

## PLANNING AND DECISION AIDS-II

### 1. TECHNIQUES FOR ALLOCATING RESOURCES.

**Resources** are the assets of the organization and include financial, physical, human, intangible, and structural.

#### 1.1 Budgeting

A **budget** is a numerical plan for allocating resources to specific activities. Budgets are popular because they're applicable to a wide variety of organizations and units within an organization.

1. There are four different types of budgets.
  - a. A **revenue budget** is a budget that projects future sales.
  - b. An **expense budget** is a budget that lists the primary activities undertaken by a unit and allocates a dollar amount to each.
  - c. A **profit budget** is a budget used by separate units of an organization that combines revenue and expense budgets to determine the unit's profit contribution.
  - d. A **cash budget** is a budget that forecasts how much cash an organization will have on hand and how much it will need to meet expenses.
2. These budgets are based on the assumption of a single specified volume—**fixed budgets**. However, volume can't be predicted exactly. Therefore, a **variable budget** is a budget that takes into account the costs that vary with volume.

#### 1.2 Scheduling

**Scheduling** involves a list of necessary activities, their order of completion, which is to do each, and time needed to complete them. Some useful scheduling tools include the following.

1.2.1. The **Gantt chart**, named after Henry Gantt, is a scheduling chart that visually shows actual and planned output over a period of time.

A **Gantt chart** is a specialized bar chart that shows the current progress on each major project activity relative to necessary completion dates.

1. A project is broken down into separate main activities listed on the left side of the chart.
2. The time frame is listed at the top or the bottom of the chart.
3. The duration and scheduling of activities is shown by a bar.
4. Gantt charts do not show interrelationships among activities.
5. Software packages for creating and using Gantt charts (and many other decision tools) on computer are becoming widely available.

#### 1.2.2 PERT, or Program Evaluation and Review Technique

PERT is a network planning method for managing and controlling large one-time projects. It is a technique for scheduling complicated projects comprising many activities, some of which are interdependent.

A **PERT network** is a flowchart like diagram that depicts the sequence of activities needed to complete a project and the time or costs associated with each activity.

1. All of the major activities in the project are specified.
2. The sequences of these activities are determined
3. A **network diagram** a graphic depiction of the interrelationships among activities, is constructed.
  - a. An **activity** is a work component to be accomplished, and is represented by an arrow on the network diagram.
  - b. An **event (or node)** represents a single point in time that is the

- beginning or the ending of an activity.
4. Three time estimates for each activity are determined and an expected time is calculated for each activity.
5. The **critical path** is the path of activities and events in the network that will take the longest time to complete
  - a. Delays on any activities on the critical path mean that the project will be delayed.
  - b. **Slack** is the degree of latitude about when various activities can be started without endangering the completion date of the entire project.
6. After the project has begun, actual times for completion of each activity are collected and recorded on the PERT network so that any rescheduling and adjustments can be made as quickly as possible.

Please remember in PERT charts the followings:

- 1) **Events** are end points that represent the completion of major activities in a PERT network.
- 2) **Activities**, which are the time or resources required to progress from one event to another in a PERT network.
- 3) **Slack time** is the amount of time an individual activity can be delayed without delaying the whole project.
- 4) **Critical path** is the longest or most time-consuming sequence of events or activities in a PERT network.

### 1.3 Breakeven Analysis

**Breakeven analysis** is a technique for identifying the point at which total revenue is just sufficient to cover total costs.

### 1.4 Linear Programming

**Linear programming** is a mathematical technique that can be used to solve resource allocation problems. **Linear programming (LP)** is a quantitative tool for planning how to allocate limited or scarce resources so that a single criterion or goal (often profits) is optimized.

1. It is the most widely used quantitative planning tools in business.
2. There are optimal conditions for using linear programming.
  - a. A single objective must be achieved.
  - b. Attainable constraints exist.
  - c. Variables are linearly related to the objective, i.e., and increase (or decrease) in the variable leads to a proportional increase (or decrease) in the objective.

## 2. CONTEMPORARY PLANNING TECHNIQUES.

Two planning techniques that are appropriate for planning in an environment that's both dynamic and complex are project management and scenario planning.

### 2.1 Project Management

A **project** is a one-time-only set of activities that has a definite beginning and ending point in time. **Project management** is the task of getting a project's activities done on time, within budget, and according to specifications.

### **Project Management Process.**

There are seven steps in the project planning process.

- a. Define objectives.
- b. Identify activities and resources.
- c. Establish sequences.
- d. Estimate time for activities.
- e. Determine project completion date.
- f. Compare with objectives.
- g. Determine additional human resource requirements.

The role of the project manager

- a. The only real influence project managers have is their communication skills and their power of persuasion.
- b. Team members seldom work on just one project; they're usually assigned to two or three at any given time.

### **2.2 Scenario planning**

A **scenario** is a consistent view of what the future is likely to be.

1. Developing scenarios also can be described as contingency planning.
2. The intent of scenario planning is not to try to predict the future but to reduce uncertainty by playing out potential situations under different specified conditions.
3. Scenario planning is difficult to use when forecasting random events

### **3. Other Planning Techniques:**

**3.1 Queuing or waiting-line models** are mathematical models that describe the operating characteristics of queuing situations.

1. Queuing situations can be any combination of single-server or multiple-server queues.
  - a. Single-server queues involved service provided at a single point.
  - b. Multiple-server queues occur when a number of stations draw from a single line.
2. Queuing models allow managers to vary the parameters of a situation to determine the probable effects.

### **3.2 Simulation Models**

Simulation is a mathematical imitation of reality. It is used when the situation is too complex for linear programming or queuing theory.

### **3.3 Decision Trees**

Trees are graphic models displaying structures of a sequence of alternative course of action and usually showing payoffs associated with various paths and probabilities associated with potential future conditions.