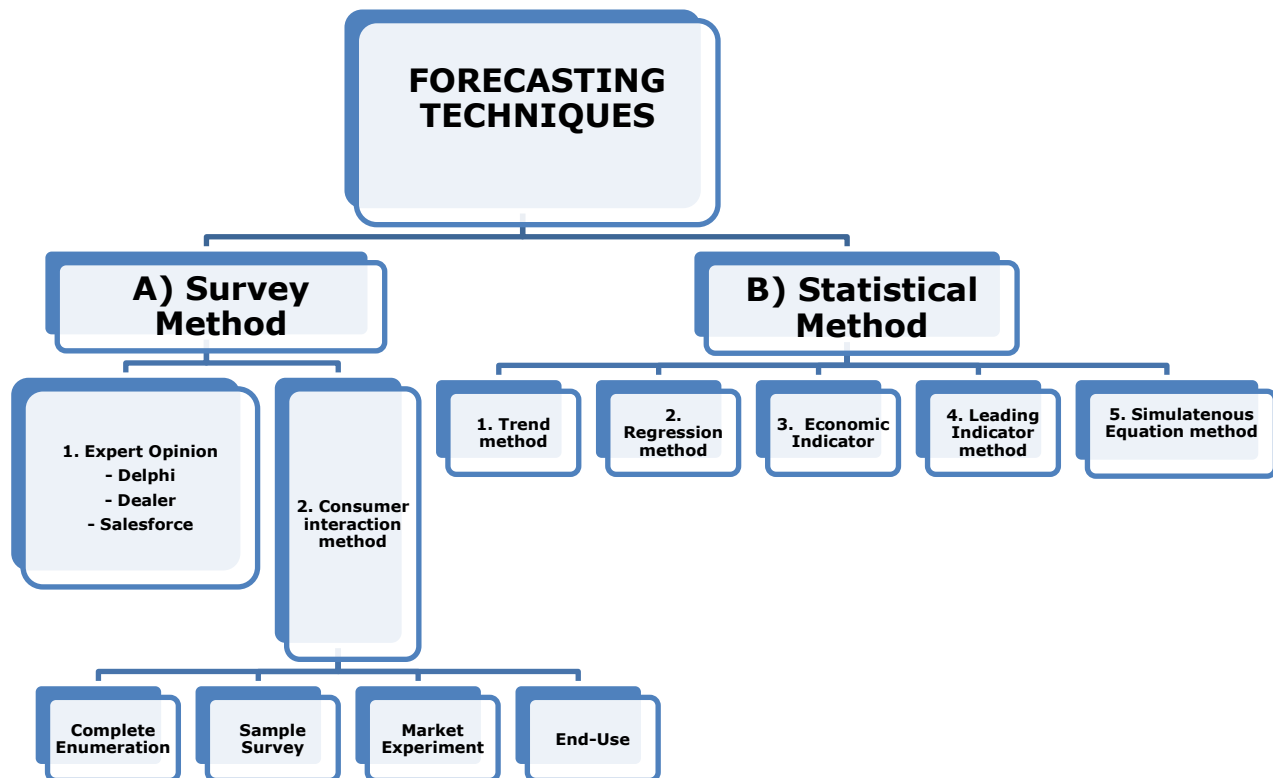Demand forecasting seeks to investigate and measure the forces that determine sales for existing and new products. Generally companies plan their business – production or sales in anticipation of future demand. Hence forecasting future demand becomes important. The art of successful business lies in avoiding or minimizing the risks involved as far as possible and faces the uncertainties in a most befitting manner

DEMAND FORECASTING TECHNIQUES

Demand forecasting is a highly complicated process as it deals with the estimation of future demand. It requires the assistance and opinion of experts in the field of sales management. Demand forecasting, to become more realistic should consider the two aspects in a balanced manner. Application of commonsense is needed to follow a pragmatic approach in demand forecasting.

Broadly speaking, there are two methods of demand forecasting:

    A) Survey Method (Direct method)
    B) Statistical Method (Indirect method)

FORECASTING TECHNIQUES

A) Survey Method

1. Expert Opinion
   - Delphi
   - Dealer
   - Salesforce

2. Consumer interaction method

Complete Enumeration

Sample Survey

Market Experiment

End-Use

B) Statistical Method

1. Trend method

2. Regression method

3. Economic Indicator

4. Leading Indicator method

5. Simulatenous Equation method

A) SURVEY METHOD (DIRECT METHOD):

1. Expert Opinion:

In this method, the experts on the particular product whose demand is understudies are requested to give their opinion about the likely share in the future period. These are the persons who have been dealing in this and related products for the year and are thus able to predict the likely level of sales in future periods under different conditions, based on their experience. If the no. of such expert is large and their expectations are different than an average simple or weighted is found to lead the unique forecast.

> #### Delphi Method:
> A variant of the opinion poll and survey method is Delphi method. It consist of an attempt to arrive at a collective or general opinion in an uncertain area, by questioning a group of experts. Each expert is given the opportunity to react to the information or consideration advanced by others but interchange is anonymous so as to avoid or reduce the 'halo effect', 'band wagar effect' and 'ego involvement' associated with publicity expressed opinion.

> #### Sales Force and Dealers Opinion:
> Under this method, Salesmen are required to estimate expected sales in their respective territories and sections. The advantage of this method is that salesman being the closest to the customers are likely to have the most intimate idea of the market. i.e, customer reaction to the products of the firm and their sales trend.

Advantages:

- This method is simple to understand.
- This method is free from the heavy costs of survey.
- It is also useful when a firm introduces a new product in the market.

Limitations:

- The opinion of the experts many a times may be biased.
- They may not aware of other demand determinants.

2. Consumer Interaction Method:

Under this method of demand forecasting, intentions of the buyers as to what they intend to buy, how much quantity to buy at different price etc. are known through personal contacts. Thus, this method shifts the burden of demand forecasting on to buyers. This work of consumer survey is entrusted to trained, reliable and experienced investigators.

a) Complete Enumerative survey:

Under this method all the potential buyers of the product are contacted; their interviews are conducted to find out the probable demand. Having ascertained the individual demand for the product by complete enumerative method, these are added together to find out the probable demand.

The main advantage of this method is that since all potential buyers are contacted, there is a greater degree of accuracy. Besides, this method is useful when new products are introduced by a firm.

But this method is expensive, time consuming and is of little use when the consumer are spread over a large area.

b) Sample Survey:

In view of the limitations of the complete enumerative method, Sample survey method has become more popular for forecasting the demand. Under this method, only a few customers are selected from the potential buyers of the product; they are interviewed.

The chief merit of this method is that it is less costly and less time consuming.

But the efficiency and accuracy of this method depends upon the competence of field investigators and experts. There is a relative shortage of such personnel in developing countries. Besides, if there is no careful planning and proper procedure sample survey method may lead to inaccurate and misleading results

c) Market Experiment method:

A potential problem with survey data is that survey responses may not translate into actual consumer behavior. That is, consumers do not necessarily do what they say they are going to do. This weakness can be partially overcome by the use of market experiments designed to generate data prior to the full-scale introduction of a product or implementation of a policy. To set up a market experiment, the firm first selects a test market. This market may consist of several cities; a region of the country, or a sample of consumers taken from a mailing list. Once the market has been selected, the experiment may incorporate a number of features. It may

involve evaluating consumer perceptions of a new product in the test market. In other cases, different prices for an existing product might be set in various cities in order to determine demand elasticity. A third possibility would be a test of consumer reaction to a new advertising campaign. There are several factors that managers should consider in selecting a test market. First, the location should be of manageable size. If the area is too large, it may be expensive and difficult to conduct the experiment and to analyze the data. Second, the residents of the test market should resemble the overall population of India in age, education, and income. If not, the results may not be applicable to other areas.

Finally, it should be possible to purchase advertising that is directed only to those who are being tested. Market experiments have an advantage over surveys in that they reflect actual consumer behavior, but they still have limitations. One problem is the risk involved. In test markets where prices are increased, consumers may switch to products of competitors. Once the experiment has ended and the price reduced to its original level, it may be difficult to regain those customers. Another problem is that the firm cannot control all the factors that affect demand. The results of some market experiments can be influenced by bad weather, changing economic conditions, or the tactics of competitors. Finally, because most experiments are of relatively short duration, consumers may not be completely aware of pricing or advertising changes. Thus their responses may understate the probable impact of those changes.

d) End – Use method:

Under this method, the sales of a product are projected through a survey of its end-users. A product is used for final consumption or as an intermediate product in the production of other goods in the domestic market, or it may be exported as well as imported. The demands for final consumption and exports net of imports are estimated through some other forecasting method, and its demand for intermediate use is estimated through a survey of its user industries.

Advantages:

- The principal advantage at this method is that provides use wise or sector wise demand forecast. In the process of obtaining the forecasts of aggregate demand, the forecaster obtains separately the demand by the individual consumer industries, by final consumer categories and by export and import sectors. This information may be useful in manipulating future demand.
- As compare to other survey methods, this method does not require any historical data.

<u>Limitations:</u>

- The major weakness of this method is that it requires every industry to furnish its plan of production correctly and well ahead of time.
- Consumer goods demands can't easily forecasted through this method.
- The individual industry will have to rely on some other method to estimate the future demand of its product for final consumption, export & imports, because the sum of consumption, export net of import demand for any commodity is convenient for the national planning organization. Thus only the intermediate demands or the input demand can be predicted by the end-use method.

B) STATISTICAL METHOD (INDIRECT METHOD):

1. Trend Projection Method:

Under the trend projection method which is one of the indirect methods of demand forecasting, past data is used to project the sales in the coming years. A firm which has been in existence for a long period has its disposal considerable data on sales pertaining to different time periods. Forecast for the future involves gathering of the past information on the subject which calls for the uses of statistical data which is collected at regular intervals of time. This type of data is known as "time series". Thus, When data for different points of time are collected for sales, production, imports, exports etc. say for a period of five years, such data constitute time series. A firm with a long standing may collect time – series data on sale from its own sales department. New firms can obtain similar data from other established firms in the same industry. The time- series data can be used to project the demand for a product through a graph or least square method. Such data can be presented graphically or in a tabular form for further analysis.

- This method is simple and less expensive.
- It gives information only about the increasing, decreasing or constant trend and not the actual quantity likely to be demanded.
- Extension of trend line involves subjectivity and personal judgment which may vary from person to person. Therefore the result may not be reliable.
- This method cannot be used for new product.
- It is based on assumption that has happened in the past will happen in future which is not always true.
- This method cannot be used for short – term estimates and also where trend is of cyclical nature having turning points of troughs and peaks.

2. Regression Method:

This method makes use of both economic theory and estimation techniques to generate forecasts from historical data. From the economic theory, the forecaster identifies the variables which determine the variable under forecasts. He then estimates the alternatives forms of the dependence relationship between the dependant (forecasting) variable and the casual variable, using the historical data on them. The least – square method is usually used for estimation purposes. He selects the form of equation (best relation) both on the basis of economic theory and statistical inference. If forecaster can somehow obtain the likely values of casual variables in the

prediction period, he can then feed those values into the estimated equation to obtain the forecast.

Advantages:

- The principal advantage of this method is that it is prescriptive as well as descriptive that is besides generating demand forecasting, it explains why demand has been at the level it is .
- The regression method is neither mechanistic like the trend method nor as subjective as the experts' opinion survey method.
- Any social scientist possessing sufficient knowledge of economic theory and econometric methods can use this method for forecasting purposes.
- Through the regression method, even cross–section data may be used to predict sales through the regression method. [The cross selection data are data of different populations (individual, consumer, consumer from different regions a country or from different countries etc) measured at the same point of time]

Limitations:

- The major limitation of regression method of forecasting is that it require the use of some other forecasting method to estimate the values of the casual variables in the prediction period. To the extent that forecasts of the values of casual variables are wrong, the forecasts based on this method will be wrong.
- As it is true for all statistical methods, the regression method forecasts on the basis of the past average relationship and so to the extent the future relationship deviates from the past average, the forecast will be wrong.

3. Economic Indicator Method:

This method of demand forecasting uses the most reliable indicator for forecasting the demand for the product concerned, e.g. the most trustworthy indicator for predicting the demand for walking stick, denture etc. is the relative rise in percentage of old people in total population, for agricultural product – right indicator is agricultural income etc. Government and other private institutions publish statistical information which the demand analyst can use with profit.

The difficulty however lies in identifying the correct indicator. It may be necessary in case of some good to take more than one indicator for gauging future demand. In case of certain goods, appropriate indicator may not be available. This difficulty is more pronounced in case of new goods.

4. Leading Indicator Method:

Leading Indicator Method of forecasting is also called Barometric method. This techniques involve statistical indicators, usually time series which, when combined in certain ways, provide indications of the direction in which economy or certain industries in it moving. Normally , three series of indicators are identified:

➢ **Leading Series:** There are leading indicators which run in advance of changes in demand for a particular product. An example of these might be an increase in the number of building permits granted which would lead to an increase in demand for building-related products. Such as wood, concrete and so on. These indicators tend to reflect future market conditions and comprise those aspects which moves up and down ahead of some other series Leading indicators can be used as input for forecasts of aggregate economic variables like gross national product, aggregate consumer expenditure, aggregate capital expenditure etc.

➢ **Coincidental Series:** These indicators coincide with rise or fall in the level of economic activity or market trends. Some of the examples of the coincidental series are as under – rate of unemployment, no. of employees in the non-agricultural sector, gross national product at constant prices etc. Coincidental indicators are used in confirming or refuting the validity of the leading indicator used a few months afterwards.

➢ **Lagging Series:** Lagging series are those which record change after some time lag. Some of its indices are- labour cost per unit of manufacturing output, loan outstanding, lending rates for short-term loan.

5. Simultaneous Equation Method:

Here is a very sophisticated method of forecasting. It is also known as the 'complete system approach' or 'econometric model building'. Moreover, this method is normally used in macro-level forecasting for the economy as a whole; in this course, our focus is limited to micro elements only. Of course, as corporate managers, should know the basic elements in such an approach. The method is indeed very complicated. However, in the days of computer, when package programmes are available, this method can be used easily to derive meaningful forecasts. The principle advantage in this method is that the forecaster needs to estimate the future values of only the exogenous variables unlike the regression method where he has to predict the future values of all, endogenous and exogenous variables affecting the variable under forecast. The values of exogenous variables are easier to predict than those of the endogenous variables. However, such econometric models have limitations, similar to that of regression method.