إدارة المشروعات

Projects Management

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Lecture 6
Time Management (Scheduling) Cont.

P2: Sequencing Activities

Network diagrams

1. Activity-on-arrow (AOA) or Arrow Diagramming Method (ADM)

Even though AOA or ADM network diagrams are generally easy to understand and create, **a different method is more commonly used:**

The precedence diagramming method (PDM)

P2: Sequencing Activities

Network diagrams

2. The Precedence Diagramming Method (PDM)

- PDM is a network diagramming technique in which boxes represent activities.
- Arrows show relationships between activities
- More popular than ADM method and used by PM software
- **Better at showing different types of dependencies**

- After you determine the reason for a dependency between activities (mandatory, discretionary, or external), you must determine the type of dependency.

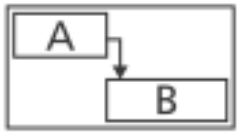
Note that the terms activity and task are used interchangeably, and the same for relationship and dependency

P2: Sequencing Activities

Task Dependency Types

There are four kinds of task dependencies

1

Task dependency	Example	Description
Finish-to-start (FS)		Task (B) cannot start until task (A) finishes.

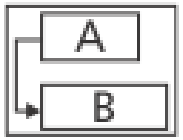
- A relationship in which the predecessor (from) must finish before successor (to) can start.
- For example, you cannot provide user training until after software or a new system has been installed.
- Finish-to-start is the most common type of relationship or dependency, and **AOA network diagrams** **use only** finish-to-start dependencies.

P2: Sequencing Activities

Task Dependency Types

2

Start-to-start (SS)



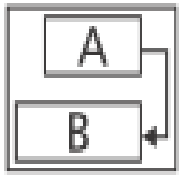
Task (B) cannot start until task (A) starts.

- A relationship in which the " from " activity cannot start until the " to " activity or successor is started.
- For example, on IT projects, a group of activities might start simultaneously, such as the many tasks that occur when a new system goes live.

P2: Sequencing Activities

Task Dependency Types

3 Finish-to-finish (FF)



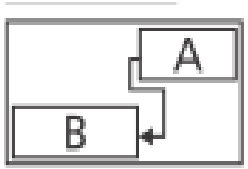
Task (B) cannot finish until task (A) finishes.

- A relationship in which the " from " activity must be finished before the " to " activity can be finished. One task cannot finish before another finishes.
- For example, quality control efforts cannot finish before production finishes, although the two activities can be performed at the same time.

P2: Sequencing Activities

Task Dependency Types

4 Start-to-finish (SF)

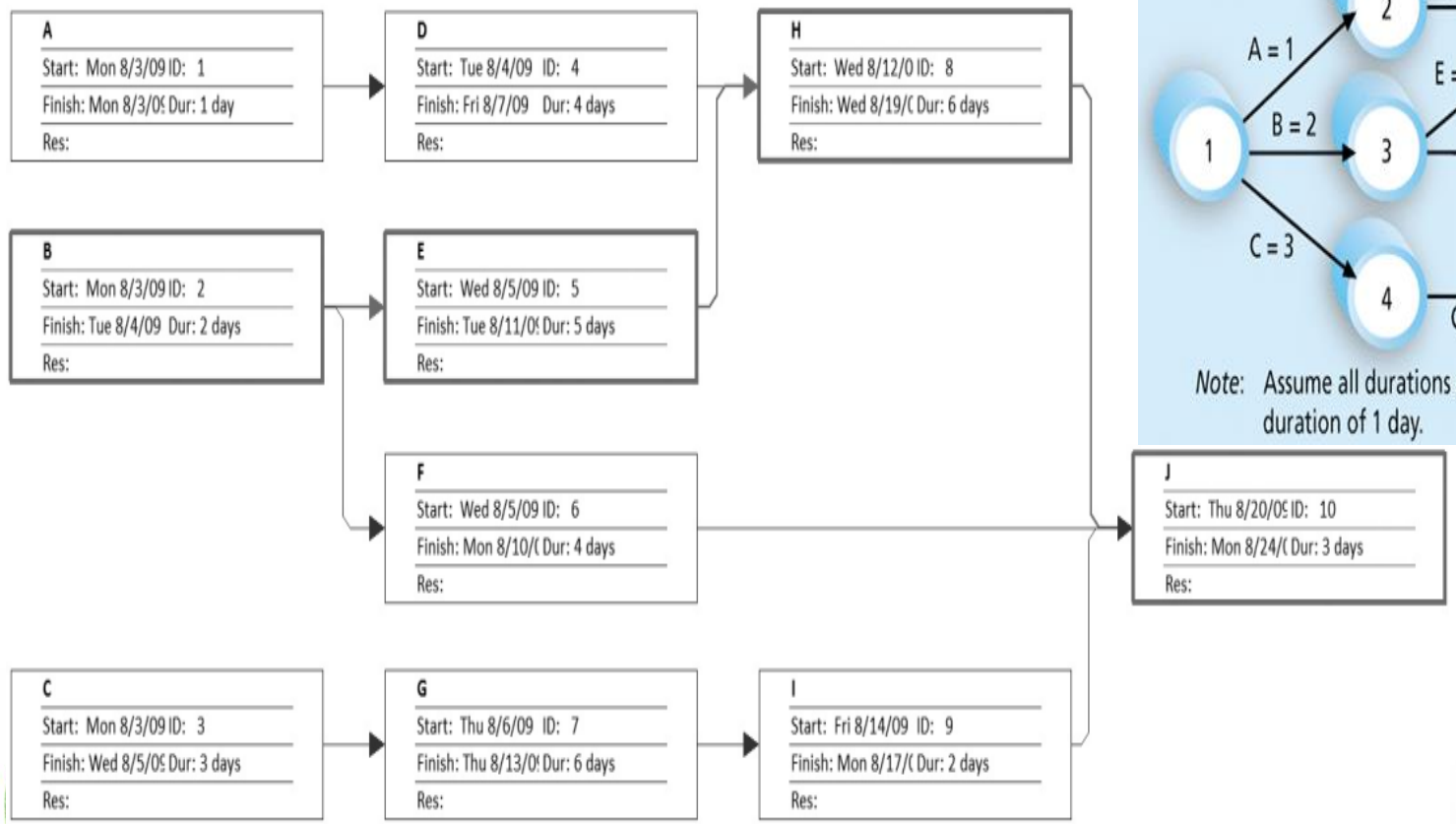


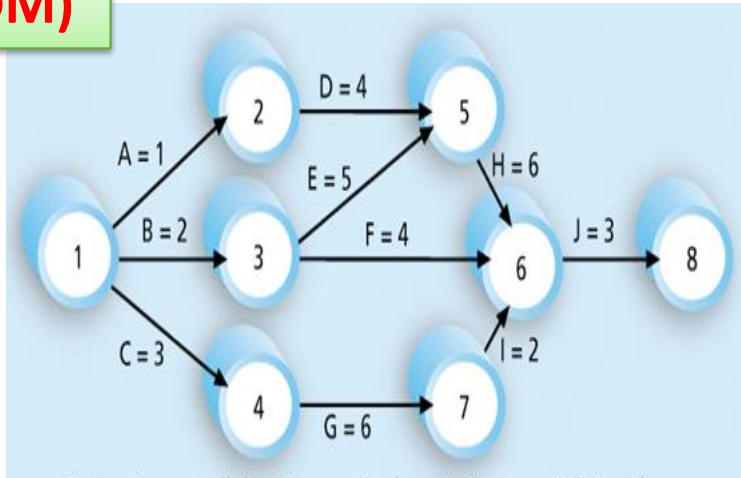
Task (B) cannot finish until task (A) starts.

- A relationship in which the " from " activity must start before the " to " activity can be finished.
- This type of relationship is rarely used, but it is appropriate in some cases.
- For example, an organization might strive to **stock raw materials** just in time for the manufacturing process to begin.
- A delay in starting the manufacturing process should delay completion of stocking the raw materials.

P2: Sequencing Activities

2. The Precedence Diagramming Method (PDM)





Note: Assume all durations are in days; A=1 means Activity A has a duration of 1 day.

P3: Estimating Activity Resources

- Before estimating activity durations, you must have a good idea of the quantity and type of resources that will be assigned to each activity
- **Resources** are people, equipment, and materials

- Consider important issues (questions to be answered) in estimating resources
  - How difficult will it be to do specific activities on this project?
  - What is the organization's history in doing similar activities?
  - Are the required resources available or need to be acquired?

Input	Tools/Techniques	Output
1) Activity List & Attributes 2) Resource Calendars 3) Enterprise Factors 4) Org Process Assets	1) Bottom-up Estimating 2) Expert Judgment 3) PM Software	1) Activity Resource Requirement 2) Resource Breakdown Structure 3) Updates to Project Docs

P3: Estimating Activity Resources

- The main outputs of the resource estimating process include a list of activity resource requirements, **a resource breakdown structure**, and project documents updates.

- ✓ A **resource breakdown structure** is a hierarchical structure that identifies the project's resources by category and type

Estimating activity resources benefits:

- ✓ It provides the basis for estimating activity durations,
- ✓ It provides a vital information for :
  - project cost estimates ,
  - project human resource management,
  - project communications management,
  - project risk management

P4: Activity Duration Estimating

- **Duration** includes the actual amount of time worked on an activity *plus* elapsed time
- Duration relates to the time estimate on a calendar, not the effort estimate.
- **Effort** is the estimate of the number of workdays or work hours required to complete a task
- Effort does not normally equal duration

Example(1) : if someone asked for an estimate of when you plan to finish reading a particular book, you might give an answer of two months.

- Two months would be the duration estimate, even if you only plan to spend 20 hours actually reading the book, which would be the **effort estimate.**

Example (2): A duration estimate of one day could be based on eight hours of work or 80 hours of work, assuming that multiple people are working on a task that day.

P4: Activity Duration Estimating

- The people/resources assigned to a task will affect the task duration estimate.
- People doing the work should help create estimates, and an expert should review them

Three-Point Estimates

- Instead of providing activity estimates as a discrete number, such as four weeks, it's often helpful to create a **three-point estimate**
  - ✓ Optimistic,
  - ✓ Most likely, and
  - ✓ Pessimistic estimate,
- Three-point estimates are needed for **PERT** **(in this chapter)** and **Monte Carlo simulations** **(in Project Risk Management chapter)**