PLANNING

Definition:

*"Planning refers to a preview of future activities". **– Henry Fayol***

*"Planning is that function of manager in which he decides in advance what he will do. It is a decision-making process of a special kind, it essence is futurity". **– Haynes and Massie***

Nature of planning:

1. ***Planning is a Primary Function:***
   Planning is a base or foundation of management process. All other functions of management are designed to attain the goals set under planning. Planning provide the basis for efficient organizing, staffing, directing and controlling.
   Without planning, there is nothing to organize, no one to actuate and no need to control.

2. ***Planning is Goal Oriented:***
   Planning is a means toward the accomplishment of objectives. Planning has no meaning unless it contributes in some positive way to the achievement of desired goals. All plans starts from objectives.

3. ***Planning is a Continuous Process:***
   Planning is an on-going and dynamic exercise. Planning does not stop after completing the plan. Plans and sub-plans are prepared continuously to adjust to changes in external forces. Of course, once plan is prepared, its basic strategy must not be change.

4. ***Planning is all Pervasive:***
   Planning is not confined to a particular section or department, nor is it limited to top management. It is job of all managers at every level in all type of organizations. Planning tend to decrease as we move down towards the lower level of management. Managers at the top level prepare long term plan for the company as whole, middle level managers formulate departmental plans. At the lower level, managers prepare operating and short term plans.

5. ***Planning is Forward looking:***
   Planning involves anticipating the future course of events. Future is uncertain; forecasting is required to prepare a plan. Forecasting involves assessing the uncertain future make provision for it.

6. ***Planning is a intellectual Process:***
   Planning is a mental exercise. Future is uncertain and unknown; planners have to apply their foresight to make estimates of the future. Past experience and its analysis are useful in estimating future event. Thus, such facilities of mind as understanding, clear thinking, decision making, imagination, sound judgments and foresight are all to be put to work while preparing a plan.

7. ***Planning is a choice of alternative:***
   Planning is essential in choosing alternative course of action. Planning presupposes the existence of alternatives. The basic task of planning is to choose the best alternative among the available alternatives.

Importance of planning:

1. ***Focus attention on Objective:***
   Every organization exists to achieve certain objective. An attempt is made through planning to realize the basic objectives within a definite period of time. In the absence of planning each head of the department will keep only short run benefits to his department and neglect the long term goals, thus, planning keep all managers conscious about organization's goal.

2. ***Reduce Uncertainty and Risk:***
   Future is uncertain. There is continuous change in the environment and the organization in both tangible and intangible forms. Tangible changes are in the form of change in technology. Market forces, government regulations etc. Intangible changes are attitudes, culture etc. All type of changes cannot be eliminated so planning helps the organization to cope with them. With the help of planning, Organization can predict future events and make provisions for them.

3. ***Helps in Co-ordination:***
   Planning is the best stage for the integration of different forces at work. Sound planning inter relates all the activities and resources of an

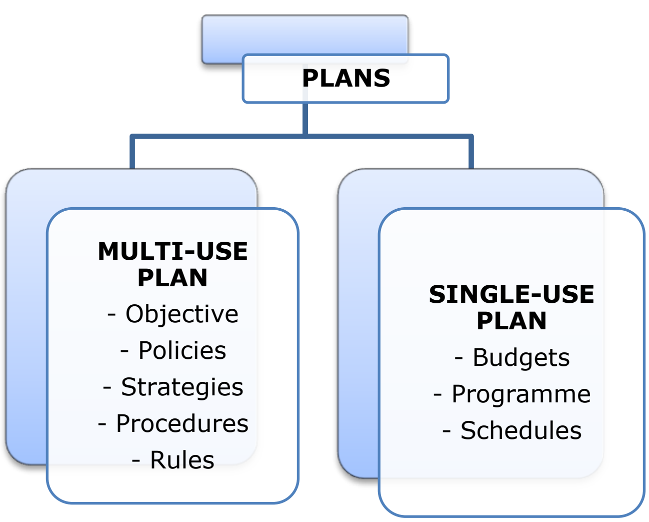
organization. It also helps to relate internal conditions and processes to external events and forces. The activities and efforts of various departments and divisions can be harmonized with the help of an overall plan.

4. ***Helps in Control:***
   If it is not known, what is to be done and how it is to be done, then there is nothing to be controlled. Planning provides the basis for control. Plans serve as standards for the evaluation of performance. Sound planning enables management to control the events.

5. ***Increase Organizational Efficiency:***
   Planning facilitates optimum utilization of available resources. It also helps in reducing wastage so it reduces cost. Each resource of the organization has a specific use at a particular time. Thus, Planning along with control ensures that resources are put in action in a way in which these have been specified.

6. ***Helps other functions of management:***
   Planning leads all other managerial functions. Since managerial operations in organizing, staffing, directing, and controlling are designed to support the accomplishment of organizational objectives, planning logically leads the execution of all other managerial functions. If policies and programmes are clearly laid down, it can be clearly decided how many employees are to be engaged, what sort of training will they need and how are they to be directed etc.

Types of plan:



Multi- use Plans : *Multi- use Plans are used repeatedly in situations of a similar nature. They are long term in nature and represent standing answers to recurring problems. They serve as ready guides to action.*

- ***Objective:***
  Every organization exists to achieve some purposes which are called its objectives. Objectives may be defined as the ends, purposes or aims which an organization wants to achieve over varying periods of time. According to Allen, "Objectives are goals established to guide the efforts of the company and each of its components."
  The terms, objectives, mission, goal, target, standard, quota, deadline, etc. are used interchangeably in management literature.

  Mission: The term mission also indicates the end which is to be achieved over the whole life of an organization. The term mission is used generally in non-business organizations like a college, a religious trust, a club, a government, etc. for example, elimination of poverty is the mission of the government of India.

  Goal: A goal is the aim of the organization expressed in specific terms. For example, the goal of Ford Company was to provide cheap and economical mode of transport. Goals are generally measurable like achieving 20% rate of return on capital employed. They are time specific and also realistic. Some people call them targets also.

- ***Policies:***
  Policies are also plans. Policies are general statements which guide the subordinates in decision making in various departments in organization. Policies deal with "how to do" the work. They only provide a framework within which decisions must be made by managers at all levels, e.g. higher positions must be filled by promotion only, raw materials must be purchased from local suppliers etc. are policies laid down by top management. They may be price policy, recruitment policy, purchase policy, advertisement policy etc. Quick decisions can be taken on the basis of policies without consulting the superior.

- ***Strategies:***
  The concept of strategy in business has been borrowed from military science where it implies the art of the military general to fight the enemy. The term 'strategy' began to be used in business with increase in

competition and complexity of operations. A strategy is a type of plan which is prepared to meet the challenges posed by the activities of competitors and other environmental forces. Strategies may be regarded as plans made in the light of the plans of the competitor. e.g. if the manager anticipate price-cut by competitors, he may prepare a strategy of launching an advertising campaign to convince the customers of the superiority of his product.

- ***Procedures:***

  A procedure is a sequence of steps to be undertaken to enforce a policy and to achieve an objective. It lays down the specific manner in which a task is to be performed. It is a planned sequence of steps for performing repetitive activities in a uniform manner. Procedures are used in all functional areas of business. In business procedures are laid down for purchase of raw materials, processing of orders, selection of employees etc. As procedures lay down a standard way of doing a job, it ensures smooth functioning various activities of organization.

- ***Rules:***

  Rules specify what should be done or not done in given situations. It is rigid and definite plan and leaves no scope for deviation. Rules ensure uniformity of action. It also facilitates discipline in the organization. A rule is different from a procedure. While a procedure specifies the sequence of steps, a rule may or may not concern with the sequence of steps. e.g, 'No smoking in the factory' is not a part of any procedure but it is a rule. 'All orders must be acknowledged within 48 hours of their receipts' is a part of the procedure for processing orders.

Single-use Plans: *Single-use Plans are formulated to meet unique and non-repetitive situations. This are tailored to fit specific situations. It is short duration and non-recurring in nature.*

- ***Budgets**:*

  A budget is a plan giving the expected results expresses in numerical terms. It may be expressed in time, money or other units. A budget may be prepared for sales, production, material, labour, any cash or capital expenditure. A budget is an instrument of both planning and controlling. It provides a standard by which actual operations can be measured and variances are found out. Generally, a budget is prepared for one year

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- ***Programme:***
  A programme is a comprehensive plan designed to implement the policies and accomplish the objectives. It spells out clearly the steps to be taken, resources to be used and the time period within which the task to be completed. It also indicates who should do what and how. The programmes are of two types; major programme and minor programme. Major programme is the basic plan and minor programme may be supplementing the major programme or it may be independent too.

- ***Schedule:***
  A schedule is a time table of work. It specifies the date when task is to be begin and the time needed to complete each task. The starting and completion date for each part of the programme are specified in the time schedule. Schedule is the process of establishing time sequence for the work to be done. Schedule is necessary in all organization to ensure completion of each task at the right time.

Planning process:

Planning vary among business unit, as their problem are not alike. But the steps involved in planning are basically the same for all of them. The steps in planning are stated as follow:

1. ***Establishing Objectives***
   Plans are formulated to achieve certain objectives. Therefore, the first step in the planning process is to identify the goals of the organization. Objectives set must be stated clearly and in measurable terms. For, example, quantity standards, cost targets and quality specifications are measurable objectives. Objectives should be established in all key areas where performance affects the health of the organization. Objectives should be laid down after an analysis of the internal and external environment of the organization. The broad objectives of the enterprise must be laid down first and then it may be sub divided into various goals for different departments of the enterprise. If there is more than one objective, they should be arranged in order to priority.

2. ***Building Premises***
   Planning is done for future. Hence basic premises must be established. The premises are assumptions about future in which planning takes place. Assumptions are to be made about future price of the products, wages

rates, taxes, sales etc. A manager has to base a planning on these assumptions. These premises are classified as under:

- *(a) External and internal premises*
- *(b) Tangible and intangible premises*
- *(c) Controllable and uncontrollable premises*

In order to develop good planning premises, it is necessary to collect data on the current status of the organization and to forecast future changes.

3. *Identification of Alternatives*

Generally, there are alternative ways of achieving the same goal. For example, in order to increase sales, an enterprise may launch advertising campaign or reduce prices or improve the quality of products. Therefore alternative course of action should be determined. This requires imagination, foresight and creativity. In determining alternatives, the critical or limited factors must be kept in view.

4. *Evaluation of Alternatives*

After considering all possible alternatives, each one of them must be properly assessed in terms of its profitability, cost, risk etc. For this purpose mathematical and statistical methods and formulas may be used wherever possible. The strong and weak points of every alternative should be analyzed carefully.

5. *Choice of Alternative*

Assessment of various alternatives makes comparison possible and easier. The best alternative among then can be easily identified. The selection of the alternative must be made carefully and at a right time, because the selection of an alternative can have far reaching effects on the enterprise.

6. *Formulation of supporting plan*

After formulating basic plan, various plans are derived so as to support the main plan. In an organization there can be various sub plans like planning for buying equipments, buying raw materials, recruiting and training personnel, developing new product, etc. These derivative plans are formulated out of the main plan and, therefore, they support it.

7. *Providing follow-up*

The plan may be executed on an experimental basis and the chances of its success may be assessed, the defects of difficulties noticed during such *trial may be rectified. Also, it is essential to keep an eye on the progress of the plan, when it is fully put into operation. Its results must be checked at frequent intervals and corrective steps must be taken in time before it is too late. All these experiences can be helpful in formulating plans in future.*

BUSINESS FORECASTING

"Business forecasting refers to the statistical analysis of the past and current movements in the given time series so as to obtain clues about the future pattern of these movements". ***– Neter and Wasserman***

Importance of forecasting

1. ***Key to Planning****:*
   Forecasting plays an important role in business planning. Forecasting provides key information and facts relating to the future for taking planning decisions. Forecasting provides the knowledge regarding the nature of future conditions. Planning without forecasting is quiet impossible.
2. ***Means of Coordination.***
   People at different levels participate in the process of forecasting. Regular interactions between the members of the organization facilitate cooperation and unity among them.
3. ***Basis for Control.***
   Forecasting provides relevant information for exercising control. The managers can know their weaknesses in forecasting process and take suitable action to overcome these. Forecasting can disclose the areas where control is lacking. Once such areas are identified, steps can be taken to make control effective.
4. ***Executive Development****.*
   Forecasting requires executives to look ahead, think through the future and improve their mental faculties. Managers develop the habit of collecting, analyzing and interpreting data instead of depending on guesswork.
5. ***Facing Environmental Challenges****.*
   Forecasting provides clues about the future happening, With the help of this knowledge, managers can save the organization from the impact of trade cycles and other threats.

Limitation of forecasting

1. ***Based on Assumptions****:*
   All forecasts are based on certain assumptions which may not always be true. The basic assumption behind forecasting is that events do not change haphazardly and there is an orderly pattern in their behavior. The assumption may not hold well in all cases. As a result, forecasts may become unreliable.
2. ***Not absolute Truth:***
   Forecasts only indicate the trend of future events and may not be fully true. The various techniques of forecasting simply project the future trends and cannot guarantee that a particular trend will occur in future. All forecasts are wrong; they only differ in the degree of error. There is always a possibility of mistake.
3. ***Time – consuming and Expensive****:*
   Lots of time and money are involved in the collection, analysis and interpretation of data for forecasting. Therefore, forecasting is useful only to the extent that benefits expected from it exceed the time and cost involved.

MANAGEMENT BY OBJECTIVE (MBO)

In 1954, Peter Drucker suggested "management by objectives and self-control" as the basis of measuring the performance of managers in an organization. In 1961, Edward Shelh advocated management by objectives as a means of integrating individuals with the organization. In 1965, John Humble, a British management consultant, published his book "Management by Objectives". Management by objectives is known by different names, e.g. "Management by results". "Goals management," "Work planning and review." In recent years, management by objectives has become a philosophy of managing in many enterprises.

Meaning:

MBO is both a philosophy and a technique of management. It represents a rational and systematic approach to management wherein measurable goals are set up in consultation with subordinate managers and the contribution of each individual is judged in terms of such goals. According to George Odiorne, "MBO is a process whereby the superior and the subordinate managers of an enterprise jointly identify its common goals, define each individual's major areas of responsibility in terms of the results expected of him, and use these measures as guides for operating the unit and assessing the contribution of each of its members."

Features:
The above definition reveals the following characteristics of MBO:

1. *MBO focuses attention on what must be accomplished (goals) rather than on how it is to be accomplished (methods). It is a goal-oriented rather than work-oriented approach.*
2. *MBO involves participation of subordinate managers in the goal setting process. It requires all key personnel to contribute maximum to achieve the overall objectives.*
3. *MBO allows management to attain maximum results available resources.*
4. *MBO involving linkage between organizational goals and individual goals.*
5. *MBO is a continuous process of goal setting, periodic appraisals and modification of goals and performance.*
6. *It sets an evaluative mechanism by which the contribution of each individual can be measured.*

Objectives:

Management by Objectives is intended primarily:

1. *To measure and judge performance;*
2. *To relate individual performance to organizational goals;*
3. *To enhance communications between superiors and subordinates;*
4. *To stimulate the subordinates' motivation' and*
5. *To serve as a device for organizational control and integration.*

Steps in MBO Process:

The MBO process consists of the followings stages:

1. ***Preliminary Goal-setting.***
   The first phase of MBO is the clarification of the objectives which the organization is to attain. The long-term overall goals of the enterprise are laid down in the key result areas. These goals are laid down keeping in view the internal and external environments of the organization. Usually, the objective setting starts at the top level of the organization and moves downward to the lowest managerial level.

2. ***Key Result Areas****.*
   Organizational objectives and planning premises together provided the basis for the identification of key result areas (KRAs). It may be emphasized that KRAs are derived from the expectations of various stakeholders and indicate the priorities for organizational performance. KRAs also indicate the present state of an organization's health and the top management perspective for the future. Examples of KRAs applicable to most of the business organizations are (i) profitability, (ii) market standing. (iii) innovation, (iv) productivity, (v) worker performance, (vi) financial and physical resources, (vii) manager performance, and (viii) public responsibility. KRAs get changed over the period in response to new needs and opportunities.

3. ***Setting Subordinates' Objectives.***
   The organizational objectives are achieved through individuals. Therefore, each individual manager must know in advance what he is expected to achieve. The process of objective setting begins with superior's proposed recommendations for his subordinate's objectives. In turn, the subordinate state his own objectives as perceived by him: Thereafter, the final

objectives for the subordinate are set by the mutual negotiation between superior and subordinate. In the beginning of MBO process in an organization, there may be wide gap between the recommended objectives by the superior and subordinate's stated objectives because the letter may like to put lesser burden on him by setting easily achievable objectives.

4. ***Matching Resources with Objectives***.

   When objectives are set carefully, they also indicate the resource requirement, there should be matching between objectives and resources. By relating these to objectives, a superior manager is better able to see the need and economy of allocating resources. The allocation and movement of resources should be done in consultation with the subordinate manager.

5. ***Appraisal.***

   Appraisal aspect of MBO tries to measure whether the subordinate is achieving his objective or not. If not, what are the problems and how these problems can be overcome. Appraisal is undertaken as an on-going process with a view to find out deficiency in the working and also to remove it promptly. It is not taken merely to punish the non-performer or to reward the performer. It is taken as a matter of systems to ensure that everything is going as planned and the organization is able to achieve its objectives.

6. ***Recycling.***

   Though appraisal is the last aspect of MBO process, it is used as an input for recycling objectives and other actions. Objectives are neither set at the top and communicated to the bottom nor are they set at the bottom and go up. Objective setting is a joint process through interaction between superior and subordinate. The outcome of appraisal at one level is recycled to see if the objectives have been set properly at the level concerned and also at the next higher level.

DECISION MAKING

Definition:

'*Decision making can be defined as the selection based on some criteria of one behavior alternative from two or more possible alternatives'.* ***– George R. Terry***

'Decision making is the actual selection from among alternatives of a course of action. It is at the core of planning." ***– Koontz and O' Donnell***

Characteristic of Decision Making:

1. ***Goal – Oriented:***
   Decision making is a goal oriented process. Decisions are made to achieve some goal or objective. The intention is to move toward some desired state of affairs, there may just be a decision not to decide.
2. ***Alternatives are the bases:***
   The problem of selection arises only when various alternatives are available. If there are no alternatives, no decision is to be made. Earnest Dale put emphasis on this fact, when he defines decision making as the selection of action from among various available courses of action.
3. ***Intellectual Process:***
   The decisions are made intelligently, that is, in such a manner that basic objectives of business are achieved. According to Franklin G, Moore, decision making is a human and psychological process. The relevant information is to be collected, analyzed and arranged and then cause-effect relationship is to be established. All this requires powers of imagination, memory and calculation.
4. ***Process of rational thinking:***
   Rash and immature decisions can harm the business. It is therefore necessary to take decisions after careful consideration of all aspects of the problem on hand.
5. ***May be positive or negative:***
   Not all decisions are positive sometimes they are negative also. The managers may decide not to do a certain things.

Types of Decision Making:

Managerial decisions may be classified into the following categories:

1. ***Programmed and Non-programmed Decision.***

According to Herbert Simon, **programmed decisions** *are concerned with relatively routine and repetitive problems. Information on these problems is* *already available and can be processed in a preplanned manner. Such decisions have short-term impact and are relatively simple. They are, therefore, made at lower levels of management. Decision rules and procedures are established to save time and effort on such decisions. These decisions require little thought and judgment. The decision-maker identifies the problem and applies the predetermined solution. For example, if an employee is habitually a late comer, he can easily be dealt with under the established procedure.*

Non-programmed decisions *deal with unique or unusual problems. Such non-repetitive problems cannot be tacked in a predetermined manner. There are no readymade answers for such problems. Therefore, high degree of executive judgment is required to solve them. Location of plant, takeover of a sick mill, opening of a new branch, development of a new product is examples of such decisions. These decisions are generally made by higher-level managers.*

2 Routine and Strategic Decisions.

Routine or operating decisions *are of repetitive nature. They involve short-term commitments and have minor impact on the future of the organization. Therefore, these decisions are generally made at lower levels of management. These decisions relate to day-to-day operations of business. Usually standard procedures are established to make such decisions quickly. For example, a supervisor can decide whether an employee is untitled to overtime pay or not.*

Strategic or policy decisions *involve long-term commitments and large investment. These exercise a permanent influence on the future of the organization as a whole. Therefore, these decisions are made at higher levels. Launching a new product, location of a new plant, installation of a computer system are examples of strategic decisions. Policy decisions are sometimes published as policy manual to guide operating managers.*

3 Organizational Decisions and Personal Decisions:

Organizational decisions*: Chester Barnard is not opinion the business decisions can be classified into organizational decisions and personal decisions. The decisions made by a manager in the organization on the basis of the power delegated to him are organizational decisions. They are of formal nature rooted in the powers of the executive and influencing a large number of employees in the organizations. These decisions are made with a view to promoting the interests of the whole business organization. These decisions are made in consultation with other executives. How much to produce, how much capital is to* *be issued, how much materials should be purchased, these are some of the examples of organizational decisions.*

A decision that concerns only a single employee in the organization and is made in individual capacity for personal matters is known as ***personal decision.*** *Though these relate to personal matter, they do affect the working of the organization. For instance, if an employee takes decision on retiring, it is a case of personal decision. The making of this decision does not require special powers or authority. Moreover, the results of the decision are to be borne by the person concerned only.*

Obviously, organizational decisions are more important as compared to personal decisions from the viewpoint of business managers.

4. Individual and Group Decisions:

Individual decisions *are those which are made by one individual. These decisions are predominant in small scale business owned by a single individual. Authority is to take decisions is not assigned nor any discussion is held with other persons. The individual concerned himself takes these decisions on his own. Generally these decisions are take in emergency or in crisis.*

The decisions taken by a group of the members of organization after deliberation among themselves are called ***group decisions****. The decisions taken by the board of directors, a committee of the experts or a sub - committee are group decisions. It has become a common practice now a days to take decisions through group discussion and an exchange of views, opinions and advice. For this reasons, group decisions are accepted and implemented without much delay. As stated by* ***Dalton Macfarland****, Group decision is a process in which individuals combine in a group and take decisions. Hence such decisions tend to be more effective and matured.*

Decision Making Techniques:

There are various techniques of decision making, They can be broadly divided into the following two groups:

A. *Traditional or Non-quantitative*
B. *Modern or Quantitative*

A. Traditional / Non-quantitative:

1. Intuition:

If a manager takes certain decision thinking that it is a right decision. It is called decision-making through intuition. It is made mainly under the influence of personal opinions, beliefs, knowledge, likes and dislikes of the decision maker. In the past, a person who could take business decisions on intuition was hailed as a capable manager but in present times, it is not, generally used when important are to be made.

Merits:

a) *Decision can be made immediately as no other individuals are to be consulted.*
b) *This method is more useful for taking day to day decisions.*
c) *Decision maker can be use his experience and knowledge to the make decision.*

Demerits:

a) *Knowledge and experience of an individual are bound to be limited.*
b) *Decisions made under the influence of individual opinions and emotions are more likely to be harmful and misleading.*

2. ***Facts:***

Business decisions should be based on actual fact rather than on individual preference. Decisions based on facts can be regarded as decisions based on a sound foundation. But the essential condition is that complete data must be available to the decision maker. The factual data should be classified and analyzed and interpreted in a scientific manner. The decision based on facts can to a large extent reduce the uncertainty of the future.

Merit:

a) *Goal-oriented decision can be made with the help of this method.*
b) *These decisions are more likely to be scientific as they are based on facts and figures.*
c) *The decisions based on facts tend to reduce future uncertainties.*

Demerit:

a) *If factual data are incorrect, decisions based on them cannot be useful.*
b) *Even if factual information is correct, decisions will be misleading is any error is committed in its classification, analysis or interpretation.*
c) *The method is expensive, time consuming and difficult.*

3. ***Experience:***

   Experience is the best teacher and guide for man. For managers too, experience is a valuable asset. Practical knowledge serves as a guide in decision making. Manager should take some guidance from their past experience. But not blindly follow it. The past decisions should be modified to the extent current situation is different from the past. Experience and facts are the subject of history. They related to the past. Good decisions should be evaluated on the basis of future events, If past experience is utilized and future situation is kept in view while taking decisions, they can be more effective and successful.

4. ***Considered opinion:***

   Under this technique, decision makers discuss the problem with their colleagues and friends and give enough importance to their considered opinion. They stand ready to make alterations importance to their considered opinion. The considered opinion of the colleagues, if given due weightage in decision making, lends more credibility to the final decisions and also induces them to co-operate fully in their implementation.

B. Modern / Quantitative:

1. ***Probability Theory**:*

   Probability theory has substantial role into decision making. It has been applied in pricing, product innovation, marketing and other related areas. The theory provides the decision maker a strong base for ascertaining the happening of future events. The probability theory is based upon the conclusion from experience that future events tend to occur in a predictable pattern with some deviations.
2. ***Game Theory:***

   Game theory is a mathematical theory that deals with making decisions when two or more intelligent and rational competitors are involved under conditions of conflict or competition. The primary aim of game theory is to develop rational criteria for selection a strategy. This is based on the assumption that every player in the game is perfectly rational and seeks to win the game. The popular examples of such competitive situations may be two companies competing for the major share of the market, managers and union leaders engaged in collective bargaining, two teams engaged in a limited over cricket match etc.
3. ***Queuing or waiting line Theory:***

Queuing theory involves the mathematical study of queues or waiting lines so as to balance the costs of waiting lines and the cost of reducing queues by increased service facility. A queuing problem arises whenever the demand for the service exceeds the service facilities. The objective of queuing theory is to determine a system that will minimize the sum of the cost of customer waiting and the cost of idle facilities. This theory does not directly solve the problem. It provides vital information for decision making. Development and analysis of queuing model requires advanced mathematical and statistical knowledge.

4. ***Linear Programming:***

   Linear Programming is a mathematical technique for allocating scarce resources along with internal and external constraints so as to achieve the optimum goal. The word 'linear' implies that the relationship among different variables in proportionate. The term 'programming' means planning. Thus linear programming involves the finding of an optimum combination of scarce resources. Linear programming involves building a mathematical model to describe the problem. Linear programming is the most versatile mathematical technique used in business decision making.

5. ***Network Analysis:***

   Network analysis is a widely used operations research technique. A network may be defined by a set of points that are connected by lines. The lines in a network are generally characterized in terms of time, cost or distance involved in crossing them. There are two most commonly used techniques of net work analysis- Programmes Evaluation and Review Technique (PERT) and Critical Path Method (CPM).

6. ***Decision Tree:***

   A schematic tree-shaped diagram used to determine a course of action. Each branch of the decision tree represents a possible decision. The tree structure shows how one choice leads to the next, and the use of branches indicates that each option is mutually exclusive. Decision tree also help you to form a balanced picture of the risks and rewards associated with each possible course of action. A decision tree can be used to clarify and find an answer to a complex problem. The structure allows users to take a problem with multiple possible solutions and display it in a simple, easy-to-understand format that shows the relationship between different events or decisions. The furthest branches on the tree represent possible end results.