Summary

- The first step in making estimates for the future consists of gathering information from the past. In this connection, one usually deals with statistical data, which are collected, observed or recorded at successive intervals of time. Such data are generally referred to as ‘time series’. It may be very difficult to study the effect of various factors that either have led to an increase or decrease in sales. The statistician, therefore analyze the effect of the various factors under the following broad heads:

    - Changes that have occurred as a result of general tendency of the data to increase or decrease, known as ‘secular movements’
    - Changes that have taken place during a period of 12 months as a result of change in climate, weather conditions, festivals, etc, such changes are called as ‘seasonal changes’
    - Changes that have taken place as a result of booms and depressions. Such changes are classified under the head ‘cyclical variations’
    - Changes that have taken place as a result of such forces that could not be predicted like floods, earthquake, famines, etc. such changes are classified under the head ‘irregular or erratic variations’

- It is customary to classify the fluctuations of the time series into four basic types of variation, which superimposed and acting all in concert, account for the changes in the series over a period of time. These four types of patterns, movements, or, as they are often called components or elements of time series, are: Secular trends, seasonal variation, cyclical variation and irregular variation.

- In traditional or classical time series analysis, it is ordinarily assumed that there is a multiplicative or additive relationship between these four components hence there are various models represented in the multiplicative form or the additive form or the combining of both the forms, in the multiplicative model it is assumed that any particular value in a series is the product of factor that can be attributed to the various components. Another approach is the additive model where we treat each observation of a time series as the sum of the four components.

- The term ‘secular trend’ or simply “trend” is very popularly used in day-to-day conversation.

- In a dynamic economy where a downward or constant tendency is observed is rare, most of the variables show an upward trend. The general tendency of the data to grow or decline over a long period of time is called ‘Secular Trend’. Trends are classified in to 2 main categories mainly:
    - Linear / Straight Line methods
    - Non-Linear Trends

- In cases of increasing trend, the main factor responsible for such a trend is the population and demand. In cases of declining trends in the series, the reasons could be due to technological, cultural and political.

- It is extremely important that the firm takes into consideration data and trends in planning for demand management, inventory and advertising to create maximum impact on consumers. This might help the firm to strategise upon various factors like introduce diverse products that cater to different seasonal peaks in demands. Other options could be consider manufacturing or accumulating stock in lean period to manufacture at a more reduced rate and spending more on off-seasonal promotion of the those products.

- The Term Cycle refers to the recurrent variations in time series that usually last longer than a year but not regular in length or amplitude. Time series related to economies and business show some kind of cyclical variations. Cyclical fluctuation is long-term movements that represent consistently recurring increase and decline in activity. A business cycle consists of recurrence of up and down movements of business activity from some statistical trend or normal.

- Any business cycle has four well defined period or phases namely:
  - Prosperity
  - Decline
  - Depression
  - Improvement

- Irregular variations refer to variations in business activities that do not have a repetitive pattern. Irregular variations are largely random and hence difficult to predict. The category labelled irregular variations is really intended to include all types of variations other than those accounting for the trend, seasonal and cyclical movements. Irregular movements are considered largely random, being the result of chance factors, which like those determining the fall of a coin are wholly unpredictable.