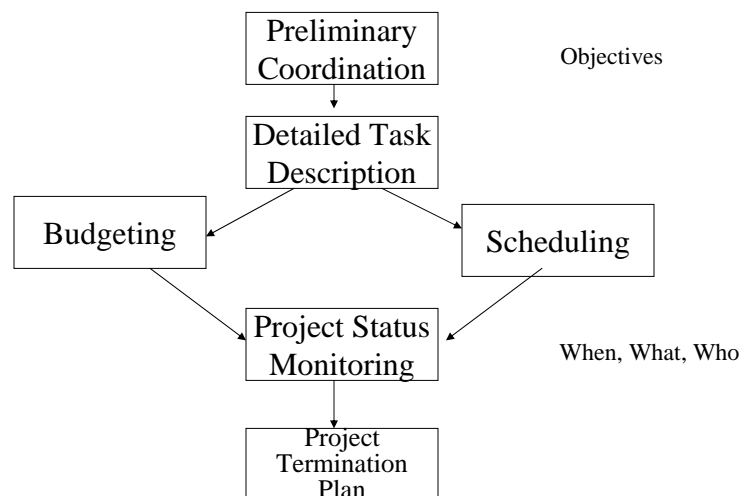


Project Planning and Scheduling

MFS606

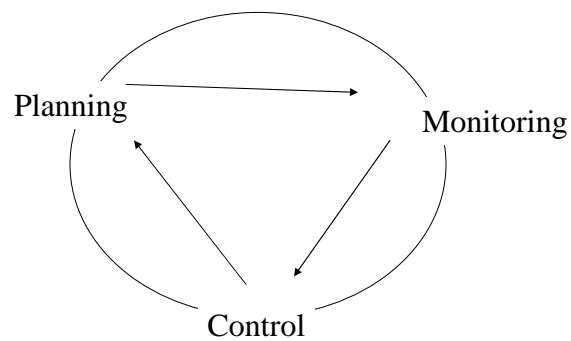
Project Planning



Project Planning

- **Work Breakdown**
 - Hierarchical Tree of activities and outcomes
 - Example:
- **Make work statement for each task**
 - Description, inputs, outputs
 - Responsibilities and involvement
- **Budget and time estimates**

Cycle



Performance
Cost
Time...

Monitoring and Control

- Control What?
 - Performance, Cost, time
- Monitor What?
 - Output results vs. activity
 - “Objective” vs. “easy to collect”
- Data sources:
 - acct., engr. test, customer, etc.

Data Collection

- Frequency Counts
- Raw Numbers
- Subjective Numeric Ratings
- Indicators
- Verbal Measures

Common Reporting Problems

- Matching reporting to project objectives
- Too much detail:
 - Most important info overlooked
 - Not “digested”
 - Costly

Reporting Goals

- Compare activity to plan
 - Compare output to desired output
 - Show variances
- Examples: Effort vs. time, milestones listing

Project Life Cycle

- Concept Phase
- Recognition of need, initial concepts
- Planning or feasibility phase
 - Adds level of detail
- Organization Phase
 - After approval, more detail
- Execution Phase
- Termination Phase

How do we do the planning and organization phase?

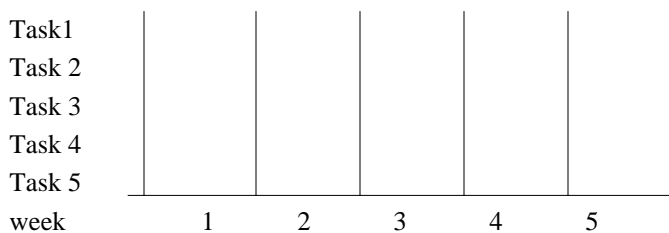
- Time frames?
- Personnel?
- Resources?
- Work Breakdown Structure (WBS)
 - Breakdown work into major elements and then into lower elements

Project Management Methods

- Bar Chart / Gantt Chart
- Milestone Chart
- Pert
- CPM

Bar Chart / Gantt Chart

- Bar chart that shows timing of tasks.
- Example:



Milestone Chart

- Emphasis is on specific program events, with required start and completion times by calendar date.
- Example:

-

Network scheduling techniques

- PERT: Program evaluation and review technique
 - Probabilistic time
- CPM: Critical Path Method
 - Deterministic Time
- Techniques for time/cost breakdown similar
- Advantages:
 - Order of tasks known
 - Help identify critical time elements
 - Graphical Picture
 - Progress tracking
 - Assist in estimating time and cost impact of changes.

Steps in network techniques

- Plan the project
 - Determine the individual activities
 - Show sequence and dependence between activities on a graph
- Schedule the project
 - Estimate how long for each activity
 - Perform computations to identify critical path (longest time chain that determines duration of project)
 - Develop more economical schedule or efficient schedule if possible
- Monitor the project
 - Use the plan and schedule to monitor and control
 - Revise and update as appropriate.

Activity conventions

- Activity On Node Convention (AON)
 - Nodes are the project activities
 - Arrows represent precedence relationships

- Activity On Arrow Convention (AOA)
 - Nodes are events: beginning or endings

- We will use AON.

PERT / CPM

- Helps show activity dependencies and possible concurrency
- Helps identify critical path
- Steps:
 - Forward pass
 - Early Start (ES) and Early Finish (EF)
 - Move to end → tells earliest possible time for completion of project
 - ES of activity is equal to the latest EF of its predecessors
 - Backward pass
 - Latest Start (LS) and Latest Finish (LF)
 - Begin with last activity: $LF = EF$
 - LF of activity is set equal to earliest LS for all its successors
 - Move to start → tells latest possible time for start of project and steps

Scheduling

- Critical Path
 - Activities on path, if delayed will delay project completion
- Float or Slack
 - Amount of time activity start can be delayed

Total float = TF = Latest start – Earliest Start

Example

More advanced

- PERT can also be labeled with
 - optimistic time
 - most likely time
 - pessimistic time
- This then used to identify the expected time (based on probability distribution)
 - Use of beta distribution defined by these three time estimates:

–