

# projectmanagement



## Project Management Fundamentals

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THE GEORGE  
WASHINGTON  
UNIVERSITY  
WASHINGTON DC



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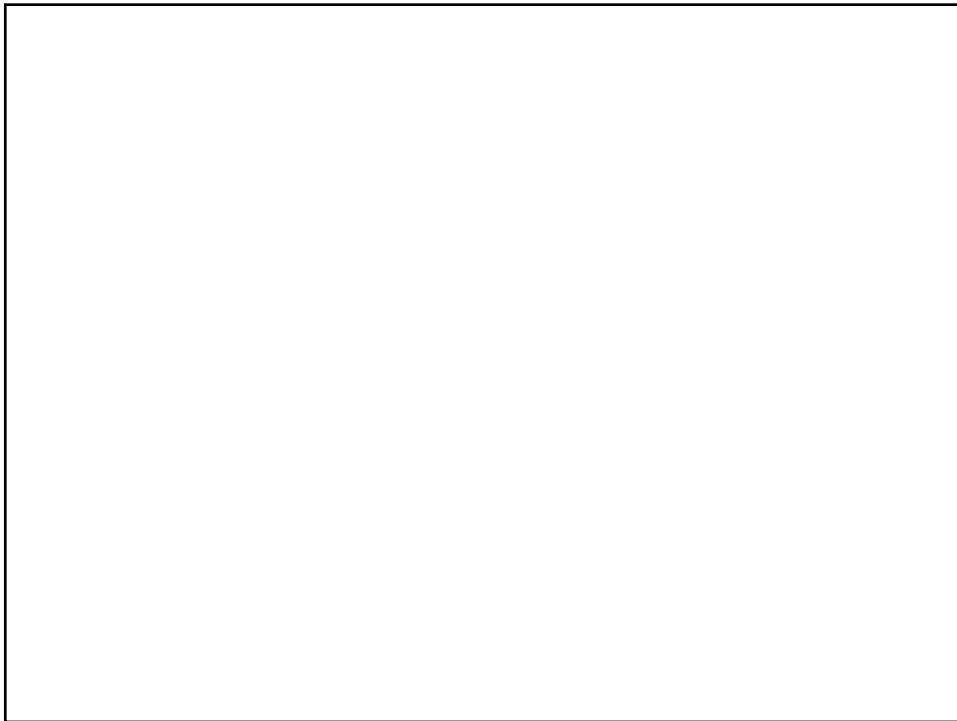
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# Project Management Fundamentals

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## Workshop Agenda

- Introduction: What Is Project Management?
- Project Initiation
- Project Definition
- Project Planning
- Project Implementation
- Project Closure



## Workshop Objectives

- Create a working definition of the term "project management"
- Break a project into logical phases and specify the primary activities that occur in each phase
- Effectively use the components of a project charter and appropriately scale each of them based on the size of a project
- Develop a procedure for managing changes in the project after it is underway



## Workshop Objectives (continued)

- Create a work breakdown structure (WBS) for a project
- Sequence activities within a project based on mandatory and discretionary dependencies
- Estimate activity durations and make appropriate adjustments as needed
- Identify, quantify, and give priorities to risks in managing a project
- Create a communication plan for reporting project progress and issues
- Capture valuable project lessons learned and use them to define and improve project management practices within your organization

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## Introduction: What Is Project Management?

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## What Is a Project?

***A temporary endeavor undertaken to create a unique product, service, or result.***

—PMBOK® Guide, p. 368

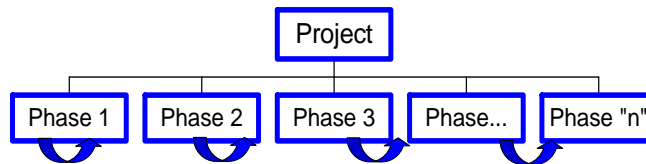
<b>to create</b>	Has an intention to produce something (project “deliverables”)
<b>unique</b>	One of a kind rather than a collection of identical items
<b>product</b>	Tangible objects but could include things like computer software, film, or stage works
<b>service or result</b>	Might include the establishment of a day-care center, for instance, but <i>not</i> its daily operations

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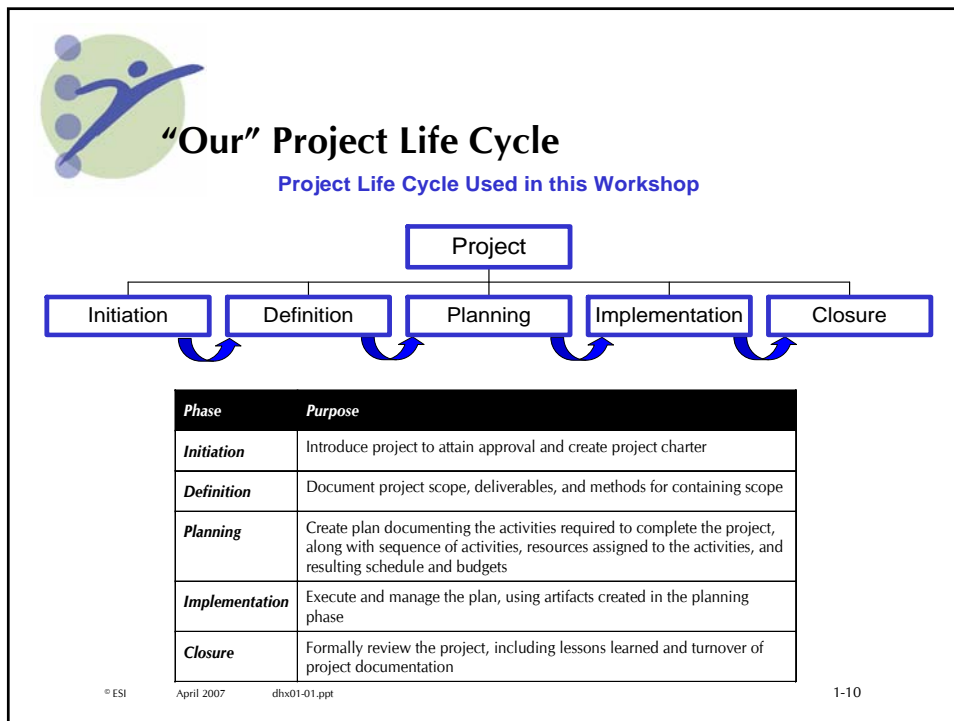
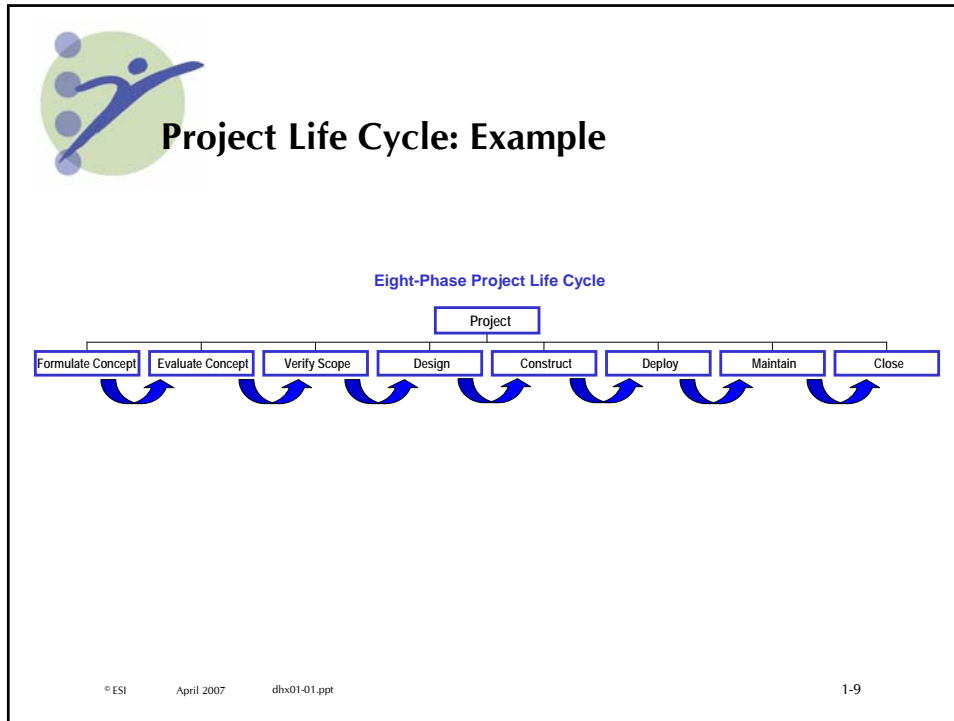


## The Project Life Cycle

### General Form of a Project Life Cycle







# Project Initiation



## How Projects Come to Be

- Project selection can be a difficult process, especially when there are a large number of potential projects competing for scarce dollars
- Some selection methods are highly intuitive; others try to add rigor through more scientific selection processes



## Sacred Cows and Pressing Needs

- “Sacred cow” selection: Senior management wants it! (It may often turn out well; many visionary projects start here)
- Business opportunity (make more \$\$\$)
- Savings potential (save \$\$\$)
- Keeping up with competition (example, many e-commerce projects are in response to competitor’s initiatives)
- Risk management (examples: disaster recovery initiatives, Y2K)
- Government or regulatory requirements



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## First Selection Criterion

**Sanity check:** Does the project fit in with the stated goals of the organization?

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## Selection Tools

<i>Numeric Method</i>	<i>Description</i>
<b>Benefit/cost ratio</b>	Determines the amount of payback per investment
<b>Net present value</b>	Estimates the current worth of anticipated cash flows resulting from the project
<b>Payback period</b>	Determines how quickly a project recoups its costs
<b>Weighted selection</b>	Scores multiple projects against a set of selection criteria with each criterion assigned a numeric weight
<b>Unweighted selection</b>	Scores multiple projects against a set of selection criteria with all criteria being equal
<b>Pairwise priorities</b>	Rank ordering a number of candidate projects by systematically comparing one with each of the others

### Exercise 1

## Office Move

Your company has outgrown its office space. The company can stay put and triple up people in offices, wait 18 months until some extra floors of the office building become available, move to a nearby location, or perhaps even move to the next county. Everyone seems to have a different idea of what would be best, which they vigorously debate in the kitchen as they heat up their lunches or get coffee. Finally, the president makes a decision: your company will move to new office space 10 blocks away.

What is the project in this scenario?

Who are the stakeholders?

What are some of the main issues that you will need to address in this project?

## Project Definition



## Project Charter

- The project charter is the project's "license to do business"
- It should come from someone who is outside the project itself and who has funding-access, resource-assignment, and decision-making authority sufficient to support the project. This person usually is referred to as the project sponsor.



## Why Have a Project Charter?

- Primary purpose: To get approval to proceed with the project and obtain sufficient approval for resources to move to the next phase of the project
- Communicate the mission and the project's objectives to stakeholders and other interested parties
- Communicate to the project team members what they are expected to accomplish

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## Project Charter Components\*

- Project mission and scope
- Project objectives
- Project assumptions
- Project constraints
- Milestones
- Project risks
- Stakeholders
- Signature page granting authority to proceed


*\*In some organizations, the project charter is an evolving document. Many of the components listed will change as the project moves into the Project Definition Phase.*

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## Project Assumptions



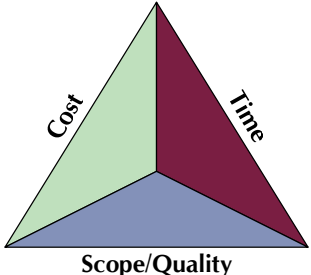
- Almost every lesson includes the reminder: “Don’t assume!”
- Turn that around and make it: “Document assumptions!”
- Don’t expect others to read your mind
- Capture as many assumptions as possible to include in your initial project charter
- Don’t be surprised if others do not share all your assumptions. This is the time to resolve differences—*before* the project is underway!



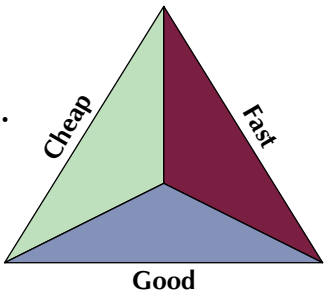
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## The Triple Constraint



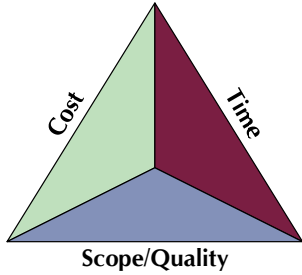
Or, in plain English . . .



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## Triple Constraint Trade-Offs



Constraint Change	Required Adjustment	Alternatives (One or Combination of Both)
Shorter Time	Higher Cost	Reduced Quality or Narrowed Scope
Reduced Cost	More Time	Reduced Quality or Narrowed Scope
Higher Quality or Increased Scope	More Time	Higher Cost

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## Exercise 2

# Starting the Charter

Project Charter Worksheet
<div style="background-color: #cccccc; text-align: center; padding: 2px;"><b>Project Mission</b></div> Write Project Mission Statement Here:
<div style="background-color: #cccccc; text-align: center; padding: 2px;"><b>Project Scope</b></div> Brief statement of project scope. (Supplement with Product Scope and Project Scope Diagrams as part of appendix.)
<div style="background-color: #cccccc; text-align: center; padding: 2px;"><b>Project Objectives</b></div> List at least three SMART Objectives.
<div style="background-color: #cccccc; text-align: center; padding: 2px;"><b>Project Assumptions</b></div> List at least three Project Assumptions.
<div style="background-color: #cccccc; text-align: center; padding: 2px;"><b>Project Constraints</b></div> See Project Priority Matrix in Appendix. List any other constraints here.
<div style="background-color: #cccccc; text-align: center; padding: 2px;"><b>Project Phases</b></div> Indicate the phases of the proposed project.
<div style="background-color: #cccccc; text-align: center; padding: 2px;"><b>Milestones</b></div> List major milestones for project identified so far (include at least five throughout the life of the project).
<div style="background-color: #cccccc; text-align: center; padding: 2px;"><b>Project Risks</b></div> Attach Risk Identification Worksheets and Risk Priority Worksheet.
<div style="background-color: #cccccc; text-align: center; padding: 2px;"><b>Stakeholders</b></div> Attach Potential Stakeholders Worksheet.
<div style="background-color: #cccccc; text-align: center; padding: 2px;"><b>Signature Page Granting Authority to Proceed</b></div> Obtain signatures of Project Sponsor and Project Manager.
Project Sponsor Signature: _____ Project Manager Signature: _____

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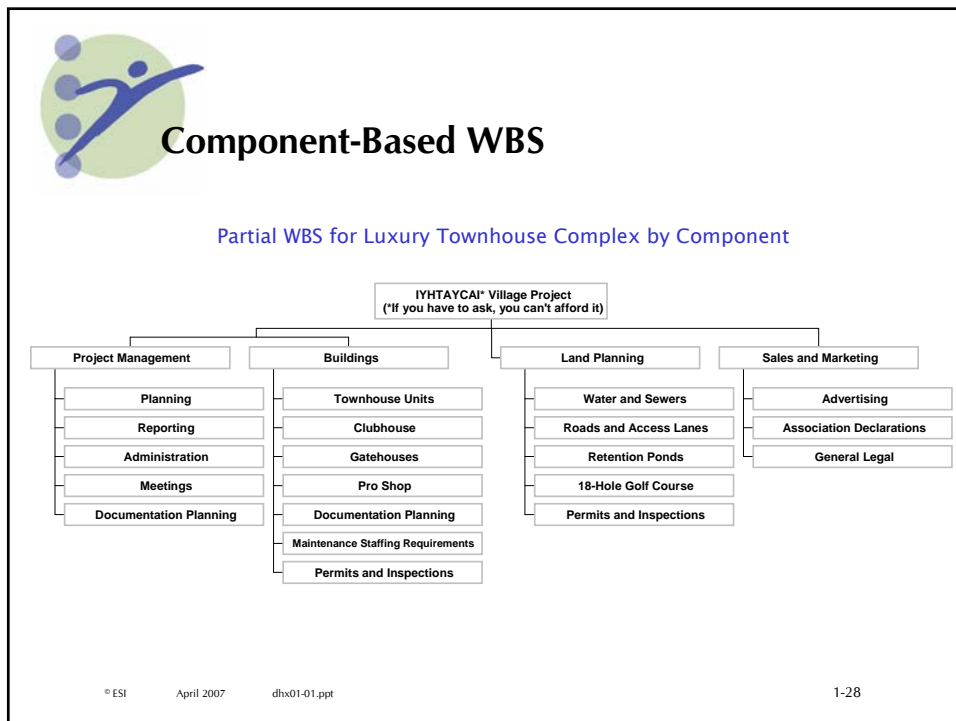
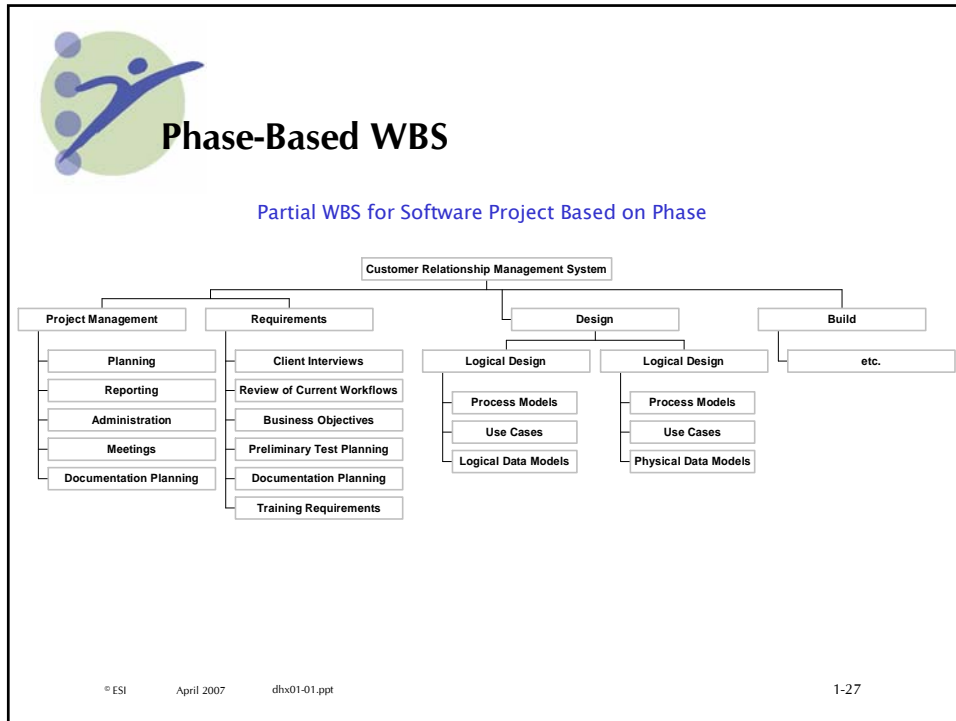


# Project Planning



## Work Breakdown Structures

- Work breakdown structures (WBSs) help to organize the activities required to meet the objectives of the project
- Focus is on deliverables
- May be organized by—
  - Phase of the project
  - Component





## Work Packages

- The lowest level of WBS is called a work package if further deconstruction into activities is possible
  - May be assigned as a subproject
  - May be subordinated into WBS structure for estimating purposes
- Activities at this level become the basis for time and duration estimates

### Exercise 3

## WBS for the Office Move

Use the following major categories to develop a WBS of those activities necessary to accomplish an office move: project management; pre-move activities; moving activities; post-move activities.

Arrange the following tasks as work packages under the four headings described above: select furniture; prepare office for move; hold kickoff meeting; set up utilities (wiring and so on); complete internal construction to final floor plan; plan move; move/relocate; install new furniture, communications equipment, and computers; install new signs; and of course, close out project.



## Schedule Planning

- Determines the time duration to complete the project
- Clarifies relationships between various work packages
- Tools help in schedule planning only when accurate information is used with the tools



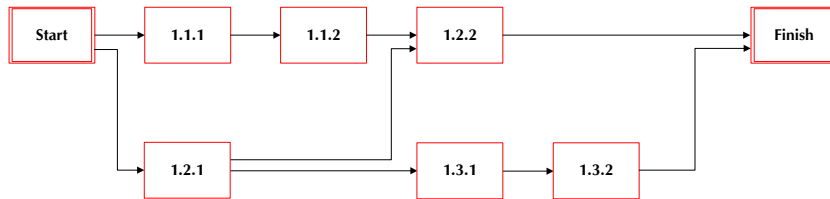
## Common Scheduling Tools

- Network diagrams
- Gantt charts
- Project calendars
- Milestone charts



## Network Diagramming

- Shows the logical relationship between work packages
- Work packages are represented by boxes
- Dependencies are represented by arrows
- Multiple arrows (dependencies) are possible

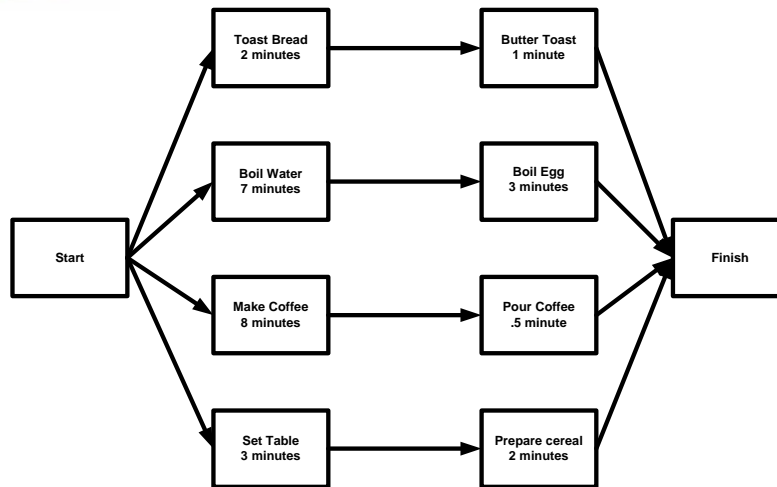


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## Network Diagramming (continued)



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## Critical Path


- Longest of all paths through the project
- Shortest time to complete the project
- Path with zero float/slack time



## Float

- Amount of time an activity may be delayed from its early start without delaying the project finish date
  - Calculated from the network diagram after completing a backward pass
  - Indicates the amount of flexibility the project manager has to adjust the timing of a particular activity
  - Float is calculated by subtracting early finish from late finish (or early start from late start)

Source: PMBOK® Guide, p. 378



## Network Diagramming Practice

**Exercise 1**

```

    graph LR
      Start --> A[Dur=3]
      A --> B[Dur=6]
      A --> C[Dur=5]
      B --> D[Dur=4]
      C --> D
      C --> E[Dur=7]
      D --> F[Dur=3]
      E --> F
      F --> Finish
    
```

**Exercise 2**

```

    graph LR
      Start --> A[Dur=4]
      A --> B[Dur=6]
      A --> C[Dur=5]
      B --> D[Dur=4]
      C --> D
      C --> E[Dur=7]
      D --> F[Dur=3]
      E --> G[Dur=1]
      F --> G
      G --> Finish
    
```

**Exercise 3**

```

    graph LR
      Start --> A[Dur=1]
      Start --> B[Dur=5]
      A --> C[Dur=7]
      B --> C
      B --> D[Dur=6]
      C --> E[Dur=3]
      D --> E
      D --> F[Dur=2]
      E --> G[Dur=8]
      F --> G
      F --> H[Dur=4]
      G --> Finish
      H --> Finish
    
```

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## Exercise 4

### Network Diagram for the Office Move

Using the WBS you developed for the office move and the durations provided below, build a network diagram for the office move.

Work Package/Activities	Duration (days)
Plan move	20
Hold kickoff meeting	1
Select furniture	25
Prepare office for move	20
Move/relocate	5
Set up utilities	30
Close out project	5
Install new signs	15
Complete internal construction to final floor plan (build out)	45
Install new furniture/communications equipment/computers	10


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## Ways to Speed Up Schedules

- Methods
  - Crashing
  - Fast tracking
- To speed up a project, you must speed up the critical path

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## Gantt Charts

Today

Task A: 1-3

Task B: 2-5

Task C: 3-5

Task D: 4-7

Task E: 3-6

Task F: 5-7

Project Month: 1 2 3 4 5 6 7

Today

Task A: 1-3

Task B: 2-5

Task C: 3-5

Task D: 4-7

Task E: 3-6

Task F: 5-7

Project Month: 1 2 3 4 5 6 7

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## Milestones

- Significant events or deliverables
  - Major project happenings (component X complete)
  - Funding points (30% of budget expended)
  - Key dates (April 15)
- Activities of “zero duration”
  - Take no time; consume no resources
- Serve as reminders for checking overall project status at key points



## Estimating

- An assessment of the likely quantitative result; usually applied to project costs and duration and should always include some indication of accuracy
- Work packages provide the basis for the project manager’s estimates

Source: PMBOK® Guide, p. 360



## Good Estimating Practices

- Acknowledge the level of accuracy
  - Estimates can and should be done at varied levels of accuracy
  - Communicate the level of accuracy with the estimate
- Get input from many sources
  - In-house sources
  - Outside sources
  - Professional organizations



## Program Evaluation and Review Technique (PERT)

$$\text{Estimated Time} = \frac{\text{Optimistic} + (4 \times \text{Most Likely}) + \text{Pessimistic}}{6}$$

$$e_{(t)} = \frac{3 \text{ days} + (4 \times 5 \text{ days}) + 8 \text{ days}}{6} = 5.17 \text{ days}$$

**NOTE: PERT is useful in estimating costs as well as schedule.**



## Building a Cost Estimate

- Top-down estimating
  - Early approximations using categories of work
  - Often has a higher level of variance
- Bottom-up estimating
  - Based on completed WBS
  - Assign cost to work packages or control accounts
  - Sum up for total cost
- Either method needs to include—
  - Direct cost
  - Indirect cost (overhead)
  - Reserve

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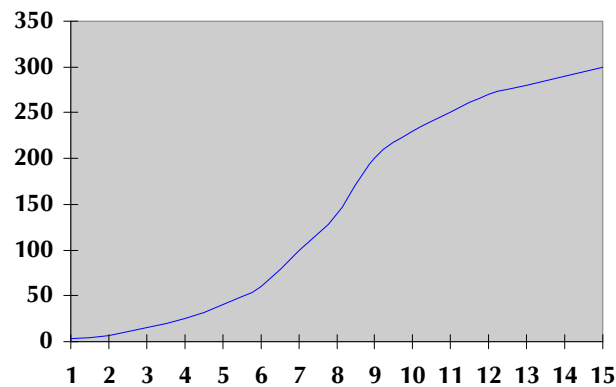
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## Cumulative Cost Curve



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## Risk Management Planning

***The process of deciding how to approach, plan, and execute risk management activities for a project***

—PMBOK® Guide, p. 373

- Risks are threats or opportunities
- Risk planning is an integral part of project planning
- Risk management consists of six processes:
  - Risk management planning
  - Risk identification
  - Qualitative risk analysis
  - Quantitative risk analysis
  - Risk response planning
  - Risk monitoring and control

\*Source: PMBOK® Guide, p. 237

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## Communication Plan

Communication	Format	Frequency	Distribution
Team briefing	Restricted intranet	Daily at 9:00	Team and stakeholders with access to secure project info area
Weekly Web bulletin	Internal intranet	Weekly	Team, sponsor, senior management
Technical Incident Report	E-mail	Immediately after incident	Webmaster, IT department
Budget and schedule detail	Spreadsheets and detailed Gantt chart	Biweekly	Sponsor, senior management
Accomplishments and setbacks	E-mail and intranet	Weekly	All internal stakeholders
Schedule milestones	E-mail and intranet	Weekly	All internal stakeholders
Cost-to-date milestones	E-mail and intranet	Weekly	All internal stakeholders
Current top five risks	E-mail and intranet	Weekly	All internal stakeholders

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## Communication Made Simple

### The Two-Floor Rule



- Every stakeholder should receive information at just the right level of detail for him or her
- High-level managers won't want to see all the gory details of the project



- Your team members need to see a great deal more
- If your level of reporting is appropriate and one of your stakeholders steps into the elevator and asks about the status of the project, you should be able to brief him or her by the time the elevator stops two floors away



## Roles and Responsibilities Matrix

Resource Task	Pat	Jean	Francis
<b>1.1.1</b>			
<b>1.1.2</b>			
<b>1.1.3</b>			

R—Responsible  
A—Accountable  
C—Consult  
I—Inform

Source: PMBOK® Guide, p. 206

# Project Implementation

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## Project Baselines

- The original plan, plus or minus approved changes
- *NOTE:* baselines (plural)
  - Scope
  - Cost
  - Time

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## Who Needs Baselines?

- Customer
- Project manager
- Management
- Accounting
- Project team



## Monitoring Project Performance

- Compare against baselines:
  - Cost
  - Time
  - Scope
- Identify variance
- React as necessary



## Earned Value

- An objective look at project status
- Schedule and cost variances
- Assessing schedule, cost, work status
- Single system to integrate multiple assessments into a single reporting structure



## Key Earned Value Terminology

- Planned value (PV)—the sum of approved cost estimates for activities scheduled to be performed during a given period
- Actual cost (AC)—the total cost incurred in accomplishing work during a given time period
- Earned value (EV)—the sum of approved cost estimates for activities completed during a given period
- Budget at completion (BAC)—the sum of approved cost estimates for all activities in a project





## Key Earned Value Terminology (continued)

- Cost variance (CV)—the difference between the value of the work completed and actual costs of the work completed of an activity
- Schedule variance (SV)—the difference between the planned scheduled completion of an activity and the amount of work actually completed expressed in dollars

## Exercise 5

### Earned Value Practice

Michael and Angela are working on a dinosaur reconstruction project. Specifically, they have been assigned to reconstruct the mouth of a hadrosaur, a dinosaur with 2,000 teeth. Each tooth has a budget of \$150. They are each supposed to complete 10 teeth a day.

It is the end of the twelfth day. They have reconstructed 300 teeth in the hadrosaur's mouth. A status report from the project accountant shows that they have spent \$48,000.

## Exercise 5

### Earned Value Practice (continued)

- AC =
- PV =
- EV =
- BAC =
- CV =
- SV =



### Assessing Complete Status

- Time
- Cost
- Scope
- Resources
- Quality
- Customer perspective



## Managing Change

***Change happens for many reasons and in many forms:***

- Customer input
- Team input
- Business input

***An organized, systematic approach is helpful in managing change:***

- Change request forms
- Review and evaluation process
- Decisions

## Project Closure



## Project Closeout Checklist

- Provide the customer with all project information
- Recognize, reward, and reassign project team members
- Terminate outstanding purchase orders from subcontractors
- Prepare final payment
- Dispose of materials and supplies
- Prepare final cost and schedule reports
- Document lessons learned
- Celebrate project successes



## Lessons Learned

- Timely
- Relevant
- In context
- Detailed
- Filed and accessible



## Stakeholders Report/Celebration

- Communicate results
- Pinpoint successes
- Propose maintenance/corrective measures if needed
  - Share contributing success factors
  - Present plans for corrective action
- “Sharpen the saw” for future project best practices
- Celebrate successes!



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## Workshop Review

***By now, you should be able to—***

- Create a working definition of the term “project management”
- Name the key stakeholders in a project and determine ways of keeping them “on task” during the phases of a project
- Break a project into logical phases and specify the primary activities that occur in each phase
- Effectively use the components of a project charter and appropriately scale each of them based on the size of a project
- Develop a procedure for managing changes in the project after it is underway

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## Workshop Review (continued)

**By now, you should be able to—**

- Create a WBS for a project
- Sequence activities within a project based on mandatory and discretionary dependencies
- Estimate activity durations and make appropriate adjustments as needed
- Identify, quantify, and give priorities to risks in managing a project
- Create a communication plan for reporting project progress and issues
- Capture valuable project lessons learned and use them to define and improve project management practices within your organization

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**The ESI Team appreciates your time.**

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