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27

Cost Accounting and Control

27.1. INTRODUCTION

(a) Cost

Cost may be defined as the amount of expenditure (actual or notional) incurred on, or attributable to, a given thing.

The word *cost* is rarely used independently; it is always related to a particular thing, *e.g.*, number of goods produced, etc.

(b) Accounting

Accounting may be defined as the *art* and *science* of recording business transactions in a methodical manner so as to show

- the true state of affairs of a business at a particular instant of time, and
- the deficiency or surplus which has accrued during a specific time period.

Accounting uses words and figures to communicate the transactions which have been entered into.

(c) Cost Accounting (or Costing) and Need for it

- *Costing* is frequently looked upon as the operation of calculating the cost of an article (for sale) as a basis to fix its selling price.
- Costing implies the techniques and processes of ascertaining costs of given things or items.
- *Costing* involves

(*i*) classifying, recording and appropriate allocation of expenditure for the determination of the costs of products or services;

(*ii*) the relation of these costs to sales values; and

(*iii*) the ascertainment of profitability.

- Costing or cost accounting deals with the internal affairs of a business. It attempts to show the results of the operations carried out and emphasises throughout the measurement and achievement of efficiency.
- Through costing, the costs are ascertained by

(*i*) predetermined standards, combined with subsequent analysis of variances between those standards and the actual cost incurred; or

(*ii*) historically, that is, after they have been incurred;

(*iii*) the use of marginal methods of presentation for either (*i*) or (*ii*), involving the differentiation between *variable* and *fixed* costs.

Cost accounting may also be defined as the process of accounting for cost from the point at which expenditure is incurred to the establishment of its ultimate relationship with cost centres (*e.g.*, a location, item of equipment, person, etc.) and cost units (*e.g.*, a unit or quantity of product service, etc.).

- The cost accounting becomes the basis of *cost control systems* and *budgetry control plans* (refer chapter No. 28).

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Cost control and budgetary control are both essential because they permit management to plan ahead and to know when to make changes in order to fulfill the plan related to the operation of a modern industrial unit.

– ***Cost accounting is necessary because it provides information for,***

(*i*) Determining, classifying and analysing the cost and income of a business enterprise.

(*ii*) Determining the prices to be quoted to customers.

(*iii*) Forming basis for managerial decisions that have to do with,

(*a*) Make or Buy (decision).

(*b*) To introduce a new product or to drop an existing one.

(*c*) To sell products in some more territories or to drop some present ones.

(*iv*) Cost control through accumulation and utilisation of cost data.

(*v*) Profitability of products.

(*vi*) Budgeting (Planning, co-ordination and control through budgets).

(*vii*) Standard costing.

(*viii*) Continuation of business.

(*ix*) Proper matching of costs with revenues.

(*x*) Control of materials and supplies.

(*xi*) Wages and overheads costs.

(*xii*) Establishing standards for measuring efficiency.

(*xiii*) Curtailment of losses due to seasonal conditions.

(*xiv*) Determining expansion and contraction policies (refer (*iii*) above).

(d) Cost Control, Necessity and importance

– Cost accounting helps control of expenditure or cost.

– Cost control leads to efficiency in use of material, machinery and labour.

– The profit making capacity of a business is guided by the efficiency with which various costs are controlled.

– Cost control provides a basis for minimising the cost or cost-reduction.

– Costs and accounts are classified to make clear the nature of expenditure or cost. Cost control works through a comparison of actual costs against predetermined standards as regards material. labour, etc.

– Cost control and hence cost reduction is necessary in order to

(1) stand in competition in a specific product line;

(2) reduce the selling price of a product to broaden its market.

27.2. ELEMENTS OF COST

– The *costs* of an industrial enterprise may be divided into three *principle elements*, namely :

1. Material.
2. Labour.
3. Expense.

1. Material cost

– It is the cost of commodities supplied to an undertaking.

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– It is of two types :

(*a*) *Direct material cost.*

(*b*) *Indirect material cost.*

(*a*) *Direct material cost*

– A direct material is one which goes into a salable product or its use is directly essential for the completion of that product, *e.g.*, a H.S.S. bit for making a turning tool for lathe; Fe, Ni, Cr. etc., to make alloy steels.

– The amount paid for or the money spent on direct materials is known as *Direct material cost.*

– Since, direct material used can be traced to a specific product and its cost becomes part of the prime cost, the direct material cost can be controlled in a positive way.

(b) Indirect material cost

– An indirect material is one which is necessary in the production process but is not directly used in the product itself, *e.g.*, it does not become an integral part of the product, *e.g.*, cotton waste, greases, oils, sandpaper, etc.

– The costs associated with indirect materials is called *Indirect material cost.*

The same material may be a direct material for one producer and an indirect material for another.

Some direct materials are in certain cases, used so little that it is not worth-while to identify and charge them as direct materials. Nails, glue and sometimes paints, are a few examples. Under such conditions, these materials are generally charged as indirect materials, or overheads.

2. Labour cost

It is the cost of remuneration (Wages, salaries, commissions, bonuses, etc.) of the employees of a concern or enterprise. Like material cost , labour cost is also classified as

(*a*) *Direct labour cost.*

(*b*) *Indirect labour cost.*

(*a*) *Direct labour cost*

– The direct labour cost is the cost of labour that can be identified directly with the manufacture of the product and allocated to, cost centres[1] or cost units[2].

– A direct labourer is one who converts the direct material into salable products; the wages, etc. of such employees constitute *Direct labour cost.*

– The wages of a welder fabricating a structure form a part of the total direct labour cost.

– Direct labour cost may be apportioned to the unit of cost or job either on the basis of time spent by a worker on the job or as a price for some physical measurement, (*e.g.*, quantity) of the product.

(b) Indirect labour cost

– It is that labour cost which cannot be allocated but which can be apportioned to, or absorbed by, cost centres or cost units.

– This is the cost of the labour that does not alter the construction, conformation, composition or condition of the direct material but is necessary for the progressive movement and handling of the product to the point of despatch. Examples of *Indirect* or *non-productive* workers are : maintenance men, helpers (in a machine shop or foundry), machine setters, supervisors and foremen, etc.

---

1. *Cost Centres* : A person, location or an equipment (or a group of these) for which costs may be ascertained and used for the purposes of cost control.

2. *Cost Unit* : A unit or quantity of product, service or time (or a combination of these) in relation to which costs may be ascertained.

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Expense

- It is a collective title which refers to all charges other than those incurred as direct result of employing workers or obtaining material.
- Expenses include the cost of services provided to an undertaking and the notional cost of the use of owned assets.
- Expenses may be of two types :

(a) Direct expenses.

(b) Indirect expenses.

(a) Direct expenses

- These are the expenses which can be identified with, and allocated to, cost centres or cost units.
- The following examples of direct expenses will clarify the idea :

(1) Costs of special layouts, designs or drawings produced for a specific job are the direct expenses of such a job, provided,

- layouts, designs or drawings are totally consumed on the job, or
- though they can be used again but there are hardly any chances of their being used again.

(2) Hire of special or single purpose machine tools or other equipments for completing a particular production order.

(b) Indirect expenses

- These are the expenses which cannot be allocated but which can be apportioned to, or absorbed by, cost centres or cost units.
- Examples of indirect expenses are

Rent of the building.

Insurance premium.

Telephone bill, etc.

(i) Fixed expenses

- Fixed expenses are those costs that tend to remain relatively constant regardless of the volume of production.
- Examples of fixed expenses are,

* Taxes on land and building.

* Depreciation arising from time.

* Rent.

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(ii) Variable expenses

- Variable expenses are those which tend to vary directly with the volume of production.
- Examples of variable expenses are,

* Royalties paid on a volume basis (as in case of gramophone records),

* Depreciation arising from use.

27.3. PRIME COST

Prime cost = Direct material cost.
+ Direct labour cost.
+ (Variable) direct expenses.

- Prime cost is limited in its use to the manufacturing division of a business concern.

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27.4. OVERHEADS

- *Indirect costs, Overheads, Oncost* and *Burden* are synonymous terms.
- Overheads are all expenses other than direct expenses.
- *Overhead* is defined as the cost of indirect material, indirect labour and such other indirect expenses, including services, as cannot coveniently be charged direct to specific cost units.
- The main groups into which *overhead* may be subdivided are

(*a*) Production or manufacturing overhead, including services.

(*b*) Administration overhead.

(*c*) Selling overhead.

(*d*) Distribution overhead.

(*e*) R & D overhead.

(*a*) Production or manufacturing overhead

- It includes all indirect expenses incurred by the concern from the receipt of the production order until its completion, *i.e.*, it being ready for despatch to the customer.
- Typical manufacturing overhead costs are :

1. Building expenses
   - Rent
   - Insurance
   - Repairs
   - Heating and lighting
   - Depreciation, etc.
2. Indirect labour
   - Supervisors and foremen
   - Machine setters
   - General workers
   - Maintenance men
   - Shop clerk
   - Shop inspectors, etc.
3. Water, Fuel and Power (steam, gas, electric, pneumatic, hydraulic).
4. Consumable stores such as cotton waste, grease, etc.
5. Plant maintenance and depreciation.
6. Sundry expenses such as those of,
   * employment office,
   * security,
   * all forms of welfare,
   * recreation and rest rooms, etc.

(*b*) Administration overhead

- Administration overhead consists of expenses incurred in the direction, control and administration of an enterprises.
- Administration overhead is the expense of providing a general management and clerical service.
- Examples of administration overhead :

Office rent.

Salaries and wages of clerks.

Director's, general manager's fees.

Insurance.
Legal costs.
Rates and Taxes.
Postage and telephones.
Audit fees.
Bank charges, etc.

(c) Selling overhead

- Selling overhead consists of expenses in order to maintain and increase the volume of sales.
- Selling overhead covers all expenses direct or indirect which are necessary to persuade consumers to buy.
- Examples of selling overhead :
  * Advertising.
  * Salaries and commission of sales managers, travellers and agents.
  * Rent of sales-rooms and offices.
  * Consumer service and service after sales, etc.

(d) Distribution Overhead

- Distribution overhead covers all expenses connected with transporting products to customers and storing them when necessary.
- Examples of distribution overhead :
  * Warehouse charges.
  * Cost of transporting goods thereto.
  * Loading and unloading charges.
  * Upkeep and running of delivery vehicles.
  * Salaries of clerks and labourers.
  * Depreciation, etc.

(e) Research and Development Overhead

- Much depends upon the nature of product or service being produced.
- R & D overhead is proportional to the size of R & D department.

27.5. FACTORY COST

Factory cost = Prime cost + Factory overhead
= Direct material cost
+ Direct labour cost
+ (Variable) direct expenses
+ Factory overhead.

27.6. TOTAL COST

Total cost = Factory cost + Selling overhead
+ Distribution overhead
+ Administration overhead.

27.7. SELLING PRICE

Selling price of a product

= Total cost ± Profit or loss

Fig. 27.1 shows the development of selling price of a product.

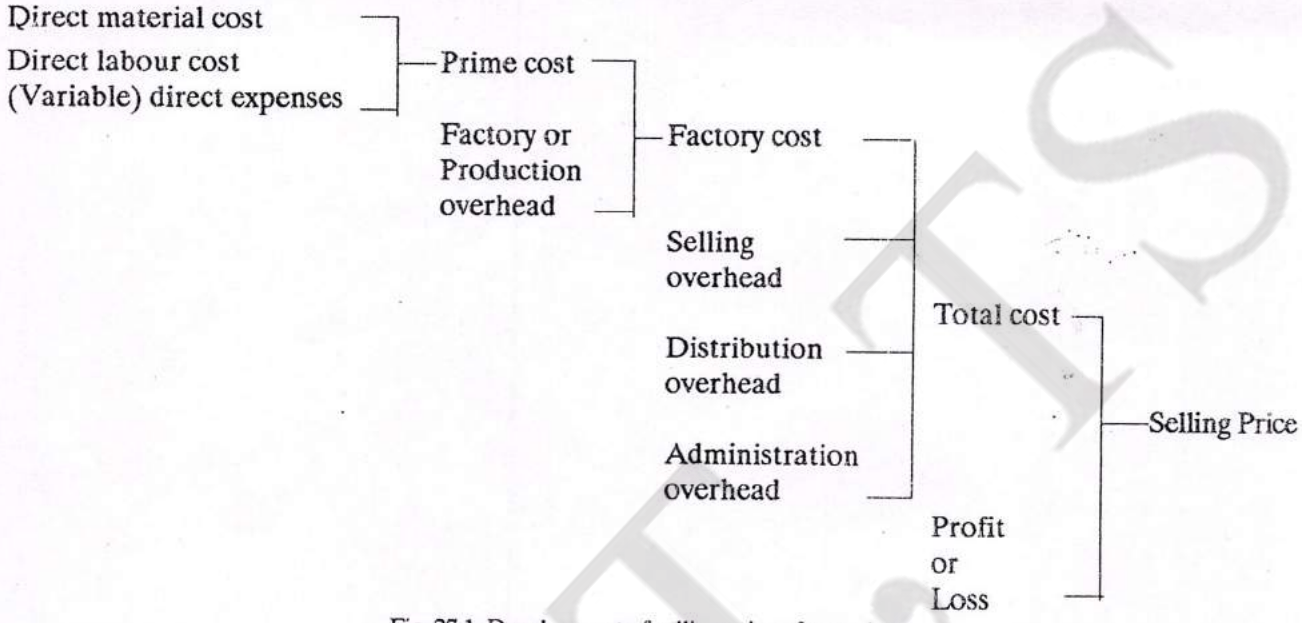


Fig. 27.1. Development of selling price of a product.

27.8. NATURE OF COST

(a) Fixed Costs

- *Fixed costs, policy costs* or *period costs* are those which tend to remain constant irrespective of the volume of output or sales.
- *Examples of fixed costs* :
  - * Staff salaries.
  - * Administration expenses.
  - * Rent and establishment charges.
  - * Depreciation, etc.

(b) Variable Cost

- *Variable costs* tend to vary directly with the volume of output.
- *Examples of variable costs*
  - * Direct productive labour.
  - * Direct materials.
  - * Direct expenses.

(c) Semivariable Costs

- These costs are partly fixed and partly variable.
- Semivariable costs vary with changes in output but the variation is irregular.
- *Examples of semivariable costs*
  - * Indirect hourly labour which varies more less with output but not in direct proportion to it, for example, wages of maintenance men.
  - * Grease and oil.
  - * Water and electricity, etc.

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(d) Controllable Cost

– Controllable cost is one which can be influenced by the action of a specified member of an undertaking.

(e) Uncontrollable Cost

– Uncontrollable cost is one which cannot be influnced by the action of a specified member of an undertaking.

27.9. TYPES OF COST

(a) Predetermined Cost

– Predetermined cost is one which is computed in advance of production on the basis of a specification of all the factors affecting cost.

(b) Standard Cost

– Standard cost is a predetermined cost which is calculated from management's standards of efficient operation and the relevant necessary expenditure.

– Standard costs are built upon a theoretically desired standard that is capable of attainment under practical operation conditions.

Standard cost is estimated cost per unit of output for labour, materials and overheads, based on a prediction of material prices, labour rates and overhead expenses for a given future period.

Standard costs represent the best estimate that can be made of what cost should be for material, labour and overhead after eliminating inefficiencies and waste.

– Any deviation from the standard of materials used will tend to produce a deviation from the standard cost.

– Variations from predicted performance can be accurately determined and action taken to prevent their recurrence.

– *Advantages* of establishing standard cost :

1. Standard costs tend to bring about a more systematic and thorough analysis of costs and discourage reliance on separate job-by-job studies as a basis for cost estimation for new products.

2. Standard costs tend to reduce to a minimum the variations in price.

3. Standard costs represent management's best measure of efficient plant operation.

Standard costs may be used as a basis for price fixing and for cost control through variance analysis.

(c) Marginal Cost, Differential Cost, Incremental Cost

– *Differential costs*, also frequently described as *marginal costs* and *incremental* costs are the increase or decrease in total costs that result from producing and distributing an additional or fewer *unit of a product, a product, a sales territory, etc.*

– If it is assumed that fixed costs remain unchanged by increasing output by one more unit, the marginal cost of a product will consist of the variable cost only.

– These are anticipated costs and refer to future operations.

– These costs are not entered in general accounting records, but may be incorporated in budgets.

– *Uses of differential costs*

1. In determining selling price of the products.
2. In making decision regarding replacement of machinery.
3. In accepting an offer.
4. In submitting a bid.

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27.10. PROCESS COST AND COST OF PRODUCTION

27.10.1. Process Cost

- It is the cost for each, of a number of distinct stages or processes which are performed to make a product.
- The total time spent and materials used on each process, as well as services such as power, light and heating, are all charged in calculating the process cost.

  For this purpose, a *process cost sheet* may be made use of.
- Process costs are usually applied in industries where the final product has passed through a number of distinct stages or processes; for example, in textile mills, gas, chemical and paper mills, breweries, etc.
- An important objective in process costing is the evaluation of wastage.

27.10.2. Cost of Production or Production Cost

- It is the cost of the sequence of operations which begins with supplying materials, labour and services and ends with primary packing of the product.

Examples 27.1. From the following data, find (*a*) material cost, (*b*) Prime cost, (*c*) Direct cost, (*d*) Factory cost, (*e*) Administrative overheads, (*f*) Cost of production, (*g*) Selling and distribution overheads, (*h*) Total cost or cost of sales, and (*i*) Selling price. Assume a net profit of Rs. 10,000.

		Rs.
1.	Material in hand (April 1, 1975), of	60,000
2.	New material purchased	2,50,000
3.	Director's fees	3,500
4.	Advertising, etc.	12,000
5.	Depreciation on sales department car	1,200
6.	Printing and stationery charges	300
7.	Plant depreciation	5,000
8.	Wages of direct workers	70,000
9.	Wages of indirect (factory) workers	10,000
10.	Rent of factory building	5,000
11.	Postage, telephone and telegraph	200
12.	Water and electricity for factory	1,000
13.	Office salaries	2,000
14.	Rent of the office	500
15.	Rent of the show room	1,500
16.	Commission of salesmen	2,500
17.	Sales department car expenses	1,500
18.	Material in hand (March 31, 1976)	50,000
19.	Variable direct expenses	750
20.	Plant repair and maintenance	3,000
21.	Heating, lighting and water for office use	2,500
22.	Cost of distributing goods	2,000

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2. Percentage of direct material cost

- This method charges an overhead rate commensurate with either the *weight* or the *cost* of direct material going into the product.
- The method is *useful* where

(*i*) the material and method of manufacture are common to all products,

(*ii*) the expenses on direct material constitute the main factor determining total cost (*e.g.* foundries).

- Percentage of direct material cost = % overhead

$$= \frac{\text{Factory overhead for budget period}}{\text{Direct material cost for budget period}} \times 100 \qquad ...(2)$$

- The method finds applications in the manufacture of cement, paint, sugar, etc.
- The method does not prove to be accurate when applied where different types of materials, (having wide variation in their prices) go into a product, *e.g.*, manufacture of industrial instruments using gold and platinum along with steel or aluminium. An instrument not having gold or platinum parts will obviously fare better than the other (having them) on the question of incurring overhead costs.

Example 27.6. (*a*) A sugar mill had its overheads of Rs. 60,000 while it purchased sugarcane worth Rs. 2,40,000. Find the percentage overhead using the percentage of direct material cost method.

(*b*) If a particular batch had a direct material cost of Rs. 30,000, determine it overheads.

Solution :

(*a*) Using equation (2) above

$$\% \text{ overhead} = \frac{60{,}000}{2{,}40{,}000} \times 100$$

$$= 25\% \text{ of direct material cost}$$

(*b*) $$\text{Overheads} = \frac{25}{100} \times 30{,}000 = \textbf{Rs. 7,500.}$$

3. Prime cost percentage rate

- Prime cost is sum of the direct labour cost and direct material cost.
- Thus, this method is similar to methods (1) and (2) explained earlier, except that the overhead instead being based on a percentage of either direct material or direct labour, relies upon the two taken together.
- Therefore, this method proves to be very useful where both material and labour costs are prominent factors in determining total cost, *e.g.* in fabrication shops.
- This method does not account for the differing rates of material and labour and different equipment sizes and capacities used in manufacturing various products
- Prime cost percentage rate = % overhead

$$= \frac{\text{Factory overhead for budget period}}{\text{Prime cost for budget period}} \times 100 \qquad ...(3)$$

- Prime cost method has same disadvantages as possessed by direct material cost and direct labour cost methods.

Example 27.7. (*a*) A fabrication and assembly shop had its total overheads of Rs. 10,000. It used direct material worth Rs. 10,000 and paid Rs. 15,000 as direct labour charges. Calculate the % overhead.

(*b*) If one product has its prime cost as Rs. 5,000, determine overheads or on cost related to it.

Solution :

(*a*) Using equation (3) above

$$\% \text{ overhead} = \frac{10,000}{10,000+15,000} \times 100 = 40\% \text{ of prime cost.}$$

(*b*) overhead (*i.e.*, on cost) $= \frac{40}{100} \times 5,000 =$ **Rs. 2,000.**

4. Labour hour rate

- Variations in pay that cause confusion in the direct labour cost basis method are eliminated in the labour hour rate method.
- In this method, *labour hours* instead of direct labour cost form the basis for finding percentage overhead.
- It is more accurate than direct labour cost method.
- The direct labour hour rate is calculated as follows :

  The rate per hour of direct labour

  $$= \frac{\text{Factory overhead for budget period}}{\text{Direct labour hours for budget period}} \quad ...(4)$$

- This method is useful where hand-labour methods exist and where uniformity of rates, workers and conditions is present.
- Since the majority of factory overhead costs accrue on the basis of time, this method provides the most equitable means of apportioning factory overhead to production.
- However, labour hour rate method
  (*i*) does not recognize variations in type and size of equipment;
  (*ii*) necessitates for additional clerical records to be maintained; and
  (*iii*) proves to be inaccurate if the factory produces various products involving both manual and machine operations.

Example 27.8. (*a*) A fitting and assembly shop had its factory overheads of Rs. 1,20,000 and the production for the period in terms of direct labour was 24,000 hours. Find the rate per direct labour hour.

(*b*) If a particular job takes 20 labour hours, calculate the overhead applied.

Solution :

(*a*) Using equation (4) above,

$$\text{Rate per hour of direct labour} = \frac{1,20,000}{24,000} = \text{Rs. } 5.$$

(*b*) Overhead $= \text{Rs. } 20 \times 5 =$ **Rs. 100.**

5. Machine hour rate

- In this method, factory overhead costs are applied to production orders on the basis of the number of *machine hours* required to complete the production.
- Machine hour rate

  $$= \frac{\text{Factory overhead for budget period}}{\text{Machine hours for budget period}} \quad ...(5)$$

- This is an accurate and very relevent method because in modern age of mechanisation and automation, the factory overhead resulting from the use of machinery are far in excess of costs from other sources.
- This method is based upon a study of the actual overhead expenses of the machines used. Factors such as capital investment, depreciation, insurance, repair and maintenance, floor space, power

and lighting costs are calculated.

- All these (factors) are added together and then divided by the machine hours to give machine rate per hour. Products made on the machine are then charged at this hourly rate on the basis of machining time involved.
- This method is very useful in concerns where machines constitute a more important and costly element than manual labour.
- However, machine hour rate method is not well adapted for industries which desire a single overhead rate for the entire plant and involve a variety of types of hand, bench and machine operations, performed by different grades of workers.
- Rather, this method is most satisfactorily employed when plants are departmentalized and a rate for each department and in some cases for each machine is required.

Examples 27.9. A machine shop has 10 lathes, 6 drill presses and 2 milling machines. Calculate the machine hour rate for lathes if the factory expenses for a particular period and other data are as follows:

1. Area occupied by lathes 10 m^2.
2. Area occupied by drill presses 3 m^2.
3. Area occupied by milling machines 2 m^2.
4. Cost of indirect material and labour Rs. 1,20,000.
5. Rent of building Rs. 36,000.
6. Insurance Rs. 15,000.
7. Depreciation Rs. 20,000 for lathes
   Rs. 15,000 for drill presses
   Rs. 20,000 for milling machines.
8. Power consumed Rs. 18,000 for lathes
   Rs. 6,000 for drill presses
   Rs. 900 for milling machines.
9. Repair and maintenance Rs.10,000 for lathes
   Rs. 4,000 for drill presses
   Rs.4,000 for milling machines.
10. Machine hours 10,000 for lathe
    6,000 for drill presses
    2,000 for milling machines.

Solution. Divide cost of indirct material and labour, rent of building and insurance as per the floor area occuiped by different machine tools, for example for lathes :

(*a*) Cost of indirect material and labour

$$= \text{Rs. } \frac{120{,}000 \times 10}{10+3+2} = \text{Rs. } 80{,}000$$

(*b*) Rent of building $$= \text{Rs. } \frac{36{,}000 \times 10}{10+3+2} = \text{Rs. } 24{,}000$$

(*c*) Insuranace $$= \text{Rs. } \frac{15000 \times 10}{10+3+2} = \text{Rs. } = 10{,}000$$

(*d*) Depreciation = Rs. 20,000

(*e*) Power consumed = Rs. 18,000

(*f*) Repair and maintenance = Rs. 10,000

Total overhead Rs. 1,62,000

∴ Rate per machine hour (*Lathe*) = Rs. $\frac{1,62,000}{10,000}$

= **Rs. 16.2**

Problem 27.4. Using the data given in example 27.9, calculate rate per machine hour for

(*a*) drill presses

(*c*) milling machines.

6. Production unit method

- One of the simplest methods of applying factory overhead to production is on the basis of *number of production units* such as kgs, tons, thousand feet, hundred litres, etc.
- Overhead rate per unit

$$= \frac{\text{Factory overhead for budget period}}{\text{Production in terms of units for budget period}} \quad ...(6)$$

- It is a simple method and easy to use.
- It is used in those industries or in one or more production departments of big industries, which employ job order cost methods.
- This method is preferred for industries manufacturing one type of product, *i.e.*, televisions, refrigerators, etc., of one size only.
- Since, mostly industries make diversified products, it is more desirable to use a common denominator such as direct labour hours rather than units of production as the basis of calculating overhead.

Example 27.10. If the estimated overhead costs of a factory making two band transistor radios is Rs. 8,000 in a particular period and if the number of transistor radios produced during that period is 400, calculate the overhead rate per transistor radio.

(*b*) If a production order '*Z*' schedules making 100 such radios, determine the factory overhead to be applied to the production order '*Z*'.

Solution. Using equation (6) above

Overhead rate per transistor radio

$$= \text{Rs. } \frac{8000}{400} = \textbf{Rs. 20.}$$

(*b*) Factory overhead for production order '*Z*'

= Rs. 20×100 = **Rs. 2000.**

27.12. CONTROL AND ACCOUNTING OF MATERIAL, LABOUR AND OVERHEAD

27.12.1. Material (Refer chapeter No. 23 also)

- A system of material control and accounting,

(*a*) requires a number of subsidiary records which will contain detailed material costs. The subsidiary records include stock ledgers, production orders, material requisitions, returned material reports, etc.,

(*b*) needs to maintain controlling accounts in the general ledger. Since materials are consumed in

production and service functions (*e.g.* maintenance), the general ledger, will summerize periodically material costs.

The general ledger controlling accounts are materials control, Materials in Process, Factory overhead control etc.

(*i*) Store issues materials and supplies after receiving Material issue Requisition form duly signed by the office-in-charge of the section/department.

(*ii*) A copy of the requisition form is kept by the storekeeper and the other returns to the section.

(*iii*) At the end of each accounting period, the materials issued from the stores can be checked against those received by the section.

(*iv*) A summary report of quantities and value of materials issued to the section during the period provides the basis for a general journal entry debiting each section account and crediting the Material Control account.

27.12.2. Labour

- Labour control has received good attention from cost accountants because there is a direct transfer of cash between a business and its labourers.
- In accounting for labour the important cosideration is the indentification of each worker as to how his services are being utilised.
- The accounting system, beside recording the wages paid, should also provide information to control labour cost effectively.
- The main functions necessary for recording and accounting for labour are,

(*i*) Engagement of labourers.

(*ii*) Compiling hours spent by each person.

(*iii*) Ascertaining direct labour hours for each cost centre.

(*iv*) Ascertaining direct labour hours for each production order.

(*v*) Calculation of cost of labour of each Production or Standing order (*i.e.*, an account which represents indirect labour--an overhead account).

(*vi*) Calculation of the wage due to each employee.

- *Accounting for direct labour*

(*i*) *Time tickets* (showing the production order number and the time required), and *piece rate cards* (showing production order number and number of pieces completed for that production order, etc.) are the basis for the daily entries by the cost department in production orders. At the end of a week or a month, (daily) reports are summarized and they form the basis for entries to general ledger accounts.

(*ii*) The entries essential to record the distribution of the direct labour cost to a production order are as follows :

Entry in general ledger :

Labour in process.....

Payroll control.....

Entry in subsidiary records :

Number of hours and labour cost are recorded everday in the labour section of production orders from the information got from piece rate cards and daily time tickets.

(*iii*) Direct labour cost may be *controlled* by the following methods :

(*a*) Effective supervision.

(*b*) Use of Workstudy.

(*c*) Estimated times–comparing estimated with actual time.

(*d*) Introduction of an incentive scheme to reduce lost time.

(*e*) Permitting over-time only when it is a must.

(*f*) Standard costing.

– *Accounting for indirect labour :*

(*i*) Indirect workers such as foremen, engineers, clerks, etc. are paid by week or month.

(*ii*) Their time (of arrival and departure) is recorded on a *time sheet* or *time card.*

(*iii*) Time sheets are summarized weekly or so, to form the basis for the entry to distribute the portion of the payroll representing indirect labour for the period.

Entry in general ledger :

Factory overhead control.....

Payroll control.....

Entry in subsidiary records :

The indirect labour cost is entered as a charge to appropriate service and production departments in the standing order for indirect labour.

27.12.3. Overhead Costs

– The prime cost of an article does not differ much from one factory to another; the major difference in the cost of an article produced by two different concerns is actually the result of differing overhead charges. Thus, overhead expenses must be controlled and minimized for *cost reduction* and increase of profits.

– *Overhead cost accounting :*

(*i*) Costs such as rent, power, gas, light, water, telephone etc., are vouchered during the accounting period and are entered in the voucher register as a charge to the general controlling account, factory overhead control.

(*ii*) Depreciation, taxes and insurance are set up through the media of adjusting entries.

(*iii*) Some of factory overhead costs may be divided directly amongst the process accounts, while for other (overheads), proper basis of distribution should be determined, and the amount of each cost to be allocated to each process should be calculated. Next, an entry is made debiting each process and crediting the controlling account, factory overhead control.

– *Overhead cost control :*

(*i*) Divide overhead into fixed, semifixed and variable costs. Spread fixed and semifixed costs over a larger production in order to reduce overhead costs per piece of product.

(*ii*) Eliminate or decrease the expenditures which are not essential to efficient operation.

(*iii*) Supplies, light, power, telephone, travel, donations, etc. should not be used in wasteful quantities.

(*iv*) If rents are high, new leases may be secured.

(*v*) Depreciation of fixed assets (Building, equipment, etc.) should be reduced through efficient, purchasing and repair policies.

A Careful study of overheads department vice, made periodically will cut short unnecessary costs.

27.13. DEPRECIATION

27.13.1. Definition and Concept

– Buildings, equipments and machinery wear and tear with the amount of use and passage of time.

Their worth does not remain as much after a few years as it is today. This is a state of *depreciation;* equipments, etc., depreciate, *i.e.* their value falls, their worth gets lowered, they become less efficient and ultimately are replaced as they no longer function economically.

- *Depreciation* may be *defined* as the reduction in the value, or the effective economic life of a product arising from the passage of time, use or abuse, wear and tear, influence of the elements, or the cessation of demand for use.
- *Depreciation* may be *defined* as a method for spreading the cost of a long-term asset over the life, or expected years of usage, of the asset.
- Depreciation is a term applied to fixed assets such as buildings, plant, machinery and vehicles which suffer natural deterioration in the course of time. Such deterioration can rarely be wholly arrested by regular maintenance.
- From an accounting point of view, depreciation is an annual charge reflecting the decline in value of an asset due to such causes as wear and tear, action of the elements, obsolescence, and inadequacy.
- From the operating standpoint, depreciation can be thought of as the *rent* paid for use of the equipment during a period of time; depreciation in effect sets aside from each year's income enough money so that funds will be availabe to buy the new machine when the present one is worn out.
- Depreciation is an overhead expense.

27.13.2. Causes of Depreciation

They are :

(*a*) Physical causes.

(*b*) Custom or usage.

(*c*) Abnormal occurrences.

(*d*) Technological developments and changes.

- *(a) Physical causes :*

(*i*) Normal physical wear and tear, due to friction, pull, impact, fatigue, twisting, etc.

(*ii*) Lack of maintenance and timely repairs of fixed assests.

(*iii*) Action of chemical elements on the component parts.

(*iv*) Passage of time.

- *(b) Custom or usage :*

With some types of fixed assets, *e.g.,* cars and other vehicles, there are customs which have been established on the rate of wear and tear normally expected every year. There is definitely a correlation between the price of a second-hand car and the likely extent of depreciation.

- *(c) Abnormal occurrences,* such as

(*i*) Accidents

(*ii*) Defects in materials

(*iii*) Excessive wear and tear

(*iv*) Contingent occurrences *e.g.* appearance of hairline cracks in a pressure vessel adequately tested.

- *(d) Technological developments and changes :*

(*i*) New equipments which supersede the existing ones, start coming in the market *e.g.* calculators have superseded the slide-rules to a major extent.

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(*ii*) Change in manufacturing methods which necessitates the use of another type of equipment.

(*iii*) Improved and automated machine tools which render the use of existing ones uneconomical (obsolescence).

(*iv*) Inadequacy of the existing equipment to perform the necessary functions such as increased output, more precision and better quality.

27.13 3. Methods of Calculating (or Providing For) Depreciation

27.13.3.1. Introduction

- A number of methods of calculating depreciation are being employed; some of them are used regularly whereas others are relatively uncommon.
- Most of the methods are concerned with charging of the original cost in the accounts over the useful life of the equipment, etc., usually after deducting the estimated scrap value of the asset concerned.
- The method used for calculating depreciation should be simple to operate and easy to understand.
- The method selected should be employed consistenly and not varied to suit particular financial years.
- Depreciation should be regarded as a legitimate cost and not simply an adjustment of profit.
- The method should be able to help replace the existing asset (*i.e.* equipment, etc.) conveniently when it needs be replaced.
- Depreciation charge should be according to the financial position of the business enterprise and the fall in the value of the fixed asset in different years.
- Legal requirements should be observed (*e.g.*, Companies Act, Income Tax Act, etc.) but requirements of management should also be kept in mind.
- The method to calculate depreciation should, preferably, be decided before purchasing the asset.

27.13.3.2. Methods

The following methods may be employed for calculating *depreciation :*

(*a*) Straight line method.

(*b*) Reducing balance method.

(*c*) Production based methods.

(*i*) Per unit; and

(*ii*) per hour.

(*d*) Repair provision method.

(*e*) Annuity method.

(*f*) Sinking fund method.

(*g*) Endowment policy method.

(*h*) Revaluation method.

(*i*) Sum of the digits method.

(*a*) **Straight Line Method**

- This method provides for depreciation by means of equal periodic charges over the assumed life of the asset.
- Thus, the method is also known as the *fixed instalment method* or *proportional method.*

- The method assumes that the fixed asset (*i.e.*, equipment) will wear out at precisely the same rate over its useful life.
- According to this method, annual depreciation charge,

$$A.D.C. = \text{Rs. } \frac{C-S}{N} \quad ..(7)$$

where C is the original cost of the asset,

S is scrap value or residual value at the end of its useful life,

and N is seviceable life in years.

- *Advantages*

(*i*) The method is easy to understand and simple to operate.

(*ii*) It is frequently-used in practice.

(*iii*) It recognises that the passing of time is a major factor in depreciation and the decline in value of an asset is directly proportionl to its age.

(*iv*) Uniform annual charge affords better comparative costs.

(*v*) The method requires little work for calculating depreciation amounts.

- *Disadvantages*

(*i*) Since fixed assets do not wear out at exactly the same rate during their life, the straight line method in many cases becomes unrealistic.

(*ii*) Usually, repair and maintenance costs tend to increase in the later years of the life of an asset, it may be better to charge a higher rate of depreciation in the earlier years.

Example 27.11. A melting unit for a steel foundry was purchased for Rs. 30,000. Rs. 5,000 more were spent on its erection and commissioning. The estimated residual value after ten years was Rs. 7,000. Calculate the annual rate of depreciation.

(*ii*) Determine the depreciation fund collected at the end of seven years after the purchase of the melting unit.

Solution :

Using equation (7),

C = Rs. 30,000+5.000=Rs.35,000

S=Rs. 7,000

N=10 years.

∴ A.D.C., Annual depreciation charge

$$= \text{Rs. } \frac{C-S}{N} = \text{Rs. } \frac{3,5000-7,000}{10} = \textbf{Rs. 2,800.}$$

(*ii*) Depreciation fund collected at the end of 7 years

$$= \text{Rs. } 2,800 \times 7 = \textbf{Rs.19,600.}$$

(*b*) **Reducing Balance Methods**

- It is also known as *Diminishing balance method* or *Percentage on book value method.*
- In mamy cases, the cost of maintenance of an equipment *i.e.*, fixed asset increases towards the end of its life. Therefore, it is sometimes considered desirable to calculate depreciation so that the charge lessens towards the end of the asset's life, thus roughly equalising the combined charge of depreciation plus maintenance over the period.

– Reducing balance method involves non-linear change that is achieved by taking a fixed percentage, p, of the undepreciated balance every year.

Thus at any time t, the undepreciated portion, will be

$$= C.(1-p)^N \qquad ...(8)$$

– The method charges to the revenue account in the first year a percentage of the cost of the asset. In the following year, the same percentage will be calculated on the reduced value of the asset after the first years's depreciation has been deducted and so on year by year until the value of the asset has been virtually reduced to nil.

– Rewriting equation (8)

$$S=C(1-p)^N \text{ , or } \left(\frac{S}{C}\right)^{\frac{1}{N}} = 1-p$$

$$\therefore \quad p=1-\left(\frac{S}{C}\right)^{\frac{1}{N}} \qquad ....(9)$$

– *Advantages*

(*i*) It is simple to understand and calculate.

(*ii*) A mathematical relation can be employed to arrive at the appropriate percentage.

(*iii*) The method is more logical as largest annual amount of depreciation is charged in the first year when repair and maintenance charges are almost negligible.

– *Disadvantages*

(*i*) It is not simple to fix percentage, p, accurately.

(*ii*) A standard percentage (p) for all conditions may produce misleading results.

(*iii*) It is not possible to ever write off an amount (investment) completely by this method; it approaches the full write-off asymptotically, but never reaches it (refer Fig. 27.1).

Example 27.12. An old car was purchased for Rs. 32,000. Its life was estimated as ten years and the scrap value as Rs. 18,000. Using the reducing balances method, calculate the depreciation rate (%)

(*b*) Estimate the depreciation fund at the end of two years.

Solution :

Using eqation (9); S=Rs. 8,000; C=Rs. 32,000 and N=10.

$$p=1-\left(\frac{S}{C}\right)^{\frac{1}{N}} = 1-\left(\frac{8000}{32000}\right)^{\frac{1}{10}}$$

$$=0.1294$$

$$\therefore \quad \%\, p = \mathbf{12.94\%}.$$

(*b*) The value of car at the end of one year

$$C_1=C(1-p)$$

$$C_1=\text{Rs. } 32{,}000\,(1-0.1294)=\mathbf{Rs.\ 27{,}859.20.}$$

The depreciation fund at the end of one year

$$=\text{Rs. } 32{,}000-\text{Rs. } 27{,}859.20$$

$$=\mathbf{Rs.\ 4140.80} \qquad ...(i)$$

The value of car at the end of second year

$$C_2=C_1(1-p)=27{,}859.20\,(1-0.1294)$$

$\therefore$ C_2=Rs. 24,237.50.

The depreciation fund for second year

=Rs. 27,859.20−24,237.50

=**Rs. 3,621.70.** ...(*ii*)

The depreciation fund at the end of two years

=Rs. 32,000−Rs. 24,237.50

=**Rs. 7,762.50.**

The same can also be obtained by adding (*i*) and (*ii*) above, *i.e.*, Rs. 4,140.80+Rs. 3,621.70=**Rs.7,762.50.**

Comparison of Reducing Balance Method with Straight Line Method

– Fig. 27.2 shows a comparison of three alternative methods of calculating depreciation.

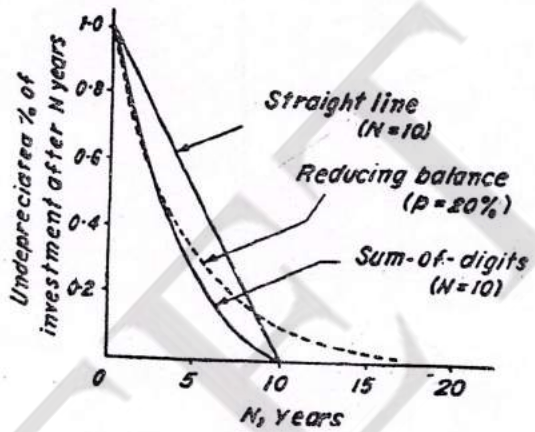


Fig. 27.2. Comparison of methods of calculating depreciation.

– Example 27.13 will further clarify the difference between the methods.

Example 27.13. Two machines are purchased, each for Rs. 12,000. The estimated useful life of the machines is 5 years. The estimated scrap value is Rs. 2,000. For machine *A*, the straight line method and for *B*, the reducing balance method with $p=30\%$ is used to calculate the depreciation every year. Compare the depreciation charged in each case.

Solution :

	Machine A (Straight line)	*Machine B (Reducing balance)*
Cost	Rs. 12,000	Rs. 12,000
Less :		
1st year's depreciation	Rs. 2,000	Rs. 12,000 × $\frac{30}{100}$ = Rs. 3,600
	Rs. 10,000	Rs. 8,400
2nd year's depreciation	Rs. 2,000	Rs. 2,500 (rounded)
	Rs. 8,000	Rs. 5,900

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3rd year's depreciation	Rs. 2,000	Rs. 1,800
	Rs. 6,000	Rs. 4,100
4th year's depreciation	Rs. 2,000	Rs. 1,200
	Rs. 4,000	Rs. 2,900
5th year's depreciation	Rs. 2,000	Rs. 900
SCRAP VALUE	Rs. 2,000	Rs. 2,000

(c) **Production Based Methods**

- If the basis of calculation – units or hours – are to accrue at the same rate for each year, then equal instalments will be charged every year. On the other hand, if output, per annum varies from one year to another (and the charge is based on the actual hours), the total annual depreciation will not be same.
- *Production unit method* : The method provides for depreciation by means of a fixed rate per unit of production calculated by dividing the value of the asset by the estimated number of units to be produced during its life

$$\text{Rate of depreciation} = \frac{\text{Value of asset}}{\text{Number of units of production}} \quad ...(10)$$

- *Production hour method :* The method provides for depreciation by means of a fixed rate per hour of production calculated by dividing the value of asset by the estimated number of working hours of its life.

$$\text{Rate of depreciation} = \frac{\text{Value of asset}}{\text{Number of production hours}} \quad ...(11)$$

- *Advantages of production based methods*

(*i*) They attempt to base depreciation on service. Instead of assuming constant depreciation every year, the hours or units in each year are estimated and depreciation is calculated

(*ii*) This approach is more realistic where depreciation is determined primarily by reference to work done.

- *Disadvantages of production based methods*

(*i*) It may not be easy to forecast accurately the total annual production units or hours.

(*ii*) These methods do not consider the fact that repair and maintenance costs tend to increase with the age of fixed assets.

Example 27.14. A machine costing Rs. 2,00,000 has a residual value of Rs. 1,00,000 after 10 years of service. The estimated rate of production is 8 units per hour. Using the production unit method calculate the rate of depreciation. Assume a 50 week year and a 46 hours week.

Solution :

Using equation (10)

$$\text{Rate of depreciation} = \frac{2,00,000 - 1,00,000}{10 \times 50 \times 46 \times 8}$$

$$= \textbf{Re. 0.5435 per unit.}$$

Example 27.15. A machine costing Rs. 15,000 has a scrap value of Rs. 5,000 at the end of 10 years of its serviceable life. If the machine runs for 2,100 hours per years, calculate the depreciation rate per hour of the machine and the total annual depreciation.

Solution :

Using equation (11)

Rate of depreciation per hour of machine

$$= \text{Rs. } \frac{15,000-5,000}{10\times2,100}$$

$$= \textbf{Rs. 0.476}$$

Annual depreciation = Rs. 0.476×No. of hours per year

= Rs. 0.476×2,100

= **Rs. 1,000.**

(*d*) **Repair Provision Method**

- This method is not strictly a separate method.
- It carries out in a more positive manner what the Reducing balance method is alleged to achieve, *i.e.,* the equalisation of the combined charges of depreciation and repair and maintenance cost over the life of asset. Repair and maintenance cost is added to the original cost to give a total capital outlay which is apportioned over the life of the asset.
- This method is oftenly used by public works contractors as a suitable method of charging the hire and use of their own plant to contracts.

Example 27.16. Cost of an air-conditioning units is Rs. 1,00,000. During an estimated life of 10 years, two major overhauls were carried out, each involving Rs, 20,000. If the scrap value of the plant is Rs. 15,000, calculate the depreciation rate on the basis of Repair provision method.

Solution :

	Rs.
Cost of air-conditioning unit	1,00,000
Cost of two major overhauls	40,000
Total cost	1,40,000
Scrap value of the plant	15,000
Remaining cost	1,25,000

Depreciation rate per year $= \frac{1,25,000}{10}$

= **12,500 per year.**

(*e*) **Annuity Method**

- It considers *original cost* and *interest* on the written down value of the fixed asset.
- It assumes that the purchase of a fixed asset is an investment on which interest is earned.
- Therefore, the *investment* for the purpose of the method is the written down value plus interest earned to date.
- The annuity method is generally used for the redemption of leases over a fairly long period, since money invested for a lengthy period in a capital asset should be deemed to be earning interest.
- The mathematical relation used to calculate rate of depreciation, R.O.D., is

$$\text{R.O.D.} = \frac{[C\,(1+I)^N - S]\,[1-(1+I)]}{[1-(1+I)^N]} \qquad \ldots(12)$$

where C, S and N are same as in equation (7)

and I is fixed rate of interest (in fractions) determined before hand and charged throughout the life of the asset.

Advantages

- Money invested in fixed asset is not idle, rather it is earning a certain rate of interest.

Disadvantages

- In most cases the interest *as such* never materialises.
- With plant, machinery and similar fixed assets, changes which take place as sales, renewals and additions tend to make the annuity method difficult to apply.

Example 27.17. The cost of a machine is Rs. 6,000 and its scrap value after 4 years is Rs. 3,000. Assuming an interest rate of 4% per year find depreciation rate per year.

Solution :

Given C = Rs. 6,000

S = Rs. 3,000

N = 4 years

I = 4% = 0.04

Using equation (12)

$$\text{R.O.D.} = \frac{[C(1+I)^N - S][1-(1+I)]}{[1-(1+I)^N]}$$

$$= \frac{[6{,}000(1+0.04)^4 - 3{,}000][-0.04]}{[1-(1.04)^4]}$$

$$= \text{Rs. } 946.$$

(f) Sinking Fund Method

- The method bases on the assumption of setting up a *sinking fund* in which money accumulates to replace the existing asset at the proper time.
- The method charges annually to revenue account such sum as, with compound interest, will amount to the net cost of the asset at the end of its useful life.
- An identical sum is charged every year as depreciation. This is invested outside the business, so that from the end of second year and each subsequent year interest is added.

  At the end of useful life of the asset, the total amount in depreciation plus compound interest should become equal to the original cost of the fixed asset.
- This is only method so far considered which provides cash for the replacement of the asset at the end of the useful life forecast for it.
- The method is frequently used to provide for the amortisation of leases.
- The mathematical relation used to calculate annual rate of depreciation, *i.e.,* R.O.D. is

$$\text{R.O.D.} = \frac{I(C-S)}{(1+I)^N - 1} \qquad \ldots(13)$$

where I, C, S and N have same meanings as in equation (12).

Example 27.18. Calculate the annual rate of depreciation from the following data, using the sinking fund method.

Cost of asset Rs. 6,000

Scrap value Rs. 3,000

Interest at the rate of 4% (compound)

Useful life period 3 years.

Solution :

Using equation (13)

$$\text{R.O.D.} = \frac{0.04\,(6{,}000-3{,}000)}{(1+0.04)^3-1}$$

$$= \textbf{Rs. 961.}$$

(*g*) **Endowment (Insurance) Policy Method**

- The method involves charging depreciation and then investing it in the form of an endowment policy. Each year the sum charged is paid as a premium to an insurance company. At the end of the life of the asset the sum payable should be equal to the original cost.
- The method is similar in effect to the sinking fund method. Cash is taken out of the business to pay the insurance premiums and is made available again at the end of the period for the purchase of another asset, when the policy matures.

(*h*) **Revaluation Method**

- Revaluation method provides for depreciation by means of periodic charges, each of which is equal to the difference between the values assigned to the assset at the beginning and end of each year, for example :

  "If the value of a machine on April 1, 1974 is Rs. 7,000 and on March 31, 1975 it is revalued as Rs. 6,000, then the depreciation for this period is Rs. 7,000–Rs. 6,000=Rs.1000".
- Usually the revaluation method is concerned with the recovery of original cost.
- The revaluation method is commonly used for loose tools, laboratory glassware, patterns, farmer's livestock, plant used on contract work, etc.

(*i*) **Sum of the Digits Method**

- The method provides for depreciation by means of differing periodic rates calulated as follows :

  "If *N* is the estimated life of a machine, the rate is calculated for each period as a fraction in which the denominator is always the sum of the series 1,2,3,4...*N* and the numerator for the first period is *N*, for second *N*-1, for the third *N*-2 and so on."
- The effect of this method is to charge depreciation at a decreasing rate each year.

Advantages

(*i*) It is a method of quick depreciation for motor vehicles.

(*ii*) It realistically takes account of the immediate drop in value of a new vehicle, even recently purchased.

(*iii*) It makes the decision to sell and repurchase before the estimated time, easier.

Example 27.19 will explain the sum of the digits method.

Example 27.19. The cost of a vehicle is Rs. 1,90,000. The residual (scrap) value after a period of 5 years is estimated as Rs. 40,000. Using the sum of the digits method, calculate the depreciation rate every year.

Solution :

As per the procedure of the method, the denominator will be 1+2+3+4+5=15, the numerators will be 5, (5–1), (5–2), (5–3) and (5–4).

Thus the depreciation charge for

–Year 1 will be $\frac{5}{15}$ of Rs. (1,90,000–40,000) = **Rs. 50,000.**

– Year 2 $\frac{4}{15} \times 1,50,000 = \text{Rs. } 40,000.$

– Year 3 $\frac{3}{15} \times 1,50,000 = \text{Rs. } 30,000.$

– Year 4 $\frac{2}{15} \times 1,50,000 = \text{Rs. } 20,000.$

– Year 5 $\frac{1}{15} \times 1,50,000 = \text{Rs. } 10,000.$

27.14. BREAKEVEN ANALYSIS

27.14.1. Concept of Breakeven Analysis

– Revenue and cost can be studied by directing attention to total revenue[1] and total cost. Breakeven analysis implies that at some point in the operations, total revenue equals total cost. Basically, breakeven analysis is concerned with finding the point at which revenues and costs agree exactly–hence the term *BREAKEVEN* (point).

– The breakeven point is, therefore, the volume of output at which neither a profit is made nor a loss is incurred (Fig. 27.3).

– The breakeven analysis can be carried out *algebraically* or *graphically.*

27.14.2. Importance and Scope of Breakeven Analysis

– Breakeven analysis helps solving the following types of problems :

(*a*) What volume of sales will be necessary to cover

(*i*) a reasonable return on capital employed;

(*ii*) preference and ordinary dividents; and

(*iii*) reserves.

(*b*) Computing costs and revenues for all possible volumes of output to fix budgeted sales.

(*c*) To find the price of an article to give the desired profit.

(*d*) To determine variable cost per unit.

(*e*) To compare a number of business enterprises by arranging their earnings in order of magnitude.

27.14.3. Calculation of Breakeven Point

– The breakeven point can be calculated by using the following relation :

$$\text{Breakeven point} = \frac{F}{1 - V/P} \quad \ldots(14)$$

where F is fixed cost

V is variable cost per unit or total variable costs.

and P is selling price of each unit (or total sales value may be substituted, symbol S).

Example 27.20. The fixed costs for the year 1975-1976 are Rs. 8,00,000. Variable cost per unit is Rs. 40. The estimated sales for the period are valued at Rs. 20,00,000. Each unit sells at Rs. 200.

(*a*) Find the breakeven point.

(*b*) If Rs. 16,00,000 will be the likely sales turnover for the next budget period, calculate the estimated contribution and profit.

(*c*) If a profit target of Rs. 6,00,000 has been budgeted, compute the turnover required.

---

1. Revenue is determined by the demand factors that affect the quantity of products (items) that can be sold at various prices.

Solution :

Given : F = Rs. 8,00,000.

V = Rs. 40.

P = Rs. 200.

S = Rs. 20,00,000.

(a) Using equation (14)

$$\text{Breakeven point} = \frac{F}{1-V/P} = \frac{8,00,000}{1-\frac{40}{200}} = \textbf{Rs. 10,00,000.}$$

(b) Contribution, $C = S\left[1-\frac{V}{P}\right]$

$$= 16,00,000\left[1-\frac{40}{200}\right] = \textbf{Rs. 12,80,000}$$

Profit $= C-F$

$$= \text{Rs. } 12,80,000-8,00,000 = \textbf{Rs. 4,80,000}$$

(c) Turnover for the stated profit (P_S)

$$= \frac{F+P_S}{1-\frac{V}{P}} = \frac{8,00,000+6,00,000}{1-\frac{40}{200}}$$

$$= \textbf{Rs. 17,50,000.}$$

27.15. BREAKEVEN CHART

Introduction

- In 1930's Walter Rautenstrauch, an industrial engineer and professor of Columbia University, invented the planning device known as a *Breakeven chart.*
- It was one of the first synthetic tools that became available to Production Management and Management Accountancy.
- Modifications of the breakeven chart that introduce risk make it an even more useful tool for the synthesis of the production management field.

Functions (scope) of

1. A breakeven chart is an aid to management and it depicts a clearer view of the position of a business.
2. It is one of the most useful graphic presentation of accounting data.
3. It is a graphic presentation of an economic rather than an accounting concept.
4. It portrays likely profits or losses at various output levels.
5. It depicts relationship between marginal costs and fixed costs.
6. It marks no profit no loss situation.
7. It portrays margin of safety.
8. It can help make specific plans to effect profits through the control of expenses.
9. It can nicely sum up the impact of alternative decisions on costs and profits.
10. It is a decision making tool in the hands of management.

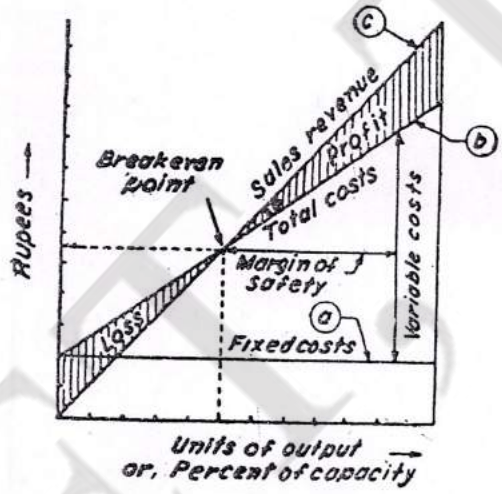
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Definition

- A *breakeven chart* is a graphical representation of the relationship between *costs* and *revenue* a given time.
- It is a graphic device to determine the breakeven point and profit potential under varyin conditions of output and costs.

Construction

- Fig. 27.3 portrays a Breakeven chart.



θ : Angle of incidence.

Fig. 27.3. A Breakeven chart.

- The breakeven chart consists of an ordinate (y-axis) and an abscissa (x-axis). The ordinat presents a scale of rupees against which fixed costs, variable costs, and rupees of revenue can b measured. The abscissa can be dimensioned in terms of the production volume, *i.e.*, number units produced.
- Three lines marked as *a, b* and *c* can be noticed on the breakeven chart.
- Line '*a*' is a fixed cost function. Fixed charges do not change as a function of increased volum of production.
- Line '*b*' is an increasing linear, monotonic function that increases with increasing volume production. It represents total costs which result from the summation of fixed and variable cost The variable costs assigned to the production system are shown by the triangular area betwee the fixed cost line and total costs line, *i.e.*, '*a*' and line '*b*'.
- Line '*c*' is the sales revenue line. A linear relationship is utilized to describe revenue; whic indicates that the price at which any quantity of the output can be sold is fixed and does not chan with volume of production.

This line indicates income at varying levels of output or production volume.

Interpretations and analysis of a Breakeven Chart

1. The breakeven point marking no profit no loss situation occurs for a given volume of productio

2. The cross-hatched area between the total cost line and revenue line on the left-hand side of th breakeven point marks loss to the concern whereas the area between the same lines on the right-hand sid of the breakeven point represents profit to the enterprise or concern.

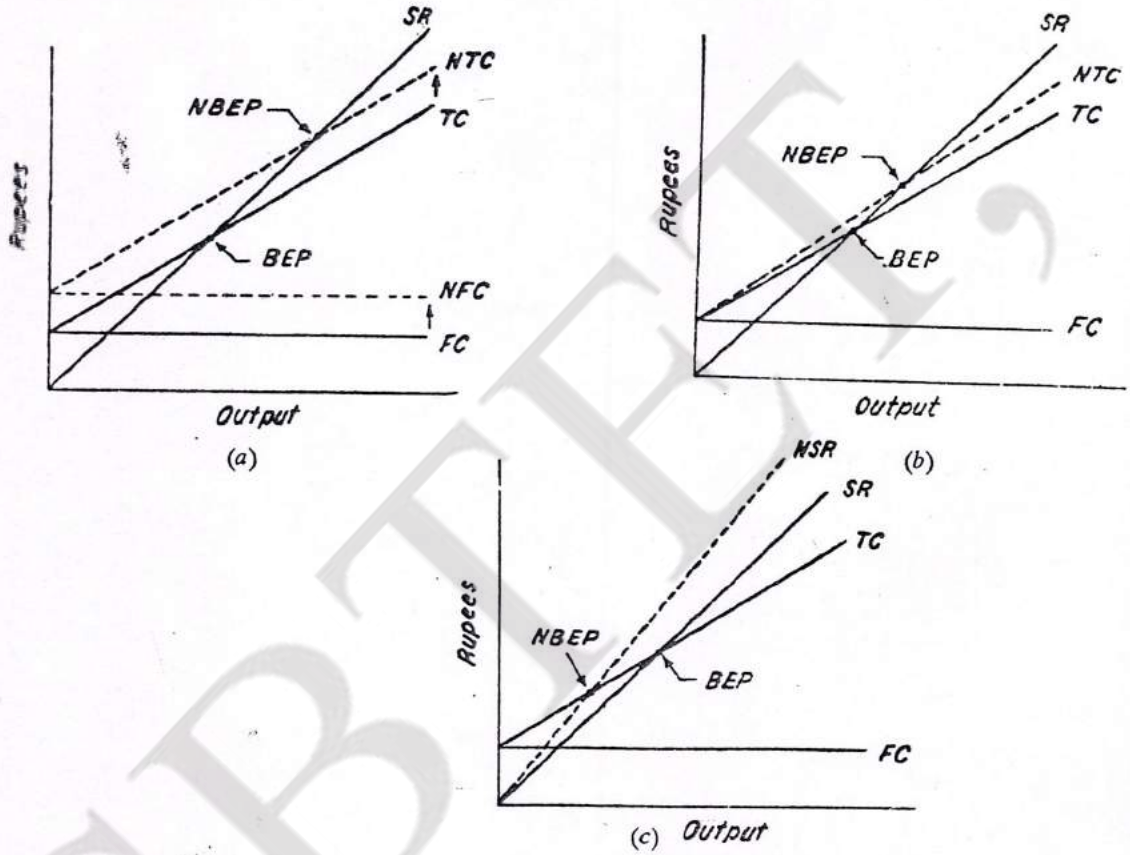
3. Profit appears only when more than a minimum volume of output is reached. Profit increases at a faster rate than do total costs.

4. *Profit margin as %*

$$= 1 - \frac{\text{Variable cost}}{\text{Sales}}$$

Where, sales = Fixed costs + (Variable costs as a % sales) sales.

5. *Effect of an increase in fixed costs* [*Fig.* 27.4 (*a*)]. An increase in fixed costs, possibly owing to the purchase of a new machine, increases the total costs and thus shifts *BEP* (Breakeven Point) towards the right-hand side. This shows that the company's profit position will be impaired if all other conditions remain the same. Therefore, one should study the market conditions carefully before purchasing the new equipments.



BEP - Breakeven point
NBEP - New breakeven point
FC - Fixed cost
NFC - New fixed cost
TC - Total costs
NTC - New total costs
SR - Sales revenue
NSR - New sales revenue

Fig. 27.4. Effect of changing different parameters on breakeven chart.

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5. *Effect of an increase in variable cost* [*Fig.* 27.4 (*b*)].

– An increase in variable cost and therefore in total costs, possibly owing to an increase in labour cost, would shift the *BEP* towards the right-hand side. This involves a decrease in profit for the same units of output. Therefore the management may think of going for some new labour saving equipment to maintain its profits as before.

7. *Effect of an increase in sales price* [*Fig.* 27.4 (*c*)]. If the price of an article rises, a new sales revenue will be drawn with a greater slope. This shifts the *BEP* towards the left-hand side and thus increases the company profits for the same volume of output.

8. Effects of a decrease, in fixed cost, variable cost and sales price can be visualised in the same manner as above by drawing separate breakeven charts as in Fig. 27.4.

– ***Margin of safety***

(*i*) Margin of safety can be presented on the breakeven chart as the distance between BEP and the output being produced (Fig. 27.3).

(*ii*) If this distance is large, it indicates that profits will be there even if there is a serious drop in production.

(*iii*) If this distance is relatively small, it hints that profits will be reduced considerably even if there is a small drop in productive capacity or sales.

(*iv*) Margin of safety may be expressed in monetary terms or as a percentage – – the margin of safety in relation to total sales.

– ***Angle of incidence***

(*i*) This is the angle (θ) at which sales revenue line cuts the total costs line (refer Fig. 27.3).

(*ii*) A large angle indicates that profits are being made at a high rate.

(*iii*) A large angle of incidence with a high margin of safety, mark the extremely favourable business position.

Limitations of breakeven chart

1. The breakeven point is difficult to determine in many instances because of the difficulty in properly classifying costs as either fixed or variable and because market conditions may not remain constant over the range of projected capacity.

2. The breakeven chart is a tool for short run analysis; it cannot be used for 8 or 10 year projections because of the difficulty of indicating variables in each of the costs line on the chart.

3. The total cost line, representing the variable costs added to fixed costs, need not be straight line, in actual fact, costs do not usually vary in direct proportion.

4. The straight line which represents sales revenue may also misrepresent the true facts.

5. The breakeven chart represents a static picture whereas business operations are far from static.

6. Analysis of breakeven chart presents additional difficulties. (*e.g.*, in product mix) when a company produces a variety of products.

Example 27.21. The fixed costs for the year 1975-76 are Rs. 80,000. The estimated sales for the period are valued at Rs. 200,000. The variable cost per unit for the single product made is Rs. 4. If each unit sells at Rs. 20, and the number of units involved coincides with the expected volume of output, construct the Breakeven Chart.

(*i*) Determine the breakeven point.

(*ii*) Above how many units, the company should produce in order to seek profit.

(*iii*) Determine the profit earned at a turnover of Rs. 160,000.

(*iv*) Find the margin of safety.

(*v*) Measure the angle of incidence.

Solution :

Given : F = Rs. 80,000 (fixed cost)

V = Rs. 4 (variable cost per unit).

P = Rs. 20 (selling price of each unit).

Estimated sales, S = Rs. 200,000.

$$\therefore \text{No. of units sold} = \frac{200{,}000\ (S)}{20\ (P)} = 10{,}000.$$

Procedure to draw breakeven chart :

1. Draw the fixed cost line (AB) at Rs. 80,000 on the graph paper.

2. Variable cost = No. of units × Variable cost per unit

= 10,000 × 4 = Rs. 40,000.

Variable cost varies from 0 at 0 units to Rs. 40,000 at 10,000 units.

3. Draw variable cost line (AC) above the fixed cost line. The variable cost when added to fixed cost gives the total cost.

4. Sales revenue is zero at 0 units and it is 200,000 at 10,000 units. Therefore draw the sales revenue line OD.

Breakeven chart has been drawn in Fig. 27.5.

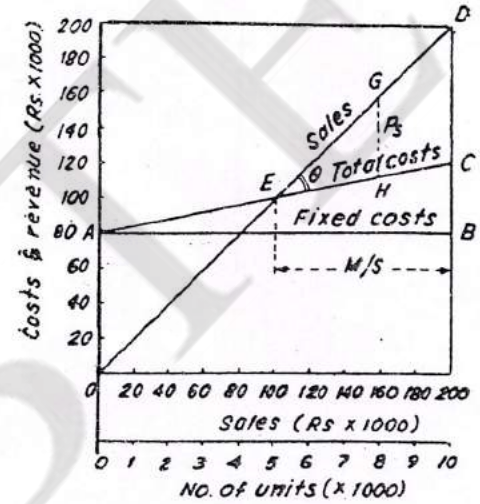


Fig. 27.5. Breakeven Chart.

(*i*) In the breakeven chart, point E represents the breakeven point. It is at 5,000 units or Rs. 100,000, *i.e.,* where production when sold will return Rs. 100,000 in revenue to the company.

(*ii*) The company should produce and sell more than 5,000 units to seek profit.

(*iii*) The profit earned at a turnover of Rs. 160,000 is marked by P_s in Fig. 27.5 and it is equal to Rs. 48,000.

(*iv*) The margin of safety at 10,000 units has been marked by M/S in Fig. 27.5 and it is

= Total sales − Sales figure at B.E.P.

= Rs. 200,000 − 100,000 = **Rs. 100,000**

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31

Sales and Marketing Management

31.1. INTRODUCTION

- Business functions can be broadly divided into three areas, namely
  - (*i*) Finance,
  - (*ii*) Production, and
  - (*iii*) Sales.
- Sales function is a very vital phase of the business.
- Actually, the major problem of today's business is not that of production but it is that of sale. With the immense competition at every step of marketing, the problem of sales has outstripped the problem of production.

31.2. SALES MANAGEMENT

- *Sales Management* is the term applied to the process of distributing goods from the producer to the ultimate user. It consists of *advertising* and *selling, storing, transporting* and *handling* and *financing* or *risk-taking.*
- The three biggest problems which seem to be attached with Sales Management are,
  - (*a*) Managing sales force and making them understand the definition of their jobs, *i.e.*, the sales force must know who is selling what, where and to whom.
  - (*b*) Compensation of salesmen, *i.e.,* rewarding sales force suitably.
  - (*c*) Training of sales force.

31.3. SALES (MARKETING) ORGANIZATION

- The actual organization of the sales force or sales department is largely determined
  - (1) by function;
  - (2) by area;
  - (3) by product group;
  - (4) by customer category and end-user category.

1. Functional Organization

- The functional organization (Fig. 31.1) is usual for the small or medium sized company with a limited range of related products.
- Functional organization has various functional (marketing) departments or specialists reporting to a sales or a marketing director.
- Functional organization has the *advantage* of administrative simplicity.
- Functional organization suffers from certain *disadvantages* such as
  - (*a*) Inadequate detailed planning for specific products and markets, since no body is assigned full responsibilty for any product or market.
  - (*b*) Products that are not favourites with various functional specialists tend to get neglected.

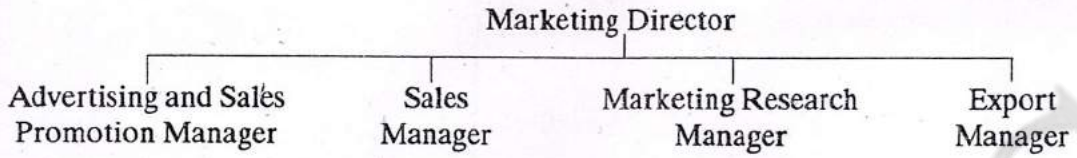


Fig. 31.1. Functional Organization.

2. Area Based Organization

The area based organization (Fig. 31.2) is one of the more common ones in use for concerns with a relatively limited range of products requiring selling and distribution to be on a more or less nationwide scale through many outlets.

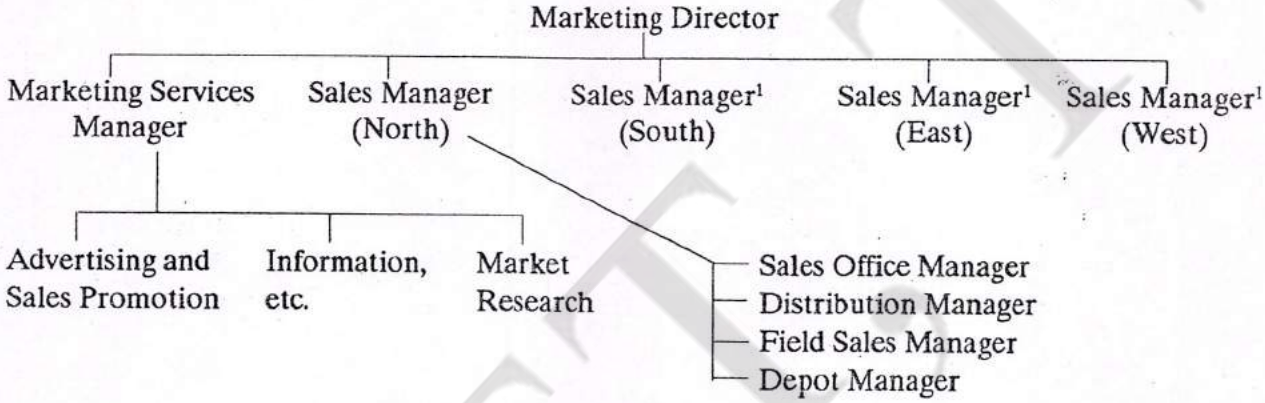


Fig. 31.2. Area Based Organization.

3. Product Group Organization

- This type of sales organization (Fig. 31.3) is employed when there is a wide range of relatively unrelated product groups which require different selling methods and the company sales forces require their own particular market and technical knowledge.

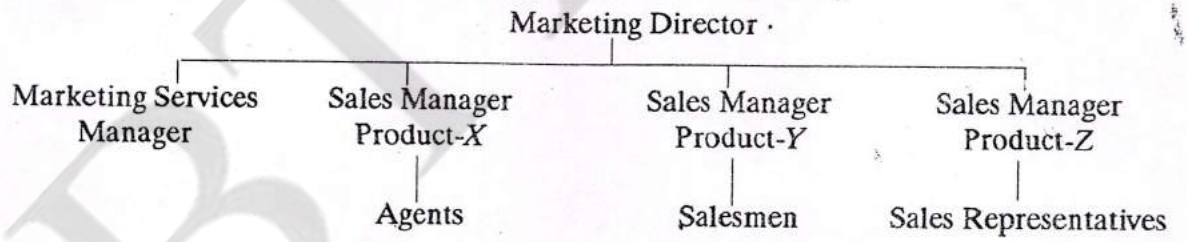


Fig. 31.3. A Product Group Organization.

4. End Use and Customer Class Sales Organization

- If an enterprise is selling a substantial range of products to dissimilar types of customers or for different uses, the selling operations are split up by type of customer or end use.
- Separate sales forces are necessary.
- However, marketing services may either be kept centralised or again split up as per the particular division of the selling operations.
- Fig. 31.4 shows the end use sales organization and Fig. 31.5 the customer class sales organization.

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1. Sales Managers, South, East and West have similar sub-organizations as that of Sales Manager (North).

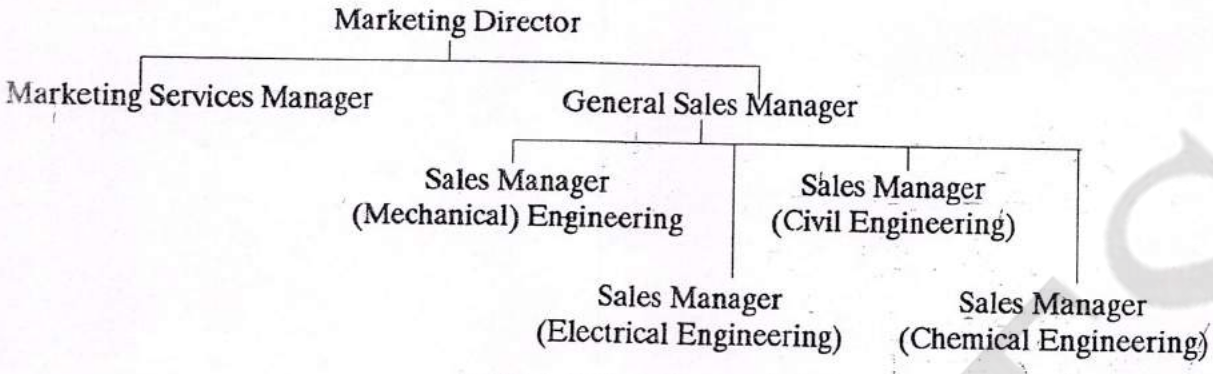


Fig. 31.4. End use sales organization.

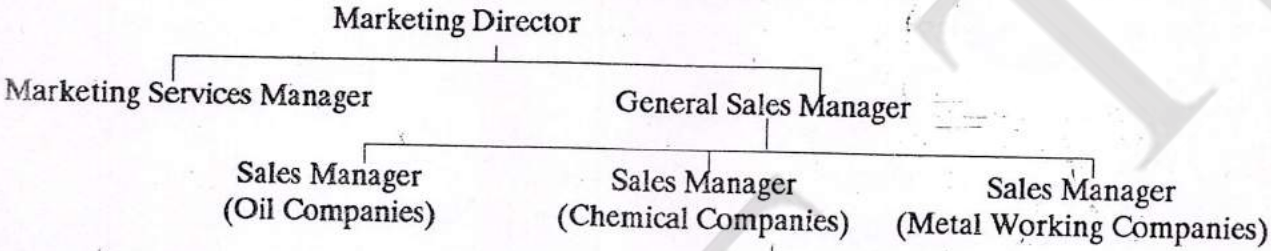


Fig. 31.5. Customer class sales organisation.

– Fig. 31.6 shows a general organization of the sales department of an engineering company.

31.4. FUNCTIONS OF SALES DEPARTMENT

(*i*) Analysing markets thoroughly.

(*ii*) Studying consumer's psychology and demand.

(*iii*) Studying the conditions existing in competitive firms.

(*iv*) Studying the market fluctuations.

(*v*) Preparing market, sales and other relevant business forecasts.

(*vi*) Assisting in the preparation of marketing plan.

(*vii*) Preparing the sales budgets from the marketing plan.

(*viii*) Deciding on the distribution policy, methods and network.

(*ix*) Planning of the advertising campaign.

(*x*) Ensuring suitable packing of the products.

(*xi*) Creating communications network for the department.

(*xii*) Developing systems for sales reporting and statistical analysis.

(*xiii*) Providing technical advisory and other services to the customers.

(*xiv*) Determining sales staff requirements and handling the recruitment, training and compensation of sales staff.

(*xv*) To explore newer markets for selling the company products.

(*xvi*) Ensuring effective coordination with production and financial departments.

(*xvii*) Striving continuously to lower selling costs, to expand sales and to improve the product for its wider acceptability.

31.5. DUTIES OF SALES MANAGER

A good idea of the duties of Sales Manager can be had from the section 31.4.

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31.6. DUTIES OF SALESMAN (SALES ENGINEER)

- The distinction between a salesman and a manager of a market area is important ; it is the difference between viewing salesmen as employees or as members of management.
- A salesman's job may be seen as that of managing a market area or the salesman may be looked upon as an order taker.
- In general, a salesman may perform as many as five different activities such as :

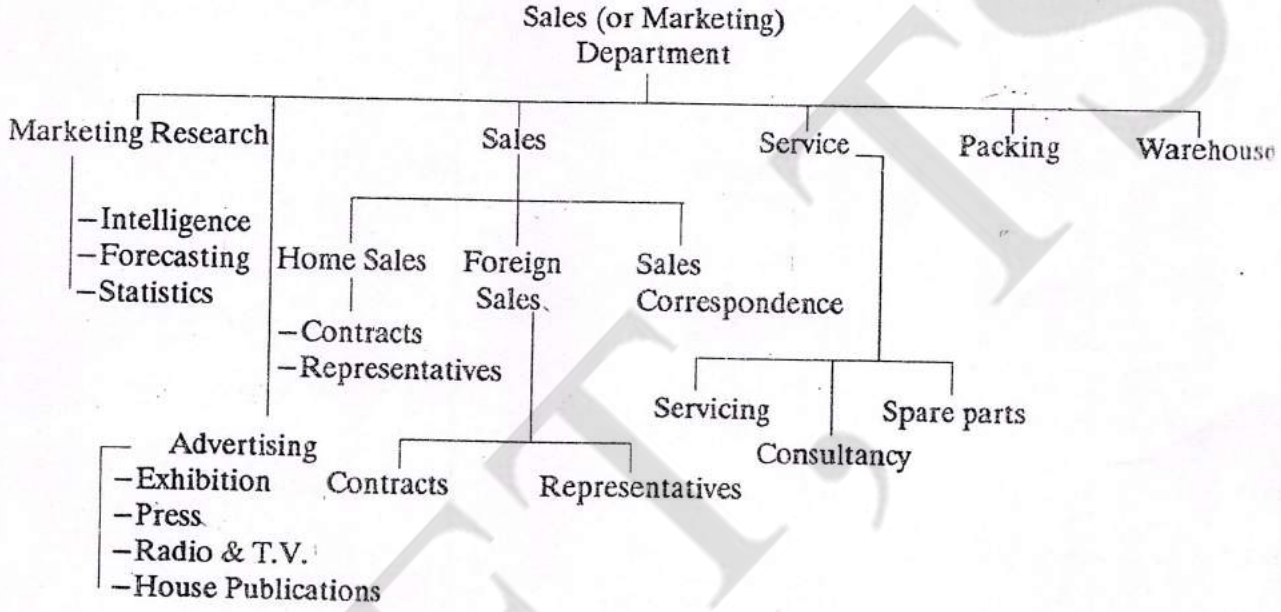


Fig. 31.6. Sales Organisation of a Company.

1. *Prospecting, i.e.,* a salesman is expected to search for additional (business) prospects.
2. *Communicating* information pertaining to company's products and services to existing and potential customers.
3. *Selling company products.*
4. *Servicing, i.e.,* providing service to different customers. Service includes providing technical help, expediting delivery, etc.
5. *Collecting Information, i.e.,* conducting market research and supplying regular reports on his findings to the company.

31.7. THE SELLING CONCEPT *VERSUS* MARKETING CONCEPT

– **The Selling Concept**

The selling concept is a management orientation that assumes that consumers will normally not buy enough of the company's products unless they are approached with a substantial selling and promotion effort.

– **The Marketing Concept**

The marketing concept is a management orientation that holds that the key task of the organisation is to determine the needs, wants, and values of a target market and to adopt the organisation to deliver the desired satisfaction more effectively and efficiently than its competitors.

– The selling concept and the marketing concept are generally confused by many businessmen and by the public. The two orientations distinctly differ from each other (Fig. 31.7) for example :

(*i*) Selling focuses on the needs of the seller whereas marketing focuses on the needs of the buyer.

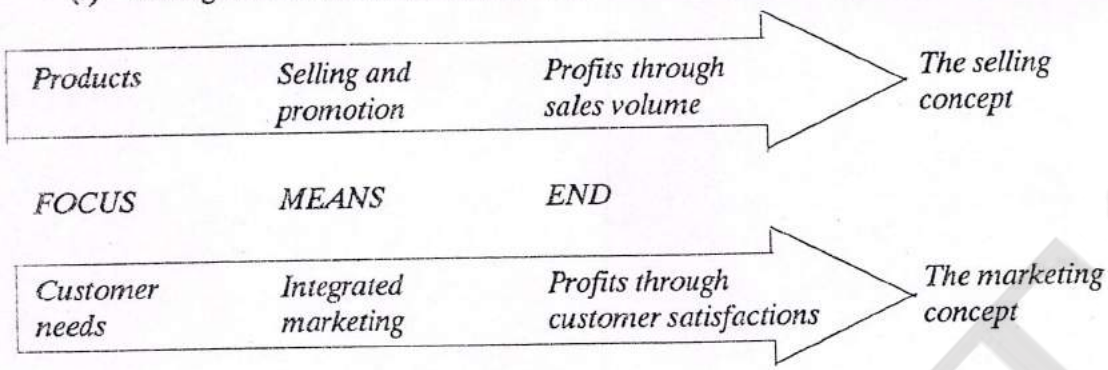


Fig. 31.7. Contrast between the sales concept and marketing concept.

(*ii*) Selling is preoccupied with the seller's need to convert his products into cash, whereas marketing lays emphasis on satisfying the needs of the customer by means of the product.

Marketing tries to know and understand the customer as well as the product or service that fits him and sells itself; marketing results in a customer who is ready to buy himself.

(*iii*) Actually, Marketing is another name for selling, with the inference that it is a rather long-haired method.

(*iv*) Marketing is a more expensive way of selling.

31.8. MARKETING, DEFINITION, PRINCIPLE AND FUNCTIONS

31.8.1. Introduction

– Marketing has its origins in the fact that man is a creature of needs and wants. Needs and wants create a state of discomfort in persons and they tend to get objects (*i.e.*, products) those satisfy these needs and wants. For example in the months of summer, if in an area, ice is not freely available or when eatable tend to get distasted in summer, persons feel discomfort and they satisfy their needs by purchasing a refrigerator.

– The word marketing has been derived from **Market** which may be looked upon as an arena for potential exchanges, *i.e.*, a place where products can be exchanged by money or anything else, *e.g.*, a political candidate offers promises of good government to a *voter market* in exchange for their votes.

There are need markets, product markets, demographic markets, geographic markets, etc.

The size of the market depends upon the number of persons who have both

(*i*) an interest in the product; and

(*ii*) are willing to offer something (say money) in exchange of the product.

31.8.2. Definition

– The concept of markets leads to the concept of marketing.

– **Marketing** means working with markets, *i.e.*, trying to actualize potential exchanges for the purpose of satisfying human needs and wants.

– **Marketing**, therefore, may be defined as human activity directed at satisfying needs and wants through exchange processes ; examples of human needs and wants are food, water, clothing, education and other services.

– Marketing in its broad meaning includes the policy, techniques and methods necessary for selling and distribution. Without marketing function, goods and services cannot be sold.

- Marketing is the total commercial and support activities of any enterprise to effect sales of company end products or services.
- Marketing involves planning and execution of all aspects and activities of a product so as to exert optimum influence on the consumer to result in maximum consumption at the optimum price and therefore producing the maximum long term profit.

31.8.3. Principles

The five basic principles of sound marketing are described below :

1. Marketing must provide a means of classifying, assessing and integrating information relevant to a business.

2. It must provide a sound base for thinking about and studying business problems and provide methods to draw correct conclusions which form basis for action.

3. Marketing must be able to explain, predict and control the process it employs.

4. Marketing must use analytical methods such as O.R., Statistics, Computer Technology, etc., to solve its problems.

5. Marketing should allow the derivation of a number of its principles adaptable to any particular business.

31.8.4. Functions/Objectives

The functions, aims and objectives of marketing are :

(*i*) To give direction and purpose to the marketing division as a whole as well as to its various departments.

(*ii*) To place present activities in perspective.

(*iii*) To discipline various future activities.

(*iv*) To place tactical plans correctly in the strategic setting.

(*v*) To set growth targets.

(*vi*) To establish the organisation and the methods which will be required.

31.9. MARKETING MANAGEMENT AND ITS FUNCTIONS

31.9.1. Concept

- The marketing management concept, which is a break through in the management thinking, by its very nature implies a Systems Approach to the management of marketing effort.
- Marketing management requires a recognition of the interrelations and interconnections between marketing and other business elements.
- Marketing management involves the integration of all the components of the marketing programme into a co-ordinated marketing mix. It demands the establishment of a communications newtork and linkages between the various functionaries and activities necessary for the accomplishment of marketing missions.
- Marketing management concerns itself with the flow of information and resources through a firm to the market place. Even the implementation of the marketing concept requires the grouping of marketing activities and the designation of a top-level executive to integrate both authority and responsibility.
- Marketing management is historically identified with the specialised job of dealing with the customer market for the end products or services of the company.

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31.9.2. Definition

– Marketing Management is the analysis, planning, implementation and control of programmes designed to bring about desired exchanges with target markets for the purpose of achieving objectives of the organisation. Marketing Management relies heavily on designing the organization's offering in terms of the target market's needs and desires and using effective pricing, communication, and distribution to inform, motivate and service the market.

31.9.3. Functions

The broad functions of marketing management consist of the following :

1. Marketing Research,
2. Sales Forecasting,
3. Advertising,
4. Sales promotion,
5. Selling,
6. Handling of inquiries and orders from customers,
7. Packing, and
8. Servicing.

31.10. MARKETING RESEARCH

31.10.1. Concept and Definition

– An industrial enterprise, if, develops products for direct market application without having any idea in advance of consumer acceptance of that product, takes quite a risk (if the product is unaccepted).

On the contrary, if another concern tends to learn consumer reaction to the product prior to manufacturing the same, it does not involve any risk associating high expenditures.

– Market research, today, has come to be a very important part of the marketing function. Market research when properly conducted and used on a regular basis is just as valuable to the manufacture as is Technical Research and ensures the continued vitality of a business.

– **Market research** may be defined as an organised approach which includes all research activities involved in marketing problems :

(*i*) gathering, recording and analysing the utility and marketability of the product;

(*ii*) the natue of demand;

(*iii*) the nature of competition;

(*iv*) the methods of marketing; and

(*v*) other aspects of movement of products from the stage of production to the point where they get consumed.

– Market research provides an effective sales forecast.

– Market research promotes soundness of marketing decisions.

– **Marketing** or **Market research** gathers records and analysis all facts about problems relating to the transfer and sale of goods and services from producer to consumer. Essentially it is designed to discover not only how much the company can hope to sell, but where, to whom and how.

– Some part of the *research* can be done right in the company's own office through the use of its recorded data, a *form* of market research known as *sales analysis.* This should provide information on which products are selling best, in what markets, and to what type of customer. It is very important that sales records be set up to yield this type of data in usable form.

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– Other *sources* of information on markets are the published statistics that give an indication of the size of the potential market in various localities. Government and consultants are valuable sources of this type of information.

31.10.2. Objectives of Marketing Research

– Market research determines who and where the customer is; what are his needs and wants; what will he buy; where and how he will buy; and how much he will pay.
– Market research tells the future of existing products and the products yet to be introduced into the market.
– Market research measures sale trends and sales potential.
– Market research analysis distribution, economic trends, and profitability.
– Market research determines advertising effectiveness, consumer reaction and dealer reaction.
– Market research studies market potential and market share.
– Market research conducts demand and price studies.
– Market research popularises the company products and makes them acceptable to the consumers.
– Market research keeps a business in touch with its markets.
– Market research explores new markets and helps developing new products.
– Market research safeguards the interests of the company against unforeseen changes in the market.
– Market research guides sales promotion efforts.
– Market research analysis user characteristics, attitudes, and opinions with particular emphasis on any shift in market composition or personal preferences.

31.10.3. Scope of Marketing Research

– Major marketing research activities are :

1. Measurement of market potential,
2. Determination of market characteristics,
3. Market share analysis,
4. Competitive product studies,
5. New product acceptance and potential,
6. Short and long range forecasting,
7. Studies of business trends,
8. Establishment of sales quotas and territories,
9. Testing of existing products,
10. Product mix studies,
11. Acquisition studies,
12. Studies of advertisement effectiveness,
13. Media research,
14. Pricing studies,
15. Plant and warehouse location studies,
16. Packaging research, and
17. Distribution channel studies, etc.

31.10.4. Market Research Procedure

1. Define the problem clearly.

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2. Develop a clear set of research objectives.
3. Supervise or subcontract the task of collecting the data from existing and would be consumers, etc.
4. Extract meaningful information from the collected data.
5. Prepare a report presenting the major findings and recommendations coming from the study.

31.10.5. Market Research Techniques

Some of the techniques used by persons engaged in market research for collecting the data [refer(3) of Market Research Procedure] are as follows :

1. Desk research

The data is collected from the information published by the company or outside sources, *e.g.* government agencies, trade associations, etc. Desk research is done on :

(*a*) *Sales analysis, i.e.* past sales, fluctuations sales and promotional expenditures, economics of order size, etc.

(b) Correlation studies, concerned with finding the relationship between two or more variables, *e.g.,* number of new cars produced and number of car batteries sold.

(*c*) *Ratios,* such as stock-turn (the relationship between sales and stocks), profit per rupee invested (earnings/capital) etc.

2. Postal Questionnaire

Carefully prepared questionnaires, consisting of questions – short, specific and statistical or open-minded are posted to a selected sample of respondents for collecting specific data from them.

3. Telephone interviews

Telephone interviews are conducted at a personal level with a selected sample of people for collecting their views.

4. Personal Interviews

Personal interviews are conducted on a simple question and answer basis. Such interviews give best results with greater reliability.

5. Observational Method

The marketing research personnel silently observe others and collect the desired information, *e.g.,* by standing outside or in a wine shop, the brands more frequently purchased can be found out.

6. Statistical Methods

- Statistical methods make use of large precollected data and logically conclude the market investigations.
- Bar chart, histogram, frequency polygon, frequency distribution curve and the concepts of average, median, and standard deviation help serve the purpose.

(Refer Chapter number 8 for details).

31.11. SALES FORECASTING

31.11.1. Introduction and Importance

- Forecasting is essentially the art of anticipating what buyers are likely to do under a given set of conditions.
- The market research conducted by a firm plus the analyses of current sales experience and trends, form the basis for the construction of a sales forecast.
- The sales forecast is a commitement on the part of the sales department and each of its divisions of the expected sales likely to be achieved in a given period at stated prices.
- Sales forecasting should be very accurate because production and stock holding plans and the whole train of events following from these are based on them.

- Sales forecasting is a basis for developing co-ordinated and goal-directed systems of marketing action.
- The sales forecast is one of the vital tools of marketing planning since adequate planning and the effective deployment of marketing resources are based on sales forecasting data.
- Sales forecasting is essential if more accurate sales budgets, production and purchasing schedules are to be set.
- Accurate forecasts are vital aids to decision making.
- Forecasts provide basis for evaluating the functioning and productivity of various segments of business activity. They can guide marketing and other business actions toward the achievement of implicit and explicit objectives.

31.11.2. Sales Forecasting Factors

The factors to be considered when making the sales forecast are :

1. *Government action.* This is important when most of the purchases are made by government departments, government controlled bodies, nationalised industries, etc., as in U.K.

2. *Economic trends.* The trends at home which are affected by government action and the trends in world market are both of interest.

3. *Competition*—existing competitors and new competitors.

4. *Changes in technology and markets.*

5. *Internal factors* such as capacity, available resources product mix and *Marketing mix*, etc.

Sales Forecasting Techniquies

(Refer to chapter 7).

31.12. THE MARKETING MIX

- A *market* is a group of existing and potential buyers or users of a product or service.
- A vital element in every marketing strategy is the *marketing mix.*
- The concept was first expounded by Professor Neil Borden of Harvard University in the 1940's, when he identified *Twelve key variables* in the typical marketing programme.
- These twelve variables have subsequently been reduced to four main headings by later writers.
- The *mix* may now be defined as *the particular group of variables offerd to the market at a particular point in time.*
- These variables are principally (1) product, (2) price, (3) promotion, (4) distribution. Each of these can be further sub-divided as illustrated below :-

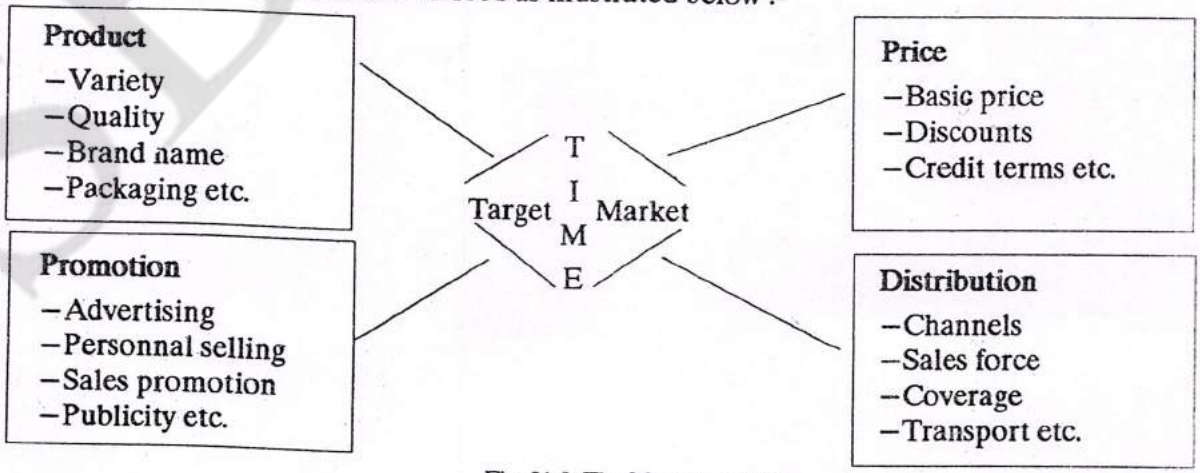


Fig. 31.8. The Marketing Mix.

- The marketing mix is the central part of an organization's marketing tactics. Once the market situation (customers, competitors, suppliers, middle men etc.) have been identified and evaluated, and once the decision has been made to penetrate, or develop particular market, then the role of marketing mix is crucial.
- *Marketing mix* is the combination of *competitive efforts* exerted by a firm to accomplish some *sales* or *profit goal.* These *efforts* usually include :

(*a*) Variations in the *products*/services being offered to customers.

(*b*) Variations in the *prices* of products being offered.

(*c*) Variations in the *promotional* blends utilized.

(*d*) Variations in the *channels of distribution* utilized.

- The firm normally has at its disposal several competitive elements that it can manipulate. For example, a particular firm may charge a very low *price* and not *advertise* at all.

  Another firm may advertise aggressively and charge a relatively high price. These two combinations of efforts represent very simple types of *marketing mix.*
- A cigarette company may elect to : (*a*) emphasize T.V. and radio advertising, (*b*) distribute through high quality tobacco shops, (*c*) charge a premium price, (*d*) sell in 60 mm lengths, and (*e*) feature an air-tight plastic package. This *mix* is more realistic in the sense that most firms confront a relatively large number of controllable competitive variables (as listed in Fig. 31.8.)
- The element of *time* is a vital factor in assessing the particular mix to be offered to a market. Any market situation can change rapidly over even a short period of time, as can be the case when a major competitor is suddenly declared bankrupt.

  By using the marketing mix as a tactical tool of an organization's marketing plans, it is possible to adopt speedily and profitably to changes in the marketing environment.

  Thus the development of the mix to meet conditions at a particular point or period in time is essentially a contingency approach to marketing management.

31.13. ADVERTISING

31.13.1. Introduction and Definition

- Advertising can become an established essential of a country's economy. It contributes to broad geographic system of distribution; to the volume sales, an essential corollary of mass production; and to the pricing of many products within the economic means of the average man.
- Just as communication is vital to good internal management, so is advertising vital to the earning of profit.
- Running a business without advertising is just like winking at a beautiful girl in the dark—you know what you are doing but she does not know it.
- Advertising is generally regarded as a form of communication the purpose of which is to convey concepts about companies, goods and services by means of words, pictures, diagrams, sound, music, colour, shapes and symbol on two levels of significance—the national and the emotional.
- Advertising is any paid form of non-personal presentation and promotion of ideas, goods or services by an indentified sponsor.
- Advertising may be defined as commercial messages to the public, designed to inform potential and established consumers and to encourage sales for the advertiser.
- Advertising can stimulate demand and, where necessary, can even create demand where none exists.
- Advertising arouses public interest, fosters a buying attitude and raises consumer demand for the products of a company.

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– Advertising is the pivot of modern trade, commerce and business.

31.13.2. Functions and Objectives of Advertising

1. Advertising introduces existing and new company products to the public.

2. Advertising enhances potential buyer's responses to the company and its offerings.

3. Advertising tells that a product which the customers want exists and from where it can be procured and at what price.

4. Advertising is undertaken to reduce selling costs; because large volume of production will lead to economies, if, through advertising, it can be supported by mass distribution.

5. Advertising makes a product stand against its competitor products.

6. Advertising

- finds new users
- supports salesmen
- increases profit
- reaches customers who would otherwise be inaccessible to sales staff,
- tells the public, the good qualities of the product, *i.e.*, why people should purchase only this brand.

7. Advertising convinces retailers that they should keep the products of that company.

8. Advertising creates a confidence in the minds of buyers regarding quality of those goods or products.

9. Advertising builds up reputation for the company goods and services.

31.13.3. Functions of Advertising Department

In general, the functions of an advertising department may be classified as follows :

1. Preparation and control of advertising budget.

2. Determining the appropriation or allocation of funds to be spent on advertising and sales promotion activities.

3. Liaison with the advertising agency.

4. Supervising advertising and marketing research.

5. Keeping in touch with representatives of important media.

6. Cooperation with the sales and other departments.

7. Distribution of advertising material.

8. Production and supervision of sales promotion material.

9. Merchandising the advertising.

10. Administration.

11. Co-ordination with the employer and public relation department for improving public and employee relations.

31.13.4. The Advertising Agency

– An advertising agency is a group of specialists in

Research
Preparation of copy
Art
Production
Selection and contact of media, etc.

Who provide expert services and counsel to product manufacturers as regards :

The art of advertising
Preparing advertising policies
Planning and preparing advertisements

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Sales promotion compaign
Recommendation of media
Arrangements for radio and T.V. programmes
The preparation of copy, etc.

- An advertising agency also acts as liaison between advertiser and media.

31.13.5. Types of Advertising

Advertising may be classed into two principal types :

(*i*) Institutional or goodwill type, and

(*ii*) Direct action type.

Institutional advertising is designed to promote an idea or the name of a company in the eyes of the public. Attractive new year's gifts or calenders bearing the name of the company can be distributed to the public for institutional advertising or special *art* paintings can be run in magazines under the company name.

Direct action advertising is designed to sell a firm's products or services. Newspapers and magazines are full of such advertisements – all inducing the customers to come and buy products of a firm.

31.13.6. Advertising Media

- An advertising medium may be considered as the carrier of the information to be advertised.
- Basically the problem is one of the communications. Modern advertising requires a highly complex thoroughly intergrated communication system, extending from the initiating firm to the consumer.
- The process of communication is as below :

Client Firms → Advertising–Agency → Media → Audience or Public → Activity/Sales

- An important part of advertising job consists of deciding the best media for carrying the advertising message or information to the target market. The advertiser tries to achieve a certain reach, frequency, impact and continuity with his advertising budget. Therefore, he must give considerations to the geographical area to be covered, type of buyer to be reached, his habits and customs, his psychological reactions and the qualities and cost of different advertising media.
- A few commonly used advertising media are

1. Newspapers.
2. Magazines.
   General magazines
   Trade journals
   Business reviews
   Technical journals, etc.
3. Radio.
4. Television.
5. Direct mail.
6. Public transportation.
7. Outdoor billboards.
8. Exhibits and displays.
9. Slides in cinemas.
10. Catalogues, samples and handout leaflets.
11. Distributing gifts, pencils, calenders, shopping bags, etc., bearing the name of company and its products.

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31.13.7. Planning and preparing the Advertisement

The various steps involved in planning and preparing the advertisement are :

(*i*) Decide the purpose of advertisment.

(*ii*) Decide the message to be conveyed to public.

The message should be such that it

(*a*) holds the public attention for a long time;

(*b*) is educative and suggestive; and

(*c*) is humorous as well, etc.

(*iii*) Put the idea into symbols of some kind, words, pictures, shapes, music, etc.

(*iv*) Select the advertising media accordingly—to convey the information to the public.

(*v*) Keep a written record of the advertising programme.

31.14. SALES PROMOTION

31.14 1. Introduction

- All the activities that go into the development of sales or those that are intended to raise the demand level for a product very quickly can be grouped under the title *Sales Promotion.*
- Sales promotion includes those marketing activities, other than personal selling, advertising, and publicity, that stimulate consumer purchasing and dealer effectiveness, such as displays, shows and exhibitions, demonstrations, and various non-recurrent selling efforts not in the ordinary routine.
- Sales promotion focuses the attention of the customer at the actual point of sales in the shops with such effectiveness that both the advertiser and the dealer are benefited. The main purpose is to increase sales.
- Sales promotion plays a critical role in introductory and maturity stages of the product life cycle and also appears to be especially effective during periods of rapid inflation.
- Sales promotion, intended to educate the consumers better and to bring about an increase in sales is used more extensively in highly competitive businesses.
- The whole idea behind sales promotion is to bring the name of product and that of the manufacturer constantly before wholesalers, retailers and the consumers in order to stimulate their interest in the product.

31.14.2. Sales Promotion Methods

Sales promotion is the catchall for various promo-tools that are not formally classifiable as advertising, personal selling, or publicity. These tools (methods) may be sub-classified as :

1. Consumer Promotion—persuading consumers to buy ; these include samples, money-refund offers, prices-off, premiums, trading stamps, contests and competitions (*i.e.,* the winner customer will have a trip to Europe, etc.)

2. Trade Promotion—incentives to distributors and others to hold stocks of company product ; these include special discounts, buying allowance, one or two free units per bulk container, dealer competitons such as free holidays, push money, etc.

3. Sales force promotions—bonuses, contests, sales rallies etc., for the salesmen.

4. Good public relations, develop goodwill and increase sales. Every proposed business policy should first be analyzed in terms of its effect upon the company image.

5. Good customer relations. Good customer relations are basically the result of their past transactions with the company. Speedy handling of complaints, assistance in emergencies, abiding by

announced policies etc., all develop good customer relations and increase future sale of company products.

6. Display. Displays at points of sale, using posters, banners, placards and leaflets, to attract the customer's attention to the product.

7. Product exhibitions, demonstrations, and conferences.

8. Holding competition and awarding prizes to winners.

9. Latest **Product styling** and appealing **product packaging** catch the eye of the consumer and increase sales volume.

31.14.3. Functions of Sales Promotion Department (or Manager)

1. Product package detailing.
2. Service to salesmen.
3. Service to dealers.
4. Making displays.
5. Helping the dealer in demonstrations, door to door canvassing, etc.
6. Publicity, (through slides, films, and calenders, etc.)

31.15. CHANNELS OF DISTRIBUTION

31.15.1. Concept and Definition

- Producers generally do not sell their products directly to the final users. Between them and the final user stand a number of *marketing intermediaries* performing a variety of functions and bearing a variety of names.
- The marketing intermediaries are called *channels of distribution, trade channels or marketing channels.*
- Each company usually confronts a number of alternative ways to make its product reach the market. They vary from direct selling (direct channel) to final user, to using one, two, three or more intermediaries.
- Channels of distribution refer to the exhange of ownership of the product until it reaches the final user.
- Distribution channels are characterized according to the number of channel levels. *Commonly used channels of distribution are :*

(*a*) Manufacturer----------> Consumer

(*b*) Manufacturer----------> Retailer----------> Consumer

(*c*) Manufacture----------> Wholesaler----------> Retailer----------> Consumer

(*a*) represents a two level distribution channel.
(*b*) represents a three level distribution channel.
(*c*) repressents a four level distribution channel.

- It can be observed from the above discussion that goods are sold either
  1. direct from producer to consumer, or
  2. from producer to consumer *via.* a middleman (*e.g.,* a wholeasaler, retailer or both).

1. The direct channel is very effective and profitable for goods which have a high profit margin, *e.g.,* office machinery such as photocopying machines, accounting machines, computers, etc.

Moreover, the more specialized or technical the product (*e.g.,* machine tools), the better is to sell it directly; because the ordinary retailer is seldom in a position to give demostration, etc., and specialized service later on.

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In direct selling, the producer has maximum control over selling practices and policies.

2. Selling through a middleman is known as *Indirect Distribution*. This method does vary well for products with a low profit margin, *e.g.,* consumer goods—tooth paste, face creams, etc.

Going through a middleman say a wholesaler usually results in larger orders.

Middleman buys goods in bulk and thus enables a producer to avoid risks connceted with stocking of goods. The risk may be in the form of a fall in price or physical deterioration of the goods.

Middlemen keep the producer informed about the prevalent market trends.

Middlemen such as wholesalers many times pay immediately to the producers the price of goods and thus help producers whose financial resources are not big.

31.16. PRODUCT PACKAGING

31.16.1. Introduction

- *Packaging* is the Art, Science and Technology of preparing goods or products for transport and sale. Packaging is the means of ensuring safe delivery of the product to the ultimate consumer in sound condition at minimum overall cost.
- A package is a complex part of the product. A package most clearly bridges the traditional realms of production and marketing.
- Packaging is an important activity of a sales promotion department because an attractive package catches fast the attention of the customers and speaks itself to them.
- The term packaging means to cover the final product for shipment from the factory to the wholesalers, retailers or the consumers.

31.16.2. Objectives

Until recently, packaging had been considered a minor element in the marketing of products but now it is regarded as a major factor in promoting company sales. Packaging of products is done for the following purposes :

1. To protect the products against damage in transit.
2. To protect the contents from being spoiled (tinned food products).
3. A packaged good is convenient to handle or transport.
4. A packaged good is safe to store.
5. An attractive package possesses considerable sales appeal and thus promotes sales of the product.

When the products are sold on a self-service basis such as in super-bazars (markets) and discount houses, it is only the package that attracts public attention, describes product's features, gives the consumer confidence and makes a favourable overall impression.

31.16.3. Requirements

The package for a product must

(*a*) Speak about the product.

(*b*) Catch the attention of consumers.

(*c*) Look clean and sanitary.

(*d*) Prevent spoilage of product.

(*e*) Be of convenient size and shape to carry.

(*f*) Be easy to open.

31.16.4. Packaging Methods

- A large variety of products taking from food and drugs to automotive parts and hardware all need suitable packaging.

- Methods of packaging depend upon the nature of product, *i.e.*, whether it is
  Liquid Solid Powder Gas
  Corrosive, Inflammable, Volatile, Explosive, etc.
- The properties of the product that help design the packaging system are its
  Size Shape
  Weight Value
  Transport hazard Fragility.

The mechanical properties of the packaging material and the compatibility of the goods and the package also deserve consideration.

- *Product can be packaged in*
  (*i*) Corrugated shipping containers.
  (*ii*) Metal cans.
  (*iii*) Paper foil cans.
  (*iv*) Glass bottles.
  (*v*) Plastic bottles.
  (*vi*) Plastic film pouches and bags.
  (*vii*) Paper cartons.
  (*viii*) Paper wraps.
  (*ix*) Card board cartons.
  (*x*) Wooden crates.
  (*xi*) Cushioned containers.
  (*xii*) Fibre board containers.
- Small products can be packaged in cardbord cartons.
- Large products such as machine tools or refrigerators can be put into wooden crates or packaging cases and (articles) firmly bolted to the side/back and bottom of the case so that there is clearance all round between the outside of the article and the inside of the case or crate.
- Product packaging methods have improved a lot in recent years, *e.g.*
  (*i*) A refrigerator can now be packed in a large fibre board container on a completely automatic machine.
  (*ii*) Delicate precision instruments that formerly required cushioned containers are now suspended in plastic envelopes in rigid boxes.
  (*iii*) Furniture which would be carefully enclosed in costlier wooden crates is now being boxed in fibre board cartons.
  (*iv*) Packaging of food in plastic and other special paper containers has contributed to its protection from getting spoiled.
  (*v*) Lumber can be shipped in palletized load instead of being piled in a truck.

31.17. PRICING

29.16.1. Introduction

- Pricing is the holy of holies of antitrust enforcement with its *per se* prohibition of price conspiracies and strong suspicion of the conscious parallelism and price leadership of oligopolistic competition and of so called administered pricing.
- The price of the products is the means whereby manufacturers obtain a fair return for their labours and replace and increase their wealth and purchasing power in return for supplying the products.
- All business enterprises face the task of setting a price for their products or services.
- Price goes by many names, *e.g.*, fares, tuitions, rents assessments and plain old price.
- *The task of pricing is faced in the following situations :*
  (*i*) When a company makes a new product and it has to set price for the first time.
  (*ii*) When circumstances such as inflation or shortages lead a firm to consider initiating a price change.
  (*iii*) When market competition initiates a price change.
  (*iv*) When a company produces serveral products that have interrelated damands and/or costs.

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31.17.2. Factors affecting price fixation

1. *Fair trade laws.* Manufacturers make agreement, with dealers who retail their products, on the price it can be sold to the public.

2. *Nationally advertised prices and government restricted prices of different products.*

3. *Desired customer clientele.* Pricing policy depends upon the buying habits of the customers who buy the products and whether, they (*i.e.,* cutomers) are price conscious people.

4. *Company monopoly.* Wheather the company has a monopoly or it is in a competitive position.

5. *Manufacturer's suggested prices*, depending upon the cost of manufacture and selling the product.

6. *Type of Merchandises, i.e.,* whether they are novelties or special interest items, etc.

7. *Nature of sales.* Whether the product sells seasonally, (*e.g.,* refrigerators) or throughout the year (*e.g.,* televisions and transistor radios).

8. *Price lining* is a policy of keeping merchandise in fairly well defined price range, *e.g.,* selling shoes at Rs. 139.95 Rs. 254.95 and Rs. 371.95, etc.

9. Whether large volume with low unit profit or relatively small volume with high unit profit is desired.

10. *Suitable channels of distribution.*

11. *Sales promotional strategy.*

31.17.3. Pricing Policy

- Pricing policy can be expressed diagrammatically (refer Fig 31.9).
- Assume that company has a sales of Rs. 100,000 and gross margin of Rs 45,000, it means that it has an *average marks up* of 45% on the total sales.
- This does not mean that every product was marked up 45% of sales; actually some product had more than this, and others less than this but the overall average markup reached 45%.

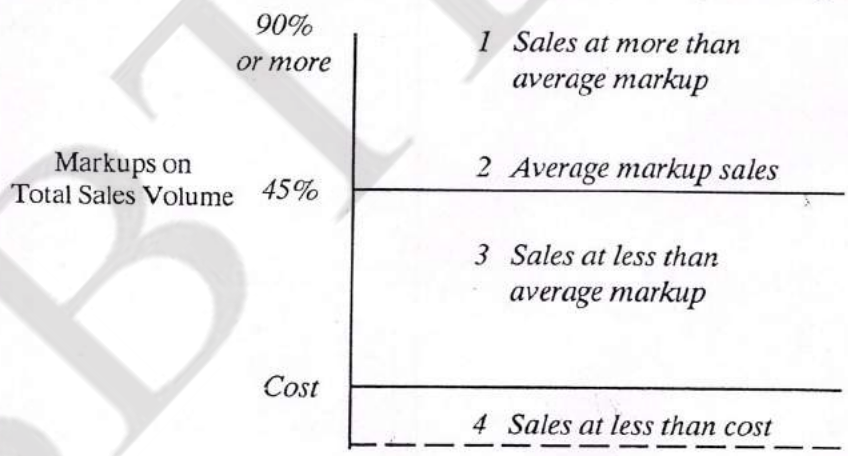


Fig. 31.9. Pricing Policy.

- *What is markup.* Markup or gross margin represents the difference between what the shopkeeper has paid to the wholesaler for getting the product and the price at which he has sold the product to the consumer. In other words markup is the reward or profit to the shopkeeper for rendering a service in bringing the merchandise to the customer.

Markup Covers

1. Operating expenses,
2. Markdowns,

3. Shortages,
4. Damaged merchandise, and
5. Profits

— Four distinct areas namely 1, 2, 3 and 4 can be seen in Fig. 31.9. A dynamic pricing policy demands that the seller must be aware of the aggregate sales volume in each area so that his overall total sales will average out to the markup necessary to provide desirable overall profits. Different products may sell in different areas, some at bigger profits, others at lesser profit but the overall position must not be less than average markup value.

31.18 THE MARKET

31.18.1 Concept

— A *market*, in common parlance, means a place or locality where things are brought and sold and where buyers and sellers personally meet to affect purchase and sale.

— However, for a student of *economics*, the term *market* has no reference to a place, where things are brought and sold. It refers to a commodity and buyers and sellers of that commodity (e.g. wheat).

— In fact the market must be thought of not as a geographic place but as any getting together of buyers and sellers in person, by mail, telephone, telegraph or any other means of communication.

— A *market* is a group of existing and potential buyers or users of a product or service.

— Marketing is the one function of management which has to be more concerned with what is going on *outside the organization* than with what is happening internally.

— Every *business organization* has its market, that is to say, the group of existing and potential buyers or users of its goods and services.

— A market may consist of a mere handful of people (e.g. specialist collectors of a certain type of antique items) or it may consist of millions (e.g, consumers of breakfast eatables).

31.18.2 Various Concepts of Market

The various concepts of market developed so far are discussed below :

(1) **Distribution of goods and service concept**

It is a traditional concept of marketing according to which marketing is an economic activity that facilitates the distribution (or flow) of goods and services from producer to consumer. This concept has no concern with the production activities of the goods.

(2) **Delivery of standard of living concept**

According to this concept, marketing includes all those activities that create and give a better standard of living to the society.

The producer tries to know the customer's needs and plans his production accordingly. In this way, customers get quality goods at cheaper rates and thus better standard of living is delivered to the society.

(3) **Creation of utility concept**

Marketing is an activity that creates *form*, *place*, *time* and *ownership* utility.

To *elaborate*, marketing consists in moving goods from the manufacturer, in a *form* in which they are required at a *time* when they are required, to the *place* where they are to be used and for *those who* are to use them for various purposes.

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(4) **Generation of revenue concept**

Marketing should generate revenue or income for the firm. Marketing consists of all activities which are performed with a view to allow the firm to earn maximum profit not by increasing the selling price, but by reducing production and selling costs and other overheads.

(5) **Social system concept of marketing**

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 which are a part and parcel of society.

(6) **Concept of customer satisfaction – Modern concept**

The modern concept of marketing emphasises the identification and the complete satisfaction of customer's needs.

It is based on two fundamental concepts :

(i) that the company policies and operations should be customer oriented and

(ii) that the goal of the firm should be profitable sales.

31.18.3 Types of Markets

The markets may be classified on the following basis:

(a) **The product sold in the market** e.g., *cloth market, jute market, share market, grain market*, etc.

(b) **Nature and volume of selling** e.g., a *wholesale market*, where goods are sold in large quantities to dealers, and a *retail market* where goods are sold in small quantities to consumers.

(c) **The nature of dealings** e.g., a *spot market* where goods are brought and sold immediately and a *forward/ future* market where actual purchasing and selling may take place at some future time/date as agreed by the buyer and the seller.

(d) **Regulated and Municipal markets**. A *regulated market* is one that is controlled by an *association.* If the municipality owns and controls the market, it is called a *municipal market.*

(e) **Area covered**. Depending upon the area covered, it may be a *home/local market, national market* or an *international market.*

(f) **Time-interval**. Depending upon the time interval, it may be a *short period market* (e.g., *money market*) or a *long period (or term) market* (e.g., *capital market*).

(g) **Economic concept** . On the basis of economics, it may be a *perfect market* or an *imperfect market.* Perfect market refers to perfect competition and imperfect market refers to absence of perfect competition and existence of monopoly.

(h) **Seller's position**. Depending upon seller's position, it may be a *primary/local market, secondary/central market* or a *terminal market.*

In the case of *local market* farmers sell their surplus produce to traders in the village. In the case of *central market*, wholesalers sell to retailers and in the case of *terminal market*, consumers buy from retailers or local dealers.

31.18.4 Cost of Marketing

— Marketing costs are generally high. The study of marketing of wheat, rice and cotton in India indicated that 50 to 60% of the total cost accounted for the marketing costs.

— *Reasons for high cost of marketing*

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(i) There is a big gap between the points of production and consumption. This gap is bridged by an army of middle men-both merchants and agents. This results in high cost.

(ii) Moreover, society has also accepted to pay high prices in view of the valuable services that it is getting in return, from the above mentioned marketing system.

(iii) The inefficiency that creeps in various marketing functions and segments due to presence of inefficient and incompetent men, also results in higher cost of marketing.

– *To reduce marketing costs*

(i) Un-necessary crowd of middlemen should be avoided.

(ii) Development of chain stores, multiple shops and departmental stores are the innovations of marketing men to avoid middlemen.

(iii) People in marketing line should be qualified and experts.

(iv) Cooperatives should be developed to provide better services to customers.

(v) Government should provide fast and reliable transportation systems (railways, roadways etc.) and communication systems.

.18.5 Modern Marketing Process

– Marketing is the process of discovering and translating consumer's wants into products and services.

According to *modern marketing concept*, marketing starts with the product-idea and ends with customer satisfaction.

– *Marketing process* covers *marketing functions* as well as *marketing agencies* or *channels of distribution.*

– Marketing process brings together producers and consumers. Each producer (or seller) has certain goals in making and marketing his products. An *exchange* (or transaction) takes place when market offering is acceptable to the consumer who is prepared to give something of value (i.e., money) in return against the product he wants to buy. In the process of exchange, both (seller and consumer) give up something and both gain something in return. The seller gets the profit and the consumer gets utility (of product) or individual satisfaction. Thus market mechanism brings together a willing seller and a willings and informed buyer together for mutual gain.

– The marketing process is influenced by (1) competition (2) government rules and policies (3) mass media or communication etc. (refer Fig. 31.10)

– *Marketing environment (Fig. 31.10)* affects both producer and consumer.

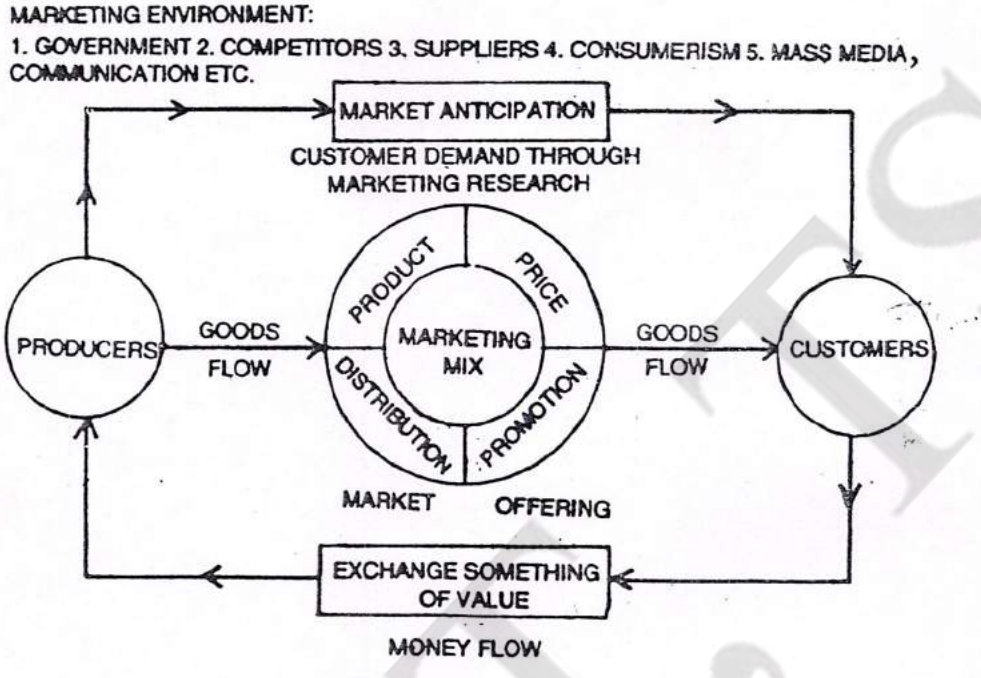
– The marketing process involves three major activities

1. Concentration 2. Dispersion 3. Equalisation

The products which have been *concentrated* at the central markets are *dispersed* from the producer toward the consumer. The process of *equalisation* involves proper adjustment of supply at all centres of distribution in the light of current market conditions.

– The producers carry out *market anticipation* work. They study customer demand through marketing research.

Marketing research is the starting point in the marketing process to ascertain and identify customer needs and desires through market analysis and investigation. Resources of men, money, materials and management are employed in the marketing system to perform marketing functions and thereby achieve the satisfaction of customer demand.



Modern Marketing Process

Fig. 31.10

— Producers manufacture a number of products. Then, marketing is a matching process by which the producer provides a *marketing mix* (product, price, promotion and physical distribution) that meets consumer demand ; thus products/goods flow from producer to the customers.

— When the customers buy the products, the flow of money takes place from the customer to the producers.

31.18.6 Marketing Concept

— *Marketing* is a *philosophy* as well as a *technology.*

— As a *philosophy*, it guides whether to produce something or not to produce.

As a *technology* it decides what should be produced, how and when products could be most effectively distributed among the customers.

— Hence, a producer, always, has to face the changing (mood or) conditions of the human behaviour.

— As a result of the changing human behaviour, the evolution of marketing concept had the following orientations :

(1) ***Exchange oriented marketing***

— In the early period of human history, every human being or a family had to gather their food by hunting or so and they were self sufficient. At this stage marketing was totally absent.

— As the time passed, man started producing more than what he could consume. Somebody produced wheat, other fruits, so they mutually exchanged their surplus with each other. This was nothing but *barter system.*

The (surplus) products used to be brought at central places (called local markets) for the purpose of exchange. This was the first stage in the evolution of marketing.

(2) ***Product oriented marketing***

— This stage came after the *Industrial revolution* when there was a shift from agriculture to industry and the means of transport and communications had also somewhat developed.

The importance of marketing concept was realised, however, no serious efforts were made to satisfy the wants of the consumers. It was because the product demand usually outstripped the production capacity.

This concept of marketing was marked as product oriented because it lay more emphasis on the product rather than on the consumers.

— In the *product-oriented concept/stage*, it is believed that if the product is good and reasonably priced, customer response is bound to be favourable and little marketing effort will be necessary to achieve satisfactory sales and profit. There was a time, in India, when only two brands of cars that is *Ambassador* and *Fiat* were available in the market and (unlike today) the customer had no choice except for to buy this or that. The consumers knew these two brands of cars and therefore no promotion efforts were there on the part of producers of these cars.

(3) ***Sales-oriented marketing stage (selling concept)***

— With the passage of time, there was rise in living standards of the customers and the means of transport and communication had developed. These changes compelled to have an organised marketing procedure.

— Under sales-oriented approach, it was assumed that the customers will normally not buy enough unless approached through incentive sales promotion, advertising and salesmanship efforts. But, under this concept, no efforts were made to satisfy the particular needs of the customers. In other words, more emphasis was laid on increasing the sales than on customer's need and satisfaction.

(4) ***Marketing-oriented approach***

— Marketing-oriented approach developed after the sales-oriented stage.

— In marketing-oriented approach, it is realised that the producer should determine the needs and wants of the customers and deliver the goods accordingly but more effectively and efficiently than its competitors.

The *aim of marketing* is to know and understand the customer so well that the product (and service) fits him and sells itself.

— The selling and the marketing concepts are quite often confused.

However; *selling* focuses on the needs of the seller (i.e., the seller's need to convert his product into cash); whereas *marketing* focuses on the needs (and satisfaction) of the consumers.

(5) ***Customer–oriented marketing***

— This is a modern philosophy of marketing and it was introduced only after 1950, when production went in excess of demand and the competition became keen.

— Under this concept, goods are produced to satisfy the needs and wants of the customers.

— Only such products are brought forward which can satisfy the wants and tastes of the consumers. Customer-oriented approach is related to the needs of the buyer.

(6) ***Socially–oriented marketing***

— The business enterprise engaged in the marketing process itself is influenced by *social*

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environment. It consists of political, economic, social, cultural and technological forces. Marketers have to adapt with these everchanging environment forces and fulfil the needs and desires of the society or community.

— According to socially-oriented concept, marketing is a social activity, because (1) marketing provides new goods and improved services to people in the society, thereby raising the standard of living of the people, (2) marketing provides employment to people, (3) sound marketing decreases the distribution cost and increases the National Income.

— In the long run, society monitors the marketing process and controls its effectiveness.

— The modern business enterprise is called upon to demonstrate simultaneously higher level of economic performance and fulfilment of *social responsibility* i.e., high level of consumer/citizen welfare and satisfaction.

Marketing process must reflect social awareness and social responsibility in all business enterprises. Then only the survival, growth and prosperity of the marketing units can be assured.

31.19 PRODUCT MIX

— The **product** means anything that is offered to a market for its use or consumption. The product can be a physical object or a service or some kind. The product offered by a manufacturer consists of physical items, such as machine tools, television sets, loaves of bread or cosmetics. Products offered by service industries include hospital care, dental treatment, holiday arrangements and accountancy services, for example.

— *The range of products offered by an organization is called the product mix.* Since most, if not all, of the organization's revenue is going to be obtained from the sale of its products, it is clearly important that the range and quality of the *product mix* is frequently evaluated and amended. *Examples of a product mix are as follows* :

(1) *Motor car manufacturer* - cheap, basic family runabouts, medium-priced family saloons, estate cars, executive saloons, and sports cars. Within most of these product lines, various other refinements can be offered e.g. two-door and four-door versions of the family saloons, hatch-backs as an alternative to the estate models, variations in engine sizes, and, of course, a range of colours.

(2) *District hospital* - surgical and medical services, diagnostic services, para-medical services, pre-natal advice and others. Within each of the major *product lines* various alternative services are offered e.g. general surgical, accident services, coronary care, X-radiography, physiotherapy, pre-natal classes and so on.

— In considering products, it is important to note that people generally want to acquire the *benefits* of the product, rather than its *features*. For example, in buying a motor car a person is buying such things as luxury or speed or economy or status. The fact that these benefits are achieved by differences in engine size, suspension design or paintwork is really of secondary interest. Similarly, the reason why we want hospitals is for such aims as the preservation of life or the improvement of health or peace of mind. Whether these things are achieved by surgery, or by drugs, or by nursing care, or by modern diagnostic apparatus is, for many people, a matter of secondary importance.

— The very existence of a *product range* is, in itself, a selling point for a product. The same consideration applies to other aspects of the product, such as *quality*, *brand*, *packaging* and *after-sales service*, where applicable. *Where quality is designed* into a product, the

benefits can be long product life, absence of faults and subsequent breakdowns, reliability, increase in value and many others. However, product quality may not be sought after at all. For example, the benefits of disposable goods are immediate and one-off. Such goods do not need to be durable or aesthetic, so long as they are hygienic and functional such as disposable syringes. Thus product quality may be high or low, depending on the wants or preferences of the market, and part of an organization's product strategy is to decide the level of quality to be aimed at.

— One important method used to sell benefits is by *branding products*. This means applying the organization's *signature* to its product by the use of special names, signs or symbols. *Branding* has grown enormously during this century, and there is hardly a product which does not have a *brand name*. Famous brand names include *Coca Cola*, Luxor, Rotomec etc., all of which have become synonymous with certain categories of products, like soft drinks, ball pens etc.

— In general, branding is a feature of consumer products. It is less common in industrial products.

— *Packaging* is an important factor in the presentation of a product to the market. Not only does packaging provide *protection* for the product, but it can also *reinforce* the *brand image* and the point-of-sale attraction to the buyer. The protective aspect of packaging is vital in respect of items such as foodstuffs, dangerous liquids and delicate pieces of machinery. Goods such as soft toys and items of clothing may not need such protection, but here other considerations apply, such as the appearance of the goods on the shelf, or the possibility of seeing the contents through the packaging. Other aspects of packaging may emphasise the convenience of the pack, as for example in cigarette packets which may be opened and reopened several times, or beer cans, which can be opened safely by pulling a ring.

— Some products are sold with a very strong *emphasis on after-sale service, warranties, guarantees,* technical advice and similar benefits. *Mail-order firms* invariably have an arrangement whereby, if customers are not satisfied with the goods received, they may return them at the firm's expense without any questions being raised. *Computer suppliers* frequently provide *customer training* as an integral part of their total product package.

In recent years the growth of *consumerism* or *consumer protection lobbies* has led to many organizations taking action to improve the service to the customer after the sale has been concluded.

— Emphasis *on the make-up of the product* is not only vital because of the need to sell benefits to potential customers, but also to take account of another key factor i.e. the *product life-cycle*. Studies have shown that most products pass through a series of stages - their life-cycle - from the time they are introduced until the time they are withdrawn. A product will typically pass through five major stages in its life. These are shown in the diagram below (Fig. 31.11)

— *The consequences of these stages of the product life-cycle are as follows :*

Introduction Costs are high (because they include the development costs), sales and profits are low. Few competitors. Price relatively high.

Growth Sales rise rapidly. Profits at peak level. Price softens. Increasing competition. Unit costs decline. Mass market appears.

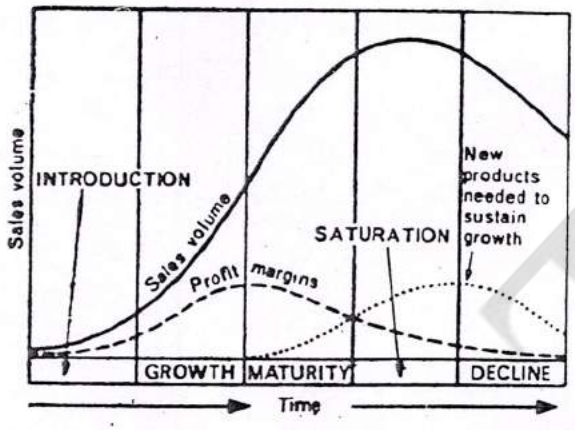


Fig. 31.11 Product Life-Cycle

Maturity Sales continue to rise, but more slowly. Profits level off. Competition at its peak. Prices soften further. Mass market.

Saturation Sales stagnate. Profits shrink. Measures taken against remaining competition. Prices fiercely competitive. Mass market begins to evaporate.

Decline Sales decline permanently. Profits low or even zero. Product is withdrawn from the market.

— The *total length of time* over which a product may decline depends on a variety of factors, such as its *relevance* to basic needs, its *adaptability* in the light of economic trends and whether it is the focus of short-term fads or of longer-lasting *fashions*. A basic foodstuff, such as a packet of ground coffee, will have a relatively long life-cycle. *Conversely*, in an economy where energy costs are high and fuel conservation is the fashion, the *expensive motor car* with a high petrol consumption will tend to have a short life-cycle, but the *economy car* will continue for years.

— Taking into account the various stages of the product life-cycle and the period of time concerned, it is possible *to plan the product mix*, plan the development and introduction of new products, plan the withdrawal of obsolete or unprofitable products, and set the revenue targets for each product within the total range. If the current position of any one product is plotted correctly on its life-cycle, then it is possible to assess the potential growth of sales, or the degree to which prices should be allowed to soften in order to maintain the market share, or whether the product should be superseded by another. Thus the concept of the product life-cycle makes an important contribution to forecasting of sales and planning of products.

31.20 PRICE MIX

— If *product* is the most important single *element in the marketing mix*, then price is usually next. *Price is important* because it is the only element of the mix which produces *revenue*; the *others* all represent *costs*. Sellers have to gear prices to a number of key factors, such as:

(a) the costs of production (and development),

(b) the ability to generate sufficient revenue and/or profits,

(c) the desired market share for the product,

(d) the prices being offered by the competitors

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— *Price is especially important at certain times. For example :*
  (a) when introducing new products
  (b) when placing existing products into new markets
  (c) during periods of rising costs of production
  (d) when competitors change their price structure
  (e) when competitors change *other* elements in their marketing mix (e.g. improving quality or adding features without increasing prices)
  (f) when balancing prices between individual products in a product line.

— When a new product is introduced, such as a video or a home computer, the price tends to be high on account of the initial development and marketing costs. This sort of product tends to be directed, initially, to higher-income groups or specialist-interest groups. As the product begins to attract increasing sales, and initial costs begin to be covered, then prices can be reduced and production volume stepped up. However, it is also possible to introduce a product with a very low price in order to obtain a foothold in a new market, or an increased share of an existing market. A bargain price may well attract considerable sales and at the same time discourage competitors. The danger is, of course, that the price may be so low that the business fails to generate sufficient revenue to cover its operating and/or capital costs.

— Few products stand still in terms of their costs. Labour costs increase from year to year; materials costs and energy costs may be subject to less regular, but sharper, increases; interest rates may be extremely variable, and hence the cost of financing products fluctuates. Many costs can be offset by productivity savings. Therefore, the costs which are the most crucial are those which represent sudden and massive increases, which cannot be absorbed by improving productivity. In this situation price increases are practically inevitable, and the question is *by how much should we increase them* ?. In certain situations, it may be possible to gain a temporary advantage over competitors by raising prices by the lowest possible margin, and offering some other advantage such as improved after sales service or credit terms.

— The activities of competitors have an important bearing on pricing decisions. The most obvious example is when a competitor raises or lowers his prices. If your product can offer no particular advantages over his, then if he drops his price, you will have to follow suit. If, on the other hand, you can offer other advantages in your marketing mix, there may be no pressure at all to reduce your price. If a competitor raises his price, perhaps because of rising costs, it may be possible to hold yours steady, provided you can contain your own rising costs. *Pricing is a very flexible element in the marketing mix and enables firms to react swiftly to competitive behaviour.*

— Competitors may throw out a challenge by improving the product and offering a better distribution service, for example. This kind of behaviour, too, can be countered by price changes - in this case by easing prices and/or improving credit terms. Much will depend on the sensitivity of the market to price changes. If price is the dominant issue for buyers, then they will prefer lower price to slightly higher quality or improved distribution arrangements. If price is not the major factor in the buyer's analysis, then marginal extra quality and delivery terms may prove the more attractive.

— Finally price is important in determining the relative standing of one product or product-line vis-a-vis another within the product mix. This issue applies particularly in

highly differentiated products in the consumer area. It is important, for example, that a motor car manufacturer establishes appropriate differentials between different models within a product-line e.g. between 1000 cc and 800 cc models. If 800 cc models are selling well but 1000 cc models are not, it may be in the seller's interests to reduce the differential so as to attract more buyers to the 1000 cc models. Otherwise a reasonable differential will be expected in order to justify the enhanced engine rating of the larger model.

— The concept of a *loss-leader* is often applied to internal *price-differentials*. This means that one product in a line is reduced to below-cost levels with the aim of attracting attention to the product-line or range as a whole. So, for example, a new fibre-tipped pen, in a range of such pens offered by a newcomer to the market, may be sold at a loss in order to draw attention to the range as a whole, and to establish a share of the total market. Loss-leaders naturally represent very good value for money to the buyer, and can be a very useful way of establishing a range in the market-place.

31.21 PROMOTION MIX

— *Every product need to be promoted* that is to say it needs to be drawn *to the attention of the market-place*, and its benefits identified. *The principal methods of promotion are advertising, personal selling, sales promotion* and *publicity*. It is in these areas that Marketing departments come into their own. They provide the bulk of the expertise, and carry the biggest amount of responsibility, in respect of these aspects of the marketing mix.

— The *aim of an organization's promotional strategy* is to bring existing or potential customers from a state of relative unawareness of the organization's products, to a state of actively adopting them. Several different stages of customer behaviour have been identified. These can be stated as follows :

Stage 1 Unawareness of product
Stage 2 Awareness of product
Stage 3 Interest in product
Stage 4 Desire for product
Stage 5 Conviction about value of product
Stage 6 Adoption/Purchase of product

— The *four different methods of promotion* mentioned earlier are applied, where appropriate, to each of the stages of customer behaviour. *Advertising* and *publicity* have the broadest applications, since they can affect every stage. *Personal selling* and *sales promotion* activities, by contrast, tend to be more effective from Stage 3 onwards.

— Before describing each of the methods in greater detail, one further point can be made about them as a whole. This is that they have a different emphasis according to whether they are being applied to *consumer markets* or *industrial markets*. *For example*, whilst advertising is very important in reaching out to consumer markets, it is of relatively little significance to industrial markets, where personal selling is the most popular method. Publicity and sales promotion activities appear to rank equally between both types of market.

(A) ADVERTISING (Refer article 31.13 also)

— Advertising is the process of communicating persuasive information about a product to target markets by means of the written and spoken word, and by visual material. By

definition the process excludes personal selling. There are five principal media of advertising as follows :

(a) the press – newspapers, magazines, journals etc
(b) commercial television
(c) direct mail
(d) commercial radio
(e) outdoor – hoardings, transport advertisements etc.

— Whatever the medium a number of questions must be decided about an organization's advertising effort. These are basically as follows:

1. How much should be *spent* on advertising?
2. What *message* do we want to put across?
3. What are the best *media* for our purposes?
4. When should we *time* our advertisements?
5. How can we *monitor* advertising effectiveness?

1. **Advertising expenditure**

— If the product is at the introductory stage, a considerable amount of resources will be put into advertising. Conversely, if the product is in decline little or no expenditure on advertising will be permitted. If the product is at the saturation stage, advertising may well be used to score points off the competition e.g. "our vehicle does more miles per gallon than theirs (naming specific competing models)."

— *Advertising expenditure* may be related to *sales revenue* or it may base on what the *competitors* are *spending*.

2. **Advertising message**

— Probably the most important aspect of any advertising campaign is the decision about *what* to say to prospective customers, and *how* to say it. This is the *message which aims* to make people aware of the product and favourably inclined towards it. Advertising copy (i.e. the text) also aims to make people desire the product. The entire process is the fundamental one of turning customer needs into customer wants.

— The advertising message should aim at, to :

(a) increase customer *familiarity with* a *product* (or variations of it e.g. brand, product-range etc.).
(b) inform customers about specific *features* of a product.
(c) inform customers about the key *benefits* of a product.

3. 4. **Choice of media and time**

— *The choice of media depends on the organization's requirements in terms of:*

(a) the extent of coverage sought to reach customers
(b) the frequency of exposure to the message
(c) the effectiveness of the advertisement i.e. is it making a relevant impact?
(d) the timing of the advertisement
(e) the costs involved

— If *wide coverage* is sought (e.g. for a new Do-it-Yourself product or a new consumer

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banking service), then a *television* advertisement put out at *a peak viewing time* would be the most effective.

— For effectiveness, *magazines and journals* tend to reach the most relevant markets, provided they are selected carefully in the first place. For example, advertisements for camping enthusiasts will tend to produce better results in camping magazines than in national newspapers or magazines aimed at other interest groups, such as collectors of antique furniture. One of the problems with magazine advertisements, however, is their relatively long lead-time before an advertisement appears. *Newspapers* are better media on this score. *Direct mail* scores high on relevance-it can be directed very specifically at certain markets, but because of the personnel costs, it can be expensive. In the final analysis, organizations have to weigh up the anticipated benefits of particular media against the costs involved. This brings us on to the question of how do organizations assess the effectiveness of their advertising?

5. **Advertising effectiveness**

There are *two main ways* of looking at the question of *advertising effectiveness* - the *first* is to consider the results of the advertising in achieving target improvements in specific tasks e.g. increasing brand awareness in a specific market; the *second* it to consider the impact of advertising on sales.

(B) PERSONAL SELLING

— However vivid the message put over by *advertising*, there is no substitute for the final *face-to-face meeting* between the buyer and the seller or his representative. Advertising creates the interest and the desire, but *personal selling* clinches the deal. In industrial markets, personal selling plays an even more extensive role. For the moment, let us consider the *basic sales process*. This is generally understood to mean:

(a) establishing customer contact
(b) arousing interest in the product
(c) creating a preference for product
(d) making a proposal for a sale
(e) closing the sale
(f) retaining the business

— So far as *consumer* markets, and especially mass markets, are concerned, advertising must play a vital role in the first three stages of the process. After that, advertising becomes rapidly less important, and personal selling takes over. By comparison, advertising plays a much less important role in *industrial* markets. Where even the first stage is dominated by personal selling.

However, personal selling is the most expensive form of sales promotion.

(C) SALES PROMOTION

— Sales promotion activities are a form of *indirect advertising* designed to stimulate sales mainly by the use of incentives. Sales promotion is sometimes called "below-the-line advertising" in contrast with above-the-line expenditure which is handled by an external advertising agency. Sales promotion activities are organized and funded by the organization's own resources. They can take a number of different forms, as, for example:

* Free samples * Twin–pack bargains (Two for price of one) * Temporary price reductions * Point–of–sale demonstrations	Promotions directed at consumers
* Special discounts * Cooperative advertising * Bonuses/prizes for sales representatives * Provision of display material	Directed at trade customers

— There are 'push' and 'pull' strategies. Sales promotion falls into the first category. It aims to push sales by offering various incentives at, or associated with, the point-of-sale. Its use is most frequent in the field of *consumer products. The objectives of a promotion directed at consumers could be to :*

(a) draw attention to a new product or line
(b) encourage sales of slow-moving items
(c) stimulate off-peak sales of selected items
(d) achieve higher levels of customer acceptance/usage of a product or product-line

— *Objectives for a trade-orientated promotion could be to*:

(a) encourage dealer/retailer cooperation in pushing particular lines
(b) persuade dealers/retailers to devote increased shelf-space to organization's products
(c) develop goodwill of dealers/retailers

— The most popular *method of evaluating a sales promotion* is to measure sales and/or market share before, during and after the promotion period. The ideal result is one which shows a significant increase during the promotion, and a sustained, if somewhat smaller increase *after* the promotion. *Other methods* of evaluation could include interviewing a sample of consumers in the target market (e.g. to check if they had seen the promotion, changed their buying habits etc.), and checking on dealers' stock-levels, shelf-space etc.

(D) PUBLICITY

— Publicity differs from the other promotional devices mentioned in this chapter in that it often does not cost the organization any money! Publicity is news about the organization or its products reported in the press and other media without charge to the organization. Of course, although the publicity itself may be free, there are obvious costs in setting up a publicity programme, but, these are considerably lower than for advertising, for example.

— Publicity usually comes under the heading of public relations, which is concerned with the mutual understanding between an organization and its public.

— *Sponsorship events* in the *arts and sports* are becoming an increasingly popular form of publicity. Concerts, both live and recorded, have been promoted jointly by the musical interests concerned and by industrial and commercial interests. Athletics meetings, tennis tournaments and horse-races have all been the subject of sponsorship. Again, although the publicity itself is free, the costs of sponsorship are not. Nevertheless, such activities can contribute significantly to an organization's public image. Organizations which are selling products that are the target of health or conservationist lobbies are often to be

found sponsoring activities such as sporting events and animal welfare campaigns.

Thus patronage of sports, the art and learning are all useful means of gaining publicity in a manner which casts a favourable light on the organization, and, ultimately, on its products.

31.22 DISTRIBUTION MIX

— Moving the *product* or *service* to the final customer/consumer is the **purpose of distribution.**

— Distribution is primarily concerned with

(a) Channels of distribution

(b) Physical distribution

(a) **Channels of distribution** (*refer article 31.15 also*)

— Channels of distribution are the marketing institutions which facilitate the movement of goods and services from their point of production to their point of consumption. Some channels are *direct* as when a computer firm sells its product direct to the users. Others, the majority, are *indirect.* This means that there are a number of *Intermediaries* between original producer and eventual buyer, as in the case of the box of foreign-made chocolates bought at a local retailer.

— The *choice of channels* utilised by a producer is determined ultimately by the customer, and in recent years there has been a trend towards shorter channels, as customers, especially in consumer markets, realise that there are price advantage to be gained when middlemen, or retailers, are by-passed in the chain of distribution. Thus direct mail, cash and carry, and 'pick your own' (fruit, vegetables etc.) operations are increasing in response to consumer interest in this approach.

— The most common channels of distribution and the role played by the various intermediaries in them is explained below.

A. Manufacturer ⟶ Customer

B. Manufacturer ⟶ Wholesaler ⟶ Retailer ⟶ Customer

C. Manufacturer ⟶ Wholesaler ⟶ Customer

D. Manufacturer ⟶ Retailer ⟶ Customer

— *Channel A represents* a direct marketing channel. This is to be found more in industrial markets than in consumer markets. Manufacturers of goods such as machine tools, computers, ships and other large or expensive items tend to move them direct to the buyer without involving middlemen or intermediaries. However, this practice is becoming more frequent in consumer markets as well. For example, in mail order operations and in door-to-door selling (e.g. cosmetics, household wares and double glazing). The reasons for direct channels are basically as follows:

Industrial markets. Relatively small number of customers; need for technical advice and support after the sale; possible lengthy negotiations on price between manufacturer and customer; dialogue required where product is to be custom-built.

Consumer markets. Lower costs incurred in moving product to consumer can lead to lower prices in comparison with other channels; manufacturers can exercise greater control over their sales effort when not relying on middlemen.

— *Channel B represents* the typical chain for mass-marketed consumer goods.

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Manufacturers selling a wide range of products over a wide geographical area to a market numbered in millions would find it prohibitively expensive to set up their own High-street stores, even if they were permitted to proliferate in this way. For such manufacturers (e.g. of foodstuffs, confectionery, footwear, clothing and soaps, to name but a few), middlemen are important links in the chain. Wholesalers, for example, buy in bulk from the manufacturers, store the goods, break them down into smaller quantities, undertake advertising and promotional activities, deliver to other traders, usually retailers, and arrange credit and other services for them. Their role is important to both manufacturer and retailer. The role of the latter is to make products available at the point-of-sale. Individual consumers need accessibility and convenience from their local sources of consumable products. They also need to see what is available, and what alternatives are offered. A retail store, whether owned by an independent trader or a huge supermarket chain, offers various advantages to consumers: stocks of items, displays of goods, opportunity to buy in *small* quantities, and convenient access to these services. So far as manufacturers and wholesalers are conce ned the retailer is, above all, an outlet for their products, and an important source of market intelligence concerning customer buying habits and preferences.

— *Channel C represents* one of the shorter indirect channels, where the retailer is omitted. This kind of operation can be found in mail-order businesses, and in cash-and-carry outlets. The former are usually composed of the larger mail-order firms, offering a very wide range of goods (and some services, too). They buy from manufacturers, store and subsequently distribute direct to customers on a nation-wide basis. Their ability to attract customer in the first place relies heavily on (a) comprehensive, colourful and well-produced catalogues, and (b) the use of part-time agents, usually housewives, working on a commission basis. Whilst such an operation does not generally offer any price advantage over a retail business, it is a very convenient way of choosing goods and there is always extended credit available. With the wider use of computers in the home, and the prospects, in the not-too-distant future of being able to order goods via a telephone link, mail-order business seems likely to grow. *Cash-and-carry outlets* usually deal in groceries, and many are open only to trade customers. They tend to rely on a rapid turnover of stock, to keep down inventory levels. Their main advantages for buyers are (a) price, which is significantly lower than in a retail operation, and (b) the opportunity to buy small-bulk quantities. Unlike mail-order businesses, they serve relatively local and specialised markets.

— *Channel D* is another version of a shorter, indirect channel. In this case, it is the wholesaler who is removed from the scene.

Not surprisingly, the retailers who dominate this channel are powerful chains or multiples in their own right. Some such retailers, as in the footwear trade, concentrate on one range of goods only. They buy in bulk from manufacturers and importers, and distribute direct to their retail outlets. They usually offer a wide selection of lines, and are very competitively priced. Other large retail groups handle a diversity of goods, which are again competitively priced, and made available in prime shopping areas.

— *Market segmentation* is undertaken by suppliers in order to get a clearer picture of the market-place in order to offer a particular marketing mix to one or more segments. The concept assumes that within any single market there are invariably other sub-markets.

— Consumer markets are usually segmented on the basis of *geography, demography* and

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buyer-behaviour. Industrial markets are segmented in a roughly similar fashion, but also include consideration of trade groups and end-use.

Geographical variables — Region, population density, climate etc.

Demographic variable — Age, sex, family size, occupation, social class etc.

Buyer-behaviour variables — Usage rate, benefits sought, brand loyalty, life-style etc.

(b) **Physical distribution**

— Whereas *channels of distribution* are marketing *institutions*, physical distribution is a *set of activities*. The former provide the managerial and administrative framework for moving products from supplier to customer. The latter provide the physical means of so doing. *Physical distribution* is concerned with order processing, warehousing, transport, packaging, stock/inventory levels and customer service. In recent years a number of attempts to integrate and coordinate these functions has come to be called *Physical Distribution Management*. This aims to integrate the activities of marketing, production and other departments in this aspect of the organization's marketing task.

— The degree of *attention paid to physical distribution* depends considerably on the proportion of total costs taken up by distribution costs. If the product is a high-quality, high-cost item, then distribution costs will probably represent a small proportion of total costs of manufacturing and marketing it, and so physical distribution may be considered very much a secondary issue. Where the product is offered at a very competitive price and hence where profit margins may be tight, all overhead costs will be carefully examined. In this situation distribution costs will form an important issue for the supplier. An important feature of such costs is that they tend to increase rather than decrease with sales volume. Whereas unit production costs tend to benefit from increased volume of production, distribution costs tend to worsen. A high level of customer service also tends to greatly increase distribution costs. For example, if a customer requires 100% delivery from stock within two days, this means carrying extra stock levels as a buffer against any shortfall in supplies to the warehouse. If that customer could be persuaded to reduce his requirements to, say, 80% delivery within two days, this might effect useful savings in distribution costs.

31.23 INTERNATIONAL MARKETING

Introduction

— Foreign trade is one of the most important factors that contribute to the economic development of a nation.

— *Economic theory* recognizes two major types of *advantages*. An absolute advantage exists when a country can produce a product more efficiently than any other country. This type of advantage is quite rare.

A *comparative advantage* exists when a country can produce a product at a *lower cost* than a competitor can.

— When a firm decides to expand from being a purely domestic business to an international operation, it can choose to become one of several types of venture:

(1) Exporting

(2) Licensing

(3) Joint ventures

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(4) Direct foreign investment

(1) **Exporting**

Exporting occurs when goods are produced in one country for consumption in another. For example, Komatsu Ltd. a Japanese heavy-equipment maker, exports its construction equipment worldwide. India is exporting tea, coffee, spices, ready-make garments, handicrafts, railway coaches, heavy electrical machinery, maruti cars, refrigerators etc. to other countries.

(2) **Licensing**

In international business, a **license** is a privilege to manufacture or sell a product in all or part of a country or to extract a natural resource from a particular location. Coca-Cola, for example, has had to obtain licenses to produce and sell its soft drinks in the over 155 countries in which it does business.

A license is a contract, and its provisions are therefore subject to negotiation. A license can require a company to pay the issuing government

- A one-time fee
- A percentage of annual receipts
- A **royalty** or share, usually of the gross output, from the extraction of a natural resource

Licenses often have a limited duration. Some licenses grant monopolies, whereas others simply allow their holders to compete for business within the country issuing the license.

(3) **Joint Ventures**

A **joint venture** is simply an agreement between two businesses to combine their resources to accomplish a particular objective. They may agree to produce a product jointly or just market it, store it, or transport it. The financial arrangements between **coventurers**, the parties in a joint venture, can vary as much as in a partnership. For small firms, joint ventures can provide entry into international business that they could not otherwise afford. In other instances, companies must form joint ventures with foreign corporations to crack a foreign market. Since 1980, AT & T, for example, has formed joint ventures with Dutch. Italian, Spanish, South Korean, Taiwanese, and Japanese coventurers.

(4) **Direct Foreign Investment**

Direct foreign investment describes the situation in which a corporation forms a subsidiary in another country to produce a product and market it in that country. Volkswagen, for instance, is a West German company. Its subsidiary, Volkswagen of America, manufactures and markets cars in this country. Similarly, the Ford Motor Company has subsidiaries across Europe. A corporation does not have to be especially large to have a foreign subsidiary. However, ownership of a foreign subsidiary is an essential requirement if a company is to become a multinational corporation.

However, Nations often attempt to protect their domestic industries by means of **trade barriers**. *Tariffs* represent one method of placing imports at a disadvantage in their competition with domestic goods. *A tariff is a tax imposed by a country on imported goods.* A second barrier to imports is the *import quota*, a limit on the quantity of a particular good that may be brought into a country. An *embargo* is a law or government order forbidding either the importing or the exporting of specified goods.

— developing the skills and capabilities of personnel, and

— motivating personnel to improve quality and to meet customer expectations.

This standard gives guidance for establishing and implementing a quality system within an organization. It is based on the generic principles of internal quality management described in IS 14004 : 1991 and provides a comprehensive overview of a quality system specifically for services.

This standard can be applied in the context of developing a quality system for a newly offered or modified service. It can also be applied directly when implementing a quality system for an existing service. The quality embraces all the processes needed to provide an effective service, from marketing to delivery, and includes the analysis of service provided to customers.

The concepts, principles and quality system elements described are applicable to all forms of service, whether solely of a service character or in combination with the manufacture and supply of a product.

A-2 FACTORS AFFECTING PLANT LAYOUT

— *Plant layout* shows the physical relationships between the plant and its equipment, workers, machines, workbenches etc.

The factors affecting plant layout are

(1) The components/products to be manufactured.

(2) The volume of production and hence the volume of raw material and inprocess inventory to be handled.

(3) The operations needed to be done on each component, sub assemblies and assemblies.

(4) The assembly relationship between the components and subassemblies of each product.

(5) The type, size and capacity of machines required for each operation and to be installed (layout) in the plant.

(6) Location of manufacturing areas for individual components, subassemblies and assemblies.

(7) Movement of material handling equipments.

(8) Characteristics and requirements of auxiliary services (e.g. compressed air, steam, standby electricity etc.) necessary for production to proceed.

A-3 ROLE OF MANAGEMENT

Given below are the roles of management which a manager has to fill :

A. *Interpersonal roles*

1. The figure head role (performing ceremonial and social duties)
2. The leader role
3. The liaison role (particularly with outsiders)

B. *Informational roles*

1. Receiving information about the operation of an enterprise.
2. The disseminator role (passing information to subordinates).
3. The spokesman role (transmitting information outside the organization).

C. *Decision roles*

1. The entrepreneurial role

2. The disturbance - handler role.
3. The resource allocator role.
4. The negotiator role (dealing with various persons and groups of persons)

A-4 PHILOSOPHY OF MANAGEMENT

— Executives (Managers) in a specific firm operate with some type of *philosophy*, regardless of whether they have studied their philosophical heritage.

— Furthermore, they may not consider consciously the broad structure of ideas that influence their decisions, let alone make explicit the elements of this philosophy to others. If they attempt to write down the basic elements, their statements tend to appear vague and general. Even though it may be difficult to verbalize these basic ideas, the attempt to understand the moral issues involved in managerial activities provides a broad framework that gives meaning to day-to-day actions.

— *Philosophies* differ among firms. *One philosophy* might be good for Firm A but not useful to Firm B. In this connection **philosophy of management** refers to those general concepts and integrated attitudes that are fundamental to the cooperation of a social group. These concepts and attitudes evolve into the particular way in which the firm perceives itself.

— Generally, the **philosophy** of a given firm can be learned only through close and continuous association with it. It is uniquely determined for the individual firm and is affected by a group of factors that, together may be called the concept of the firm. The concept of the firm is the total of how the firm got where it is, the place it occupies in the industry, its strengths and weakness, the view points of its managers, and its relationship to social and political institutions.

A-5 FEASIBILITY STUDY

— *Development of a project involves following steps* :

(1) Feasibility study
(2) Analysis
(3) Design
(4) Programming and testing
(5) Implementation
(6) Post implementation support

These are the major sub-divisions of any project and each must be formally acknowledged by the client (or user) before starting out on the development. Authorization will be required at each stage prior to moving on to the next.

— **Feasibility study** is carried out in order to assess the viability of a new project.

A number of difficult questions need to be answered, such as :

* Is the envisaged system worth developing ?
* Will the system improve efficiency ?
* Will the system improve productivity?
* Will the system facilitate a reduction in staff ?
* Will the system provide faster, better management information to enable better business decisions to be taken?
* Will the system ultimately save the enterprise money or make it more profitable?

* What will the system cost to develop and to operate and can it be justified?
* Will the system be acceptable to the staff using it on a day-to-day basis?
* How will the system affect the enterprise's organization?

— In any feasibility assessment, these major policy considerations need to be evaluated as early as possible as they may well have an over-riding influence on the shape of proposed new design.

— The importance of conducting a thorough *feasibility study* and beginning the development process in a slow and carefully controlled way is to be emphasized. This point is reiterated here.

— Typically, it is the project leader's responsibility to carry out a feasibility assessment and he will, in consequence, have to live with the results of his work throughout the lifetime of the project.

— It is well worth making sure, therefore, that all interested people and departments have been involved in the feasibility assessment and that some measure of agreement has been reached as to the general direction of the project. All decision-makers need to be kept informed of progress on a regular basis, and the project initiator needs to keep in touch with the feasibility study on a day-to-day basis. The danger of too much involvement, however, needs to be borne in mind.

— The *objective* of the feasibility assessment is to answer the question 'Is it worth spending money on a systems investigation for this project or is it clearly a non-starter?

— While the overall feasibility assessment will include an *evaluation of* the *technical and social acceptability of the project*, it is usual to find that *financial feasibility* far outweighs these other two considerations.

— *Financial feasibility* must not be interpreted simply as the cost in terms of hardware and manpower resources needed to develop the system. These are one-time costs which while clearly playing an important part in the feasibility assessment, are only part of the total cost of the new system. The impact of the final system on the business must be assessed.

Typical questions that may be asked at this time are :

* Will the new system allow more work to be processed without an increase in costs?
* Will the client be able to reduce overhead costs and still maintain the same level of output?
* Can new product lines be introduced into the system more easily?
* Will better management control be available to enable the client to plan the use of the company's resources better than before?

— A good feasibility assessment needs to be able to answer these basic business questions. In short, the *justification* for any new capital outlay must be that it will *increase the profit* of the enterprise, *improve the quality* of service or products which are the business of the enterprise, or *reduce expenditure*. New system developments will therefore be justified by *cost and benefit criteria* that ensure that projects which give the best return, according to the enterprise's policies, are those which are carried out first.

— The assessment of *technical feasibility* is clearly based on preliminary outline systems design ideas relating to what can be accomplished with existing or imminently available technology. At times of rapid technological change, this is clearly a difficult process and it is not unknown for many systems developments to be started with only a hazy idea of the detailed technology that will be used to secure their implementation.

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— The assessment of *social feasibility* is assuming greater importance now than earlier. This is due to the inroads that new systems are making on the work practices of end users and the growing realization among employee organizations of the need to negotiate new technology agreements with employers.

— The culmination of the *feasibility study stage* is the production of the *feasibility study report, which* is presented to the client or user. The structure of a *typical report* is shown in Table A-1, together with an outline of the contents. The project leader will secure commitment to the proposal set out in the feasibility study report from the user or the client, and this commitment and the general agreement reached will be documented. Assuming, then, that the project is to go ahead, the feasibility study stage truly concludes with the preparation of the terms of reference for the next stage – investigation and analysis.

— From the project leader's point of view, the *feasibility study* is probably the most difficult to manage as quantitative measures of progress are difficult to establish and to monitor. The data on which conclusions and recommendations are based is often scanty or speculative. The task of identifying and quantifying benefits in terms that senior management can readily understand and accept is difficult. Costing at this stage can only be considered budgetary and there is always the danger that they become embedded in management's minds so that subsequent phases of the project are judged against these early estimates rather than the more accurate costing derived as the project progresses. The project leader should protect himself from such constraints by including suitable caveats in his feasibility report and getting the necessary authorizing signatures.

TABLE A-1 Feasibility Study Report Structure

STRUCTURE	CONTENTS
Identification of Report	**The front page should specify :**
Management Summary	* the project title
Introduction	* the project reference number
Existing System Outline	* the date of issue
Definition of Management Requirements	* the authorizing signatory (ies)
Review of Alternative Solutions	* the distribution of the report
Proposed Solution	
Development and Implementation	
Back-up Resources	
Action Plan	
Conclusion	

Management Summary

This should be a concise summary of the major recommendations of the report in no more than six pages so that it can quickly be understood by senior executives. It is usually placed at the beginning of the report. On very large projects it will not be possible to include sufficient detail on six pages and in these cases a separate document may have to be produced.

Introduction

This section should state the *objective* of the report and of the project; it should refer to the terms of reference of the feasibility study and the constraints within which it has been conducted.

Existing System Outline

A succinct and precise *definition* should be given of the existing system using system flowcharts, tables and charts that show:

* the organization
* the scope of the system
* the main procedures
* the current staffing levels
* the operating costs of the system
* performance statistics of the current system, manual or automated
* a critique of the problems

Definition of Management Requirements

This section should describe the user requirements of a new system, addressing the key areas identified above. Attention should be given particularly to operational deadlines, staffing levels and operating costs.

Review of Alternative Solutions

The major possible alternative solutions should be discussed and compared using clearly defined criteria. If possible, numerical weighting for each criterion should be established, but if this is done it is important to use the results from such weightings as guidelines only and qualitative criteria should be added to the evaluation as well.

Proposed Solution

More detail should be given of the solution which seems to best fit the user's requirements. This should concentrate on the effect on business operations, departmental organization changes, development and running costs and benefits to the user department. Wherever possible, benefits should be quantified and tangible benefits included as well.

Development and Implementation

A broad plan for the development and implementation of the proposed system should be given which identifies major activities, time-scales, resource requirements and costs. However, it must be stressed that this is an initial high-level estimate and that facts presented must not be held as binding because subsequent phases of the development will refine them.

Back-up Resources

To give the user department confidence in the new system, it will be necessary to state what procedures will be followed if, for any reason, the new statement is unavailable through failure or breakdown. Alternative computer solutions should be given and,

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wherever possible, an ultimate manual standby. The restrictions of such standby facilities should be clearly specified.

Action Plan

This section states in detail the next development steps to be taken assuming that the feasibility report is approved. It should concentrate on the next phase - *investigation and analysis* - but highlight major actions in all phases until completion. These actions should include those which are the responsibility of the user department as well as those of the systems development team.

A-6 PROJECT APPRAISAL

Introduction

Once the stream of costs and benefits of an investment project is defined, the next logical question to ask is: Is the project worthwhile? A wide variety of criteria have been suggested to judge the worthwhileness of investment projects. The important investment *appraisal criteria*, classified into two broad categories—non-discounting criteria and discounting criteria.

Appraisal Criteria

1. *Non-Discounting Criteria*
   - Urgency
   - Payback Period
   - Accounting Rate of Return
   - Debt Service Coverage Ratio (DSCR)
2. *Discounting Criteria*
   - Net Present value
   - Benefit Cost Ratio
   - Internal Rate of Return
   - Annual Capital Charge

— As mentioned above there are *two broad categories of appraisal criteria*: *non discounting criteria and discounting criteria*. The important non-discounting criteria are: urgency, payback period, accounting rate of return, and debt service coverage ratio. The important discounting criteria are: net present value, benefit cost ratio, internal rate of return, and annual capital charge.

— According to the *urgency criterion,* projects which are deemed to be more urgent get priority over projects which are regarded as less urgent. The problem with this criterion is: How can the degree of urgency be determined?

— The *payback period* is the length of time required to recover the initial cash outlay on the project. According to this criterion, a project is acceptable if its payback period is less than a certain specified payback period. Though the payback period has serious shortcomings, it is widely used because it seems to serve as a proxy for certain types of information which are useful in investment decision-making.

— The *accounting rate of return*, also referred to as the average rate of return, is a measure of profitability which relates income to investment, both measured in accounting terms. Since income and investment can be measured variously, there can be a very large number of measures for accounting rate of return. A project is deemed acceptable if its accounting rate of return exceeds a certain cut off rate of return.

— Financial institutions, which provide the bulk of long-term finance for industrial projects, consider debt service coverage ratio (DSCR) as an important index of financial viability. DSCR is defined as

$$\frac{\text{Profit after tax + Depreciation + Interest on term loans}}{\text{Interest on term loan + Loan repayment instalment}}$$

DSCR is calculated for each year of the currency of the loan and for the entire period of the loan. A DSCR of 1.5 or 2.0 is considered satisfactory.

— The *net present value* of a project is equal to the sum of the present value of all the cash flows (outflows and inflows) associated with the project. A project is acceptable if its net present value exceeds zero.

— The *net present value method* assumes that the intermediate cash inflows of the project are reinvested at a rate of return equal to the firm's cost of capital.

— The *net present value criterion* has a sound rationale underlying it: When the net present value is maximised, you reach the highest consumption frontier.

— There are two measures of *benefit cost ratio*. The first measure is:

$$\frac{\text{Present value of benefits}}{\text{Initial investment}}$$

The second measure is :

$$\frac{\text{Present value of benefits–Initial investment}}{\text{Initial investment}}$$

— A project is acceptable if the benefit cost ratio, as per the first measure, exceeds 1. (An equivalent decision rule is: Accept a project if its benefit cost ratio as per the second measure, exceeds 0).

— The *Internal rate of return* of a project is the discount rate which makes net present value equal to zero. A project is acceptable is its internal rate of return exceeds the cost of capital.

— There are two possible *economic interpretations* of internal rate of return (i) Internal rate of return represents the rate of return on unrecovered investment balance in the project. (ii) Internal rate of return is the rate of return earned on the initial investment made in the project.

— If the cash flow stream of a project has multiple changes of sign there may be more than one internal rate of return.

— The *annual capital charge* of an investment is the cost on an annual basis of the initial outlay and operating costs associated with that investment. This method is helpful in choosing between alternatives which provide similar services but have differing patterns of costs associated with them.

— A *wide variety of measures* are used in practice for appraising investments. These include measures suggested by capital budgeting literature and several non-standard measures.

— The *most commonly used method* for evaluating small-sized investments is the payback method. For larger investments, accounting rate of return, and, in more recent years, discounted cash flow methods, are commonly employed.

Types of Appraisal

Broadly, four types of appraisal may be conducted while evaluating an investment project.

* Market appraisal
* Technical appraisal

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* Financial appraisal
* Economic appraisal

Market Appraisal

Market appraisal is concerned primarily with two questions:

* What would be the aggregate demand of the proposed product/service in future?
* What would be the market share of the *project under appraisal*?

To answer the above questions the market analyst requires a wide variety of information and appropriate forecasting methods. The kinds of information required are:

— Consumption trends in the past and the present consumption level
— Past and present supply position
— Production possibilities and constraints
— Imports and exports
— Structure of competition
— Cost structure
— Elasticity of demand
— Consumer behaviour, intentions, motivations, attitudes, preferences, and requirements
— Distribution channels and marketing policies in use
— Administrative, technical, and legal constraints

Technical Appraisal

Appraisal of the technical and engineering aspects of a project needs to be done continually when a project is formulated. Technical appraisal seeks to determine whether the prerequisites for the successful commissioning of the project have been considered and reasonably good choices have been made with respect to lactation, size, process, etc. The important questions raised in technical appraisal are:

— Whether the preliminary tests and studies have been done or provided for?
— Whether the availability of raw materials, power, and other inputs have been established?
— Whether the selected scale of operation is optimal?
— Whether the production process chosen is suitable?
— Whether the equipment and machines chosen are appropriate?
— Whether the auxiliary equipments and supplementary engineering works have been provided for?
— Whether provision has been made for treatment of effluents?
— Whether the proposed layout of the site, buildings, and plant is sound?
— Whether work schedules have been realistically drawn up?
— Whether the technology proposed to be employed is appropriate from the social point of view?

Financial Appraisal

Financial appraisal seeks to ascertain whether the proposed project will be financially viable in the sense of being able to meet the burden of servicing debt and whether the proposed project will satisfy the return expectations of those who provide capital. The aspects looked into while conducting financial appraisal are:

— Investment outlay and cost of project

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— Means of financing
— Cost of capital
— Projected profitability
— Break-even point
— Cash flows of the project
— Investment worthwhileness judged in terms of various criteria of merit
— Projected financial position and flows
— Level of risk

A-7 PROJECT FINANCING

The term *project financing* describes a variety of financing arrangements for large, individual investment projects. Often a separate legal entity is formed to own the project. Suppliers of capital then look at the earnings stream of the project for repayment of their loan or for the return on their equity investment. Often, the projects involve energy: not only large explorations of gas, oil, and coal but also tankers, port facilities, refineries, and pipelines. Other projects include mineral extraction operations, aluminium plants, fertilizer plants, and very importantly power plants. An example of the latter is a cogeneration project.

Projects of this sort require huge amounts of capital, often beyond the reach of a single company. Many times a consortium of companies is formed to spread risk and to finance the project. Part of the capital comes from equity participations by the companies, and the rest comes from lenders or lessors.

If the loan or lease is on a nonrecourse basis, the lender or lessor pays exclusive attention to the size of the equity participation and to the economic feasibility of the project. In other words, the lender or lessor can look only to the project for payout, so the larger the equity cushion and the greater the confidence that can be placed in the projections, the better the project. In another type of arrangement, each sponsor may guarantee its share of the project's obligation. Under these circumstances, the lender or lessor places emphasis on the credit worthiness of the sponsors as well as the economic feasibility of the project.

For the sponsors of the project there are several types of sharing rules. In a *take-or-pay* arrangement, each sponsor agrees to purchase a specific percentage of the output of the project and to pay that percentage of the operating costs of the project plus debt-servicing charges.

This obligation exists whether or not output actually occurs. When pipelines are involved, the type of sharing rule is frequently a *throughput* arrangement. Here each sponsor is required to ship through the facility a certain amount or percentage, of product. If the total shipped is insufficient to cover the expenses of running the facility, sponsors are assessed additional amounts to cover the shortfall. The amount of assessment is proportional to their participation.

The maturity of the loan or lease corresponds to the likely ability of the project to general cash over time. Although the financing need not be long term, in most cases it extends over a period of eight or more years.

In this type of arrangement, the lender or lessor has limited recourse to the project's sponsors in the sense of being assured of minimum cash flows.