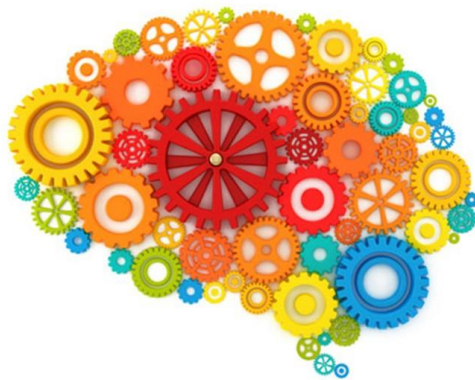


Project Management

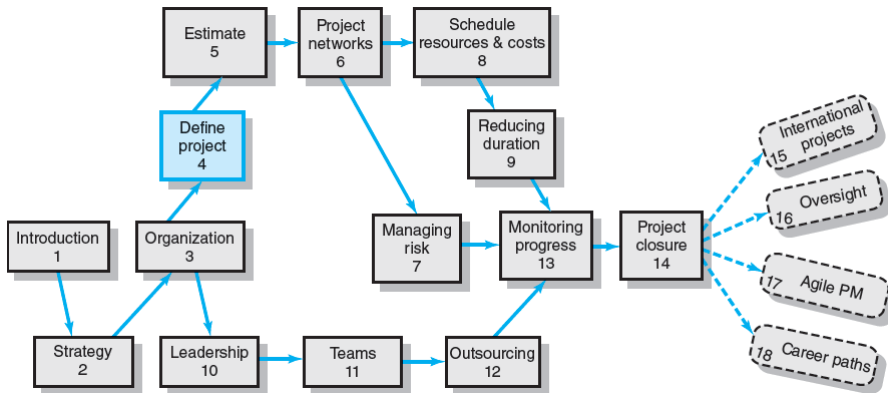


Defining The Project



2-2

Where We Are Now



4-3

Defining the Project

Step 1: Defining the Project Scope

Step 2: Establishing Project Priorities

Step 3: Creating the Work Breakdown Structure

Step 4: Integrating the WBS with the Organization

Step 5: Coding the WBS for the Information System

4-4

Step 1: Defining the Project Scope

- Project Scope
 - A definition of the end result or mission of the project—a product or service for the client/customer—in specific, tangible, and measurable terms.
- Purpose of the Scope Statement
 - To clearly define the deliverable(s) for the end user.
 - To focus the project on successful completion of its goals.
 - To be used by the project owner and participants as a planning tool and for measuring project success.

4-5

Project Scope Checklist

1. Project objective
2. Deliverables
3. Milestones
4. Technical requirements
5. Limits and exclusions
6. Reviews with customer



4-6

Project Scope: Terms and Definitions

- Scope Statements
 - Also called statements of work (SOW)
- Project Charter
 - Can contain an expanded version of scope statement
 - A document authorizing the project manager to initiate and lead the project.
- Scope Creep
 - The tendency for the project scope to expand over time due to changing requirements, specifications, and priorities.

4-7

Step 2: Establishing Project Priorities

- Causes of Project Trade-offs
 - Shifts in the relative importance of criterions related to cost, time, and performance parameters
 - Budget–Cost
 - Schedule–Time
 - Performance–Scope
- Managing the Priorities of Project Trade-offs
 - Constrain: a parameter is a fixed requirement.
 - Enhance: optimizing a criterion over others.
 - Accept: reducing (or not meeting) a criterion requirement.

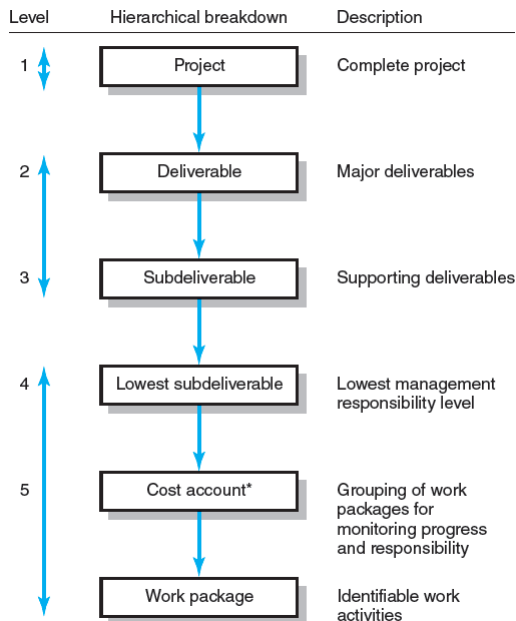
4-8

Step 3: Creating the Work Breakdown Structure

• Work Breakdown Structure (WBS)

- An hierarchical outline (map) that identifies the products and work elements involved in a project.
- Defines the relationship of the final deliverable (the project) to its subdeliverables, and in turn, their relationships to work packages.
- Best suited for design and build projects that have tangible outcomes rather than process-oriented projects.

4-9



Hierarchical Breakdown of the WBS

* This breakdown groups work packages by type of work within a deliverable and allows assignment of responsibility to an organizational unit. This extra step facilitates a system for monitoring project progress (discussed in Chapter 13).

FIGURE 4.3

4-10

How WBS Helps the Project Manager

- WBS

- Facilitates evaluation of cost, time, and technical performance of the organization on a project.
- Provides management with information appropriate to each organizational level.
- Helps in the development of the organization breakdown structure (OBS), which assigns project responsibilities to organizational units and individuals
- Helps manage plan, schedule, and budget.
- Defines communication channels and assists in coordinating the various project elements.

4-11

Work Breakdown Structure

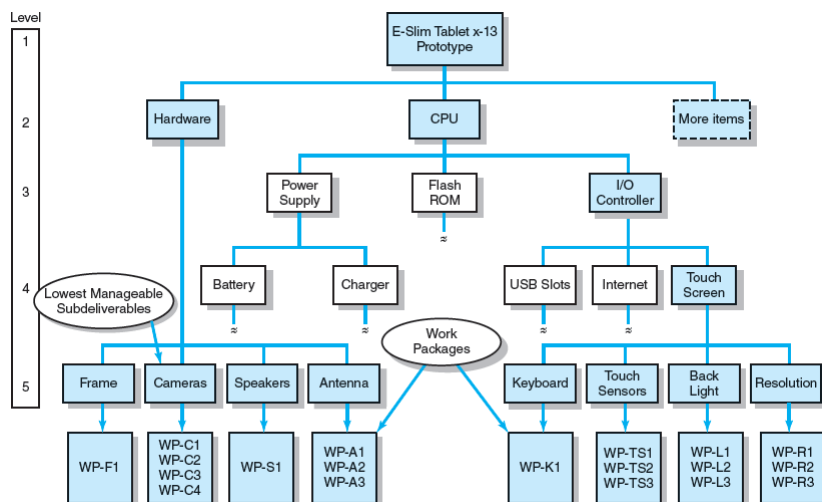


FIGURE 4.4

4-12

Work Packages

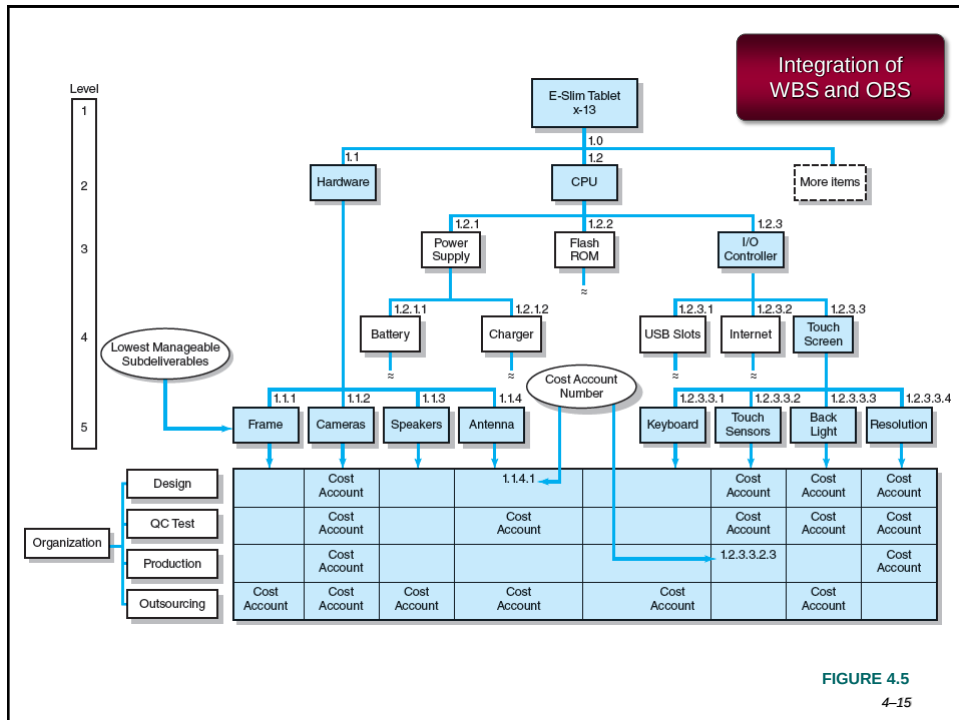
- A work package is the lowest level of the WBS.
 - It is output-oriented in that it:
 1. Defines work (what).
 2. Identifies time to complete a work package (how long).
 3. Identifies a time-phased budget to complete a work package (cost).
 4. Identifies resources needed to complete a work package (how much).
 5. Identifies a person responsible for units of work (who).
 6. Identifies monitoring points (milestones) for measuring success.

4-13

Step 4: Integrating the WBS with the Organization

- Organizational Breakdown Structure (OBS)
 - Depicts how the firm is organized to discharge its work responsibility for a project.
 - Provides a framework to summarize organization work unit performance.
 - Identifies organization units responsible for work packages.
 - Ties organizational units to cost control accounts.

4-14



Step 5: Coding the WBS for the Information System

- WBS Coding System

- **Defines:**
 - Levels and elements of the WBS
 - Organization elements
 - Work packages
 - Budget and cost information
- **Allows reports to be consolidated at any level in the organization structure**



	Task Mode	Task Name
1		1 E-Slim Tablet x-13 Prototype
2		1.1 Hardware
3		1.1.1 Cameras
4		1.1.2 Speakers
5		1.1.3 Antenna
6		1.2 CPU
7		1.2.1 Power supply
8		1.2.1.1 Battery (more items)
9		1.2.1.2 Charger (more items)
10		1.2.2 Flash Rom (more items)
11		1.2.2.1 I/O controller
12		1.2.2.2 USB slots (more items)
13		1.2.2.3 Internet (more items)
14		1.2.3 Touch screen
15		1.2.3.1 Keyboard
16		1.2.3.1.1 Work package
17		1.2.3.2 Touch sensors
18		1.2.3.2.1 Work package
19		1.2.3.2.2 Work package
20		1.2.3.2.3 Work package
21		1.2.3.3 Back light (more items)
22		1.2.3.4 Resolution (more items)

Coding
the WBS

EXHIBIT 4.5
4-17

Responsibility Matrices

- Responsibility Matrix (RM)
 - Also called a linear responsibility chart.
 - Summarizes the tasks to be accomplished and who is responsible for what on the project.
 - Lists project activities and participants.
 - Clarifies critical interfaces between units and individuals that need coordination.
 - Provide an means for all participants to view their responsibilities and agree on their assignments.
 - Clarifies the extent or type of authority that can be exercised by each participant.

Responsibility Matrix for a Market Research Project

Project Team

Task	Richard	Dan	Dave	Linda	Elizabeth
Identify target customers	R	S		S	
Develop draft questionnaire	R	S	S		
Pilot-test questionnaire		R		S	
Finalize questionnaire	R	S	S	S	
Print questionnaire					R
Prepare mailing labels					R
Mail questionnaires					R
Receive and monitor returned questionnaires				R	S
Input response data			R		
Analyze results		R	S	S	
Prepare draft of report	S	R	S	S	
Prepare final report	R		S		

R = Responsible
S = Supports/assists

FIGURE 4.7

4-19

Responsibility Matrix for the Conveyor Belt Project

Organization

Deliverables	Design	Development	Documentation	Assembly	Testing	Purchasing	Quality Assur.	Manufacturing
Architectural designs	1	2			2		3	3
Hardware specifications	2	1				2	3	
Kernel specifications	1	3						3
Utilities specifications	2	1			3			
Hardware design	1			3		3		3
Disk drivers	3	1	2					
Memory management	1	3			3			
Operating system documentation	2	2	1					3
Prototypes	5		4	1	3	3	3	4
Integrated acceptance test	5	2	2		1		5	5

1 Responsible
2 Support
3 Consult
4 Notification
5 Approval

FIGURE 4.8

4-20

Project Communication Plan

- What information needs to be collected and when?
- Who will receive the information?
- What methods will be used to gather and store information?
- What are the limits, if any, on who has access to certain kinds of information?
- When will the information be communicated?
- How will it be communicated?

4-21

Information Needs

- Project status reports
- Deliverable issues
- Changes in scope
- Team status meetings
- Gating decisions
- Accepted request changes
- Action items
- Milestone reports



4-22

Developing a Communication Plan

1. Stakeholder analysis
2. Information needs
3. Sources of information
4. Dissemination modes
5. Responsibility and timing



4-23

Example: Project Communication Plan

<i>What Information</i>	<i>Target Audience</i>	<i>When?</i>	<i>Method of Communication</i>	<i>Provider</i>
Milestone report	Senior management and project manager	Bimonthly	E-mail and hardcopy	Project office
Project status reports & agendas	Staff and customer	Weekly	E-mail and hardcopy	Project manager
Team status reports	Project manager and project office	Weekly	E-mail	Team recorder
Issues report	Staff and customer	Weekly	E-mail	Team recorder
Escalation reports	Staff and customer	When needed	Meeting and hardcopy	Project manager
Outsourcing performance	Staff and customer	Bimonthly	Meeting	Project manager
Accepted change requests	Project office, senior mgmt., customer, staff, and project mgr.	Anytime	E-mail and hardcopy	Design department
Oversight gate decisions	Senior management and project manager	As required	E-mail meeting report	Oversight group or project office

FIGURE 4.10

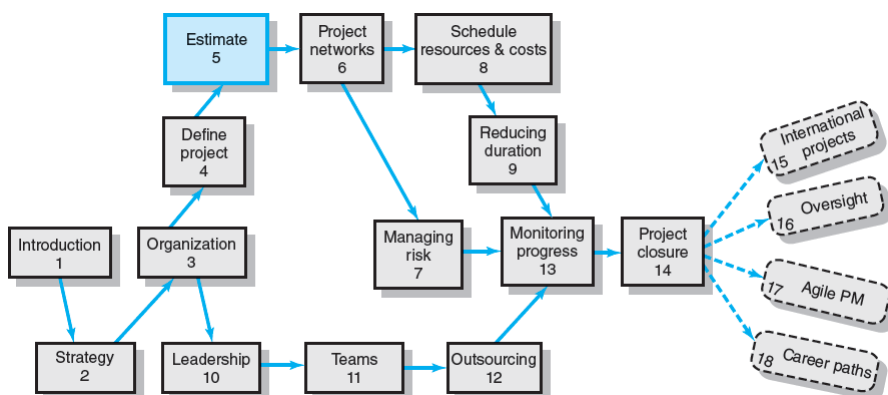
4-24

Estimating Project Time & Cost



2-25

Where We Are Now



5-26

Estimating Projects

- Estimating

- The process of forecasting or approximating the time and cost of completing project deliverables.
- The task of balancing expectations of stakeholders and need for control while the project is implemented.

- Types of Estimates

- Top-down (macro) estimates: analogy, group consensus, or mathematical relationships
- Bottom-up (micro) estimates: estimates of elements of the work breakdown structure

5-27

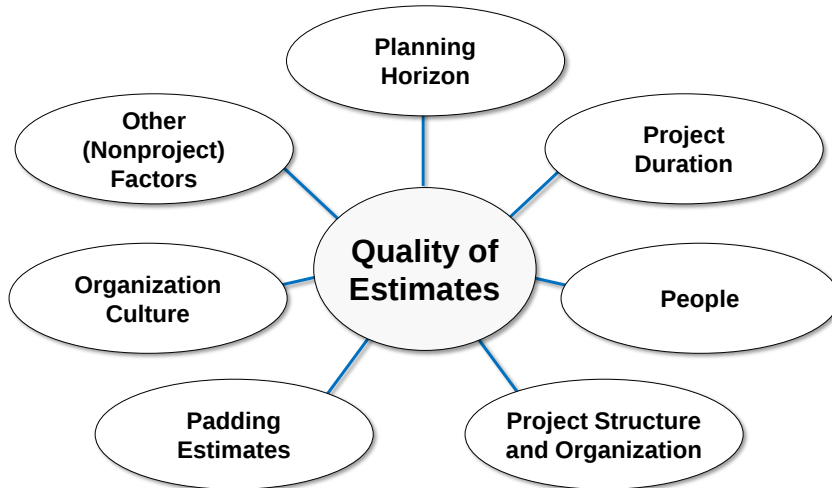
Why Estimating Time and Cost Are Important

- To support good decisions.
- To schedule work.
- To determine how long the project should take and its cost.
- To determine whether the project is worth doing.
- To develop cash flow needs.
- To determine how well the project is progressing.
- To develop time-phased budgets and establish the project baseline.

EXHIBIT 5.1

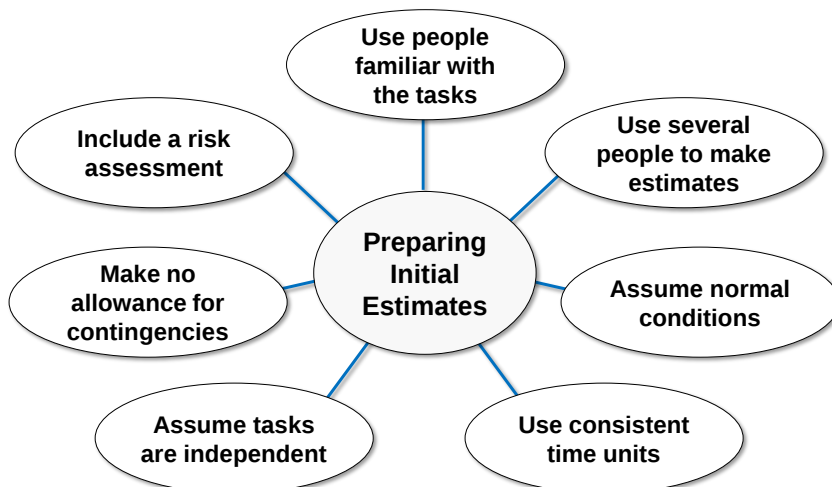
5-28

Factors Influencing the Quality of Estimates



5-29

Developing Work Package Estimates



5-30

Estimating Guidelines for Times, Costs, and Resources

1. Have people familiar with the tasks make the estimate.
2. Use several people to make estimates.
3. Base estimates on normal conditions, efficient methods, and a normal level of resources.
4. Use consistent time units in estimating task times.
5. Treat each task as independent, don't aggregate.
6. Do not make allowances for contingencies.
7. Add a risk assessment to avoid surprises to stakeholders.

5-31

Top-Down versus Bottom-Up Estimating

- Top-Down Estimates

- Are usually derived from someone who uses experience and/or information to determine the project duration and total cost.
- Are made by top managers who have little knowledge of the processes used to complete the project.

- Bottom-Up Approach

- Can serve as a check on cost elements in the WBS by rolling up the work packages and associated cost accounts to major deliverables at the work package level.

5-32

Top-Down versus Bottom-Up Estimating

Conditions for Preferring Top-Down or Bottom-up Time and Cost Estimates

Condition	Top-down Estimates	Bottom-up Estimates
Strategic decision making	X	
Cost and time important		X
High uncertainty	X	
Internal, small project	X	
Fixed-price contract		X
Customer wants details		X
Unstable scope	X	

TABLE 5.1

5-33

Estimating Projects: Preferred Approach

- Make rough top-down estimates.
- Develop the WBS/OBS.
- Make bottom-up estimates.
- Develop schedules and budgets.
- Reconcile differences between top-down and bottom-up estimates

5-34

Top-Down Approaches for Estimating Project Times and Costs

- Consensus methods
- Ratio methods
- Apportion method
- Function point methods for software and system projects
- Learning curves



5-35

Apportion Method of Allocating Project Costs Using the Work Breakdown Structure

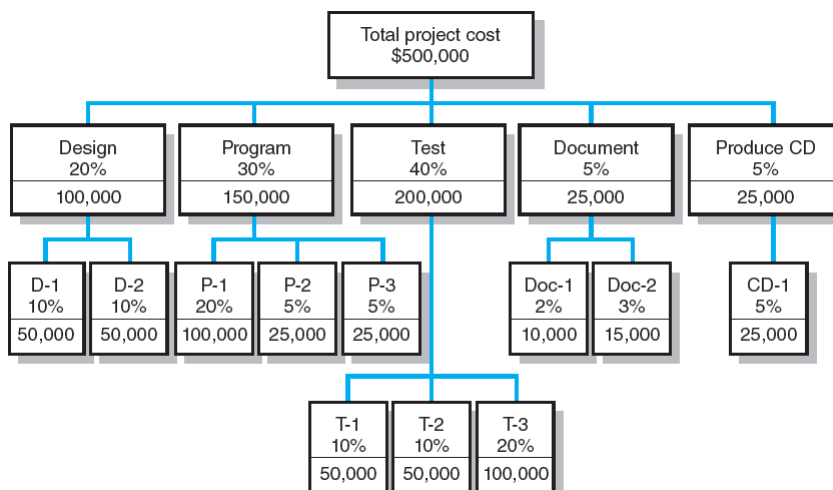


FIGURE 5.1

5-36

Bottom-Up Approaches for Estimating Project Times and Costs

- Template methods
- Parametric procedures applied to specific tasks
- Range estimates for the WBS work packages
- Phase estimating: A hybrid



5-37

Top-Down and Bottom-Up Estimates

Top-Down Estimates	Bottom-Up Estimates
Intended Use Feasibility/conceptual phase Rough time/cost estimate Fund requirements Resource capacity planning	Intended Use Budgeting Scheduling Resource requirements Fund timing
Preparation Cost 1/10 to 3/10 of a percent of total project cost	Preparation Cost 3/10 of a percent to 1.0 percent of total project cost
Accuracy Minus 20%, to plus 60%	Accuracy Minus 10%, to plus 30%
Method Consensus Ratio Apportion Function point Learning curves	Method Template Parametric WBS packages Range estimates

FIGURE 5.4

5-38

Level of Detail

- Level of detail is different for different levels of management.
- Level of detail in the WBS varies with the complexity of the project.
- Excessive detail is costly.
 - Fosters a focus on departmental outcomes
 - Creates unproductive paperwork
- Insufficient detail is costly.
 - Lack of focus on goals
 - Wasted effort on nonessential activities

5-39

Types of Costs

- Direct Costs
 - Costs that are clearly chargeable to a specific work package.
 - Labor, materials, equipment, and other
- Direct (Project) Overhead Costs
 - Costs incurred that are directly tied to an identifiable project deliverable or work package.
 - Salary, rents, supplies, specialized machinery
- General and Administrative Overhead Costs
 - Organization costs indirectly linked to a specific package that are apportioned to the project

5-40

Contract Bid Summary Costs

Direct costs	\$80,000
Direct overhead	<u>\$20,000</u>
Total direct costs	\$100,000
G&A overhead (20%)	<u>\$20,000</u>
Total costs	\$120,000
Profit (20%)	<u>\$24,000</u>
Total bid	\$144,000

FIGURE 5.5

5-41

Three Views of Cost

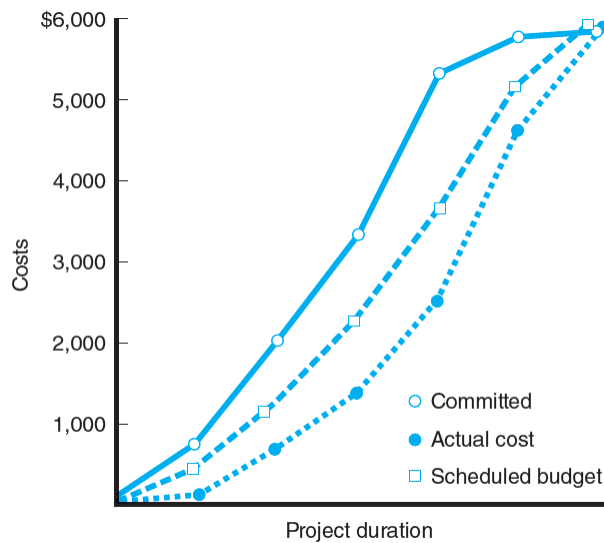


FIGURE 5.6

5-42

Refining Estimates

- Reasons for Adjusting Estimates
 - Interaction costs are hidden in estimates.
 - Normal conditions do not apply.
 - Things go wrong on projects.
 - Changes in project scope and plans.
- Adjusting Estimates
 - Time and cost estimates of specific activities are adjusted as the risks, resources, and situation particulars become more clearly defined.