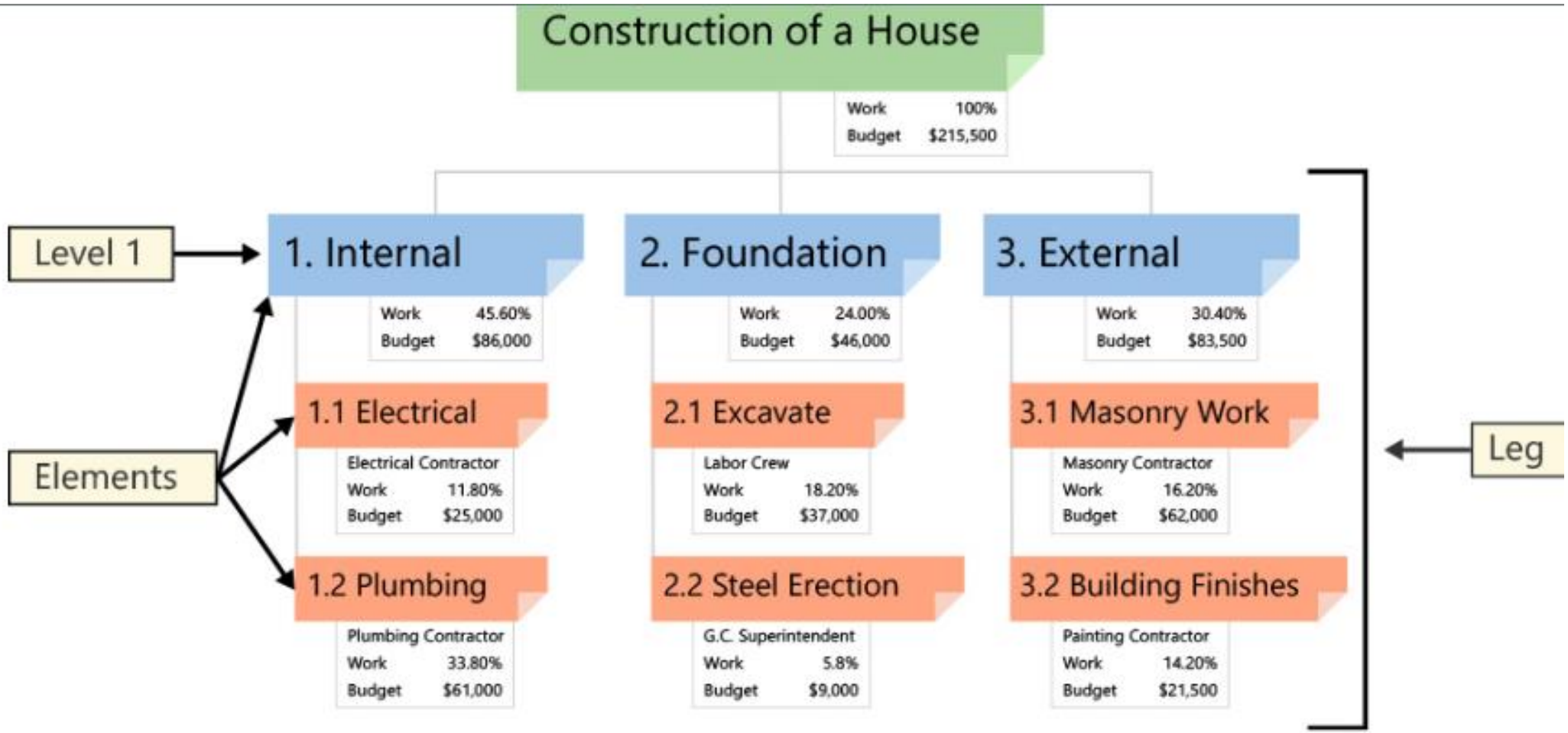
Project Planning

- Planning is essential and software development is no exception.
- Achieving success in software development requires planning.
- Software project planning involves deciding what tasks need to be done, in what order to do the tasks, and what resources are needed to accomplish the tasks

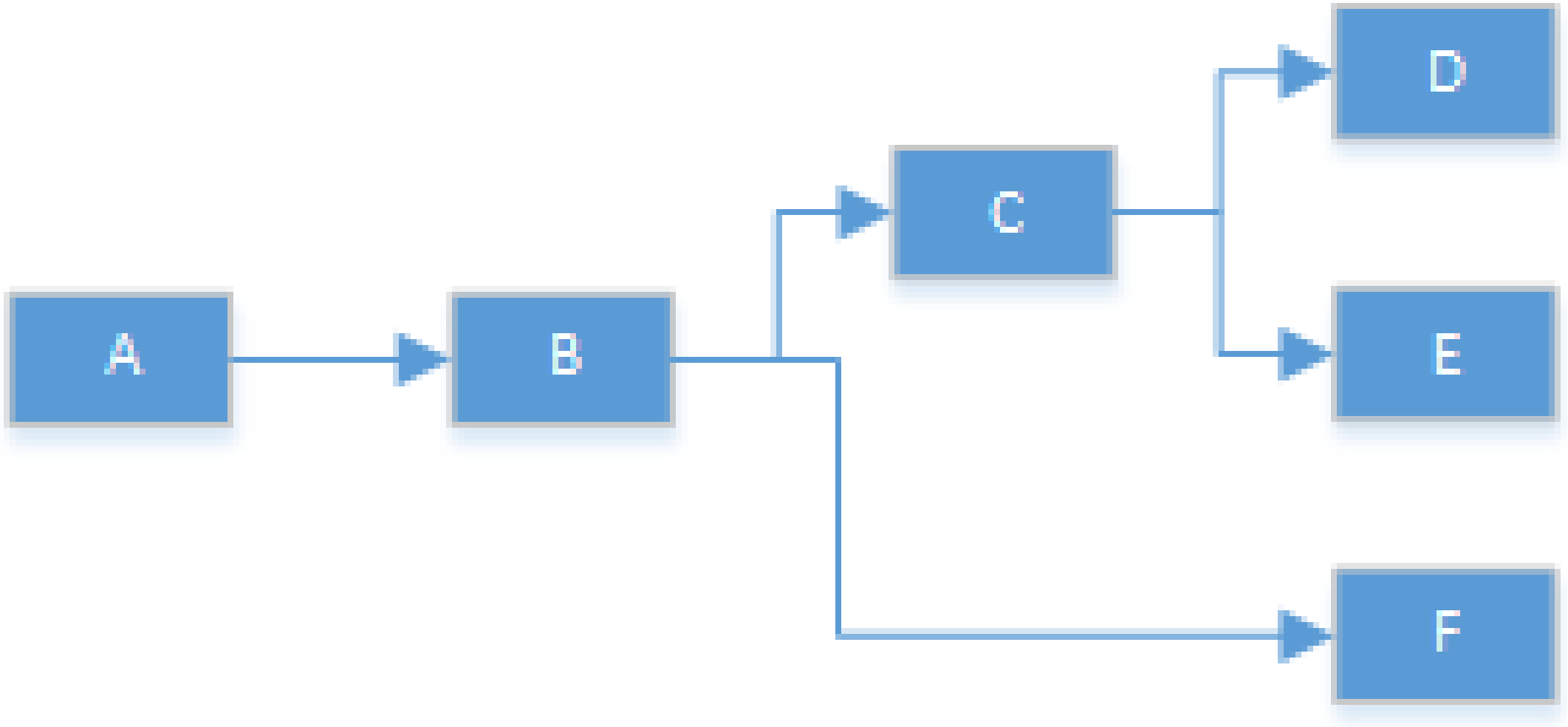
WBS—Work Breakdown Structure

- One of the first tasks is to break the large tasks into small tasks. It means finding identifiable parts of the tasks. It also means finding deliverables and milestones that can be used to measure progress.
- The work breakdown structure (WBS) should be a tree structure. The top-level breakdown usually matches the life cycle model (LCM) used in the organization. The next-level breakdown can match the processes in the organization's process model (PM). Further levels are used to partition the task into smaller, more manageable tasks.


Construction of a House
Work 100%
Budget $215,500
Level 1
1. Internal
Work 45.60%
Budget $86,000
2. Foundation
Work 24.00%
Budget $46,000
3. External
Work 30.40%
Budget $83,500
Elements
1.1 Electrical
Electrical Contractor
Work 11.80%
Budget $25,000
2.1 Excavate
Labor Crew
Work 18.20%
Budget $37,000
3.1 Masonry Work
Masonry Contractor
Work 16.20%
Budget $62,000
1.2 Plumbing
Plumbing Contractor
Work 33.80%
Budget $61,000
2.2 Steel Erection
G.C. Superintendent
Work 5.8%
Budget $9,000
3.2 Building Finishes
Painting Contractor
Work 14.20%
Budget $21,500
Leg

WBS must require…..

1. The WBS must be a tree structure. There should be no loops or cycles in the WBS. Iterative actions will be shown in the process model and/or the life cycle model.
2. Every task and deliverable description must be understandable and unambiguous. The purpose of a WBS is communication with team members. If the team members misinterpret what the task or deliverable is supposed to be, there will be problems.
3. Every task must have a completion criterion (often a deliverable). There must be a way to decide when a task is completed, because subtasks that have no definite ending encourage false expectations of progress. This decision is called a completion criterion. It may be a deliverable, for example, a complete design for the project, and then a peer review can decide if it is complete.

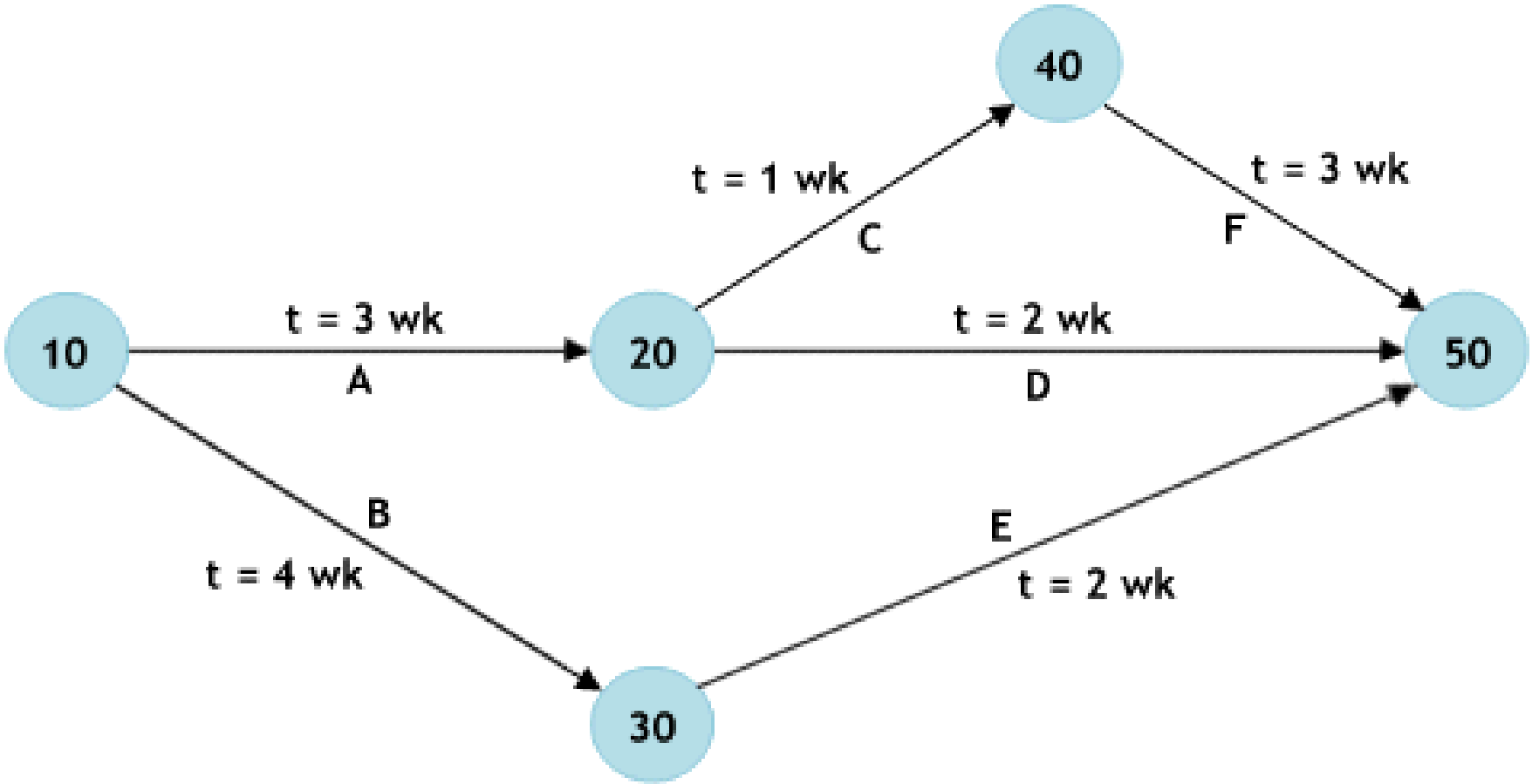

A
B
C
D
E
F

1. All deliverables (artifacts) must be identified. A deliverable must be produced by some task or it won’t be produced.
2. Positive completion of the tasks must imply completion of the whole task. The purpose of the work breakdown schedule is to identify the subtasks necessary to complete the whole task. If important tasks or deliverables are missing, the whole task will not be accomplished.

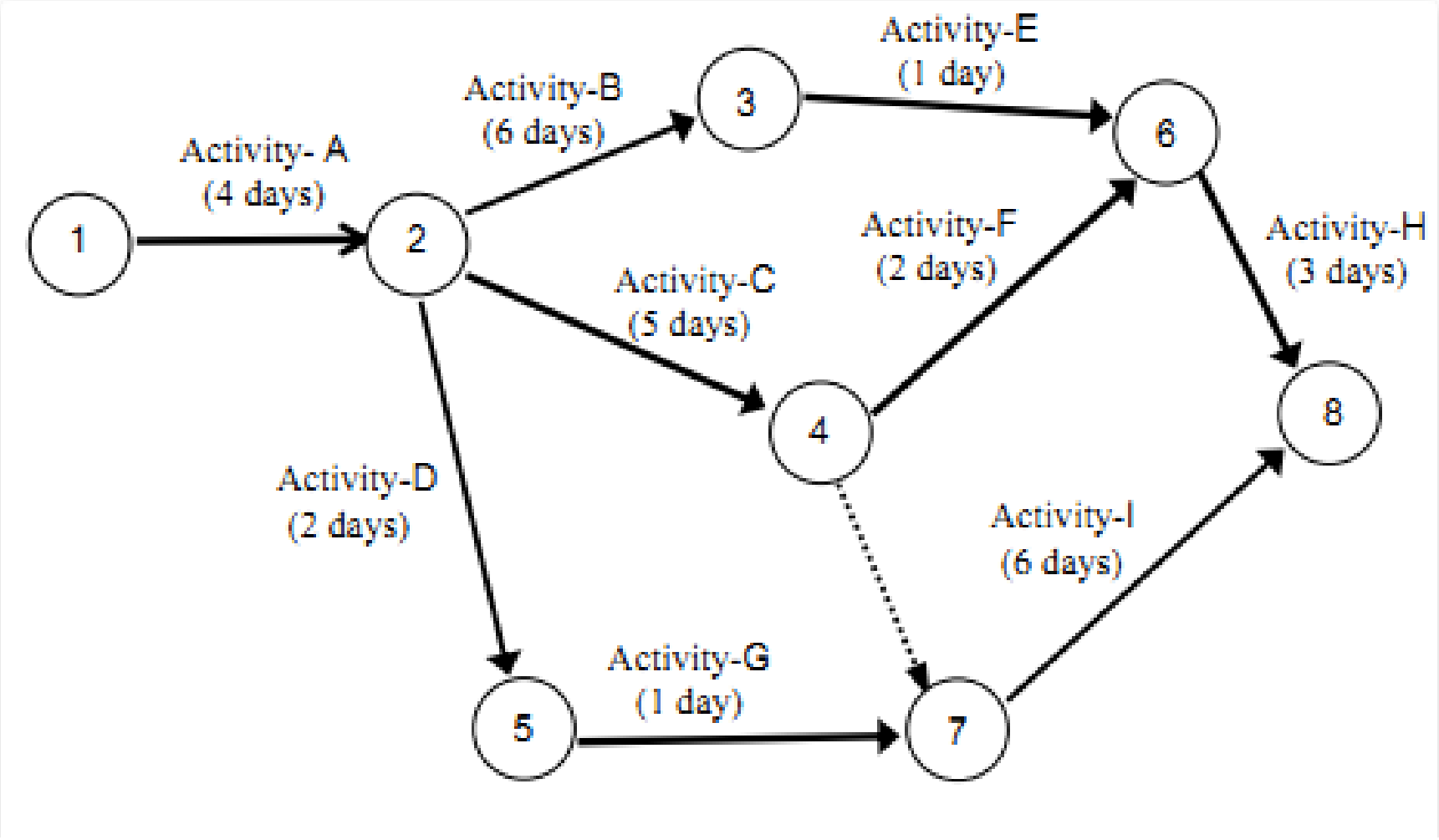
PERT—Program Evaluation and Review Technique

This technique creates a graph that shows the dependencies among the tasks. Each task has an estimate of the time necessary to complete the task and a list of other tasks that have to be completed before this task can be started (dependencies).

The graph may not always have only one starting subtask or only one stopping subtask. The whole task is only completed when all the subtasks are completed. The graph can be used to calculate the completion times for all the subtasks, the minimum completion time for the whole task, and the critical path of the subtasks.



A simple PERT network


Activity-E
(1 day)
Activity-B
(6 days)
3
6
Activity- A
(4 days)
1
2
Activity-F
(2 days)
Activity-H
(3 days)
Activity-C
(5 days)
8
4
Activity-D
(2 days)
Activity-I
(6 days)
Activity-G
(1 day)
5
7

Project planning

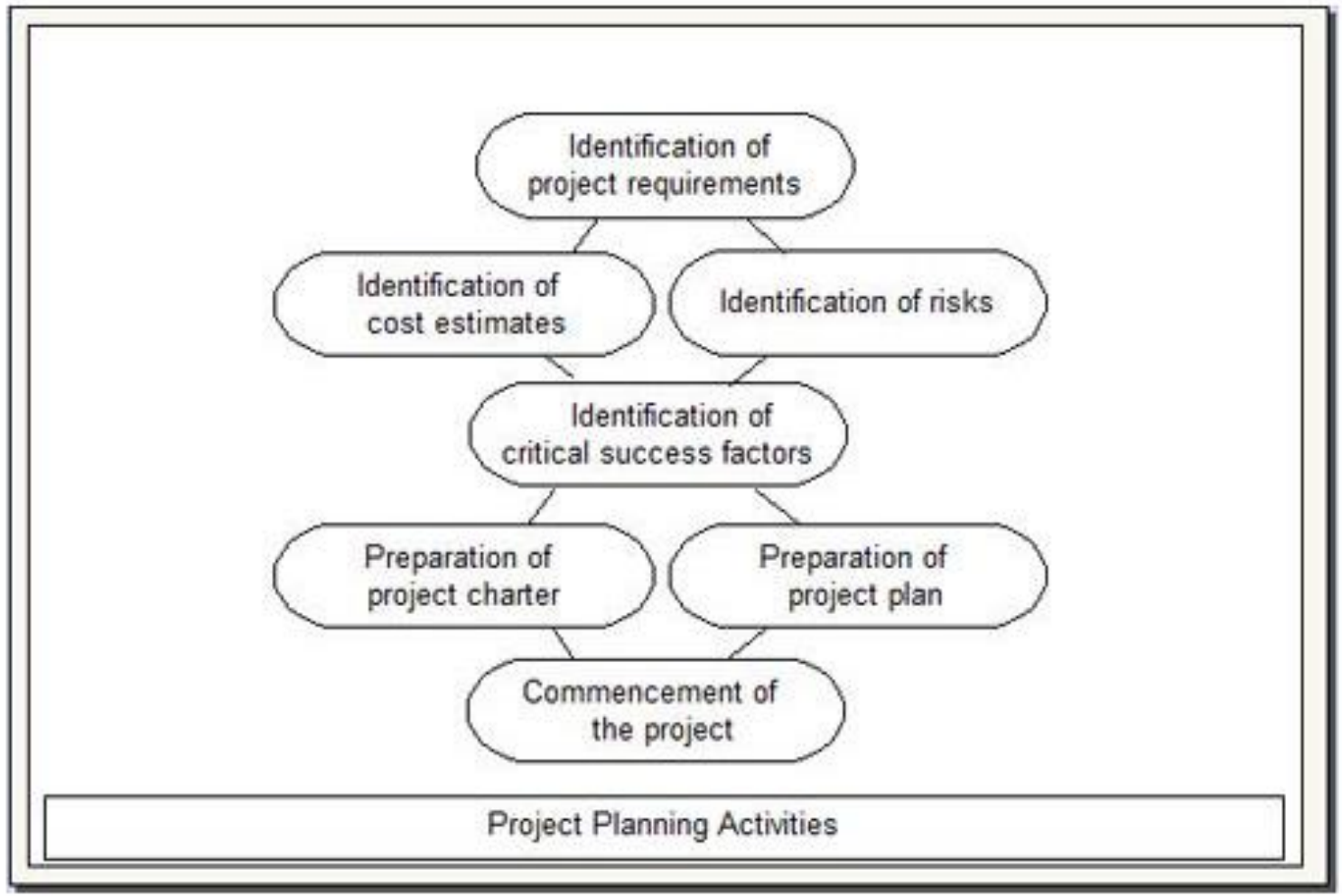
- The project planning process involves a set of interrelated activities followed in an orderly manner to implement user requirements in software and includes the description of a series of project planning activities and individual(s) responsible for performing these activities. In addition, the project planning process comprises the following.

Need of Project Planning

- Objectives and scope of the project
- Techniques used to perform project planning
- Effort (in time) of individuals involved in project
- Project schedule and milestones
- Resources required for the project
- Risks associated with the project.

Project Planning….

- Project planning process comprises several activities, which are essential for carrying out a project systematically.
- These activities refer to the series of tasks performed over a period of time for developing the software.
- These activities include estimation of time, effort, and resources required and risks associated with the project.


Identification of project requirements
Identification of cost estimates
Identification of risks
Identification of critical success factors
Preparation of project charter
Preparation of project plan
Commencement of the project
Project Planning Activities

Benefits….

- It ensures that software is developed according to the user requirements, objectives, and scope of the project.
- It identifies the role of each project management team member involved in the project.
- It monitors the progress of the project according to the project plan.
- It determines the available resources and the activities to be performed during software development.
- It provides an overview to management about the costs of the software project, which are estimated during project planning.

A typical project plan is divided into the following sections

- **Introduction:** Describes the objectives of the project and provides information about the constraints that affect the software project.
- **Project organization:** Describes the responsibilities assigned to the project management team members for completing the project.
- **Risk analysis:** Describes the risks that can possibly arise during software development as well as explains how to assess and reduce the effect of risks.
- **Resource requirements:** Specifies the hardware and software required to carry out the software project. Cost estimation is done according to these resource requirements.
- **Workbreakdown:** Describes the activities into which the project is divided. It also describes the milestones and deliverables of the project activities.
- **Project schedule:** Specifies the dependencies of activities on each other. Based on this, the time required by the project management team members to complete the project activities is estimated.

- **Quality Assurance Plan**
- **Verification and Validation Plan**
  - **Reviews and walkthroughs:**
  - **System test plan and procedures**
  - **Acceptance test and preparation for delivery**
- **Configuration Management Plan**
- **Staffing Plan**
  - **Skills assessment:**
  - **Training**
  - **Organization chart**
- **Maintenance Plan**
  - **Budget**
  - **Roles and responsibilities:**
  - **Performance measures and reporting:**
  - **Training**
  - **Acceptance**
  - **Documentation strategies:**