Project Planning & Work Breakdown Structure (WBS)

Wednesday, May 7, 2025 3:34 PM

1. Introduction to Project Planning

- **Definition:**
  - Project planning involves defining the project scope, objectives, deliverables, tasks, and schedule to ensure successful project execution.
- **Purpose of Project Planning:**
  - Establish project objectives and deliverables.
  - Identify required resources and stakeholders.
  - Develop a detailed schedule and budget.
  - Assess risks and formulate mitigation strategies.
- **Key Planning Documents:**
  - Project Management Plan
  - Scope Management Plan
  - Work Breakdown Structure (WBS)
  - Schedule Management Plan
  - Risk Management Plan
  - Quality Management Plan

2. Work Breakdown Structure (WBS)

- **Definition:**
  - A hierarchical decomposition of the project scope into smaller, manageable components known as work packages.
- **Purpose of WBS:**
  - Provides a clear structure of deliverables.
  - Ensures all work is accounted for.
  - Establishes a basis for cost estimation and resource allocation.
- **Components of WBS:**
  - Project: The complete project.
  - Deliverables: Major project components (e.g., product features).
  - Work Packages: Small, manageable units of work.
  - Tasks/Activities: Specific actions to complete work packages.

3. Creating a WBS: Key Steps

1. **Identify Major Deliverables:**
   - Analyze project scope and identify high-level deliverables.
2. **Decompose Deliverables:**
   - Break down deliverables into work packages and tasks.
3. **Assign Identification Codes:**
   - Assign unique identifiers to each WBS element (e.g., 1.1, 1.1.1).
4. **Establish WBS Dictionary:**
   - Provides detailed descriptions, assumptions, and constraints for each work package.
5. **Verify Completeness:**
   - Ensure all scope elements are covered in the WBS.

4. WBS Dictionary: Critical Elements

- **Code of Account Identifier:** Unique reference code.
- **Description of Work:** Detailed task description.
- **Assumptions and Constraints:** Specific project conditions.

- **Schedule Milestones:** Key dates and deadlines.
- **Resources Required:** List of required resources.
- **Cost Estimates:** Estimated budget for each work package.
- **Quality Requirements:** Standards and acceptance criteria.

5. WBS vs. Project Schedule

Aspect	WBS	Project Schedule
Purpose	Breaks down scope into manageable components.	Defines the sequence and timing of tasks.
Focus	Deliverables and work packages.	Tasks, durations, and dependencies.
Structure	Hierarchical (tree structure).	Chronological (timeline or Gantt chart).
Output	Work Breakdown Structure Diagram.	Schedule Network Diagram or Gantt Chart.

6. Planning Processes (PMBOK 6th Edition)

1. **Plan Scope Management:**
    - Establishes how scope will be defined, validated, and controlled.
    - Includes scope management plan and requirements management plan.
2. **Define Scope:**
    - Develops a detailed project scope statement.
    - Identifies boundaries, exclusions, and acceptance criteria.
3. **Create WBS:**
    - Breaks down project deliverables into work packages.
    - Defines work at the task level.
4. **Plan Schedule Management:**
    - Develops the schedule management plan, specifying how schedule will be developed and controlled.
5. **Define Activities:**
    - Identifies specific tasks needed to complete project deliverables.
6. **Sequence Activities:**
    - Establishes logical sequence and dependencies between tasks.
7. **Estimate Activity Durations:**
    - Estimates time required to complete each task.
8. **Develop Schedule:**
    - Creates project schedule using techniques such as Critical Path Method (CPM), Gantt Charts, and PERT analysis.

7. WBS Decomposition Techniques

- **Top-Down Approach:**
    - Start with major deliverables and progressively decompose into smaller tasks.
- **Bottom-Up Approach:**
    - Identify individual tasks and aggregate them to form higher-level deliverables.
- **Rolling Wave Planning:**
    - Decompose near-term deliverables in detail while keeping future deliverables at a higher level.
- **Mind Mapping:**
    - Visual brainstorming to identify all tasks and deliverables.

8. Work Packages: Critical Aspects

- **Size and Scope:**
  - Work packages should be small enough to be estimated, scheduled, and assigned to a single owner.
- **Time and Cost Estimates:**
  - Assign duration and cost estimates to each work package.
- **Responsibility Assignment Matrix (RAM):**
  - Assigns work packages to responsible team members.
- **Control Accounts:**
  - Defined points in the WBS to measure performance, cost, and schedule.

9. Project Schedule Development Techniques

- **Critical Path Method (CPM):**
  - Identifies the longest path of tasks in the project.
  - Determines minimum project duration.
- **Gantt Chart:**
  - Visual representation of the project schedule using a bar chart.
- **Program Evaluation and Review Technique (PERT):**
  - Estimates task durations using three-point estimates (Optimistic, Pessimistic, Most Likely).
- **Dependency Types:**
  - **Finish-to-Start (FS):** Task B starts after Task A finishes.
  - **Start-to-Start (SS):** Task B starts simultaneously with Task A.
  - **Finish-to-Finish (FF):** Task B finishes after Task A finishes.
  - **Start-to-Finish (SF):** Task B finishes after Task A starts.

10. Network Diagrams:

- **Precedence Diagramming Method (PDM):**
  - Visual representation of project activities and their dependencies.
- **Node Types:**
  - Activity-on-Node (AON): Activities represented as nodes.
  - Activity-on-Arrow (AOA): Activities represented as arrows.

11. Resource Allocation and Scheduling

- **Resource Calendars:**
  - Defines availability of resources.
- **Resource Leveling:**
  - Adjusts start/finish dates based on resource availability.
- **Resource Smoothing:**
  - Adjusts activities to stay within resource limits without affecting critical path.

12. Key Terms and Definitions

- **Scope Baseline:** Approved version of the project scope, WBS, and WBS dictionary.
- **Decomposition:** Technique for dividing project deliverables into smaller components.
- **Milestone:** Significant event in the project schedule.
- **Work Package:** Smallest unit of work in a WBS.
- **Control Account:** Specific point in the WBS for performance measurement.
- **Schedule Baseline:** Approved project schedule, including start and finish dates.