Planning and Managing the Project

Work Breakdown Structure (WBS):

In software engineering, tracking progress and managing projects effectively are essential for ensuring successful outcomes. One crucial aspect of project management is the development of a Work Breakdown Structure (WBS), which helps in organizing and planning the project's tasks and activities. Here's an overview of WBS and its importance:

Tracking Progress:

- Understanding the customer's needs, designing a system to address those needs, estimating development time, and determining project costs are fundamental questions in project management.
- Project schedules outline the software development cycle, breaking it down into phases, stages, tasks, and activities.
- Milestones mark significant points in the project, such as the completion of an activity or phase.

Purpose of Creating WBS:

WBS improves the accuracy of cost, time, and resource estimates, defines a baseline for performance measurement and control, and facilitates clear responsibility assignments.

Activity: takes place over a period of time.

Milestone: completion of an activity -- a particular point in time.

Precursor: event or set of events that must occur in order for an activity to start.

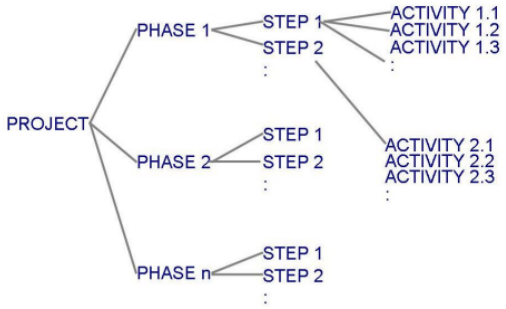
Duration: length of time needed to complete an activity.

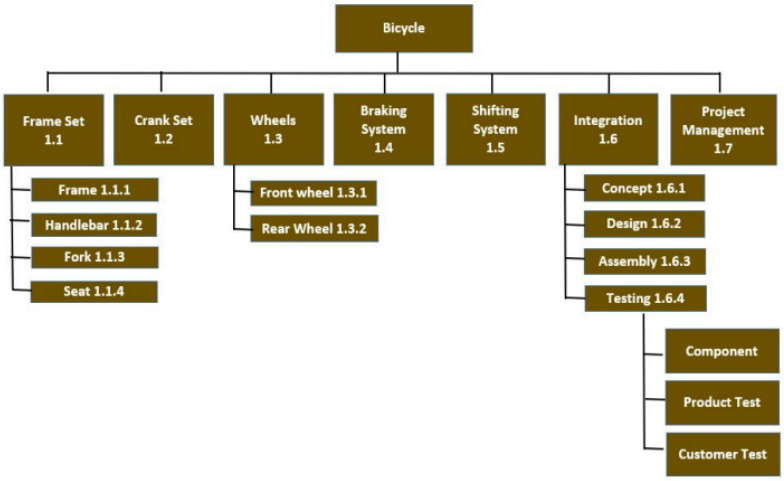
Due date: date by which an activity must be completed.

WBS Example:

A WBS example illustrates how the project's tasks and activities are broken down into manageable components, providing a clear structure for project execution.

Project development can be separated into a succession of phases which are composed of steps, which are composed of activities

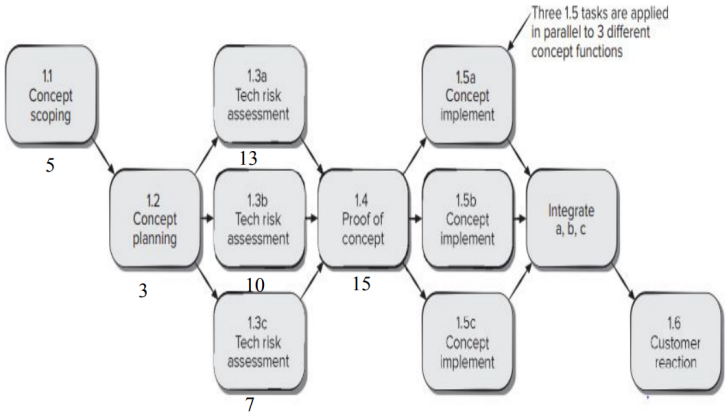




Activity Graphs:

Activity graphs, such as PERT charts, depict dependencies among activities, showing nodes for project milestones and lines for activities involved.

A Task Network for concept development



Critical Path Method (CPM):

- CPM determines the minimum time required to complete a project by identifying critical activities that must be completed on time.
- Critical path analysis helps in scheduling and resource allocation, ensuring timely project delivery.

Real time (actual time): estimated amount of time required for the activity to be completed.

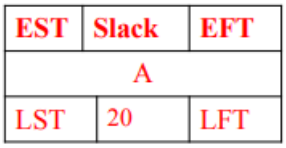
Available time: amount of time available in the schedule for the activity's completion.

Slack time: the difference between the available time and the real time for that activity

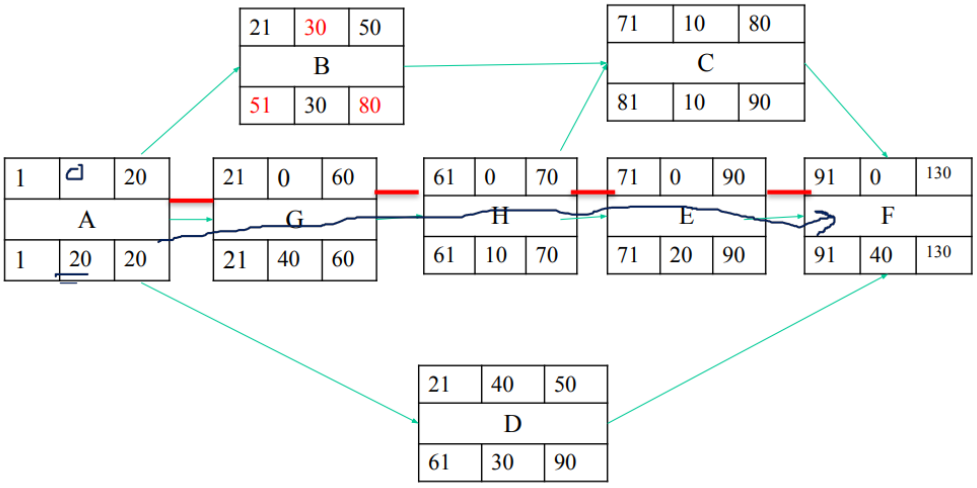
Slack time = available time – real time

= latest start time – earliest start time

Critical path: the slack at every node is zero
→ can be more than one in a project schedule



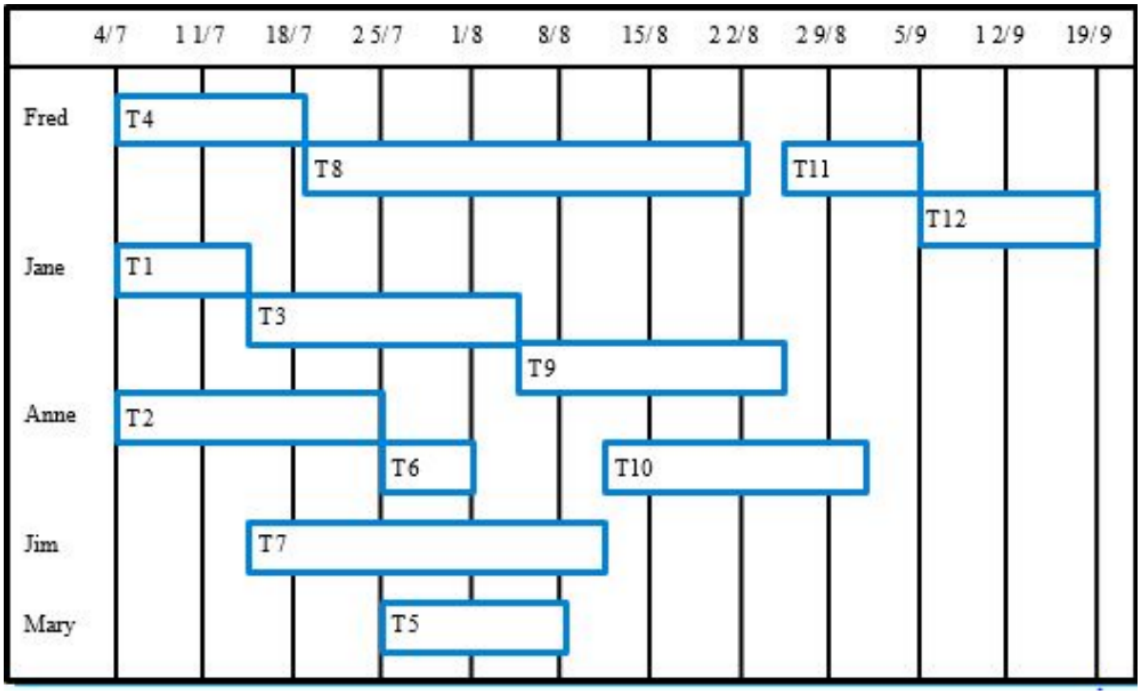
Exercise



Tools to Track Progress:

Various tools, such as Gantt charts and Burndown charts, help in tracking project progress and visualizing timelines and dependencies.

Gantt Chart



An Example Gantt (Timeline) Chart