

LCS International, Inc.

# PMP Review

## Chapter 4

# Creating the Project Schedule

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These slides are intended to be used only in settings where each viewer has an original copy of the Sybex *PMP Study Guide* book.

# Creating the Project Schedule

- **Define Activities**
- Sequence Activities
- Estimate Activity Resources
- Estimate Activity Durations
- Develop Schedule

# Define Activities

Define Activities is the process of identifying the specific actions to be performed to produce the project deliverables. The Create WBS process identifies deliverables at the lowest level in the Work Breakdown Structure. Project work packages typically are further decomposed into smaller components called activities that represent work necessary to complete that work package. Activities provide a basis for estimating, scheduling, executing, and monitoring and controlling work. Implicit in the process is defining and planning activities to achieve the project's objectives.

## Inputs

- .1 Scope baseline
- .2 Enterprise environmental factors
- .3 Organizational process assets

## Outputs

- .1 Activity list
- .2 Activity attributes
- .3 Milestone list

## 6.1 Project Time Management

To Sequence Activities , Estimate Durations

## Tools & Techniques

- .1 Decomposition
- .2 Rolling wave planning
- .3 Templates
- .4 Expert judgment



# Creating the Project Schedule

- Define Activities
- **Sequence Activities**
- Estimate Activity Resources
- Estimate Activity Durations
- Develop Schedule

# Sequence Activities

Sequence Activities is the process of identifying and documenting relationships among the project activities. Activities are sequenced using logical relationships. Every activity and milestone except the first and last are connected to at least one predecessor and one successor. It may be necessary to use lead or lag time between activities to support a realistic and achievable project schedule. Sequencing can be performed by using project management software or by using manual or automated techniques. Most software uses Precedence Diagramming Method (PDM).

## Inputs

- .1 Activity list
- .2 Activity attributes
- .3 Milestone list
- .4 Project scope statement
- .5 Organizational process assets

## Outputs

- .1 Project schedule network diagrams
- .2 Project document updates

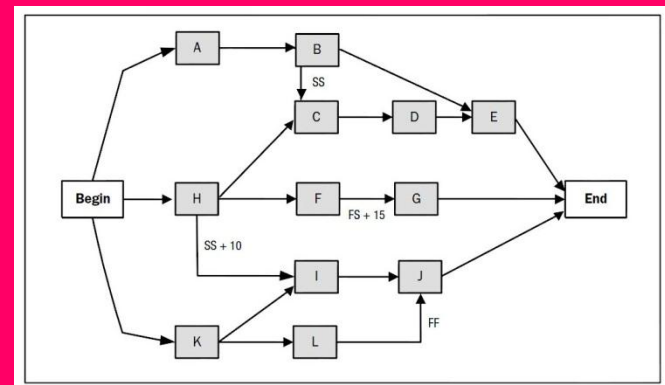
## 6.2 Project Time Management

To Develop Schedule

From Define Activities

## Tools & Techniques

- .1 Precedence Diagramming Method (PDM)
- .2 Dependency determination
- .3 Applying leads and lags
- .4 Schedule network templates



# Creating the Project Schedule

- Define Activities
- Sequence Activities
- ***Estimate Activity Resources***
- Estimate Activity Durations
- Develop Schedule

# Estimate Activity Resources

Estimate Activity Resources is the process of estimating the type and quantities of material, people, equipment, or supplies required to perform each activity. Among the challenges is finding out when each resource will be available. The resource estimating process is closely coordinated with the Estimate Costs process. Activities may have dependencies between them that can affect application and use of resources. Resource requirements may depend upon when an activity is scheduled, and estimates may vary significantly when based on different assumptions.

## Inputs

- .1 Activity list
- .2 Activity attributes
- .3 Resource calendars
- .4 Enterprise environmental factors
- .5 Organizational process assets

## Outputs

- .1 Activity resource requirements
- .2 Resource breakdown structure
- .3 Project document updates

## 6.3 Project Time Management

To Estimate Durations, Develop Schedule

## Tools & Techniques

- .1 Expert Judgment
- .2 Alternatives analysis
- .3 Published estimating data
- .4 Bottom-up estimating
- .5 Project management software

From Define Activities



# Creating the Project Schedule

- Define Activities
- Sequence Activities
- Estimate Activity Resources
- ***Estimate Activity Durations***
- Develop Schedule



# Estimate Activity Durations

Estimate Activity Durations is the process of approximating the number of work periods needed to complete individual activities with estimated resources. Estimating activity durations uses information on activity scope of work, required resource types, estimated resource quantities, and resource calendars. Inputs originate from the person or group on the project team who is most familiar with the nature of the work in the specific activity. Activity duration estimates are progressively elaborated, and the process considers the quality and availability of input data.

## *Inputs*

- .1 Activity list
- .2 Activity attributes
- .3 Activity resource requirements
- .4 Resource calendars
- .5 Project scope statement
- .6 Enterprise environmental factors
- .7 Organizational process assets

## *Outputs*

- .1 Activity duration estimates
- .2 Project document updates

## **6.4** *Project Time Management*

→ To Develop Schedule

## *Tools & Techniques*

- .1 Expert judgment
- .2 Analogous estimating
- .3 Parametric estimating
- .4 Three-point estimates
- .5 Reserve analysis



From Define Activities, Estimate Activity Resources

# Creating the Project Schedule

- Define Activities
- Sequence Activities
- Estimate Activity Resources
- Estimate Activity Durations
- ***Develop Schedule***

# Develop Schedule

Develop Schedule is the process of analyzing activity sequences, durations, resource requirements, and schedule constraints to create a project schedule. Often an iterative process, it determines planned start and finish dates for project activities and milestones. The process can require review and revision of the duration estimates and resource estimates to create an approved project schedule that can serve as a baseline to track project progress. Schedule development continues throughout the project as work progresses and environmental factors change.

## Inputs

- .1 Activity list
- .2 Activity attributes
- .3 Project schedule network diagrams
- .4 Activity resource requirements
- .5 Resource calendars
- .6 Activity duration estimates
- .7 Project scope statement
- .8 Enterprise environmental factors
- .9 Organizational process assets

## 6.5 Project Time Management

## Outputs

- .1 Project schedule
- .2 Schedule baseline
- .3 Schedule data
- .4 Project document updates

→ To Control Schedule

From Estimate Activity Duration, Risk Management

## Tools & Techniques

- .1 Schedule network analysis
- .2 Critical path method
- .3 Critical chain method
- .4 Resource leveling
- .5 What-if scenario analysis
- .6 Applying leads and lags
- .7 Schedule compression
- .8 Scheduling tool

Milestone Schedule		Project Schedule Time Frame					
Activity Identifier	Activity Description	Calendar units	Period 1	Period 2	Period 3	Period 4	Period 5
1.1.MB	Provide New Product Z Deliverable - Begun	0	◆				
1.1.1.M1	Component 1 - Completed	0			◆		
1.1.2.M1	Component 2 - Completed	0				◆	
1.1.MF	Provide New Product Z Deliverable - Finished	0					◆

← Data Date

Summary Schedule		Project Schedule Time Frame					
Activity Identifier	Activity Description	Calendar units	Period 1	Period 2	Period 3	Period 4	Period 5
1.1	Provide New Product Z Deliverable	120	[Gantt bar spanning Period 1 to Period 5]				
1.1.1	Work Package 1 - Develop Component 1	67	[Gantt bar spanning Period 1 to Period 2]				
1.1.2	Work Package 2 - Develop Component 2	53		[Gantt bar spanning Period 2 to Period 3]			
1.1.3	Work Package 3 - Integrate Components	53			[Gantt bar spanning Period 3 to Period 5]		

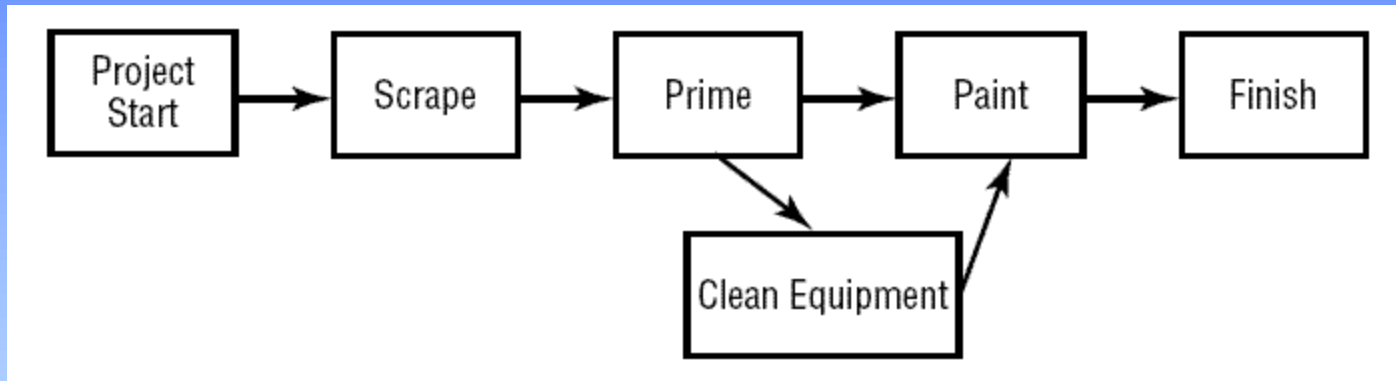
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# The Activity Sequencing Process

- Activity Sequencing Tools and Techniques
  - Precedence diagramming method (**PDM** or **AON**)
  - Arrow diagramming method (**ADM** or **AOA**)
  - Schedule network templates
  - Dependency determination
    - Mandatory (Hard limitations)
    - Discretionary (Soft or preferential logic)
    - External
  - Applying leads and lags

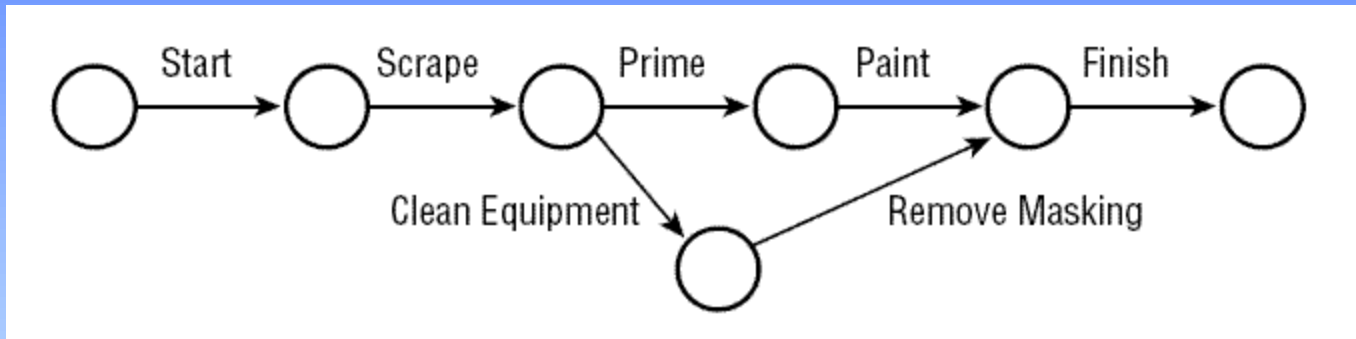
# Precedence Diagramming Method

**PDM = AON (Activity On Node)**



# Arrow Diagramming Method

**ADM = AOA (Activity On Arrow)**



# Logical Relationships

- ***Finish to Start*** (FS)
- **Start to Finish** (SF)
- **Finish to Finish** (FF)
- **Start to Start** (SS)

