UNIT 18 SALES FORECASTING

Objectives

After studying this unit, you should be able to:

- understand what a sales forecast is
- appreciate how the sales forecast is prepared .
- list the product-sales determinants of different type of products
- explain the need for evaluating sales forecast and its relationship with sales budget and profit planning.

Structure

18.1 INTRODUCTION

Sales forecasting, though crucial, is one of the grey areas of marketing management. It is crucial because without a proper sales forecast the marketing executive cannot determine the type of marketing programme to use in order to attain the desired sales and marketing objectives. It is a grey area of marketing management in the sense that it is based on a number of assumptions regarding customer and competitor behaviour as well as the market environment, and therefore, its reliability depends upon the extent of culmination of the uncertainty as predicted. Before understanding the various aspects of sales forecasting let us look at the sales forecasting practices followed by two large size companies.

> A leading automobile engine manufacturing company determines the sales forecast of its diesel engines by using two approaches. In the first instance, it tines an econometric model and an estimate of the company's market share to derive ,e company forecast. Under the second approach the company initiates the process by undertaking a detailed study of the needs of each of its diesel vehicle customers. This study includes an analysis of market factors such as the vehicle manufacturer's present engine inventory and back orders as well as the vehicle manufacturer's marketing programme. The resulting forecast is prepared by vehicle manufacturer, model, and month-wise. These individual manufacturer forecasts are aggregated to produce a company sales forecast which is then compared with the company forecast arrived at under the first approach, and finalised.

> A colour television receiver manufacturing company develops its sales forecast on the basis of : total colour television market demand (including the replacement rate of black & white television by colour television), growth rate of the colour television market, the government plans for commissioning additional transmission centers, availability of imported kits, and company's market share objective.

18.2 WHAT IS A SALES FORECAST?

A sales forecast predicts the value of sales over a period of time. It becomes the basis of marketing mix and sales planning.

A **short-term** sales forecast (say for a period of one year) when linked to the sales budget helps in the preparation of an overall budget for the firm as a whole. The short-term sales forecast in effect also provides the essential financial dimension to sales in terms of expected sales revenue and expenses required. Also, it helps in assessing the cash inflow and outflow needs and their sources.

A long-term sales forecast (say for a period of 5 years or so) on the other hand, focuses on capital budgeting needs and process of the firm. It provides for changing the marketing strategy of the firm, if needed, and includes reference to emerging product market needs, new market segments to be catered, review of distribution network and promotional programmes, organisation of salesforce, and marketing set up. The long-term sales forecast triggers the task of aligning the production, procurement, financial and other functional needs of the firm with the finalised sales forecast.

18.3 HOW TO PREPARE A SALES FORECAST?

The preparation of a sales forecast requires (a) the availability of historical information on the product and industry sales, (b) identification of product sales determinants, (c) prediction regarding the behaviour of market forces for the period under forecast, (d) use of appropriate techniques for forecasting, (e) judgement of executives preparing the sales forecast, and (f) the firm's market share objectives. These sales forecasting requirements are discussed below.

Information Needs for a Sales Forecast

Use of reliable, up-to-date and relevant information is me most critical aspect of sales forecasting. The information required for a sales forecast should cover:

1. An assessment of the total market size
2. An appreciation of the market trends
3. Innovations which may have an impact on the market
4. Market trends in foreign countries where the market pattern is in advance of the domestic market
5. An evaluation of the market share obtained
6. An evaluation of competitive strengths
7. The criteria on which purchase decisions are likely to be made
8. Assessment of elements at work in the market which will influence sales
9. The influence in the market of competitors
10. The level of sales needed by the company to obtain optimum use of resources
11. The image of the Company in the market
12. The marketing strategy of the company to capitalise on its strengths and overcome its weaknesses
13. An evaluation of the market share which can be obtained
14. Assessment of factors within the company which will influence sales levels
15. Planned distribution and sales promotion activities by the company

Activity 1

By interviewing relevant persons, try to find out how the following forecast the sales of their merchandise:

A) Shopkeeper

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B) Wholesaler

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………………………………………………………………………………………………
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C) Manufacturer

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18.4 PRODUCT SALES DETERMINANTS

Product sales, generally speaking, depend upon the market need, price of the product, demand-supply situation, purchasing power available with the customers and their willingness to spend that on the purchase of the product. The importance of these factors varies according to the type of product sold i.e., consumer non-durable goods, consumer durable goods, and industrial goods. Let us now identify the major determinants of product sales relating to different types of goods.

Consumer Non-durable Goods

Three basic factors determine the sales of relatively low priced, short shelf life and frequently purchased consumer goods. These are: **disposable personal income** (personal income minus direct taxes and other deductions) of the customer; **demographic characteristics** (age, sex, occupation, urban/rural location, etc.) of the population, and the **price level** including competitive structure of the market.

The growth in the disposable income level as well as per capita availability of products provide continuity in the sales of food products, textiles, household articles and similar products.

Price of a product relative to the disposable income of the customer influences the customer choice criteria regarding purchase of complimentaries as well as substitutes. It also affects the quality level (high, average, low) of the products purchased.

Changes in demographic characteristics of the population such as its size, literacy, number of children in a family, etc. help in the selection of preferred market segments and their cultivation with the appropriate marketing mix.

Consumer Durable Goods

These goods have a durable (long) life and are generally bought out of savings. Their purchase frequency is thus limited to once or twice in the life of a household. The purchase of such products is influenced by:

a) discretionary income (disposable income minus essential expenditures on basic necessities and other fixed obligations like debt payments, insurance premiums, etc.) level of the population.

b) availability of infrastructural and support facilities for the product usage in the country such as pucca roads for the usage of scooters and other vehicles; broadcasting stations and transmission centres in the case of radios, transistors and television; and electricity n the case of various electrical appliances including refrigerators and air-conditioners. Availability of repair, spares and maintenance facilities in proximity to the households location help increase the sale of consumer durable further.

c) price, credit or hire-purchase facilities available, and

d) life-style of the households and the role of ego, status and prestige in it.

The improvements recorded in the levels of discretionary income, extension in infrastructural and support facilities, easy availability of consumer loans and hire-purchase/ instalment schemes as well as changes in urban life-style has opened up the Indian consumer durable market in a big way. The rising sales of transistors, two-in-ones, televisions, scooters and motor-cycles, mixers and cookers, foam mattresses and furniture items, etc. are just a few indications of the same.

Industrial Goods

These goods help in the production of other goods which are closer to consumer usage. Their demand, therefore, is linked with the off-take by the ultimate users and so is, popularly called `derived' demand. In other words, industrial goods are mainly basic or mother goods, such as machine tools, power equipment, steel, industrial machinery, components, control instruments, lubricants, etc. And, to repeat, the sales of industrial goods is linked with the demand in the user industries e.g., demand of watch making machinery and components in India is determined by the sale and demand of watches in India.

Industrial goods forming part of the industrial infrastructure are greatly influenced by the Government of India's industrial and technology policy, budgetary outlays, developmental plans and the availability of industrial finance through national and international sources. Any policy or allocation change, therefore, affects the working of Industrial goods, firms and often makes them face either a recession or a recovery position in the market.

In short, an industrial products sales forecast is influenced by (a) company forecast, (b) industry forecast, (c) national economic forecast, and (d) world economic forecast.

18.5 APPROACHES TO SALES FORECASTING

There are two general approaches to sales forecasting at the level of the firm-the breakdown approach (also called top-down approach), and the market build-up approach.

Breakdown Approach

Under this approach, the head of the marketing function initially develops a general economic and market sales potential for a specific period. The firm's sales potential is then derived from it. The example of a colour television receiver company developing its sales forecast given in the beginning of this unit relates to the use of the breakdown approach.

Market Build-up Approach

In this approach the task of sales forecasting begins by first estimating the sales at the product, product lines, customer groups or geographical area level. The estimates of the different product, product lines, customer groups or geographical areas are then aggregated and reviewed in the light of the firm's objectives, available resources, as well as competitors activities before the sales forecast is finalised. The example of a leading automobile engine manufacturing company given in the beginning of this lesson relates to the use of both a breakdown approach and a market build-up approach.

While both the approaches have their own usefulness, the breakdown approach is' less time consuming and costly when it can use aggregate data made available by others. It may, however, lack the advantages of greater realism and reliability which result from the use of market build-up approach. Combination of both the approaches though time consuming seems ideal and worth the effort expended.

18.6 METHODS OF FORECASTING

Let us now consider various methods used for preparing the sales forecast. These methods are commonly grouped into 5 categories: executive judgement, surveys, time series analysis, 'correlation anti regression methods and market tests.

Executive Judgement

It is an efficient method of sales forecasting. Based on the past performance, insights gained and intuition of the executive(s), this method of sales forecasting works out fairly well particularly when the market is stable. However, this method generally suffers from difficulty in realistically reflecting changes in the market. Salesforce composite method and jury of executive opinion are the two popular forms of this method of sales forecasting.

Surveys

A second way of sales forecasting is by surveying the customers, salesforce, experts, etc. and ascertaining their predictions. **Customer surveys** can provide information relating to type and quantity of products which customers intend purchasing. **Salesforce surveys** can provide estimates of overall territory off-take, company's share and the share of the major competitors. Dealers survey may also form part of the salesforce survey if a firm so desires. Expert **surveys** provide sales forecast as the experts and industry consultants look at it. They bring in an outsider's view to the company's internal forecast and help many a times by adding new dimensions for consideration of management.

Time Series Analysis

Using the historical sales data, this method tries to discover a pattern or patterns in the firm's sales volume over time. The identification of the patterns helps in sales forecasting.

Time series analysis helps locate the trend, seasonal, cyclical and random factor changes associated with the past sales data. In this way, it improves the prediction from the past sales data. Experience reveals that time series analysis for sales forecasting are quite accurate for short and medium term forecasts and more so when demand is stable or follows the past behaviour.

Some of the popular techniques of time series analysis are: moving averages, exponential smoothing, time series extrapolation, and Box-Jenkins technique.

Correlation and Regression Methods

These methods attempt at examining the relationship between past sales and one or more variables such as population, per capita income or gross national product, etc. The use of regression analysis is done in order to determine whether any relationship exists between the past sales, and changes in one or more economic, competitive or internal variables to a firm. The accuracy of forecasts made by using correlation and regression methods is generally better than the other methods. Typical forecasting applications of these methods are sales forecasts by product class. Though the correlation method helps in identifying the association between the factors, it does not explain any cause and effect relationship between them.

Some more advanced forecasting methods explaining cause-effect relationship besides regression method include econometric model, input-output model and life-cycle analysis method. The life-cycle analysis method is used for forecasting of new product's growth rate based on s-curves. The phases of product acceptance by the various groups of customers such as innovators, early adopters, early majority, late majority, and laggards are central to the analysis.

Market Tests

Market tests are basically used for developing one time forecasts particularly relating to new products. A market test provides data about consumers' actual purchases and responsiveness to the various elements of the marketing mix. On the basis of the response received to a sample market test and providing. for the factor of a typical market characteristic as well as learning from the market test, product sales forecast is prepared.

Substantial fluctuation that one finds in reality from market to market limit the accuracy of sales forecasts made by this method,, unless the market test is designed systematically.

Combining Forecasts and Using Judgment

Experience brings out that the forecasts resulting from the use of multiple methods in a combined way greatly surpass most individual methods of sales forecasts. Research also supports the combined use of quantitative and qualitative methods of sales forecasting in a given situation rather than using either of the two. Application of judgment to quantitatively arrived forecasts should be done in a structured manner with a view to adding insights and realism to the forecasts so arrived at, since a forecast is a prediction and needs the subjective perception too.

Several studies have shown how combining forecasts by using one or the other methods can improve accuracy of the forecasts. The methods which can be used for combining forecasts are: (i) a simple average of two or more forecasts, and (ii) by assigning historical or subjective weights to such forecasts which more closely reflect the changing reality. In

short, being aware of the conditions under which some forecasting methods work better than, others enables the firm to prepare for different alternative forecasts. By monitoring which alternative works better, the firm can learn to achieve its goals more effectively.

Activity 2

Suggest some useful techniques for sale forecasting in case of the following:

1. Pagers ……………………………………………………………………………
2. Cellular Phones………………………………………………………………..
3. Soft Drinks ……………………………………………………………………….
4. Sun Glasses ……………………………………………………………………
5. Dentist ……………………………………………………………………………
6. Room Heaters …………………………………………………………………
7. Audio Systems…………………………………………………………………
8. Readymade Garments (Children)……………………………………………..
9. 100 c.c. Motor Cycles …………………………………………………………
10 Light Commercial Vehicles …………………………………………………...

18.7 STATUS OF FORECASTING METHODS USAGE

In a study of 127 U.S. companies Steven C. Wheelwright and Darral G. Clarke found among other things the criteria used by U.S. companies for selecting the forecasting methods and also the usage of various forecasting methods by them.

The survey findings are summarised below in Tables 1 and 2.

Table 1
Criteria for selecting a forecasting method

Factor 1: User's Technical Ability
- Level of forecasting sophistication
- Understanding of the method
- Formal training in forecasting

Factor 2: Cost
- User's time
- Preparer's time
- Computer time
- Data collection

Factor 3: Problem-specific Characteristics
- Time horizon' to be forecast
- Length on each time period
- Functional **area** involved
- Degree of top management support
- **user-preparer** relationship

Factor 4: Method Characteristics Desired
- Accuracy 10
- Statistics available

Table 2

Sales Forecasting Acceptance and use of alternative forecasting methods

Method	Use of the method by those familiar with it	Ongoing use of the method by those who have tried it	Those unfamiliar with the method
Jury of executive opinion (executive judgement)	82%	89%	6%
'Regression analysis	76	91	8
Time series smoothing	75	84	13
Sales force composite surveys	74	82	10
Index numbers	67	85	33
Econometric models	65	88	12
Customer expectations surveys	57	78	15
Box-Jenkins	40	71	39

18.8 THE EVALUATION OF FORECASTS

Managers face a great deal of difficulty in evaluating their forecasts. The task becomes more difficult when the manager lacks any specific criteria for evaluating the forecast. Survey of literature suggests the consideration of the following important factors when evaluating forecasts. These factors are: understanding of the. state of the art of forecasting techniques, the availability of reliable data bases, and knowledge about monitoring environmental changes. The value and outcome of the evaluation process depends on the firm's data base and the forecasting manager's experience, the manager's knowledge of the forecasting Methods, and models, and his ability to understand the past and present changes.

The Forecasting Audit

In the final analysis, forecasting is more of an art than a science; nothing can currently replace experience and good judgement. Professor J. Scott Armstrong of Wharton School, U.S.A., suggests a Forecast Audit Checklist consisting of 16 questions covering the forecasting process, assumptions and data, uncertainty and costs. More no's to the questions will indicate negligence on the part of the manager and also lead him to think ideas on how to improve the forecasting process. The suggested checklist appears in Table 3.

Table 3
Forecasting Audit Checklist

Forecasting Methods	NO	—	YES
1 Forecast independent of top management	—	—	—
2 Forecast used objective methods	—	—	—
3 Structured techniques used to obtain judgements	—	—	—
4 Least expensive experts used	—	—	—
5 More than one method used to obtain forecasts	—	—	—
6 Users understand the forecasting methods	—	—	—
7 Forecasts free of judgemental revisions	—	—	—
8 Separate documents prepared for plans and forecasts	—	—	—
Assumptions and Data			
9 Ample budget for analysis and presentation of data	—	—	—
10 Central data bank exists	—	—	—
11 Least expensive macro-economic forecasts used	—	—	—
Uncertainty			
12 Upper and lower bounds provided	—	—	—
13 Quantitative analysis of previous accuracy provided	—	—	—
14 Forecasting prepared for alternative futures	—	—	—
15 Arguments listed against each forecasts	—	—	—
Costs and Benefits			
16 Amount spent on forecasting reasonable	—	—	—

It is also said that the ultimate test of how good a sales forecast is whether it can improve the firm's marketing strategy.

18.9 COMPUTERISED SALES FORECASTING

The rapid developments in computer hardware and software has made it possible for managers to make sophisticated forecasts with the help of computers. The greatest advantage of this is that managers can introduce subjective inputs into the forecast and immediately test their effects.

Specifically, the last few years have seen sophisticated forecasting models being rewritten using Spread Sheet software programmes for personal computers. Lotus 1-2-3 and Microcast programmes are now available at reasonably affordable prices. Developments in the computer field especially in computer artificial intelligence systems have also enabled the development of expert systems models i.e., the model that the experts use in making a decision. These are of great use when judgement is an important part of the forecast. In future, we are going to see greater use of computers in sales forecasting in India.

18.10 RELATING THE SALES FORECAST TO THE SALES BUDGET AND PROFIT PLANNING

In order to achieve forecasted sales and planned profits, a certain level of sales inputs are a must. The required sales inputs when expressed in monetary term result in the preparation of the sales budget. Since the sales inputs have to be deployed in anticipation of the sales results which may or may not be achieved on the expected lines suggest caution to be exercised while expending the sales budget.

Profitable marketing suggests a break up of the sales budget on product-wise, territory sales-wise and time-period-wise in the first instance. The second basic requirement relates to close monitoring of the actual sales against the targets on a continuing basis.

The thumb rule is that not more than 40 per cent of the, sales budget should be spent in the first six months of the budget year. The underlying logic is that since a sales forecast is based on assumption, sales efforts should be spent in conjunction with the culmination of reality as assumed.

The dynamic nature of the market, therefore, requires that the managers must feel the pulse of the market particularly with regard to customer behaviour, competitors plans and reactions as well as the way the market environment unfolds itself. In case the market reality is markedly different from the forecasted one a thorough probe and necessary modification may be required in the deployment of sales inputs, budget and even in the profit plan.

In a nutshell, sales forecasting should be treated as a dynamic activity particularly in relation to the sales budget and profit plan of the firm. For, if forecasting is not practised as a dynamic activity then there may be little to regulate the continued use of sales budget and erosion of profitability. It is important, therefore, to use simple yet comprehensive sales information formats to monitor the market and conduct sales analysis at a regular periodicity.

18.11 SUMMARY

Evaluating the sales potential obtaining in the market place and preparing a sales forecast is an important function of the sales and marketing managers. While different approaches and methods can be used for preparing the sales forecast, a combined approach using together the quantitative and executive judgement methods help in putting realism into the sales forecast. The finalised sales forecast will be of greater utility if it is related to the sales budget and profit plan of the firm. Close monitoring of actual sales against the sales forecast and a thorough probe in case of substantial deviation can forewarn the unregulated expending of the sales budget.

18.12 KEY WORDS

Company sales forecast: The value and volume of a product that a firm actually expects to sell during a specific period at a given level of company marketing activities.

Expert forecasting survey: Preparation of sales forecasts by experts, such as economists, management consultants, or other professionals outside the firm.
Market potential: The maximum sales possible for all sellers of a product to an identified market segment within a specified time frame.
Sales potential: The maximum sales possible for one company's product as the firm's marketing efforts increases relative to competitors.
Seasonality analysis: A method of predicting sales in which a manager studies daily, weekly or monthly sales figures to evaluate the degree to which seasonal factors, such as climate, festivals and holiday activities, influence the firm's sales.
Top down forecasting: Analysis of sales for the purposes of forecasting from world, to natural to industry to firm level.

18.13 SELF-ASSESSMENT TEST

Self-test Questions

A) Check whether the following statements are true or false.

Statement	True/False
1. A sales forecast must be specific in terms of time	
2. The customer survey is the most feasible sales forecasting method for a soft drink company	
3. Time series analysis seeks a pattern in a firm's sales volume based on historical data	
4. The top down sales forecast begins by examining the national economy and its forecasts	
5. The accuracy of the sales forecast depends upon the sophistication levels of the forecasting methods used	

B) Tick the one most appropriate answer.

1 A sale helps the marketing manager determined:
   a) What sales forecast volume to expect
   b) how much to produce
   c) how much effort to spend on the marketing programme
   d) all of the above

2 Sales forecasting methods should be:
   a) sophisticated and computerized
   b) the same as those of the competition
   c) as simple and inexpensive as possible
   d) none of the above

3 Using past sales data to identify patterns in sales volume is called:
   a) executive judgment
   b) correlation method
   c) survey of sales data
   d) trend analysis

4 Market potential is:
   a) usually greater than market capacity
   b) usually less than primary demand
   c) the limiting level of a market demand function
   d) none of the above

5 A poor forecasting capability can cause a firm to have:
   a) poor confidence measure
   b) inconsistent competitive power
   c) biasing tendencies
   d) an undesirable inventory level.

Key to Self-test Questions

(A) I (True), 2(False), 3 (True), 4 (True), 5(False)

(B) 1 (d), 2 (c), 3 (d), 4((I), 5 (d)

Questions

1 What is a company sales forecast? Why is it important?

2 Under what conditions executive judgement method is useful for sales forecasting? Discuss its advantages and limitations.

18.14 FURTHER READINGS

William J. Stanton. Michael J. Etzel , Bruce J. Waler *fundamentals of Marketing,* 5th edition, McGraw-Hill, International edition

Philip Kotler - *Marketing Management,* 11th edition 2002; PHI- New Delhi