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USE OF COSTING TECHNIQUES FOR EFFECTIVE MARKETING*

1. INTRODUCTION

1.1 An Industrial operation has got two main aspects—production and marketing. Several problems arise in both these fields for the level of activity of an industrial concern is limited by its ability to produce and/or to market. Hence, the use of scientific approach to these problems has become necessary. Historically, the scientific approach seems to be strongly grounded in the improvement of general administrative practices with an orientation toward production. The propounders of scientific Management like Taylor, Gilbreth étc., developed methods and techniques to improve productivity, providing an environment where the performance of a firm was assessed in terms of physical inputs and outputs, cost and revenue. Even during the period between two great wars management techniques' were developed only to effect improvements in manufacture and a concern which achieved production efficiency was supposed to have reached the general management level.[1] As a result, the science of Cost Accounting was developed initially in the production area. But gradually, it was felt that to achieve the production targets was not so difficult as that of economically increasing the sales because of the accessibility of necessary resources and technical know-how in the case of the former. The change in the nature of market from sellers' to buyers' necessitated the treatment of marketing management as a distinct function. Therefore, only in recent years, proper recognition has been given to the task of marketing management and certain scientific tools have been developed to solve marketing problems. Cost Accounting, with the help of other cognate sciences i.e. Mathematics and Statistics, has provided many tools and techniques to improve marketing efficiency. This paper aims at analysing the use of costing techniques for marketing efficiency.

2. MEANING AND SIGNIFICANCE OF MARKETING:

2.1 It is generally stated that marketing is a process that starts from the primary package of production and ends when the goods reach the hands of the final consumer. The American Marketing Association Committee

on Definitions says that marketing is "the performance of business activities that direct the flow of goods and services from producer to the consumer or user". This appears to be a narrow. interpretation. In fact, the process starts much before actual production and continues even after the sales are made to the final consumer. An industrial concern conducts market research before manufacturing the goods so as to decide on the colour, size, shape and brand of the product or products. Similarly, if the concern wants repeat business from its present customers and wants them to speak well of their products, it has to satisfy the customers by guaranteeing the quality of the products and by rendering after-sales services. Therefore, the process of marketing involves the functions of marketing research, product planning and development, sales promotion, credit management, besides the functions of storage, warehousing, transportation, selling and distribution. So, it is a broader concept. Stanton[2] has aptly defined the term marketing as "a total system of interacting business activities designed to plan, price, promote and distribute want satisfying products and services to present and potential customers". According to him, marketing is a managerial function and the relevant strategies, tactics and policies shall have to be established to perform this function efficiently. It is an integration of several segmental functions which have to be co-ordinated properly. And it is not a separate and distinct activity, but the result of interaction of different activities.

2.2. The maximization of profits is the primary goal of every business concern and the main strategy adopted in recent years is to produce on a mass-scale. But mass marketing is the basic requisite of mass production. Before 1920, it was generally said about business operation that the president planned, purchasing agent purchased, the production executive manufactured, the financial officer budgeted and the sales executive sold the goods in the market. Marketing then was not a problem because, the demand generally out-weighed the available supply. Thereafter, factory economies developed due to the innovation of various sophisticated techniques of manufacture; competition ruled the market and the trade became more intricate. Hence, the need arose to devise better methods of marketing and to appoint specialists in marketing. This led to the conclusion that marketing is vital for the success of a concern and that planning, policies and operations of business shall be oriented toward customer and the satisfaction of his wants. It is nicely said by a marketing executive of General Electric Company, one of the leading companies in U.S.A., "We feel that marketing is a fundamental business philosophy. This definition recognises marketing's functions and methods of organisational structuring as only the implementation of the philosophy. These things are not, in themselves, the philosophy"[3]. The fundamental factors for considering marketing as the philosophy of business are : (i) it is customer-oriented,

the customer becomes the fulcrum around which the business moves (ii) marketing is rooted in the profit concept but not in the profit less volume concept. Therefore, today marketing has been the basis of any business activity of either production, engineering or finance. A market policy is more important than a production policy. Today, the marketing manager is given equal status as that of production manager. The man who is an expert in marketing has even assumed the status of President of organisation in some of the reputed firms in the U.S.A.

2.3. Because of its significance in the growth and very existence of a business concern, marketing process needs to be managed efficiently. The task of management is to select a proper and scientific 'marketing mix.' It is a technical concept qualifying the combination of four elements i.e., product, the channels of distribution, the pricing policies and practices and the promotional methods. It is difficult to select a proper combination of these elements, for, any policy taken in this respect does not yield exact results. So, a firm is confronted always with many marketing problems. The management science has provided certain approaches to solve some of these problems on scientific lines. Cost Accounting as a form of management science has afforded highly useful techniques for marketing management decisions.

2.4. The marketing process comprises the following functions:
1. Marketing Research
2. Product planning and development
3. Inventory managment.
4. Sales forecasting and budgeting
5. Pricing the product.
6. Selling
7. Channels of distribution.
8. Credit Management.
9. Advertising and sales promotion.
10. Foreign marketing.

We shall discuss now the use of costing techinques in the accomplishment of each one of these functions.

3. MARKETING RESEARCH

3.1. Market research involves not only a critical and objective study but a detailed investigation, of data exposing the alternative courses and aiding the decision making process.

3.2. Marketing research consists of the subsidiary types of research like product research i.e., determining the sources of customer dissatisfaction, determining the new uses of present products, probable changes in the size and design of the products etc., market analysis i.e. determining the size of market, elasticity of demand, sales potentials and profitability

of each territory etc., sales methods research, research on pricing and research on advertising and promotional activities i.e., determining the advertising . media, evaluating the advertising effectiveness, determining the motivational activities etc. It forms the basis of any marketing decision.

3.3. Since the marketing research is an objective study, the statistical techniques such as correlation analysis, methods of dispersion, theory of probability, sampling etc., shall be employed to come to a scientific conclusion. Adequate information shall be collected and reported in such a way that it can be interpreted easily and in definite words. Good reporting is not only precise, but also self informative in respect of necessary matters. The reports on marketing research shall have cost columns. The cost ascertainment and cost comparisons help much in taking effective decisions. The conclusions of market reports based on quantitative research may sometimes misguide the mangement. For instance, a market analysis report may conclude that the estimated demand for product A is 20,000 units, whereas for product B, of equal value,it is 10,000 units and therefore, product A shall be produced. But when costs are ascertained and compared, if it is found that profit margin for product A is 5% whereas for product B it is 50%, then product B is preferred for manufacture. It will be more helpful to take effective decisions if the related costs are classified into fixed and variable.

4. PRODUCT PLANNING AND DEVELOPMENT:

A scientific product planning ensures the possible maximum profit and helps in maintaining the concern's competitive position. This planning depends upon the market potentials, sales potential, and price strategy for which the marketing research is undertaken beforehand and the information is gathered to have a sound product planning decision.

4.2. Many problems enter this area. Important of them are:

a) What should be the product mix?
b) Is a new product profitable?
c) Can a product line be eliminated?
d) Whether to make or to buy a product ?
e) What should be the product strategy?

4.3. Product development embraces all technical activities of product engineering and design. So, it deals with the developments of or changes in size, colour, style and design of product or products. After determining the composition of products, decisions are taken regarding the development of such products. While developing a product, consideration is given to the costs involved, economy and new uses of a change in product development and to the profitability of a particular product development.

4.4.   The management must be keen on the problems of planning and development. It is fundamental to all other marketing activities. The costing techniques that can be used to tackle the problems of planning and development are:

> i) P/v ratio,   ii) Contribution Analysis,   iii) Incremental costing,
> iv) Profitability Analysis,   v) Graphical Presentation of profit margin through the products' life cycle.   vi) Linear Programming etc.

4.4. 1. **P/v Ratio**: it is nothing but contribution to sales ratio. Contribution is that part of sale revenue which is over and above the marginal cost. Greater the P/v ratio, more justifiable that product line will be to push up. This ratio helps in the selection of a product mix. The following example explains the fact clearly:

	Product lines		
	I	II	III
	Rs.	Rs.	Rs.
Sales value	20,000	15,000	10,000
Marginal cost	5,000	7,500	8,000
Contribution	15,000	7,500	2,000
Fixed cost	10,000	10,000	10,000
P/v Ratio	75%	50%	20%

	Profitability of Products mix		
	I&II	II&III	I&III
	Rs.	Rs.	Rs.
Total Sales Value	35,000	25,000	30,000
Total Marginal Cost	12,500	15,500	13,000
Total Contribution	22,500	9,500	17,000
Fixed Cost	10,000	10,000	10,000
Net profit (+) or Loss (—)	(+) 12,500	(—) 500	(+) 7,000

Thus, the product mix decision, if taken on the basis of P/v ratio, will be more justifiable and brings more profit to the concern.

But this ratio is not useful in the following cases :

(1) Where it is difficult to classify the costs into fixed and variable.

(2) Where it is difficult to identify the direct cost of each product line, for instance joint and by-product industry.

(3) Where the limiting factor is one. of the items of variable cost, such as material, labour etc. If there is only one limiting factor, the contribution per unit of limiting factor is taken as the basis

for a decision to push up a product line. In the case of two or more limiting factors, the problem of product mix is solved by linear programming.

(4) P/v ratio misguides the management if the contribution is considerably small, even if the P/v ratio is greater than any other product line. It is so due to the fact that net profit maximisation depends upon the total contribution of product mix towards fixed cost and profit. For example.

		Product Lines		
		A	B	C
		Rs.	Rs.	Rs.
Sales Value	—	15,000	2,000	10,000
Marginal Cost	—	7,500	800	6,000
Contribution	—	7,500	1,200	4,000
Fixed Cost	—	7,000	7,000	7,000
P/v ratio	—	50%	60%	40%

		Profitability of Product mix		
		A & B	B & C	A & C
		Rs.	Rs.	Rs.
Total Sales value	—	17,000	12,000	25,000
Total Marginal cost	—	8,300	6,800	13,500
Total contribution	—	8,700	5,200	11,500
Fixed Cost	—	7,000	7,000	7,000
Profit (+) or Loss (—)	—	(+)1,700	(—)1,800	(+)4,500

Therefore, although the P/v ratios of A & B are greater than C, it is not comparatively advantageous to recommend the A & B product mix. A & C—mix contributes more than A & B—mix, so, it is recommended as a more profitable product—mix.

4.4. 2. *Contribution Analysis :* This analysis helps the management of a multiproduct industry while deciding on the continuation of a product, elimination of a product and whether it is profitable to introduce a new product. For the working of this analysis, the total cost of product and sale is classified into fixed cost and variable cost. As the fixed cost is the function of time, only the variable cost is considered to judge on the profitability. If the sales revenue is more than the variable cost, the difference counts contribution. According to this analysis, if there is any contribution from the sale of units of a product, it is profitable to continue the production of that product and profitable to introduce if it is a new one. On the other hand, the negative contribution justifies the elimination of a product.

This analysis is helpful only for short term decisions. It fails to guide the management if there is change in the capacity installed.

4.4.3. *Incremental Costing :*   The product development problems are solved by following this technique. It takes into account both the change in the product cost as well as the change in the capacity cost. Different product developments involve the use of different materials, machinery and equipments. The sales differ from one development model to another as the customers may like more of one model than the other. Therefore, the sales revenue will also change like the total cost. Under incremental costing, the increase in cost is compared with the increase in revenue and the incremental savings are calculated for new product development models. The development model which provides more incremental savings than any other model is recommended as the most profitable product development model. An illustration given below explains it clearly :

TABLE

	Total cost	Total Revenue	Increase in cost from old	Increase in revenue from old	Incremental savings
	Rs.	Rs.	Rs.	Rs.	Rs.
Product development (Old) (Particular contribution of size, colour, design etc.)	10,000	16,000	—	—	—
Product development I (New)	11,000	19,000	1,000	3,000	2,000
Product development II (New)	15,000	30,000.	5,000	14,000	9,000
Product development III (New)	9,000	15,000	—1,000	—1,000	—
Product development IV (New)	9,700	18,000	— 300	2,000	2,300

Thus, the incremental costing analysis justifies the product development II (New) denoting a particular combination of changes in size, colour and design etc. of the product, as there will be more positive incremental savings than any other new model.

4.4.4. *Profitability Analysis :*   Different profitability ratios are calculated under this analysis, to judge on a product line from different angles. The purpose is to evaluate the product line. In evaluating a

product line, the attention shall be focused on growth trend, competition, profitability, and the return on capital employed. Therefore, the business concerns prepare product profitability statement for each product to know the return on sales, return on capital, contribution margin, market potentiality achieved and other profitability measurements. Such statements help a great deal in deciding on the pushing up or elimination of product/ products. It also helps in finding out the area of cost reduction. Obviously, it is an improvement over contribution analysis technique. A model of product profitability statement is given below :

BHARAT CO. LTD.,

Profitability Statement—Product Line A.
Analysis for the years 1966-67 and 1967-68

		1966-67	1967-68
Units produced		60,000	55,000
Units sold		56,000	44,500
Units unsold		4,000	10,500
Unit price (Rs.)		80	100
Sales value		44,80,000	44,50,000
Market potential achieved		30%	26.5%
Variable Cost : (Rs.)			
Factory	—	11,20,000	15,12,500
Selling	—	8,96,000	8,90,000
Contribution Margin (Rs.)		24,64,000	20,47,500
Contribution-sales ratio		55.0%	46.02%
Fixed cost apportioned (Rs.)		15,00,000	13,50,000
Direct profit on sales		21.54%	15.67%
Direct B.E.P.* (rounded off to .'000)		27,28,000	29,34,000
Direct capital investment		12,00,000	11,60,000
Return on capital employed		80.34%	60.12%
Turn over of capital employed		3.73	3.83

Thus, the statement besides guiding in the continuation and elimination of product decisions, is an important tool to point out the areas of inefficiency and to take proper action for reducing costs and improving the profitability.

4.4. 5. *Graphical Representation :* Every product will have a life cycle as that of a man. The life cycle of a product consists of five stages: introduction, growth, maturity, saturation and decline. A man once born must die one or the other day. Like that, a product once introduced, must become obsolete one or the other day. Therefore, the products becoming

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*Break Even Point

obsolete shall have to be replaced by new products, so that the company's expected rate of profit is sustained. So, it is essential to know the sales volumes and profit margins of each product through its life cycle. The market research and cost analysis provide figures of sales volume and profit margin at each stage and the same can be represented in the form of a graph. The graphical representation helps a good deal while deciding on the product strategy, the time as to when a new product shall be developed and the profitable product mix. It is a guiding factor in sustaining the expected rate of profit and therefore, is an important tool of product planning and development.
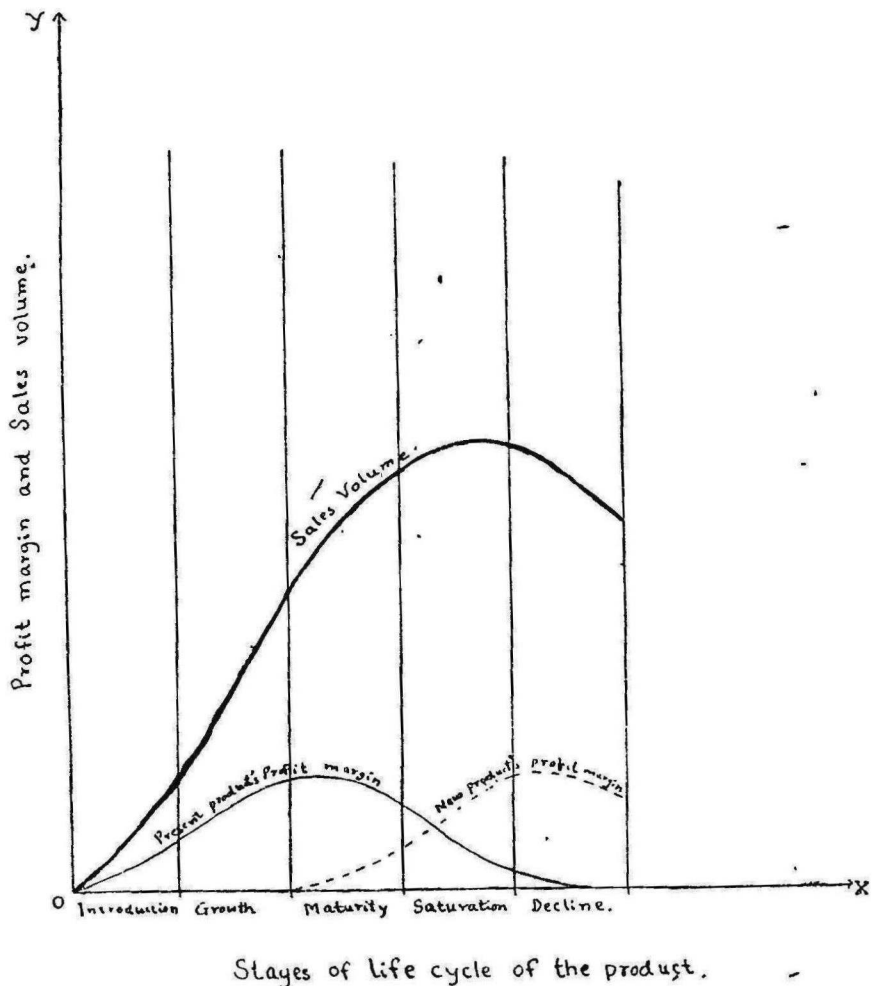

Fig. 1

Fig. 1 depicts the sales volumes and profit margins through the life cycle of a product and the timing of the new products' development.

The effectiveness of this technique is limited by the difficulty of perfect judgement on the life time of a product, the period of each stage in the life cycle and the sales volume and profit margins at different stages.

4.4. 6. *Linear Programming:* It is a mathematical technique that provides scientific solutions to the problems having linear relationships. When there are many alternative ways to achieve an objective function, the advanced mathematical technique of linear programming may have to be applied to reach sound conclusions. In connection with the product planning and development, linear programming solves the problems, among others, of maximum profitable product mix and the product strategy.

But this technique of Operation Research is of no use in all those circumstances where linearity does not exist. Since problems involving non-linear relationships are of frequent occurrence in actual business life, Prof. R.G.D. Allen[4] has rightly remarked that the practical utility of the linear programming technique is confined to a meagre five to ten per cent in finding out scientific and perfect solutions to managerial problems.

5. INVENTORY MANAGEMENT

5.1. Inventory is nothing but the stock of materials and goods maintained to back up the sales and production by ensuring the continued availability of stock with least possible delay. It consists of raw materials, work-in-progress, consumable stores and the finished stock. The purpose of carrying the inventories is to maximise the sales and production efficiency. The maintenance of inventories is necessary to avoid the cost of idle time and/or loss of profit due to shortages and stock outs. Surplus inventories cost the company a good amount in the form of interest on capital tied up, storage, insurance, deterioration and obsolescence etc. Hence, it is essential that inventories be controlled and managed effectively in order to maximise operational efficiency.

5.2. The problems that encounter in this area are :
1. Determination of economic lot size of purchase
2. Detection of obsolete materials
3. Inventory carrying cost control
4. Adequate but feasible stock maintenance.

5.3. There are some costing techniques and methods which help solve these technical problems of inventory management. They are :
 (i) Square root formula
 (ii) Ratios and percentages
 (iii) Information Method
 (iv) Levels setting and
 (v) H-M-L Analysis

5.3. 1. *Square root formula* : This is a generally accepted tech-nique to determine the economic lot size of purchase. The minimisation of inventory cost is the objective function of this technique. As the inventory cost is the sum total of the cost of procurement and the cost of stocking, we must fix the purchase quantity at such levels as minimise these two cost ingredients. The cost of procurement declines with the increase in quantity purchased, due to the economies of large-scale purchase. On the contrary, the cost of stocking or the carrying cost increases with the increases n the quantity of purchase. Thus, they are of opposite nature. Therefore, the optimum quantity to be ordered will be that level where the cost of procurement and the cost of carrying inventory are equal. At this level, the total inventory cost will be the minimum. This is represented diagrammatically and a model for economic lot size is developed below :
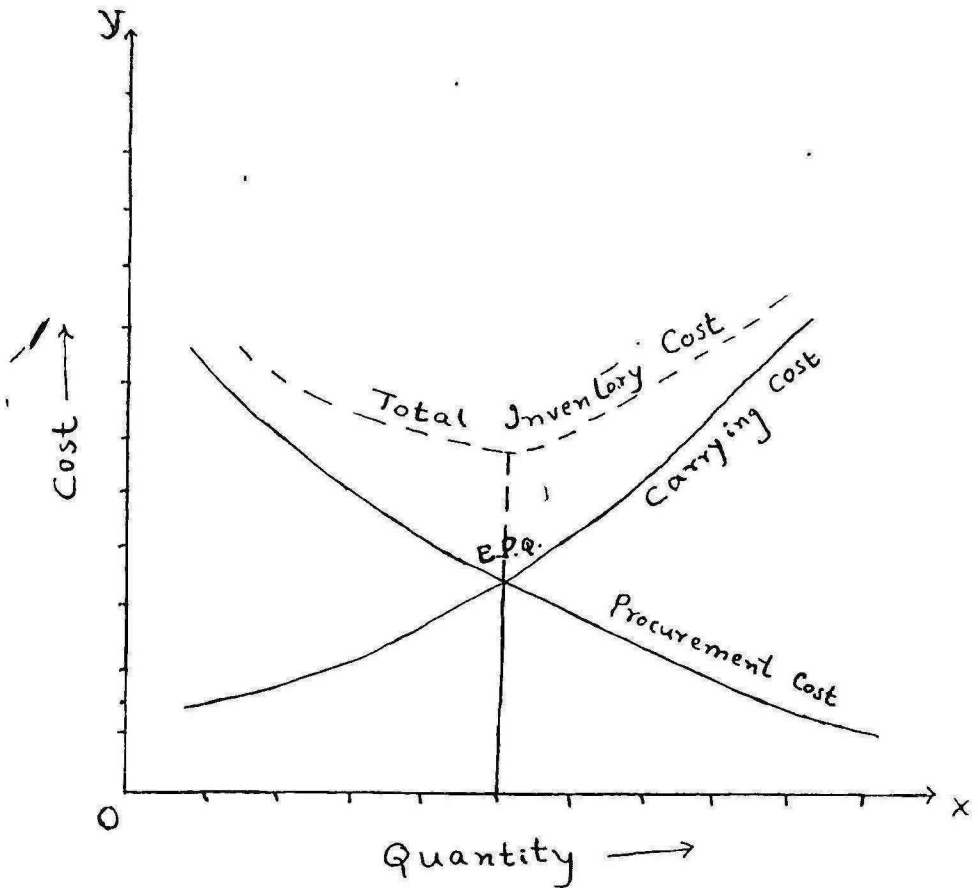
Inventory Cost Diagram.

Model. Let E.P.Q.=Economic purchase quantity in units.

C=Cost per procurement

I=Annual cost of stocking as a percentage of unit price.

S=Unit price

A=Annual consumption in units.

$$\text{Cost of procurement} = \frac{A}{\text{E.P.Q.}} \times C.$$

$$\text{Cost of carrying inventory} = \frac{\text{E.P.Q.}}{2} \times IS$$

The total inventory cost will be minimum at a level where the procurement and carrying costs are equal.

$$\frac{A}{\text{E.P.Q.}} \times C = \frac{\text{E.P.Q.}}{2} \times IS$$

$$\frac{A}{\text{E.P.Q.}} \times C = \frac{\text{E.P.Q.}}{2} \times IS = 0$$

$$2\,AC - \text{E.P.Q.}^2\,IS = 0$$

$$\text{E.P.Q.}^2 \times IS = 2\,A.C.$$

$$\text{E.P.Q.}^2 = \frac{2\,A\,C}{IS}$$

$$\text{E.P.Q.} = \sqrt{\frac{2\,AC}{IS}}$$

The formula has been developed under certain assumptions which curtail the scope of its application. The assumptions are—

(a) The consumption rate remains the same throughout the year.

(b) The lead time remains the same for all procurements during the year.

(c) The ordering cost is the same for all procurements.

(d) There is no provision for minimum stock.

The orders are given in such a way that the procured materials will arrive only at that time when the stock has reached zero level.

But in the actual business practice, a certain amount of minimum stock is always maintained as a safety measure to avoid ill-effects of shortages. There is all probability in practice that the lead time and consumption rates may vary and the stock may run out within the lead time. Similarly, often there may be over-production or under-production; there may be distribution and forecasting errors which affect the sales and production activities for the feeding of which inventories are maintained. Therefore, all these uncertainties shall be taken into account to develop a sophisticated model. Such models have been developed in the advanced countries, but their calculation necessitates the employment of electronic computer.

5.3. 2. *Ratios and Percentages* : These techniques are followed with a view to detecting the obsolete materials and goods; to know the extent of spoilage, deterioration and defective works. The inventory management is not complete and effective unless these elements are properly controlled. A few of the ratios and percentages may be of some help in this area. They are :—

(i) Material turnover ratio $= \dfrac{\text{Cost of material on hand}}{\text{Cost of average stock of that material during a period.}}$

(ii) Inventory (finished Stock) turnover ratio. $= \dfrac{\text{Value of inventory of a finished product}}{\text{Value of sales of that product during a period.}}$

(iii) Inventory turnover in terms of days $= \dfrac{\text{Inventory turnover ratio}}{\text{No. of days during the period.}}$

These ratios indicate the movement of a particular material or finished good. If the inventory turnover ratio or material turnover ratio is greater whereas, the turnover in terms of days is smaller, then it means that the relative finished product or material is fast moving and vice-versa. When the ratios detract continuously from the standard ratios, it implies that there is a need to revise the stock levels particularly the minimum stock, ordering level and the ordering quantity. Thus these ratios also help maintain adequate but feasible stock of materials and goods.

(iv) Waste and spoilage percentage $= \dfrac{\text{Cost of spoilage}}{\text{Cost of inventory}} \times 100$

$\quad$ or $= \dfrac{\text{Cost of spoilage}}{\text{Works cost}} \times 100$

$\quad$ or $= \dfrac{\text{Cost of spoilage}}{\text{Sales}} \times 100$

(v) Defective works percentage $= \dfrac{\text{Cost of defective work}}{\text{Inventory cost}} \times 100$

$\quad$ or $= \dfrac{\text{Cost of defective work}}{\text{Works cost}} \times 100$

$\quad$ or $= \dfrac{\text{Cost of defective work}}{\text{Sales}} \times 100$

(vi) Inventory cost percentage $= \dfrac{\text{Inventory cost}}{\text{Sales}} \times 100$

 or $= \dfrac{\text{Inventory cost}}{\text{Works cost}} \times 100$

 or $= \dfrac{\text{Inventory cost}}{\text{Cost of production}} \times 100$

(vii) Inventory investment to total capital employed $= \dfrac{\text{Inventory investment}}{\text{Total capital employed}} \times 100$

These percentages are compared with the previous periods percentages or with the standards allowed and the variations are analysed to expose causes and suggest remedial action. These percentages guide the management in minimising the wastages, spoilage, defective work and also about the working capital investment in inventories.

5.3.3. *Information Method:* This is an alternative tool for detecting obsolete materials, the extent of spoilage and defectives etc. Under this method, the movement of stock sheet is prepared and maintained for each week or a month. The stock movement is usually influenced by the market conditions, concern's future programme of production and sale, and the frequency of their use etc. Therefore, to know the extent of their influence, these sheets contain columns for quantity in stock, quantity ordered, period of storage and the conditions of stock etc. A model of stock movement sheet is given on page 60.

On the basis of this sheet, the management can decide whether to dispose of or to make use of the dead stock and spoilages. The dead stock may be used by the same department for alternative purposes or by other departments where it could be used more advantageously, for the wastages in the processing of a product may form the raw material for another product. Similarly, if the defectives are considerable in quantity, the management can think of reprocessing them economically and sell them with profit. Thus, the information method guides in the effective management of the inventories.

5.3.4. *H-M-L. Analysis:* With a view to controlling the inventory carrying cost, the H.M.L. analysis is followed whereby the items of inventory are classified under three headings, viz.

1. High value inventory,
2. Medium value inventory, and
3. Low value inventory.

High value inventories are those items which form only 5 to 10% of total inventory in magnitude, whereas, their value forms nearly 70 to 90% of total inventory value. On the other hand, low value inventories form 70

..............Company Limited

MOMENT OF STOCK SHEET

For the month of....................197

S. No.	Code No.	Particulars	Quantity	Expected date of arrival	Period of storage					Condition of Stock					Remarks
					Below one month	Below 3 month	Below 6 month	Below one year	Above one year	Work in progress	Safety	Spoilage	Defectives	Dead Stock	

Prepared by : Sd/-

Verified by : Sd/-

Sd/-
Signature of the
Stores Officer

Date:

to 90 % of inventory in magnitude, whereas their value forms 5 to 10 % of total inventory value. The medium value inventories are moderately important from the point of view of both quantity as well as value. This analysis indicates that the capital invested in H-items is very considerable and any deterioration and/or obsolescence of such items costs a good deal to the concern. There should be rigid control over such items. Such items shall be stocked to the minimum. The provision of scientific storage and continuous stock verification are essential. But the low value inventories need not be rigidly controlled otherwise the controlling cost itself will be avoidably high. It will be alright if there is moderate control over the M-items. Thus, instead of treating all the items of inventory on equal footing, it is advantageous to discriminate different categories of inventories in the interests of a rigid control and lower carrying cost.

5.3.5. For the setting up of different stock levels i.e. maximum, minimum, ordering and danger level, the perpetual inventory system of record-keeping and stores audit are other measures that are generally adopted. The efficient management of inventories is an essential condition for effective marketing.

6. SALES FORECASTING AND BUDGETING:

6.1. Forecast and budget are generally synonymously used. But they are distinctive terms. Forecast refers to the foresight or calculation of probable events that may happen in a future definite period. Budget means a plan of programmes during a definite period of time as per the anticipated but probable events. Therefore, forecast precedes budgeting. Forecasting of events is the paramount need of a business concern and in particular sales forecasting is inevitable because of its importance as a limiting factor.

6.2. While forecasting the sales, we have to pay attention to the factors that influence the sales. These factors are grouped as—
(i) Economic and social factors
(ii) Factors arising out of Govt's policy
(iii) Factors operating within the industry
The population growth, change in the character of population, harvests, distribution of income etc. are the economic factors. The change in fashion, ostentation, change in tastes and social habits etc. are the social factors. National wages policy, regulation and control over supply, rationing, compulsory bonus, levy and duty etc. are the factors arising out of Govt's policy. The modernisation of production capacity, availability of material and labour, price and distribution policy etc. are the factors within the industry. The effectiveness of sales depends upon these factors as they influence, to a more or less extent, the realisation of sales by the firm.

6.3. Many techniques are used for sound and systematic sales fore-

casting and budgeting. Correlation analysis of population growth or income and sales is undertaken to estimate the sales. A comparative analysis of sales effected and the advertising and promotional efforts undertaken in the past few years suggests the degree of market potentiality that can be expected. Analysis of profit margin relating to different price-policies i.e., increase in price, constant price, price differential etc. helps management to decide on an effective price policy that leads to sales and profit maximisation. Flexible budgeting is the mostly accepted technique of planning for selling and distribution expenses. An analytical sales budget, giving a clear vision of territory-wise, product-wise, salesman-wise and period-wise sales is an important tool of management to measure the efficiency of salesmen. Monthly sales budgets are more effective than six-monthly or yearly sales budgets. The fixation of standards is necessary for controlling the selling and distribution costs. Thus, many costing techniques can be usefully employed for systematic forecasting and budgeting of sales.

7. PRICING THE PRODUCT:

7.1. Sales-price determination, though important, often evades exactitude. It is difficult to have an exact pricing model because of the lack of perfectness in the ascertainment of cost of production at different volumes and in the estimation of demand at different prices.

7.2. Generally, it is said that the price shall be fixed over and above the cost so as to allow a reasonable profit margin to the producer. But, the cost of production is not the only criterion to determine the price. The management must consider other factors that are equally important in price fixation. Some of these factors that influence the price determination policy are:

(a) Cost of production and sale,
(b) Elasticity of demand in relation to price,
(c) Competition,
(d) Expected share of market,
(e) Nature of product,
(f) Concern's distribution and promotional policies,
(g) Goals of the business—profit or service.

7.3. It may be useful to discuss some of the techniques of costing that are useful in determining the product price. Each one of them is advantageous only under certain circumstances. They are:

1. Cost plus pricing
2. Marginal cost pricing
3. Return on investment or capital employed
4. Market-equated method of pricing.

7.3.1. *Cost-plus-pricing*: According to this technique the price fixed is the sum total of aggregate cost of production and a certain percentage of

such cost to recover the administrative expenses and allow a reasonable amount of profit to the producer. Suppose the total cost of production of a lot—both fixed and variable cost—is Rs. 2,00,000. And the percentage allowed on such cost for recovering administrative cost and reasonable profit is 10%. The sales value of that lot will be Rs. 2,20,000. If that lot of production consists of 1,000 units, the sales price per unit will be Rs. 220. This technique is mostly followed in the case of government contracts. It is also advisable to adopt in the case of special job orders, products having inelastic demand, and to price new products of highly distinctive character. It is not justifiable to follow this technique while pricing competitive products. Even for the pricing of new products the 'cost plus' approach may be adopted on a temporary basis because soon after the initial stage, a new product shall be exposed to competitive forces when an adjustment to demand factors shall become inevitable.

7.3.2. *Marginal cost pricing:* Here, the costs are divided into fixed and variable and the price is determined over and above the variable cost, consistent with the competition and demand factors operating in the market. Marginal costing is normally considered as a tool of management to solve short-term problems like pricing during depression, dumping, acceptance of an offer and make or buy etc. Although particular attention is paid for the recovery of variable cost, it does not mean that the fixed cost is completely neglected under this technique. In fact, an overall sound policy would incorporate fixed costs so that an effective long-term price policy is forged out. Suppose that the market analysis report indicates that the budgeted sales could be realised at a P/v ratio of 20%. This would mean that the management could expect only Rs. 20 by way of contribution out of a sales value of Rs. 100. Suppose further that the unit variable cost is Rs. 10/-. Then, the sales price is determined under this technique as follows.

$$
\begin{aligned}
\text{Sales price} \quad &= \quad \frac{\text{Variable Cost}}{(100\% - 20\%)} \\
&= \quad \frac{\text{Rs. 10}}{80\%} \quad \text{i.e. } 10 \times \frac{100}{80} \\
&= \quad \text{Rs. 12.50}
\end{aligned}
$$

Thus, a multi-product industrial concern can establish first the P/v ratios for different product lines consistent with competition, demand, and the achievement of overall P/v ratio. Afterwards, price may be determined for each product line on the basis of the formula cited.

Break-even-chart is the replica of the C-V-P (Cost - Volume - Profit) relationship when the costs are classified as per the marginal cost analysis. The common break-even-chart consists of sales line, total cost line and fixed cost line drawn straight under the basic assumptions that:

(a) Sales price and variable cost per unit remain constant at all times,

(b) fixed cost remains the same at any level of production within the available capacity, and

(c) all the goods produced are immediately sold in the market.

Under these assumptions, the common b-e-p (break-even-point) chart depicts the profit or loss at particular volume and price of sales and the point where the business breaks even at a certain price. But, these underlying assumptions do not hold good in the practical business operation. Therefore, the simple form of break-even-chart has a limited value as a pricing tool, especially, in such cases where the demand for the products is highly price-elastic. However, this chart can be a valuable pricing tool provided certain refinements are introduced in its simple form through the use of mathematical models and demand analysis. The following is an example whereby
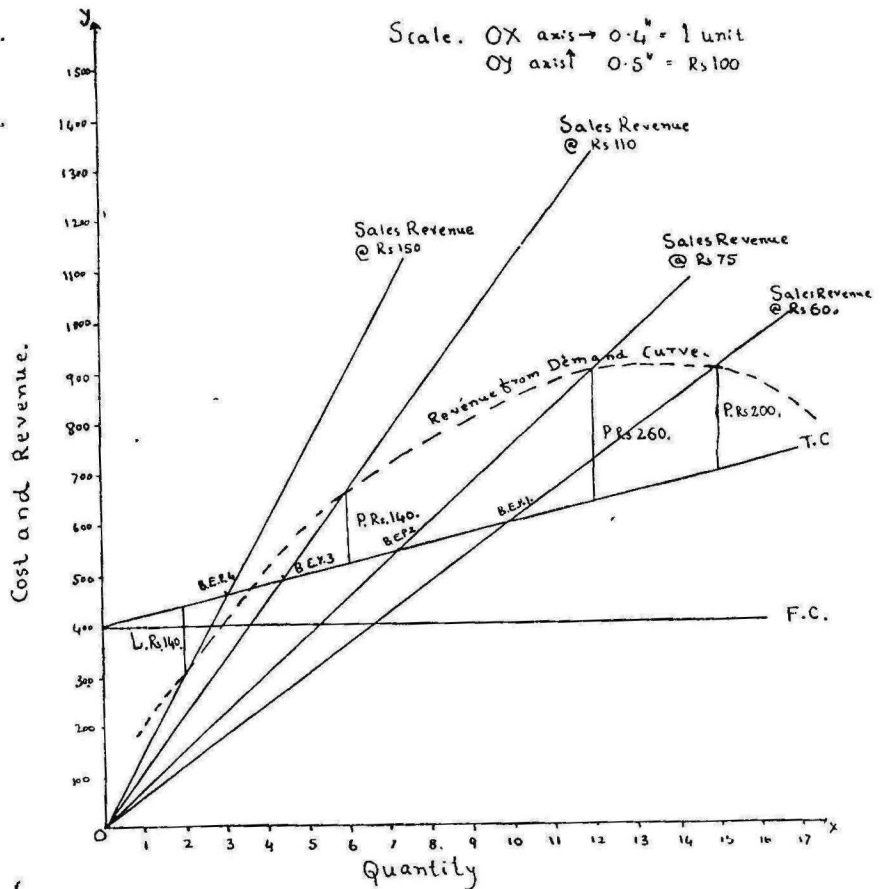
Superimposition of demand curve in the simple form of Break Even Chart

a refinement is introduced by estimating demand at different selling prices and super-imposing the same information on the pre-determined break-even data.

TABLE

Price per unit Rs	Market demand in units	Total Revenue Rs.	Cost of production			B.E.P. in units	Profit or loss at number of units sold Rs
			Variable Rs	Fixed Rs	Total Rs		
60	15	900	300	400	700	10.	(+) 2000
75	12	900	240	400	640	7.3	(+) 260
110	6	660	120	400	520	4.4	(+) 140
150	2	300	40	400	440	3.08	(—) 140

The refined graphic presentation on page 63 provides a more feasible solution for price fixation. The simple form of b-e-p would have otherwise suggested that the selling price be determined at· Rs 150 as the concern breaks even earlier and the angle of incidence is greater at that price level. It would have resulted into a loss of Rs. 140 to the concern.

7.3.3 *Return on investment or capital employed*: It is nothing but a variation of cost-plus pricing. Here, it is observed that the price fixed shall allow a reasonable rate of interest on the capital employed after recovering the necessary costs. If the price does not provide for this, the proprietor of the business has to pay for the use of capital from his own resources other than that of the business i.e. there will be a business loss. Here, a simple formula may be followed and the price determined. The equation is given below:

Sales price—Cost=Capital×Rate of return

i.e. Sales price=Cost+Capital×Rates of return.

Suppose that the cost of a product line includes: material Rs. 1000/-, labour Rs. 1000/- and other expenses Rs. 2000/-. Therefore, the working capital employed in this product line is Rs. 4000/-. Suppose that the fixed capital employed in this product line (segregated on the utilisation basis) is Rs. 20,000/- and the rate of return expected is 10%.

Total capital employed=Rs. 4000+Rs. 20,000=Rs. 24,000

Selling price=Rs. 4000+Rs. 24,000×10%=Rs. 6,400.

If it is presumed that the total number of units turned out are 1,000 the per unit price would work out to Rs. 6.4.

The severe limitations of this technique are that it has completely neglected the market demand. Further, the segregation of the capital employed according to product lines is imperfect. However, it is useful in pricing less competitive products if the concern has undertaken adequate promotional

activities so as to induce the customers to accord a preference for the firm's products.

7.3. 4.   *Market equated Method of Pricing*: It considers the going price in the market and the mark-up percentage that the retailers usually demand. Instead of working forward from cost to price as we do in the foregoing techniques, the going price is accepted here and worked backward so as to know whether it is profitable to determine the price of a product at the going price level.   It is advantageous to determine at the going price provided the net selling price after allowing for mark-up percentage is more than the total cost of production.   Assuming that the going price for a product is Rs. 20/-. The retailers demand 30% mark-up on selling price.   Then the net selling price will be Rs. 20 —Rs. 6=Rs. 14/-.   Therefore, it is advisable to determine at Rs. 20/-, if the cost is less than Rs. 14/-.   The difference counts the profit margin to the firm.   Provided the firm is in a substantial cost-advantage position and the competition is just growing, the firm can as well allow higher mark-up percentage and thereby attract more sales.   But this method of pricing is not suitable in the long run as the costs and competition may increase so much as to detract much from the utility of this pricing approach.

8.   SELLING:

8.1.   The aim of all marketing efforts is to increase the profitable sales in the long run.   A firm can undertake the function of selling in different ways.   Noted amongst them are:

(i) Direct selling
(ii) Mail order selling, and
(iii) Middlemen or Indirect Selling.

In fact, the first method of selling is the best one mainly for two reasons. (a) It is one of the promotional methods.   (b) The management comes to know the reasons for customers'-dissatisfaction and will have an opportunity to convince them about the uses and utility of the product.   But most of the large concerns sell their goods through the wholesalers and other middlemen. Some of them sell the goods according to the pre-received order-sizes, because of the organisational difficulties of direct selling.   However, some concerns have found it more economical and profitable to sell directly to the customers by opening retail shops at each market centre than through the middlemen selling.   Important problems of selling may be identified as follows:

(1)   Fixation of sales commission,
(2)   Acceptance of an order size,
(3)   Recruitment of salesmen,
(4)   Incentives to salesmen and customers, and
(5)   Measurement of sales efficiency.

8.2. Sales commission is generally fixed as a percentage of sales value and is paid in addition to the basic salary and other allowances. The commission may also be fixed as a certain amount per unit of sales. The rate of sales commission may differ from one product to another and from one firm to the other. The fixation of commission on a sales-value basis does not affect the profit of a single product industry so much as it does in the case of a multi-product industry, because the contribution differs from product to product. In a multi-product industry, if the higher value goods contribute a lesser amount to fixed cost and profit, the fixation of commission as a percentage of sales value is not justifiable from the point of view of the firm. Therefore, it is suggested that the sales commission shall be a fixed percentage of contribution, irrespective of sales value. The percentage of contribution can as well be converted into the percentage on sales value, if at all the management has decided to maintain the secrecy of the contribution. The following is illustrative of such a situation:

	Product 'A' Rs.	Product 'B' Rs.
Sales Value	10,000	5,000
Gross contribution	1,000	2,500
(i) Sales Commission—10% on value: (Traditional Method)	1,000	500
Total contribution after commission:	Rs. 2,000	
(ii) Sales commission—20% on contribution.	200	500
Total contribution after commission	Rs. 2,800	

(iii) Revised sales commission on

$$\text{Sales value} = 20\% \ . \ 10\% = 2\%$$

8.3. Generally, it is felt that the small orders are less profitable than the large orders. In fact, it may not be so for all the products. The customers/dealers order in several sizes and therefore, the management must know as to whether an order-size can be acceptable. The best way to judge on this point is to take order-size profitability analysis. The first step in this procedure is to establish order-size categories which can be accomplished by conducting a statistical sampling of invoices to reveal the pattern of order-size ranges. Then the total sales relating to each order-size range shall be determined on the basis of the same sample data. For example, 500 invoices have been selected at random and the order-size ranges have been established. The same 500 invoices shall be used to ascertain the total sales falling within each order-size range. It is necessary, then, to associate the relevant costs with the relevant order-size ranges so that the order-size profitability can be judged.

The following is a model illustrative of order-size profitability analysis.

Order-size Profitability Analysis

Order-size Range (units)	No. of invoices	Total Sales Rs	Relevant Costs Rs	Profit or loss Rs	
1 — 25	10	1,000	2,100	(—)	1,100
26 — 50	30	25,000	26,500	(—)	1,500
51 — 75	40	49,000	45,000	(+)	4,000
76 — 100	80	1,05,000	70,000	(+)	35,000
101 — 125	200	4,25,000	3,20,000	(+)	1,05,000
126 — 150	100	2,75,000	1,75,000	(+)	1,00,000
151 — 175	35	1,50,000	1,05,000	(+)	45,000
176 — 200	5	1,10,000	1,15,000	(—)	5,000
	500				

Thus, the analysis guides in rejecting the unprofitable order-sizes and to decide on the price differentials according to order-size.

8.4. The selection of an adequate sales force is also a basic requisite. Every concern needs to increase its actual as well as potential sales. No doubt every salesman adds something to sales by his efforts. But the management has to decide on the adequacy of sales force unit. The technique of marginal revenue and cost helps in this managerial decision. The attention is given, here, to the potential marginal income of successive salesman. As per this technique, the recruitment of an additional salesman is justifiable if the potential or achieveable revenue from such salesman is more than the relevant marginal costs applicable to him. This process of recruitment can be carried on until the point of sales saturation is reached where the potential revenue is equal to marginal cost. Another approach to this problem is the break-even-analysis for each individual salesman. The expenses associated with individual salesman and his sales i.e., variable factory cost, basic salary, commission, travelling expenses, freight, bad-debts etc., are classified into fixed and variable. The sales value necessary to break even is determined. It is advantageous to the concern, provided the potential sales of a salesman are more than his break even point of sales. For instance, it has been estimated that the potential sales value of Basavaraj, if appointed as a salesman, will be Rs 30,000. The expenses relating to him are classified as: variable expenses: 60% of sales and fixed expenses Rs. 10,000.

$$\text{Break even point of sales} = \frac{\text{Fixed cost}}{\text{P/v}}$$

$$\text{His B-E-P sales} = Rs \frac{10,000}{40\%}$$

$$= 10,000 \times \frac{100}{40}$$

$$= Rs\ 25,000$$

Potential Profit from his recruit-
ment

$$=40\%(\text{Rs } 30,000 - \text{Rs } 25,000)$$
$$=40\% \text{ of Rs } 5,000$$
$$=\frac{40\times5,000}{100} = \text{Rs } 2,000$$

His recruitment is justified.

8.5. The incentive schemes such as distribution of prizes to the winners in the competition of maximisation of sales, rebates, concessions and free-gifts to the customers who have purchased over and above a particular quantity etc. are the effective tools to maximise the sales and profits of the concern. While deciding on the amount of prizes and gifts, the management shall know the extent of contribution from extra sales over the normal sales. It is suggested that the amount of incentives shall be a certain percentage of such contribution.

8.6. Sales and profit variances analysis and ratios such as profitability ratio, participation ratio and the exploitation efficiency ratio are the guiding factors in measuring the effectiveness of sales. Sales budgeting and the recording of actual results help analyse the sales and profit variances. The profitability ratio is one which sales minus costs bears to the costs. The ratio of sales to total market demand convey the extent of participation in the market. And the exploitation efficiency ratio is that ratio which the sales-increase ratio bears to the costs-increase ratio.

9. CHANNELS OF DISTRIBUTION

9.1. Distribution is the concomitant of selling. Efficient selling requires the selection of a channel/channels of distribution which are more appropriate to the nature of market, goods and services.

9.2. A channel of distribution is a route starting from producer to the ultimate consumer or user whereby different intermediaries take title to the goods. There are good many channels of distribution. Any channel taken in isolation, includes both the producer and the consumer, besides the persons who take title to goods in between. The producer-retailer-consumer, is a channel. The producer-wholesaler-retailer-consumer is another channel. The producer-agent-wholesaler-retailer-consumer is also a channel of distribution. If the firm maintains branches and depots, there will be multiplication of channels. Therefore, all these alternate channels shall have to be evaluated and analysed to select the most appropriate channel/ channels of distribution.

9.3. The analysis must start with the consumer and work backward to the producer. Therefore, the following considerations shall be given due attention:

(i) An understanding of the retail as well as wholesale markets for the product;

(ii) A knowledge of the middlemen available in both the markets;

(iii) Decision on the kind of middlemen to be used;

(iv) Decision on the number of middlemen to be used;

(v) A determination of the methods of distribution i.e. transportation and warehousing.

9.4. The reporting of market research studies will help in understanding the size of retail and wholesale markets. It also conveys an idea about the kind of middlemen available in such markets. The decision on the kinds and quantity of middlemen to be used depends upon varied factors such as type of goods, size of potential market, undertaking of financial risk, order-size etc., etc. Therefore, it is less dependent on the costing factors. The decision on the number of middlemen to be used can be taken on the basis of potential revenue and cost as it is done in the case of determination of the optimum number of salesmen. The transportation and warehousing form a considerable portion of distribution cost. The control of such costs is highly essential and therefore, the management scientists have developed a sophisticated technique to control transportation as well as warehousing costs. In the circumstances where the goods are stocked in different warehouses situated in different localities and where the retail shops are widely spread, there are innumerable alternative ways of transportation. Each alternative mode of transport costs differently from the other. So, we have to select that mode which is the best and ensures the least cost routing of goods. This selection is possible only if we adopt the linear programming technique. Likewise, the same technique may also solve the problem of optimum utilisation of limited warehouse space facility.

10. CREDIT MANAGEMENT

10.1. Selling on credit is a general feature of business. Compelled by competition or of its own accord, the concern may provide credit sales in order to attract more customers. Today, credit is universally demanded and it pushes up the working capital needs to stupendous levels. Further, credit is allowed not only for a fortnight or a month but even for a quarter, six months or a year depending upon the product and the terms of trade. Hence, credit management needs due recognition by the management. Its importance is highlighted when we analyse its repercussions.

(i) Credit sales lead to blocking up of capital,

(ii) There will be fear of bad and doubtful debts,

(iii) It involves additional administrative cost, and

(iv) Increased credit sales weaken the firm's financial position.

As such, credit sale needs to be managed efficiently. The responsible executive can make use of the ratio-analysis and variance-analysis techniques to judge on his efficiency in the management of credit. On the same grounds, he can find out the means for improving his efficiecy. The useful ratios in

credit management are:

(1) Credit and collection Ratio $= \dfrac{\text{Total credit sales}}{\text{Credit sales collected during the period}}$

This ratio denotes the efficiency of management in the collection of money from the debtors.

(2) Debtors to turnover Ratio $= \dfrac{\text{Debtors during the period}}{\text{sales}}$

It depicts the extent of credit allowed.

If the management has fixed the form for credit sales at 25% of total sales, this ratio guides the management to know the ability of the sales executive in controlling credit sales.

(3) Average Age of Debtors $= \dfrac{\text{Debtors (Average)}}{\text{Sales}} \times 365$

It denotes the period of time taken by the debtors on an average to pay the money. Suppose that the management has informed not to allow credit more than 30 days and if the average age of debtors is 40 days, it speaks on the inefficiency of the collecting authority.

(4) Bad-debts to Sales Ratio $= \dfrac{\text{Bad-debts at the end}}{\text{Sales}}$

Bad-debts are the losses to the concern and therefore, a high ratio is always harmful to the concern. If it is found that the ratio is considerably high, the management can introduce the policy of allowing credit sales on a security basis.

(5) Debtors to working capital $= \dfrac{\text{Debtors}}{\text{Working capital}}$

This ratio indicates the portion of working capital blocked up in the credit sales.

All these ratios provide facts and figures for better credit management. Similarly, the current year's credit sales, debtors at the end, bad debts during the period, cost of collection etc., can be compared with the previous years or with the fixed norms and the variances can be drawn and analysed into the causes to know the factors responsible for such differences and to take proper steps to avoid the adverse variances. For the purpose of analysis, ratios or even the amounts involved may be used.

11. ADVERTISING AND SALES PROMOTION

11.1. Mass-communication is required for mass-marketing. Despite direct selling, a concern can accomplish this job through advertising and

sales promotion. Because of their significance, every industrial concern has got a separate campaign for advertising and sales promotion.

11.2. Advertising aims at the psychological orientation of society. The function of advertising is to help organise and modify the basic preceptual process of the consumer so that he is guided toward seeing and feeling a product in a given predictable way[5]. Thus the basic objective is to orient and create feeling in the customers to purchase the product and thus generate a sale immediately or at some time in future. The concern shall take the functions of product advertising and institutional advertising to stimulate customers and to establish goodwill for the concern. Advertising is performed through different media. The important areas in advertising where the costing techniques can be fruitfully employed are:

(i) Selection of the combination of media which costs minimum but ensures maximum potential sales.

(ii) Measurement of advertising efficiency.

11.3. Each combination of advertising media involves certain amounts of advertising cost and ensures certain potential sales. There are innumerable combinations of media to reach the potential market. Out of these innumerable combinations, we have to select that combination which yields maximum potential sales but involves-minimum advertising cost. This problem is solved systematically by linear programming with an objective function of minimisation of potential sales. The efficiency of advertising campaign is measured by calculating certain ratios and percentage. The advertising cost per unit of sales, the advertising cost as a percentage of sales revenue, the units sold per rupee of advertising cost, and the increase in advertising cost as compared with the increase in the seizure of potential market etc., may be some of the tools of measuring efficiency. A comparison of these ratios with the standards provides an idea of relative efficiency. It also gides in budgeting for future advertising cost.

11.4. The American Marketing Association defines sales promotion as "those marketing activities, other than personal selling, advertising and publicity, that stimulate consumer purchasing and dealer effectiveness, such as displays, shows, expositions, demonstrations and various non-recurrent selling efforts not in the ordinary routine."[6] Sales promotion has got a greater importance in today's marketing because of geographical spread between producer and consumer and increase in the number of potential customers. Considerable amounts are spent today on sales promotion. In view of this the impact of promotional measures on sales must be carefully assessed so that the costs involved may be justified. To realise this effect, it is suggested that out of the dealers promoted, a few shall be selected through random-sampling. The customers who placed their orders with such selected dealers in the past few months shall be analysed and the effect can be determined. We can as well have a scientific conclusion with respect to the effect of pro-

motion on sales by using probability theory and establishing the relationship between the dealers promoted and the business obtained.

12. FOREIGN MARKETING

12.1. Foreign marketing refers only to export marketing. We cannot say that a firm exports because it manufactures more products than what is demanded in the domestic market for the competition in the foreign martket may curtail the activities of the firm. Likewise, it may not be apt to say that a firm exports because the demand is less in the domestic market. In fact, a foreign market may offer greater growth and profit opportunities than the domestic market. The nature of competition, the buying behaviour in the foreign market and the cost structure, pricing and distribution channel for foreign marketing are altogether different from domestic marketing. However, the management can make use of many of the costing techniques explained in the above paragraphs for an effective foreign marketing.

13. CONCLUSION

13.1. The function of marketing has got greater significance today than production. We do require precise and detailed information about this area for scientific marketing decisions. That we don't have. It is the opinion of McCloskey and Trefethen[7] that the general area of marketing and sales management is the one in which, perhaps, the least precise and complete information has been available for the guidance of administrative decisions. However, some methods and techniques have already been developed to take sound decisions on certain problems of marketing. Yet, there is greater scope to develop many more sophisticated techniques that will be highly useful for effective marketing.

Foot Notes

1. Article "Management Science in Marketing—Status and Prospects"—by Melvin Anshen published in the book "Executive Readings in Management Science" edited by Martin Kenneth Starr. 1st ed. P. 288.

2. "Fundamentals of Marketing"—by William J. Stanton. published by McGraw-Hill. Inc. in 1964. p. 5.

3. "Fundamentals of Marketing"—by Stanton. p. 12.

4. Lecture delivered on "Linear programming—its concept and scope" on 21st September 1967 under the auspices of Department of Commerce, Karnatak University, Dharwar-3.

5. "The functions of Advertising in Our Culture"—article by Irving. S. White published in the Journal of Marketing. July, 1959, pp. 8-14.

6. "Marketing Definitions: A Glossary of Marketing Terms"—A.M.A. publication 1960. p. 20. Quoted by Stanton in his "Fundamentals of Marketing", p. 555.

7. "Operations Research for Management"—J. F. McCloskey and F.N. Trefethen. Vol. I: p. 305.