

4. WBS creation breeds commitment

- The process of developing and completing a WBS breeds excitement and commitment.
- Although the project manager will often develop the high-level WBS, he will seek the participation of his core team to anticipate or estimate extreme detail of the WBS. This participation will spark involvement in the project.

4.6 ROLE ASSIGNMENT

- After preparing WBS, next step is to assign roles and responsibilities to various people of project team because everybody in the project needs to understand their role and responsibilities.
- During this process we try to assign works identified during WBS with the help of OBS, so that different responsibility levels and appropriate reporting needs can be clearly defined.
- This task of role assignment is very effectively and efficiently done by the concept of RACI matrix.
- RACI matrix is a tool used for identifying roles and responsibilities and avoiding confusion of roles and responsibilities during a project.

The acronym RACI stands for:

- **Responsible:** The person who does the work to complete the activity. They have responsibility for getting the work done or decision made.
- **Accountable:** The person who is accountable for the correct and thorough completion of the task. This must be one person and is often the project executive or project sponsor.
- **Consulted:** The people who provide information for the project and with whom there is two-way communication. This is usually several people, often subject matter experts.
- **Informed:** The people kept informed of progress and with whom there is one-way communication. These are people that are affected by the outcome of the tasks; hence need to be kept updated.

Table 4.1
RACI matrix

Person \ Task	Person A	Person B	Person C	Person D
Task 1	R	A	C	I
Task 2	A	R	C	I
Task 3	C	R		A
Task 4	R	C	I	A
Task 5	I	A	R	

4.7 PROJECT SCHEDULING

- Project scheduling is a process of determining project completion time such that implementation of project is done within this estimated time limit.
- Project scheduling is the process of identification of sequence of activities, their order of occurrence and resources required for each activity.
- Steps in project scheduling:
 1. **Defining the activities:** The high-level requirements are broken down into high-level tasks or deliverables. These are then broken down into activities and presented in the form of WBS (Work Breakdown Structure).
 2. **Sequencing the activities:** The activities identified in the previous step should be sequenced based on the order in which they are needed to be done depending on their interdependencies.
 3. **Estimating the resources required:** The estimation of the amount and the types of resources required for activities is done in this step. The project management team will need a clear understanding of resource availability and capability.
 4. **Estimating the time required:** This is a key step in the project planning process and there are a number of tools that can also be utilized to help you to estimate the required activity resources. Most of the organizations follow Work Breakdown Structure (WBS) based estimating. Once the activity estimates are completed, the critical path of the project should be identified in order to determine the total project duration. This is one of the key inputs for the project schedule management.
 5. **Developing the schedule:** In order to create an accurate schedule, several parameters from the previous steps are required including: the activity sequence, duration of each activity, and the resource requirements. Techniques used for project scheduling is as discussed below.

4.7.1 Techniques for Project Scheduling

A. Bar Charts

- Bar charts were introduced by Henry Gantt around 1900 A.D., therefore they are also called as **Gantt charts**.

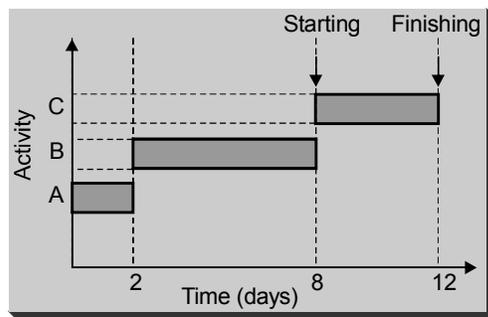


Fig. 4.2

- Bar chart is a graphical representation of activity v/s time.
- Horizontal axis represents the time duration and vertical axis represents activities or jobs to be performed.

Advantage of Bar Chart

1. It is simple to draw, easy to understand and can be drawn quickly.
2. No trained/skilled personnel are required to make the chart.
3. The progress achieved at site is expressed in terms of percentage.
4. It may be used for depicting the resource requirement of a construction project.
5. It provides a visual representation of the entire project which shows exactly when each of the above activities is supposed to start and finish.

Limitations of Bar Chart

1. Lack of Degree of Details

In case of big projects only major activities can be shown, if all the activities of big project are shown on the bar chart then it may become too clumsy. Therefore bar charts are not preferred for big projects.

2. Review of Project Progress

A bar chart does not show the progress of work in the project and therefore it can not be used as a control device.

3. Activity Inter-relationship

There is a serious drawback with the bar charts that they do not show interdependencies and relationship between various activities of the project.

4. Time Uncertainties

Bar charts are not at all useful in those projects where there are uncertainties in determination of time required for completion of particular activities. e.g. research projects.

5. It does not indicate the critical activities of the project.

It does not distinguish between critical and non-critical activities, knowledge of critical activities need the maximum attention of construction team to finish the project in time.

6. No Cost Optimization

Since exact critical path is not available in bar chart so it is not possible to crash the activities and get the optimum cost and duration of the project.

B. Milestone Charts

- The milestone chart is a improvement over the original bar chart.
- In each activity, there are certain key events which mark the completion of certain portion of the main activity. Such key events are called as milestone.
- Milestone can be represented by a arrow, square or a circle on the bar of that particular activity.

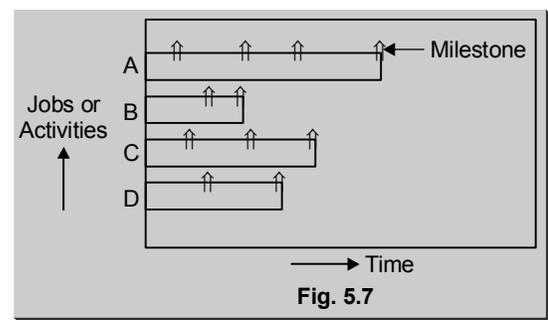


Fig. 5.7

- Each milestone can be considered to be specific event along the main activity and this chart is called as milestone chart.
- It has been observed that when a particular activity represented by a bar is very long. The details of sub-activities will be lacking.
- If, this activity is broken down into number of sub activities or key events, each one of which can be recognised during the progress of that activity, and through which controlling can be achieved.

Limitations of Milestone Chart

In milestone chart relationship between two activities is not revealed.

4.8 NETWORK ANALYSIS TECHNIQUE

- A network is a graphical and logical model or plan which lists out the sequence of various activities (with interdependencies) which are required for the completion of project.