investment in thesfe current assets? or what should be the level of these currint assets? is a crucial inbestmenr decision. Because, exerss levels of currint assets cut into the profitabilityh of a business and insufficiency of currint assets tesult in loss of liquidity. These decisions are called shoret-term inbestment decisions because their impact on the business is for a short period.

☆ Takes - up internal audit to establish proper checks and controls.

☆ Decides the dividend policy of the company.

All the above mentioned functions are supposed to be discharged by a Financial Mmanager, with in the frame work of laws in force, for the ultimate achievement of wealth maximisation of shareholders.

1.5. Finance Functions.

Finance Functions are important activities in the business management irrespective of nature, size, age and structure of the organisation. A business finance function expresses the relationship between value of a business enterprise and its various determinants. Value of a business enterprise is nothing but its net worth to the owners. Net worth is the difference between the market value of assets and the value of liabilities (outsidersí claims)

Net Worth = Assets - Liabilities

If net worth of a business enterprise increases it can be interpreted that the value of a business enterprise is rising. The value of a business depends upon the following factors.

1.5.1 Internal :

☆ Investment activities

☆ financing mix

☆ distribution of profits

1.5.2 External :

☆ State of the economy

☆ Capital market conditions.

☆ Tax rates

Among these factors some are controllable and some are uncontrollable. Assuming that the uncontrollable factors are held constant, the value of a business is a function of internal or controllable factors. Therefore, value of a business is a function of investment, financial, distribution of profits.

V = f [I, F, D]

1.6. Organisation of Finance Function

Finance is an integral part of a company. All functional areas of management are related to finance function. Production, marketing, human resource etc. are related to finance. In the area of finance specific tasks are performed by specialists. The organisation of finance function can be better understood by the following figure 1.1

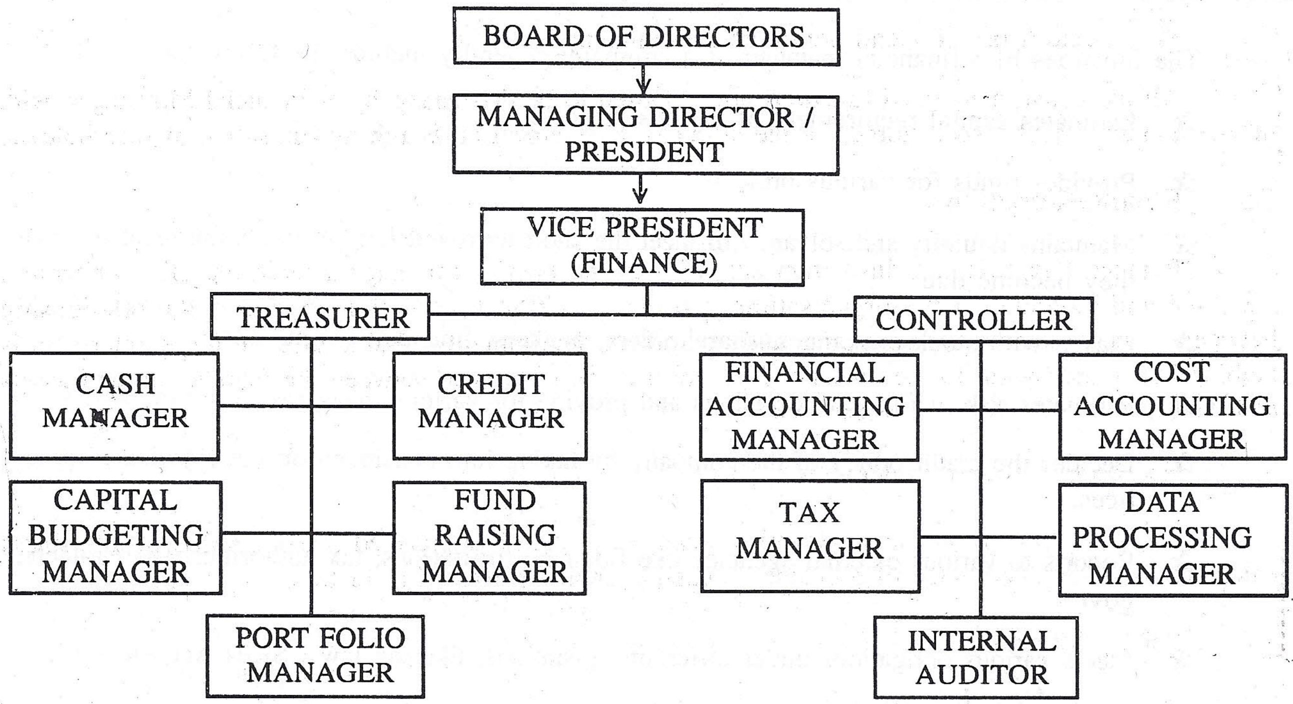

Figure 1.2

Organisation of Finance Function

1.7. Financial goals of the company

Company is a form of organisation in which the ownership and management are separated. Shareholders are the owners and the board of directors are the agents of the shareholders. The team of management takes various decisions involving the profitability and perpetuity of the company. When these strategic decisions are taken, what should be the goal of the firm ? It is the fundamental question which automatically leads us to the economic benefit to the shareholders. As shareholders provide capital and face maximum risk, they expect the company the company to provide them maximum return.

There the two widely discussed approaches to achieve the above objective.

(a) Profit maximisation

(b) Wealth maximisation

Should be company aim at maximising profit or wealth ?

1.4. Role of a Financial Manager

The functions of a financial manager of a company generally include the following:

- ☆ Estimates capital requirement of various projects.
- ☆ Provides funds for various projects.
- ☆ Maintains liquidity and solvancy to meet the short-term and long term commitments, when they become due
- ☆ Liason with stock exchanges, shareholders, bankers, financial institutions
- ☆ Estimates risk in financial decisions and provide for various measures to minimise risk.
- ☆ Decides the credit policy of the company by taking into consideration the established practices.
- ☆ Reports to various external agencies like financial institutions, tax authorities, shareholders, govt.
- ☆ Meets various obligations under different legistations, like tax laws, SEBI Act, etc.
- ☆ Takes up internal audit to establish proper checks and controls.
- ☆ Decides the dividend policy of the company.

All the above mentioned functions are supposed to be discharged by a Financial Mmanager, with in the frame work of laws in force, for the ultimate achievement of wealth maximisation of shareholders.

1.5 FINANCIAL GOALS OF THE COMPANY

Company is a form of organisation in which the ownership and management are separated. Share holders are considered the owners where as board of directors are their agents. The separation of ownership and the owners. The objectives of management may differ from those of the shareholders. In big copanies where shares are held by a large number of share holders it is difficult to make the managemenr know the expectations of the share holders. Managers may have persomal goals that compete with shateholders' wealth maximixation goalj and such conflict is known as agency conflict. The separation of ownership from management creates a situation in which the management may act in its own interests rather than those of the management will make optimal decisions only if appropriate incentives ate given. To teduce agency conflict, shate holders must incur agency costs, wh8ich include all costs borne by shateholders to encoutage managetrs to maximize the stock price rather than act in their own self-interest. The optimal solution lies in the situyation where executive compenasation is tied eo performance.

Presently, as majority of the shares in companies is owned by institutional investors such as insurance companies, mutual funds, pension funds, ect., and representatives of the lending agencies like development banks are being placed on the Board of Directors of companies there is a considerable scope for exercising influence over a company's operations. Another notable feature is that the belief in practicing good corporate governance is on the rise.

The team of management takes various decisions involving the prosperity and perpetuity of a company. When such strategic decisions are what goal should guide them. Obviously the economic interest of the share holders, who are taking the maximum risk, should guide the manegement.

There are two widely discussed approaches to achieve the above objective.

(a) Profit Maximisation

(b) Wealth Maximisation

Should the company aim at maximising profits of wealth?

1.5.1. Profit Maximisation :

Business is an economic activity, where scarce resources are used to produce goods and services. Business activities involve costs and revenues. The unique measure of efficiency is surplus, i.e, the excess of revenues **over costs**, which is popularly known as profit. Therefore a company should aim at profit maximisation. This goal can be justified on the following grounds.

1. Economic activity aims at utility maximisation. Utility is measured in terms of profits.
2. Profit is a measure of economic efficiency
3. Profit leads to efficient allocation of resources
4. It ensures maximum social welfare
5. It leads to efficient use of important and scarce resources.

Profit maximisation goal of a company is having the following limitations.

i) Ambiguity : The goal of profit maximisation is considered to be very vague and ambiguous. Profit has various connotations and amenable to different interpretations by variours persons. For example, profit may be,

short run profit	or	long run profit, total profit or rate of profit,
after tax profit	or	Before tax profit,
return on equity	or	return on total capital employed.

There will be always a dilemma as to which of these variations of profits should a company try to maximise.

ii) It ignores the timing of benefits : The goal of profit maximisation ignores the differences in the timing of benefits from investment. Between two alternative projects which have different time pattern of profits, the goal makes no difference. For example, project A and project B have the following profits

Implications of Wealth Maximisation :

- ☆ The goal aims at prosperity and perpetuity of a company.
- ☆ The goal helps in measuring the performance of a company
- ☆ The goal helps in allocation / reallocation of scarce resources
- ☆ It helps the company in discharging its responsibilities effectively, such as
  - * Consumer protection
  - * Payment of fair wages
  - * Provision of safe working conditions.
  - * Environmental protection.
  - * Support to social problems.
- ☆ It leads to efficient use of scarce and precious resources
- ☆ It considers risks associated

What is Wealth Maximisation ?

Wealth maximisation means maximising the net present value of a course of action. Net present value (NPV) is the difference between present value of expected benefits and present value of costs.

If the benefits at end of each each year are

A_1 , A_2 , A_3 , ... A_n

the present value of these benefits can be calculated by discounting the future benefits by using a dsicounting factor, i.e.,

$$\frac{A_1}{(1+K)}, \quad \frac{A_2}{(1+K)^2}, \quad \frac{A_3}{(1+K)^3} \cdots\cdots\cdots\cdots \frac{A_n}{(1+K)^n}$$

Sum of these present values is the PV of future benefits .

If costs at the end the of each year, are

C_o , C_1 , C_2 , C_3 .... C_n

Their present value the investments is calculated as under :

$$C_0, \quad \frac{C_1}{(1+K)^1}, \quad \frac{C_2}{(1+K)^2}, \quad \frac{C_3}{(1+K)^3}, \cdots\cdots\cdots\cdots \frac{C_n}{(1+K)^n}$$

Sum of these present values is the PV of costs of investment

NPV = PV of Benefits - PV of costs

Search for high profits may result in the collapse of the company, as it involves high degree of risk. And goes against the interest of the shareholders who are bearing the maximum risk. Therefore, profit maximisation is not considered to be an appropriate goal.

The goal of EPS maximisation also suffers from the following limitations : (i) its does not specify the time of expected returns (ii) it does not consider risk associated with future earnings, and (iii) it does not take into account the financial risk.

1.5.2. Wealth maximisation : Principle of maximisation of shareholders wealth is the rational guide for running a business. The goal of a company is to maximise the present wealth of the owners i.e. equity shareholders in a company. Company's equity shares are actively traded in the stock market. Shareholders wealth is represented by the market value of equity holdings. Market price of share acts as an index of performance of a company. Shareholders' wealth maximisation means the maximisation or market price of share (MPS). If MPS is a measure of efficiency, the goal or maximisation of wealth helps in the efficient allocation of financial resources in a society.

Implications of Wealth Maximisation :

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- ☆ The goal helps in measuring the performance of a company
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Sum of these present values is the PV of costs of investment

NPV = PV of Benefits - PV of costs

$$= \left[\frac{A_1}{(1+K)} + \frac{A_2}{(1+K)^2} + \ldots\ldots\ldots \frac{A_n}{(1+K)^n}\right] - \left[C_0 + \frac{C_1}{(1+K)} + \frac{\quad}{(1}\right.$$

$$\text{NPV} = \left[\sum_{t=1}^{n} \frac{A_t}{(1+K)^t}\right] - \left[\sum_{t=0}^{n} \frac{C_t}{(1+K)^t}\right]$$

In the above equation K referes to the discount rate and t refers to the time period.

Every financial decision involves costs and benefits and also result in NPV. Maximisation of this NPV is construed as maximising wealth of financial decisions which have a long term impact on the company. They are strategic, crucial and which involve risk are

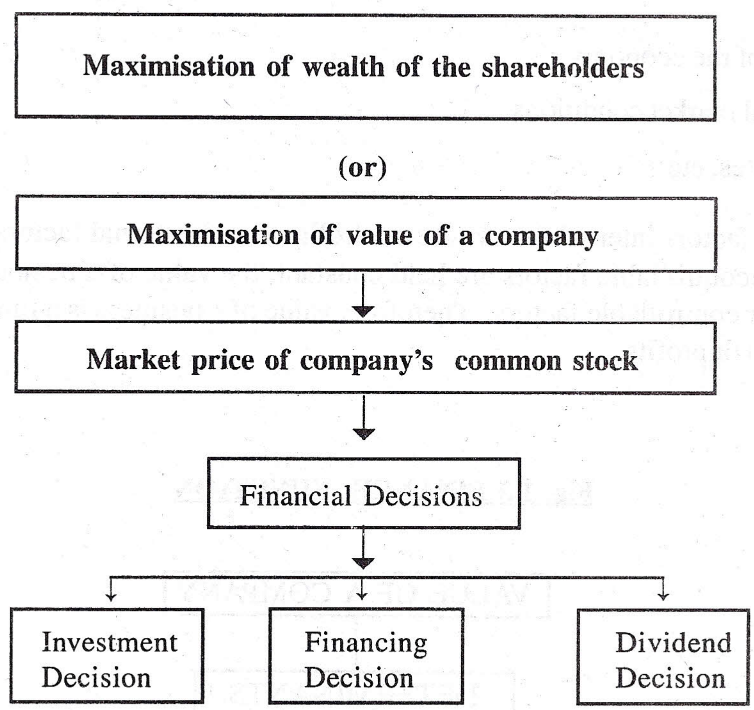
☆ Investment decision

☆ Financing decision

☆ Dividend decision

These decisions taken with an objective of maximising Net Present Value (NPV) result in value maximisation of the company and inturn wealth maximisation of shareholders.

Fig. 1.2 Goal of a company



Value of a company = f [Investment, Financing, Dividend decision]

V = f [I, F, D]

1.6 Finance Functions.

1.6.1 Meaning

Finance Functions are important activites in the business management irrespective of nature, size, age and structure of the organisation. A business finance function expresses the relationship betwween value of a business enterprise and its various determinants. Value of a business enterprise is nothing but its net worth to the owners. Net worth is the difference between the market value of assets and the value of liabilities (outsiders' claims)

Net Worth = Assets - Liabilities

If net worth of a business enterprise increases it can be interpreted that the value of a business enterprise is rising. The value of a business depends upon the following factors. (Fig.1.3)

Internal :

* Investment activities
* financing mix
* distribution of profits

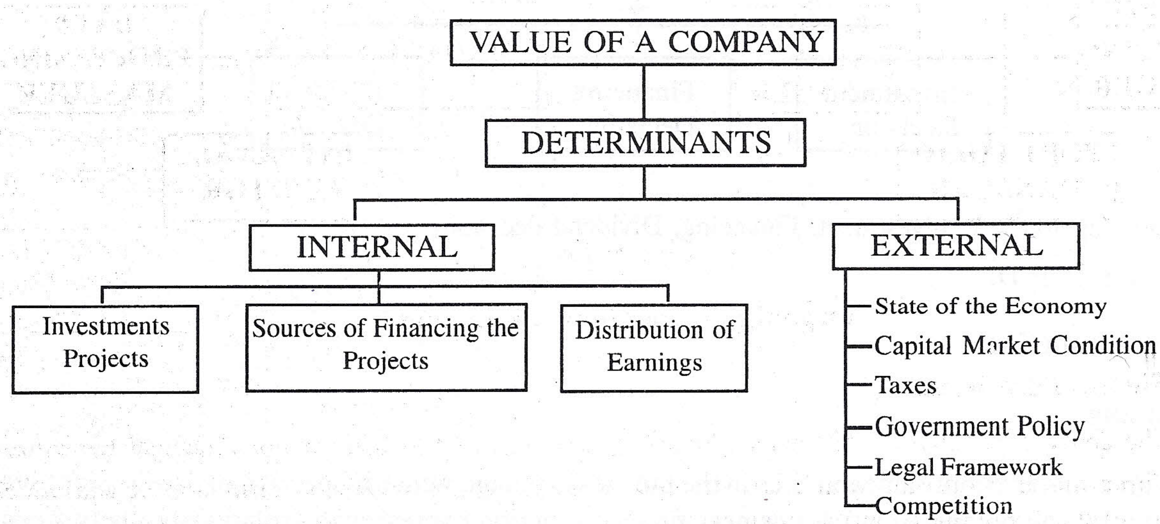
External :

* State of the economy
* Capital market conditions
* Tax rates, etc

Among these factors internal factors are controllable and enternal factors are uncontrollable. Assuming that the uncontrollable factors are held constant, the value of a business is a business is a function of internal or controllable factors. Therefore, value of a business is a function of investment, financing, distribution of profits.

V = f [I,F,D]

Fig. 1.3 FINANCE FUNCTION



1.6.2 Organisation

Finance is an integral part of a company. All functional fareas of management are related to finance function. Production, marketing, human resource etc. are related to finance. In the area of finance specific tasks are performed by specialists. The organisation of finance function can be better understood by the following figure 1.4

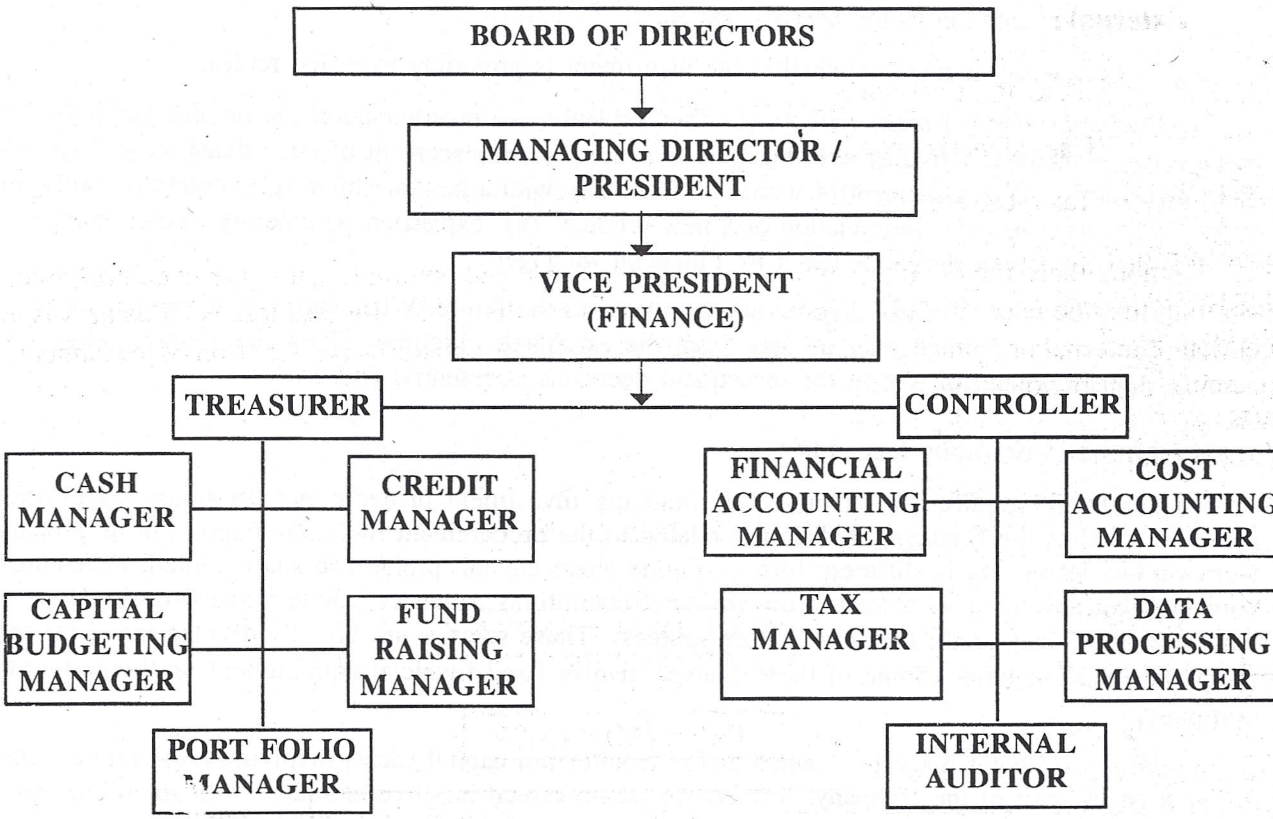


Figure 1.4

Organisation of Finance Function

1.6.3 Financial Decisions

The above said activities of Finance Functions are classified as three major Financial Decisiions.

Three major decisions, which are strategic, crucial, which have long term impact and which cannot be reversed without abnormal losses are

(a) Investment decision

(b) Financing decision

(c) Dividend decision

1.6.3.1 Investment decision : Investment decision relate to the selection of projects or investment opportunities which are financially viable. The process of investment decision involve the following steps

-- Generation of investment ideas or opportunities

-- Defining the objective in quantitative terms

-- Evaluation of each opportunity using techniques of evaluation

-- Selection of the best alternative investment

-- Implementation of the best investment

-- Follow up or monitor whether the investment is providing expected return.

Decisions like (a) make or buy, (b) buy or lease, (c) outright purchase or hire purchase, (d) replacement of manual activities with machine is action, (e) replacement of out / dated technology with latest technology (f) replacement of worn out machinery with a new machine, (g) mergers (h) amalgamation (i) acquisitions , (j) introduction of a new product (k) expansion (l) entering foreign market are some of the investment decisions taken by Financial Manager.

These decisions are based on estimates related to the future. When future is uncertain, there is a chance that actual outcome may deviate from the estimated outcome. This changeis is called risk. Therefore measurement of risk in the investment decisions is essential and crucial.

1.6.3.2 Financing Decision :

Funds are required in business for financing investment projects and for financing business operations. Thus the financing decision is related to the procurement of funds. Funds can be procured from various forms and in different forms. Equity share capital, preference share capital, debentures , company deposits, long term loans from financial institutions, inter corporate borrowings, bank loans, bank overdraft, cash credit are some of the sources. These sources are broadly divided into : (a) long term, and (b) short term. Some of these sources involve fixed financial commitment on the part of the company.

Equity is ownership capi when as the creditorship capital (debt) involving fixed interest commitment on the part of the company. Preference share capital is a hybrid source with some features of both equity and debt.

Financing decision is related to judicious mix of debt and equity. It decides the capital structure of a company. and also related to the mix of short and long term sources. When investment decision is a trade off between return and risk, financing decision is a trade off between cost and risk. Investment decision involves business or operating or investment risk. Financing decision involves financial risk.

Financial decisions are

➔ Determination of degree of leverage

➔ Raising funds through equity and debt and also raising funds from long term and short term sources

➔ Consideration of tax benefit of usage of debt

1.6.3.3 Dividend Decision :

Dividend decision is indirectly a financing decision. If sources of funds are classified as internal and external sources, all the sources discussed under the 'financing decision' are external sources. Dividend decision relates to the distribution of profits among the equity shareholders.

No business enterprise will distribute all the profits to the owners. Some of the profits are retained for future purposes of the business. These retained profits are considered as internal source. These retained profits belong to the existing shareholders. Net worth of the shareholders is a sum of equity share capital plus retained earnings. If net worth increases the book value of share increases. It will have a favourable impact on the market price of the shares.

Dividend decision is concerned with the determination of dividend pay-out ratio (percentage earnings to be distributed by way dividends). Dividends provide current earnings to the shareholders, whereas, retained earnings increase the scope for higher future earnings. Taking into consideration the company's future investment opportunities, the company's ability to tap the capital market, tax effect, shareholder's expectations, etc, a dividend decision has to be taken.

Thus, the investment, financing and dividend decision are interrelated. Their impact on the value of the company should be taken into consideration. as they affect the market value of the share.

1.6.4 RISK-RETURN /RISK-COST TRADE-OFF:

Investment decisions involve two aspects i.e. the risk and the return. Finance managers have to select those investment projects by balancing the rerun. When fulute is uncerlain, these is a chance of variabilily in the expected return which is called business risk or operating risk or investmenr risk. Any attempt to increase the forces of risk element. There fore, a finance manager has to optimise the forces of risk and teturn. Selection of investment opportunities where risk and return are optimised is known as risk-return tradc-off.

Financing decisions also involve return and risk. When the decision related to the capital siruciure or debt-equity mix or financial leverage is taken, it is quite possible that a company may attempt to use more debt, as purpose. Increasing use of debt reduces the cost of capital to the company. But, it increasing the variability of the share holders' return. There fore, finance manager has by increasing risk and roturn and arrive at an optimum capital structure. Selection of optimum capital structure where return and risk are optimised is known as risk-trade-off [fig 1.5]

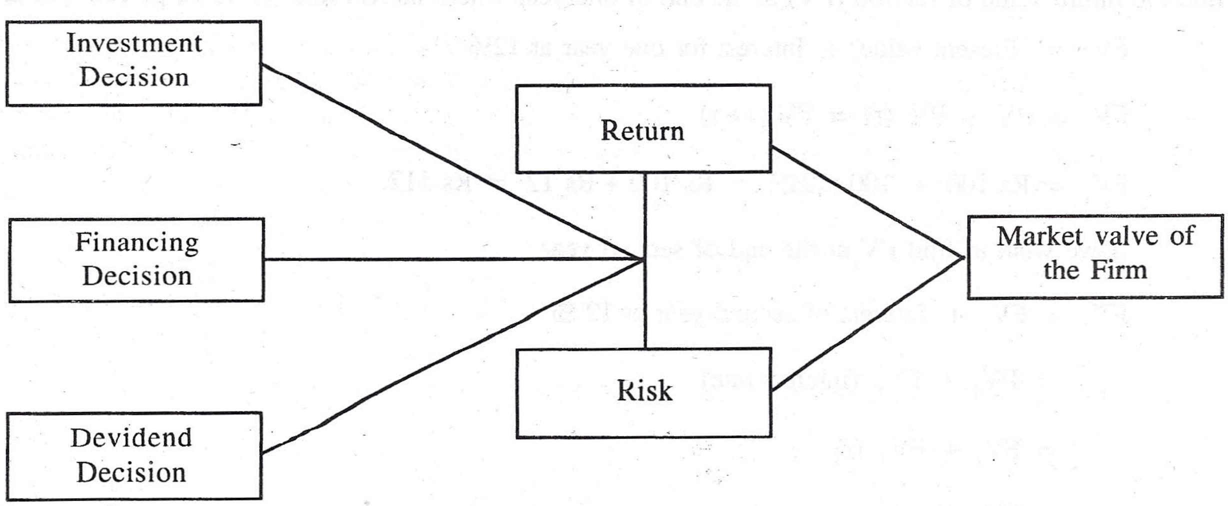


Figure 1.3. : Trade - off between Return and Risk

1.7. Time Value of Money

An important principle in finance is that the value of money is dependent on time. The value of money received today is different from the value of money received after sometime in the future. The principle is based on the fact that what we receive today can be invested and a return can be earned on it. For example, between Rs 100 now or Rs 100 after one year, Rs 100 now will have more time value because it can be invested, for example at 10% rate of interest, and a return of Rs 10 can be earned. Rs 100 becomes Rs 110 a year after.

In business, various decisions involve outflow and inflow of funds. Outflows and the inflows do not take place at the same time. For example, in the case of investment decision outflows in the form of cost of the project takes place first and they are followed by inflows in the form of profits or returns in future.

	Outflows	← Inflows →			
Time	t_0	t_1	t_2	t_3	t_n
	(Cost of the profect)	Returns(or) profit	Returns (or) profit	Returns(or) profit	Returns (or) profit

The difference in their timing makes it difficult to compare the costs and benefits. Therefore there is a need to equalise the time values of inflows and outflows. For this purpose Time value can be incorporated into financial decisions either by compounding or by discounting.

Let us try to understand these methods.

1.9.1. Compounding : Compounding is the process of finding the Future Value of an amount (which is called present value) at the end of a period using an interest rate. For example, if we want to find the future value of Rs 100 (PV) at the end of one year when interest rate (r) is 12 percent per annum

FV = Present value + Interest for one year at 12%

$FV_1 = PV + PV\ (r) = PV\ (1+ r)$

FV_1 = Rs 100 + 100 (12%) = Rs 100 + Rs 12 = Rs 112.

If we wish to find FV at the end of second year

$FV_2 = FV_1$ + Interest of second year at 12 %

$= FV_1 + FV_1$ (interest rate)

$= FV_1 + FV_1\ (r)$

$= FV_1\ (1 + r)$

We know that $FV_1 = PV\ (1 + r)$

$\therefore FV_2 = PV\ (1 + r)\ (1 + r) = PV\ (1 + r)^2$

Future value at the end of n years

$FVn = PV\ (1 + r)^n$

Compounding more than once :

Twice in a year $FV = PV\left[1+\frac{r}{2}\right]^{2n}$

Quarterly compounding $FV = PV\left[1+\frac{r}{4}\right]^{4n}$

Yearly compounding $FV = PV\left[1+\frac{r}{12}\right]^{12n}$

m times a year $FV = PV\left[1+\frac{r}{m}\right]^{mn}$

As ëmí approaches infinity, the term

$\left[1+\frac{r}{m}\right]^{mn}$ approaches e^{rn}

Where e = 2. 71828 approximately.

$FV = PV\,e^{rn}$

Where

FV = future value

PV = present value

r = rate of interest

n = number of years.

Continuous compounding results in the maximum possible future value at the end of n periods for a given rate of interest (r).

1.9.2. Discounting - Discounting is the process of finding the present value of an amount (future value) expected to be received at the end of a period (n) using a rate of interest (called the discount rate). If we want to find the present value of Rs 100 to be received at the end of one year, when the rate of interest is 12 per cent

$$PV = \frac{FV}{(1+r)} = \frac{100}{1+12\%} = \frac{100}{1.12} = \text{Rs. } 89.29$$

It means that the present value of Rs 100 to be received at the end of one year, when discounted at 12%, is Rs 89.29.

PV of Rs 100 to be received at the end or ní years $PV = \frac{FV}{(1+r)^n}$

You are provided with two types of Tables in the Appendix

(a) Compound / future / terminal value Tables

(b) Present value Tables.

3)

Compound value Tables :

By making use of these tables, we can find the compound value of any amount, for any period, at any rate. In these Tables compound values of Re.1 are provided.

In the compound value formula, the value of the expression $(1 + r)^n$ is given for Re. 1 for a given rate and period. For example, when

PV = Rs 1300 r = 13% n = 15 years,

What is compound value or ?

$CV = PV (1 + r)^n = Rs\ 1300\ (1 + 0.13)^{15}$

the value of $(1 + 0.13)^{15}$ is given in the Table for Re.1. We can find the C V just multiplying Rs. 1300 with this value which is called compound factor.

CV = Rs 1300 X Compound factor (n = 15 years, r = 13%)
= Rs 1300 X 6.254
= Rs 8, 131

For any period and at any rate, we can find the compound value by using these Tables.

Present value tables :

By making use of these Tables, we can find the present value of any amount. In the present value formula, the value of the expression $[1/(1+r)^n]$ for Re.1 is given for a given discount rate and period (n).

For example :

If we wish to know the present value of Rs 5000 to be received at the end of 18 years with a discount rate 15 per cent, then

FV = Rs 5000, r = 15% n = 18 years.

$$PV = FV \left[\frac{1}{(1+r)^n} \right]$$

the value of the expression shown in the pranthies can be found out from PV Tables for any n, r.

PV = FV x PV Factor (given r, n)
= FV x discount factor (given r, n)

PV = Rs 5000 x PV factor (a + r = 5%, n= 18 years)

= Rs 5000 X 0.081

= Rs 405

It means that, the PV of Rs 5000 to be received at the end of 18th Year is Rs 405 when discounted at 15 per cent rate.

Annuity : An Annuity is a stream of constant cash flows (payment or receipt) occurring at regular intervals of time. When cash flows occur at the end of each period we can find the future value by compounding and present value by discounting.

Compound value of annuity : Future or compound value of an annuity (FVA) can be calculated by using the following formula.

$$\text{FVA} = \text{Annuity amount X} \left[\frac{(1+r)^n - 1}{r}\right]$$

In the above equation, $\left[\frac{(1+r)^n - 1}{r}\right]$ expression is compound factor for one rupee annuity received at the end of each year for n years with 'r' compound interest rate.

Compound value Tables given in the Annexure contain CV of annuity of Re.1 for a given period and rate.

For example :

If we wish to find the compound value of Rs 1200 annuity for a period of 10 years and when the interest rate is 12 per cent. Future value of annuity at the end of 10 years will be

FV_{10} = Rs 1200 X CV of annuity of Re.1 (r = 12%, n = 10 years)

= Rs 1200 X 17.549

= Rs. 21058-80

Present value of Annuity :

Present value of an annuity (PVA) can be calculated by using the following formula.

$$\text{PVA} = \text{Annuity amount X} \left[\frac{1 - \frac{1}{(1+r)^n}}{r}\right]$$

The expression $\left[\frac{1 - \frac{1}{(1+r)^n}}{r}\right]$ is given for Re.1 Annuity Table in the Annexure for given r and n.

For example, if we want to find the present value of Rs 1000 annuity for 10 years when the discount rate is 12 %, we can find the present the value of Re.1 annuity from the Table and multiply it with Rs 1000.

Annuity = Rs 1000 r = 12% n = 10 years

PVA = Rs 1000 X 5.650

= Rs 5650

Having understood the methods of incorporating time value of money, through compounding and discounting, let us now see, how these methods are relevant in financial decision making.

1.9.3. Financial Decisions : Time value of Money

(a) Investment Decision : Investment decision involves current cash outlay for expected stream of cash inflows in future.

Time	t_0	t_1	t_2	t_n
cash flows	Current Cash outlay (Co)	cash inflow	cash inflow	cash inflow

The cash flows (outflows and inflows) occur at different timings. Therefore, they are not comparable. Time value of money is taken into consideration by discounting the cash inflows to find the present value of all cash inflows. Then PV of cash inflows is compared with current cash outlay or cost of an investment project.

For example : A project costs Rs.100000. It is expected to provide cash inflows as follows for 3 years. The company's cost of capital or required rate of return is 15%. Whether the project is acceptable?

Year	1	2	3
cash Inflows	Rs 40000	Rs 50000	Rs 30000

Solution :

PV of cash inflows = PV of Rs 40000 + PV of Rs 50000 + PV of Rs 30000

= [40000 X 0.870] + [50000 X 0.756] + [30000 X 0.658]

= Rs 34800 + Rs 37800 + Rs. 19740

= Rs. 92340

In this example, the present value of cash inflows is Rs 92340, whereas, the cost of the project is Rs 1 lakh. As the benefits are less than the cost, the project is not acceptable.

(b) Financing Decision : When a company issues debentures, it receives cashflows now. Interest payments (cash outflows) are to be made at the end of each year. At the end of the period the debenture amount is redeemed. Therefore, the financing decision involves cash inflows first, followed by cash outflows

Time	t_o	t_1	t_2	t_n
cash flows	Sale value of debentures	Interest	Interest	Interest and redemption value

As these cash flows takes place at different times, they cannot be compared. Time value of payment is taken into consideration by finding the discounted value (present value) of interest payments and redemption value. The present value of cash outflows is compared with sale value of debentures and financing decision is taken whether to take up the issue of debentures.

1.10. Summary

This lesson has provided you an overview of Finance in a business entity. The scope, of financial management and finance function have been covered. The primary financial objectives of a company and the broad goal of a company have been discussed. Profit maximasation vis-a-vis wealth maximisation revealed that profit maximisation goal has certain limitations, which can be overcome with wealth maximisation goal.

The organisation of finance function and role of finance manager provide an insight into organisational chart and various functions of financial manager.

There are three major financial decisions, viz., Investment, Financing and Dividend decision. Investment decision relates to the selection of viable projects and estimating capital budget. Financing decision is concerned with the ways of finding funds to meet the capital budget requirement. Dividend decision is about how the earnings of the company are to be used i.e, a break up between dividends and retention.

Finally, the time value of money has been presented.

1.11. Key words

Financial Management : Concerns the acquisition, financing, and management of assets with some overall goal.

Future Value : The value at some future time of a present amount of money, or a series of payment, evaluated at a given interest rate.

Net Present Value : The Present Value of an investment projects net cash flows minus the projects initial cash outflow.

Present Value : The current value of a future amount of money, or a series of payments, evaluated at a given interest rate.

Price / earning ratio (P / O) : The market price per share of a firm's common stock dividend by the most recent 12 months of earnings per share.

Risk : The variability of returns from those that are expected.

Capital structure : The mix of a firm's permanent long - term financing represented by debt, prefessed stock, and common stock equity.

Compount Interest : Interest paid on any previous interest earned, as well as on the principal borrowed.

Funds	:	Funds include not only cash but also the total current assets or financial resources.
Profit Maximisation	:	It is a criterion for economic efficiency as profits provide a yard stick by which economic performances can be judged under condition of perfect competition.
Wealth Maximasation	:	It stands that the management should seek to maximise the present value of the expected returns of the firm.
Discounting	:	A reduction of some future amount of money to a present value at some approprite rate in accordance with the concept of the time value of money.

1.12 Self - Assessment questions.

1. What do you mean by "Finance" ? Explain the scope of finance Function.
2. What is Financial Management ? What role a Financial Manager plays in a corporate enterprise ?
3. Do you think Wealth Maximisation, as a goal of a company, is superior to Profit Maximisation? Explain.
4. What are the major Financial Decision ? How do you trade off risk and return ?
5. How is Finance Function Organised ? What are the functions that finance officers perform in a large firm ?
6. What do you mean by Time Value of Money ? Explain its relevance in financial decision making.

1.13. Further Readings

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LESSON - 9

OBJECTIVES AND SYSTEMS OF PRODUCTION MANAGEMENT

Objectives of the Unit:

After going through this unit you will be able to:

- Define the adjective of production management
- Scope of production/operation Management
- Types of production systems

Structure:

1. Defining production management
2. Objectives of production management
3. Scope of production/operation management
4. Types of Production systems
5. Techniques and procedures used in production system

1.1 Introduction:

Operations management may be defined as the design, operation, and improvement of the production systems that create the firm‘s primary products or services. Like marketing and finance, OM is a functional field of business with clear line management responsibilities. This point is important because operations management is frequently confused with operations research and management science (OR/MS) and industrial engineering (IE).

There are four functional areas in a business organization—marketing, production, finance and personnel. Production is the basic activity of all industrial units. All other activities revolve around this activity. The end-product of the production activity is the creation of goods and services for the satisfaction of human wants. The production activity is nothing but the step-by-step- conversion of one form of materials into another either chemically or mechanically. This is done in factories which house manufacturing processes. The basic inputs of the production processes are men, machines, plant, services and methods. The products of the mine, farm, sea and forest are used as raw materials on which the processing is done to create or enhance the form utility. It should be noted that the finished product of one manufacturing unit does not always furnish a ready-made product for the ultimate consumption. In a chain of manufacturing activities, the finished product of the processor sometimes becomes the raw material (or component) for the other manufacturing firms falling next in the sequence.

Meaning: The meaning of the term ―Production‖ and ―Production management‖ should be noted carefully..

―Production‖ involves the step-by step conversion of one form of materials into another through chemical or mechanical processing to create or enhance the utility of the products or services. According to economists, production is an activity through which the form utility is either created or enhanced; e.g., a piece of wood has no doubt, some utility. However, when it is converted into a chair with some mechanical processing, the utility of the material (i.e., a piece of wood) would enhance substantially. According to E.S. Buffa, ―production is a process by which goods and services are created.‖

These days therefore both manufacturing and service organizations fall into the scope of production Management. Thus production management which was formerly considered as manufacturing management only, now after inclusion of services into its scope, is broadly known as operations management. Many non-manufacturing organizations providing services like hospitals, banks, transportation, farming, warehousing etc. are now covered by operations management.

Operations by formal definition is a process of changing inputs into outputs, with the creation or adding of value to some entity. The process of alteration or transportation or storage or inspection or any combination thereof to add value to an entity is rightly called operations. The growth of service industry has brought with it the term ‗operations management'. It is a general term these days.

Operations in the services organizations has some unique features, different from those which has manufacturing base. These are:

1. Non-inventoriable output of service, since generally no stock is produced
2. Variable demand.
3. Labour –intensive operations mostly.
4. Location of service is dictated by the location of the users.

The word ‘Production management‘ arrived first with the emergence of manufacturing industry and the necessity to manage it as such. The meaning of the term ―Production Management‖ is clarified in the following definitions:

1. ―Production management is the process of planning, organizing, directing and controlling the activities of the production function. Production function is the conversion of raw materials into finished products.‖
2. According to H.A. Harding, ―Production management is concerned with those processes which convert the inputs into outputs. The inputs are various resources like raw materials, men, machines, methods, etc. and the outputs are goods and services.‖
3. According to M.J.S. Harry, the word production is often used to mean the same as manufacture. In order to go through a process of manufacturing itself , we need basically three things: someone to do the job, his equipment and the necessary materials. To run production, we require service activities which make sure that the manufacturing activity can go on and control to make sure that it goes in the right direction.
4. According to E.S. Buffa, ―Production management deals with decision making related to production processes so that the resulting goods or service is produced according to specifications, in the amounts and by the schedule demanded and at minimum cost.‖

The definition given by E.S. Buffa is simple. Clear and exhaustive. It explains the following important aspects of production management.

(a) It is a decision-making managerial function.
(b) The decisions are made regarding the production processes required for converting the raw materials into finished products, and
(c) The production or output should be according to specifications, in the specified quantities, as per the schedule and at minimum cost.

Both _Production Management‘ and _Operations Management‘ have been treated synonymously in this book.

1.2 Objectives of Production Management:

Production is an organized activity in a manufacturing organization. Each organized activity must spell out its objectives so that its existence can be justified on the basis of the degree of the attainment of these objectives. Moreover, such identification of the objectives increases the consciousness of the personnel working in the respective organizations in checking their efforts by verifying whether they are in conformity with the stated objective of the organization. The objectives of the production function are classified as under : (1) Ultimate objectives, and (2)Intermediate objectives.

(1) **Ultimate objectives:** The primary responsibility of the manufacturing activity is to produce a product or products at (a) Pre-established cost, (b) according to the specified quality, and (c) within the stipulated time schedule,

Thus the ultimate objectives can be sub-classified as under: (i) Manufacturing costs, (ii) Product quality and (iii) Manufacturing time-schedule.

(i) **Manufacturing costs**: The unit cost of the product should be estimated carefully and every effort should be made to stick to the cost standards. For this purpose, the efforts should be made to segregate the costs into two – direct costs and variable costs. Efforts should be made for the following:

(a) Reduction the variable costs.
(b) Reduction in the fixed costs.
(c) Increase in the volume of production, so that the fixed costs may be spread over more production resulting in the reduction in the per unit absorption.
(d) The allocation of the fixed overheads should be made on scientific basis.

(ii) **Product quality**: Generally, the product quality standards are often established by the product specifications or by the consumers. The manufacturing organization should try to translate such quality prescriptions into some measurable objectives. It should be noted that the product quality comes in conflict with the manufacturing cost objective and the manufacturing time-schedule. The maintenance of the quality should not result in increase in manufacturing costs of delay in the production. A proper balance must be maintained between quality and cost as well as quality and time-schedule.

(iii) **Manufacturing schedule**: There are many forces which compel side-tracking in the manufacturing activity. The time schedule should not be set for the shipment alone, it should be broken up into all the sub-systems like operating cycle time, inventory turnover rate, machine utilization rate, direct and indirect man-hours per unit, capacity utilization, machine and labour idle time set-up, repair and maintenance time etc. Time schedule objective directly affects the cost, quality and the goodwill of the business in terms of regularity of shipment.

(2) **Intermediate objectives**: Production is the result of various types of inputs, like men, materials machines and manufacturing services. The intermediate objectives strive to attain the optimum utilization of these various types of inputs. It should be noted that the output resulting out of the inputs is measured in terms of the cost, quality and time which relate to the prescription of aforesaid ultimate objectives. The intermediate goals can be spelled out as under:
(i) Machinery and equipment, (ii) Materials, (iii) Manpower, and (iv) Manufacturing services.
(i) **Machinery and equipment:** The objectives in the area of machinery and equipment are divided into: (a) Acquisition of machinery and equipment, and (b) Utilization of machinery and equipment.

The adequacy of the existing machinery should be considered and proper additions and replacements should be made according to the requirements. Efforts should also be made to increase the utilization rate of machinery through repair, maintenance and maximum occupancy of the machines.

(ii) **Materials:** The materials objectives must be prescribed in terms of units, rupee value and space requirements. The per unit materials costs should be specified and efforts should be made to increase the inventory turnover of all types of inventories – raw materials, work-in- progress and finished goods.

(iii) Manpower : Manpower is an important as well as typical input in manufacturing activities. So the objectives of the production activities are as regards manpower must be closely allied with the objectives of selection, placement, training, rewarding and utilization of manpower. Usually, these objectives are considered in terms of employee turnover rats, safety measurements, industrial relations, absenteeism etc.

(iv) Manufacturing services: The provision of proper and adequate services directly affects the utilization of other inputs such as men machines and materials. Proper objectives should be set for the installation of important facilities such as power, water supply, material handling etc. In a condensed form, it can be stated that the objectives of the manufacturing activities are – to manufacture a quality product, on schedule, at the lowest possible costs, with maximum asset turnover, to achieve consumer satisfaction. This statement is closely related to the ultimate and intermediate objectives of the production function.

To summarize, production has to:

(i) Make sure that it develops a product which can function as expected, i.e. product with the correct Quality,
(ii) Produce the product in correct Quantity
(iii) Deliver the product in Time to the right Place,
(iv) And to perform these functions at the right Price.

1.3 Scope of Operations Management:

Basically, this discipline has to decide about a production/operation system to generate customer satisfaction at optimum cost. As such, there are certain long-term strategic decisions involved, influencing substantially the whole system. Mostly these decisions are with respect to the Design and Planning aspects.

To illustrate, let us examine some of these decisions.

(i) Product Selection and Planning: The product mix makes our system either efficient or inefficient. Choosing the right products, keeping the mission and overall objectives in mind is the key to success. Design of the product, which gives it enough functional and aesthetic value, is of paramount importance. It is the design of the product which makes us competitive or non-competitive. Value engineering does help us to retain enough of features, while eliminating the unnecessary cost increasing features.

(ii) Process Selection and Planning: Selection of a process involves taking decisions about technology, machines and equipment. We have to optimize the output from a given process. Process planning, detailing the stages of the process, give us an idea of optimum automation and mechanization.

(iii) Facilities Location: Where can we locate our operations/production? It commits us at a location for a long time. So a wrong decision may prove disastrous. Location should as for as possible cut down on production and distribution cost. Therefore, from the alternatives open to us, we have to evaluate and judge a suitable location for us. While evaluating, there are diverse factors to be considered.

(iv) Facilities Layout and Materials Handling: Plant layout deals with the arrangements of machines and plant facilities. The machines should be so arranged that the flow of production remains smooth. There should not be over-lapping, duplication or interruption in production flow. Product layout, where machines are arranged in a sequence required for the processing of a particular product, and process layout, where machines performing similar processes are grouped together – are two popular methods of layout. The departments are laid out in such a way that the cost of material handling is reduced. There should be proper choice of materials handling equipment.

(v) Capacity Planning: This deals with the procurement of productive resources. Capacity refers to a level of output of the conversion process over a period of time. Full capacity indicates maximum level of output. Capacity is planned for short-term as well as for long-term. Process industries pose challenging problems in capacity planning, requiring in the long run, expansion and contraction of major facilities in the conversion process.

Operational or Short-term Decisions: These deal with short-term planning and control problems Some illustrative decisions are:

(i) Production Planning : Planning is a pre-operation activity. It aims at anticipating the probable difficulties so that they can be eliminated before they materialize or be mitigated before they become grave. Production planning aims at setting the goals or targets and allocating the existing resources viz. men, machines, materials and plant services, among varied production operations so that their best possible use can be made in the light of the set goals or standards.

According to Bethel, Atwater, Smith and Stackman, ―Production planning takes a given product or line of products and organizes in advance the manpower, materials, machines and money required for a predetermined output in a given period of time.‖

(ii). **Production Control**: Control is a management technique which aims to see that the activities are carried on in line with the predetermined standards. In case of production activities, production control tries to see that the actual manufacturing conforms to the per determined standards and schedules of productions. Production control is considered to have a wider scope and thus it includes production planning.

According to Soriegel and Lansburgh, ―Production control is the process of planning production in advance of operations; establishing the exact route of each individual item, part or assembly; setting, starting and finishing dates for each important item, assembly and the finished products; and releasing the necessary orders as well as initiating the required follow-up to effect the smooth functioning of the enterprise.‖

Production control involves the following stages:

(i) Planning – Setting targets of production.

(ii) Routing – to decide the route of flow-of production activity.

(iii) Dispatching – to issue materials and authorizations for the use of machines and plant services.

(iv) Follow-up- it compares the actual production with the targeted production. Deviations are found out and corrected and reasons are investigated.

(iii) **Inventory Control** : Inventory control deals with the control over raw materials, work-in-progress, finished products, stores supplies, tools etc. The management of these items is closely related with the production function and so is included in production management.

The raw materials, supplies etc. should be purchased at right time, or right quality, in right quantity, from right source and at right price. These five _Rs' consideration enables the scientific purchases.

Store-keeping is also an important aspect of inventory control. The raw materials, work-in progress, finished goods, supplies, tools etc.

(iv) **Quality Control** : The long-run success of the business largely depends on its ability to maintain the quality standards as decided by the management and accepted by customers. The quality standards are prescribed in terms of specifications like size, colour, shape, tastes etc. The quality control is maintained by testing the actual production and by ascertaining whether they conform to the set standards. The raw materials, work-in-progress, finished products etc. are inspected at various stages of production.

(v) **Method Study**: Standard methods should be devised for performing the repetitive functions efficiently Unnecessary movements should be eliminated and suitable positioning of the workers for different processes should be developed. Such methods should be devised with the help of time study and motion study.

(vi) **Maintenance and Replacement**: In this we cover preventive methods o avoid machine breakdown, scheduled and breakdowns maintenance, policies regarding repair and replacement decisions. Maintenance manpower is to be scheduled and repair jobs are to be sequenced. There are some preventive replacements also. Machine condition is to be constantly monitored. Effective maintenance is a crucial problem for India which can help better capacity utilization and make our operations systems productive enough.

(vii) **Cost Reduction and Control**: Cost reduction ultimately improves productivity. The industry becomes competitive. Essentially cost reduction and cost elimination are productivity techniques. Value engineering, budgetary control, standard costing, cost control of labour and materials etc. help us to keep our costs optimal.

All production decisions are subject to control measures, after receiving proper feedback. Control function is exercised over the quantity to be produced. quality expected, time needed, inventory consumed and carried and costs incurred. Control system is designed after due cost benefit analysis. Controls should be selective. A self-controlling cybernetic system though preferable is not possible in all complex industries.

1.4 Types of Production Systems:

When viewed from a different context, the operations/ Production system can be equated with the flow of materials –Flow into, flow through and flow out of the conversion process. When we analyze the characteristics of this flow, we find in some systems it to be very smooth, whereas in others it is much more complex. The more difficult the materials flow, the more complex is the system to manage. Depending on the flow characteristics, there are four classes of the production system.

(i) Mass production of flow-line production system

(ii) Batch production system

(iii) Job shop

(iv) Projects (Unit manufacture)

(i) Mass production System or Flow-line Production Systems: In these systems, the flow is in a straight line. All Facilities are arranged are arranged as per the sequence of operations. Output of one operation becomes the input for the subsequent operation. The system is cascaded. Some peculiar problems of this system are balancing of assembly line/production function.

(ii) Batch Production System: In this system, a batch consisting of a certain quantity is made on a machine. The same machine then may be used for another product. Thus here there are a variety of products; and it is not possible to maintain a separate assembly line for each product. Products compete for the share of the machine.

(iii) Job Shop : Here, the shop accepts customer‘s orders and executes them. It does have its own product mix. Primarily, we have facilities and processes in a job shop to undertake a wide variety of customer jobs in different batch quantities. Each order may be unique – requiring its own planning and tooling. Here the flow of material is also complex. A busy job shop is a difficult system to plan and control.

(iv) Project: Consider the manufacturing of a ship such products are never made in large number. Manpower, facilities and other resources centre around such products. Each such product can therefore be treated as a project requiring sequencing of certain activities either in series or concurrently . PERT/CPM or network analysis is a useful technique to plan and control such projects.

1.5 Materials Management

All types of organizations, whether manufacturing trading or even non-profit, are continuously involved in procurement, storage and stock replenishment of different types of materials. At different points of time many of the items are bought, stored and stocked either for immediate or future use. The function of buying or stocking is a result of decision-making process which may be simple or complex, intuitive or analytical, hasty or deliberate. In the manufacturing organizations materials management is relatively more important as well as complex.

In the manufacturing organizations, the important inputs are- men machines and materials which are the results of the monetary commitments. Materials being a key and inevitable input, directly affects the fundamental economic objective viz. profitability, of any manufacturing organization. Materials Management is a term to describe the grouping of management functions related to the complete cycle of material flow, from the purchase and internal control of production materials to the planning and control of work-in-progress, to the warehousing shipping and distribution of the finished product. It differs from the materials control in that the latter term, traditionally is limited to the internal control of production materials.‖

Materials management is concerned with those management functions circumscribed in the complete cycle of materials flow like purchasing, production and inventory control, material handling, packaging, traffic and distribution. All these related functions are grouped together and are put under the direct control of a line manager.

Production Organization:

In a small organization, production, servicing and control are handled by a single person. The larger the organization grows, the complex, the organization structure becomes and the functions are handled by different specialists. A typical factory may have the following organization structure.

General Manager

↓

Production Manager

↓

Plant & Maintenance	Production Planning & Control	Production Engineering	Quality Control

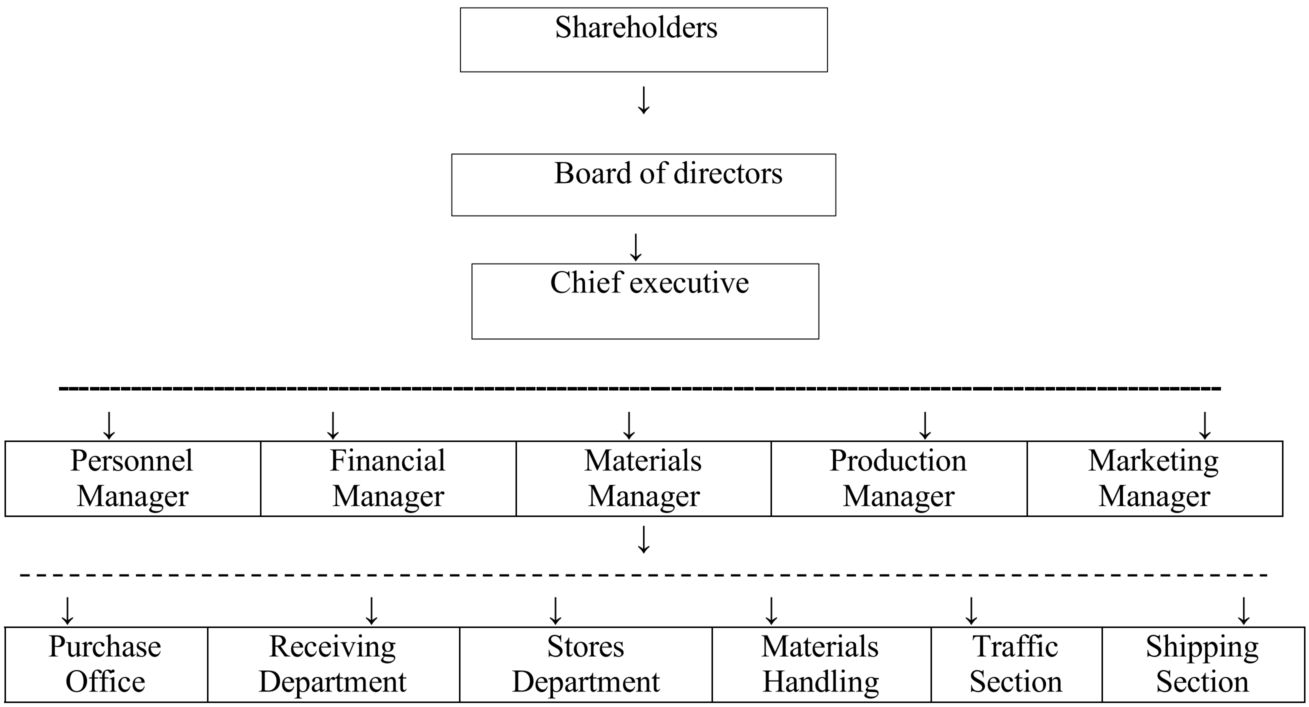
Services are provided by the human relations department and the maintenance department. Finance and account department provide the control is also exercised by departments like production control.

1.5.1 Role of Materials Management:

(i) Materials management as a prime corporate function: Where materials management holds a key ole in the management of the organization and is considered as a prime or top-level corporate activity, it is placed in charge of the Materials Manager who directly reports to the Chief Executive. Like production, marketing, finance and personnel, it is treated as an important area of management; e.g. in process industries where little layout is added to the raw materials for their conversion into finished products, the cost of the materials may be as high as 80% to 90% of the product cost.

(ii) **Materials management as an operating function**: Under this, the function of materials management is considered subordinate to the production function. The materials manager acts as a subordinate to the works manager. Materials management is considered as a service function to operations and is regulated with the other operations under the control ad superintendence of the woks manager.

Chart-2: Structure of Materials Management in Manufacturing Organization



(i) Production department: Regarding the flow of materials, selection of the supplier, etc.

(ii) Marketing Department; For converting the sales forecast into production schedule and giving delivery dates to customers, etc.

(iii) Finance department: For maintaining the level of the stock, locking up of funds into inventory, tapping cash discount and quantity discounting, pledging or hypothecating the materials for working capital needs, etc.

(iv) Engineering department: For the specification of materials, quality requirements, product research, etc.

(v) Personnel department: For manning the materials management department, vendor relationships, advertising, public relations, etc.

(vi) Top management: As an important profit centre, top management has a great concern for materials management.

1.5.2 Need for Integrated Approach to Materials Management

In order to be effective, we have to attain highest materials productivity (getting the most out of materials investment). This is possible when there is co-ordination and integration of different areas in materials decision-making. Inventory control is depended upon demand/supply management, lead-time, standardization, codification and variety reduction. Thus the problems are inter-dependent and inter-related. Development of vendors affect the inventory control. The areas now integrated under the materials function are:

(i) Planning function : The planning part of materials management deals with the following issues;

(i) Translation of the sales projections into long-term requirements of methods.

(ii) On the basis of updated production plan adjusted to the latest sales demand, to adjust the materials accordingly.

(iii) To project the facilities required for the materials management.

(ii) Production Control: The Production control function develops the short-range operations plans and schedules from the long-range plans.

(a) To develop plans for the production of parts or final products along with the needs of the materials.

(b) To schedule the operations of parts and products on the basis of the availability of materials, operating cycle time, lead time, fluctuations in the sales etc.

(c) To dispatch the materials to the production departments.

(d) To expedite the operations so that the production may be completed according to the schedule along with the feedback variations.

(iii) Inventory Control: Materials control or inventory control is systematic procedure for ensuring the availability of items necessary to meet the production requirements at optimum cost. It is concerned with the following issues.

(i) Requisition of the materials according to requirements at appropriate time.

(ii) Decision about the optimum size of the order which is popularly known as economic ordering quantity (EOQ).

(iii) To keep the updated records of the materials received, Issued and held in balance.

(iv) To report the inventory data to those who use them as the decision tools.

(iv) Purchasing: The basic objective of purchasing is to procure the materials of desired quality in time to meet the production specifications and at the lowest ultimate cost. The main activities of purchasing are as under:

(i) To select the acceptable supplier.

(ii) To place the purchase order with the selected supplier.

(iii) To expedite the delivery of materials to meet the inventory requirements.

(iv) To keep abreast of the market conditions for the new as well as reordered materials.

(v) Receiving and Stores: The main activities of this section are as under:

(a) To accept the delivery of purchased materials, to verify them with the purchases order and packing slip, to inspect them and to prepare the _goods received note' for stores and accounts, and to route the received materials to stores or to the using department according to the direction of the order.

(b) To store the materials properly according to the policy and ensure their quick identification.

(c) To issue the materials according to authorized requisition.

(d) To verify the materials physically at periodic intervals and to record discrepancy if any, along with the reasons.

(vi) Shipping: The Shipping function is concerned with the distribution of the finished goods. It involves the following functions:

(a) To receive the finished goods from the production department and to verify the quantity.

(b) To store the finished goods properly till they are distributed.

(c) To pull the goods from the stores, to identify the customer, to pack and label them and to load into the vehicles for the transportation to customers.

(d) To prepare shipping documents such as packing slip, bill of lading, railway receipt, lorry receipt etc. Which are forwarded with the shipment.

(e) To report about the shipment to the accounting department for billing the customer, to sales department for order closing and customer notification.

(f) To administer the fleer of the company vehicles used in shipment. If the services are to be hired then to negotiate with the outside carriers about freight, route etc.

(vii) Material handling: The material handling function is sometimes grouped with the stores functions. Material handling as a district service involves the following functions:

(i) To handle in-plant materials though trucking, pallets, containers etc.

(ii) To maintain the material handling equipment and other incidental items like pallets, containers etc.

(viii) Traffic: Traffic function is concerned with the incoming consignments of raw materials and outgoing shipments of finished goods. The former is sometimes attached to the receiving function and the latter to the shipment.

(a) To carry raw materials from the supplier's or other destinations.

(b) To carry finished goods to customers, branches, wholesalers or retailers.

(c) T administer freight rates, routes, etc. if transport services are hired.

(d) To maintain the fleer of delivery vans, if vehicles are owned by the company.

(ix) Waste management: Materials wastage is to be reduced as far as possible. Wastage is an index to our materials productivity. Minimum waste results in better productivity. An integrated approach to materials calls for co-ordination of all the above areas so as to optimize managerial effectiveness for this vital function.

1.6 Production Systems

The heart of OM is the management of production systems. A Production system uses operations resources to transform inputs into some desired output. An input may be a raw material, a customer, or a finished product from another system. As indicated in the bottom of Exhibit 1.1 operations resources consist of what we term the Five P's of operations management : people, plants, parts, processes, and planning and control systems. People are the direct and indirect workforce. Plants include the factories or service branches where production is carried out. Parts include the materials (or, in the case of services, the supplies) that go through the system. Processes include the equipment and steps by which production is accomplished. Planning and control systems are the procedures and information management uses to operate the system. Transformations that take place include:

Physical, as in manufacturing

Location, as in transportation.

Exchange, as in retailing.

Storage as in warehousing.

Physiological, as in health care.

Informational, as in telecommunications.

These transformations, of course, are not mutually exclusive.

System is a collection of interrelated entities. As stated earlier, operations management is the management of transformation systems which convert inputs into goods and/or services. The inputs to the system are materials, labour, equipments and capital These inputs are combined and converted into goods and/or services by a suitable process technology. The types of inputs used vary from one industry to another. In product manufacturing, the major inputs are capital, machines, equipments and tools, and labour is required to operate and maintain the equipments. The materials input is the basis for the conversion process.

The systems aspect of production/operation function of an organization, explains that the organization receives several inputs as indicated on the left hand side and converts them into useful products and/or services using its facilities (manufacturing facilities). In the Process of conversion, definitely, there will some deviations in the product's attributes like quality, size, shape and number of units produced. Just to cope up with the predetermined plans and policies, it is highly essential o communicate these deviations to the input stage in the form of feedback for making necessary corrections.

A sample list of corrections is presented below:

* Tight quality check on the incoming raw materials

* Adjustment of machine settings

*Change of tools

*proper allocation of operators to machines with matching skills

*Change in the production plans, like increase or decrease in volume of production

* Rigid in –process quality programme to avoid rework

The system operates in an environment. So, the system has to take feedback from its environment and adjust its parameters accordingly. The environment can be classified into internal environment and external environment. The top management may be treated as the internal environment and its instructions and expectations will form internal feedback. The system must respond to these modifications for achieving better results.

Managing the transformation system involves continual monitoring of the system and its environment. The environment outside the firm may change in terms of legal, political, social or economic conditions, thereby necessitating the corresponding change in the environment of production/ operations. So, the production/operations system must consider these as feedback from external environment and adjust its parameters accordingly.

The techniques and procedures used in Production/operation system are as follows.

(i) Forecasting

(ii) Location and layout techniques

(iii) Product design and analysis, work study

(iv) Production control techniques

(a) aggregate planning

(b) Master production schedule

(c) Materials requirements planning

(d) Capacity planning

(e) Scheduling and control

*Line balancing

*Line of balance

*Single machine scheduling

*Flow shop scheduling

*Job shop scheduling

(v) Maintenance management

(vi) Feedback and control techniques

(a) Quality control

(b) Inventory control

The finished products/ services produced by the system are to be checked for conformance with quality specifications and other design specifications. These are done at the output stage and corresponding feedbacks are given to the input stage for necessary corrections. This feedback mechanism is a continuous process, but the degree of corrections required depends on the materials‘ quality, equipments‘ condition, employees‘ skills and their commitments.

1.7. Questions:

1. Define production management? Explain the objectives of production management.
2. What is the role of materials management in production system?
3. What are the types of production system.

1. 8. Further Readings:

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LESSON – 1O

Production Management

Plant Layout Design

After going through this lesson you will be able to understand

- Features of plant layout
- Significance of plant layout
- Factors governing plant layout
- Advantages of Product and process layout

Structure

1. Need for plant layout
2. Significance of plant layout
3. Factors governing plant layout
4. Distinction between product and process layout

2.0 Introduction:

The simple meaning of the word „layout" is an arrangement. Plant layout is the physical configuration of departments, work stations and equipments in the conversion process . Plant layout signifies arrangement of machinery, equipment and other industrial facilities like recurring, storage and supply of raw materials and supplies and final products, tool room, maintenance room, employee amenities such as rest rooms, canteen, crèches, material handling so as to attain the highest efficiency of the production flow. Professors Knowles and Thomson defined the phrase "Plant Layout."

(i) Planning and arranging manufacturing machinery, equipment and services for the first time in completely new plants and

(ii) The improvements is the layouts already in use in order to introduce new methods and improvements in manufacturing procedures".

2.1 Features of plant layout

Essentials of a sound Plant layout: A good layout brings home comforts and convenience, safety, efficiency, compactness and profits. The following are the requisites of a sound or good plant layout.

1. **Departmentation** : Good plant layout strongly believes in Departmentation of factory into a viable number of divisions or compartments that facilitates the smooth flow of production . Departmentation may be by functions , products or processes that increases span of control for effective supervision for better results.
2. **Scientific Array of plant and machinery**: A sound plant layout works on scientific and orderly and well thought out way to coordinate smoothen and quicken the process of production to increase the output, improve the quality of output and reduce the cost of output. It means, the greatest achievement of what society expects.
3. **Strategic placement of equipments and Tools** : Plant and machinery are the major installations and machines which are founded firmly at a place or places as per production design system.
4. **Proper Arrangement of Material Handling** : The stock of raw-materials moves from one department to another and in the same department from one machine to another in the course of manufacturing. This needs flexible and reliable material handling and making available other auxiliary services needed in the very course of conversion.

2.3 NEED FOR PLANT LAYOUT

The need for plant layout becomes inevitable on several occaions backed by rational causes and forces.

1. **To produce newly designed products**: The concept new product is really very difficult to define. New product has a different design specification.
2. **To Introduce New- product line**: The product line as the breadth of a single product in terms of variety, sizes, styles, and hence functions and prices.
3. **To Meet increased Demand** : No company can ever dream of fully go into hundred percent of is installed capacity at once. It is because, when the product is launched in the market, it is to catch up its demand, resulting in ever increase over a period. A product is quality one, reasonably priced and has regular and adequate supply encouraging the firms to move from lower level key to higher level key.
4. **To Reduce Industrial Accidents**: Accidents are common in all industrial units as road accidents. These are causal by bad working conditions on one hand and psychological forces on the other.
5. **Changes in the technology of production**: The technology as applied to every walk of life is moving at a faster pace. Within a very short span of time the existing technology or method becomes obsolete.
6. **Shift of plant to another place :** A plant which has worked on a site for decades has to shift to new area because of legal restrictions, cost reduction programmes and expand which is possible by moving over to new areas.

2.4 SIGNIFICANCE OF PLANT LAYOUT

One is able to appreciate the real significance of an ideal location if one knows the influence of efficient layout on the manufacturing functions. It has salutary effects on this functioning and functions to effect economy, efficiency and productivity and therefore, the positive benefits.

1. **Effective use of Space** : Spatial considerations play a ole of paramount importance in any walk of life and more so in case of industrial unit. The question is one of the best use of the available limited space for best results with accent on esthetics of the space and surroundings.
2. **To Facilitate the Manufacturing Processes:** The basic aim of any sound layout is to bring into play that kind of manufacturing process that makes the processing optimal. Optimizing the manufacturing processes or converting raw-materials into end-products is possible by (1) Arranging the equipment to derive greater utilization (2) Minimizing production delays and reducing undesirable congestion (3) Increasing the output by shortening the manufacturing cycle or time through improved lay out.
3. **To Minimize Material Handling**: The manufacturing process involves movement of material from one stage of completion to another, from one machine to another in a particular department and from one department to another. It can be handled manually and mechanically or both.
4. **To Maintain High Rate of Turnover of Semi-finished Goods**: In all those plants where production processes involve unduly high time, which results in accumulation of semi-finished products at various points may be a machine or a department creating bottlenecks or deterrents. Bottlenecks refers to any pace in production process, where materials tend to put up or produced at rates of speed less rapid than the previous or subsequent operations.
5. **To Ensure Employee Morale**: Men are part and parcel of manufacturing process. There is vast difference between men and other inputs because these men who work on these physical means in converting inputs into value added output. Therefore, man power working needs all these facilities and conveniences so that human energy is not wasted and the work-force feels more comfortable and consider work as a play.
6. **To Ensure Effective Use of Labour force**: Whenever and wherever, the labour is paid according to time, it costs every second if not a fraction of second. The time for which a worker is to work say eight hours has productive time and idle time. This idle time can be normal and abnormal.
7. **To Facilitate Accurate Production Planning and Control**: A steady and regular quantity of work output is assured by scientific layout of the production capacity and

utilization. The extent of idle capacity utilization is reduced to the minimum as a balanced capacity is on the track intact.

8. **To Ensure Effective Supervision**: A scientific, and therefore, sound plant layout makes it easy and economical the task of supervision because the workers are able to carry out their assigned activities and tasks without the need for detailed instructions and supervision.
9. **Improved Quality Control:** The reputation attached to an organization for the quality of its products and services is accepted as a key to its success and the future of its employees. The consumer no longer required to make a choice ;between price and quality, and competitiveness in quality is not only central to profitability, but crucial to business survival.
10. **To Bring About Reduced Equipment Investment:** Investment in equipments can be minimized to a greater extent by planned machine balance and the location, minimum handling distance, by installing the general purpose machines than specialized, through planned machine loading.

2.5 Factors governing Plant layout : Every industrial plant to achieve the highest standards to performance by the best or ideal layout. Unfortunately there is nothing like a „standard" layout which can match perfectly to each individual case because these norms differ from plant to plant, industry to industry and time to time. The actual layout is the outcome of certain factors or forces which determine it. The most significant factors that influences the type of layout a unit is to have are:

1. Factory Location : It is the general location and specific site of the factory that determines the very pattern of plant layout. For instance, some localities have more advantages by way of right kind of labour, proximity to market, availability of raw- materials than the other locations. The size, shape and the topography of the site affects the construction of a factory building which, in turn, will decide the internal arrangement of departments.

2. The type of the Manufacturing process: The type and the nature of manufacturing process involved in conversion of inputs into output determine the type of plant layout. It is worth while to known different types of processes involved. There are five possible types.

They are : a) Synthetic (b) Analytical (c) Intermittent (d) Repetitive and (e) Non- repetitive. “Synthetic” process is one which combines different inter-related inputs in case of main product. “Analytical “ process is one that starts with basic raw-material and splits it down into various constituents. “Intermiltant “ process is one Which manufactures the semi finished and finished products required for main product in separate departments or workshops. “Repetitive” process is quite common in case of those products which are standardized and produced on mass-scale in anticipation of demand.

3. The type of the product : The physical and chemical properties of the product its design, size, form, weight, volume are to decide the pattern of plant layout. Even other characteristics such as supplementary and suiplicity and complexity of its fabrication, costlier or cheaper, solid or liquid, small quantity or large quantity requirements, luxury item or base necessity terms all determine the type of layout.

4. The Material Input : When one says that the nature of material influences the layout, it refers to the need for its storage and movement in the plant in the travel from original form into an end product. Therefore, storage and material handling constitute important determinants of costs. These facilities involve initiats investment in storage locations or points and material handling equipments such a cranes, trolleys, hand-trucks, lifts, pipe-lines and the like.

5. The Employee Requirements : Employees on the factory floor are integral part of manufacturing process who work on materials and machines equipments, appliances and hand tools. Therefore, their requirements do have hearing on plant layout. The layout designer can not afford to forget the type, position and the individual needs of employees for conversion of inputs into output.

6. To start with the type of machinery, to be installed as a part of plant or in the plant, is determined by the type of product, the volume of output the type of processing and the managerial policies. In turn, it is the machinery that has greater influence an plant layout. Output is the outcome of nice blend and manipulation of men materials and machines. It is the combination ratios of these three basic elements that decides the production activity and these ratios depend on their relative costs and benefits and the processes selected.

7. The Managerial Policies: Managerial policies finally decide the plant layout as to its various aspects. These Managerial policies which are designed to achieve predetermined goals hover

round the following points (1) Quality and 1uantity of output (2)Size of the plant and the extent of its integration (3) Making or buying a particular components part of the main product. (4) Plant expansion in the long-run (5) The extent of automation welcomed (6)Inventory policies – both input and output.

2.6 Various Types of Plant Layout:

Lay out are classified into 4 types they are :

1. Product Layout
2. Process layout
3. Combined layout
4. Fixed layout.

- **The Product Layout** : " Product" layout is also known as "line" layout or "straight-line" layout. It is a kind of an arrangement of machines where machines are gathered and arranged keeping product as the focal point. The production department installs the machines in sequence of operation as required in case of a product. It intends to bring into effect an orderly and logical arrangement of productive facilities that will be in consonance with large production volume.

  Professor James. M. Moore has defined this as "In the product layout, the equipment used to fabricate a given product is lived up in order of appearance. The raw-material arrives at one end of the line goes from one operation to the next quite rapidly, with a minimum of work in progress, storage and materials handling."

  Product layout can be arranged in any one of the four alternative possibilities namely, (A) Straight-line (B) „U‟ Shaped (C) Circular and (D) Odd angle,

  (A) **Straight-line Type** : These machines are installed as near as possible because the output of one machine becomes the input for the next machine.

  (B) **„U‟ Shaped Product Layout** : „U‟ Shaped arrangement is more compact than straight-line. It brings about economy is floor space and allows closer supervision span than straight line.

(C) **Circular Product Layout** : Under this arrangement, the machines are laid out in the shape of a circular like a " Rung ring a rosy." The operations are carried out inside or outside the circular or circle.

(D) **Odd angle Product Layout** : It is "odd" in the sense that there is no any fixed pattern for arranging the machines but is designed to suit the available space. However sequence of operations is strictly maintained.

2.6.1 Advantages and Disadvantages of product layout

Advantages: The product layout is advantageous as under

(i) Reduced material handling cost due to straight-line production flow.

(ii) Line balancing may eliminate bottlenecks and idle capacity,

(iii) Line balancing may eliminate bottlenecks and idle capacity.

(iv) Shorter operating cycle due to shorter and speedier movement of materials.

(v) Maximum utilization of machine and labour capacity through developing proper balance between them.

(vi) Effective control over production with reduced supervision by generalists supervisors. By reducing the manufacturing to simple steps we can often use less skilled labour.

(vii) Effective quality control with reduced inspection points. It does not require frequent changes in machine set-up.

(viii) Effective production planning and control. Unlike process layout, the routing, scheduling, dispatching and follow-up are relatively easier.

(ix) Maximum use of space due to straight production flow and reduced need of interim storing.

(x) It facilitates the implementation of the group incentive schemes for the workers.

(xi) It is relatively easy to control.

Disadvantages: The following are the main disadvantages of the product layout.

(i) The duplication of machines and equipment necessitates the increased investments in them sometime resulting in idle capacity.

(ii) The production flow is regulated though the straight line sequence and fixed rated capacity, and thus makes it highly inflexible .

(iii) The break –down of one single machine in the line interrupts the entire production flow.

(iv) Unlike process layout, the benefits of specialized supervision in not possible.

(v) As the entire production is the result of the joint efforts of all operations in the line, it is difficult to implement individual incentive schemes.

(vi) They are less flexible than others. Any change in product requires re-balancing the line. If there is any trouble with one machine, the line goes out of balance.

4. Process Layout:

The "Process" layout is also called as "functional" layout. It is a kind of arrangement of machines and equipments performing similar functions together in an assigned area. According to professor R. Read, in his book "Plant layout – factors, principles and techniques", defines process lay-out as "one which is signified by the grouping together of like machines based up on their operational characteristics."

Merits:

1. **Lower capital lockup** : The initial capital lock up is going to be much lower because, the production apparatus is applied to maximum capacity utilization. With minimum duplicity, variety of products.
2. **Greater Flexibility** : This provides greater flexibility in production planning and control . This is the special advantage of limited specialization unlike product layout.
3. **Quality Supervision** : The specialized supervision abilities can be used in a particular department. Therefore, one can expect, better planning, direction, control and maintenance of operations of each department. This specialized knowledge is sure to pay when the firm thinks of diversification and modification of products or product lines.
4. **Uninterrupted Functioning** : Each department has alternative similar type of machines performing specialized functions, even if one machine fails, the others are ready to take the extra load caused by break down, thus allowing the production cycle to continue and complete without any hindrance.
5. **Fuller Utilization of Machine Capacity**: A machine is not manufacturing a particular product, there is greater degree of better machine capacity utilization. Even if a particular product is not manufactured for one reason or the other, still the machine can be engaged in providing over products.

Demerits:

1. **Difficulties in Production planning and Control**: The production processes are completed in separate departments. It very difficult to plan the minute and significant takes of routing and scheduling and even controlling in terms of dispatching and follow up of work.
2. **Excessive Handling of Materials** : The cost of material handling will be the highest because, it cannot be fully mechanized in absence of a regular and definite routes or channels.
3. **Larger Stock-piles in the Process** : Production process taken longer time for completing the usual production cycle where material in process is to wait for instructions, transit-delays, loading, unloading, inspection and conveying to other departments.
4. **Possibility of More Floor Area**: The factory floor is divided into specialized departments where sufficient space is consumed by compartment lasing area plus sufficient space for incoming and outgoing semi finished and finished products is to be provide for storage; space is also needed for isolated passage, inspection cribs, service facilities and so on.
5. **Longed Production Cycle Time:** The process layout by its very nature of arrangement of production facilities, increases the time consumed in completing a given production cycle. It is because, the materials and semi finished goods are to move from one department to another only after relevant process or stage of manufacturing is completed.

2.6.2 Distinction between ”Product” and “process” Layout:

A clear cut distinction is possible between “product” and “Process” layout on certain grounds. There can be at least ten such grounds for distinction. These are:

1. Arrangement of Production Facilities : In case of “Product” layout, the machines and equipments performing different functions are arranged one after another in a single .. on the same floor making it possible to put one end raw –materials and to get final product on the other. On the other hand, in case of “Process” layout the machines and equipments performing similar functions are grouped in a separate departments of the factory floor.
2. Suitability: “Product” layout is most suited where there is mass and standardized production moving straight from raw-material stage to another end to final product. Here the production is in anticipation of demand and goes round the clock and round the year. On the other hand, “process layout is suited for small lot and non-standardized production. Intermittent type of

production which is not in anticipation of demand where products are not standardized and unique warrants process production layout.

3. Economy: Speaking from the point view of cost, comparatively the product layout is, in fact, costlier as there is duplication of machines and equipments and the machines are not used to the full extent or capacity though there is mass production is undertaken. On the other hand, in case of “Process” Layout the costs are comparatively much lower as there is uninterrupted fuller use of machines and equipments or production facilities, even if the production is not on mass scale.
4. Expansion Possibilities: In case of “Product” Layout, it is not possible to increase the production capacity of a plant beyond a particular limit. It is because, it entails duplication of entire machine capacity and the possible under- utilization. Contrary to this, in case of “process” layout it is possible to add to the existing capacity than lateral expansion.
5. The Flow of Work: In fact, in case of “Product” layout, the work should move on faster provided, there is no machine break down in the chain. There is no back-tracking as materials and semi-finished goods move directly from one machine to another. On the other hand, by very nature materials and semi-finished goods move slowly as they move from one department to another waiting on the way.
6. Material Handling Expenses: Material handling costs are much lower in case of product layout as it moves from one machine to another though mechanical devices straight next sequential stage. There is no question of waiting for and back-tracking. On the other hand, in case of process layout, there is good deal of material traffic moving to and from one department to another and waiting in quence one reason or the other.
7. Flexibility: Product layout is most rigid as it is difficult and costly to change the existing arrangement of machines and other facilities once set. On the contrary, the process layout is more flexible or adaptable as changes in the existing set up can be brought about easily and ever new additions can be made in or department or departments needed depending on the changing needs of the time dimension.
8. Time Span of Production Cycle: The Product layout is such an arrangement whereby valuable time is not wasted in processing as there fast movement of work in process without holdups is possible from machine to machine on a single floor, while in cause of “process” layout it takes comparatively much more time as material and semi-finished products are to

travel from one department to another, waiting for completion and then go to next department for the next stage of processing.

9. Cost and effectiveness of Supervision : In case of „Product" layout, supervision works easier, costlier and economical as one or two supervision are enough as they can command the entire floor where each supervisor can have span of supervision between 5 to 8 lines of similar products – right from starting point till end-that is raw materials to-final products. On the other hand, in case of "process" layout, each department has a supervisor who is to supervise only a part of entire job.
10. Production planning and Control: The Crucial task of production planning and control that is, routing, scheduling, dispatching and following-up poses much less problems and pressures on foremen and supervisory staff in case of product layout, as sequence of operations is pre-set and it moves on its own. Contrary to this, in case of "process" layout, it is really an up heat task because, on the same routes, different products are move on for completion from raw-materials to end products.

2.7 Layout Design procedures :

Layout design procedures can be classified into manual methods and computerized methods.

Manual Methods. Under this category , there are some conventional methods like, travel chart and systematic Layout Planning (SLP).

Computerized methods . Under this method, again the layout design procedures can be classified into constructive type algorithms and improvement type algorithms.

Construction type algorithms

*Automated Layout Design Program (ALDEP)

*Computerized Relationship Layout Planning (CORELAP)

Improvement type algorithms

*Computerized Relative Allocation of Facilities Techniques (CRAFT).

Systematic Layout Design Procedure:

An organized approach to layout planning has been developed by further and has received considerable publicity due to the success derived from its application in solving a large variety of layout problems. This approach is referred to as systematic layout planning or simply

SLP. It is clear that once the appropriate information is gathered, a flow analysis can be combined with an activity analysis to develop the relationship diagram. The space-relationship diagram is constructed by combining space considerations with the relationship diagram. Based on the space –relationship diagram, modifying considerations and practical limitations, a number of alternative layouts are designed and evaluated. In comparison with the design process, SLP begins after the problem is formulated.

Computerized Relative Allocation of facilities Technique (CRAFT)

CRAFT algorithm was originally developed by Armour and Buffa. CRAFT is more widely used than ALDEP and CORELAP. It is an improvement algorithm. It starts with an initial Layout by interchanging the departments pair wise so that the transportation cost is minimized. The algorithm continues until no further interchanges are possible to reduce the transportation cost. The result given by CRAFT is not optimum in terms of minimum cost of transportation. But the result will be good and close to optimum in majority of applications. Hence, CRAFT is mainly a heuristic algorithm.

CRAFT requirements

1. Initial layout
2. Flow data
3. Cost per unit distance
4. Total number of departments
5. Fixed departments: Number of such departments and Location of those departments
6. Area of departments.

CRAFT Procedure:

The steps of CRAFT algorithm are summarized below.

Step 1.Input: 1.Number of departments

2.Number of interchangeable departments

3.Initial layout

4.Cost matrix

5. Flow matrix

6. Area of departments

Step 2. Compute centroids of departments in the present layout.

Step 3. Form distance matrix using the centroids

Step 4. Given data on flow, distance and cost, compute the total handling cost of the present layout.

Step 5. Find all the possible pair wise interchanges of departments based on common border or equal area criterion. For each possibility, interchange the corresponding centroids and compute approximate costs.

Step 6. Find the pair of departments corresponding to the minimum handling cost from among all the possible pairs of interchanges.

Step 7. Is the cost in the previous step less than the total cost of the present Layout? If yes, go to step 8. If not, go to Step 11.

Step 8 Interchange the selected pair of departments. Call this as the NEW LAYOUT. Compute centriods, distance matrix and total cost.

Step 9. Is the cost of new layout less than the cost of the present layout?

If yes, go to step 10. If not, go to Step11.

Step. 10. The new layout is here after considered as the PRESENT LAYOUT. Its data on centroids, layout matrix and the total cost is retained. Go to Step 5.

Step 11. Print the present layout as the FINAL LAYOUT.

Step 12. Stop.

Automated Layout Design Program (ALDEP)

ALDEP is a construction type algorithm. This algorithm uses basic data on facilities and builds a design by successively placing the departments in the layout. After pacing all the departments in the layout, a score is computed. This is nothing but sum of the closeness rating values of different neighboring departments in the layout. This algorithm is repeated for a prespecified number of times and the best layout is selected based on maximum layout score.

The basic data required for is algorithm are listed bellow.

1. Total number of departments.
2. Area of each department.
3. Length and width of layout.
4. closeness ratings of various pairs of departments in the form of Relationship Chart.
5. Minimum department preference(MDP) value.
6. Sweep width.
7. Number of iterations to be performed.

8. Location and size of each restricted area in the layout if present.

Steps of ALDEP

Step 0. Input.

1. Number of departments in the layout.
2. Area of each department.
3. Length and width of the layout.
4. REL-CHART(Relationship Chart).
5. MDP value.
6. Sweep width.
7. Number of iteration to be carried(N).
8. Current iteration to be number(I),1.
9. Locations and sizes of fixed departments if present.
10. Score of the current layout (It is assumed as a very high negative value before performing the first iteration).

Step 1. Select a department randomly and place it in the layout.

Step 2. Scan the relationship (REL) –chart and classify the unselected departments into two lists, namely List A and List B.

List A contains the unselected departments whose relationship values in relation to the lastly selected department are less than MDP value.

List B. contains the unselected department whose relationship values in the relation to the lastly selected department are greater than or equal to the MDP value.

Step. 3. Is the List B empty? Is so, go to Step 4: otherwise, go to step5.

Step 4. Select a department randomly from list A and place it in the layout. Go to Step 6

Step 5. Select a department from List B which has the maximum REL value in relation to the lastly selected department and place it in the layout.

Step 6. Whether all the departments are paced in the layout? If not go to Step2; if yes, go Step 7.

Step.7. Compute the score of the layout.

Step 8. Is the score of the layout more than the score of the current best layout? If yes, update the new layout as the current best layout and store the corresponding score. Otherwise, drop the new layout.

Step.9 Is the current iteration number I = N? If yes, go the step 10; otherwise, increment the iteration number by one (I = I+ 1)and go to Step 1.

Step 10. Pint the current best layout and the corresponding score.

Computerized Relationship Layout Planning (CORELAP)

This algorithm is based on Muther"s procedure given in Systematic Layout Planning. A computer algorithm was developed by R.C . Le. Interactive version was developed by James Moore. Input requirements

- Number of departments and their area.
- Closeness relationship as given by REL-chart entries.
- Weighted ratings for REL-chart entries.

Optional input information

- Scale of output.
- Building length to width ratio.
- Department pre-assignment.

General approach is to select the most critical department first, and place it at the centre of the layout.

After the first department is placed, then the department having highest closeness relationship with the departments which are already placed is selected and placed in the best location adjacent to the previously placed departments. CORELAP builds the layout from centre. The final layout will not have a regular rectangular shape. The user has to modify it slightly to suit the situation.

Final score of the layout is developed by using the closeness values and rectilinear distance between all pairs of departments. The following are the major steps of CORELAP algorithm.

1. Defining basic data.
2. Determination of placement order.
3. Placement of departments in the layout.
4. Finding the total score of the layout.

2.8 Algorithms and Models for Group Technology

In this section, Rank Order Clustering (ROC) and Bond Energy Algorithm applied to Group Technology(GT) are presented. Also, mathematical models for GT cell formation are presented.

Rank Order Clustering Algorithm (ROC)

This algorithm was developed by J.R. King (1980). This algorithm considers the following data.

*Number of components.

*Component sequences.

This algorithm is used to obtain machine-component cells in group technology.

Based on the component sequences, a machine-component incidence matrix represent the machines which are required to process the components. The columns of the matrix represent the component numbers.

Steps in ROC: The steps in ROC algorithm are given below:

Step. O. Input: Total number of components, Component sequences

Step.1. Form the machine- component incidence matrix using the component sequences.

Step.2. Compute binary equivalent of each row.

Step.3. Rearrange the rows of the matrix in rank wise (high to low from top to bottom)

Step. 4. Compute binary equivalent of each column and check whether the columns of the matrix are arranged in rank wise (high to low from left to right)? If not, go to Step 5; otherwise, go to step7.

Step.5. Rearrange the columns of the matrix rank wise and compute the binary equivalent of each row.

Step 6. Check whether the rows of the matrix are arranged rank wise? If not go to Step 3: other wise, go to Step 7.

Step.7. Print the final machine-component incidence matrix.

Bond Energy Algorithm

Bond energy algorithm was developed by Mc-Cormick et al. (1972). The objective of this algorithm is to obtain machine-component cell formation in group technology. To demonstrate this algorithm, consider the following initial machine-component matrix.

Where, a is the machine-component incidence matrix element for the I th row and J th column, M is the total number of rows (machines) in the machine- component incidence matrix, and I and j are adjoining columns.

Algorithm

Step 1. Select a column randomly from the machine-component incidence matrix and place is in a new matrix

Step 2. Compute bond energy for each of the unselected columns with each of the selected columns.

For a given unselected column, there may be more than one value for bond energy. If so, select the column with the maximum bond energy and place it in the new matrix as per the position determined while computing the maximum bond energy.

Step 3. Now treat the matrix obtained in the previous step as the source matrix .

Select a row randomly and place it in a new matrix. Then compute the bond energy for each of the unselected rows with each of the selected rows.

Step.4. Treat the machine-component matrix obtained in the previous step as the final machine component incident matrix.

2.9 Questions:

1. Explain the significant of plant layout
2. What are the factors governing plant layout
3. Explain the difference between process layout and product layout
4. Explain various layout design procedures.

2.10 Further Readings:

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2. N.G. NAIR "Production and operations Management", Tata Mc. Graw – Hill publishing Company Limited. Delhi/
3. Dean.S.Ammer, Materials management and purchasing, Taraporerala & sons.

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Lesson - 11

FACILITIES, PRODUCT AND PROCESS DESIGN

Objectives :

After going through this unit you will be able to understand:

- Facilities location
- Factors affecting location Structure
- Product and process design
- Materials Handling

Structure:

1. Factors affecting location
2. Steps in new product development.
3. Process planning and design.
4. Materials handling Programme.
5. Objectives of materials handling

3.0 Facilities location:

Site selection is an important activity which decides the fate of the business. A good location may, reduce the cost of production and distribution to a considerable extent. Locating a business involves a large, relatively permanent investment. If the site selection is not proper, all the money spent on factory building, machinery, and their installation will go in waste and the owner has to suffer a great loss. The need for selecting a suitable site are:

(1) While starting a new factory
(2) During the expansion of the existing plant.
(3) When the existing plant is to be re-located at some other place, to remove the drawback of the present location or to gain the benefits of a still better location.

3.1 Factors affecting the Location

3.1.1 Primary factors

(i) Supply of Raw Materials: It is necessary to consider the adequate supply of raw materials and the nature of raw materials. The cost of raw materials are an important element of the total cost of production. If the supply of raw materials is not regular, it may lead to frequent stoppages and breakages in production.

(ii) Nearness to Market : Every producer wants to sell his product in the market. Nearness to market is important from the point of view of his control over the market. In those industries where raw materials are obtained from different sources, nearness to the source of raw material is not as important as nearness to the market.

(iii) Transport Facilities : Speedy transport facilities are needed for the regular and timely supply of raw materials at low cost and for transporting Finished products on time to the market. Transport facilities with a good speed and capacity are needed for transporting labourers and establishing contacts in the market, and controlling supply according to changes in demand.

(iv) Supply of Labour : The supply of labour at low cost is important. The importance of labour supply has not lessened in spite of mechanization. Labour costs are important Machines cannot produce anything without the availability of skilled labourers.

(v) Power : Power is necessary for the process of production and for transporting finishing goods and raw materials. Power may be electrical, diesel and atomic energy. All types of power like electricity diesel and atomic energy are localized and mobile.

(vi) Supply of Capital: Industries require capital for initial promotion and expansion. Therefore, a capital ,market must be developed in industrial centers. Large-scale production, mechanization and big industries require large amounts of equity capital and debenture capital for a long period.

3.1.2 Secondary Factors

(vii) **Facilities:** An enterprising spirit , innovation, technical knowhow and an industrious nature of population – all these factors taken together and a favorable government policy create a favorable atmosphere for the purpose of the establishment of industries.

(viii) **Natural Factors** : Land, water, climate, source of raw materials and agricultural climate are some natural factors which are important for some industries like cotton textiles sugar and jute. These industries depend on a good climate and source of natural raw material.

(ix) **Political Factors** : The government‘s policy of licensing and encouraging the development of industries in underdeveloped regions determines the location of industries. Such a policy may cause the dispersal of industries. The location of defense industries depends on the political policy of the government.

(x) **Government Subsidies and Facilities**: The government may encourage the dispersal of industries in underdeveloped areas by making capital, land, water and power available at subsidized rates. The government may give such facilities as development rebate, tax exemptions, price subsides, banking, insurance and postal facilities at low rates, priority in transport and supply of raw materials, etc.

(xi) **Historical and Religious Factors**: Some industrial cities are of historical importance. some of them are capital cities having religious importance – e.g. Benaras, Prayag, Kolhapur, Nasik, etc. Industries grow at these religions centers because these are places of historical Importance.

(xii) **Initial Start and Goodwill**: Some industries get located at a place because some industrialists start the industry at that place at an stage. Government restrictions play a negative role in the location decision. Industries are not permitted to be started or expanded in certain developed urban areas. So certain industries are relocated from urban areas to rural or less developed or the divisions or branches of the industries established in urban areas are started in such rural or undeveloped areas.

(xiii) **Personal Factors** : In business history, it is found that personal considerations have decidedly affected the location of certain industrial units. There is no rationale for such considerations, however, when there is a possibility of multiple locations, this factor plays a decisive role in locational consideration.

(xiv) **Miscellaneous Factors**: The following factors also affect the location of the unit.

- (i) Water supply, if water is consumed in large quantities in the production processes.
- (ii) Disposal of waters.
- (iii) Strategic factors like dangers of air-attacks.
- (iv) Availability of fire-fighting facilities.
- (v) Availability of recreational, medical educational facilities.
- (vi) Facilities like schools, hospitals, post-office, parks, etc. enjoyed by the community.
- (vii) Community attitudes
- (viii) Ecological and environmental considerations.
- (ix) Regional aspirations of people and their political satisfaction.

3.2 Recent Trends in the location of industries

The traditional factors like nearness of sources of raw materials, motive power, nearness of markets, Labour supply etc. have no longer remained the effective pulling forces in the location of industries. The Locational trends have changed substantially due to the development of substitute raw materials, network of electrification and transportation by roads and railway, mobility of the labour and persuasive and compulsive policies of the government for balanced regional development. The recent trends in the selection of industrial location can be described as under:

(i) Priority for the suburban areas: The industrialists show their preference for the suburban area as the site for establishment of a new unit or relocation of the existing one. The industrial policy of the government does not permit the establishment of anew unit or expansion of an existing one in city areas. At the same time infrastructure facilities are developed in the suburban areas.

(ii) Industrial development in the notified backward areas: In order to have balanced regional development, the Central Government as wall as the State Government has notified certain backward areas e.g., Panchamahals, Bharuch and Surendra Nagar are the centrally notified backward districts of Gujarat states. Similarly, Gujarat State Government has also notified certain backward talukas. Different types of incentives like cash subsidy, tax reliefs, concessional financial assistance, cheaper land and power supply etc. are provided. So, many such areas have been developed substantially in the recent times.

(iii) Establishment of industrial estate: Industrial estate is piece of vast sub-divided into different industrial plots wherein factory sheds are constructed. The Government of India has planned a national policy for the development of industrial estates. It assigned the responsibility of the development of industrial estates to State Government.

(iv) Decentralization of industries: Under the conscious industrial policy of the Government, concentration of industrial units is prevented through licensing policy. New units are not permitted to be started in certain industrially congested areas. Similarly, existing units either establish their additional plants in a less developed area or sometimes relocate the whole unit in such areas.

(v) Increased role of the Government in the decision of location of industries: Government through its persuasive and compulsive methods, greatly affects the locational decisions in recent times. It provides certain attractive incentives to the promoters to establish their units in less developed areas, at the same time it does not permit excessive industrialization in certain developed areas.

(vi) Competition between Government and institutions: As industry provide job opportunities to the local population, many local organizations attempt to tempt the prospective promoters to establish the units in their areas. They provide different types of incentives like cheap land, relief in local taxes etc. Sometimes the objective of local organizations and the government, comes in conflict on the issue of location of industries. Thus, the whole pattern of decision about the location of industries has undergone substantial changes in recent times.

3.3 Regulations on Location of Industries:

The basic objective of the private sector is to obtain maximum profits out of the business operations. So private sector industries select such a site which reaps maximum economic advantage. Such a policy results in the concentration or localization of industries in certain areas leaving the other areas underdeveloped. Such a policy distorts the quality of income, wealth and opportunities. So the government being the custodian of public interest, intervenes in the locational decisions as under:

1. Through the licensing policy, it restricts the concentration of industries in developed areas:
2. It provides certain tempting incentives for the spread of the industries in the industrially backward areas:

3. It establishes the giant public sector units in the relatively less developed areas.

This objective of state intervention and control are:

1. To attain balanced regional development.
2. To narrow down the gap of inequality of income and wealth through creating and providing employment opportunities to less developed areas.
3. To reduce the concentration of population and congestion of industries in city areas.
4. As strategic defence policy, spread of industries reduces the chances of heavy losses in war time.

3.4 Product Design And Process Design

In any business venture, product design is the first step immediately after accepting the concept of a product. Product design has direct bearing on plant layout and in-process materials flow. In the process of product design, one has to critically analyze different design features with relevance to places of use, substitute materials, and carefully plan equipment alternatives for manufacturing the product. Therefore the purpose of product design and analysis is to determine and specify products that will be profitable to manufactures and distributors and will give human satisfaction. The various aspects in produce design are :

(a) Design for function: A product must perform the function which its customer expects it to do. If a product is designed by taking its functional features into account, then it will create satisfied customers, and will further lead to having more repeat customers. The factors which are to be considered for functional design are strength and wear ability of the product and its components.

(b) Design for making: A product design that solves the functional problem smoothly, but is impossible to manufacture, is of no use. Attention must be given to materials. Fastening devices etc., while designing a product. The hardness of the material specified at the design stage must be within the permitted range while machining. In some intricate design, to join components, we may require small size fasteners. If these are not available in the market, then the design may become infeasible at the manufacturing stage. Making use of standard parts is an important aspect of product design. Also, operational convenience of the machineries must be taken into account at the design stage.

(c) Design for selling: A product that functions well and is easy to make, but is wanted by no one is of no avail. It makes no difference whether the product is a pen o a CNC machine, it has to sell itself to the customers. The features like, appearance and convenience, depending on the customers, needs, are to be considered. Product convenience can be improved using pre-determined motion-time systems. So, the engineers, designers and psychologists should work together to design a better product for selling.

3.4.1 Modules of product design and analysis: product design may be classified into design for new products (new product development) and design fo modifications of existing products. Product design is a repetitive task. A careful analysis of the product attributes would reduce obsolescence and extend product‘s life. The following are the various aspects of product design and analysis.

- Process Planning and design
- Value analysis/Value engineering
- Standardization and simplification
- Make or buy decision
- Ergonomic considerations in product design
- Concurrent engineering

  Since a new product development requires special emphasis, its concepts and steps are presented before discussing he aforementioned aspect of product design and analysis.

3.4.2 New Product Development –Its Process

The product may be upgraded either by changing some parts to improve its operational performance or by completely changing the technology employed in the manufacturing process. Sometimes, a change in the product must be introduced to reduce its price so that the price becomes competitive in the market. Companies require flexibility to enable themselves to introduce new products rapidly and to change their product mixes often.

The design of the goods and services that a company offers in the market is strategic in nature. Apart from directly affecting the company‘s success in the market place, the effects of design are interrelated and they may affect many functions of the company. Design is guided by objectives and policies that are best addressed when a company considers the types of goods and services it intends to offer and the level of quality it intends to provide. Furthermore, a product‘s design and reputation affect perceptions of the company as viewed by its employees, `customers and the public.

Some of the factors which are to be taken into account while designing a product are as listed below:

- External appearance of a manufactured product which influences potential buyers to make purchase decision.
- Internal components of a product which will have effect on its performance, reliability and durability, and hence, the customer‘s long-term satisfaction.
- The number, type and complexity of a product‘s components which affect the type of suppliers with which a company must deal and the amount of work and operating costs involved. The type of components used in a product can also affect the production processes required to make it, and hence the capital investment and personnel skills, which are important to the company.

One can see that design affects many aspects of operations in addition to pricing, sales, revenues and costs.

Manufactured products or services must have market appeal and be reasonably easy to produce with quality and economy. It has been estimated that 70 percent or more of a manufactured product‘s cost is determined by its design. This is because the design establishes the number of parts that must be made or purchased the type of material and equipment that will be needed. So, designers must be careful about the consequences of the different design parameters while designing a product. A general guideline often followed by designers of manufactured items is to educe the number of parts a company should make. This is possible through standardization and simplification.

Standardization aims to have fewer choices of the components and products that will be produced, so thee is more focus on the production operations. The use of common components in multiple models of a product is a example of standardization. Simplification aims to have no more parts than are necessary to perform the product‘s intended function and tries to reduce the complexity of those parts.

3.5 Steps in New Product Development

The steps involved in new product development process are as follows:

(i) New product strategy development,

(ii) Idea generation,

(iii) Screening and evaluation,

(iv) Business analysis,

(v) Development,

(vi) Testing,

(vii) Commercialization.

New Product strategy provides corporate strategic guidelines for the new product development process through assessment of internal experience and external opportunities. Idea generation involves the use of various idea sources and idea generation techniques required to indentify new ways to satisfy needs and monitor the evolving technologies. New product screening is the development and systematic use of criteria to evaluate the potential of new product ideas.

Business analysis is an in-depth study of the estimated economic feasibility of new product ideas. Product development involves developing the product (or Service) itself (with attention to attributes preferred by customers) and further development of manufacturing, packaging and distribution cost estimates. Testing stage thoroughly evaluates potential market acceptance through the use of market research. Commercialization is the actual introduction of the product into the market place, with all the related decisions and resource commitments.

3.6. Process Planning and Design

(i) Selection of Process : Process selection decisions determine the type of productive process to be used and the appropriate span of that process. For example, the managers of a fast-food restaurant may be required to decide whether to produce food strictly o customer order or to inventory. The managers must also decide whether to organize the process flow as a high-volume line flow or a low-volume batch-production process. Furthermore, they must decide whether to integrate forward towards the market and/or backward towards their suppliers. All these decisions help in defining the type of process which will be used to make the product.

(ii) Process Selection Decisions: Processes can be classified and selected according to product flow and the type of customer order . The customer order is generally of two types—make-to stock and make-to-order . Make-to-stock aims to produce products in advance and helps to have ready stock when demands occur. This is applicable for a product which has no specific customer at the time of manufacturing. For example, tooth paste, soap, etc. Make-to-order aims to manufacture products only on orders. For example, crane manufacturing ship, boiler, etc.

The following six factors influence process selection from among the processes shown in table 2.1

- Market conditions
- Capital requirements,
- Labour,
- Management skills,
- Raw materials,
- Technology.

Table 2.1 Process Characteristics Matrix

	Make-to-Stock	Make-to-Order
Line Flow	Soap, Paste, Fertilizer, Cement	Automobile assembly line, Dumpers, Railway coaches.
Intermittent Flow	Medicines, Fasteners, Furniture	Automobile assembly line, Hospital, Custom jewelry
Project	Real estate development, Commercial paintings.	Buildings, Dams, Bridges, Boilers

A good process selection requires a careful analysis of each of the above factors through several types of studies. A market research study should be done to assess potential demand and other market conditions. Future sales should be projected in terms of a range of possible estimates like, _pessimistic' most likely and _optimistic'

3.6.1 Process Planning Design : It is a complete determination of the specific technological process steps and their sequence to be followed to produce products at the desired quality and cost. This task is generally managed by process engineering.

The process engineer should therefore:

- determine the method of manufacturing a product.
- establish the sequence and the type of operations involved.
- Select the tools and equipments required, and
- Analyze how the manufacturing of the product will fit into the facilities.

The effect of process planning no manufactured parts and end products is more when compared to others. Hence, their decision will have direct effect on all departments, i.e on costs, methods of manufacturing quality and production rates. The basic input process planning can be classified into production information and production system information. Production information include. Product design, Production volume, Market environment, Quality requirements, and Major technologies selection. Production system information include Resource availability and Technology capabilities. Profit can be realized by minimizing the cost of production. Hence, the process planner should be knowledge and experienced in relevant fields. To do this properly, the process engineer should:

1. be able to interpret the product shown by all specifications and tolerances on the product drawing.
2. Know the functions, capabilities and limitations of the available manufacturing machineries and related tooling.
3. Be able to evaluate the need for new or special tooling and equipment.
4. Prepare the best sequence of operations for producing good quality parts, and
5. Provide the necessary inspection equipment.

Once the product design has been issued for production, its specifications are scrutinized by the process engineer with all the above details in mind. The responsibilities of process Planning Engineer are:

(i) Interpretation of

*Part print analysis, *symbols

(ii) Gathering the fundamental details of product design:

- type of rough stock,
- dimensional tolerances,
- type of finish,
- production rate,

- production volume,
- scrap losses,
- down time,
- design changes.

(iii) Recommending design changes: Process engineer should always aim to propose some changes in the given product design in view of minimizing the cost.

(iv) Selection of proper machinery with allied tooling based on :

- required machine capability
- step-up time,
- practical lot size,
- quality of parts, and
- cost and type of tooling.
-

(v) To study the effect of engineering changes upon existing tooling : He should check existing tooling, fixtures, etc. for possible redesign and rework. He should discuss cost benefit aspect of tooling, etc.

(vi) Tooling Data: Process engineer must have updated knowledge on new and modern tools through journals and sales representatives. He must be in a position to adopt new tooling based on economic considerations. Also, he must look for rework and redesign of tools to improve quality and production rate.

(vii) To obtain the sequence of operations : This is obtained through product design. Once an analysis of product design, overall facilities and machine capabilities are over, the best sequence is established and forwarded for approval.

(viii) To decide the inspection equipments in order to meet the desired quality.

3.6.2 Steps in Process Planning :

The steps in process planning are summarized below :

(i) Analyze the part print to get an overall picture of what is wanted.

(ii) Make recommendations to or consult with product engineers on product design changes.

(iii) List the basic operations required to produce the part to the drawing or specifications.

(iv) Determine the most practical and economical manufacturing method and the form of tooling required for each operation.

(v) Devise the best way to combine the operations and put them in sequence.

(vi) Specify the gauging required for the process.

3.7 Material Handling System

In a manufacturing firm, the raw materials are obtained from the suppliers and are stores in the store-room. They are issued to production departments and are moved inside the plant area from one process to another for the purpose of processing till they are converted into finished products. Finished products are sent to the shipping section. The function of the material handling is confined only to the movement of raw materials from the store-room to the shipping section.

According to the American Material Handling Society, Materials handling is the art and science involving the movement, packing, and storing of substances in any form.‘ Thus material handling function includes all types of movements vertical, horizontal or combination of both and of all types of materials fluid, semi-fluid and discrete items and of movements required for packaging and storing.

3.7.1 Materials Handling Programme

The material handling problem is not considered but it considered in the context of the following factors.

(i) Type of product: The material handling programming is largely affected by the characteristics of the product itself. The material handling services are largely governed by the bulk, shape, weight, fragility, liquidity etc. of the materials.

(ii) Plant layout: Plant layout affects the material handling programme in terms of the sequence of the movement and the distance to be moved during the processing.

(iii) Type of production system: As compared to the continuous production system, the intermittent production system poses the specific problems affecting the materials handling programme.

(iv) Factory building: The factory building with its various features like floor strength, ceiling heights type and strength of roofs, door locations and sizes, partitions, stairs, width of the aisles etc. have a decisive effect on the material handling services.

(v) Production planning and Control: Material handling function is not a part of production planning and control. However, the routing and scheduling functions of production control are closely related to the material handling services.

(vi) Packaging: The handling of materials during the processing is facilitated through the pallets, while the finished products are packed in the specific containers.

(vii) Material handling equipment : The material handling programme should be developed in the context of the existing material handling equipment. Their performance should be evaluated from time to time and necessary changes may be made in the light of the economic benefits availed from such changes.

3.7. 2 Objectives of a Good Material Handling System : A well planned material-handling system must be capable of achieving the following objectives. These are :

(i) Minimization of Processing Time : Minimization of processing time is dependent upon the speed and the economy in moving the materials. In some cases, a standard time is needed to make the materials in process from one stage of completion to another. It is said to minimize process time when it keeps up to the standard and not fast movement.

(ii) Minimization of Material Handling Costs : It is estimated that material-handling costs are in range 15 to 25 percent of the total cost. These material handling costs and other costs making the total cost very much fat. There fore, it is only through minimization of costs, the prices can be kept low and margin can be reasonably high. This is possible by taking care of engineering side and ergonomics side of personnel.

(iii) Preventing Damages to Goods and Materials : The quality and the quantity of the output depends on the quality and quantity of inputs. In many cases, while handling the materials particularly manual, more damage is caused to materials than mechanical movement. However, if they cross the standard limits, these become abnormal which is not a welcome thing.

(iv) Preventing Accidents: The material-handling system should be such that it is safe and dependable so that accidents or injuries are reduced to the minimum. Many a time, for no fault of workers, they will be the victims. Therefore, one of the objectives is to prevent the accidents.

(v) Minimization of Fatigue and Drudgery: The fatigue, or tiresomeness both physical and mental, should be its minimum point. Again persons should under estimate material handling as take it easy and routine. It should be game like but not a drudge. It is not a question of pulling on but willingly going on. It is good material handling system that reduces both fatigue and a dragging attitude.

(vi) Improved Productivity: Material-handling is a major activity in a manufacturing organization. Nothing takes place-particularly conversion inputs in to output unless inputs, tangible and intangible and supportive, move from one work-station to another. Therefore , a sound material-handling system always aims of higher productivity which means greater, better and cheaper production.

(vii) Elevated Plant Efficiency: Higher the plant efficiency lower will be the costs, better utilization of all resources, economical and effective use of time. All these have a salutary impact on production, productivity in terms of costs, efforts margins.

(viii) Greater Utilization of material Handling Equipment: In the days of advanced technology, manual methods work out costly, time wasting, end exposure to more accidents. To keep pace with fast moving and competition driven economy, speed of goods movement is of greater importance. Each company is interested in speedy and safe movement of goods in various forms in the process of conversion.

(ix) Better House-Keeping: Materials handling system makes if compulsory to have better house keeping. That is the area for movement of materials, goods, and tools and appliances is to be clear, clean, well lit, non-slippery. This adds to efficient working of the system. Since material-handling is only a part of production and operations system, it becomes to maintain cleanliness, clearness, and allied aspects of house keeping relating lighting ventilation and so on.

(x) Efficient store Keeping: Store keeping is a science and an art that makes possible easy location of items, receiving, issuing the items. Since, stores is to serve the needs of production and operations department, it is to be very effective, efficient.

(xi) Lower investment in Work-in Progress: A good material-handling-system moves at a time, adequate inputs, to work station or stations- just in time thus keeping the production cycle to standard. If production cycle is say 15 days and is delayed even by I day, the investment cost shoots up and consumer, supply schedule can not be met.

3.8 Factors Considered While Solving the material handling Problems

There are two important sets of factors that deserve special attention to solve the problems that crop up in smooth material handling. These are mechanical and economic.

Engineering Factors cover atleast four points, viz., building and plant layout, manufacturing process and equipment, nature of materials and products to be handled and material handling equipments. The factor of ―building and plant layout‖ encompasses the factors of processes and departments to be lied—width of isles—location of columns—carting heights—Number of floors—load-bearing strengths of the floors.

The ―manufacturing process and equipment‖ factor covers the forces of production equipment –method of production—sequence of operations—quantities of materials involved. The factor of ―Nature of Materials and products to be handled covers the points such as—nature of raw-materials or parts handled. That is large or small, singly or jointly, heavy or light, symmetrical or non, rough or fragile—quantities handled—continuous or intermittent flow-distances over which transported.

The ―Material handling equipment factor‖ embraces the aspects – the kind of equipment suitable for the job for instance trolleys, fort-lifts, trucks, conveyors, overhead cranes and so on; capacity of the equipment-hours of service per day - space required for operation - power requirements - case of operation - speed of operation - auxiliary equipment required - adaptability with the other equipment in use or contemplated.

Economic Factors comprise of : initial cost of equipment - cost of installation including rearrangement or alterations to the existing equipments - cost of maintenance and repairs - cost of power - cost of labour required to operate the equipment taxes and insurance - interest on investment depreciation - license fees - supervision costs - salvage value - saving due to reduction in number of men released for the other work - saving due to expenses on the equipment - displaced - savings due to reduction in rework and rejection on account of improvement in handling - savings due to increase in production as a direct consequence of changes in materials handling system.

3.9 Questions:

1. Explain the factors affecting the location.
2. How do you differentiate product design with process design.
3. Explain the factors considered in materials handling.
4. Explain objectives of material handling.
5. Mention steps in new product development.

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